Aug. 18, 1942. N. KNAUS ET AL 2,293,607

TRIMMING MECHANISMS FOR SEWING MACHINES

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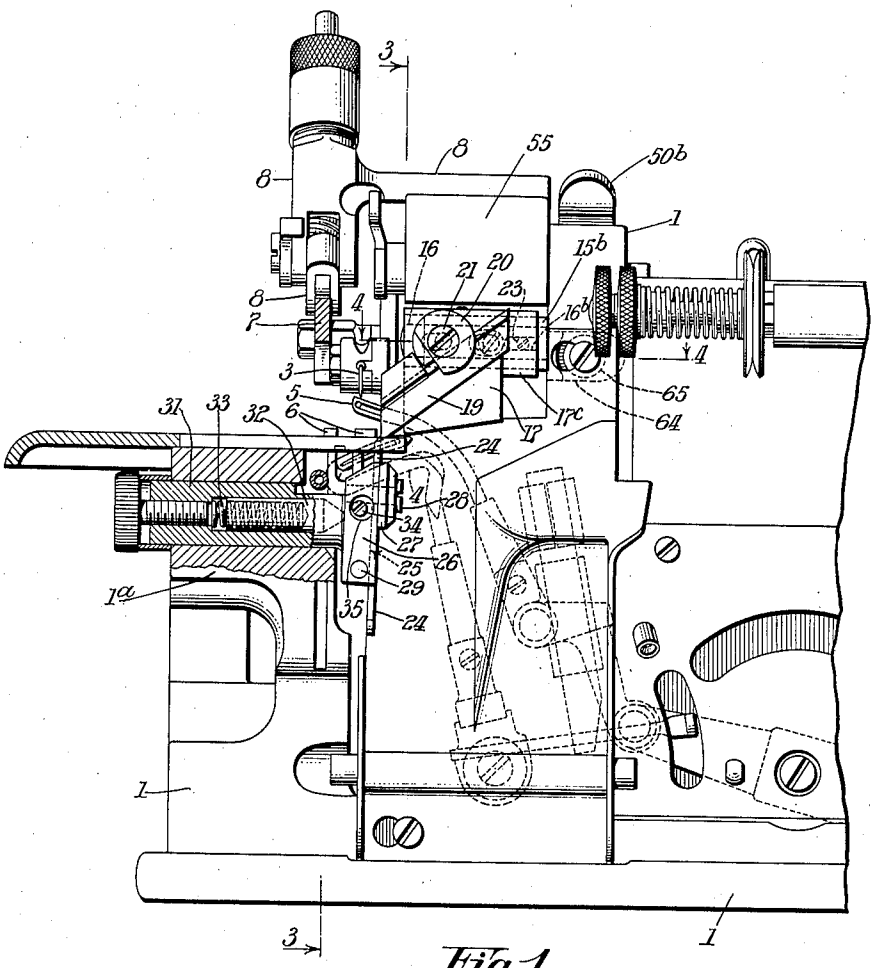


Fig. 1.

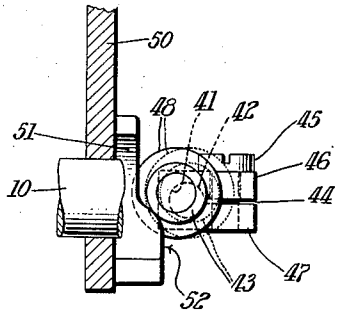


Fig. 5.

Inventors
Nicholaus Knaus
and Anna M. Pailey

Witness:
Godfrey Peirce

By John F. Heine
Attorney

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TRIMMING MECHANISMS FOR SEWING MACHINES

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Fig. 2.

