Sept. 16, 1947. N. KNAUS 2,427,609

TRIMMER ADJUSTERS FOR SEWING MACHINES

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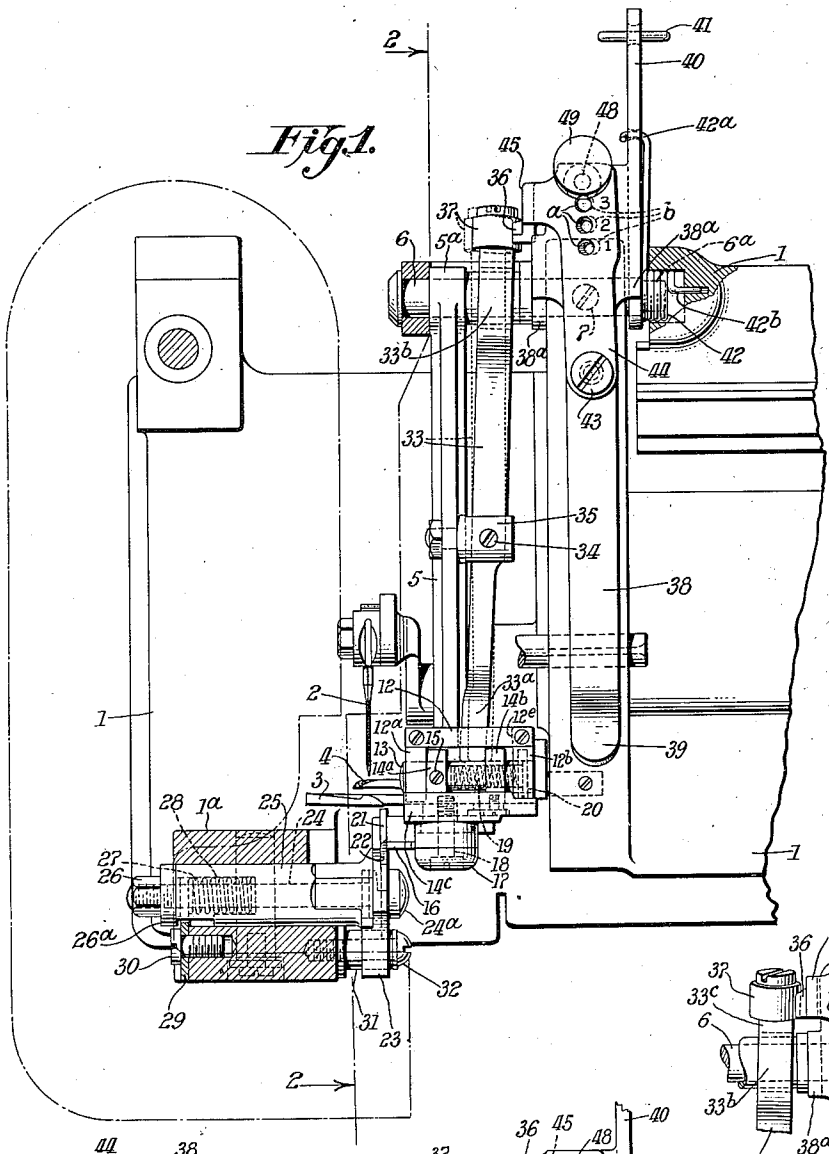
Fig. 1.



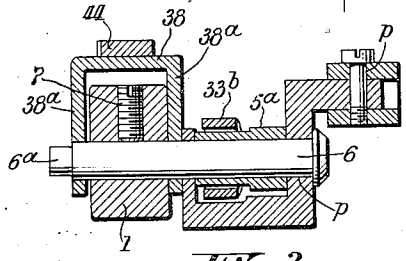


Fig. 3.

