Nov. 29, 1938. H. J. LE VESCONTE 2,138,765

SEWING MACHINE WORK TRIMMER

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FIG. I.

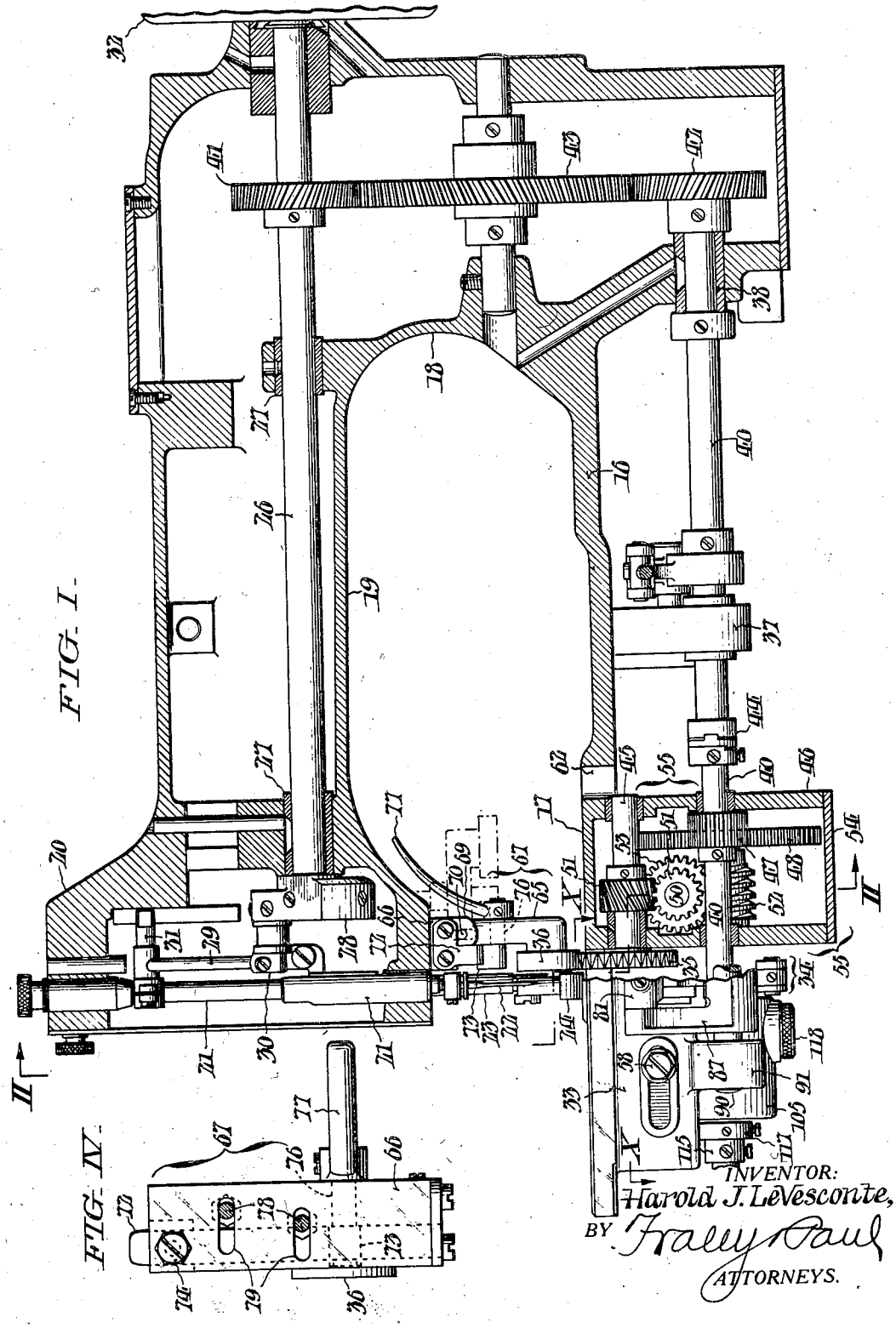


FIG. IV.

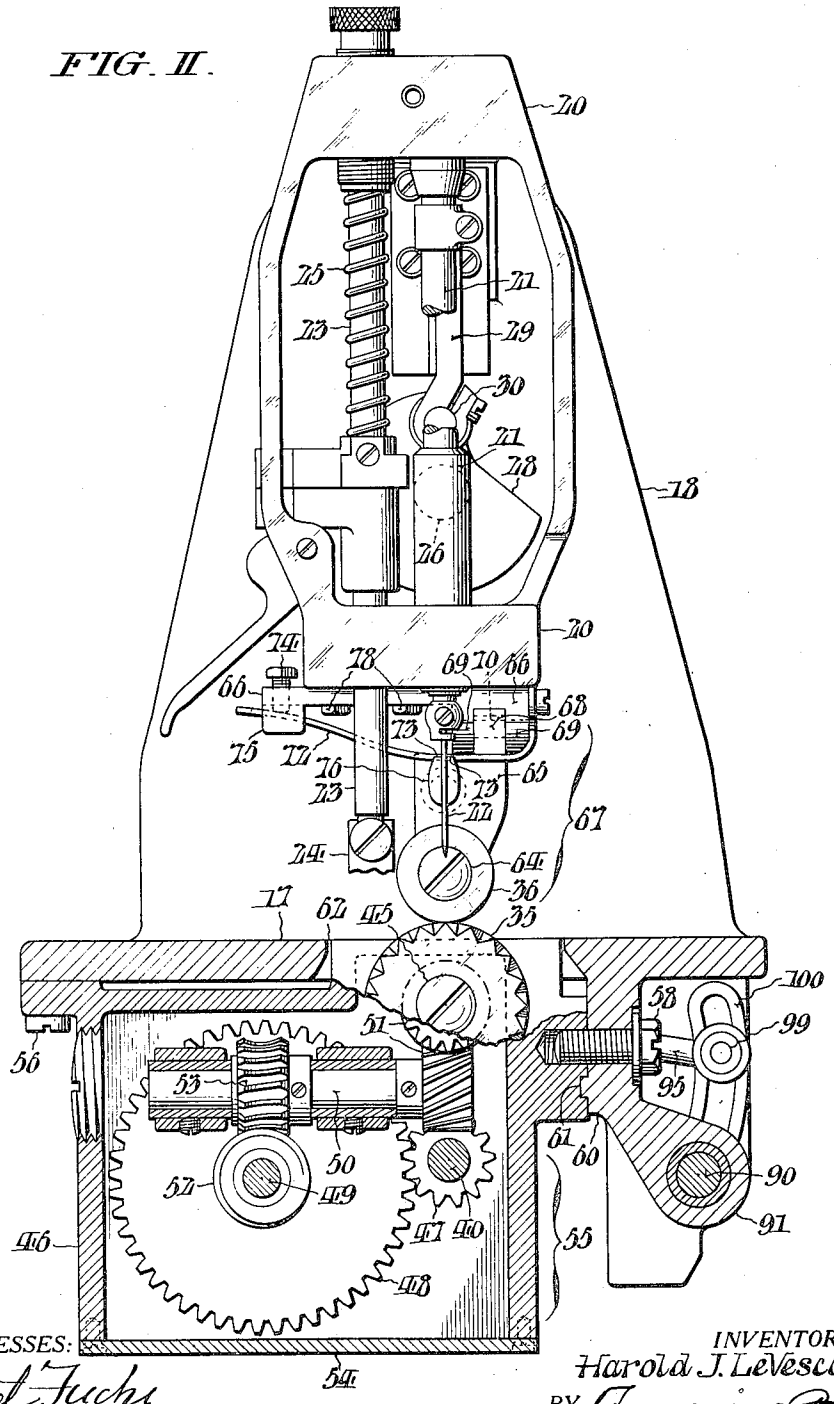
INVENTOR:
Harold J. LeVesconte,
BY Fraley & Paul
ATTORNEYS.

Nov. 29, 1938. H. J. LE VESCONTE 2,138,765

SEWING MACHINE WORK TRIMMER

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FIG. II.



