March 16, 1965 H. ADAM 3,173,393

THREAD CUTTING MECHANISM FOR LOCKSTITCH SEWING MACHINES

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FIG. 1

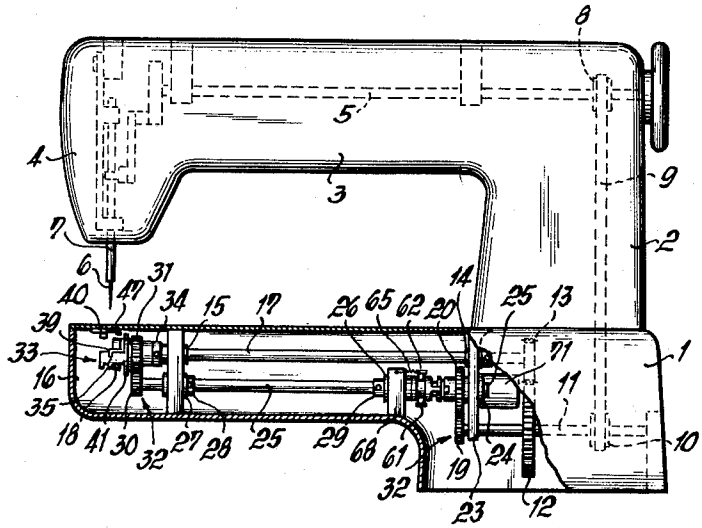


FIG. 7

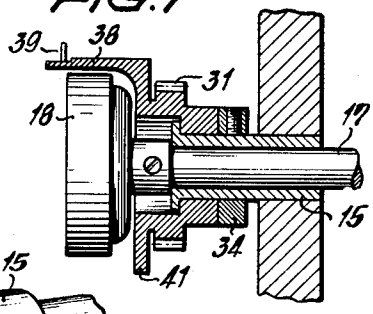


FIG. 2

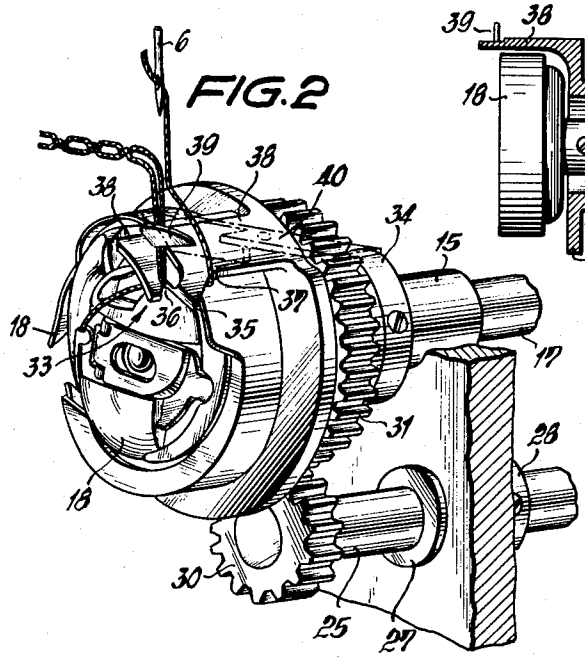
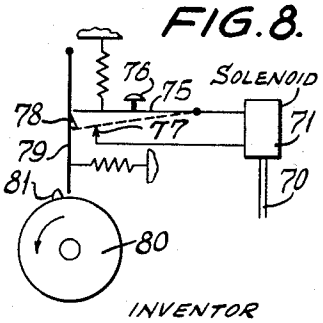


FIG. 8.