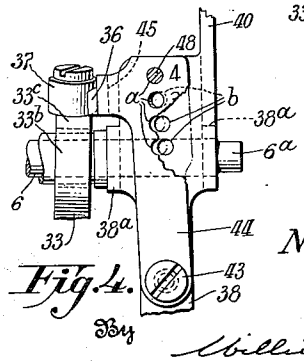


Fig. 4.

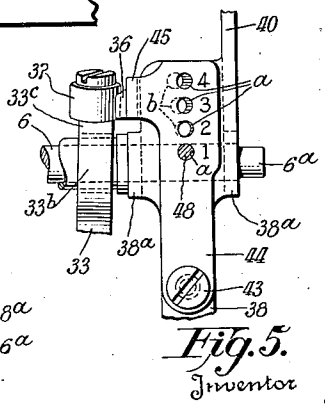


Fig. 5.

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TRIMMER ADJUSTERS FOR SEWING MACHINES

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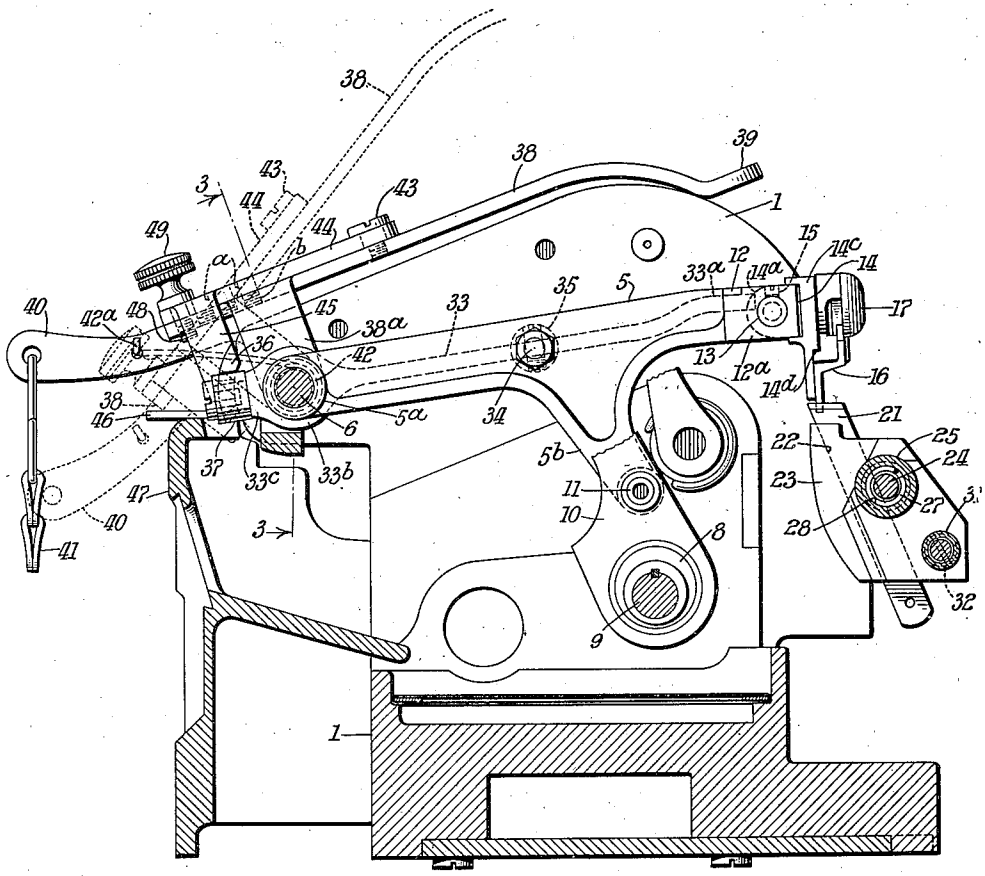

Fig. 2.

