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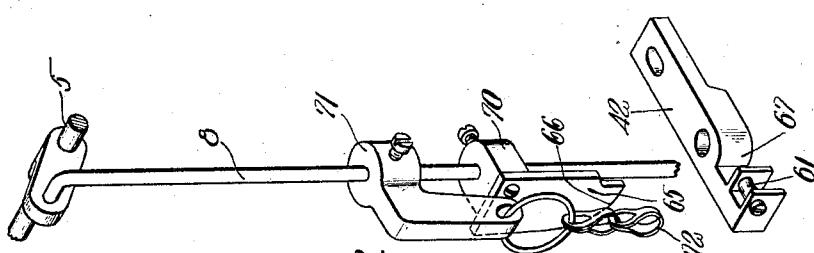
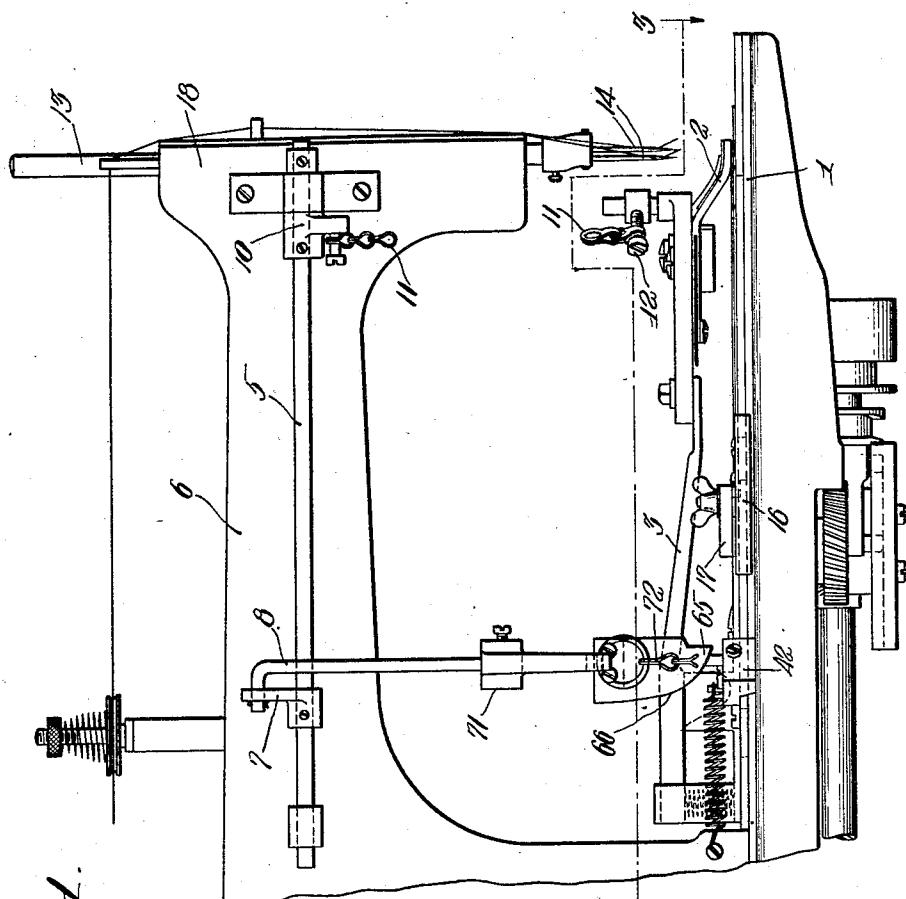
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BUTTON SEWING MACHINE

