May 31, 1927. 1,630,754

P. C. McNULTY

METHOD AND APPARATUS FOR EMBOSSING FLEXIBLE MATERIAL

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Fig. 1.

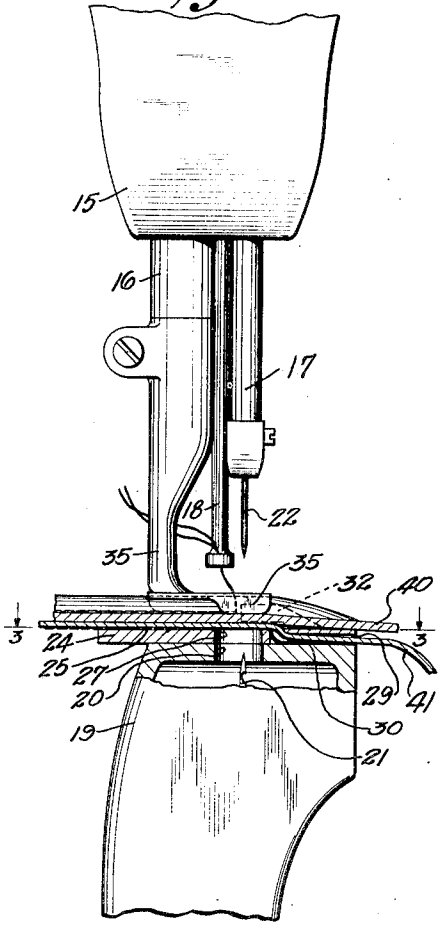


Fig. 2.

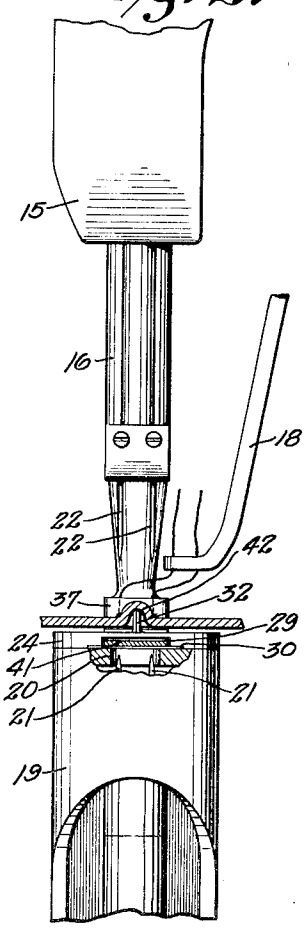


Fig. 3.

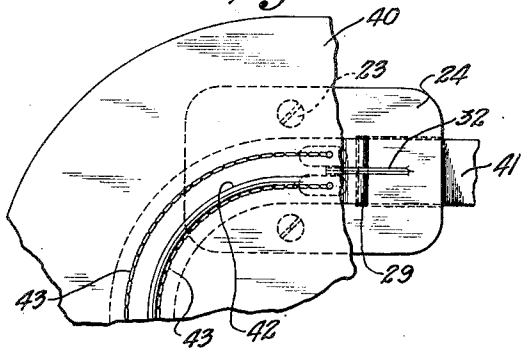
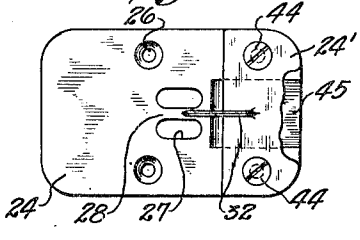


Fig. 14.



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METHOD AND APPARATUS FOR EMBOSSING FLEXIBLE MATERIAL

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Fig. 4.