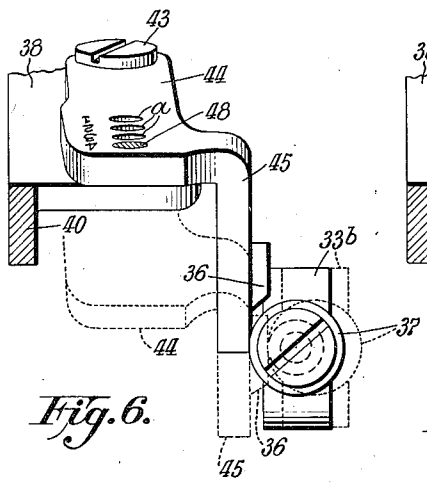

Fig. 6.

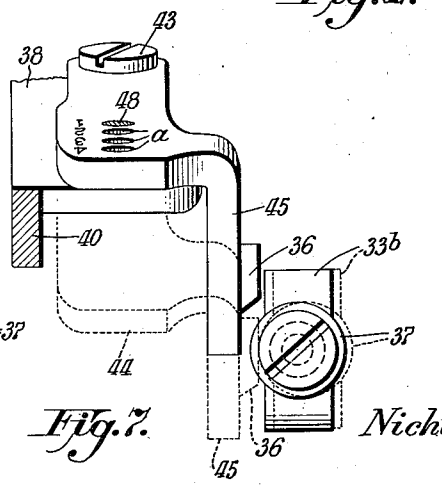

Fig. 7.

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Patented Sept. 16, 1947

2,427,609

UNITED STATES PATENT OFFICE

2,427,609

TRIMMER ADJUSTERS FOR SEWING MACHINES

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Application October 2, 1945, Serial No. 619,801

8 Claims. (Cl. 112—126)

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This invention relates to sewing machines and more particularly to trimming mechanisms therefor of that type 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, however, 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 penetrations and the trimmed edge of the work, as the nature of the work may require. These prior constructions, however, have been cumbersome and inconvenient to operate and have usually necessitated the lateral shifting of the entire trimming mechanism and portions of its actuating means.

This invention has as its primary object to provide a trimming mechanism of the type comprising relatively movable upper and lower trimmer blades, spring pressed together, and to combine therewith improved means adapted to be actuated by the operator and during the operation of the machine, for shifting the upper trimmer blade laterally of the line of seam formation and relatively to its 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.

Still another object of the invention is to provide an improved adjusting means for the trimmer shifting mechanism whereby a unit movement of the shifting lever may be caused to give to the upper trimmer blade any pre-selected one of a plurality of predetermined lateral movements.

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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 plan view, partly in section, of a portion of an overedge sewing machine embodying the present invention.

Fig. 2 is a vertical sectional view taken substantially on the line 2—2 of Fig. 1.

Fig. 3 is a detail sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a detail plan view illustrating one extreme adjustment of the arm which carries the trimmer-shifting cam, later to be described.

Fig. 5 is a view similar to Fig. 4 but showing the arm in its other extreme position of adjustment.

Figs. 6 and 7 are enlarged detail rear end views, partly in section, of the parts shown in Figs. 4 and 5 and with the parts in the same relative positions, respectively.

Referring more specifically to the drawings, the invention is disclosed as embodied in an overedge sewing machine of the type disclosed in United States Patent No. 2,238,796, April 15, 1941, N. Knaus, and in connection with the trimming mechanism similar to that which forms the subject of United States Patent No. 2,293,607, August 18, 1942, Knaus et al.

The machine has a main frame 1 which supports overedge stitch-forming mechanism comprising a reciprocating curved needle 2, an under or needle-loop-taking looper 3 and an overedge looper 4 which cooperates with the needle and looper 3 in the formation of overedge stitches. The machine also includes a conventional work-feeding mechanism (not shown) and a cooperating presser device (the universal pivot of which is designated as *p* in Fig. 3) for advancing the work to and beyond the stitch-forming mechanism, and a trimming mechanism which is adapted to trim the work at one side of the line of seam formation. The trimming mechanism comprises an upper vibratory trimmer-bar 5, pivotally mounted, at its rear end 5a on a stud 6 which is supported by the machine frame and is held therein by a set screw 7. Vibratory motions are given to the trimmer-bar by an eccentric 8 secured upon a rotary main shaft 9,