Filed Oct. 9, 1929

3 Sheets-Sheet 1



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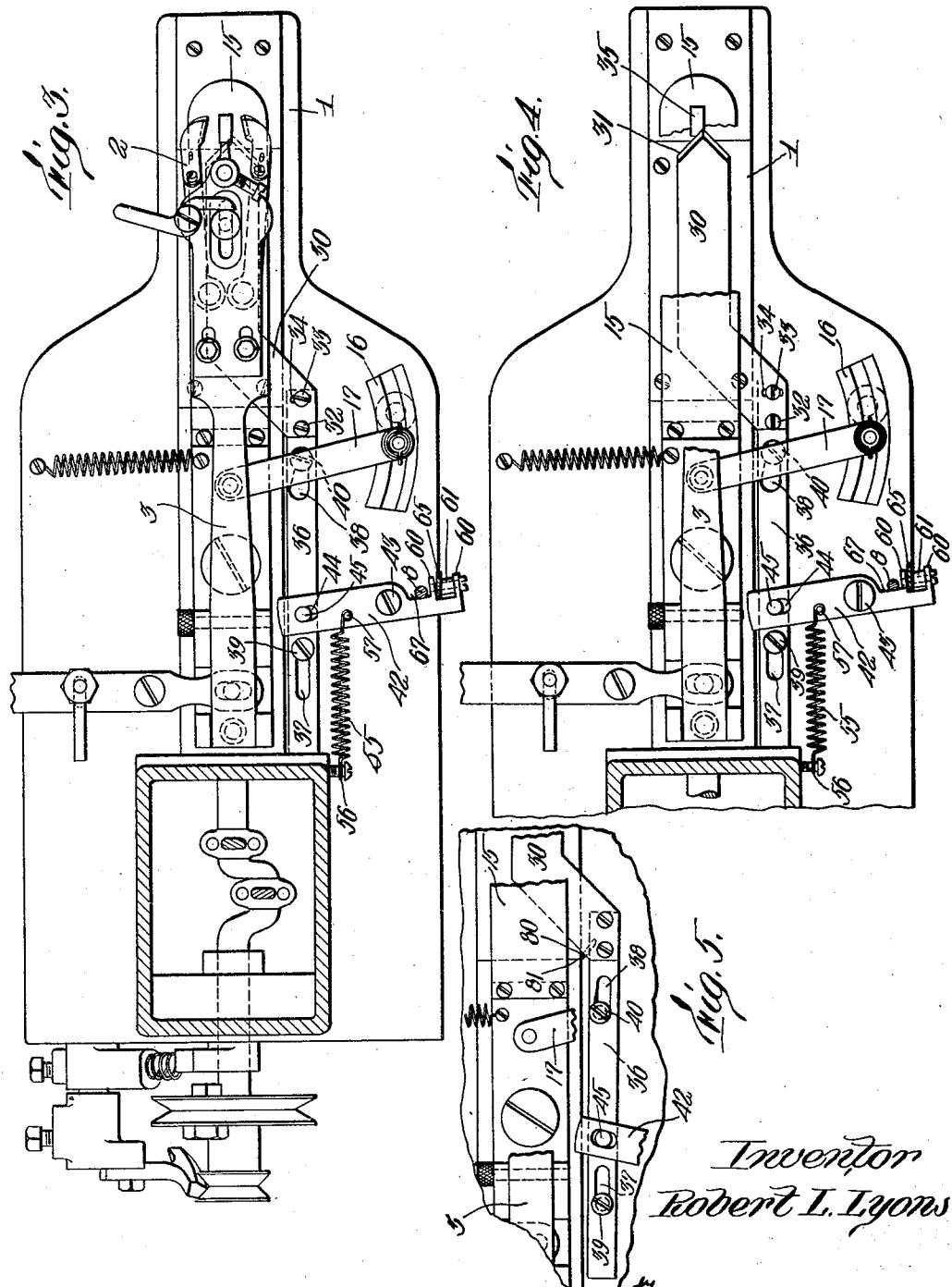
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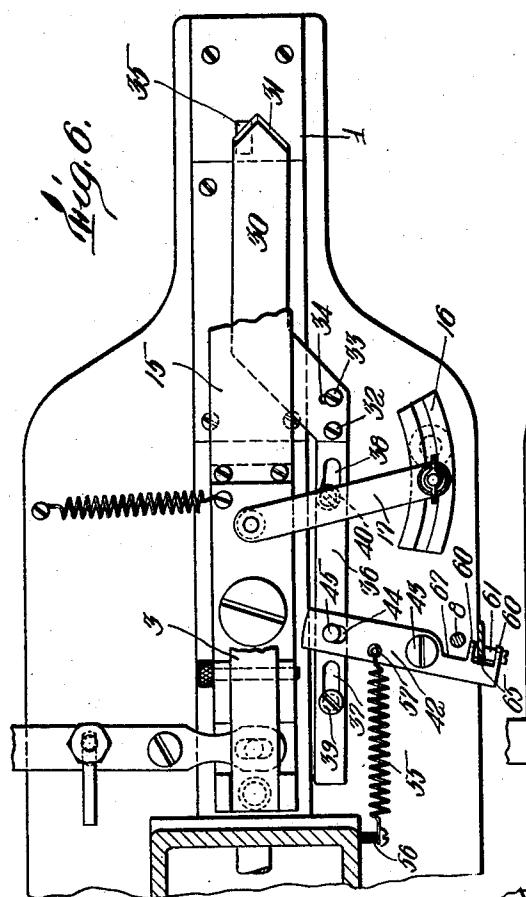
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UNITED STATES PATENT OFFICE

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BUTTON SEWING MACHINE

Application filed October 9, 1929. Serial No. 398,408.

