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E. J. RAY

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ATTACHMENT FOR SEWING MACHINES

Filed April 19, 1929

Fig. 5

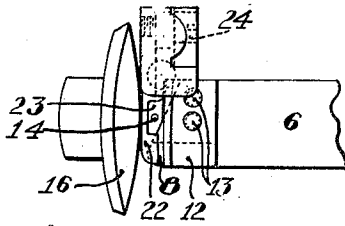


Fig. 4

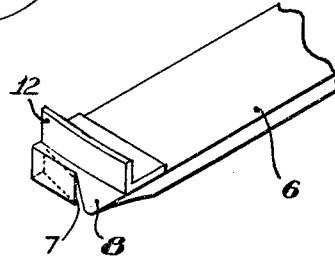


Fig. 1

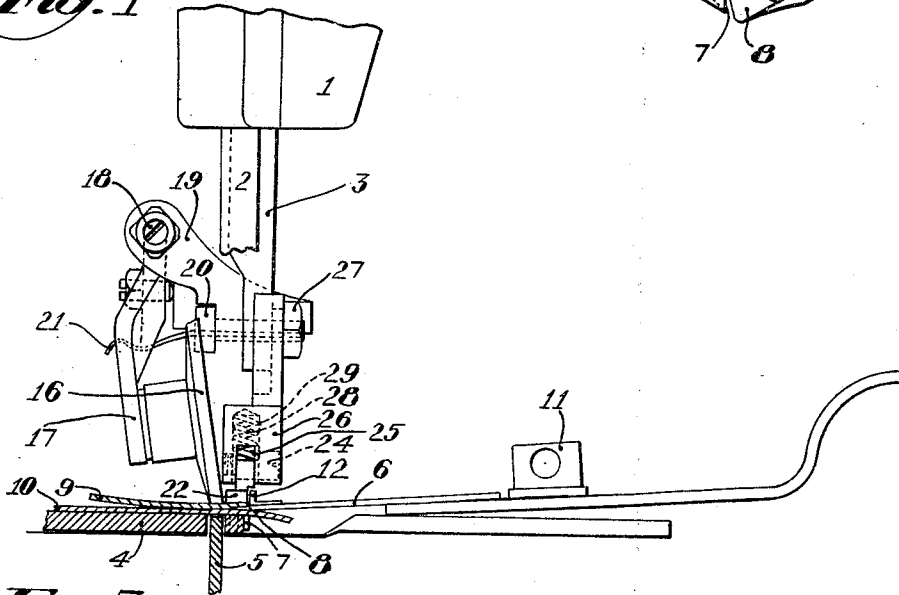


Fig. 3

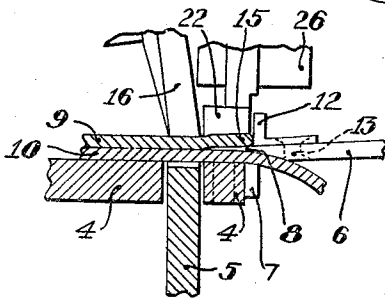
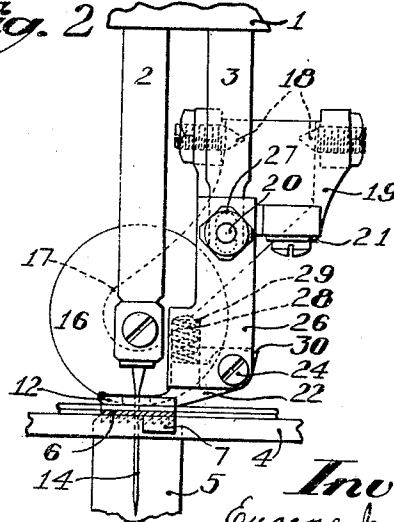


Fig. 2



Witness

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ATTACHMENT FOR SEWING MACHINES

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The present invention has relation to sewing machines, and in particular to attachments therefor enabling the said machines to sew a seam parallel to a finished edge of the work while simultaneously trimming a layer of the work in parallel with the seam being formed.