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FIG. 3

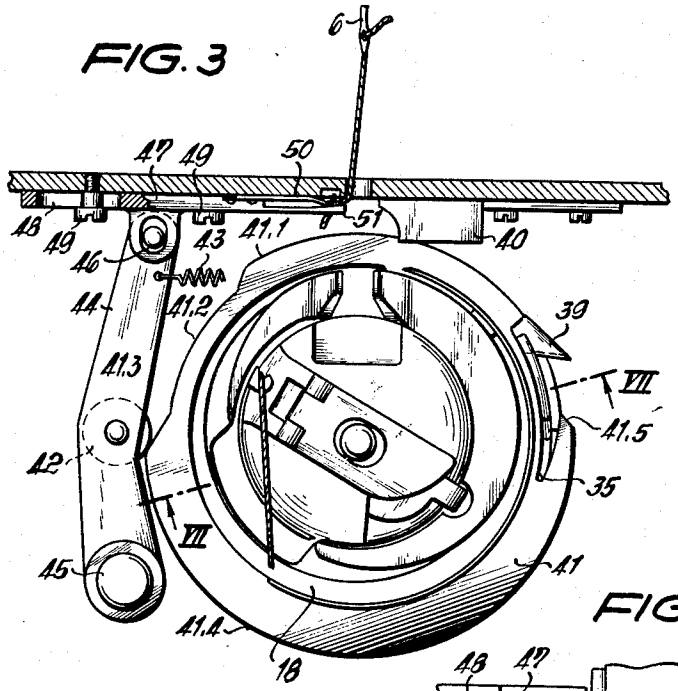


FIG. 5

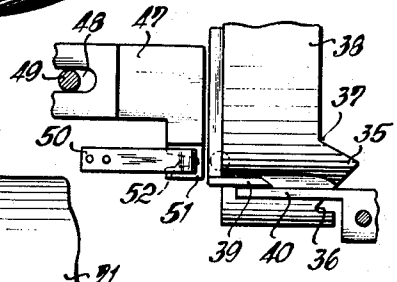


FIG. 4

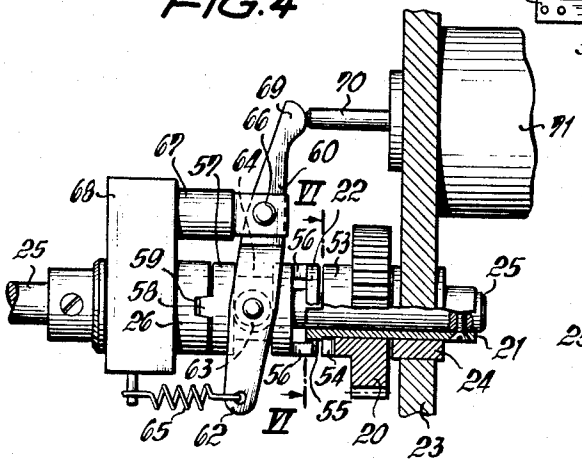
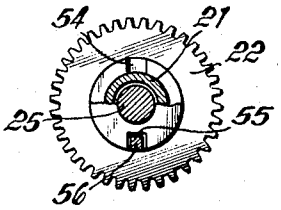


FIG. 6



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3,173,393

THREAD CUTTING MECHANISM FOR LOCKSTITCH SEWING MACHINES

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Claims priority, application Germany, Dec. 13, 1961, P 28,414
10 Claims. (Cl. 112—252)

The present invention relates to thread cutting and control mechanism for sewing machines, more particularly to machines of the type including a rotary looper or loop taker cooperating with a reciprocating needle for the production of lockstitches, in a manner well known in the art.

An important object of the invention is the provision of improved thread trimming mechanism for machines of the above type by means of which both the upper or needle thread and the lower or looper thread may be cut in the proper position at the end of a sewing operation by the provision of a suitable catch-thread and trimming device operable during and in cooperation with a normal needle operating or reciprocating cycle.

Another object of the invention is the provision of combined upper and lower thread trimming means of the type referred to, being operably associated with upper or needle thread locking means, whereby to enable a trimming of the needle thread with a minimum projecting length from the eye of the needle, while at the same time ensuring a safe and reliable initiation of the upper and lower thread interlock at the starting of a subsequent seam or stitching operation.

Yet another object of the invention is the provision of unitary control means in conjunction with upper and lower thread trimming and locking means of a lockstitch sewing machine of the type referred to, to automatically sew a predetermined number of initial or starting stitches during locking of the cut end of the needle thread.