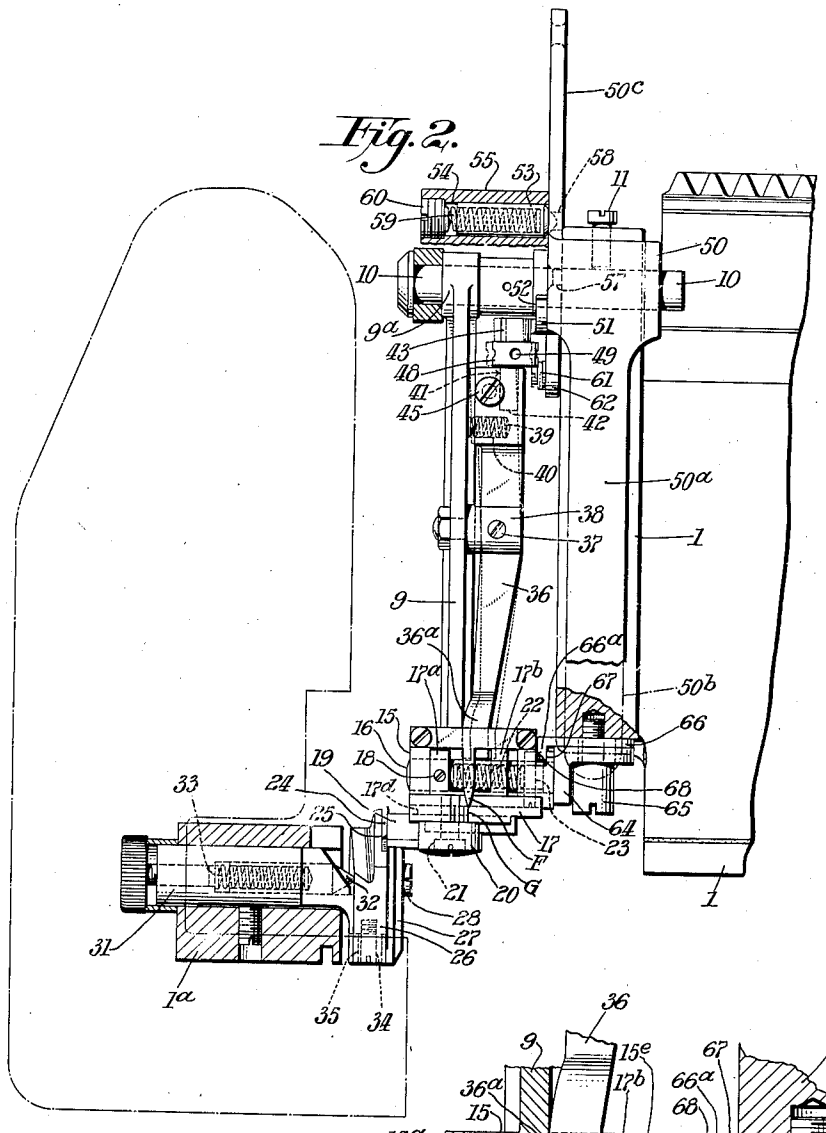
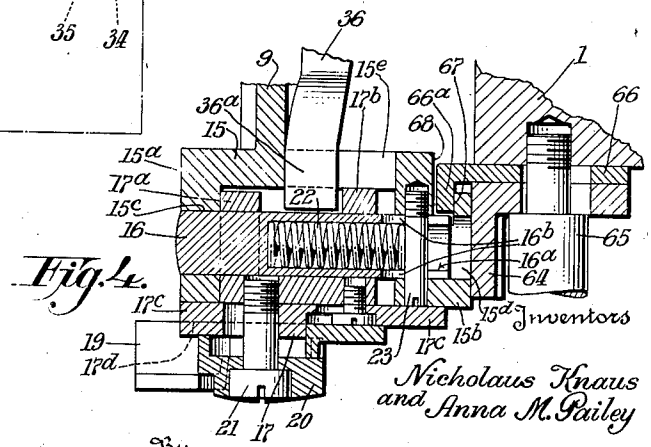


Fig. 4.