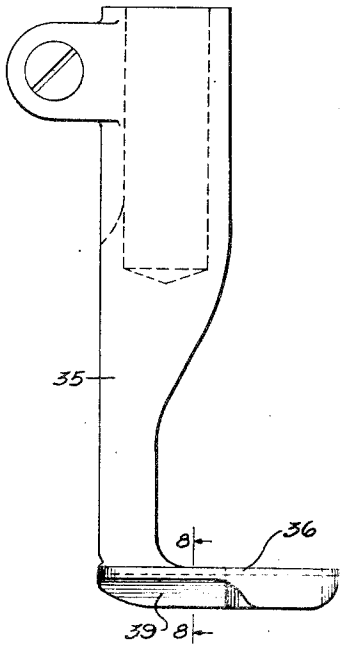


Fig. 7.

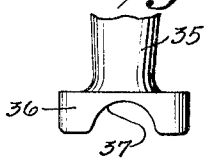


Fig. 8.

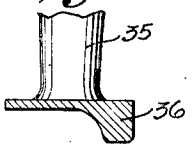


Fig. 9.

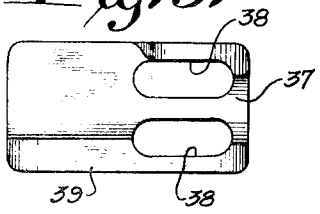


Fig. 5.

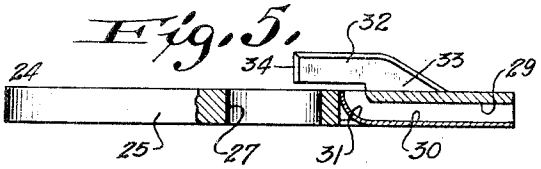


Fig. 10.

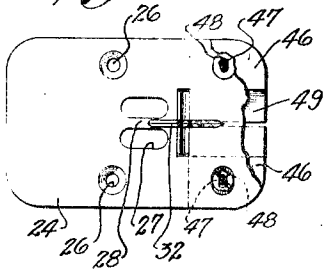
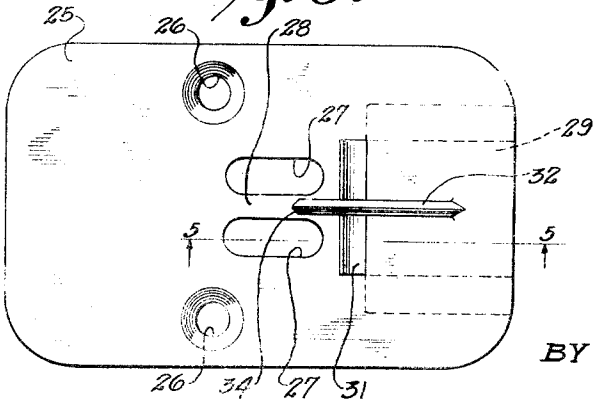


Fig. 6.



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Fig. 11.