There has already become known as described by U.S. patent application Serial No. 215,317, filed by Kristen Hedegaard, entitled Thread Trimming Mechanism for Lockstitch Sewing Machines, and assigned to the same assignee as the instant application thread trimming mechanism or devices for lockstitch sewing machines including a rotary loop taker and utilizing a catch-thread and trimming device cooperating with a stationary cutter at a predetermined loop taker position or position of the upper and lower threads during the loop forming period of a complete needle oscillating cycle or operation. More particularly, in the known arrangement the catch-thread and trimming device is operated in a to and fro or oscillating movement upon reaching the predetermined loop taker position during a needle operating cycle, whereby to first trap the loop taker thread and the work limb of the needle thread loop during one half-cycle movement of said device, and to subsequently cut both threads by the stationary cutting knife during the remaining half-cycle or movement of the device in the opposite direction.

In thread trimming devices of the aforementioned and other types, it is necessary, in order to prevent unthreading or disengagement of the needle thread from the needle during the first stitch formation subsequent to a thread trimming operation, to sever the needle thread at a point sufficiently spaced from the needle, that is, to ensure an adequate projecting length of the cut thread from the eye of the needle, in an effort to enable a safe and reliable thread interlock between the upper and lower threads at the commencement of a new stitching operation. This has the disadvantage, among others, that the beginning of the needle thread may not be fully drawn through the

work or fabric during the subsequent stitching cycle and as a result will project from the top or upper surface of the work or fabric. This condition is highly objectionable in many cases, in particular in ornamental stitching, so that it becomes necessary to subsequently remove or cut the undesirable projecting thread ends, or to manually draw the same through and to the underside of the work.

Aside from ornamental stitching and the like special sewing operations, it is generally desirable, if not imperative, to cut the needle thread at a point as close as possible to the needle without endangering the safe and reliable thread interlock during the initial stitches of a subsequent sewing operation.

A more specific object of the present invention is, therefore, the provision of means in conjunction with an upper and lower thread trimming device of the general type referred to, wherein the drive or operating means of said device, being synchronized with the needle operation, is additionally utilized to temporarily operate a suitable upper thread clamping or locking device, to ensure a safe initiation of a new lockstitch operation subsequently to a thread cutting operation.

The invention, both as to the foregoing and ancillary objects and novel aspects thereof, will be better understood from the following detailed description of a preferred practical embodiment, taken in conjunction with the accompanying drawings forming part of this specification and in which:

FIG. 1 is a general elevational view of a sewing machine, shown partly in section, and embodying thread-trimming and locking means constructed in accordance with the principles of the invention;

FIG. 2 is a partial perspective view showing the catch-thread and trimming device and the unitary control cam therefor being embodied in the machine according to FIG. 1;

FIG. 3 is a front view of the thread-trimming and locking device with the stitching plate of the machine being shown in section;

FIG. 4 is a plan view partly shown in section of the coupling mechanism for the thread-trimming and locking device;

FIG. 5 is a partial plan view of the thread-trimming and locking device;

FIG. 6 is a sectional view taken on line VI—VI of FIG. 4;

FIG. 7 is a sectional view taken on line VII—VII of FIG. 3; and

FIG. 8 is an electrical circuit diagram schematically illustrating the operation of the thread cutter, locking device and starting switch control in accordance with the invention.

Like reference numerals denote like parts and elements in the different views of the drawings.

With the foregoing objects in view, the invention, according to one of its aspects, involves generally the provision of a conventional lockstitch sewing machine of the type including a throat or stitching plate, a reciprocating needle above said plate and a rotary loop taker having a needle thread seizing beak and mounted below said plate for cooperation with said needle, to produce lockstitches by the needle and looper threads, with thread trimming mechanism comprising a catch-thread device disposed close to the outer surface of said loop taker for rotation coaxially therewith, said device, in the preferred embodiment, having a recess and adjoining triangular projection pointing in a direction opposite to said beak, whereby to catch and trap both the looper thread and the work limb of the needle thread loop formed by said loop taker upon rotation of said device from a predetermined starting position in respect

to and synchronously with a needle oscillating or operating cycle, said projection preferably moving in a direction opposite to said beak. Said device is furthermore provided with first cutting means in the form of a cutting knife for cooperation with a stationary plate or cutter, to sever both said threads in the trapped position during an active needle oscillating or operating cycle of the machine.

There is furthermore provided in accordance with the present invention suitable means to couple said catch-thread device with the driving shaft of the machine at a predetermined position during the needle operating cycle, to initiate the thread cutting operation and to arrest the device for subsequent use.