WITNESSES:
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Nov. 29, 1938. H. J. LE VESCONTE 2,138,765

SEWING MACHINE WORK TRIMMER

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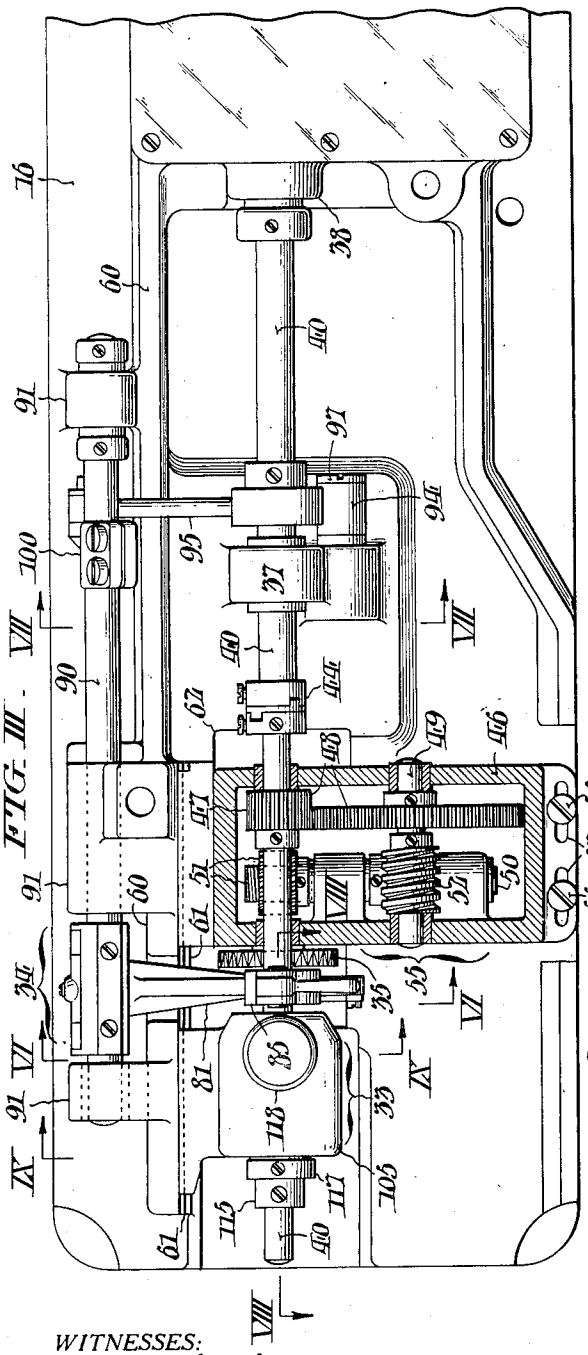


FIG. III.

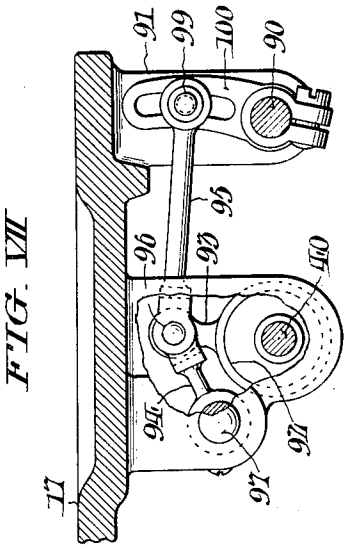


FIG. VIII

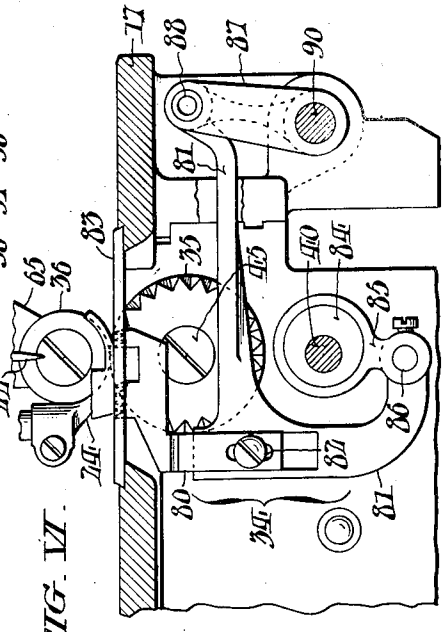


FIG. VII

WITNESSES:
Hubert Fuchs
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Nov. 29, 1938. H. J. LE VESCONTE 2,138,765

SEWING MACHINE WORK TRIMMER

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FIG. XVI.

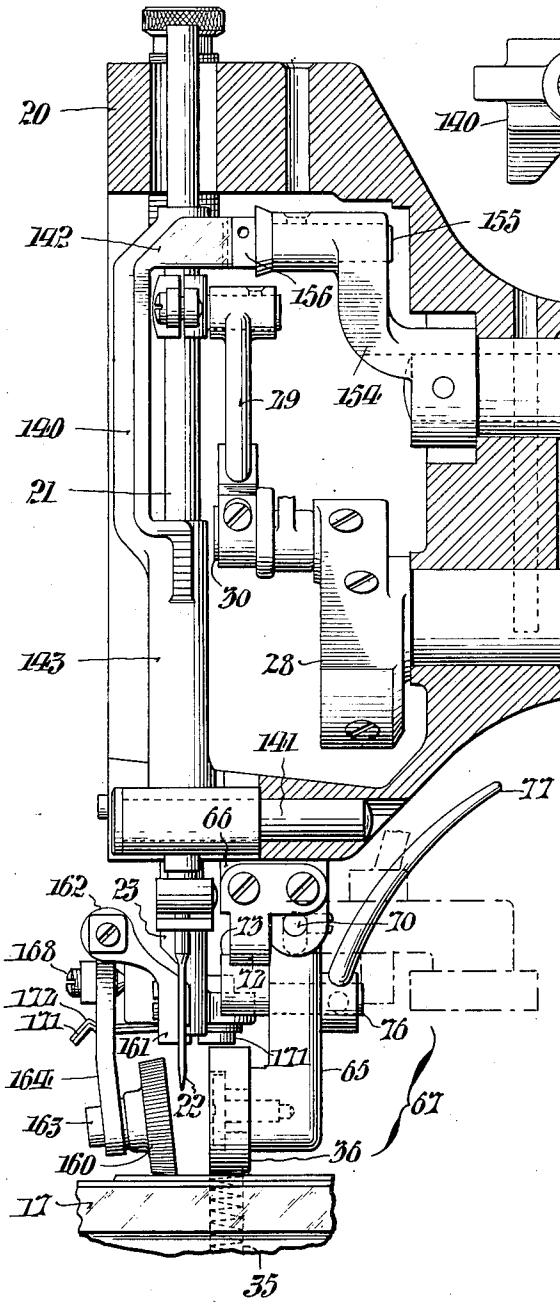


FIG. XVIII.

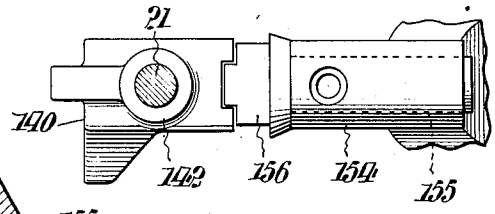
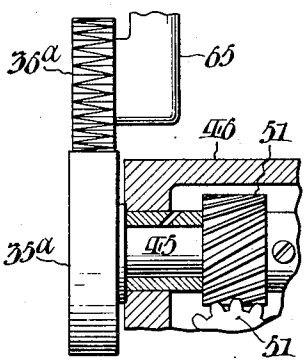


FIG. V.



WITNESSES:
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Nov. 29, 1938. H. J. LE VESCONTE 2,138,765

SEWING MACHINE WORK TRIMMER

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FIG. VIII.