Witness:
Godfrey Peirce

Inventors
Nicholaus Knaus
and Anna M. Bailey

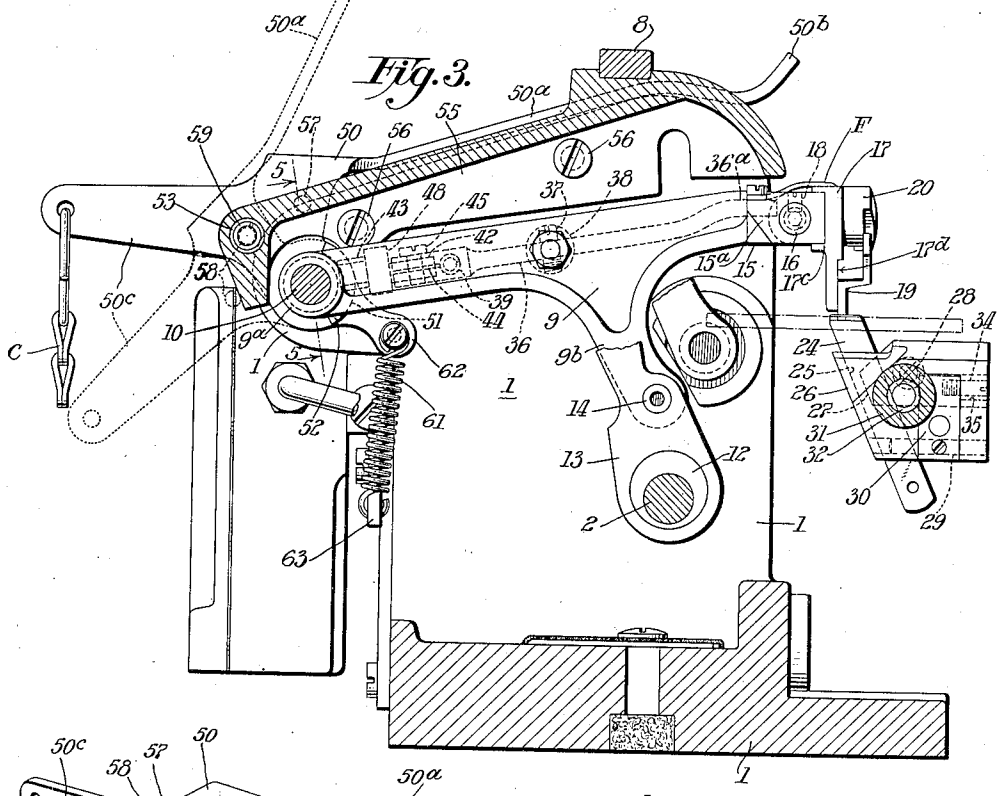
By
John F. Heine
Attorney

Aug. 18, 1942. N. KNAUS ET AL 2,293,607

TRIMMING MECHANISMS FOR SEWING MACHINES

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Fig. 3.



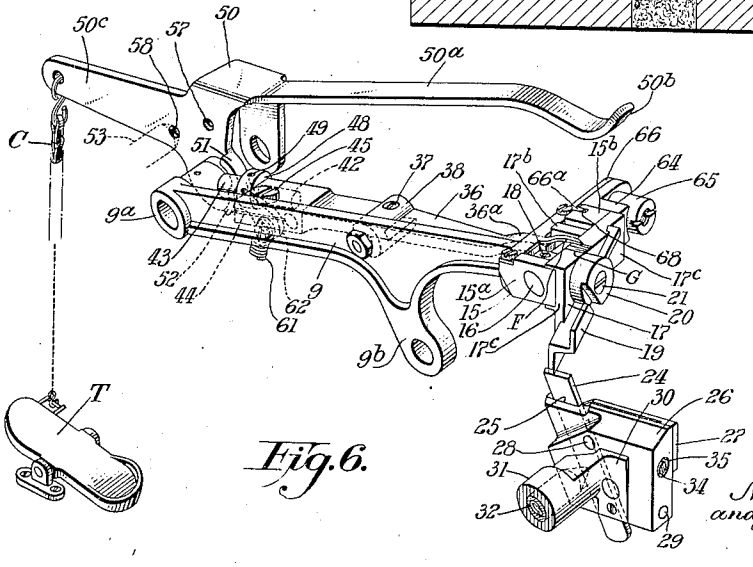


Fig. 6.

Witness:
Godfrey Reina

Inventors
Nicholaus Knaus
and Anna M. Bailey

By John F. Heine
Attorney

Patented Aug. 18, 1942

2,293,607

UNITED STATES PATENT OFFICE

2,293,607

TRIMMING MECHANISM FOR SEWING MACHINES

Nicholaus Knaus, Newark, and Anna M. Pailey, Elizabeth, N. J., assignors to The Singer Manufacturing Company, Elizabeth, N. J., a corporation of New Jersey

Application August 13, 1940, Serial No. 352,350

18 Claims. (Cl. 112—126)

This invention relates to sewing machines and more particularly to trimming mechanisms therefor of that type which are adapted to trim off the marginal portion of the work adjacent to and parallel with the line of seam formation.

An overedge sewing machine is a good example of one form of sewing machine which frequently embodies this type of trimming mechanism; the trimming of the work being effected in advance of the stitch-forming mechanism and the overedge seam thereafter being formed over the trimmed edge. This invention will, therefore, be shown and described in connection with an overedge sewing machine, but it is to be understood that its application is in nowise limited to that type of machine.