Furthermore, according to another aspect of the present invention, there is provided means being operably associated with the thread trimming mechanism to continue the loop taker and needle operation during a limited number of needle operating cycles subsequently to the thread trimming operation and before arresting the device, for the actuation of a needle thread clamping or locking device during a predetermined number of initial or starting stitches of a subsequent sewing operation with the cut end of the upper thread in the locked position, to ensure a safe and reliable starting or interlock of the upper and lower threads during commencement of said sewing operation. As a result, the threads, in particular the needle thread may be cut at a point being at a minimum distance from the eye of the needle, to prevent the end of the thread from projecting from the work, as well as to avoid other defects and to generally improve and stabilize the thread interlock or stitch formation at the start of a new seam or sewing pattern.

For the foregoing purpose, the catch-thread and trimming device rotating together with the loop taker is advantageously fitted with a control cam cooperating with suitable cam follower means which, in turn, serves to control a needle thread clamping slide or the like, said cam having a control surface or contour such as to effect, during a complete revolution thereof corresponding to a predetermined number of loop taker revolutions or needle oscillating cycles, the integrated sequential operations of catching and cutting the threads, of locking the needle thread, performing a desired number of subsequent initial or starting stitches with the needle thread in the locked condition, and finally unlocking the thread for the continuance of ordinary stitching by the machine.

In order to initiate the thread trimming operation, the locking and initial stitch formation, the catch-thread device and control cam may be coupled with the drive shaft of the machine through a suitable releasable coupling device preferably operated by means of a solenoid in conjunction with suitable further means to initiate the coupling connection at a predetermined position during the needle oscillating cycle, that is, during the downward needle movement, while disconnection of the device may be effected upon a complete revolution of the cam by de-energization of said solenoid, in a manner as will become further apparent as the following description proceeds in reference to the drawings.

Referring more particularly to FIG. 1, there is shown a conventional sewing machine comprising a base **1** supporting an upright **2** from which extends an overhanging upper arm **3** terminating in a sewing head **4**. Mounted within the arm **3** is the main drive shaft **5** of the machine being operably connected with the vertically reciprocating needle bar **7** carrying an eye-pointed needle **6** through which is passed in a known manner the upper or needle thread, FIGS. 2 and 3. Secured to the main drive shaft **5** is a first pulley **8** which serves to impart rotation to an auxiliary shaft **11** parallel to shaft **5** and mounted in the base **1** by way of a belt **9** and cooperating second pulley **10** mounted upon said auxiliary shaft. Operably connected with the shaft **11**, through a pair of

gears **12**, **13** is the loop taker drive shaft **17** being supported by a pair of sleeves or bearings **14**, **15** mounted within the lower or work supporting arm **16** of the sewing machine. The front end of shaft **17** carries a cylindrical rotary looper or loop taker **18** of known construction for cooperation with the reciprocating needle **6** for the formation of lockstitches by interlocking of the looper and needle threads in the ordinary manner. For this purpose, the looper **18** may have a needle thread seizing beak **18'** serving to draw out and cast off the needle thread loop formed during rotation of the looper which, by a suitable design of the transmission ratio **12**, **13**, may perform two revolutions during each complete reciprocating oscillating cycle of the needle, as is customary with conventional double lockstitch sewing machines.

The end of the auxiliary shaft **11** carries a further gear **19** which meshes with a counter gear **20** being loosely mounted upon a hollow shaft **21**, FIG. 4, between a flange **22** of said shaft and a sleeve or bushing **24** secured in a supporting wall **23** attached to the lower arm **16** of the sewing machine. The hollow shaft **21** being driven, in the example shown, at a speed reduction 2:1 from the shaft **11** is, in turn, fixedly connected to a horizontal drive shaft **25** of the thread cutting and locking device, said last-mentioned shaft being supported by a pair of sleeves or bearings **26**, **27**, FIG. 1, and secured against axial displacement by the provision of a pair of setting or locking rings **28**, **29**. Mounted at the lefthand end of shaft **25** is a pair of further transmission gears **30**, **31** which together with the gears **19**, **20** form a transmission system **32** producing a total speed reduction of 4:1 between the shaft **11** and the driving gear **31** of the thread cutting and locking device, in the case of the example illustrated. Gear **31** rotating at half the speed of gear **30** forms an integral unit with the catch-thread device **33**, FIG. 2, and is rotatably mounted upon the supporting or bearing sleeve **15** of the loop taker shaft **17** and secured against displacement by means of a locking ring **34**. The catch-thread and trimming device **33** of special construction has a recess **36** and adjoining triangular projection **35**, FIGS. 2 and 5, said recess pointing in a direction opposite to the beak **18'** and merging at the points **36** and **37** into a cross-piece or slightly arcuate plate **38** to the longitudinal edge of which is secured a cutting knife or blade **39** adapted to cooperate with a stationary cutting plate **40** mounted upon the underside of the throat or stitching plate **50'** of the sewing machine forming part of the lower arm **16**.