through the medium of a link 10 having a portion surrounding the eccentric and being pivotally connected at 11, to a depending part 5b of the trimmer-bar 5. The link 10 also has a portion which extends upwardly above the pivotal connection 11 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 12 having spaced arms 12a and 12b provided with aligned apertures within which is slidingly mounted an endwise movable rod 13. A trimmer-blade-carrying head 14 has arms 14a and 14b surrounding the rod 13 and a portion 14c secured to the head 14 and slidable therewith. The head 14 is secured to the rod 13 by means of a set-screw 15 threaded through the arm 14a and bearing upon the rod. An upper trimmer-blade 16 is adjustably secured in a groove 14d formed in the front face of the portion 14c by a clamp-block 17 pressed against the blade by a clamp-screw 18 threaded into the head 14.

From the foregoing it will be understood that the upper trimmer-blade is carried by the head 14 which is secured to and slidable horizontally in the yoke 12 with the rod 13.

The head 14 and the blade 16 carried thereby are normally maintained in one extreme lateral position, i. e., to the left as viewed in Fig. 1, with the arm 14a in contact with the arm 12a of the yoke. This is effected by an expansion spring 19 inserted within an axial bore formed in the rod 13 and bearing, at one end, against the bottom of the bore and at its opposite end against a pin 20 threaded into the yoke 12 and passing through slots in the rod 13.

Cooperating with the upper movable trimmer-blade 16 is a lower normally stationary trimmer-blade 21 mounted, for endwise adjustment, in a slot 22 formed in a blade-holder 23 and held therein by the head 24a of a clamp-screw 24. The blade-holder 23 is formed integrally with a cylindrical shank 25 supported, for longitudinal movement, in a pedestal 1a forming a part of the main frame of the machine. The screw 24 extends through a bore in the shank 25 of the blade-holder and has threaded, on its outer end, a clamp nut 26 which bears against a washer 26a which, in turn, abuts the end of the shank 25. Thus by turning the nut 26 in one direction the screw 24 is moved axially in the bore in the shank 25 thereby causing the head 24a, which overlies the blade 21, to clamp the blade against its holder 23.

The blade-holder 23, and the lower trimmer blade 21 carried thereby, are normally biased toward the right as seen in Fig. 1, to cause the lower trimmer blade to bear laterally against the upper trimmer blade in all the adjusted positions of the latter. This is effected by a coil spring 27 fitted within a bore 28 in the shank 25 and bearing at its inner end against the end wall of the bore and at its outer end against a fixed abutment plate 29 secured to the pedestal 1a by a screw 30. The blade-holder is guided in its lateral movements by its sliding connection with a stud 31 which is clamped to the pedestal 1a by a screw 32.

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 5, is a trimmer-shifting member 33 fulcrumed, intermediate its ends, on a screw 34 carried by a block 35 secured to the trimmer-bar. The forward end 33a of the member 33 extends through a slot 12e in the back of the yoke 12 and engages the arm 14b on the trimmer-blade carrying head 14 and is adapted, at certain times, to shift the head laterally in opposition to the spring 19.

Adjacent its rear end, the member 33 is formed as a loop 33b through which freely passes the hub 5a of the trimmer-bar 5 (Fig. 3). The member 33 projects rearwardly beyond the loop 33b and terminates in a rear end portion 33c which is engaged by a manually actuated cam 36, later to be described, which turns the member about its pivot 34 to effect lateral adjustment of the upper trimmer blade. If desired, the rear end of the member 33 may carry a roller 37 for engagement by the cam 36, but such roller is not essential. As shown herein, the roller is provided but it may be considered to be a part of the member 33.