In overedge sewing machines the trimming of the work is usually effected as close to the line of needle penetration as is practical so that the overedge seam may be relatively narrow. It has been found that under certain conditions, such for example as when sewing over cross-seams, inserted elastics, etc., the normal setting of the trimming mechanism relative to the line of needle penetration affords an insufficient amount of material to produce a strong seam. Various mechanisms heretofore have been provided for enabling the operator temporarily to widen the margin between the line of needle penetration and trimmed edge of the work as the nature of the work may require. These prior constructions have, however, been cumbersome and inconvenient to operate and have usually necessitated the lateral shifting of the entire trimming mechanism and portions of its actuating means. Also in the prior constructions the relatively movable trimmer-blades have been pressed together with heavy spring pressure with the result that the blades were worn out in a relatively short time.

This invention has as its primary object to provide a trimming mechanism of the type comprising relatively movable upper and lower trimmer-blades and to combine therewith improved manually actuable means, operable during the operation of the machine, for shifting the trimmer-blades laterally of the line of seam formation and relative to their supporting and actuating means, so that the margin between the line of needle penetration and the edge of the work may be varied at will.

Another object of the invention is to provide a trimming mechanism, of the type described above, in which the upper vibratory trimmer-blade may be shifted laterally on its supporting and actuating bar during the operation of the machine and the lower or normally stationary blade will be given corresponding lateral movements therewith, the two blades being held together in cutting contact by relatively light spring pressure, thereby to avoid excessive wear in the two cooperating blades.

Still another object is to render available an improved adjustable trimming mechanism, as above described, which, by minor adjustments, readily may be adapted selectively for hand or treadle control.

A still further object is to provide, in an adjustable trimming mechanism, simple and effective means for holding the upper vibratory trimmer-bar against lateral deflection in either direction while maintaining the trimmer-blade freely adjustable thereon and for holding the blade against inadvertent movement either toward or away from the line of seam formation.

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.

In the drawings,

Fig. 1 is a side elevation, partly in section, of a portion of an overedge sewing machine embodying the present invention.

Fig. 2 is a plan view, also partly in section, of the machine shown in Fig. 1, with certain parts thereof omitted.

Fig. 3 is a transverse vertical section taken substantially on the line 3—3 of Fig. 1.

Fig. 4 is a detail sectional view substantially on the line 4—4 of Fig. 1.

Fig. 5 is a detail sectional view substantially on the line 5—5 of Fig. 3, showing manually actuable cam and roller means for effecting lateral shifting of the upper trimmer-blade.

Fig. 6 is a perspective view of the upper vibrating trimmer-bar, the trimmer-blade carried thereby and the means for shifting the trimmer-blades laterally of the line of seam formation.

Referring more specifically to the drawings, the invention is disclosed as embodied in an overedge sewing machine comprising a main frame 1 in which is journaled a rotary main shaft 2 (Fig. 3) from which is actuated an oscillatory curved needle 3, a cooperating needle-loop-taking looper 4 and an overedge looper 5. A feeding mecha-

nism, of which only the feed-dog 6 is shown, also is actuated from the main shaft. Cooperating with the feed-dog is a presser mechanism, the presser-foot supporting bar 7 of which is shown in section in Fig. 1. The means for depressing the presser-bar, thereby to hold the presser-foot (not shown) on the work, is designated generally as 8.

Inasmuch as the above described mechanism forms no part of the present invention, detailed illustration and description thereof is deemed unnecessary. For a more complete understanding of the overedge sewing machine to which the present invention has been applied, reference may be had to the pending application of N. Knaus, Serial No. 278,393, filed June 10, 1939.

The improved trimming mechanism comprises an upper vibratory trimmer-bar 9 pivotally mounted, at its rear end 9^a, on a stud 10 supported by the machine frame and held therein by a set-screw 11. Vibratory movements are given to the trimmer-bar by an eccentric 12, secured upon the main shaft, through the medium of a link 13 having a portion surrounding the eccentric 12 and being pivotally connected, at 14, to a depending part 9^b of the trimmer-bar 9. The link 13 also has a portion which extends upwardly above the pivotal connection 14 and serves as a take-up for the needle-thread but as this take-up forms no part of the present invention the upper part of the link has been broken off better to disclose features of this invention.

