June 4, 1968 R. J. ROSS 3,386,402

THREAD TRIMMING MECHANISM FOR SEWING MACHINES

Filed July 5, 1966 4 Sheets-Sheet 1

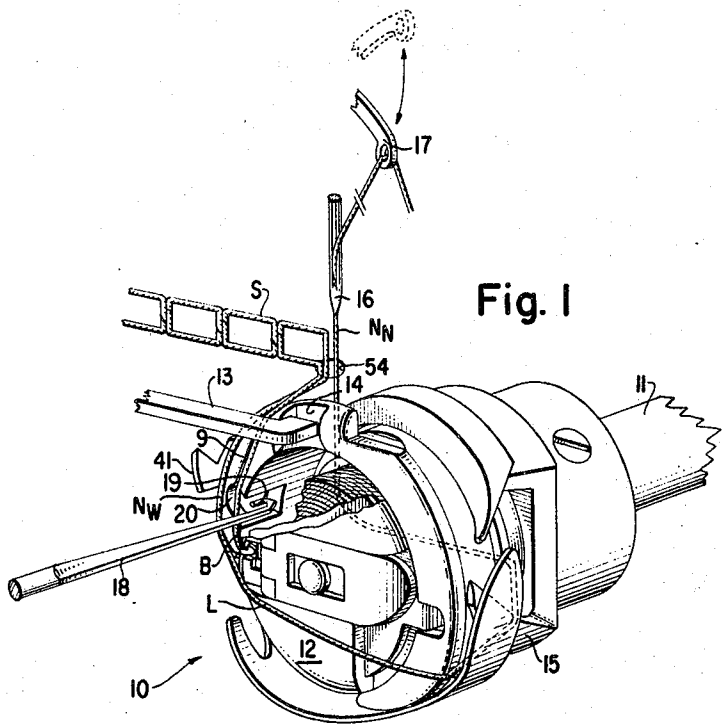


Fig. 1

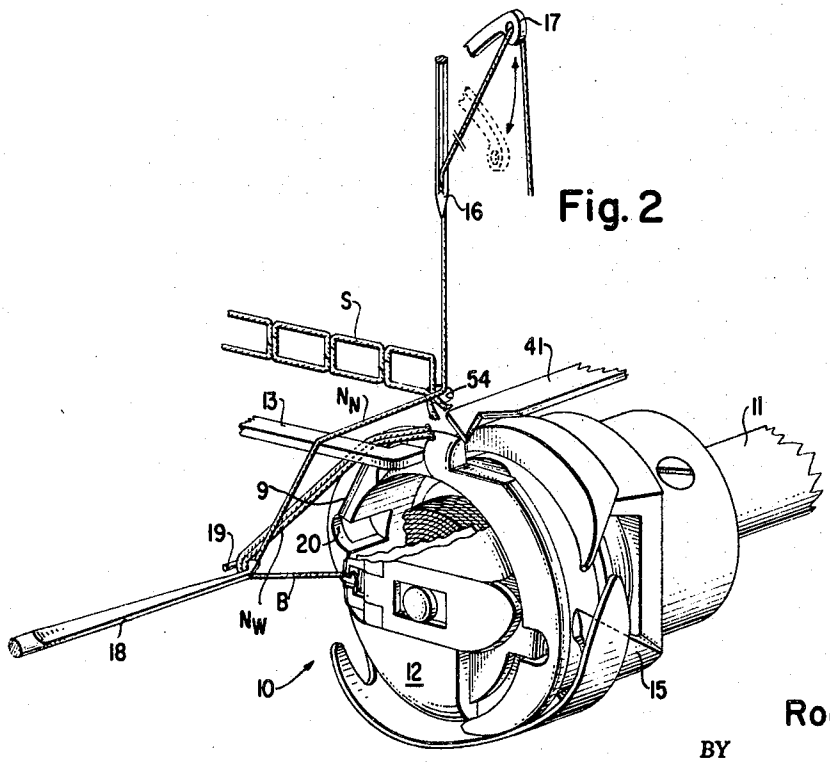


Fig. 2

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THREAD TRIMMING MECHANISM FOR SEWING MACHINES