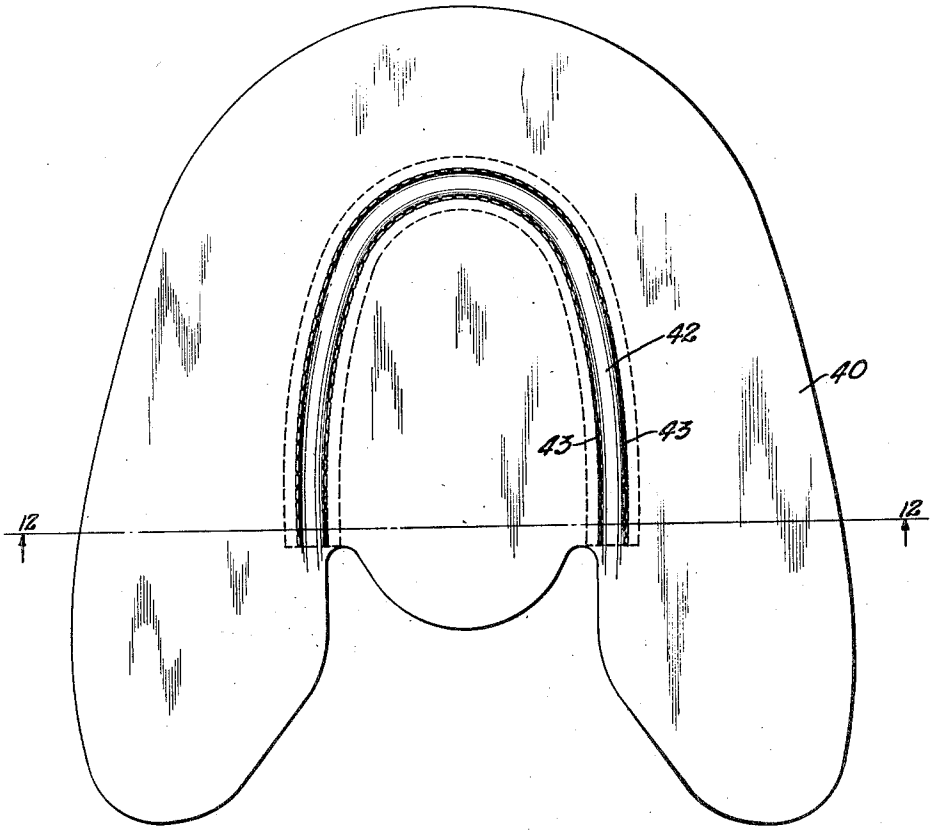


Fig. 12.

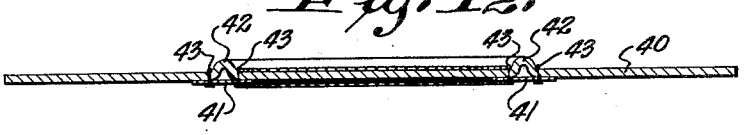
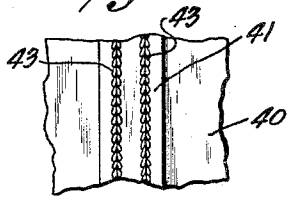


Fig. 13.



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Patented May 31, 1927. 1,630,754

UNITED STATES PATENT OFFICE.

PETER C. McNULTY, OF MILWAUKEE, WISCONSIN.

METHOD AND APPARATUS FOR EMBOSSING FLEXIBLE MATERIAL.

Application filed December 7, 1925. Serial No. 73,917.

The invention relates to stitching attachments for sewing machines for forming a bead or embossment upon leather, fabric, or other materials, and to the method of producing this bead.

Heretofore it has been proposed to form a bead on leather or other materials solely by stitching, in one instance, and by the use of a cord, tape and stitching, in another instance. Machines for forming the beaded edge solely by stitching have not been commercially practical, and the method of forming the beaded edge with a cord, tape and stitching is objectionable because of the use of the cord, which increases the expense, introduces additional operations after the bead has been formed, is awkward to handle, and does not produce the best quality of work. The object of the present invention is to improve these prior processes by forming the bead between a pair of cooperative rigid dies and maintaining the bead in its formed condition by stitching a stay piece or tape to the body of the material adjacent the bead as said bead is formed, and to provide mechanism for carrying out this method, which may be readily attached to sewing machines of known construction.

The invention is especially applicable to the forming of a bead on a shoe vamp so that such vamps may be used for making moccasin or shoe-pack type of footwear, the bead facilitating the forming of the vamp over the last to the desired shape.

The invention further consists in the several features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings, Fig. 1 is a side elevation view of apparatus embodying the invention, parts being broken away and parts being shown in section, applied to a sewing machine;

Fig. 2 is a front elevation view of the apparatus, parts being broken away and parts being shown in section;

Fig. 3 is a detail sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is an elevation view of the presser-foot;

Fig. 5 is a side elevation view, partly in section, along the line 5—5 of Fig. 6, of the forming-and-tape-guide member;

Fig. 6 is a plan view of the member shown in Fig. 5;

Fig. 7 is a detail front end view of the presser-foot;

Fig. 8 is a detail sectional view taken on the line 8—8 of Fig. 4;

Fig. 9 is a bottom view of the presser-foot;

Fig. 10 is a view similar to Fig. 6, parts being broken away to show a modified form of tape guide;

Fig. 11 is a plan view of a shoe vamp having a bead or embossment produced in accordance with the method;

Fig. 12 is a detail sectional view taken on the line 12—12 of Fig. 11;

Fig. 13 is a detail bottom view of a portion of the vamp; and

Fig. 14 is a plan view of a modified form of forming-and-tape-guide member.