The forward end of the trimmer-bar is formed as a yoke 15 having spaced arms 15^a and 15^b provided with aligned apertures 15^c and 15^d, respectively, within which is slidingly mounted an endwise movable rod 16. A trimmer-blade-carrying head 17 has arms 17^a and 17^b surrounding the rod 16 and a portion 17^c partially embracing and slidingly mounted on the front face of the yoke arms 15^a, 15^b. The head 17 is secured to the rod 16 by means of a set-screw 18 threaded through the arm 17^a and bearing upon the rod. An upper trimmer-blade 19 is adjustably secured in a groove 17^d formed in the front face of the head 17 by a clamp-block 20 pressed against the blade by a clamp-screw 21 threaded into the head 17.

From the foregoing it will be understood that the upper trimmer-blade is carried by the head 17 which is secured to and slidable horizontally in the yoke 15 with the rod 16.

The head 17 and the blade 19 carried thereby are normally maintained in one extreme lateral position, i. e., to the left as viewed in Figs. 1, 2 and 4 with the arm 17^a in contact with the arm 15^a of the yoke. This is effected by an expansion spring 22 inserted within an axial bore 16^a formed in the rod 16 and bearing, at one end, against the bottom of the bore and at its opposite end against a pin 23 threaded into the yoke 15 and passing through slots 16^b in the rod 16.

Cooperating with the upper movable trimmer-blade 19 is a lower normally stationary trimmer-blade 24 adjustably mounted, for endwise movement, in a slot 25 formed in a blade-holder 26 and held therein by a clamp-plate 27 and clamp-screw 28. The blade-holder 26 is pivotally mounted on a horizontally disposed pin 29 carried by a head 30 formed at the end of a cylindrical shank 31 supported, for longitudinal adjustment, in a pedestal 1^a forming a part of the main frame of the machine.

To bias the blade 24 sidewise about its pivot 29 against the trimmer-blade 19 there is provided, in a longitudinal bore in the cylindrical shank 31, a plunger 32 and a biasing spring 33 which exert pressure upon the blade-holder 26, as shown in Figs. 1, 2 and 6. The longitudinal axis of the pivot-pin 29 is parallel to the cutting plane of the blades 19 and 24 and transversely of the plane in which the shank 31 is adjustable. A stop screw 34, secured in the head 30 and having a portion located within an aperture 35 in the blade-holder 26, serves to limit the lateral swinging movement of the holder about the pivot-pin 29.

As hereinbefore stated, this invention relates primarily to means for shifting the trimmer-blades laterally of the line of seam formation during the operation of the machine. This is effected by mechanism now to be described.

Extending lengthwise of the trimmer-bar 9 is a lever 36 fulcrumed, intermediate its ends, on a screw 37 carried by a block 38 secured to the trimmer-bar. The forward end 36^a of the lever 36 extends through a slot 15^e in the back of the yoke 15 and at certain times is adapted to engage the arm 17^b on the trimmer-blade carrying head 17 to shift the head laterally in opposition to the spring 22. A spring 39, seated within a socket 40 in the lever 36 and bearing against a side of the trimmer-bar, tends to rotate the lever clockwise (as viewed in Fig. 2) about the pivot-screw 37. At its rear end the lever 36 is formed with a socket 41 adapted to receive a stud 42 which carries, at its exposed end, an eccentrically mounted roller 43 adapted to be acted on by a lever-shifting cam later to be described. At one side of the socket 41 the lever 36 is split horizontally, as shown at 44 in Fig. 5, and a clamp-screw 45 passing freely through the upper wall 46 and threaded into the lower wall 47, serves to draw the two together thereby to clamp the stud 42 in its various angular positions in the socket 41. To facilitate rotation of the stud 42, thereby to adjust the roller 43 laterally, the stud is provided with an enlarged collar portion 48 having a series of holes 49 into which a suitable pin may be inserted for rotation of the stud after the clamp-screw 45 has been released. After the desired adjustment of the roller 43 has been effected, the stud 42 is again locked against rotation by tightening of the clamp-screw 45.

Pivotally mounted on the stud 10, between the hub of the trimmer-bar 9 and that portion of the main frame 1 of the machine in which the stud is mounted, is a manually actuable lever 50 one portion 50^a of which extends forwardly over the machine to the front thereof where it is formed with a hand-grasp 50^b conveniently accessible to the hand of the operator when in her normal working position. The lever 50 also has a rearwardly extending arm 50^c adapted to be connected for either knee or foot actuation. In the drawings the arm 50^c is shown as connected by a chain C to a foot-treadle T but it is to be understood that, if desired, a knee-lever may be substituted for the foot-treadle.