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Fig. 3

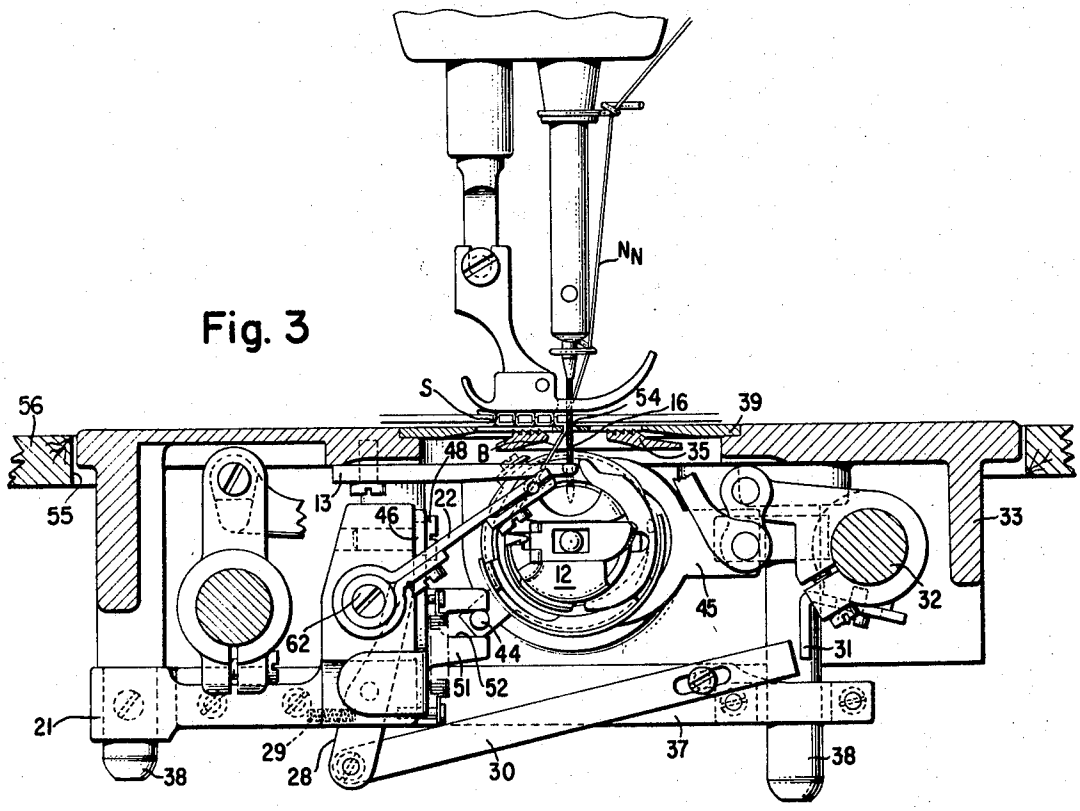
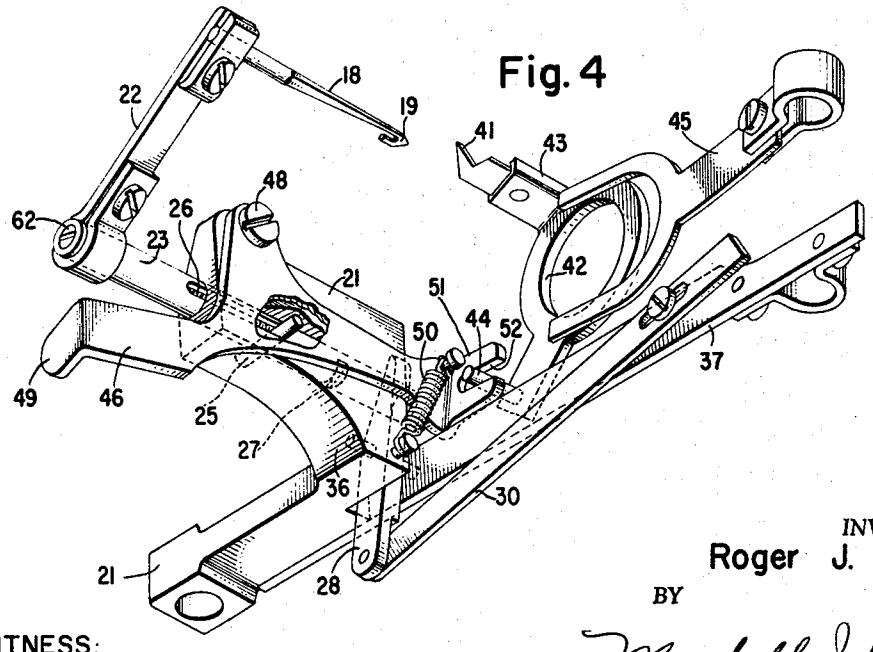



Fig. 4

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THREAD TRIMMING MECHANISM FOR SEWING MACHINES

Filed July 5, 1966 4 Sheets-Sheet 3

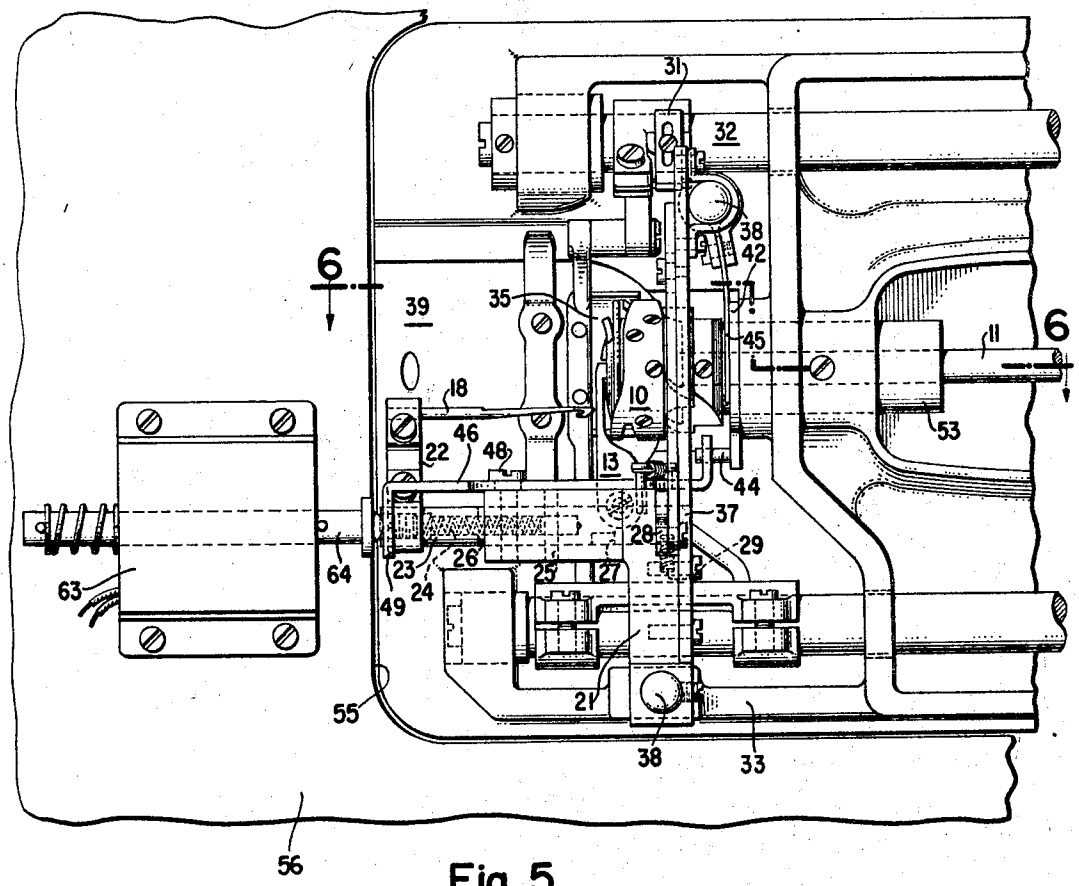


Fig. 5.