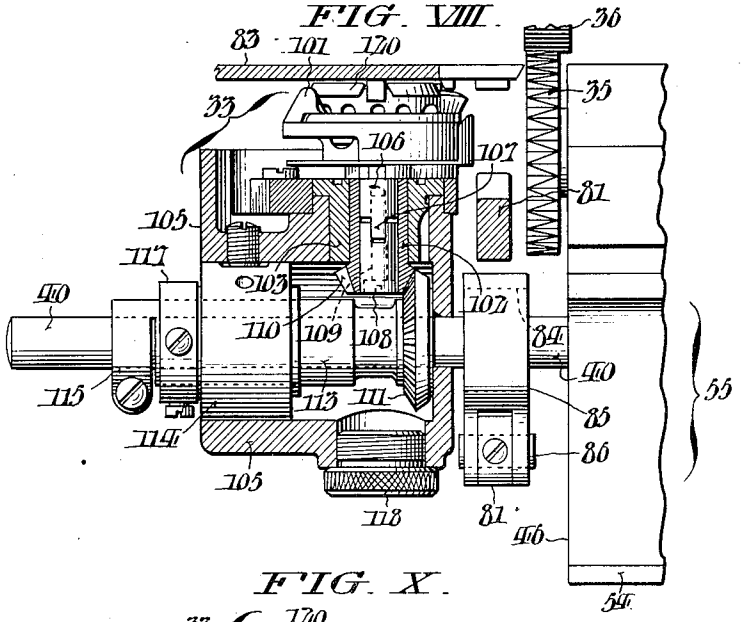


FIG. X.

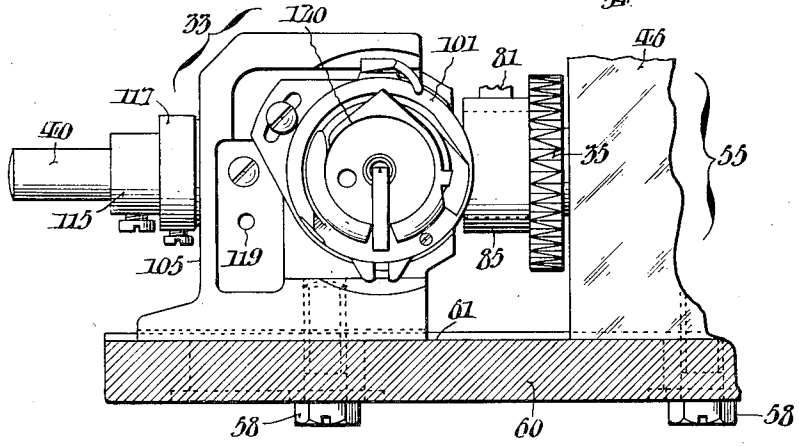
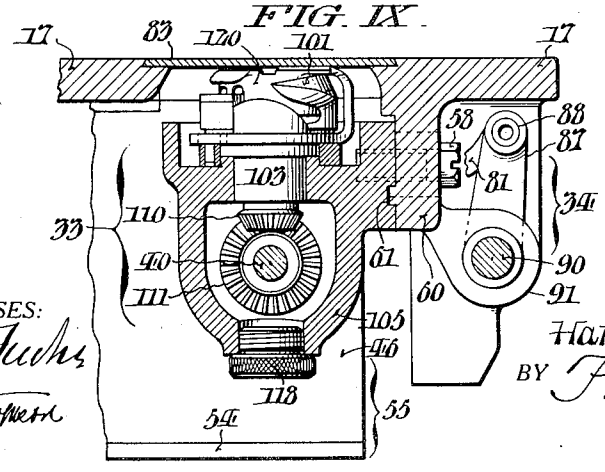


FIG. IX.



WITNESSES:

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Moorhouse Sturgess

INVENTOR:

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SEWING MACHINE WORK TRIMMER

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FIG. XII.

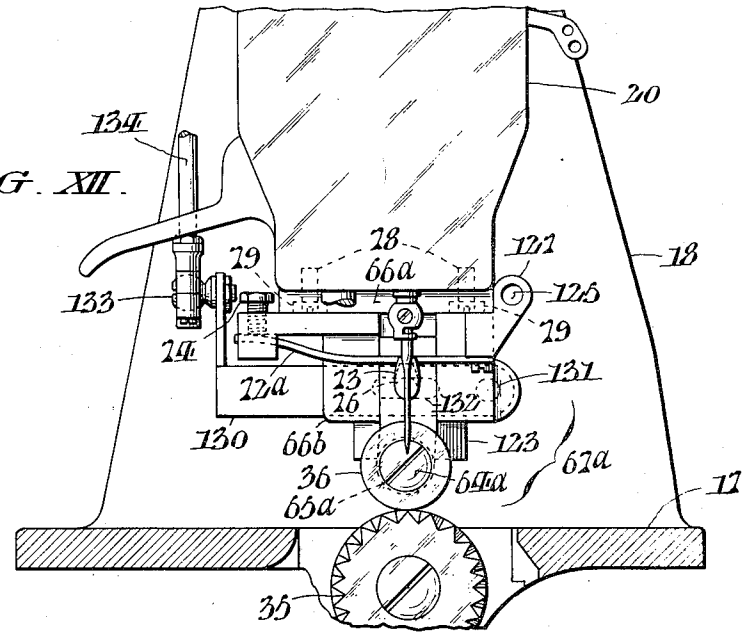


FIG. XI.

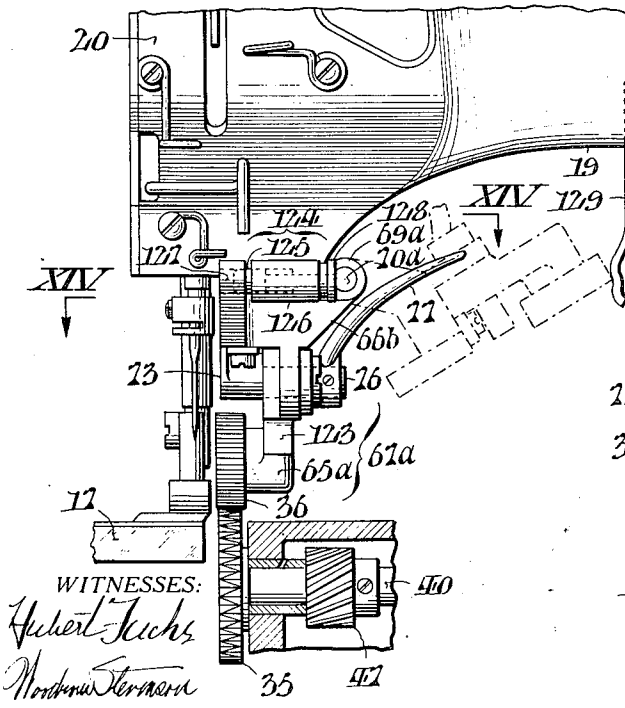
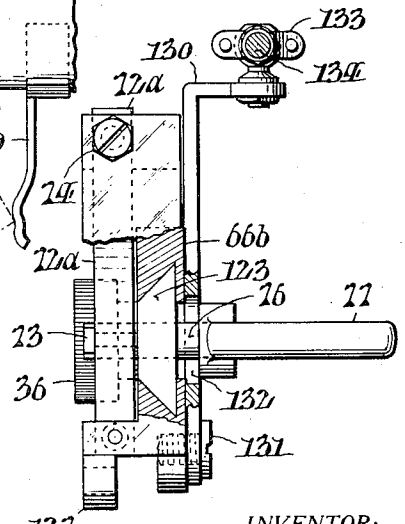


FIG. XIV.



WITNESSES:
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Nov. 29, 1938. H. J. LE VESCONTE 2,138,765