Pivotally mounted on the stud 6 and straddling that portion of the main frame 1 in which the stud is mounted (Fig. 3) are the downturned and laterally spaced portions 38a of a manually actuable lever 38. One portion of the lever extends forwardly from its pivot over the machine to the front thereof where it is formed with a finger piece 39 conveniently accessible to the hand of the operator when in her normal working position. The lever 38 also has a rearwardly extending arm 40 adapted to be connected, as by a chain 41, to either a knee or foot actuated treadle not shown.

As used herein, in reference to the lever 38, the term "manually actuated" is intended to mean a lever actuated by any part of the person of the operator.

A torsion spring 42 surrounding the projecting end 6a of the stud 6 and having one limb 42a engaging the arm 40 and its other limb 42b anchored in the main frame 1 (Fig. 1) normally holds the lever 38 in the position illustrated in full lines in Fig. 2 with the forward end portion resting on the machine frame.

Pivotally mounted on the upper face of the lever 38, by a shoulder screw 43, is an arm 44 having a downturned portion 45 which overhangs the lever and carries the trimmer-shifting cam 36, hereinbefore mentioned. Thus turning of the lever 38, by hand, foot or otherwise, from the position shown in full lines in Fig. 2 to the position indicated in dotted lines causes the cam 36 to be brought into contact with the rear end of the member 33 and to swing that member about its pivot 34 counter-clockwise as viewed in Fig. 1. This movement of the member 33 shifts the upper trimmer-blade away from the line of needle penetration in opposition to the spring 19, thereby increasing the margin between the line of needle penetration and the trimmed edge of the work. As above stated, the lower trimmer blade is shiftable laterally by the spring 27 and bears against the upper trimmer blade in all the adjusted positions thereof. A stop plate 46, supported by a guard member 47 secured to the main frame, forms an abutment for the lever 38, as indicated in dotted lines in Fig. 2, thereby predetermining the unit angular movement which may be given to the lever.

The extent of movement given to the member 33, and thereby to the upper trimmer-blade, by

a unit movement of the lever **38** is dependent upon the setting of the cam **36** relative to the rear end of the member **33**, herein shown as comprising the roller **37**. To enable the arm **44**, and the cam carried thereby, to be set at various distances from the roller **37** and locked in their adjusted positions, the arm is provided with a series of apertures *a* arranged in a row extending lengthwise of the arm. Upon swinging of the arm on its pivot **43**, the apertures *a* are successively aligned with complemental apertures *b* formed in the lever **34** and arranged in a row extending obliquely of the length of the lever and intersecting the row of apertures *a*. A threaded stud **48**, having a knurled head **49**, is adapted to be passed through the apertures *a* and threaded into an aligned aperture therebeneath, thereby to lock the arm **44** to the lever **38** in various positions of adjustment of the arm.

In Figs. 1, 4 and 6 the stud **48** is shown as inserted into the rearmost ones of the apertures *a* and *b*. In this setting of the parts the cam **36**, carried by the arm **44**, wholly overlies the roller **37** and therefore a unit movement of the lever **38** will cause the cam to shift the roller, and the rear end of the member **33** which carries it, from the position shown in full lines in Figs. 1 and 6 to the position indicated in dotted lines. This causes the forward end of the member **33** to give to the trimmer-blade carrier **14**, and the upper trimmer-blade **16** carried thereby, their maximum movements to the right as viewed in Fig. 1.

In Figs. 5 and 7, the arm **44** is shown as swung horizontally about its pivot **43** to position the foremost apertures *a* and *b* in line for the reception of the stud **48** to effect minimum lateral adjustment of the upper trimmer blade. As shown most clearly in Fig. 7, this setting of the parts places a portion of the cam **36** to one side of a vertical plane tangential to the roller **37**, whereupon a unit movement of the lever **38**, arm **44** and cam **36** will have a less shifting effect upon the roller **37** as compared with the setting shown in Fig. 6, as indicated by the full and dotted line positions in Fig. 7, thus giving to the upper trimmer blade carrier a substantially less lateral movement. Insertion of the stud **48** into the intermediate apertures *a* and *b* will cause the upper trimmer blade carrier to be given intermediate lateral adjustments by a unit movement of the lever **38**. By having the apertures *a* and *b* arranged in intersecting rows at an acute angle to each other it is possible to obtain very fine increments of adjustment together with a positive locking of the parts.