Secured to the catch-thread device **33** intermediate the cross-plate **38** and the driving gear **31** and rotatable with the latter is a cam disk **41** having profiled cam sections **41.1**, **41.2**, **41.3**, **41.4**, and **41.5**, FIG. 3, in the example illustrated. Cam **41** is resiliently engaged by a cam follower roller **42**, FIG. 3, through the action of a spring **43**. Roller **42** is mounted upon a lever **44** having one secured to a shaft **45** which is rotatably supported by the arm **16**, the opposite end of said lever being provided with a slot to compensate for the radial movement thereof. The thread clamping slide **47**, being operably connected with the lever **44** through a pin moving within the slot **46**, is mounted upon the underside of the stitching plate **50'** by means of screws **49** movable within guide slots **48** of said plate which at its front end carries a wedge-shaped clamping element **51** having a triangular recess **52** for cooperation with a stationary thread locking leaf spring **50**.

The gear **20**, FIGS. 4 and 6, being loosely mounted upon the hollow shaft or sleeve **21** has a lateral extension **53** being provided, in the case of a transmission ratio 2:1 between the gears **19**, **20**, with two diametrically opposed grooves or recesses **54**. Furthermore, the flange **22** of the shaft **21** is provided with two corresponding recesses or notches **55** adapted for engagement by a pair of coupling pins or fingers **56** axially extending from the right-

hand side of a coupling sleeve 57 mounted upon and axially displaceable relative to the shaft 25. The lefthand side of the coupling sleeve 57 has a nose or projection 58 being urged normally, that is, in the de-coupled position of the coupling sleeve 57, to engage a stationary recess 59 in the bearing 26 by the action of a tension spring 65 to be described presently.

In order to displace the coupling sleeve 57, there is provided a lever 60 having a pair of forked ends or arms 61, 62, FIG. 1, which carry rotatable rollers 63 engaging a central circular groove 64 of the sleeve 57. Connected to the end of the arm 62 of the lever 60 is the tension spring 65 which serves to urge the sleeve 57 to its inoperative or locked position as shown in the drawing. Lever 60 is rotatably mounted by means of a pin 66 upon a split bolt 67 being, in turn, secured to the supporting wall 68 of the arm 16 which also serves as a support for the bearing or sleeve 26. Lever 60 has a further arm 69 adapted to engage the actuating rod 70 of an electromagnet or solenoid actuator 71 mounted upon the supporting wall 23 of the arm 16.

With specific reference to the example illustrated by the drawing, the gear ratios have been chosen to perform two initial or starting stitches with the cut needle thread and maintained in its locked position after cutting of the threads. This has been found sufficient to ensure a safe and reliable starting or stitch formation in commencing a new seam or sewing pattern. Inasmuch as a complete revolution of the shaft 11 or oscillating operating cycle of the needle is required for each of the cutting and thread locking operations, there follows a speed reduction ratio of 4:1 between the shaft 11 and the driving gear 31 of the thread trimming and locking device which ratio has been divided equally upon the gear pairs 19, 20 and 30, 31, respectively.

On the other hand, if a greater number such as, for example, four initial or starting stitches are desired, as in sewing relatively thin fabric pieces, a speed reduction of 6:1 by the gear ring 32 will be required which may again be equally divided upon the gear pairs 19, 20 and 30, 31. In such a case, that is, assuming that the gears 19, 20 have a transmission ratio of 3:1, the coupling sleeve 57 is provided with three coupling pins or fingers 56 arranged at angular spacings of 120° and cooperating with three similarly arranged grooves or recesses 54 and 55 of the gear 20 and hollow shaft 21 respectively. In this manner, starting of the thread cutting and locking device 33 is ensured at the proper point within the needle operating or oscillating cycle, that is, during the downward movement of the needle within said cycle.