SEWING MACHINE WORK TRIMMER

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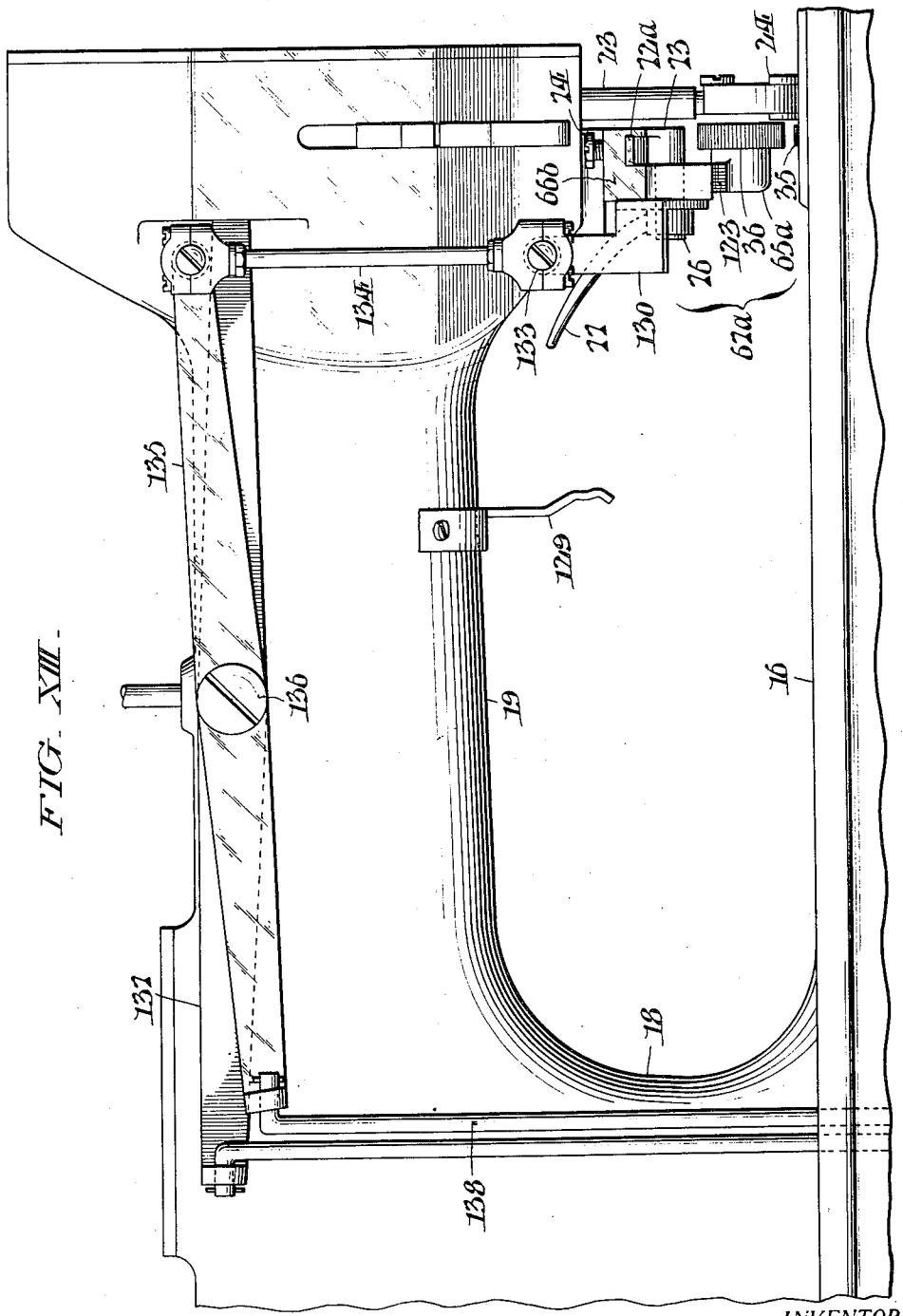


FIG. XIII.

WITNESSES:
Hubert Fuchs
Woodrow Stevenson

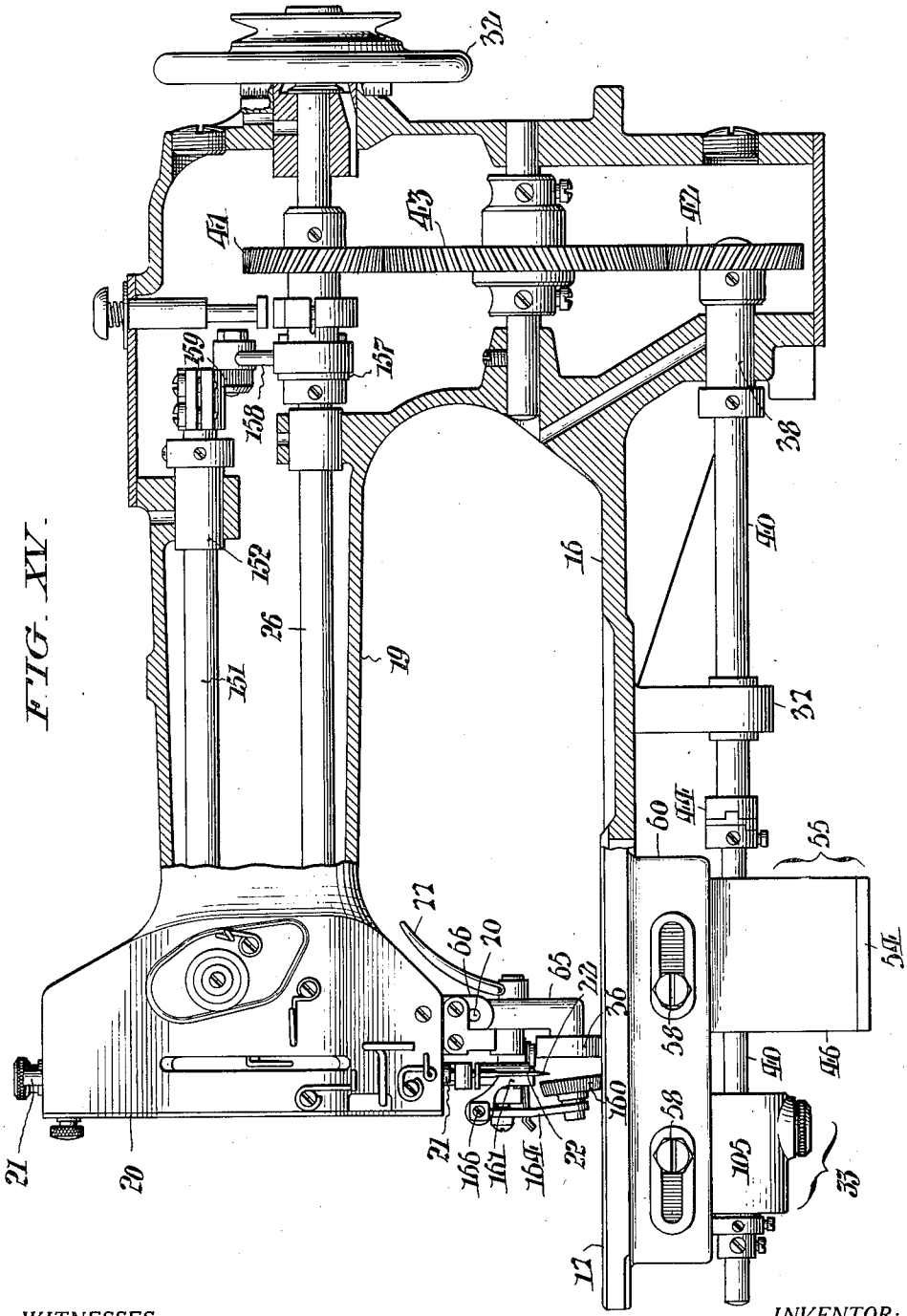
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Nov. 29, 1938. H. J. LE VESCONTE 2,138,765

SEWING MACHINE WORK TRIMMER

Filed Sept. 9, 1936 9 Sheets-Sheet 8

FIG. XV.