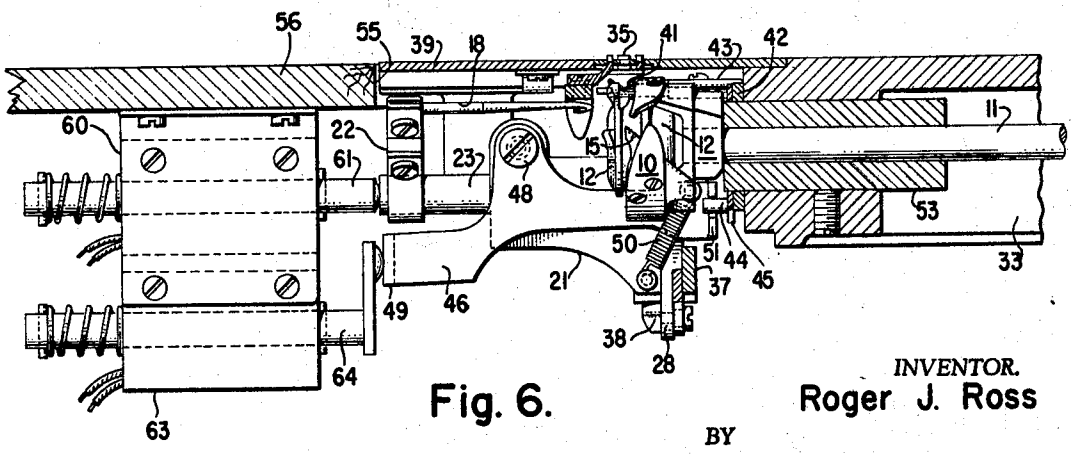


Fig. 6.

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THREAD TRIMMING MECHANISM FOR SEWING MACHINES

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Fig. 7

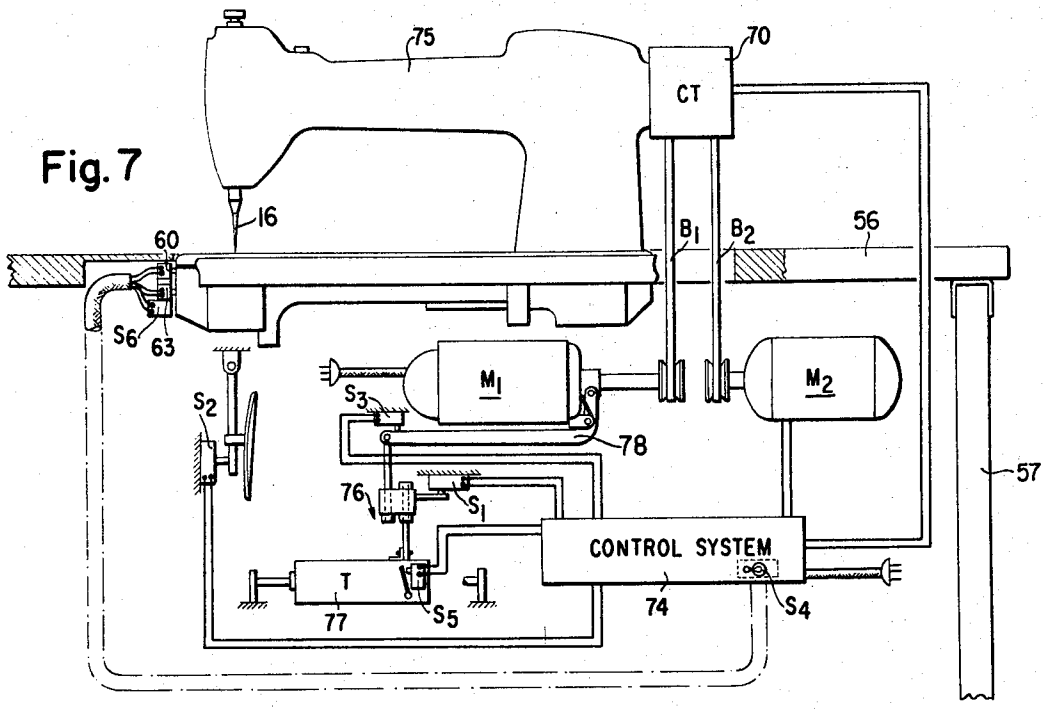
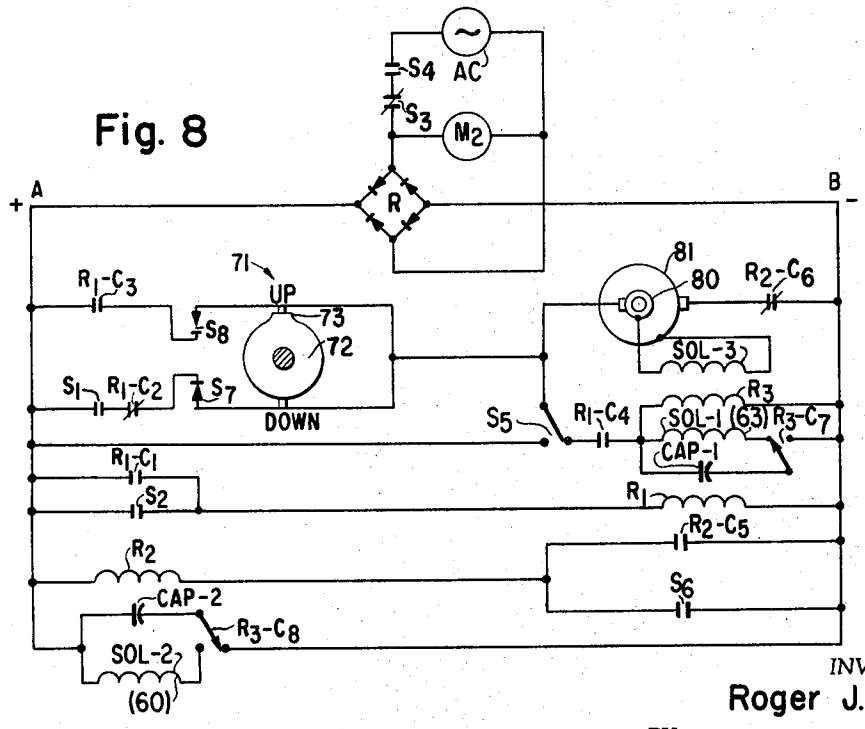