This invention relates to machines for sewing on buttons or the like and more particularly to such machines of the chain stitch or single thread type. In such machines it is customary to pass the needle, where a single needle is used, through the same hole in the button twice at the end of the stitching cycle, which knots the thread, whereupon the operator pulls on the work and breaks the thread. When a pair of sewing needles and a single looper for taking loops of thread from both needles is employed, as in the machine disclosed and claimed in my application for patent Serial No. 351,391, filed March 30, 1929, for fastening means and method and machine for securing buttons to work therewith, no special knotting stitch is necessary, the two threads being effectually knotted at each stitch. The threads may then be broken at the end of the stitching cycle as in the case of the single-needle machine adjacent to the knot at the last stitch. This breaking of the thread, particularly when heavy thread is employed, is not always easy and sometimes the thread does not break at the desired place relative to the knot, either leaving a long thread end or being so close as to endanger the security of the knot.

In accordance with the present invention, therefore, means are provided for cutting the thread at the proper point after the stitching cycle and before the work is removed. This may be accomplished automatically when the button clamp is raised to release the work. When the machine stops at the end of the stitching cycle the needle is retracted, the thread passing therefrom through a stitching hole in the button and the work, being looped about the looping mechanism and extending to the knot. In accordance with this invention a knife is arranged to cut the loop portion of the thread between the looper and the work, approaching the thread from the outside of the loop and cutting the thread between the looper and the knot.

For a more complete understanding of this invention, reference may be had to the accompanying drawings in which

Figure 1 is a fragmentary side elevation of

a button sewing machine provided with a thread cutter.

Figure 2 is a fragmentary perspective of cooperating portions of the cutter actuating mechanism.

Figure 3 is a horizontal section through the machine substantially on line 3-3 of Figure 1.

Figure 4 is a view similar to a portion of Figure 3, but showing parts of the button clamp broken away to disclose the thread cutter.

Figure 5 is a fragmentary plan, parts being broken away showing a modified form of cutter actuating mechanism in knife-projected position.

Figures 6 and 7 are views similar to Figure 4, but showing the knife in projected position, Figure 7 showing a modified construction.

Figures 8 and 9 are fragmentary perspectives illustrating successive positions of certain of the machine parts with relation to the work.

Figure 10 is a plan of a back face of the work showing the position of the cut thread ends.

Referring first to Figures 1 and 3, the machine illustrated includes a work table 1 supporting a cloth plate 15 on which the work is supported and which is held against the upper face of the work table by a superposed button clamp of any suitable type indicated at 2. This button clamp as shown is carried by an arm 3 pivoted rearwardly of the button clamp in the usual manner and arranged to be lifted from the cloth plate to release the work by any suitable mechanism which commonly is actuated by a treadle. As illustrated in Figure 1 this raising mechanism includes a rock shaft 5 arranged horizontally along one side of the stitching arm 6 and having fixed thereto an arm 7 with which is engaged a pull rod 8 extending downwardly to the actuating mechanism and which also has fixed thereto an arm 10 carrying the upper end of a chain 11, the lower end of which is fixed as at 12 to a portion of the button clamp. The button clamp and the cloth plate may be vibrated laterally to bring each of a pair of

holes in the button into the needle path alternately during the stitching cycle, in a manner well known, a rocking segment 16 and connecting link 17 being shown for that purpose. The sewing arm 6 is provided with the usual head 18 in which is carried a needle bar 13. As illustrated in Figure 1 this needle bar is provided with a pair of sewing needles 14, this machine having a pair of sewing needles 10 being more particularly illustrated, described and claimed in my application for patent Serial No. 351,391, filed March 30, 1929. While the two-needle machine is herein shown, it is of course evident that the invention 15 might be applied to a single-needle machine though the utility of this invention is more clearly apparent in the two-needle machine where it is necessary to sever two threads in order to free the work from the 20 machine at the end of the stitching cycle.