The operation of the thread cutting, locking and initial stitch formation afore-described is as follows:

After completion of a first sewing operation or upon reaching the end of a seam, the solenoid 71 is energized during the downward movement of the needle, for instance, by depressing a switch arm 75, FIG. 8, by means of a pushbutton 76 or the like, to close a contact 77 in the solenoid operating circuit. As a consequence, the actuating rod 70, FIG. 4, operates, by way of the lever 60 and rollers 63, the coupling sleeve 57 from the rest position shown to its operative position with the two coupling pins 56 of said sleeve passing through the grooves 55 of flange 22 of shaft 21 and into the grooves 54 of the extension 53 of the continuously rotating driving gear 20. The latter is thus coupled with the drive shaft 25 through the sleeve or hollow shaft 21. As a consequence, the catch-thread device 33 is started to rotate in a direction opposite to the rotation of the looper 18 by way of the gear pair 30, 31, that is, both the device 33 and looper 18 rotate during the time while the needle passes through the work or fabric and the beak 18' of the looper 18 draws the seized needle thread loop around the looper housing, whereby the needle thread loop forms a triangle between the stitching plate 50' and the looper housing.

During continued rotation of the device 33, its point

or projection 35 penetrates the triangle of the needle thread, whereby to cause its limb adjoining the needle to engage the point 37 and to cause the looper thread and work limb of the needle thread to engage the projection 35. The looper thread and work limb of the needle thread loop are thus separated from the needle thread limb of said loop and stretched, during continued rotation of the device 33, between the stitching hole in the plate 50' and point 36, across the cutting blade 40, whereby to cut both said threads by cooperation of said blade with the cutting knife 39.

The thread cutting operation takes place during a full revolution of the main drive shaft corresponding to a single needle operating cycle or oscillation or to a quarter revolution of the device 33 in the case of the example illustrated. During this partial rotation of the device 33, the follower roller 42 engages the concentric cam section 41.1 of the disk 41, whereby the locking slide 47 remains in its rest or inoperative position.

The next following operating cycle, after the threads have been cut in the manner described, again begins with a downward movement of the needle, while the disk 41 continues to rotate in a direction opposite to the looper 18. As a consequence, roller 42 engages the cam section 41.2 of said disk, whereby to cause the locking slide 47 to be operated towards the right from its normal or rest position by the action of the spring 43. As a consequence, the slide assumes a position to the right of the stitching hole in the plate 50' prior to the penetration of the needle, the latter subsequently passing through the triangular recess 52 while entering the work or fabric.

After the needle has again left the stitching plate 50' during its following upward movement, the roller 42 engages the cam section 41.3, thereby to return the slide 47 to the left against the action of spring 43 and to cause the recess 52 to seize and lock the cut end of the needle thread by the wedge 57 and spring 50, in the manner shown in FIG. 3 of the drawings. As a result, the disk 41 has been rotated by a further quarter revolution, to now cause the roller 42 to engage the concentric cam section 41.4 of said disk.

During the subsequent formation of an initial or starting stitch, the disk 41 performs a further quarter revolution with the roller 42 still engaging the cam section 41.4 and the slide 47 remaining in the locked position shown in the drawing. Shortly before the commencement of the last or second starting stitch, the roller 42 engages the cam section 41.5 of the disk 41, whereby to slightly move the slide 47 towards the right and to release the needle thread. Thereafter, de-energization of the solenoid will return the device to its starting position. This may be accomplished in the manner illustrated by FIG. 8 by locking the switch arm 75 by the nose 78 of a spring-urged locking lever 79 and unlocking the same by a cam 80 having a projection 81 adapted to engage the end of said lever, cam 80 being either identical with the disk 41 or driven in synchronism therewith.

