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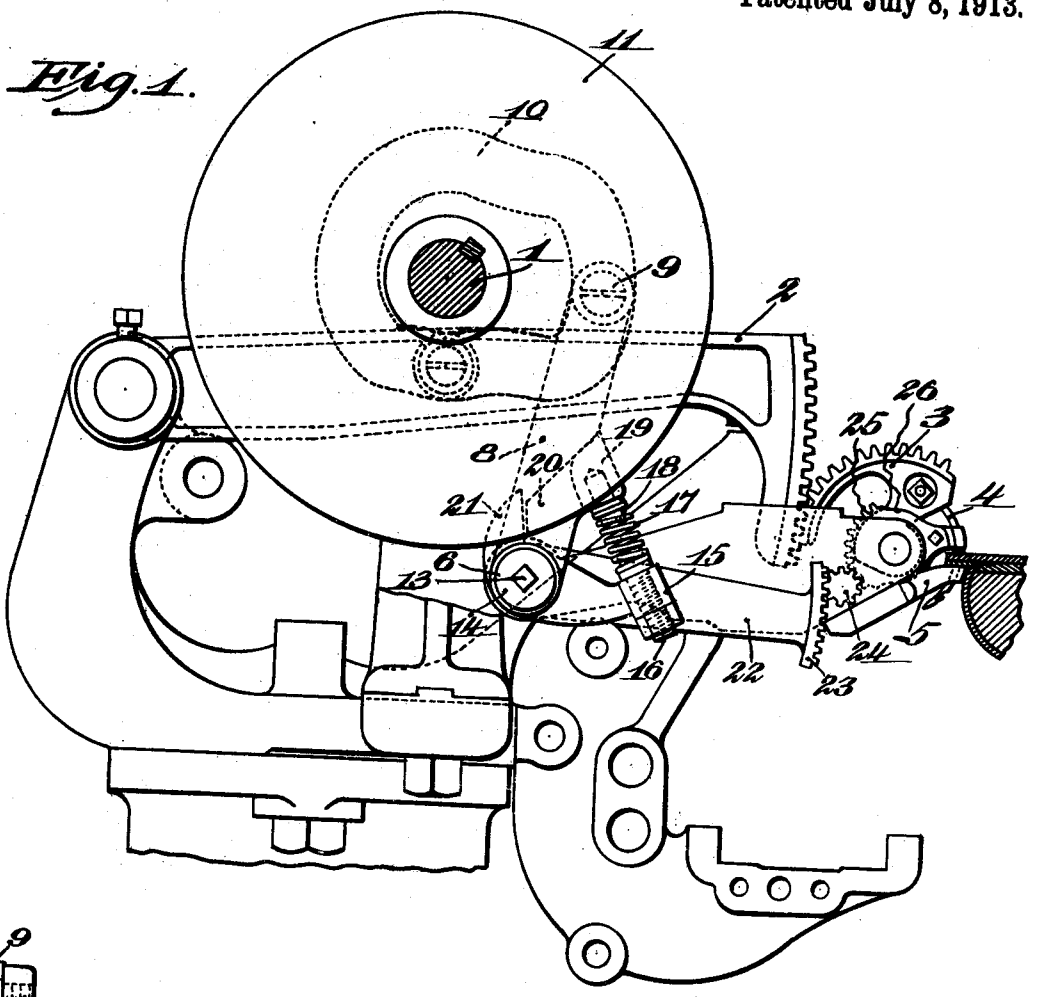
NEEDLE GUIDE FOR SEWING MACHINES.

APPLICATION FILED JULY 23, 1910.

1,066,924.

Patented July 8, 1913.

Fig. 1.



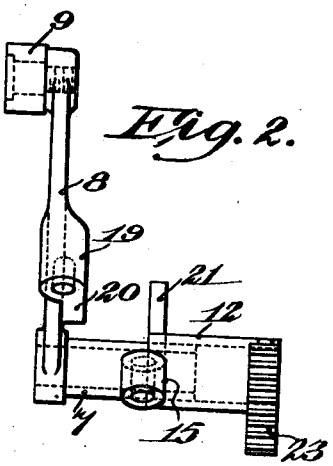


Fig. 2.

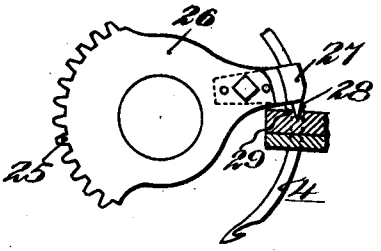


Fig. 3.

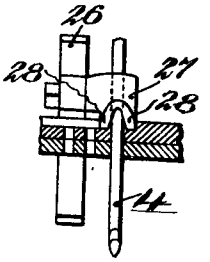


Fig. 4.