Fig. 8

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United States Patent Office

3,386,402
Patented June 4, 1968



3,386,402

# THREAD TRIMMING MECHANISM FOR SEWING MACHINES

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Filed July 5, 1966, Ser. No. 562,576
10 Claims. (Cl. 112—252)

This invention relates to thread trimming mechanism for lock stitch sewing machines, and more particularly, to a mechanism for trimming both the needle and bobbin threads, closely adjacent to the work and for providing sufficient lengths of thread to the bobbin and to the needle after trimming so that stitching on a succeeding seam may proceed.

It is an object of this invention to provide a novel and effective thread trimming mechanism which may be applied completely beneath the bed of a sewing machine and which does not require alteration or modification of the stitch forming instrumentalities. The trimming mechanism of this invention may thus be applied to any conventional lock stitch machine without adversely influencing the stitching characteristics. Furthermore, the presence of the trimming mechanism of this invention does not interfere with any fittings, work guides or other attachments to the sewing machine.

Another object of this invention is to provide a thread trimming mechanism adapted to cooperate in a novel and advantageous manner with a programming device such as a needle positioner for a non-cyclic sewing machine.

Trimming mechanisms for the sewing threads are most highly developed in the prior art in association with sewing machines which are cyclic in operation such as buttonhole machines or tackers. Included as part of such cyclic sewing machines for purposes other than thread trimming, are stop motion devices and programming devices such as cams or the like. When thread trimming mechanisms have been heretofore incorporated in cyclic sewing machines, therefore, they have been operatively interconnected with the sewing machine stop motion and programming devices with the result that all mechanisms associated with the thread trimmers including the operating mechanism and controls therefor are carried by the sewing machine frame.

There are, furthermore, known in the prior art thread trimming devices for sewing machines which are not cyclic in operation. Here also it is conventional for the operating mechanism and controls for the trimmers to be carried by the sewing machine frame. The elements of a thread trimming mechanism which engage and manipulate the threads constitute only a small proportion of the total structure and cost of the entire trimming mechanism, with a far higher proportion being accounted for in the actuating and control mechanisms for the trimmer. The disadvantages of the known thread trimming mechanisms are not only that the entire cost of a trimming mechanism must be included in the cost of each individual sewing machine to which it is applied but also that the already limited space available in a sewing machine frame is burdened by inclusion of the entire trimming mechanism.

The present invention obviates these disadvantages of the known trimming mechanisms by the provision of a thread trimming mechanism in which only those elements which engage and manipulate the threads need be carried by the sewing machine. The actuating mechanism for the trimmer as well as the control means therefore may be associated with the power table on which the sewing machine is exchangeably supported. As a result, each sewing machine need only be burdened with a minor portion of the structure and cost of the trimmer and the sewing machine support which can accommodate interchangeably any one of a plurality of sewing machines is fitted with the actuating and control mechanism for the thread trimmer.



With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

FIG. 1 is a fragmentary perspective view of a rotary hook, a needle and a needle thread take-up member associated with thread cutting and thread catching tools, in positions required immediately prior to the thread-catching and thread-trimming operations in accordance with this invention;

FIG. 2 is a fragmentary perspective view showing the mechanism illustrated in FIG. 1 with the parts located in the positions to which they travel immediately subsequent to thread-catching and thread-trimming;

FIG. 3 is a left elevation of a sewing machine, including the mechanism shown in FIG. 1 and associated elements provided for operation thereof;

FIG. 4 is a bottom perspective view of most of the elements of the thread-trimming and thread-catching mechanism shown in FIG. 3, removed from the sewing machine;

FIG. 5 is a fragmentary bottom plan view of the machine shown in FIG. 3;

FIG. 6 is a cross sectional view taken substantially along line 6—6 of FIG. 5;

FIG. 7 is a schematic diagram of a sewing machine including a needle positioning control system for a trimming device in accordance with this invention, and

FIG. 8 is an electrical schematic diagram of the control system shown in FIG. 7.

Referring to FIG. 1, a rotary hook **10** is secured to the bed shaft **11** of a lock stitch sewing machine. Operation of such a rotary hook is described in the U.S. patent of Habedonk et al., No. 3,074,367, Jan. 22, 1963. Journaled within the rotary hook **10** is a bobbin carrying case **12** which is prevented from rotating by a rotation restraining finger **13** secured to the bed of the sewing machine and inserted into a rotation restraining notch **14** in the bobbin carrying case **12**. The rotary hook includes a hook beak **15** which partakes of two revolutions in cooperation with each vertical reciprocation of a needle **16** to concatenate threads into lock stitches. The conventional thread take-up member **17** cooperates to manipulate the needle thread in the conventional manner.

A thread catching finger **18** having a thread catching hook **19** on one end thereof is shown in FIG. 1 inserted into a thread catching aperture **20** in the bobbin carrying case **12**. The bobbin carrying case **12** is identical to standard cases with the exception of provision of the thread catching aperture **20** which is provided to receive the thread catching hook **19**.

