Oct. 30, 1945. F. L. AYERS 2,387,710

INNERSOLE

Filed March 24, 1943 2 Sheets-Sheet 1

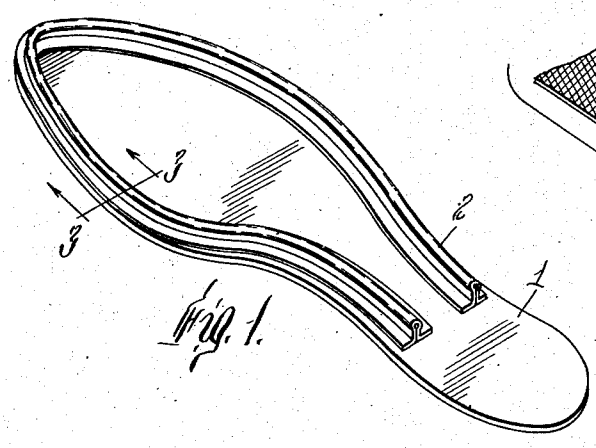


Fig. 1.

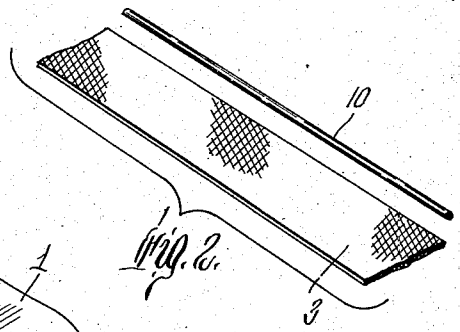


Fig. 2.

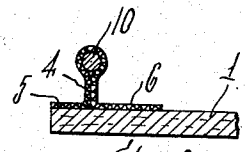


Fig. 3.

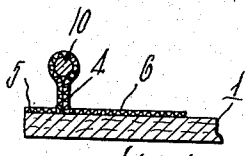


Fig. 4.

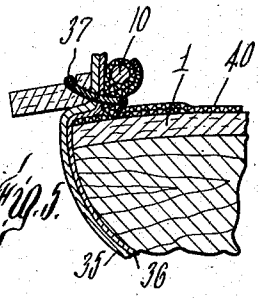


Fig. 5.

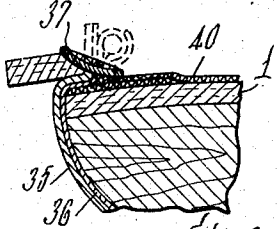


Fig. 6.

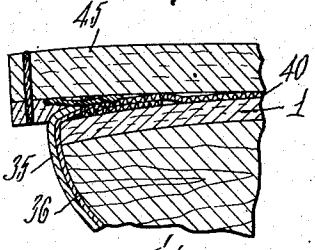


Fig. 7.

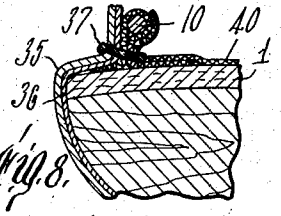


Fig. 8.

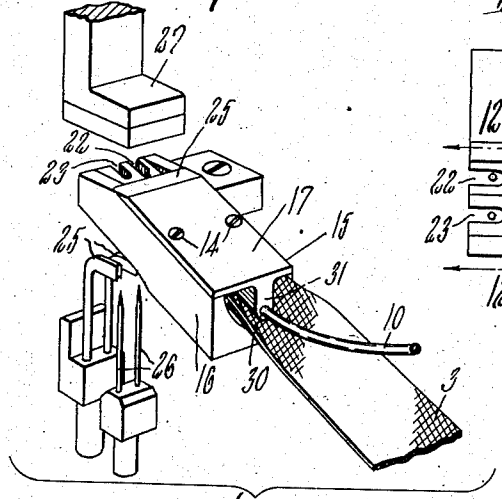


Fig. 9.