As illustrated in my prior application for patent and as shown also in Figures 8 and 9, each one of these needles has its own sewing thread and places stitches through a pair of 25 holes in the button and through the work, the stitching being done simultaneously with the two needles. In button sewing machines of the chain stitch type the loops of thread passed through the button are taken successively by some form of looper mechanism 30 beneath the work table, each loop as taken being passed through a previously formed loop in order to form the chain stitches.

In the two-thread machine of the chain 35 stitch type as illustrated in my prior application hereinbefore referred to, this looper mechanism comprises a latch needle as shown at 20 in Figure 8, this latch needle being arranged to take loops of thread from both the 40 needles 14 and to draw these loops through loops previously drawn to produce the chain stitches. It will be noted that whenever the stitching needle is retracted from the work a loop of thread extends therefrom about the 45 looper mechanism and back to the work and in order to remove the work at the end of the stitching cycle it is necessary to sever the thread in order that the work may be released.

In accordance with the present invention 50 means are provided for cutting the thread, this means engaging the looped portion of the thread where it is under tension about the looper and being so positioned as to cut the thread a short distance from the knot and 55 in the case of the two-needle machine to cut both sewing threads. By this means sufficient thread extending from the knot is insured to prevent untying of the knot while insuring against the leaving of a long thread 60 end at the work and providing sufficient thread extending from the needle at the end of the severing operation to prevent likelihood of the needle becoming unthreaded or of there being insufficient length of thread 65 end for the starting of the next stitching

cycle. As illustrated in the drawings this thread-severing mechanism comprises a knife 30 having a V shaped cutting edge 31 at its forward end, this knife being positioned on the upper face of the work table and beneath the cloth plate 15 and the button clamp and as illustrated it is arranged to be brought into action at the end of the stitching cycle, and preferably, and as shown, it is actuated by the button clamp raising mechanism to sever the stitching thread or threads. This knife 30 is shown as secured to an actuating bar 36 as by means of a pair of screws 32 and 33. At least one of these screws is shown as extending through a slot 34 in the knife in order that the angular position of the knife may be adjusted as desired in order to bring the desired cutting portion thereof into proper position relative to the throat 35 in the work table through which the needles pass.

As illustrated in Figure 3 the actuating bar 36 is provided with a pair of guide slots 37 and 38 through which extend guide screws 39 and 40, respectively, the bar 36 being held thereby at one side of the cloth plate 15, the forward end of the knife being laterally offset to extend beneath the cloth plate. The slot 37 is of sufficient width to permit the bar 36 to slide easily on the screw 39 but the rear end portion of the slot 38 is shown as wider than the forward portion so as to permit a lateral swinging motion of the bar 36 about the screw 39 as an axis. The bar 36 is shown as moved axially and laterally by means of a lever 42 pivoted at 43 on the top of the work table. The inner end of the lever 42 is provided with a slot 44 in which rides a pin 45 projecting from the bar 36 and the parts are so proportioned that when the lever 42 is swung to project the knife carrier bar 36 forwardly, this pin 45 strikes the outer end of the slot 44 before this forward motion is complete, whereupon further swinging of the lever 42 acts to pull the bar 36 laterally as is permitted by the large portion of the slot 38 as well as to move it forwardly. The cutting edge 31 of the knife therefore moves forwardly and laterally in a curved path, thus producing a shearing motion against the threads which extend up in loop formation through the throat 35, the upper portion of each loop extending to the knot on the lower side of the work and the lower portion of the loop extending up through the work and a hole in the button to a needle 14 as is illustrated in Figure 8. Of course where but one sewing needle is employed only one such loop of thread is presented to be engaged by the knife edge. As the loop of thread so presented is engaged about the looper mechanism, which imposes frictional resistance to its passage therewith, the side of the loop extending from the knot to the looper is under greater tension than that extending from the looper to the needle and hence offers the

greater resistance to the passage of the knife so that this side of the thread loop is cut. The loop thus being cut on one side is immediately freed from tension so that it yields to the knife so that no further cutting of the thread is accomplished. The cut position is then at a sufficient distance from the knot to avoid danger of the knot untying and yet does not leave a long thread end extending from the work. The position of this cut is illustrated in Figure 10 where the short thread ends are illustrated at 50. Where the loops are taken by a latch needle, as is illustrated in Figure 8, the threads pass sharply about the looper mechanism, thus producing substantial frictional resistance to slipping of the thread about the looper mechanism while the loop is tight so that cutting of the proper side of the loop is readily insured even though the knife approaches and engages the loop from outside, the sides of the loop being close together. In the case of the two needle machine the knife engages two such loops and in practice it has been found that it uniformly cuts that side of each loop which extends between the looper and the knot.

