F. EBERT

TRIMMING MECHANISM FOR SEWING MACHINES

Filed Dec. 17, 1935

Fritz Ebert

Inventor:

By William C. Linton

Att'y.
The present invention relates to sewing machines having a supporting arm and is, more particularly, concerned with a trimming mechanism for such machines, adapted to operate in a horizontal plane.

Trimming mechanisms of this kind, known hitherto, have the great disadvantage, that the knives or blades must be of curved form, so that satisfactory trimming may be obtained with difficulties only. Moreover, the adjustment of the knife-blades is troublesome and the manufacture of the blades involves high expenses. The distance, between the knife-blade and the needle is, furthermore, too great, so that curves of small radius may not be trimmed and sewn.

Another known arrangement of a trimming mechanism, provided with vertically movable hook-shaped knife-blades, again has the drawback, that the stroke of the blade is very limited. This is particularly unfavorable when handling heavy materials, for instance thick linings or thick knitted fabrics. Satisfactory trimming with blades of this kind has hitherto not been possible for the purpose stated above.

Now, the object of the present invention is to obviate all these disadvantages and to provide a trimming mechanism which compared with known trimming mechanisms has particular advantages, because not only trimming of the thinnest as well as of the thickest materials is possible, but also the knife-blades are of very simple construction and may easily be ground after wear. The movable lower knife-blade may yield in a vertical direction and is pressed against the fixed upper knife-blade during the performance of its trimming movement in a horizontal plane. The fixed upper blade is mounted upon an angle-shaped bracket adjustably fixed in turn, by means of an adjusting screw, upon a bearing block. In a well known manner the movable lower knife-blade is, by a movable jaw, held in position in a dovetailed member, while the fixed upper knife-blade is held in position by means of a laterally arranged screw, pressing upon a conical pin which on tightening the screw effects an upwardly directed shifting of the knife-blade in the dovetailed member. The lever actuating the movable lower knife-blade is, by means of an intermediate gear, driven by the main shaft of the sewing machine. A sector-shaped lever allows adjustment of the knife-blade within wide limits.

In the accompanying drawings one embodiment of a trimming mechanism according to the invention is shown by way of example.

In these drawings:

Fig. 1 diagrammatically shows a perspective view of the parts of the sewing machine necessary to understand the invention and illustrates a trimming mechanism according to the invention fixed to the supporting arm of the sewing machine;

Fig. 2 shows a perspective view of the front end of the supporting arm looking from the left in Fig. 1;

Fig. 3 is a side elevation of the machine partly in section and partly broken away;

Fig. 4 is a section on line 4—4 of Fig. 3;

Fig. 5 shows in plan the device illustrated in Fig. 3;

Fig. 6 is a vertical section on line 6—6 of Fig. 5;

Fig. 7 shows a detail view partly in section of the lever carrying the lower knife-blade, looking from the left and

Fig. 8 is a plan view of the lever shown in Fig. 7.

The supporting arm 1 of the sewing machine, indicated in dash and dotted lines in Fig. 1 only, has fixed thereto, by means of screws 2 a small bearing block 3. The end 30 of the connecting rod 25 is threaded for connection with the head 28 and is held by a nut 31. The double-arm lever 7, 8 held in position upon the shaft 6 is a double-armed lever 7, 8 held in position upon the shaft 6 by means of a screw 9.

Fixed upon the main shaft 10 of the sewing machine is an eccentric 11 with strap 12 which actuates a lever 13 forming part of the driving mechanism of the needle bar not shown in the drawings. An arm 14, connected to or forming part of the eccentric strap 12, is pivoted to one end of a link 15 by a screw 16 having a portion 17 of spherical shape engaging a corresponding recess of the link 15. The other end of the latter engages with a spherically shaped portion of another screw 18 which is adjustably fixed in an elongated slot 19 provided in the arm 7 of the double-armed lever 7, 8. The hub 20 of the double-armed lever 7, 8 bears with one of its side walls against the eye 4 of the bearing block 3. Fixed upon the shaft 6 by means of a set-screw 21 is a set collar 22 which bears against the other eye 8 of the bearing block 3. In this manner the shaft 6 is prevented from moving in the longitudinal direction.

The movement of the double-armed lever 7, 8 is transferred to the arm 23 of a double-armed lever 23, 24 by means of a connecting rod 25, connected to the arm 8 of the double-armed lever 60 7, 8 by a screw 26 the portion 27 of which has a spherical surface and cooperates with a head 28 fixed by a screw 29. The end 30 of the connecting rod 25 is threaded for connection with the head 28 and is held by a nut 31. The double-armed lever 23, 24 is rotationally driven by a shaft 32, which is supported by two bearings 33, 34 engaging the inner surfaces of a groove 35 in the arm 36 of a sector-shaped lever 37. The lever 37 is pivotally mounted in a bearing block 38 by means of a pin 39. A similar bearing block 40 is pivotally mounted to the stationary arm 41 by means of a pin 42. In these bearings 33, 34, 40 a double-armed shaft 43, 44 is mounted.
arm lever 23, 24 is mounted upon a vertical shaft 32 swingably journaled in the supporting arm 1 near the free end thereof. The second arm 24 of the double-armed lever 23, 24 carries the lower knife-blade 33.

