Oct. 23, 1951 P. A. MATTER 2,572,170

WORK GROOVING KNIFE FOR SHOE SOLE SEWING MACHINES

Filed June 23, 1949

Fig. 1

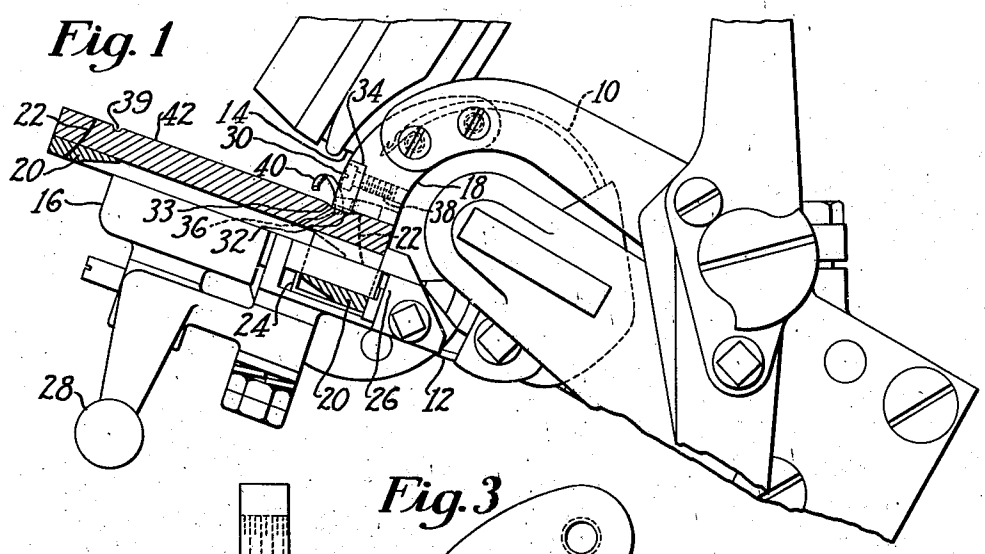


Fig. 3

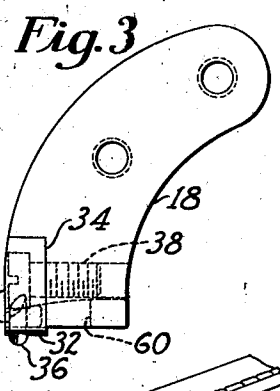


Fig. 2

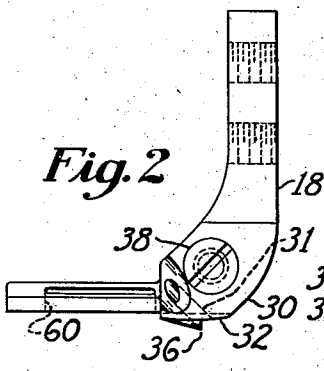
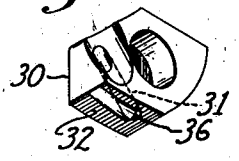


Fig. 5



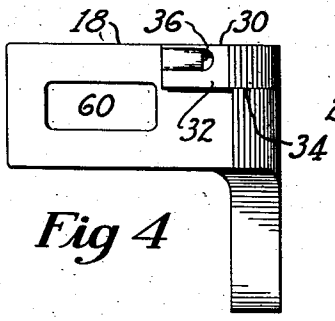


Fig 4

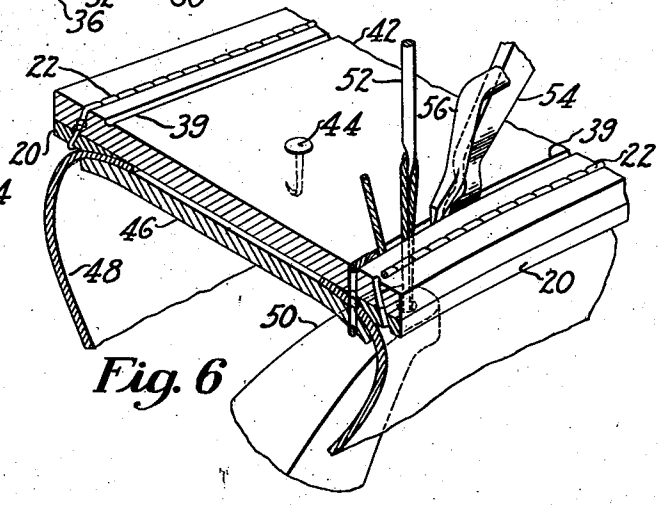


Fig. 6

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WORK GROOVING KNIFE FOR SHOE SOLE SEWING MACHINES

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1 Claim. (Cl. 112—37)