As shown in FIG. 1, the thread catching hook **19** is positioned in the thread catching aperture **20** in such manner that the bobbin thread B and the needle loop L have been pulled against it by the counter-clockwise rotation of the hook beak **15**, so that upon retraction of the thread catching finger **18**, the thread catching hook **19** draws the bobbin thread B and the needle loop L to the left, away from the rotary hook **10**. However, the work limb $N_w$ of the needle thread and the bobbin thread B passing to the work represented by the line of stitches S are drawn behind the rotation restraining finger **13**, whereas the needle limb $N_n$ of the needle thread is drawn by the hook beak **15** into a position finally overlying the

rotation restraining finger **13**, as shown in FIG. 2. The thread catching hook **19** is preferably inserted into the thread catching aperture **20** when the needle is in its lower dead center position, approximately at the time when the hook beak **15** is first engaging a needle loop L. As the hook beak **15** rotates, the needle loop is pulled thereby against the thread catching finger **18**, and the bobbin thread B is positioned in a slot **9** in the bobbin carrying case **12**, which slot **9** is aligned with the thread catching aperture **20** and the path traversed by the thread catching finger **18** and hook **19** during a stroke thereof.

After the thread limbs have been caught and drawn outwardly by the thread catching hook **19** to a length permitting cutting of sufficient lengths of needle and bobbin threads for resumption of sewing following trimming without manipulation, a knife **41** can be drawn across the work limb $N_w$ of the needle thread and the bobbin thread B. Because the knife travels below the needle limb $N_n$, that limb will not be trimmed and will remain long enough for commencement of the next sewing operation. When the cutting stroke occurs preferably at top dead center of the needle, the needle thread take-up member **17** will be raised, in the conventional manner, for tightening the last stitch S and providing tension on the threads. Provision of adequate tension permits employing a single blade **41** operative without employing an opposing blade, i.e., without a scissors action, to trim the limbs of thread if they are struck by the blade **41** with considerable impact. Tension also assures that the needle limb $N_n$ will not be cut because it is retained by the thread catching hook **19**, the rotation restraining finger **13** and the wall of a needle aperture **54** in a throat plate **39** (see FIG. 2) sufficiently distant from the knife **41**.

Referring to FIGS. 3 and 4, the thread-catching finger **18** is secured at the end opposite its thread-catching hook **19** to a clamping arm affixed to a guide rod **23** slidably supported in a hole through a supporting bracket **21** secured to one column or foot **38** which depends from the sewing machine bed **33** and to a supporting bar **37** secured to another column or foot **38**. The guide rod **23** has a longitudinal alignment slot **26** retained in alignment by an alignment pin **25** inserted through and secured to the supporting bracket **21**, so that the thread-catching finger **18** will be guided along the same longitudinal path by the guide rod **23**. The guide rod **23** may be driven into the hole through the supporting bracket by means of a first solenoid **60**, having a plunger **61** aligned to strike the outer end of the guide rod **23** as illustrated in FIGS. 6 and 7.

The guide rod is hollowed from its outer end to the opposite end of the alignment slot **26** for receiving a coil spring **24** adapted to engage alignment pin **25** at one end and a set screw **62** at its opposite end. Set screw **62** is secured concentrically in the outer end of the guide rod **23** by means of threads therein. Coil spring **24** urges the guide rod outwardly.

As the thread catching hook **19** must remain inserted within the thread catching notch **20** until the needle loop L as been drawn around the thread catching finger **18**, a latch is provided for temporarily holding the guide rod inserted within the supporting bracket **21**. The latching mechanism comprises a latch notch **27** formed in the guide rod on the portion thereof which will extend outside the opposite end of the supporting bar **21** and a latch lever **28** pivoted on a latch lever pivot pin **36** is secured to the supporting bracket **21** and supporting bar **37**. A latch spring **29** housed in confronting holes in the supporting bracket **21** and the latch lever **28** biases the opposite end of the latch lever into engagement with the portion of the guide rod **23** extending outside the adjacent end of the hole through the supporting bracket. Thus, the latch lever **28** will be forced into the latch notch **27** by the latch spring **29** when the guide rod **23** is driven inwardly by the plunger **61** of the first solenoid. **60**. The latch lever **28** is pivoted in a space defined between a recess in the supporting bracket **21** and one side of supporting bar **37**.

Referring to FIG. 5, the sewing machine includes a conventional drop feed mechanism such as that shown in the U.S. patent of Van Ness, No. 2,848,694, to which reference may be had. The work feeding mechanism includes a work feed dog **35** which is raised into engagement with work fabric being sewn after each upstroke of the needle by a feed lifting rock shaft **32**. Since it is on the upstroke of the needle that the thread catching finger must be removed from the thread catching notch **20**, the feed lifting rock shaft **32** has a latch-releasing ear **31** secured thereto to engage the end of a sliding latch-releasing link **30** pivotally secured at its opposite end to the opposite end of latch lever **28**. The latch releasing ear **31** forces the latch lever **28** against latch spring **29** and releases engagement of the latch lever **28** within the latch notch **27** in the guide rod **23**. Thus, the spring-biased guide rod **23** and the thread-carrying finger **18** will be driven outwardly by spring **24**, carrying the threads therewith.

Subsequently, after the needle **16** has been drawn out of the needle aperture **54** to top dead center, and the needle-thread take-up member **17** is fully raised, the knife **41** may be operated most effectively.

The knife **41** is secured to a knife-holder arm **43** extending from a knife-holder ring **42** journalled on the outer surface of the bearing **53** for the bed shaft **11**. The knife-holder ring **42** and the bearing **53** are concentric with the bed shaft **11**. The knife-holder ring **42** is secured against lateral motion by a forked retaining spring **45** secured to one of the bed-supporting columns **38**.

Extending from the knife holder ring **42** is an arm having a knife-holder pin **44** extending therefrom into engagement with a slot **52** in a turned tab **51** formed on one end of a bell-crank lever **46** pivotally secured to the supporting bracket **21** by a pivot screw **48** and having a turned ear **49** at its opposite end. A second solenoid **63** as illustrated in FIGS. 5, 6 and 7 has a plunger **64** aligned to strike the ear **49**, thereby pivoting the bell-crank lever **46** to push the knife-holder pin **44**, thereby turning the knife-holder ring **42**, arm **43** and the knife **41** to cut the threads. A return spring **50** secured to the bell-crank lever **46** and the supporting bracket **21** returns the bell-crank lever **46** and the knife **41** and its holder to normal position upon retraction of the plunger **64** of the second solenoid **63**.

