Jan. 26, 1932.

J. V. POOLE

1,842,838

MACHINE FOR MAKING RIBBED INNERSOLES

Filed March 19, 1929

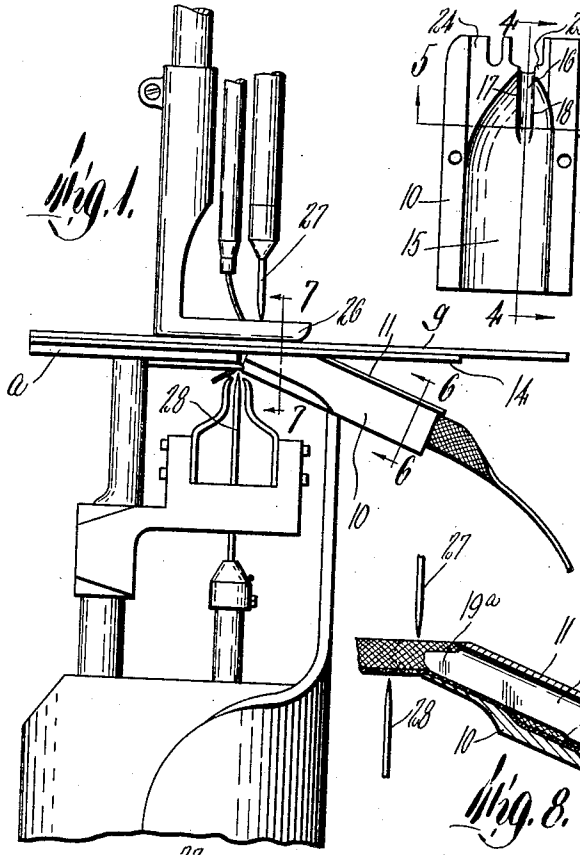


Fig. 1.

Fig. 2.

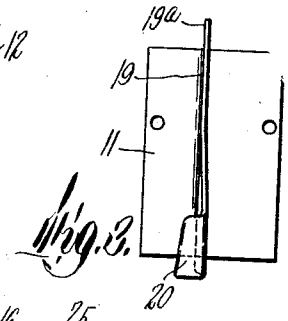


Fig. 3.

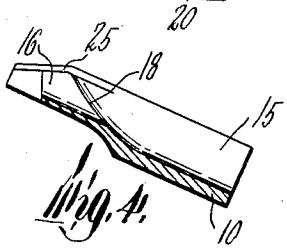


Fig. 4.

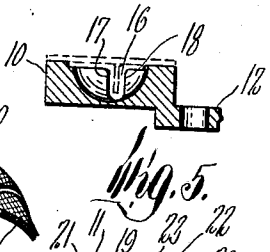


Fig. 8.

Fig. 5.

Fig. 6.

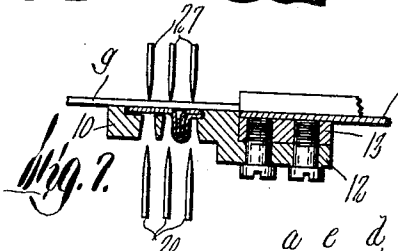


Fig. 7.

Fig. 9.

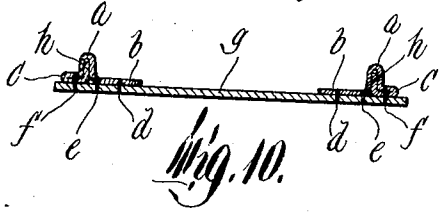


Fig. 10.

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Patented Jan. 26, 1932 1,842,838

UNITED STATES PATENT OFFICE

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MACHINE FOR MAKING RIBBED INNERSOLES

Application filed March 19, 1929. Serial No. 348,168.

The present invention relates to innersoles having reinforced ribs made of material originally separate from the innersole body and united to the latter by stitches in a sufficiently secure and permanent manner to serve the needs of an innersole in making welt shoes. The particular purpose of the invention is to furnish means by which a reinforced rib may be folded and formed from a single strip of suitable material and stitched to the innersole body in a continuous operation.

The rib structure, which it is my purpose thus to form and apply, is not original or novel with me, but has long been known. It is made from a single strip of suitable material, usually cotton duck cut on the bias, and folded longitudinally to make a central ridge, which constitutes the rib proper, and outturned flanges through which the stitches pass in attaching it to the innersole body, and the edge part of the strip is turned back under one of said flanges and turned up into the rib proper between the plies of material forming the sides thereoef, to provide a reinforcement for the rib. Heretofore the rib structure thus constituted has been made and sold as a complete article of manufacture to be applied by shoe makers to the body parts of innersoles in manufacture of the complete ribbed innersole. In thus making the rib material as an article of manufacture, it has been necessary to incorporate in it means for retaining it in its folded condition and preventing the folds from opening and the strip from reverting to its original flat condition before use. The means for this purpose commonly comprises a sewed seam, the stitches of which pass through the sides of the rib and the interposed reinforcement. When the rib material thus constituted is prepared for sale, the portions which are designed to provide the base flanges are laid against one another in continuation of the sides of the rib proper, and these flanges have to be separated and turned outward in the course of applying the rib material to innersole bodies.