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The present invention relates to shoe sole sewing machines of the lockstitch type and more particularly to the construction and arrangement of a knife on the presser foot of a sewing machine to form a groove in the surface of the work being sewn for the reception of stitches spaced from the seam being inserted so that a second seam may be guided thereby in spaced parallel relation to the seam first sewn.

The object of the invention is to improve the construction and operation of such knife in a shoe sole sewing machine in order to form a stitch-receiving groove with uniformity in accurately spaced relation to the seam being inserted while at the same time avoiding any irregularities and difficulties encountered as a result of performing two operations simultaneously at different locations transversely of the seam line on a single work piece. Accordingly, a feature of the invention relates to the use in a lockstitch shoe sole sewing machine having a curved hook needle, a shuttle, a work support and a presser foot formed with needle-receiving openings, of a work grooving knife block mounted on the presser foot and spaced transversely from the line of a seam inserted by the needle, the knife being provided with a work depressing surface projecting below the work engaging surface of the presser foot surrounding the block to avoid lateral displacement of that portion of the work being grooved.

These and other features of the invention as hereinafter described and claimed consist in the constructions, combinations and arrangements of parts, the advantages of which will clearly be understood from the following detail specification and drawings, in which

Fig. 1 is a view in right side elevation of a portion of a lockstitch shoe sole sewing machine including those parts surrounding the point of sewing operation and illustrating a shoe sole in operating position;

Fig. 2 is a detail front view on an enlarged scale of the presser foot employed in the machine of Fig. 1;

Fig. 3 is a detail view in right side elevation;

Fig. 4 is a bottom plan view of the presser foot;

Fig. 5 is a perspective detail view looking from below and toward the front of the grooving knife carried by the presser foot; and

Fig. 6 is a sectional perspective view of a shoe being completed with a McKay type stitch guided by the groove formed in the machine of Fig. 1.

The machine illustrated in the drawings is a lockstitch shoe sole sewing machine of the same

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general type as that illustrated in United States Letters Patent No. 1,169,909, granted February 1, 1916, upon application of Fred Ashworth and No. 2,334,299, granted November 16, 1943, upon application of Carl F. Whitaker. The machine employs a curved hook needle 10, a curved awl 12, a shuttle 14, a work support 16, and a presser foot 18 actuated to clamp and release the work engaging the work support. The work support is in the form of a flat top table intended for assisting in the presentation of an unattached outsole, to prevent bending and distortion of the outsole during sewing. The sewing operation performed by the machine is for the purpose of securing a feather edged welt 20 with stitches 22 inserted at an angle to the general plane of the outsole, the exposed threads being disposed further from the edge at the tread surface of the outsole than from the outer edge of the welt. To direct the welt against the outsole the work support has a guide 24 and an edge gage 26 shiftable manually by a handle 28 during sewing to enable the location of the seam 22 to be changed.

It is common procedure to sew a seam in an outsole and to employ at the same time a knife for forming a stitch receiving groove for the same seam during its insertion. To this end it is necessary to locate the groove cutting knife in line with the seam and with the point of needle operation, the outsole being fed by an awl which forms a needle receiving perforation in the outsole. During feeding movement of the awl the knife, which is stationary, is operative actively to form the stitch receiving groove. Since the awl acts directly in line with the knife a straight line pull is exerted without tendency to distort the outsole permanently or to deflect its feeding movement.