There is thus provided by the invention operating and control mechanism which, upon being set in motion at the completion of a seam, causes a predetermined number of consecutive needle operating cycles with the upper and lower threads being cut during the first cycle, the cut end of the needle thread being locked during the second cycle, and a number of starting stitches being effected during the remaining cycles, for the purpose and with the novel effects and advantages as pointed out herein. Where the operating cycles follow each other consecutively in the manner described, the work will be advanced during the second or locking cycle by the feed dog of the sewing machine, whereby to automatically start the new seam immediately following the preceding seam. This operation may be desirable, for instance, in the production of ornamental stitching or in connection with the like sewing operations. On the other hand,

if a greater interval is desired between the locking of the thread and the starting of a new seam the switch 75 may be released or unlocked after the thread locking operation by the provision of an additional projection upon the cam 80 (not shown) being properly spaced from the projection 81. After the work has then been moved to the new sewing position, starting of the initial stitches and unlocking of the thread may be effected by renewed depression of the button 76, with the thread being unlocked subsequently, in a manner readily understood from the foregoing.

In summing up the operation of the cutting and locking device, the needle at the beginning of a thread cutting operation moves in the downward direction or, more specifically, may have traversed, at the instant of coupling of the device 33 with the shaft 11 by the fingers 56, a path corresponding to about 60° of a revolution of said shaft. Inasmuch as the cutting operation requires exactly one revolution of the shaft 11 or in turn the main drive shaft 5, the needle will assume the same initial position at the termination of the thread cutting cycle. While the needle continues its second operating cycle, the roller 42 engages the cam section 41.2, thus moving the slide 47 to the right. After the needle has again passed the stitching plate during its ensuing upward movement, the roller 42 engages the cam section 41.4, thus displacing the slide to the left and locking the needle thread until shortly before the completion of the second starting stitch, in the manner described. After the needle, during the continued revolution of the shafts 5 and 11, has reached its upper dead center position, the roller 42 engages the cam section 41.5, thereby opening the thread clamp and leaving the remaining 60° of the fourth revolution of said shafts for the clamp and the device to return to its starting position by interruption of the circuit of the solenoid 71 and resultant decoupling of the gear 20 and shaft 21 at the instant of the nose 58 engaging the recess 59.

In the foregoing the invention has been described with reference to a specific illustrative device. It will be evident, however, that modifications and variations, as well as the substitution of equivalent parts and elements for those shown and disclosed herein for illustration, may be made without departing from the broader scope and spirit of the invention as set forth in the appended claims. The specification and drawings are accordingly to be regarded in an illustrative rather than in a restrictive sense.

I claim:

1. In combination with a lockstitch sewing machine including a stitching plate, a reciprocating needle above said plate, and a rotating cylindrical loop taker mounted below said plate and synchronized with said needle, to form lock stitches by the needle and loop taker threads; thread trimming mechanism comprising an arcuate blade element having a front edge forming triangular projection and provided with a recess adjoining said projection, said element being disposed close to the outer surface of, and rotatable coaxially with said loop taker, operating means to initiate rotation of said element from a starting position in predetermined relation to and in synchronism with a needle operating cycle of said machine, first cutting means upon said element, and second stationary cutting means arranged for cooperation with said first cutting means, said projection, said recess and said cutting means designed to sequentially effect, during rotation of said element in a single direction from said starting position, stretching and separation of the loop taker thread and work limb thread of the needle loop from the needle limb of said loop by said projection, trapping of the separated threads by said recess, and severing of the trapped threads by said cutting means.

2. In combination with a lockstitch sewing machine of the type including a stitching plate, a reciprocating needle above said plate, and a rotating cylindrical loop taker below said plate having a needle thread seizing beak and synchronized with said needle, to form lock stitches by the needle and loop taker threads; thread trimming mechanism comprising an arcuate blade element disposed close to the outer surface of and rotatable coaxially with and in a direction opposite to the rotation of said loop taker, the front edge of said element having a triangular projection pointing in the direction opposite to said beak and provided with a recess adjoining said projection, operating means to initiate rotation of said element in synchronism with said needle and starting from a position in predetermined relation to a needle operating cycle, first cutting means upon said element, and second stationary cutting means arranged for cooperation with said first cutting means, said projection, said recess and said cutting means designed to sequentially effect, during rotation of said element in a single direction from said starting position, stretching and separation of the loop taker thread and the work limb thread of the needle loop from the needle limb of said loop by said projection, trapping of the separated threads by said recess and severing of the trapped threads by said cutting means.