The lever 42 is normally held in retracted position with the knife retracted from the throat 35, as shown in Figure 3, as by means of a spring 55, one end of which engages an abutment such as a screw 56 fixed to the machine frame and the other end of which engages the lever 42 as at 57. The outer end of the lever 42 is shown as provided with spaced jaws 60 between which is mounted a cam roller 61 and fixed to the pull rod 8 of the button clamp raising mechanism is a cam plate 65 having a cam edge 66, which, when the rod 8 is depressed, impinges on the following roll 61 and swings the outer end of the lever 42 rearwardly thus to push the knife forwardly as shown in Figure 6 to cut the threads. The lever 42 is also shown as provided with a cut away portion 67 in which the rod 8 rides. As illustrated in Figure 2 the cam plate 65 is carried by a collar 70 adjustable on the rod 8 and the rod 8 also carries a collar 71 to which is attached the upper end of the pull chain 72 which leads to the actuating treadle mechanism. Thus as the button clamp is raised at the end of the stitching cycle to free the work, the thread cutter is projected forwardly to sever the thread so that the work may be freely removed from the machine. Adjustment of the position of the cam plate 65 on the rod determines the closeness of the cutting of the threads to the work and thus the length of the thread ends extending therefrom. The lower the cam plate is set, the earlier is the cutting effected on raising the button clamp and the closer are the cuts to the work and the shorter the thread ends.

Another means of producing the lateral as well as the forward motion of the knife is

illustrated in Figure 5 in which the bar 36 is provided with a projecting pin 80 which engages and rides over a shoulder 81 on the work table. While this lateral motion of the knife is often desirable, the knife may be guided for a front and back motion without the lateral motion if desired. Where this is desired the guide slots for the bar 36 are both of substantially the width of the guide pins or screws 39 and 40 and the slot 44 in the lever 42 to receive the pin 45 is sufficiently long so that its ends clear the pin in all positions as is illustrated in Figure 7. Particularly where no lateral movement of the knife is desired, the knife may be adjusted so that the cutting portion at either side of its apex may be brought into operative relation to the thread loops. Thus the knife may be adjusted as it becomes dull in one portion to bring another portion of the cutting edge into operative position by merely adjusting the angular relation of the knife to its actuating bar 36, this being facilitated by its screw and slot connection thereto.

Certain embodiments of this invention having thus been described, it should be evident to those skilled in the art that various changes and modifications might be made therein without departing from its spirit or scope as defined by the appended claims.

I claim:

1. A button sewing machine having a work table means above said table for supporting work and a button in position for sewing the button to the work, sewing instrumentalities including a loop engaging member for fixing the button to the work by chain stitches, a thread severing element between said table and said button supporting means, and means actuatable at the end of the stitching cycle for actuating said element to cut one side of a loop of the thread while engaged by said member.

2. A button sewing machine having means for supporting work and a button in position for sewing the button to the work, sewing instrumentalities including a pair of needles for simultaneously placing securing stitches through holes in the button and through the work, and means actuatable at the end of a stitching cycle to cut the thread from each needle adjacent to the work.

3. A button sewing machine having means for supporting work and a button in position for securing of the button to the work, chain stitch sewing instrumentalities including a latch needle for engaging successive loops of thread and drawing them through the previously formed loops, a cutter, and means actuatable at the end of a stitching cycle for bringing said cutter against a loop of thread held taut by said latch needle to sever the thread to facilitate removal of the work from the machine.

4. A button sewing machine having a work

table means above said table for supporting work and a button in position for sewing the button to the work, means for sewing the button to the work including means for drawing successive loops of thread, and means actuatable at the end of the stitching cycle and while a loop of thread is held by said drawing means for severing the thread between said table and supporting means at said loop to facilitate removal of the work from the machine.