WITNESSES:
Hubert Fuchs
Woodrow Stevenson

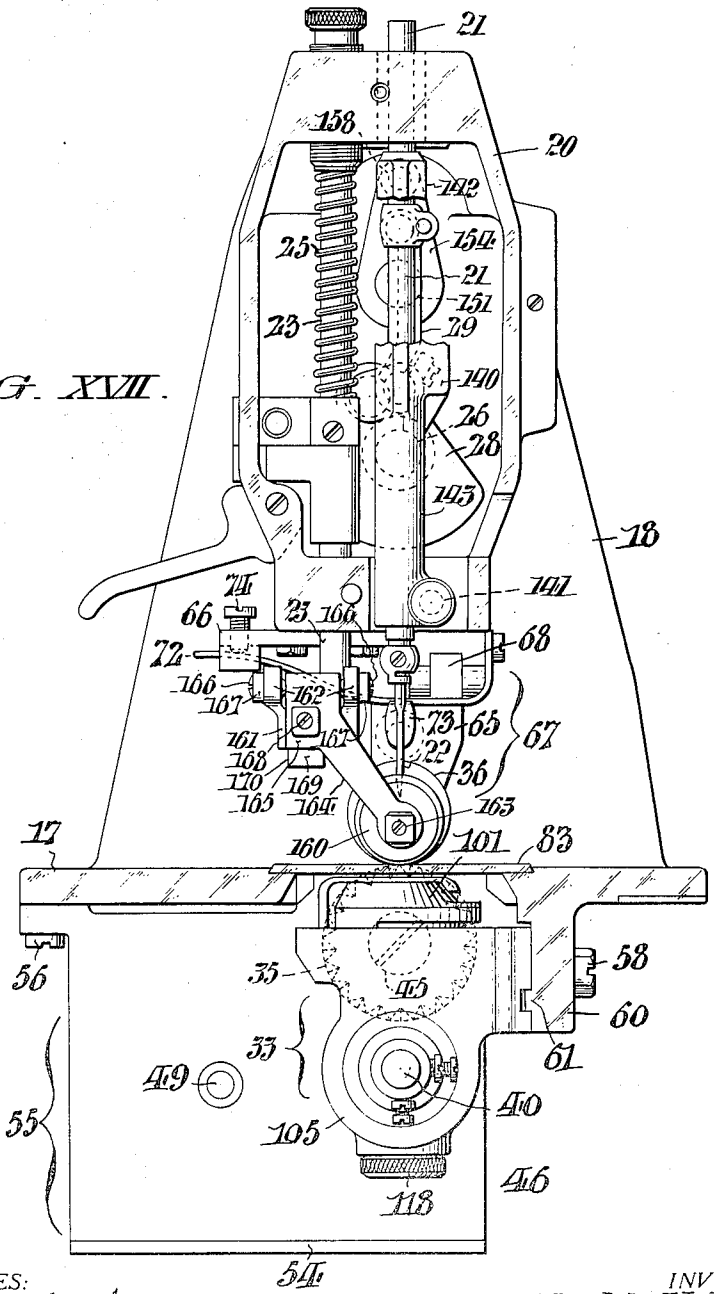
INVENTOR:
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SEWING MACHINE WORK TRIMMER

Filed Sept. 9, 1936 9 Sheets-Sheet 9

FIG. XVII.



WITNESSES:
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Patented Nov. 29, 1938

2,138,765

UNITED STATES PATENT OFFICE

2,138,765

SEWING MACHINE WORK TRIMMER

Harold J. Le Vesconte, Western Springs, Ill., assignor to Union Special Machine Company, Chicago, Ill., a corporation of Illinois

Application September 9, 1936, Serial No. 99,913

19 Claims. (Cl. 112—124)

This invention relates to work feeding and cutting devices for sewing machines and the like, and especially rotary devices. The invention is very advantageous for the type of work-trimming generally known as pinking, in which a recurrent-patterned or scalloped edge is produced adjacent a seam. In suitable forms of embodiment, such as hereinafter described, the invention obviates difficulties in installing the devices employed to the right of and directly opposite the needle, beneath the work support, even in lock-stitch machines; affords unitary mechanisms that can easily be installed on existing machines; and permits of readily putting the cutting means out of action when it is desired to use the machine for ordinary sewing, without trimming. Other features and advantages of the invention will appear from the following description of species or forms of embodiment thereof, and from the drawings.

In the drawings, Fig. I is a side view of a lock-stitch type of sewing machine conveniently embodying my invention, the main frame of the machine and certain other parts being in vertical section.

Fig. II is a view from the left of Fig. I with a cover plate removed to show the mechanism in the needle-head, and with the work support and associated parts mainly in cross-section as indicated by the line and arrows II—II in Fig. I.

Fig. III is a bottom plan view of the work support and associated parts, with the lower portion of a gear casing cut away and removed.

Fig. IV is a plan view of a supporting bracket for an upper pinking device and the associated parts, detached from the needle-head of the machine.

Fig. V is a fragmentary view similar to a portion of Fig. I, but showing a different arrangement of pinking devices.

Fig. VI is a side view of a work feed device and associated parts, taken as indicated by the line and arrows VI—VI in Fig. III.

Fig. VII is a similar view illustrating driving mechanism for the feed, taken as indicated by the line and arrows VII—VII in Fig. III.

Fig. VIII shows a longitudinal sectional view through the rotary hook mechanism of the machine, taken as indicated by the line and arrows VIII—VIII in Fig. III.

Fig. IX shows a section at right angles to Fig. VIII, taken as indicated by the line and arrows IX—IX in Fig. III.

Fig. X is a plan view of the rotary hook mechanism, with associated structure in horizontal section as indicated by the line and arrows X—X in Fig. I.

Fig. XI is a fragmentary side view illustrating a modified construction of the upper pinking unit, with the needle-bar and needle, the presser-foot, a portion of the needle-head, the work-support, and the lower pinking unit, the casing of the latter being shown in section.

Fig. XII is a similar view at right angles to Fig. XI.

Fig. XIII is a rear side elevation of the machine equipped with the upper pinking-unit of Figs. XI and XII.

Fig. XIV is a fragmentary plan view partly in horizontal section as indicated by the line and arrows XIV—XIV in Fig. XI, illustrating some of the parts of the upper pinking unit shown in Figs. XI, XII, and XIII.

Fig. XV is a view similar to Fig. I illustrating a lock-stitch machine having a needle feed and equipped with my pinking devices.

Fig. XVI shows the needle head and associated parts of the Fig. XV machine, with the main frame in vertical longitudinal section.

Fig. XVII is a view from the left of Fig. XV with a cover plate removed to show the mechanism in the needle-head.

Fig. XVIII is a fragmentary plan view of an operating connection which appears in side elevation in Fig. XVI.

As shown in Figs. I, II, and III, the frame of the sewing machine here illustrated includes a bed **16** carrying a work support **17** at its left-hand end and an upright hollow standard **18** at its right-hand end, with a horizontally projecting hollow arm **19** that carries a needle head **20** over the work support **17**. With the head **20** are associated a vertically reciprocating needle bar **21** carrying a needle **22**, and a spring actuated presser bar **23** carrying a presser foot **24**. The presser bar **23** is mounted in the head **20** so as to be vertically movable, and is yieldingly urged downward by a helical compression spring **25**, as usual. The needle bar **21** may be actuated from the horizontal main drive shaft **26** (mounted in bearings **27**, **27** in the arm **19**) by any suitable means, such as a counter-balanced crank **28** on the end of the shaft with a pitman connection **29** from its crank pin **30** to a pivot pin **31** suitably mounted on the needle bar. The shaft **26** may be driven from any suitable source of power by any suitable means, here indicated by a portion of a hand and pulley wheel **32** fast on the right hand end of said shaft **26**. The usual accessories (not here shown) may of course be provided, such as thread tension,

take-up, presser-foot lifting means, tension-relieving device, and thread guides, etc. These are illustrated and described in the application of Norman V. Christensen and Oscar Quist, cited below.

Beneath the work support 17, to the left of the needle 22 in Fig. I, there is a stitch forming mechanism or unit 33 for coacting with the needle 22, this mechanism being shown as of horizontally rotating type such as illustrated and described in the application of Norman V. Christensen and Oscar Quist, Serial No. 53,552, filed December 9, 1935, assigned to the assignee of this application. Work feeding mechanism 34 of four-motion type is also shown beneath the work support 17, for coacting therethrough as usual with the presser foot 24. To the right of the needle 22 and the presser foot 24 and feed mechanism 34 is shown work-trimming or pinking mechanism of rotary type, comprising lower and upper rotors or rolls 35 and 36, which coact with one another through the work support 17. Mounted in bearings 37, 38 beneath the work support 17 is shown a longitudinal horizontal shaft 40 from which may be driven or actuated the stitch-forming mechanism 33, the work-feeding mechanism 34, and the pinking mechanism, or, as shown in Figs. I and II, the lower pinking roll 35. This shaft 40 may be driven from the shaft 26 by means of helical gears 41, 42 of equal diameters on the shafts 26, 40, and an interposed coacting idle gear 43 mounted on a short intermediate shaft. As shown in Figs. I and III, the shaft 40 consists of approximately aligned sections with an interposed flexible or universal coupling 44 that takes care of slight misalignment, and permits slight adjustments of the left-hand shaft section.