Decided advantages are afforded by locating the lever 50 above the work-support and the trimming mechanism where it is readily accessible to the operator. A certain construction heretofore has been provided in which the trimmer-shifting lever is located adjacent the lower trimmer-blade and in a position where it is normally covered by the work. It will readily be perceived that with the trimmer-shifting lever so located it may be engaged and shifted only with considerable difficulty and by reaching

under and disturbing the position of the work, whereas in the present construction, in which the trimmer-shifting lever is located wholly above the work, it is always conveniently accessible without disarranging the work.

Secured to the lever **50** adjacent its fulcrum is an arcuate cam **51**, the effective face **52** of which is adapted to engage the roller-stud **43** on the trimmer-shifting lever **36**. Movement of the lever **50**, in a counter-clockwise direction as seen in Figs. 3 and 6, will, by the action of the cam-face **52** on the roller-stud **43**, cause the roller-stud and the rear end of the lever **36** carrying the same, to be shifted toward the trimmer-bar **9**. Consequently the forward end **36a** of the lever **36** moving in the opposite direction will, through contact with the portion **17b** of the upper trimmer-blade-carrying head, cause the upper trimmer-blade to be shifted laterally away from the line of seam formation. The lower trimmer-blade **24**, being spring-pressed against the upper trimmer-blade will move therewith and consequently the blades will then trim the work at a greater distance from the seam. The amount of swinging movement given to the lever **36** and thereby the extent of lateral adjustment of the trimmer-blades effected by complete actuation of the lever **50** is determined by the point of contact between the face **52** of the cam **51** and the roller-stud **43**. As hereinbefore indicated the effective action between the cam and the roller may be varied by rotation of the stud **42** and the consequent lateral adjustment of the roller **43** relative to the cam. To indicate the amount of lateral movement given to the upper trimmer-blade in any setting of the stud **42** the laterally movable trimmer-blade-carrying head **17** is provided with series of graduations G which cooperate with a stationary indicator finger F secured upon the yoke **15** of the trimmer-bar.

As hereinbefore stated, the lever **50**, and the cam **51** carried thereby, selectively may be actuated either from the front end by hand or from the rear end by a knee-lever or foot-treadle. When adapted for hand actuation detent means is provided for holding the lever in each of its two extreme positions, i. e., either in the position shown in full lines in Fig. 3, in which the trimmer-blade-carrying head **17** is in its extreme position toward the needle **3**, or in the position shown in dotted lines in Fig. 3 in which the trimmer-carrying head is shifted to the right, as seen in Figs. 1 and 2. This detent means comprises a spring-pressed plunger **53** located within a bore **54** formed in a bracket **55** secured to the main frame **1** by screws **56**, see Fig. 3. The plunger **53** has a conical end adapted to enter detent apertures **57** and **58** in the lever **50** to hold the lever in its extreme positions of adjustment. A coil-spring **59** within the bore **54** urges the plunger into contact with the side of the lever **50** and, when aligned therewith, seats the end of the plunger in the apertures **57** and **58**. The spring **59** is backed up by a screw **60** threaded into the end of the bore **54**.

When adapted for knee or foot actuation, the detent means preferably is rendered ineffective, as by removal of the spring-plunger **53**. A tension-spring **61** (see Figs. 2 and 3) is then connected between a downwardly extending arm **62** formed on the lever **50** and a finger **63** secured to the rear side of the machine frame. This spring yieldingly holds the lever **50** in the position shown in full lines in Fig. 3, from which position it may be shifted more or less as desired by the connection C to a knee-lever or the foot-treadle T, always returning to its original position when pressure on the lever or treadle is relieved.

To prevent lateral deflection of the trimmer-bar **9** away from the line of seam formation, one end of the yoke **15** is caused to abut against an abutment block **64** rigidly secured to the main frame by a clamp-screw **65**, as shown most clearly in Figs. 2, 4 and 6. Deflection of the trimmer-bar in the opposite direction is prevented by the engagement of the laterally offset portion **66a** of an L-shaped member **66**, also secured to the main frame by screw **65**, with the face **67** formed by making a cut **68** in the arm **15b** of the yoke **15**.