My purpose has been to enable shoe makers and other users and manufacturers of ribbed innersoles to form up a reinforced rib of the character above identified out of flat strip stock in the course of feeding the strip to the innersole body and sewing it thereto, thus saving the expense of folding up the rib as a separate precedent operation and the cost of the thread for the seam needed to preserve the rib pending its application to the innersole body in a separate operation.

In accomplishing this object I have provided a folder adapted for attachment to a sewing machine and having means for shaping an originally flat strip, tape or the like into the desired finished reinforced rib with base flanges. In its fundamental characteristics and cooperation with the sewing machine, the folder of the present invention is similar to that disclosed in my prior Patent No. 1,244,891, granted October 30, 1917, but it contains improvements and additions adapting the folder to obtain results of which the one shown in the said patent is not capable.

The invention consists in the novel principles and characteristics of my improved folder, its combination with a sewing machine, and the method of forming a stitched reinforcing rib of the character designated and applying the same to an innersole body in the production of ribbed innersoles, to which the use of such folder contributes.

In the drawings furnished herewith for better illustration of the invention,—

Fig. 1 is a front elevation of a part of a sewing machine with a folder containing the present invention applied thereto;

Fig. 2 is a plan view of the folder with its cover removed;

Fig. 3 is an under plan view of the cover part of the folder;

Fig. 4 is a longitudinal section of the folder taken on line 4—4 of Fig. 2;

Fig. 5 is a cross section of the folder taken on line 5—5 of Fig. 2;

Figs. 6 and 7 are detail cross sections taken on lines 6—6 and 7—7, respectively, of Fig. 1;

Fig. 8 is a longitudinal section of the complete folder, including the parts shown in Figs. 2 and 3 in their assembled cooperative relationship;

Fig. 9 is a perspective view of a complete innersole with a rib of the character herein identified secured thereto;

Fig. 10 is a cross section of the innersole taken on line 10—10 of Fig. 9.

Like reference characters designate the same parts wherever they occur in all the figures.

The characteristics of the rib herein referred to are illustrated in Figs. 9 and 10. *a* represents the rib proper, and *b* and *c* the outturned base flanges through which the stitches of seams *d*, *e* and *f* pass in securing the rib to the body part *g* of an innersole. Such rib, with its flanges, is made from a single strip of fabric, the flange *b* being formed from one edge portion of the strip, the rib proper being an intermediate longitudinal fold of the strip, and the flange *c* being a second longitudinal fold. The part of the strip between the second fold and the adjacent edge is laid back and bent up into the interior of the first fold, making the reinforcing strip *h* between the plies which provide the sides of the rib proper, and integrally connected with the flange *c*.

In order to fold the originally flat strip into this form and deliver it to the innersole body and to the stitch forming mechanism by which the uniting seams *d*, *e* and *f* are made, I provide a folder consisting of a body or base 10 and a cover or top member 11. The base member of the folder is provided with a lug 12 by which it is secured to a beam 13 underlying the table 14 of a sewing machine, in such manner that the top surface of the rear end of said base member is flush with the table. The folder as a whole is inclined to the plane of the sewing machine table and the cover 11 overlies that part of its upper side which diverges from the table, as shown in Fig. 1. In the folder base or body is a substantially semi-cylindrical cavity 15 extending from its forward or receiving end toward the rear or discharge end. In approaching the latter end the sides of the cavity are gradually tapered or inclined toward an intermediate longitudinal groove 16, and the bottom of the cavity gradually rises at each side of the groove, forming shoulders 17 and 18 which bound the groove. This groove has a width and depth approximately equal to the corresponding dimensions of the rib proper and is located at distances from the opposite sides of the cavity 15 corresponding to the widths of the respective flanges *b* and *c*. The width of the cavity 15 measured on its curved surface is approximately equal to so much of the width of the strip as is needed to form the flange *b*, the rib proper *a*, and the upper ply of the flange *c*. The cover 11 is provided with a fin 19 projecting from its under or inner surface, the rear end 19*a* of which protrudes beyond the cover as a tongue, in position to occupy the middle part of the groove 16 when the cover is in place; and the major part of the fin extends in approximate alinement with the groove, but the part toward the forward end of the cover is slightly inclined both to the plane of the cover and to the direction of feed, as best shown by Figs. 3 and 6. At its forward end this fin is provided with a reversely turned lip 20 which forms a guide or trough for that edge of the strip which furnishes the rib reinforcement. The distance from the bottom or apex of this guide trough, measured along the side of the fin, to the surface of the cover, and across the latter from the fin to the nearer boundary of the cavity 15, is equal to the width of that part of the strip needed to furnish the under ply of flange *c* and the reinforcing member *h*. Thus the folder is provided at its entrance end with four guiding points, that is, the bottom of the guide trough 20 which receives one edge of the strip, the angle 21 between the body and cover which receives the opposite edge of the strip, the angle 22 between the cover and the opposite boundary of cavity 15, which locates the fold of the flange *c*, and the angle 23 between the fin and cover which locates the bend between the upturned reinforcing strip *h* and the under ply of flange *c*.