In the drawings the numeral 15 designates a part of the stitcher-head in which a presser-foot 16 and an awl-carrying bar 17 reciprocate, and a thread-guide 18 works in the usual manner, and 19 a work-support having an opening 20 therein through which the needles 21 work in the usual manner. The bar 17 carries the awls 22 which work in conjunction with the needles in the usual manner.

Forming a part of the support 19 and mounted thereon, as shown in Figs. 1 to 3, inclusive, by screws 23 and in place of the usual flat-throat plate of the sewing machine, is a forming-and-tape-guide member 24 which is shown in detail in Figs. 5 and 6. This member 24 has a flat plate portion 25 provided with holes 26 for the screws 23, spaced elongated needle slots 27 with a bridge 28 between them, and a tape-guide slot 29 formed on its under side. The bridge 28 is of known flat form to strengthen the plate and perform the usual function of supporting the stock between the needles during the stitching operation. A piece 30, secured to the plate portion 24 in any suitable manner and curved upwardly at 31, forms the bottom of the tape-guide slot. The member 24 also has a centrally disposed bead-forming die portion in the form of a relatively narrow projection 32 extending from its base 33 over and slightly above the delivery end of the slot 29 and the flat surface of the plate portion 24, and with its end 34 terminating adjacent a part of the bridge 28.

A presser-foot 35, secured in the usual

manner to the reciprocating bar 16, has a laterally extending foot 36. This foot is provided with a toe forming a concave bottom bead-forming die 37. Behind the die 37 are spaced slots 38 in which the awls 22 and needles 21 are free to work, and a rearwardly extending strengthening flange 39 on one side. The side opposite the flange 39 is open so that the work may be readily turned in the machine away from the main working parts of the machine.

With this construction, the material to be embossed, such as a piece of leather, for example in the form of a vamp 40, is placed on the forming member 24 and over a strip 41 of tape which has been threaded through the guide-slot 29. The machine is then started and as the material between the dies is pressed over the fixed die 32 by the reciprocating arched presser-foot or die 35 to form a bend or bead 42, the awls 22 cooperate with the needles 21 and the thread-guide 18 to stitch the body of the material adjacent to the bead to the tape 41 by the rows of stitching 43, which action is successively performed upon the material as the operator feeds it through the machine and guides it so as to form the desired configuration of bead which, in case of a vamp for shoe packs, is of the form shown in Fig. 11. Thus the bead is formed between a fixed and movable die and while so formed is permanently maintained in formed position by stitching the tape to the underside of the material adjacent the bead. In the form of sewing machine herein shown, the oscillation of the needles feeds the work, and hence the tape, through the machine.

Instead of forming the die 32 integral with the plate portion 24, it may, as shown in Fig. 14, be formed as a part of a plate 24′ secured to the plate portion 24 by screws 44 and cooperate with a recess 45 formed in the upper part of plate portion 24 to form a tape-guide.

Where it is desired to adjust the width of the tape-slot or guide, the construction shown in Fig. 10 may be used, wherein a pair of recessed plates 46 are adjustably secured to the plate portion 24 by means of screws 47 whose shanks pass through slots 48 in said plate portion, these plates 46 being slidably mounted in a recessed portion of the plate 24, which is similar to the recess formed by the slot 29 except that it extends all the way across the plate 24. Thus the plates 46 are adjustable toward and away from each other to vary the width of the tape-slot 49 formed by said plates and the plate portion 24 so as to accommodate tape of different widths.

The modifications shown in Figs. 10 and 14 act in conjunction with the presser-foot 35 the same way as the forming-and-tape-guide member shown in Figs. 5 and 6, except that the construction shown in Fig. 10 has provision for adjusting the width of the tape-guide.