The illustrated machine is also provided with a groove cutting knife in the form of a block 30 having a slightly rounded work engaging surface 32 secured in a recess 34 in the presser foot. The block has a passage 31 inclined upwardly from the work, a bulging portion of the block forming with the passage an arcuate edge 36 projecting below the work engaging surface of the block to insure a cutting entry into the substance of the outsole. The block is secured in place by a screw 38 passing through an opening therein into threaded relation with the presser foot. The groove formed by the knife, indicated at 39, is formed by removing a chip 40 (Fig. 1) which is carried through the passage in the block and is projected clear of the stitch forming devices.

After the welt is sewed to the outsole the out-

sole is attached to a shoe by McKay stitching as shown in Fig. 6. In attaching the outsole, indicated at **42**, it is located by temporary fastenings, such as one or more tacks **44** driven through the outsole and an insole **46** of a McKay type shoe comprising an upper **48** lasted over the insole. A McKay sewing machine is employed to insert the second line of stitching and is provided with a shoe entering horn **50**, a straight hook needle **52**, a presser foot **54** and a feed point **56**. The presser foot **54** is shaped to enter the groove **39** formed by the knife block **30**, which groove guides the formation of the McKay seam in a well-known manner, the feed point also acting within the groove. If the groove is formed in uniform parallel relation to the seam **22** and with the proper spacing transversely from the line of the seam **22** satisfactory results from a quality standpoint are obtained. When, however, an attempt is made to form a groove spaced transversely from the line of the seam inserted by an outsole sewing machine, such as that illustrated in Fig. 1, there is a tendency for the force applied to an outsole by the feeding movement of the awl, to produce a transverse drawing action on the outsole along a line connecting the awl and the knife with the result that the outsole is displaced under some circumstances or permanently distorted, a jagged edged groove also being formed.

To avoid the formation of a jagged edged groove and to insure uniform spacing transversely of the seam line throughout the length of the groove without permanent distortion of the outsole, according to the present invention, the work engaging surface **32** of the present grooving knife is arranged to depress and clamp the outsole **42** more securely along that area of the outsole surrounding the cutting edge of the knife than elsewhere. The block **30** is mounted in its recess in the presser foot with its work engaging surface **32** projecting below the work engaging surface thereof. For this reason the work engaging surface portion of the block causes a temporary indentation **33** in the outsole (see Fig. 1) which reacts on the work support to clamp the outsole **42** most securely about the cutting edge of the knife. Any strains which are set up in the material of the sole during feeding movements of the awl will be offset by the indentation of the sole as soon as the sole is clamped by the presser foot. For instance, if there should be sufficient elasticity in the outsole to cause it to stretch along a diagonal line running between the cutting edge **36** of the knife and the awl during its feeding movement the strain will be relaxed inasmuch as the sole is indented and flattened by the portion of the block surrounding the cutting edge of the knife rather than adjacent to the awl as in the usual form of presser foot employing a work grooving knife. Accordingly, no slippage will occur of the sole beneath the work grooving knife after clamping and during the succeeding work feeding movement a smooth edged continuation of the groove will be formed in accurate parallel relation to the seam **22**.

For convenience in construction and effectiveness in operation the presser foot is provided with a needle and awl receiving opening **60** and the knife block **30** is located on the presser foot at a position spaced transversely of the seam line from the needle receiving opening therein as more clearly illustrated in Fig. 4. With this arrangement a rigid and smoothly acting presser foot is provided with which the work engaging surface thereof is of relatively large extended area so that there is little likelihood of damaging or marking the tread surface of the outsole sewn on the machine.

The nature and scope of the invention having been indicated and a particular embodiment having been described, what is claimed is:

A lockstitch shoe sole sewing machine having stitch forming devices including a curved hook needle and a shuttle, and means for clamping the work including a work support and a presser foot formed with their work engaging surfaces having openings to receive the needle, in combination with a work engaging knife block having an arcuate chip forming edge mounted on the presser foot with the edge spaced from the point of needle operation transversely of the seam line from the needle receiving opening in the presser foot to form a groove in the surface of the work being sewn by the machine for the reception of stitches by a further sewing operation, disposed in parallel relation to the seam being inserted, said knife block having a work engaging surface which surrounds the knife edge and which projects below the working surface of the presser foot to indent temporarily that portion of the work being grooved to an extent which will insure uniformity of spacing between the groove and the seam being inserted.

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REFERENCES CITED

The following references are of record in the file of this patent:

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