From the foregoing it will be apparent that this invention has provided improved means actuable during the operation of the machine either by the hand of the operator or by a knee-lever or foot-treadle for shifting the trimmer-blades laterally relative to the line of seam formation as the nature of the work may require.

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

1. In a sewing machine, a frame, a trimmer-bar mounted on said frame, means to actuate said trimmer-bar, an upper trimmer-blade adjustably carried by said trimmer-bar, a cooperating lower trimmer-blade supported by said frame, means for maintaining said trimmer-blades in working contact with each other, and means including an element carried by said trimmer-bar and operable during the operation of the machine for shifting said upper trimmer-blade laterally on said trimmer-bar.

2. In a sewing machine, a frame, a trimmer-bar pivotally mounted at one end on said frame, means to vibrate said trimmer-bar, an upper trimmer-blade adjustably carried by the other end of said trimmer-bar, a cooperating lower trimmer-blade adjustably supported by said frame, spring means for maintaining said trimmer-blades in working contact with each other, and means including a lever located above said trimmer-blades and operable during the operation of the machine for shifting said upper trimmer-blade laterally on said trimmer-bar.

3. In a sewing machine, a frame, a trimmer-bar pivotally mounted at one end on said frame, means to actuate said trimmer-bar, a trimmer-blade carrying-head adjustably carried by the other end of said trimmer-bar, an upper trimmer-blade secured in said head, a cooperating lower trimmer-blade supported by said frame, means for maintaining said trimmer-blades in working contact with each other, and means including an element carried by said trimmer-bar for shifting said head and upper trimmer-blade, and thereby the lower trimmer-blade, laterally during the operation of the machine.

4. In a sewing machine, a frame, a trimmer-bar jouraled on a fixed pivot provided by said frame, means to vibrate said trimmer-bar on its pivot, an upper trimmer-blade adjustably carried by said trimmer-bar, a cooperating lower trimmer-blade, a holder for said lower trimmer-blade, a pivotal connection between said holder and said frame, spring means for urging said lower trimmer-blade into working contact with the upper trimmer-blade, and manually operable means carried by said trimmer-bar for shifting said upper and lower trimmer-blades laterally during the operation of the machine.

5. In a sewing machine, a frame, a trimmer-

bar pivotally mounted at one end on said frame, means to actuate said trimmer-bar, a trimmer-blade carrying-head slidingly mounted on the other end of said trimmer-bar, an upper trimmer-blade secured in said head, a cooperating lower trimmer-blade pivotally supported by said frame, means for maintaining said trimmer-blades in working contact with each other, a lever carried by said trimmer-bar and having one end operatively connected with said head, and means operable during the operation of the machine for swinging said lever about its fulcrum to effect lateral shifting of said upper and lower trimmer-blades.

6. In an overedge sewing machine, a frame, a trimmer-bar pivotally mounted on said frame, means to actuate said trimmer-bar, an upper trimmer-blade slidingly mounted for horizontal movement on said trimmer-bar, a cooperating lower trimmer-blade supported by said frame, means for maintaining said trimmer-blades in working contact with each other, a trimmer-blade shifting lever fulcrumed intermediate its ends and extending lengthwise of said trimmer-bar, an operative connection between one end of said lever and said upper trimmer-blade, and means engaging the other end of said lever and operable during the operation of the machine for swinging said lever and thereby shifting said upper trimmer-blade laterally on said trimmer-bar.

7. A sewing machine as set forth in claim 6 in which the means for swinging the trimmer-shifting lever comprises a cam supported by the machine frame, and in which a manually actuable lever is connected with said cam for shifting the same.

8. A sewing machine as set forth in claim 6 in which the means for swinging the trimmer-shifting lever comprises a rotary cam journaled on the machine frame and in which a lever, having a portion extending forwardly over the machine frame to the front of the machine for hand operation, is connected with said cam for rotating the same.

9. A sewing machine as set forth in claim 6 in which the means for swinging the trimmer-shifting lever comprises a rotary cam fulcrumed on the machine frame and in which a lever, having a portion extending rearwardly from its fulcrum and connected for treadle-actuation, is connected with said cam for rotating the same.

10. A sewing machine as set forth in claim 6 in which the means for swinging the trimmer-shifting lever comprises a rotary cam fulcrumed on the machine frame and in which an actuating lever is connected with said cam for rotating the latter, said actuating lever having portions extending in opposite directions from its fulcrum and adapted respectively for hand and treadle operation.