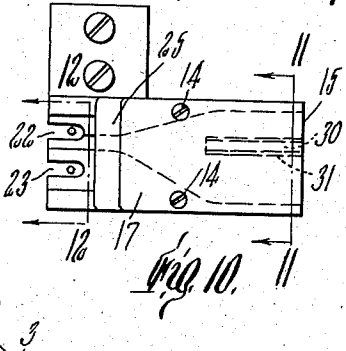


Fig. 10.

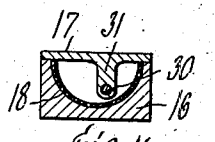


Fig. 11.



Fig. 12.

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INNERSOLE

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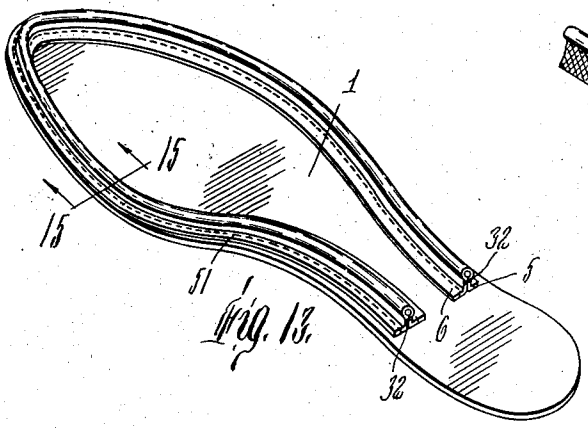


Fig. 13.

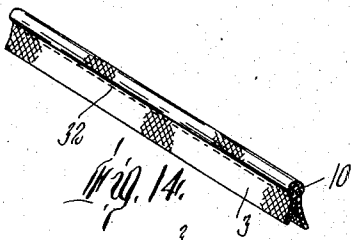


Fig. 14.

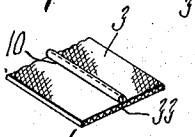


Fig. 14a

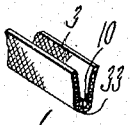


Fig. 14b

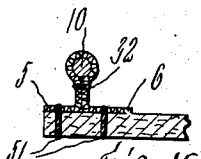


Fig. 15.

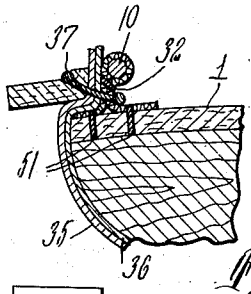


Fig. 16.

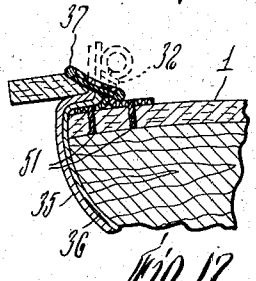


Fig. 17.

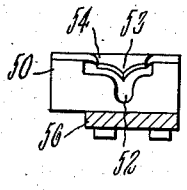


Fig. 20.



Fig. 21.

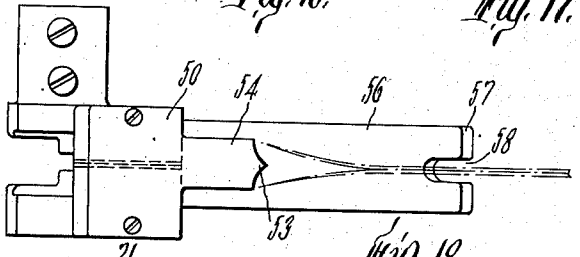


Fig. 18.

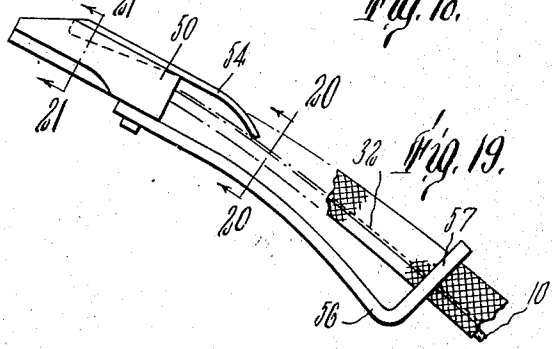


Fig. 19.