The shaft 32 is provided with a longitudinal bore 34 adapted to accommodate a spring 35 the lower end of which bears against a screw 36 inserted in the supporting arm 1. By means of this arrangement the double-armed lever 23, 24 as well as the lower knife-blade 33 may yield in the vertical direction. The lower knife-blade 33 is, in a well known manner, held in position in a dove-tailed guide 37 by means of a jaw 38 which is adjustably held in position by a screw 39.

The upper knife-blade 40 is adjustably fixed in a bearing block 41 connected to the free end of the supporting arm 1. By means of a screw 42 an angle-shaped bracket 43 is fixed to the bearing block 41. This bracket 43 serves the purpose of adjusting the position of height of the upper knife-blade 40 and may be shifted with regard to the bearing block 41 by a screw 44 having a ring-shaped projection 45 which engages a notch provided in the bracket 43.

The upper knife-blade 40 is mounted with some play in a dove-tailed guide 46 and may be fixed in adjusted position from the side of the sewing machine. Below the upper knife-blade 40, a member 47 having a conical surface 43 is mounted in the angle-shaped bracket 43 and a screw 49, provided with a cone-shaped end 50, bears against the conical surface 49 of the member 47. By adjusting the screw 49, the member 47 is raised and thereby effects lifting of the upper knife-blade 40 in its dove-tailed guide 46 in such a manner as to automatically fix the knife-blade 40 in the desired position of height.

What I claim is:

1. In a trimming mechanism for sewing machines having a supporting arm, a fixed upper knife-blade, a horizontally movable lower knife-blade, an intermediate shaft connected to the supporting arm, a double-armed lever fixed upon said intermediate shaft, an arm provided at the strap of the eccentric on the main shaft actuating the needle bar of the machine, a link pivoted on the eccentric strap and having a slot and bolt connected to one arm of said double-armed lever, a screw fixed to the other arm of said double-armed lever, a ball-shaped member forming part of said screw, a connecting rod having one of its ends pivoted to said ball-shaped member, a vertical shaft mounted in the supporting arm near the free end thereof, a bell-crank lever, carrying said lower knife-blade, fixed to said vertical shaft and connected with one of its arms to the free end of said connecting bar.

2. In a trimming mechanism for sewing machines having a supporting arm, a fixed upper knife-blade, a horizontally movable lower knife-blade, an intermediate shaft connected to said supporting arm, means for swinging said intermediate shaft by the main shaft of the sewing machine, means for transmitting the swinging movements of said intermediate shaft upon said upper knife-blade, a vertical shaft mounted in the supporting arm near the free end thereof, a bell-crank lever fixed to said vertical shaft and supporting said lower knife, a spring inserted in a longitudinal bore of said vertical shaft, and a screw fixed in said supporting arm below said vertical shaft and forming a bearing for one end of said spring, said spring permanently tending to shift said lower knife-blade in a direction towards said fixed upper knife-blade.

3. In a trimming mechanism for sewing machines having a supporting arm, a bearing block provided at the free end of the supporting arm, an angle-shaped bracket having a slot in one of its shanks and carrying said upper knife-blade, a screw passing through the slot in said angle-shaped bracket and inserted in said bearing block, said screw serving to adjust said upper knife-blade, a set screw cooperating with said angle-shaped bracket and adapted to be screwed into said bearing block, for vertically adjusting said angle-shaped bracket, a dove-tailed guide provided at said angle-shaped bracket for holding said upper knife-blade, a member having a conical surface loosely arranged in said angle-shaped bracket in contact with the lower surface of said upper knife, a second set screw inserted in said angle-shaped bracket and provided with a conical end adapted to cooperate with the conical surface of said member for adjusting and fixing said upper knife in its dove-tailed guide, a horizontally movable lower knife-blade permanently pressed in a direction towards said upper knife-blade, an intermediate shaft connected to the supporting arm, means for swinging said intermediate shaft by the main shaft of the sewing machine, and means for transmitting the swinging movements of said intermediate shaft to said lower knife-blade.

4. In a trimming mechanism for sewing machines having a supporting arm, a fixed upper knife-blade, a horizontally movable lower knife-blade, an intermediate shaft pivotally arranged within said supporting arm, a double-armed lever mounted on said intermediate shaft, an arm provided at the strap of the eccentric on the main shaft actuating the needle bar of said sewing machine, a link pivotally connected at one end to said arm and pivotally connected at its opposite end to one arm of said double-armed lever, a connecting rod pivotally connected to the other arm of said double-armed lever, a vertical shaft mounted in said supporting arm, a bell crank lever carrying said lower knife-blade and mounted on said vertical shaft and one arm of said bell crank lever being connected to said connecting bar.

FRITZ EBERT.