With the above attachments sewing machines obtainable on the market can be readily equipped with the presser-foot and forming-and-tape-guide member made in accordance with my invention for producing a bead or embossment upon the work.

By the term "tape" I mean a flat strip or stay piece of any suitable stitchable material.

I desire it to be understood that this invention is not to be limited to any specific form or arrangement of parts, or manner of operating the parts, except in so far as such limitations are specified in the claims, it being noted that the method may be carried out by hand as well as machine operation.

What I claim as my invention is:

1. In a bead-forming machine for shoe vamps, the combination of a movable presser foot provided with a forming die and a relatively fixed die cooperating therewith to form a bead in the material being operated upon, means for guiding a tape beneath the material, below the fixed die, and means for stitching the tape to the material adjacent the bead as said bead is formed by said dies.

2. In an attachment for sewing machines of the spaced-seam type, the combination of a reciprocating presser foot provided with a forming die, and a work-support having openings through which the needles work and provided with a relatively fixed die cooperating with the reciprocating die to form a bead in the work as it is fed through the machine, said support also having a tape-guide to introduce a tape beneath said relatively fixed die, the spaced needles of the machine working through said support to stitch the tape to the material adjacent the bead as said bead is formed by said dies.

3. In an attachment for sewing machines of the spaced-stitch type, the combination of a reciprocating pressure foot provided with a forming die, and a work-support having openings through which the needles work and provided with a relatively fixed die cooperating with the reciprocating die to form a bead in the work as it is fed through the machine, said support having an adjustable tape-guide, the spaced needles of the machine working through said support to stitch the tape to the material adjacent the bead as said bead is formed by said dies.

4. In an attachment for sewing machines of the spaced-stitch type, the combination of a reciprocating presser foot provided with a forming die, and a work-support having openings through which the needles work and provided with a relatively fixed die cooperating with the reciprocating die to form a bead in the work as it is fed through the

machine, said support having an adjustable tape-guide including a pair of adjustable plates recessed to form a guide, the spaced needles of the machine working through said support to stitch the tape to the material adjacent the bead as said bead is formed by said dies.

5. In a sewing machine for forming an imitation moccasin seam, the combination of a pair of needles, a guide plate having a pair of parallel slots through which said needles work and having a supporting portion between said slots for supporting a tape, a member secured to said plate and spaced from said slots, said member and said plate forming a channel for guiding said tape, a mandrel carried by said member and overhanging and projecting over a portion of said plate, said mandrel being equally spaced from said slots and adapted to have the work slit thereover, and a presser foot having a grooved lower face adapted to engage the upper side of said work and cause the work to arch up over said mandrel, whereby the work is retained upwardly arched and the tape is stitched to the under side of the work on opposite sides of the upwardly arched portion.

6. In a sewing machine for forming an imitation moccasin seam, the combination of a pair of needles, a guide plate having a pair of parallel slots through which said needles work and having a supporting portion between said slots for supporting a tape, a member detachably secured transversely across said plate and spaced from said slots, said member and said plate forming a channel for guiding said tape, a mandrel carried by said member and overhanging and projecting over a portion of said plate, said mandrel being equally spaced from said slots and adapted to have the work slide thereover, and a presser foot having a grooved lower face adapted to engage the upper side of said work and cause the work to arch up over said mandrel, whereby the work is retained upwardly arched and the tape is stitched to the under side of the work on opposite sides of the upwardly arched portion.

7. In a sewing machine for forming an imitation moccasin seam, the combination of a pair of needles, a guide plate having a pair of parallel slots through which said needles work and having a supporting portion between said slots for supporting a tape, a fixed die associated with said plate, a tape guide through which a tape may be passed beneath said die, and a presser foot having a grooved lower face cooperating with said die to press the work between said die and said foot whereby the work is upwardly arched and the tape is stitched to the under side of the work on opposite sides of the upwardly arched portion.

In testimony whereof, I affix my signature.

PETER C. McNULTY.