Fig. 5.

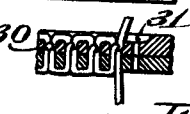


Fig. 6.

Witnesses

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NEEDLE-GUIDE FOR SEWING-MACHINES.

1,066,924. Specification of Letters Patent. Patented July 8, 1913.

Application filed July 23, 1910. Serial No. 573,366.

To all whom it may concern:

Be it known that I, FRED N. LA CHAPELLE, a citizen of the United States, residing at Beverly, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Needle-Guides for Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to a needle-guide groove cutter for sewing machines.

The object of my invention is to provide means whereby the bur raised by the awl used in the perforation of the work may be cut down and the bobbin thread may be sunk into a channel or groove cut in the work. After the awl has been thrust through and withdrawn from the work it leaves upon the side opposite that entered by the awl a bur or raised edge pushed up about the mouth of the awl hole. When the thread is drawn through the hole, this raised bur or edge is engaged by the thread, and the thread is pulled across this bur and by the tension of the thread the bur is cut into and pulled down in the setting of the stitch, the result being that the thread will sometimes more easily be drawn down through the bur and the lock of the stitch will thus be placed at different depths from the surface of the work, depending upon the relative resistance which the burs about the several awl holes offer to the thread as they are drawn down by it.

This invention contemplates means associated with the needle-guide whereby this raised bur may be cut down before the thread is drawn through the hole to set the stitch, and the lock of every stitch set at a uniform distance from the surface of the work.

After the outsole has been sewed to the welt in a Goodyear welt shoe, the channel flap of the outsole is turned down to close the channel and cover the stitches, in the finishing operation the sole being buffed to secure a smooth sole surface. As usually sewed, the stitch projects a little from the bottom of the channel, and after the channel flap is turned down and buffed, the buffing leaves a thinner place in the channel flap over the stitch which weakens it and allows it to open more readily when wet.

An object of my invention is so to set the stitch into the work at bottom of the outsole channel, that the channel flap may be turned down and buffed without being weakened by the stitch projecting under the flap. This I attain by the use of my improved needle guide groove cutter, which cuts away the awl bur thus allowing the stitch to be set more easily into outsole leather, and in addition to cutting away the awl bur, the cutting edges cut into or indent the leather at the side of the awl hole thus forming a continuous groove of a predetermined depth into which the bobbin thread is sunk below the bottom of the outsole channel.

Another object of my invention is to so place the cutting edges that the groove cut by them shall closely follow the line of the awl holes when sewing a sharply curved line of stitches.

A still further object of my invention is to so arrange my groove cutting edge that it will engage the work only when the work is held by the needle and so prevent its drag on the work as the work is fed through the machine and also prevent the wearing of the cutting edge by the dragging of the work over it.

With the above objects in view, the present invention consists in the needle-guide groove cutter for sewing machines hereinafter described, as defined in the claims.

The preferred form of the present invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation showing the needle and the needle-guide mechanism; Fig. 2 is a front elevation showing the cam-operated lever arms to actuate the needle guide; Figs. 3 and 4 are side and front views respectively of the needle, its guide, and the groove cutter, the work being shown in cross section; Figs. 5 and 6 are, respectively, a top view and a cross section of the work in which the stitches are being taken.

The preferred form of the invention is illustrated as applied to a shoe-stitching machine of the type commonly known as the Goodyear rapid outsole stitcher, said machine being substantially illustrated in the patent to French and Meyer, No. 473,870, dated April 26, 1892, although it is to be understood that the said invention is equally applicable to other types of sewing machines.

In the drawings, 1 indicates the driving shaft, 2, the cam-operated lever arm for actuating the needle segment 3 which bears the curved hooked needle 4, and 5 indicates the work support through which the hooked needle passes, these parts being substantially arranged as set forth in the above-mentioned patent to French and Meyer, and hence further description thereof is considered unnecessary and only such detailed description as necessarily relates to the invention contemplated will be given.

About the bearing stud 6 rigidly fixed to the machine frame, is pivoted a sleeve 7, said sleeve being integral with the lever arm 8, which is thus pivoted about the fixed stud, and which bears upon its upper end a cam roller 9 which runs in a cam groove 10 cut into the right-hand side (looking from the front of the machine) of the wheel 11 which is keyed upon the driving shaft, the rotation of the shaft thus serving to oscillate the lever 8. Over the sleeve 7 there is fitted another sleeve 12, these two sleeves being held in relative position upon the bearing stud 6 by means of a nut 13 and bearing washer 14. Upon one end of the sleeve 12 is formed, integrally, a lug 15 which is perforated and screw-threaded, and holds an adjusting screw 16 which bears against and compresses a spiral compression spring 17 the other end of this spiral compression spring being held by a pin 18 which engages in a recessed lug 19 upon the lever arm 8. Upon the lever arm 8 is formed a shoulder 20 against which strikes a lug 21 integral with the sleeve 12, the engagement of these lugs limiting the turning of the sleeve 12 about the sleeve 7 and holding the spring 17 under compression, and when the lever arm 8 (in Fig. 1) is moved to the left, the engagement of these lugs serves as a positive means for lifting the lever arm 22 which is formed integral with the end of the sleeve 12.