Attachments of this type are employed in the manufacture of shoes for performing the operation known as top stitching, in which the uppers of shoes after being cut to shape are combined with one or more layers of lining or other material. In combining the upper and the lining, it is desired to sew the marginal portions of the two together and simultaneously to trim the lining so that its edge will be flush with or slightly inside of the edge of the upper, which latter has been previously finished in suitable manner as by skiving and turning, burnishing, or burning the leather so as to cause its edge to curl over and present a smooth rounded contour, all as well known. The edges of the upper sewed and trimmed in this manner appear in the finished shoe around the top thereof and along the lacing slit.

It is essential for satisfactory work to sew the edge of the upper to the lining with the seam spaced uniformly in parallel to said edge, and to trim the lining without injuring the finished edge of the outer portion on which the aforesaid finished edge has been formed. The work varies in thickness, since the lining is apt to bunch up under the upper in making the circuit of the marginal portions thereof, and occasional seams are met with both in the lining and in the upper, extending at right angles to the edge, as for instance the back seam. It has been found difficult to perform this sewing and trimming operation satisfactorily with the devices hitherto in use on account of the tendency of these thickened portions to deflect the knife into injurious contact with the finished edge. Further, in work of this nature, it is necessary to use a presser-foot of the well-known disc type to hold the work down in engagement with the feed, in order to permit the work to be swung through sharp angles in following the contour of the top and

lacing slit. Such disc type of presser-foot must be arranged to engage the work in offset relation with respect to the point of contact of the needle, and thus unavoidably leaves the work unsupported in the vicinity of the needle and subject to buckling or crumpling when the outer portion of the upper is manipulated by the operator in holding it up to an edge gage determining the spaced relation of the seam from the finished edge of the upper. Such buckling or crumpling is particularly common in working upon uppers having the relatively flexible and flimsy finished edge produced by burning, and results in unsightly deviation of the line of stitches out of parallel with said edge and also in many instances allows the finished edge to be damaged through escape from the edge gage and coming into contact with the trimming knife.

The object of the present invention is to provide an attachment for use in top stitching which shall be free from the objectionable features of operation referred to.

The present invention consists in a top stitching attachment for sewing machines having a reciprocating edge-trimming knife, an edge-gage cooperating with the knife to engage and direct the finished edge of the upper, and a separator blade or lip entering between the layers of material being sewed and preventing the finished edge from coming in contact with the knife at all times whether the finished edge escape from its edge gage or whether the knife be deflected from its normal path by bunches or other resistant portions of the material being trimmed. This separator blade or lip may be supported in any desired manner but as affording a simple and efficient construction is preferably formed on the knife.

In addition to the parts just described, the invention also contemplates the provision of an auxiliary presser-foot arranged between the disc presser-foot and the edge-gage to maintain the material which rests upon the separator blade or lip in smooth and flat relation, so that the edge of the upper shall not escape from its edge gage and so that

the line of stitches shall always be disposed in parallel to the finished edge.

An illustrative embodiment of the invention is shown in the accompanying drawings, in which Fig. 1 is a front elevation of portions of the head, the needle bar, presser-bar, work table and feed of a typical sewing machine, with the devices of the invention applied thereto; Fig. 2 is a side elevation of the same; Fig. 3 is a view showing in detail certain of the parts of Fig. 1; and illustrating the relation of the knife, its lip and edge gage, and the presser-feet to the material; Fig. 4 is a perspective view of the improved knife with its lip and edge-gage; Fig. 5 is a plan view showing the working relation of the knife with its lip and edge gage to the disc and auxiliary presser-foot.

At 1 is indicated a portion of the head of a typical sewing machine having the usual needle-bar 2 and presser-bar 3 mounted therein for vertical movement. The work-plate is indicated at 4, and the feed at 5. At 16 is the familiar disc presser-foot holding the work down against the feed 5, it being rotatably borne upon a swinging arm 17 pivotally mounted at 18 upon a bracket 19 affixed to the presser-bar 3 by a bolt 20 and maintained in working relation by a spring catch 21 attached to said bracket and engaging with the swinging arm.