When the strip is initially fed into the folder, its inherent stiffness causes it to conform to the surfaces of the folder and enter the guiding angles thereof substantially as described and as shown in Fig. 6. In this figure the unformed strip is shown in cross section and designated by the letter *k*. As it progresses through the folder the rising shoulders 17 and 18 which bound the groove 16 indent the convexly curved strip and, in cooperation with the fin 19 and its tongue 19*a*, fold it so as to form the rib *a* and lay the plies thereof against the guiding fin and the reinforcing lip. The top surface of the folder body at its emerging end is cut down or recessed to provide plane surfaces 24 and 25 at a sufficient depth below the plane of the table 14 to admit the flanges *b* and *c* (note Fig. 7). The discharge end of the folder is located beneath the presser foot 26 of the sewing machine and to some extent in the paths of awls 27, by which the innersole body is fed and holes are made therein for passage of the sewing needles 28. Thus the folder delivers the formed rib strip to the under side of an innersole body placed on the sewing machine table, right at the point where the stitches of the attaching seams are formed. The machine is a plural needle machine having as many awls, needles and accessory mechanisms as needed to place simultaneously the stitches of all the seams by which the rib is united to the innersole body.

The feeding of the body and rib is performed automatically by the machine, while the operator guides the body as needed to place the rib in its desired location. Thus the rib forming strip is pulled through the folder.

What I claim and desire to secure by Letters Patent is:

1. A combined sewing machine and folder for forming and attaching to an innersole body a rib constituted by a single strip folded to provide a rib proper, base flanges and an integral reinforcing member extending from one of said flanges into the interior of the rib proper; said sewing machine having work feeding means, and stitch forming means arranged to place stitches in the work in laterally separated locations, and the folder being located to deliver the folded rib to the said body approximately at the location of said stitch forming and feeding means, and having provisions for folding a strip of fabric and doubling the central part thereof around an inturned edge of the strip to form a reinforced rib, while bending out the fold made when such edge is turned in, to form a flange.

2. In combination with a sewing machine having means for supporting an innersole body, stitch forming means and work feeding means, a folder connected to the machine in position to deliver a stitch receiving rib for attachment to an innersole body at approximately the plane of said supporting means and the operating location of said stitch forming and work feeding means, said folder having a cavity arranged to receive a strip of innersole rib fabric, a fin projecting into said cavity, and guiding means for turning inward one edge of the strip, for guiding such edge, and folding an intermediate part of the strip about such edge to form a rib embracing such edge and form base flanges at opposite sides of the rib.

3. A folder for coaction with a sewing machine as and for the purpose set forth, comprising a body having a longitudinal cavity open at one end of the folder and partly obstructed at the other end, a groove opening from the latter end of the cavity, a cover having a fin entering the middle part of the groove and extending throughout the cavity, and a lip on said fin forming with the latter a guide trough.

4. A folder comprising a body or base portion and a cover, said base portion being formed with a substantially semi-cylindrical cavity extending from its receiving end toward its discharging end, and at the latter end being diminished in width on both sides and in depth, and having a relatively narrow groove opening from the said cavity at the discharging end of the folder; and the cover having a fin projecting into said cavity and groove and extending longitudinally thereof and provided at the entrance end of the cavity with an upturned lip forming a guide trough.

5. A folder having cooperative means and configuration for bending a strip in a transverse arched formation and folding one edge portion thereof inward toward the middle part of said arched formation and having means for guiding and limiting the position of such edge and further means for bending in the arched portion of the strip at both sides of the inturned edge to make a rib, the sides of which embrace said inturned edge.

6. The method of producing a ribbed innersole which consists in progressively folding a fabric strip lengthwise, forming therein an intermediate longitudinal rib, turning out flanges at the sides of said rib and folding an integral reinforcing lip inward from one of said flanges and into the channel between the sides of said rib, and delivering the strip thus folded to the surface of an innersole body with said flanges in contact with such surface and the reinforced rib projecting outwardly therefrom, and stitching both flanges to the innersole body, in continuous uninterrupted sequence.

In testimony whereof I have affixed my signature.

JESSE V. POOLE.