11. A trimming mechanism for sewing machines comprising a trimmer-bar, means to actuate said trimmer-bar, an upper trimmer-blade adjustably mounted on said trimmer-bar, a lower trimmer-blade adapted to cooperate with the upper trimmer-blade, means to maintain said trimmer-blades in working contact with each other, and means including a lever located above said trimmer-blades and operable during the operation of the trimming mechanism for shifting said upper trimmer-blade laterally in opposite directions on said trimmer-bar.

12. A trimming mechanism for sewing machines comprising a trimmer-bar, means to vibrate said trimmer-bar, an upper trimmer-blade adjustably mounted on a free end of said trimmer-bar, a lower trimmer-blade adapted to cooperate with the upper trimmer-blade, spring means to maintain said trimmer-blades in working contact with each other, and manually actuated means including a lever extending substantially parallel with said trimmer-bar and operable during the operation of the trimming mechanism for shifting said upper trimmer-blade laterally in opposite directions on said trimmer-bar.

13. A trimming mechanism for sewing machines comprising a trimmer-bar fulcrumed at one end and having a yoke at its opposite end, means to vibrate said trimmer-bar, a trimmer-blade carrying-head slidingly mounted in said yoke, an upper trimmer-blade adjustably mounted on said head, a lower trimmer-blade adapted to cooperate with the upper trimmer-blade, spring means to maintain said trimmer-blades in working contact with each other, a lever fulcrumed intermediate its ends and having one end connected to said head, and manually actuable means engaging the opposite end of said lever for swinging the latter, thereby to shift said head, and the trimmer-blade carried thereby, laterally during the operation of the trimming mechanism.

14. A trimming mechanism for sewing machines comprising a trimmer-bar, means to actuate said trimmer-bar, an upper trimmer-blade adjustably mounted on said trimmer-bar for lateral movement, a cooperating lower trimmer-blade, means for maintaining said trimmer-blades in working contact with each other, a lever pivotally mounted on said trimmer-bar, an operative connection between said lever and said upper trimmer-blade, and means for swinging said lever to cause it to shift said upper trimmer-blade laterally.

15. A trimming mechanism for sewing machines comprising a horizontally disposed trimmer-bar, means to actuate said trimmer-bar, a trimmer-blade carrying-head adjustably mounted on said trimmer-bar, an upper trimmer-blade mounted on said head, a cooperating lower trimmer-blade, means for maintaining said trimmer-blades in working contact with each other, a lever pivotally supported by said trimmer-bar, an operative connection between one end of said lever and said head, a stud carried by the opposite end of said lever, a cam cooperating with said stud to shift said lever and thereby said upper trimmer-blade, and a manually actuable lever for actuating said cam.

16. A trimming mechanism for sewing machines comprising a trimmer-bar, means to actuate said trimmer-bar, an upper trimmer-blade adjustably mounted on said trimmer-bar for lateral movement, a cooperating lower trimmer-blade, means for maintaining said trimmer-blades in working contact with each other, a lever pivotally mounted on said trimmer-bar, an operative connection between said lever and said upper trimmer-blade, a rotatable cam for swinging said lever to cause it to shift said upper trimmer-blade laterally, and manually actuable means, operative during the operation of the trimming mechanism, for rotating said cam.

17. A trimming mechanism for sewing machines comprising a trimmer-bar, means to actuate said trimmer-bar, a trimmer-blade adjustably mounted on said trimmer-bar for lateral movement, spring means acting on said trimmer-

blade yieldingly to hold it in one extreme lateral position, a lever pivotally mounted on said trimmer-bar, an operative connection between said lever and said trimmer-blade, and manually actuable means operable during the operation of said trimming mechanism for shifting said lever, thereby to adjust said trimmer-blade laterally away from said extreme position.

18. A trimming mechanism for sewing machines comprising a trimmer-bar, means to actuate said trimmer-bar, a trimmer-blade adjustably mounted on said trimmer-bar for lateral movement, a trimmer-shifting lever pivotally mounted on said trimmer-bar, an operative connection between said lever and said trimmer-blade, an adjustable hand-lever, a cam on said manually actuable lever engaging the first named lever to effect lateral shifting of said trimmer-blade, and detent means for holding said hand-lever in its various positions of adjustment.

NICHOLAUS KNAUS.
ANNA M. PAILEY.