As shown in Figs. I, II, and III, the pinking roll 35 is associated with an enclosed speed reduction unit. The roll 35 is mounted on the projecting end of a short shaft 45 located directly above the shaft 40 and (like it) in line with or directly opposite the needle 22, though below the top of the work support 17. The shaft 45 and the pinking roll 35 may be driven from the shaft 40 through reduction gearing enclosed in a casing 46 provided with journal bearings for the shafts 40, 45, etc., and preferably forming an oil-tight housing for the enclosed parts. The shaft 40 carries a pinion 47 (held fast thereto by a set screw) that meshes with a gear 48 on a short shaft 49 extending parallel to the shafts 40 and 45; and the shafts 40 and 45 are interconnected through a short cross-shaft 50 which is mounted in bearings on the casing wall and is connected to shaft 45 through coacting spiral gears 51, 51, and to shaft 49 through a worm 52 on shaft 49 that meshes with a worm wheel 53 on shaft 50. The bottom of casing 46 is shown as a separate plate 54, detachably secured thereto by screws. As here shown, the casing 46 with its enclosed parts and the roll 35 constitute a lower pinking unit 55, bodily adjustable with roll 35 toward and from the needle 22 to vary the distance from the stitching to the pinked edge. The pinking unit 55 may be detachably secured to the work support 17 by means of screws 56, 56 taking into the rear margin of the work support through slots 57, 57 in a rear flange on casing 46, and by a screw 58 (Fig. II) taking into the front wall of said casing 46 through a slot in a depending flange 60 on the work support. As shown in Figs. II and III, there is a tongue and groove engagement at 61 between the flange 60 and the side of the casing 46, to assist in definitely positioning and aligning the unit 55; and the upper portion of the casing 46 projects upward into a longitudinal opening 62 in the work support 17, flush with its top surface. The pinion 47 is shown with a relatively wide face, permitting easy lateral shifting or adjustment of the pinking unit 55 along the shaft 40 toward and from the needle 22 by loosening up and retightening the screws 56, 56 and 58, without opening up the casing bottom 54 to get at the setscrew of pinion 47.

As already mentioned, the lower pinking roll 35 coacts through an opening in the work support 17 with an idle, freely rotating upper pinking roll 36, shown in Figs. I and II as rotatably mounted on a pivot 64 at one side of a supporting arm 65 that is carried by a bracket 66 attached to the needle-head 20, these parts constituting an upper pinking unit 67. Preferably, the upper roll 36 is yieldingly pressed against the lower roll 35 in normal operation, but is arranged to be easily shifted out of coaction with said lower roll when desired, to allow ordinary sewing to be done on the machine without cutting or trimming the work.

As shown, the arm 65 has at its upper end a lug 68 by which it is pivoted between lugs 69, 69 of the bracket 66, on a pivot pin 70 removably secured in the lugs 69, 69. The hole 71 for pivot 70 in arm-lug 68 is vertically elongated to allow up and down play or movement of the arm relative to the bracket. Normally, arm 65 is yieldingly pushed downward by a fairly strong but flexible spring 72 acting on the upper flat side of a lateral shoulder 73 on arm 65, thus holding the periphery of roll 36 yieldingly pressed against that of roll 35. As shown in Fig. II, the spring 72 is a leaf-spring with one end bent upward and attached to bracket 66 by screws, while its other (free) end rests against an adjustable abutment formed by a setscrew 74 in the bracket, between depending guide lugs 75, 75 thereon (Fig. II). The shoulder 73 on arm 65 engages against the mid-portion of the spring 72, so that the initial downward pressure and the upward resistance of the spring may be adjusted by means of the setscrews 74.

The shoulder 73 is here shown as in effect a cam eccentric upward above an axis afforded by a pivot-shank 76 extending through the arm 65 and provided with an arcuate handle-arm 77; so that by turning this handle 77 90° either way, the shoulder cam 73 will be disengaged from spring 72, and the tension of the latter relaxed or released. This allows the arm 65 to be lifted to clear the roll 36 over the roll 35, and then swung to the right and upward 90°, out of coaction with roll 35 and out of the way, as indicated in dotted lines in Fig. I. By a reversal of these movements, roll 36 may be returned into coaction and engagement with roll 35, as shown in full lines.

As shown in Figs. II and IV, bracket 66 is clamped to the needle head 20 by screws 78, 78 that take into the head through slots 79, 79 in the bracket. This affords a convenient means of adjusting the upper pinking unit 67 laterally toward and away from the needle 22, in accordance with the adjustment of the lower pinking unit 55 as described above.

In Figs. I, II, and III the larger positively driven lower pinking roll 35 is shown as the cutter, having a sharp zig-zag peripheral edge such as well known in the art, while the smaller idle upper roll 36 has a plain, flat periphery that coacts with the cutter 35 as an abutment. This

roll 35 also acts to feed the material, as well as the feed 34. The rolls 35, 36 may be detachably secured to the parts which carry them, as by screws such as shown in Fig. II, to permit their easy removal and replacement. In Fig. V, an interchange of functions is illustrated, the smaller idle upper roll 36a being a zig-zag sharp-edged cutter, while the larger lower roll 35a has a plain, flat periphery that acts as an abutment. In this case, the upper cutting roll 36a is only driven by the work as it is fed and by the coaction of the driven lower plain roll 35a. In Fig. V, other parts and features are marked with the same reference numerals as in Figs. I and II, as a means of dispensing with repetitive description.

Figs. VI and VII illustrate one type of four-motion feed 34 which is suitable and preferred for my purpose, being readily adaptable to permit extreme closeness of both the stitch mechanism 33 and the pinking devices 35, 36 to the needle 22. This feed is that shown and described in the application of George Sauer, Serial No. 54,805, filed December 17, 1935, and assigned to the assignee of this application. It comprises a feed-dog 80 adjustable up and down on a feed-bar 81 by means of a screw and slot connection 82, and coacting with the presser-foot 24 through an opening in a throat or stitch-plate 83 associated with the work-support 17. The feed-bar 81 receives up and down work-engaging motion from an eccentric 84 on shaft 40, through an eccentric strap and rod device 85 pivoted to the feed bar at 86, directly below the shaft. The feed-bar 81 receives to and fro work-feeding movement from an oscillatory crank-arm 87 pivoted to the feed bar at 88, and fast to a longitudinal shaft 90 extending parallel with the shaft 40 beneath the work support 17. This shaft 90 is shown as mounted in bearings 91, 91, 91 on the work-support 17. The shaft 90 may be actuated by an eccentric 92 on shaft 40, through connections comprising an eccentric strap and rod device 93 and a toggle whose links 94 and 95 are pivoted together and to said device 93 at 96. Toggle link 94 is anchored on a fixed pivot 97 carried by the work-support 17, while link 95 is pivoted at 99 to a slotted crank arm 100 fixed to shaft 90. By shifting the link pivot 99 along the slotted arm 100 toward or from the shaft 90, the feed and the stitch length can be shortened or lengthened as desired.

As shown in Figs. I, III, and VIII–X, the lock-stitch mechanism or unit 33 is of horizontally rotating rotary hook type, comprising a rotary looptaker hook 101 whose upright axis consists of a hollow shaft 102 arranged parallel with the needle 22 and in the vertical plane of the shaft 40. The shaft 102 is journalled in a bearing bushing 103 in the wall of a casing 105 through which the shaft 40 extends. As shown in Fig. VIII, the rotary hook 101 is removably mounted on the upper end of the hollow shaft 102, being provided with an axial stud 106 that fits free but not loosely in the shaft 102 and has a flat tongue 107 that engages in a diametral slot in a plug 108 fixed in the lower end of the shaft bore. The rotary hook 101 may be removably secured in the shaft 102 by a screw 109 extending axially through the stud 106 and taking into the plug 108. The rotary hook shaft 102 may be driven from the shaft 40 by intermeshing bevel gears 110, 111 fixed to said shafts. The gear ratio may be such as to give two revolutions of the hook 101 for each complete reciprocation of the needle 22. As shown in Fig. VIII, the gear 111 is not attached directly to the shaft 40, but to a sleeve 113 fitting free but not loosely on the shaft 40, and journalled in a bearing bushing 114 in the left-hand wall of the casing 105. The outer end of the sleeve 113 forms a split-collar 115, with a screw for clamping it fast on the shaft 40. This clamping arrangement not only permits of adjusting the gear 111 angularly relative to the shaft 40, but also facilitates adjusting the entire rotary hook stitching unit 33—consisting of the hook 101, casing 105, and the associated parts—along the shaft 40, laterally toward or from the needle 22. A collar 117 fixed on the sleeve 113 by a setscrew coacts with the hub of the gear 111 and the bearing bushing 114 to keep sleeve 113 and gear 111 in proper positions.