Upon the end of the lever arm 22 is a segmental gear 23 which meshes with a pinion 24 fixed to a shaft, the other end of which bears a pinion meshing with the segmental gear 25 upon the needle guide segment 26. This arrangement of gearing between the segmental gear 23 and the needle guide segment 26 is substantially that set forth in the above-mentioned French and Meyer patent except that the pinion 24 is rigidly secured to its shaft, since in my improved mechanism considerably more strain is put on this gearing.

Removably fixed to the front of the needle guide segment 26 is a needle guide 27 through which the curved hooked needle 4 passes. The lower end of this needle guide is formed with two cutting edges 28, these cutting edges being formed upon opposite sides of the needle receiving guide perforation and within a vertical plane which extends in the same direction as the work is moved. Directly behind the cutting edges 28 is formed a stop shoulder 29 which bears against the surface of the work and so limits the depth to which the edges 28 may cut.

The operation of the needle-guide groove cutter will be readily understood from an inspection of Figs. 1, 3, and 4, of the drawings. After the awl has been withdrawn from the work, the needle descends and passes through the awl hole, the needle guide following the needle downward and the cutting edges 28 striking the work on either side of the needle, thus cutting down the raised bur left by the awl. The needle-guide is thrown down by the movement of the lever arm 8 in Fig. 1 to the right. This movement of the lever arm 8 compresses the spiral spring 17 and moves the lever arm 22 downwardly the motion being transmitted through the train of gearing 23, 24, and 25 to the needle guide segment 26. After the groove cutter has engaged the work the spring 17 insures a uniform pressure of the groove cutter upon the work, the depth of the cut being governed by the shoulder 29 pressing upon the surface of the work. The pressure of the needle-guide groove cutter upon the work may be regulated by adjusting the tension of the spring 17 by means of the screw 16. The spring 17 allows the needle guide groove cutter to accommodate itself to work of different thickness, and if there be a hard spot in the work into which the cutting edges are not able to cut, the spring allows the cutter to yield and place no abnormal strain on the machine. When the needle guide is raised by the movement of the lever arm 8 to the right, the shoulder 20 striking against the lug 21 causes a positive lift of the lever 22 and hence a positive upward movement of the needle guide 27. The needle guide is thus pressed downwardly with spring pressure, but is given a positive upward movement.

The cutters, descending upon either side of the awl hole, cut down the bur and indent the leather uniformly at each awl hole and hence when the stitch is drawn, the lock, as shown at 30 in Fig. 6, is always set a uniform distance from the surface of the work, and the bobbin thread drawn into the groove 31 thus being itself set into the work at a depth determined by the projection of the cutting edges 28 beyond the stop shoulder 29. The two cutting edges being upon opposite sides and close to the needle shank, allow the work to pivot about the needle and hence the cutters closely follow the awl holes when sewing a sharply curved line of stitches as at the toe of a shoe, a result which it was impossible to obtain when the groove cutting edges were formed upon a presser foot. By dividing my groove

cutting edge into two parts and placing these two cutting edges one in either side and in close proximity to the needle, I secure the closest possible following of the cut groove upon the line of the awl holes. The cutting edges descend only when the work is held by the needle and hence there is no drag of the cutting edges against the work to interfere with the free feeding of the work through the machine, and moreover the cutting edges are not dulled by the dragging of the work across them since the only time the cutting edge comes into engagement with the work is on its chisel-like downward cutting stroke.

What is claimed is:—

1. A lock stitch sewing machine having, in combination, stitch forming devices including a hook needle, and a needle guide having a cutting edge for forming a stitch receiving groove in the work, substantially as described.

2. A lock stitch sewing machine having, in combination, stitch forming devices including a hook needle, and a needle guide having a cutting edge for forming a stitch receiving groove in the work and a limiting shoulder for bearing upon the work to determine the depth of the groove, substantially as described.

3. A lock stitch sewing machine having, in combination, stitch forming devices including a hook needle, and a needle guide having cutting edges on both sides of its needle receiving perforation for cutting a stitch receiving groove in the work, substantially as described.

4. A lock stitch sewing machine having, in combination, stitch forming devices including a hook needle, a needle guide having a cutting edge for forming a stitch receiving groove in the work, and means for pressing the needle guide against the work with a yielding pressure, substantially as described.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."