As illustrated in FIGS. 5, 6 and 7, the sewing machine to which this invention is illustrated as being applied in the accompanying drawings is of the type adapted to be supported in a cut-out **55** of a power table top **56** which may be floor supported by legs **57**. While the thread catching member and the thread trimming mechanism hereinbefore described are supported on the sewing machine frame, the solenoids **60** and **63** may be carried by the power table top **56**. Moreover, the control mechanism for operating the solenoids **60** and **63** in correlation with a sewing machine control programmer such as a needle positioner as will hereinafter be described may also be carried by the power table. As a consequence, the sewing machine frame need not be burdened with the trimmer operating or control means and critical space in the sewing machine frame is spared. It is also an advantage that individual sewing machines may be exchanged in the power table each cooperating with the one set of trimmer actuating solenoids and the control mechanism on the power table.

As both the thread-catching and the trimming mechanisms are adapted to be actuated by solenoids, this thread-trimming system is especially well suited for operation in response to programmed control. In particular, needle positioners and cooperating control systems can and have been successfully employed to control operation of this type of thread trimmer.

In FIG. 4, substantially all of the additional parts

required to be added to a conventional sewing machine for the instant trimming and thread-catching system are shown with the exception of the latch releasing ear **31**, and the solenoids **60** and **63**. The sole modifications required to be made to a conventional sewing machine to accept this trimming mechanism other than tapping or providing mounting holes, comprise smoothing of the rotation restraining finger **13** and providing the thread-catching aperture **20** in the bobbin carrying case **12**.

In the operation of the thread-catching and trimming mechanism of this invention, three steps are required to be performed. At or near bottom dead center position of needle reciprocation, the thread catcher must be shifted into the thread-catching aperture **20** as by atcuation of the first solenoid **60**. Thereafter, the needle must be reciprocated toward top dead center position during which motion, the thread-catching finger will be unlatched and in returning to the at-rest position, will draw the thread loops out of the rotary hook. As a final step, the knife must be operated as by actuation of the second solenoid **63**.

This trimmer can be operated in several fashions, including employing manually operated switches, when the sewing machine is properly positioned manually or by an independent needle positioner.

However, the trimmer described herein is particularly well adapted to be employed in combination with a needle positioner of the variety described in U.S. Larys et al. Patent No. 2,942,564 which employs an auxiliary motor and a timer and clutch which can be secured in place of the usual balance wheel and synchronized with reciprocation of the needle bar of the sewing machine.

As the Larys et al. patent describes a needle positioner without making any reference to a trimmer, and because the present trimmer is adapted to operate in accordance with the above-described sequence, employment of a control unit for coordination of the system is desirable. It is especially important that the knife operate only when the needle has been removed from the needle aperture and that the thread catching finger be inserted after the needle has been lowered.

In FIG. 7, units of a control system adapted to operate a trimmer in accordance with this invention are shown generally to indicate how they can be employed on a sewing machine. Timing of the trimming device is effected by employing a needle positioning device basically of the variety disclosed in the above Larys et al. patent. The needle positioning device includes a clutch-and-timer unit **70** secured in place of the conventional balance wheel of a sewing machine head **75**. The details of construction of such a unit are disclosed in the above Larys et al. patent. Basically, however, the clutch is double acting and is biased to connect the transmitter belt **B1** driven by a conventional clutch-brake transmitter **M1** to the arm shaft of the sewing machine. Operation of a clutch solenoid SOL–3 (FIG. 8) in the clutch-and-timer unit **70** drives the clutch therein into a position connecting an auxiliary belt B2 driven by an auxiliary motor M2 to the arm shaft. The auxiliary motor M2 is operable at a lower speed which permits slow and accurate needle positioning. A normally-closed control switch S3 is secured to the transmitter operating lever **78** of the transmitter M1. Lever **78** is employed for controlling the clutch and brake thereof. The control switch S3 will be opened to remove power from the elements of a control system **74** when the transmitter-operating lever **78** is lowered by depressing the treadle **77**. Lowering of the transmitter-operating lever releases the brake and engages the clutch of the transmitter M1 to drive the transmitter belt B1.

When the operator raises the lower link of a pitman **76** connecting the treadle **77** to the transmitter operating lever **78** by "heeling" the treadle **77**, a normally-open "heel" switch S1 will be closed to cause the control system **74** to position the needle **16** in the needle aperture **54**, i.e., "down." Then the transmitter M1 will be in braked condition and the system will be prepared for trimming.

If it is desired to sew additional stitches prior to trimming, a "toe switch" S5 secured to the treadle **77** can be closed. This causes the control system **74** to operate a solenoid SOL–3 in the clutch-and-timer unit **70** to connect the auxiliary belt B–2 to the arm shaft. The control switch S3 will be closed, because the transmitter-operating lever **78** will be in its at rest position, and accordingly the auxiliary motor M2 will be powered. In this way, the toe switch S5 can drive the sewing machine at low speed for as many needle strokes as the operator desires.

Then the system may be prepared for trimming by "heeling" the treadle **77** thereby closing the "heel" switch S1 and consequently, positioning the needle **16** "down." Subsequent operation of a knee switch S2 by a knee pedal will close contacts causing the thread-catching finger **18** to be driven into position by solenoid **60**, simultaneously raising the needle **16** to the "up" position and releasing the latch holding the thread catching finger as described above, and causing the control system to actuate the thread cutting solenoid **63** to operate the knife **41** when the timer in the clutch and timer unit **70** indicates that the needle has been raised to the "up" position.

Operation of the trimmer solenoid **63** will cause a solenoid switch S6 to be closed, thereby preventing further low-speed operation by the slow-speed "toe" switch S5.

Further aspects of operation of the needle positioner and control system are described below with reference to FIG. 8 which is a schematic diagram of the pertinent portions of the electrical system of this invention.