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

1. In a sewing machine, in combination, 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 carried by said frame, means for maintaining said trimmer-blades in working contact with each other, and means for shifting said upper trimmer-blade laterally on said trimmer-bar comprising a trimmer-shifting member pivotally mounted intermediate its ends on said trimmer-bar and operatively connected at its forward end with said upper trimmer-blade, a manually actuable lever fulcrumed on said frame and adapted to be given a unit movement, a trimmer-shifting cam supported by said lever and adapted upon movement of the lever to engage the rearward end of said member thereby to shift the member and the upper trimmer blade, and means to adjust said cam on said lever to vary the amplitude of movement given to said member and upper trimmer-blade by the unit movement of said lever.

2. A sewing machine as set forth in claim 1 in which the trimmer-shifting cam is carried by an arm adjustably mounted on the manually actuable lever and adjustable toward and from the rearward end of the pivoted trimmer-shifting member, and in which means is provided for securing said arm to said lever in any one of a plurality of positions to vary the effectiveness of the cam on said member.

3. A sewing machine as set forth in claim 1 in which the trimmer-shifting cam is carried by an arm pivotally mounted on the manually actuable lever and adjustable toward and from the rearward end of the pivoted trimmer-shifting member, and in which means is provided for securing said arm to said lever in any one of a plurality of predetermined angular positions.

4. A sewing machine as set forth in claim 1 in which the trimmer-shifting cam is carried by an arm adjustably mounted on the manually actuable lever and adjustable toward and from the rearward end of the pivoted trimmer-shifting member, and in which a locking stud passing through said arm and entering any one of a series of apertures in the lever, locks the two together in various positions of adjustment thereby to vary the effectiveness of the cam on said member.

5. A sewing machine as set forth in claim 1 in which the trimmer-shifting cam is carried by one end of an arm pivotally mounted at its opposite end on the manually actuable lever and swingable toward and from the rearward end of the trimmer-shifting member; in which the arm and lever are each provided with a series of apertures adapted to be successively aligned by the swinging movement of the arm; and in which a stud is adapted to be inserted into the aligned apertures to lock the arm to the lever in the various positions of adjustment of the arm.

6. A sewing machine as set forth in claim 1 in which the trimmer-shifting cam is carried by one end of an arm pivotally mounted at its opposite end on the manually actuable lever and swingable toward and from the rearward end of the trimmer-shifting member; in which the arm and lever are provided with intersecting rows of apertures, the individual apertures of said rows being adapted to be successively aligned by the swinging movement of the arm; and in which a stud is adapted to be inserted into the aligned apertures to lock the arm to the lever in various positions of the arm.

7. A sewing machine as set forth in claim 1 in which the manually actuable lever is located above the level of the trimmer shifting member and pivotally supports an arm having a downwardly extending portion which overhangs the edge of the lever and carries the trimmer-shifting cam; in which the lever is provided with a row of apertures arranged at an acute angle to the longitudinal axis of the lever; in which the arm is provided with a row of apertures arranged in line with the longitudinal axis of the arm and adapted to be aligned successively with the apertures in the lever by angular movement of the arm; and in which a stud is adapted to be inserted into the aligned apertures to lock the arm to the lever with the cam in various operative positions relative to the trimmer-shifting member.

8. 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 member pivotally supported by said trimmer-bar, an operative connection between one end of said member and said head, a manually shiftable lever, a cam carried by said lever and acting on the other end of said member to shift the member and thereby said upper trimmer-blade, and means for adjusting the position of said cam on said lever, thereby to vary the action of the cam on said member by a unit movement of said lever.

NICHOLAUS KNAUS.

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