5. A button sewing machine having means for supporting a button and work in position to stitch the button to the work, sewing instrumentalities including a plurality of needles each having a sewing thread and a looper for taking loops of thread from both needles, and means actuatable at the end of the stitching cycle to sever the threads between 10 the work and the looper.

6. A button sewing machine having means for supporting a button and work in position to stitch the button to the work, sewing instrumentalities including a plurality of needles each having a sewing thread and means for taking loops of thread from both needles, and means actuatable to cut the loops of all the threads.

7. A button sewing machine having means for supporting a button and work in position to stitch the button to the work, sewing instrumentalities including a plurality of needles each having a sewing thread and means for taking loops of thread from said needles, 30 a knife and means actuatable to bring said knife against all the threads at the loops and sever said threads.

8. In combination with a machine of the class described having a work table, a button clamp for holding a button and work in position to sew the button to the work, means for lifting the button clamp, and sewing instrumentalities including a looper for fixing the button to the work by loops of thread in 40 chain stitch formation, a knife mounted for movement above the work table and beneath the button clamp, and means actuated by the lifting of the button clamp to move the knife against a loop of thread held by the looper 45 and to sever the thread on one side of said loop.

9. In combination with a machine of the class described having a work table, a cloth plate on said work table, means for holding a button and work in superposed relation above said cloth plate in position to fix the button to the work, and sewing instrumentalities including mechanism positioned beneath the work table for sewing the button 55 to the work by chain stitches, a thread cutter positioned between the work table and the cloth plate, and means for actuating said cutter to cut thread extending from the work to said mechanism.

60 10. In combination with a machine of the

class described having a work table, means for holding a button and work in superposed position to fix the button to the work above said table, and sewing instrumentalities for fixing the button to the work, a member slidably guided on said work table, a knife carried by said member, a lever operatively connected to said member, means yieldingly holding said member in position to hold said knife retracted, and means actuatable to rock said lever to project said knife against and to cut a thread held by said instrumentalities. 70

11. In combination with a machine of the class described having a work table, means for holding a button and work in position to fix the button to the work above said table, and sewing instrumentalities for fixing the button to the work, a member slidably guided on said work table, a knife carried by said member, a lever operatively connected to said member, means yieldingly holding said member in position to hold said knife retracted, and means actuatable to rock said lever to project said knife against and to cut a thread held by said instrumentalities, said operative 80 connections including means for causing said knife to be moved in a curved path as it is projected.

12. In combination with a machine of the class described having a work table, means for holding a button and work in position to fix the button to the work above said table, and sewing instrumentalities for fixing the button to the work, a member slidably guided on said work table, a knife carried by said member, a lever having a pin and slot connection with said member, means yieldingly holding said member in position to hold said knife retracted, and means actuatable to rock said lever to project said knife against and to cut a thread held by said instrumentalities, the pin of said pin and slot connection being positioned to engage one end of said slot as said knife is projected whereby further rocking of said lever projects said knife in a curved path. 90 100

13. In combination with a machine of the class described having a work table, a button clamp for holding a button and work above said table in position to fix the button to the work, means including a depressible element for raising such button clamp to release the work, and sewing instrumentalities to stitch the button to the work while the clamp is down, a knife slidably guided on the work table, a lever operatively connected to said knife to project and retract said knife by swinging of said lever, means yieldingly holding said knife retracted, a cam carried by said depressible element, and a cam follower carried by said lever in the path of said cam 115 when said knife is retracted, said cam being shaped to swing said lever and project said knife to cut the stitching thread between the work and certain of said instrumentalities 120 when the button clamp is being raised. 125 130

14. In combination with a machine of the class described having a work table, a button clamp for holding a button and work above said table in position to fix the button to the work, means including a depressible element for raising such button clamp to release the work, and sewing instrumentalities to stitch the button to the work while the clamp is down, a knife slidably guided on the work table, a lever operatively connected to said knife to project and retract said knife by swinging of said lever, means yieldingly holding said knife retracted, a cam carried by said depressible element, and a cam follower carried by said lever in the path of said cam when said knife is retracted, said cam being shaped to swing said lever and project said knife to cut the stitching thread between the work and certain of said instrumentalities when the button clamp is being raised, said cam being adjustable relative to said depressible element to adjust the time of cutting relative to the raising of said button clamp to thereby determine the length of the cut thread end.

In testimony whereof I have affixed my signature.

ROBERT L. LYONS.

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