An alternating current power supply AC is connected through a power switch S4 and the normally-closed contacts of the control switch S3 to a full-wave rectifier R. The control switch S3 is opened by the clutch arm when the treadle **77** is depressed by the toe of the operator to disconnect power from the circuit, i.e., when the sewing machine is being operated at full speed. The fullwave rectifier R supplies power across the lines A–B.

When the treadle **77** is heeled by the operator, contacts of the heel switch S1 are closed to pass current through a clutch solenoid SOL–3 in the clutch and timer unit **70** which drives the clutch into position to connect the arm shaft to the auxiliary motor M2 for the purpose of lowering the needle to lower dead center position. Current passes from line A to line B through contacts of the heel switch S1, normally-closed contacts R1–C2 of a knee relay R1 and the lower timing points S7 of the timer **71** which is operated by a timing cam **72** having a projection **73** broad enough to provide appropriate positioning by holding the points open long enough to assure full braking. The clutch solenoid SOL–3 for connecting the clutch in the clutch and timer unit **70** to the auxiliary belt B–2 of the auxiliary motor M2 is connected by a first slip ring **80** to lower timing points S7 and by a second slip ring **81** through normally-closed clutch control contacts R2–C6 of an end-of-cycle relay R2 to line B.

When the sewing machine reaches its lower dead-center needle position, the timing cam **72** opens the lower timing points S7 thereby releasing the clutch of the unit **70** to its normal position in which the arm shaft is reconnected to the transmitter belt B1. The transmitter M1 will have been braked previously when the treadle **77** was positioned in its normal at rest position (or was heeled by the operator). Thus, the brake of the transmitter M1 will then be connected to brake the arm shaft of the sewing machine. If desired, a toe switch S5 can be operated to operate the sewing machine at a low speed to end the line of stitches precisely where desired. Switch S5 supplies power from line A to the clutch solenoid SOL–3. Then when S5 is released contacts S7 will reposition the needle.

Then the operator may operate the knee switch S2 to close its normally-open contacts, thereby connecting the coil of the knee relay R1 across lines A and B to close three sets of contacts R1–C1, R1–C3 and R1–C4 and

open one set of "down" control contacts R1–C2. The normally-open holding contacts R1–C1 hold the knee relay R1 in operation during the remainder of the trimming operation. Normally-closed "down" control contacts R1–C2 open, thereby disconnecting the circuit through the lower timing points S7 of the timer, to prevent operation of the machine beyond top dead center after the needle 16 has been positioned "down."

Normally-open "up" control contacts R1–C3 are closed by the knee relay R1 thereby supplying power to the clutch solenoid SOL–3 through the upper timing points S–8 which will now be closed because the needle 16 is "down" and timing cam 72 will be in a corresponding position holding the lower timing points S7 open. Thus, the needle 16 will be driven relatively slowly out of the needle aperture 54.

Simultaneously with the above, the knee relay R1 closes the cutting control contacts R1–C4 to power a solenoid control relay R3 to reverse a single-pole double-throw thread-catching switch R3–C8 to connect a charged capacitor CAP–2 across the finger solenoid SOL–2 or 60 which supplies an impulse to SOL–2 to drive the thread-catching finger 18 into the finger aperture 20 in the bobbin-carrying case 12. The capacitor CAP–2 will have been charged previously by connection through the blade of the thread catching switch R3–C8 and the pole connected to line B (one end of both capacitor CAP–2 and finger solenoid SOL–2 is connected to line A), across lines A and B. As described above the finger is latched and then released in timed relationship with the position of the needle.

A second single-pole, double-throw trimmer switch R3–C7 is also operated to connect one end of a capacitor CAP–1 (connected between a cutting control contact R1–C4 and the blade of the trimmer switch R3–C7) to line B, the other end thereof being connected to line A through the cutting control contacts R1–C4, upper timing points S8 and a pair of "up" control contacts R1–C3. Thus, capacitor CAP–1 will have been charged for operating the thread-cutting solenoid SOL–1, when the blade of the thread cutting switch R3–C7 is subsequently returned to its normal position connecting the thread-cutting solenoid SOL–1 and capacitor CAP–1 in parallel, after the upper timing points S8 have opened.

The sewing machine will be driven until the upper timing points S8 of the timer 71 open, at top-dead-center needle position, thereby disconnecting power from the solenoid control relay R3 to return the trimmer switch R3–C7 to its normal position with the capacitor CAP–1 connected across the thread cutting solenoid SOL–1 (63) thereby operating the thread-cutting solenoid SOL–1 (63) by an impulse of current from the capacitor CAP–1.

The solenoid switch S6 is momentarily closed by the trimmer actuating solenoid SOL–1 (63) as its plunger reciprocates while actuating the trimmer linkage. Switch S6 connects line B to the coil of an end-of-cycle relay R2 which closes a pair of normally-open holding contacts R2–C5 in series with the end-of-cycle relay R2 across lines A and B. The end-of-cycle relay R2 is provided to open normally-closed clutch control contacts R2–C6 which disconnect the slip rings 80, 81 from line B, thereby preventing repeated positioning of the machine, should the operator attempt to operate the machine at slow speed subsequent to trimming by means of toe switch S5 and heel switch S3. This is desirable because otherwise new stitches would be sewn and repeated operation of the trimmer would be required, thereby slowing production. Thus, accidental operation of the toe switch S5 after trimming will not tend to slow production.

It will be understood that the system can be manufactured without the toe switch S5 and that the end of cycle relay R2 and the solenoid switch S6 can be eliminated from the circuit without affecting the operation of the trimming device of this invention. It is also interesting to note that the toe switch S5 is not connected in series with the timing points, and accordingly, it is not employed as a needle positioning control. It is simply an actuator for the clutch in the unit 70 for temporarily connecting the auxiliary motor M2 to the arm shaft.

If by mistake, the knee switch S2 were operated before the heel switch S1 had been actuated, no problem would be encountered, because the trimmer would operate only after the "up" timing points S8 had opened removing power from the solenoid control relay R3 and thus providing an impulse of power from capacitor CAP–1 to the trimmer solenoid SOL–1. The "down" timing points S7 would be excluded from the circuit by the "down" control contacts R1–C2 which would prevent stopping of the machine with the needle "down."