3. In thread trimming mechanism as claimed in claim 2, a drive shaft for said needle, said operating means comprising a releasable coupling interposed between said shaft and said element and including a pair of relatively axially displaceable coupling members fitted respectively with coupling pins and cooperating recesses positioned relatively angularly such as to effect coupling of said members at said predetermined starting position of said element.

4. In thread trimming mechanism as claimed in claim 1 including further means to stop said element in a predetermined relative position to the needle operating cycle upon release of said operating means.

5. In combination with a lockstitch sewing machine of the type including a stitching plate, a reciprocating needle above said plate, and a rotating cylindrical loop taker mounted below said plate and synchronized with said needle, to form lock stitches by the needle and loop taker threads; thread trimming mechanism comprising an arcuate blade element having a triangular projection and provided with a recess adjoining said projection, said element disposed close to the outer surface of and rotatable coaxially with said loop taker, first operating means to initiate rotation of said element in the direction of said projection from a predetermined starting position in relation to and in synchronism with a needle operating cycle, first cutting means upon said element, second stationary cutting means arranged for cooperation with said first cutting means, said projection, said recess and said cutting means designed to sequentially effect, during a first needle operating cycle, stretching and separation of the loop taker thread and the work limb thread of the needle loop from the needle limb of said loop by said projection, trapping of the separated threads by said recess, and severing of the trapped threads by said cutting means, second operating means to lock the cut end of the needle thread during a subsequent needle operating cycle, and unitary control means for said first and second operating means synchronized with said needle, to sequentially cut said threads, to lock the cut end of the needle thread, and to produce a predetermined number of starting stitches in the locked needle thread position during a corresponding number of consecutive needle operating cycles.

6. In thread trimming and locking mechanism as claimed in claim 5, a drive shaft for said needle, said control means comprising a cam supporting and driving said element, and releasable coupling means for temporarily connecting said cam with said shaft during a predetermined number of revolutions thereof corresponding to an equivalent number of needle operating cycles, and cam follower means to actuate said second operat-

ing means, said cam being designed to actuate said second operating means during the needle operating cycle following the separation of said threads during said first operating cycle.

7. In thread trimming and locking mechanism as claimed in claim 6, said coupling means including a pair of relatively axially displaceable coupling members fitted respectively with projecting coupling pins and cooperating recesses positioned relatively angularly such as to effect coupling of said members at a position corresponding to said starting position of said element.

8. In combination with a sewing machine including a stitching plate, a reciprocating needle above said plate, a drive shaft for said needle, a rotating cylindrical loop taker having a needle thread seizing beak and mounted below said plate for cooperation with said needle, to produce lock stitches; thread trimming mechanism comprising an arcuate blade element having a triangular projection and an adjoining recess and disposed close to the outer surface of and rotatable coaxially with and in a direction opposite to said loop taker, operating means to initiate rotation of said element from a starting position in predetermined relation to and in synchronism with an operating cycle of said needle, to separate the loop taker thread and the work limb of the needle thread loop from the needle limb of said loop by said projection and to trap the separate threads by said recess, first cutting means upon said element, and cooperating stationary cutting means, to sever the trapped threads during a first needle operating cycle, locking mechanism to lock the cut end of the needle thread during a subsequent needle operating cycle, and unitary control means synchronized with said needle, to sequentially operate said thread trimming and locking mechanisms and to produce a predetermined number of starting stitches in the locked

needle thread position during a corresponding number of consecutive needle operating cycles, and means to unlock said needle thread by said control means upon termination of said starting stitches.

9. In thread trimming and locking mechanism as claimed in claim 8, said control means comprising a cam supporting and driving said element and releasable coupling means to temporarily connect said cam with said drive shaft during a predetermined number of revolutions thereof, and a cam follower to actuate said locking mechanisms, said cam being designed to effect operation of said locking mechanism during the needle operating cycle following said first operating cycle.

10. In thread trimming and locking mechanism as claimed in claim 8, said coupling means including a pair of relatively axially displaceable coupling members fitted respectively with projecting coupling pins and cooperating recesses positioned relatively angularly such as to effect coupling of said members at a relative position corresponding to the starting position of said element.

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