The trimming knife 6 is formed, mounted, and actuated as hitherto in some instances, in particular as shown and described in U. S. Letters Patent No. 156,267, issued to L. L. Barber, on October 27, 1874, and reissued August 28, 1877, #7,860. As illustrated, the knife comprises a thin blade or shank portion arranged to vibrate in a horizontal plane, i. e., substantially in the plane of the work, and a portion extending vertically downward at right angles to the shank provided with a cutting edge which, during the vibration of the knife, moves back and forth in the line of feed. The knife is the same in construction as the knife disclosed in the Barber patent with the exception that its cutting end has the novel form illustrated in Fig. 4, the cutting edge 7 being provided with an integrally-formed separator-blade or lip 8 which extends beyond the vertical cutting edge 7 in a horizontal direction so as to enter inwardly between the outer portion 9 of the upper and the lining 10 and extend between the upper and lining beyond the line of cut in the relation shown clearly in Fig. 3. Thus when the knife 6 is vibrated rapidly in a substantially horizontal plane about its pivot at 11 by suitable actuating means (not shown) and the vertical cutting edge 7 trims the under layer 10 during its stroke in the direction opposite to the feed, the lip 8 travels in advance of the cutting edge and projects laterally under the margin of the top layer 9 comprising the outer portion of the upper.

The margin of the top layer is thus supported above the level of the cutting edge 7 and consequently out of range thereof at all times, even though the knife encounter thick places in the under layer 10 sufficiently resistant to spring the knife upwardly out of its usual path of vibration. The lip 8 is shaped in such manner as not to interfere with the needle, as indicated in Figs. 4 and 5, herein merging into the body of the knife abreast of the cutting edge 7, but may be varied in its shape to support the top layer beyond said edge if desired when the timing and throw of the knife are appropriately arranged.

To locate the line along which the lower layer 10 shall be trimmed with respect to the finished edge 15 of the top layer 9 or outer portion of the upper, an edge-gage 12 is provided to determine the position of such finished edge with respect to the cutting edge 7 of the knife as the work travels through the machine. Herein this edge-gage is conveniently carried by the knife itself, and comprises a member of angular section secured by rivets 13 to the shank of the knife, the up-standing flange which engages the edge of the top layer 9 being curved concentric with the axis on which the knife swings. The up-standing flange is positioned with respect to the cutting edge 7 in the relation giving the desired type of trimming action to the under layer 10, that illustrated in the drawings being designed to undercut the layer 10 or lining slightly with respect to the finished edge of the top layer 9.

The edge-gage 12 also serves to determine the spaced relation of the line of stitches made by the needle 14 with respect to the finished edge 15, and to produce satisfactory work this spaced relation must not vary an appreciable amount. To prevent crowding of the material of the top layer 9 laterally by the operator into the space between the disc presser-foot 16 and the edge-gage 12, with consequent harmful deviation of the line of stitches out of parallel with the finished edge 15, or escape of the finished edge over the top of the edge-gage, with the same result, an auxiliary presser-foot 22 is provided to fill substantially all the space between the disc presser-foot and the edge-gage and hold the top layer 9 in smooth and flat relation upon the lip 8 which supports it from below. This auxiliary presser-foot is cut away as shown at 23, Fig. 5, to provide clearance for the needle 14, and its heel is pivoted at 24 in a slot 25 formed in a bracket 26 adjustably secured to the presser-bar 3 by a nut 27 applied to the end of bolt 20. The auxiliary presser-foot is held down by a spring 28 confined between its upper surface and the end of a recess 29 formed in the bracket 26 and intersecting the slot 25, so that it has capacity for up-and-down movement relative to the

disc presser-foot 16, and so that it can ride up when thickened portions of the margin of the material are encountered without lifting the disc presser-foot and interrupting the feed. A shoulder 30 at its rearward end engages the wall of the slot as the presser-bar is lifted, to limit its rotation about pivot 24, enabling it to be lifted clear of the work upon occasion.

With the parts constructed and arranged as illustrated in the drawings, the edge of the outer portion of the upper can readily be kept in contact with the edge-gage 12, and since the space between the disc presser-foot 16 and the edge-gage is completely filled by the auxiliary presser-foot 22, the operator cannot force the outer portion of the upper in so as to cause its edge to ride up over the gage. By reason of the separator blade or lip 8, the parts cannot be manipulated so as to cause the upper to be injured by the cutting edge. In case bunches or thick places occur in the lining, inside of the line of pressure of the disc presser-foot, the knife together with the edge gage and the auxiliary presser foot can yield upwardly without interfering with the feeding engagement of the disc presser-foot with the work. Also, this upward movement can take place without any liability of the upper escaping over the top of the edge-gage.