The casing 105 of the rotary hook unit 33 has a tongue and groove engagement 61 with the work-support flange 60, similar to that of the lower pinking unit 55, and is secured to said flange 60 by a similar clamp screw and slot arrangement at 58. Thus the unit 33 can easily be adjusted or shifted laterally along the shaft 40 toward and from the needle 22. Like the pinking unit 55, the hook unit 33 affords journal bearing for the section of shaft 40 to the left of coupling 44. The casing 105 forms an oil-tight enclosure for the gears 110, 111, and may be charged or emptied by means of an opening with a screw-plug 118 in its bottom. The journal bearing of sleeve 113 in bushing 114 may be lubricated with oil supplied through a duct 119 extending down from the top of the casing 105 as shown in Fig. X. The rotary hook 101 may be provided with the usual lockstitch accessories, such as the bobbin case 120, etc.

From the foregoing description and a consideration of Figs. I, III, and VIII, it will be appreciated that the horizontally rotating type of looptaker mechanism is especially advantageous in affording room for the lower pinking roll 35 and associated parts at the right of the needle 22, below the top of the work support 17. Also, the type of feed mechanism 34 illustrated is peculiarly adapted to the combination, since it takes up little room laterally at the level of the pinking roll 35 and the horizontally rotating hook 101. Lower down, on the other hand, the pinking and stitch units 55, 33 afford ample room between them for the lower parts of the feed mechanism 34. Both pinking units 55, 67 can be readily installed on the type of sewing machine illustrated, or removed therefrom.

Figs. XI–XIV show the machine of Figs. I–X with a modified construction of the upper pinking unit, various parts and features being marked with the same reference numerals as in Figs I–X in order to dispense with repetitive description, and a distinguishing letter being added to these numerals where such distinction appears necessary.

Corresponding to the one bracket 66 of Figs. I–VIII, the upper pinking unit 67a of Figs. XI–XIV comprises a base-bracket 66a attached to the needle-head 20 by screws 78, 78 in slots 79, 79, and a guide-bracket 66b pivoted to said bracket 66a by a lug 68a between lugs 69a, 69a, and a pivot pin 70a. The bracket 66b affords upright dovetail guideways for vertical movement of a corresponding dovetail portion 123 of the arm 65a on which the upper idle pinking roll 36 is rotatably mounted, as by means of a headed shoulder-stud 64a. The spring 72a that urges arm 65a and roller 36 downward is mounted on the guide-bracket 66b. Normally, the bracket

66b (with the parts that it carries) may be held in the full-line position of Figs XI and XII by a spring latch device 124, comprising a yieldingly-protruded plunger-pin 125 sliding in the bore of a barrel 126 on the base-bracket 66a, and engaging in a socket-lug 127 of the guide-bracket 66b. A head 128 on the rear end of the reduced shank of the plunger 125 serves as a stop to limit the protrusion of said plunger by a helical compression spring in the barrel 126 around the reduced plunger shank, and as a handle for retracting the plunger 125 when desired. Retraction of pin 125 out of socket 127 (after release of the normal tension of spring 72a) allows the bracket 66b and the parts carried thereby to be swung to the right to an inoperative position such as shown in dotted lines in Fig. XI, where roll 36 is out of coaction with roll 35. The parts may be held in such inoperative position by any suitable means, such as a shouldered latch spring 129 on the machine arm 19 for engaging the corner of roll 36. When this has been done, the machine will sew indefinitely without possibility of cutting or trimming the work.

Provision may be made for conveniently throwing the pinking device in and out of action at will without stopping the machine, or even interrupting the sewing of a seam, by lifting the upper roll 36 a short distance above the lower roll 35. For this purpose, a lever 130 is fulcrumed on a lug or ear of guide-bracket 66b, as by means of a shoulder-screw 131, and is provided with a slot 132 through which extends the pivot-shank 76 connecting shoulder-cam 73 to handle 77. The free end of lever 130 has a ball-stud pivot connection 133 to a link 134 whose upper end is pivoted to one end of a lever 135 that is fulcrumed on the machine arm 19, as by means of a shoulder-screw 136 which also serves as a fulcrum for a lever 137 of the usual presser-foot lifting mechanism. The other end of lever 135 may be suitably connected (as by a link 138) to any convenient actuating device, such as a foot-treadle or a knee-press (not shown).

It will be observed from Fig. XII that when the upper roll 36 is in its depressed operative position for engaging or coacting with the lower roll 35, the ball-stud pivot 133 is in axial alignment with the hinge pivot 70a of bracket 66b on bracket 66a. Thus the connections for temporarily lifting roll 36 out of engagement with roll 35 do not interfere at all with swinging the whole bracket 66b and the parts carried thereby to the right to render the pinking device wholly inactive. However, the latch device 124 prevents any possibility of swinging bracket 66b to the right when lever 130 is operated to lift arm 65a in the guideway of said bracket 66b.

Figs. XV–XVIII illustrate the application of my invention to a needle-feed type of lockstitch sewing machine such as illustrated in the application of George Sauer, Serial No. 55,502, filed December 21, 1935, but equipped with a horizontally rotating stitch mechanism 33 such as above described, and without the feed 34 of Figs. I–VII. In general this machine is similar to that shown in Figs. I and II, and various parts and features are marked with the same reference characters as in Figs. I and II as a means of dispensing with repetitive description.

As shown in Figs. XV, XVI, and XVII, the needle bar 21 reciprocates in a guide bracket 140 which is pivoted on a stud 141 secured in the lower end of the head 20, and includes upper and lower guide bearings 142 and 143 for said needle bar. Openings in the upper and lower ends of the head 20 afford clearance for the needle bar 21 to swing or oscillate relative to the head. As here shown, the guide bracket 140 is oscillated about its pivot 141 from a horizontal shaft 151 mounted in bearings 152 in the arm 19, by means comprising a rocker arm or crank 154 fixed to the end of the shaft 151 and provided with a pivot pin 155 whose flattened end 156 is slidingly engaged in a vertical slot or groove in the upper portion 142 of the bracket 140, Figs. XVI and XVIII. The shaft 151 may preferably be driven from the shaft 26 by means adapted to impart an adjustably variable oscillation to said shaft 151.

The mechanism shown in Fig. XV for actuating shaft 151 from shaft 26 includes an eccentric 157 on said shaft 26 with an eccentric rod connection 158 to a crank 159 fast on the adjacent end of shaft 151. For adjusting the amplitude of oscillation imparted to shaft 151 and through it to the needle bar guide 140, provision may be made for adjusting eccentric 157 radially or diametrally of shaft 151, either as described in said application of George Sauer, Serial No. 55,502, or by any of the well-known means for so adjusting an eccentric.

The oscillation of needle bar guide 140 as described causes a corresponding to and fro motion of needle 22 in the direction of feed. With suitable adjustment or setting of the various eccentrics and cranks, as shown, there is a movement of needle 22 in the direction of feed while engaged in the work. The driven roll 35 also acts to feed the work. The contrary movement of the needle 22 takes place while it is out of the work. The amplitude of this work-feeding movement of the needle 22 can be adjusted by adjustment of the eccentric 157 as above indicated.

In the absence of any lower feed, this combination of a needle-feed with a horizontally rotating stitch mechanism 33 allows of maximum compactness: i. e., the stitch mechanism 33 and the pinking roll 35 can both be set as close as desired to the needle. However, any suitable lower feed (such as the four-motion feed of Figs. I–VII) can of course be added to the combination as shown in Figs. XV–XVIII.

The presser foot 160 shown in Figs. XV, XVI, and XVII is of roller type. It comprises a bracket structure 161 attached to the lower end of presser bar 23 and having laterally projecting arms 162, 162. The roller revolves on a stud 163 mounted in the lower end of a sloping arm 164 whose upper shoulder portion 165 is pivoted about a horizontal axis parallel with the line of feed. For this purpose, conical-ended pivot-screws 166, 166 in the bracket arms 162, 162 engage in corresponding sockets in the part 165 of arm 164, these screws 166, 166 being shown as provided with lock-nuts 167, 167. For determining and adjusting the exact position of the roller relative to the needle 22, as well as the angular relation of its periphery to the work support 17, there is a stop-screw 168 in the part 165 of arm 164, adapted to engage against bracket 161 and provided with a lock-nut 169. A (double) leaf-spring 170 is attached to bracket 161 at 171, and its free end has a beveled latch-hump 172 that engages against the lower edge of shoulder 165 and holds arm 164 in the position shown, with stop-screw 168 against bracket 161. By forcibly swinging arm 164 to the left (Fig. XII), its shoulder 165 can be snapped past the latch end of spring 170 and freed, so that the roller can be swung up out of the way for insertion or

removal of work beneath the presser-foot. As shown in Fig. XVI, the "tread" of the beveled roller makes a very acute angle with the plane of work support 17.