Thus the needle would not be in the needle aperture, i.e., in a position to be struck by the knife. Under such circumstances, the treadle would have to be depressed to open the control switch S3, or switch S4 could be opened momentarily thereby shutting off power to the circuit and therefore reopening the holding contacts R1–C1 of the then de-energized knee relay R1 in order to permit operation through the trimming cycle in the proper sequence.

In any event, the treadle must be depressed in order to return the control system to its initial condition after the heel switch S2 has been closed, thereby reopening the normally-open holding contacts R1–C1.

Having thus set forth the nature of this invention, what is claimed herein is:

1. A device for trimming the sewing threads of a lock stitch sewing machine having a reciprocating thread carrying needle, a loop taker including a thread carrying bobbin, drive means interconnecting said needle and loop taker for movement in timed relation in the formation of lock stitches, motor means operatively connected to said drive means, and a needle positioning device operatively connected to said drive means, first operator influenced means for at will interrupting operation of said drive means by said motor means, second operator influenced means effective upon interruption of operation of said drive means by said motor means for operating said needle positioning device to drive said needle to a preselected position, said thread trimming device comprising a thread catching element shiftably supported on said sewing machine for movement relatively to said loop taker to engage and distend loops of thread from both said needle and said bobbin, a thread cutter shiftably supported on said sewing machine for movement relatively to said loop taker to sever at least one limb of each of said needle and bobbin thread loops distended by said thread catching element, actuating means for said thread catching element and for said thread cutter, third operator influenced means for operating said needle positioning device to drive said needle beyond said preselected position subsequent to actuation of said second operator influenced means and for initiating operation of said actuating means to shift said thread catching element and said thread cutter in seriatim, and interlock means rendering said actuating means ineffective to shift said thread catching element and said thread cutter except in respective predetermined positions of reciprocation of said needle subsequent to operation of said needle positioning device in response to operation of said second operator influenced means.

2. A thread trimming device for a sewing machine as set forth in claim 1 including a power table in which said sewing machine is adapted to be removably supported, in which said actuating means for said thread catching element and for said thread cutter are carried by said power table.

3. A thread trimming device for a sewing machine as set forth in claim 1 in which individual actuating means are provided for said thread catching element and for said thread cutter and in which said interlock means renders each of said individual actuating means effective in a different position of reciprocation of said needle in response to operation of said needle by said needle positioning device beyond said preselected position.

4. A thread trimming device for a sewing machine as set forth in claim 3 in which said interlock means renders effective said actuating means for said thread catching member only while said needle is reciprocated by said needle positioner into a work penetrating position which comprises said preselected position, and said interlock means renders effective said actuating means for said thread cutter only after the next subsequent elevation of said needle by said needle positioning device after operation of said actuating means for said thread catching element.

5. A thread trimming device for a sewing machine as set forth in claim 4 in which said thread-catching element is secured to a member spaced substantially from said loop taker and movable from a biased position into a position of proximity to said loop taker in the path of said needle thread and said bobbin thread, latch means constraining said thread catching element in said position of proximity for a predetermined angle of rotation of said loop taker, and means operable by said drive means for releasing said latch means when said needle reaches a said predetermined position, said latch release means being timed to follow engagement of said thread catching element with said thread loops for the purpose of distending said thread loops, said needle positioning device operating a switch upon elevation of said needle, and said switch operatively connected with said interlocking means to enable said actuating means to operate said thread cutter.

6. In a lock stitch sewing machine having a vertically reciprocatory thread carrying needle, a needle thread take up mechanism effective to draw the needle thread taut during upstroke of the needle, a loop taker operatively connected with said needle and including a thread carrying bobbin, drive means for said needle, loop taker and take up mechanism, operator influenced means for at will interrupting said drive means and a needle positioning device effective to position said needle selectively either up or down, a trimming device for both the needle and bobbin threads comprising a thread catching element shiftably supported on said sewing machine for movement relatively to said loop taker into and out of the path of needle and bobbin threads thereon, a thread cutter shiftably supported on said sewing machine for movement relatively to said loop taker, actuating means for operating said thread trimming device and said needle positioner in concert and including operator influenced means for shifting said thread catching element into a shifted position in the path of said needle and bobbin threads on said loop taker only when said needle is positioned down by said needle positioner, detaining means for detaining said thread catching element in said shifted position, operator influenced means for operating said needle positioner to raise said needle, and means rendered effective by said operation of said needle positioner to raise said needle, to release said thread catching element detaining means and to actuate said thread cutter in seriatim.

7. A sewing machine thread trimming device as set forth in claim 6 in which said actuating means for operating said thread trimming device and said needle positioner in concert is operated electrically and includes solenoids for operating said thread catching element and said thread cutter.

8. A sewing machine thread trimming device as set forth in claim 7 including a power table in which said sewing machine is adapted to be supported, in which said actuating mechanism including said solenoids for operating said thread catching element and said thread cutter are carried by said power table, and in which said thread catching element and said thread cutter are arranged on said sewing machine for operation by said power table supported solenoids when said sewing machine is supported on said power table.

9. A sewing machine thread trimming device as set forth in claim 7 in which said needle positioning device controls electrical interlock circuitry included in said actuating means, whereby said needle positioner provides an electrical output shifting said interlock circuitry when the needle is positioned down to permit operation of said solenoids, and further interlock circuitry connected with a said solenoid for operating said thread cutter, said further circuitry including a switch responsive to mechanism synchronized with said needle to indicate elevation of said needle above the level of said thread cutter.

10. A sewing machine thread trimming device as set forth in claim 9, wherein adjacent said solenoid for operating said thread cutter is a second switch for disabling said needle positioning device connected to additional interlock circuitry, which second switch is operatively connected to be operated by said solenoid for operating said thread cutter upon actuation thereof, said additional interlock circuitry remaining operative to disable said needle positioning device until interruption of said drive means is terminated.

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