The nature and scope of the invention having been indicated and a mechanism embodying the invention having been specifically described, what is claimed is:

1. A sewing machine having, in combination, stitch forming devices, an edge-trimming knife arranged to trim a layer of the material being sewed to form an edge substantially flush with the edge of another layer of the material, and a lip upon the knife entering between the layers of material being sewed and extending between said layers beyond the line of cut.

2. A sewing machine having, in combination, stitch forming devices, an edge-trimming knife comprising a thin blade vibrating in substantially the plane of the work and provided with a cutting edge at right angles to the blade moving during the vibration of the blade back and forth in the line of feed, and a separator blade entering between the layers of material being sewed and extending between said layers beyond the line of cut.

3. A sewing machine having, in combination, stitch forming devices, an edge-trimming knife arranged to trim a layer of the material being sewed to form an edge substantially flush with the edge of another layer of the material, an edge-gage cooperating with the knife, and a lip upon the knife entering between the layers of material being sewed and extending between said layers beyond the line of cut.

4. A sewing machine having, in combina-

tion, stitch forming devices, a vibrating edge-trimming knife arranged to trim a layer of the material being sewed to form an edge substantially flush with the edge of another layer of the material, an edge-gage carried by the knife, and a lip upon the knife entering between the layers of material being sewed and extending between said layers beyond the cutting edge of the knife to maintain a layer of material to be trimmed within range of the cutting edge and a layer of material which is not to be trimmed out of range thereof.

5. A sewing machine having, in combination, stitch forming devices and a vibrating edge-trimming knife arranged to trim a layer of the material being sewed to form an edge substantially flush with the edge of another layer of the material having an edge-gage and a surface engaging a layer of the work beyond the line of cut adapted to maintain said layer of the work out of range of the cutting edge of the knife.

6. A sewing machine having, in combination, stitch forming devices, a vibrating edge-trimming knife arranged to trim a layer of the material being sewed to form an edge substantially flush with the edge of another layer of the material, an edge-gage cooperating with the knife, a surface upon the knife engaging a layer of the work beyond the line of cut and supporting said layer of the work out of range of the cutting edge of the knife, and a presser-foot pressing said layer against the said surface to keep the layer in flat relation.

7. A sewing machine having, in combination, stitch forming devices, a vibrating edge-trimming knife arranged to trim a layer of the material being sewed to form an edge substantially flush with the edge of another layer of the material, an edge-gage cooperating with the knife, a separator blade entering between the layers and extending between said layers beyond the line of cut and supporting a layer of the work out of range of the cutting edge of the knife, and a presser-foot pressing said layer against the said separator blade to keep the layer in flat relation.

8. A sewing machine having, in combination, stitch forming devices, a vibrating edge-trimming knife arranged to trim a layer of the material being sewed to form an edge substantially flush with the edge of another layer of the material, an edge-gage carried by the knife, a lip upon the knife entering between the layers of material being sewed and extending between said layers beyond the line of cut, a disc presser-foot, and an auxiliary presser-foot between the disc presser-foot and the edge-gage to smooth the material resting upon the lip.

9. A sewing machine having, in combination, stitch-forming means, a disc presser-foot, an edge-gage, a knife acting below the

edge-gage to trim one layer of a plurality comprising the work being sewed to form an edge substantially flush with the edge of another layer, a separator blade supporting the layer not being trimmed and extending between said layers beyond the line of cut, and an auxiliary presser-foot holding down the work between the disc presser-foot and the edge-gage.

10 10. A sewing machine having, in combination, stitch forming devices, an edge trimming knife comprising a thin blade vibrating in substantially the plane of the work and provided with a cutting edge at right angles to the blade moving, during the vibration of the blade, back and forth in the line of feed, and a lip upon the knife entering between the layers of material being sewed and extending between said layers beyond the line of cut.

20 In testimony whereof I have signed my name to this specification.

EUGENE J. RAY.

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