Having thus described my invention, I claim:

1. In a sewing machine, the combination of a bed provided with a work support at one end and a standard at the other end carrying an arm with a sewing head over said work support, a needle bar operating in said head and a needle carried thereby, a rotary looptaker with its axis extending in the general direction of said needle-bar at the outside of the needle from said standard, and means for pinking the work during sewing comprising a positively driven rotary pinking cutter at the inside of the needle acting on the work from beneath through said support.

2. In a sewing machine, the combination of a bed provided with a work support at one end and a standard at the other end carrying an arm with a sewing head over said work support, a needle bar operating in said head and a needle carried thereby, a horizontally revolving looptaker below said work support at the outside of the needle from said standard, a positively driven rotary pinking cutter at the inside of the needle acting on the work from beneath through said support, and a roller above said support at the inside of the needle, yieldingly pressed against said cutter.

3. In a sewing machine, the combination of a bed provided with a work support at one end and a standard at the other end carrying an arm with a sewing head over said work support, a needle bar operating in said head and a needle carried thereby, a looptaker at the outside of the needle from said standard, and means for pinking the work comprising a positively driven lower rotor at the inside of the needle acting on the work from beneath through said support and a freely rotating upper rotor normally yieldingly pressed against said lower rotor, but swingable toward said standard out of coaction with said lower rotor.

4. In a sewing machine, the combination of a work support, work feeding and stitch forming means including a needle bar with a needle carried thereby and a rotary looptaker with its axis extending in the general direction of said needle-bar but to one side of the needle, and a pink-cutting device operating on the fabric at the other side of said needle and adjustable transversely of the line of feed toward and from the needle, and including means engaging the fabric from beneath through the work support.

5. In a sewing machine, the combination of a bed provided with a work support at one end and a standard at the other end carrying an arm with a sewing head over said work support, a driving shaft beneath said work support, a needle bar operating in said head and a needle carried thereby, a rotary looptaker at the outside of the needle from said standard actuated from said shaft, a rotary pinking cutter at the inside of the needle directly above said shaft actuated therefrom and acting on the work through said support, and a coacting roll above the work support at the inside of the needle yieldingly pressed against said cutter.

6. In a sewing machine, the combination of a bed provided with a work support at one end and a standard at the other end carrying an arm with a sewing head over said work support, a driving shaft beneath said work support, a needle bar operating in said head and a needle carried thereby, a rotary looptaker with upright axis at the outside of the needle from said standard actuated by said shaft, a rotary pinking cutter at the inside of the needle directly above said shaft actuated therefrom and acting on the work through said support, and a coacting roll above the work support at the inside of the needle normally yieldingly pressed against said cutter, but shiftable out of coaction therewith.

7. In a sewing machine, the combination of a bed provided with a work support at one end and a standard at the other end carrying an arm with a sewing head over said work support, a driving shaft beneath said work support, a needle bar operating in said head and a needle carried thereby, a rotary looptaker at the outside of the needle from said standard actuated by said shaft, a rotary pinking cutter at the inside of the needle directly above said shaft driven therefrom and acting on the work through said support, and a coacting roll above the work support at the inside of the needle normally yieldingly pressed against said cutter, but swingable toward said standard out of coaction with said lower rotor.

8. In a sewing machine, the combination of a needle bar operating above the work, with a needle carried thereby, work feeding means including a feed bar extending in the direction of feed beneath the needle, a looptaker coacting with said needle and revolving horizontally at one side of the needle above said feed bar, and a pinking rotor at the other side of said needle and feed bar acting on the work from beneath.

9. In a sewing machine, the combination of a work support, a needle bar above said work support, with a needle carried thereby, a drive shaft beneath said work support, work feeding means including a feed bar extending in the direction of feed over said shaft, an actuator for said feed bar on said shaft beneath the feed bar, a looptaker over said shaft driven therefrom and revolving horizontally above said feed bar, and a pinking rotor at the opposite side of said feed bar from said looptaker, located over said actuator and shaft and driven from the shaft.

10. In a sewing machine, the combination of a needle bar and needle having an up and down movement and also a lateral to and fro work-feeding movement, and acting on the work from above, a looptaker at one side of the path of work-feeding needle movement, and a pinking rotor at the other side of the path of work-feeding needle movement acting on the work from beneath.

11. In a sewing machine, the combination of a needle bar and needle having an up and down movement and also a lateral to and fro work-feeding movement, and acting on the work from above, a looptaker revolving horizontally at one side of the path of work-feeding needle movement, and a pinking rotor at the other side of the path of work-feeding needle movement acting on the work from beneath.

12. In a sewing machine, the combination of a work support, a needle bar above said work support, with a needle carried thereby, having an up and down movement and also a lateral to and fro work-feeding movement, a drive shaft beneath said work support, a looptaker over said shaft driven therefrom and revolving horizontally at one side of the path of work-feeding needle movement, and a pinking rotor over said shaft at the other side of the path of work-feeding

needle movement, driven from said shaft and acting on the work from beneath.

13. In a sewing machine, the combination of work feeding and stitch forming means including a needle bar with a needle carried thereby, and a rotary pink-cutting device for the work including a positively driven lower rotor and a freely rotating upper rotor normally yieldingly pressed against said lower rotor, but swingable out of coaction therewith at the will of the operator.

14. In a sewing machine, the combination of work feeding and stitch forming means including a needle bar with a needle carried thereby, and a rotary pink-cutting device for the work including a positively driven lower rotor and a freely rotating upper rotor normally yieldingly pressed against said lower rotor, but swingable in the vertical plane of its axis out of coaction with said lower rotor.

15. In a sewing machine, the combination of a work support, a needle bar operating above said work support, with a needle carried thereby, a driving shaft beneath said work support, a lockstitch unit removably mounted on said work support around said shaft at one side of said needle and adjustable toward and from the latter, and having a rotary looptaker with upright axis driven from said shaft, and a pinking unit removably mounted on said work support around said shaft at the other side of said needle and adjustable toward and from the latter, and having a pinking rotor over said shaft driven from the latter and acting on the work from beneath.

16. In a sewing machine, the combination of a bed provided with a work support at one end and a standard at the other end carrying an arm with a sewing head over said work support, a driving shaft beneath said work support, a needle bar operating in said head and a needle carried thereby, a rotary looptaker with upright axis removably mounted on said bed at the outside of the needle from said standard and driven by said shaft, a lower pinking unit removably mounted on said bed at the inside of the needle and including a rotor directly above said shaft driven therefrom and acting on the work from beneath, and an upper pinking unit mounted on said head and including a rotor at the inside of the needle yieldingly pressed against the aforesaid rotor.

17. In a sewing machine, the combination of a work support; a needle bar operating above said work support, with a needle carried thereby; a looptaker revolving horizontally at one side of the needle and coacting therewith; a rotary pink-cutting device at the other side of the needle, including a positively driven lower rotor acting on the work from beneath and a coacting upper rotor normally yieldingly pressed downward against said lower rotor, but swingable aside away from the needle out of coaction with said lower rotor; and means for at will temporarily raising said upper rotor from said lower rotor without interrupting the sewing of a seam by the machine.

18. A pinking attachment for sewing machines comprising a speed reduction unit including a frame structure with means for mounting it beneath the work support on a rotary hook-supporting bracket of the machine, means for driving said speed reduction unit when so mounted from a rotary shaft beneath the work support, and a shaft projecting from said unit with a rotary pinker thereon.

19. A pinking attachment for sewing machines comprising a frame and casing structure with means for mounting it beneath the work support on a rotary hook-supporting bracket of the machine, reduction gearing mounted and enclosed in the frame and casing structure, and including a gear for meshing with a gear on the hook-driving shaft of the machine, and a shaft driven by said gearing carrying a pinking rotor with its periphery exposed upward above the casing, for engaging through the work support with work thereon.

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