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UNITED STATES PATENT OFFICE

2,387,710

INNER SOLE

Fred L. Ayers, Watertown, Mass.

Application March 24, 1943, Serial No. 480,320

3 Claims. (Cl. 36—22)

It has been suggested to form an innersole stitch receiving rib from a longitudinally folded strip of fabric secured to the lower face of an innersole blank, but this has not been satisfactory because such a rib is so soft and pliable that it does not stand up to the sewing or other fastener inserting machine guide mechanism sufficiently to insure correct placing of the stitches or other fastenings. It has also been proposed to stiffen such a strip by placing a core or insertion between the sides of the fold and extending outwardly from the face of the blank. This construction provides the desirable body and stiffness to the stitching rib. When such a construction is employed with a relatively thin innersole blank, however, there is sufficient of this stiff rib left after the inseam trimming operation to produce the effect of a ridge on the top face of the innersole which is not only unsightly but also may cause discomfort to the wearer of the shoe.

An object of the present invention is to provide a stitching rib which will stand up properly to the stitching or fastener inserting machine guiding means to insure a proper placing of the stitches or other fastenings, but which after the inseam trimming operation will leave no undesirable stiff rib. This is accomplished in accordance with the present invention by providing a thickened or stiffened free edge portion for the rib. This may be done by reinforcing the outer portion only of the folded fabric rib as with a filler element, so that after this edge portion has served its purpose in aiding in correct placing of the stitches or other fastenings, this portion of the rib containing the stiffening or reinforcement is completely removed during the inseam trimming operation, leaving the innersole in condition as though no reinforcement had been used but with the stitches or other fastenings properly positioned. In some cases the fabric portion of the rib may be omitted and a cord, or the like, may be directly secured to the innersole blank, at least the marginal portion of this cord being removed in the trimming operation.

Further objects and advantages will appear from a description of certain embodiments of the invention shown in the accompanying drawings in which

Figure 1 is an inverted perspective view of an innersole constructed in accordance with the present invention.

Figure 2 is a fragmentary perspective view showing the components of which the stitching rib is formed.

Figure 3 is a detail sectional view on the line 3—3 of Figure 1.

Figure 4 is a view similar to Figure 3, but showing a modification.

Figures 5, 6 and 7 are sectional details showing successive operations in the making of a welt shoe embodying the innersole of this invention.

Figure 8 is a view similar to Figure 5, but showing a shoe employing no welt.

Figure 9 is a fragmentary perspective view showing portions of a tape applying machine for forming up a stitching rib from the parts shown in Figure 2 and sticking such rib to an innersole blank.

Figure 10 is a top plan of parts shown in Figure 9, certain other parts being omitted for the sake of clarity.

Figures 11 and 12 are detail sectional views of the machine on lines 11—11 and 12—12, respectively, of Figure 10.

Figure 13 is a view similar to Figure 1, but showing a modified construction.

Figure 14 is a fragmentary view of the stitching rib material which is to be applied to an innersole blank to form the structure shown in Figure 13.

Figures 14*a* and 14*b* are fragmentary perspective views of still another form of stitching rib.

Figure 15 is a detail sectional view on line 15—15 of Figure 13.

Figures 16 and 17 are detail sectional views similar to Figures 5 and 6, respectively, but showing the innersole illustrated in Figure 13.

Figures 18 and 19 are bottom plan and side elevational views, respectively, of a guide for presenting the rib of Figure 16 to the innersole blank for attachment to such blank.

Figures 20 and 21 are detail sectional views on lines 20—20 and 21—21, respectively, of Figure 19.

As shown best in Figure 1, the innersole comprises a blank 1 to which is secured a stitch receiving rib 2. This rib extends at least about the forepart of the innersole but may be extended into the shank as shown, or it may be extended around the heel end, the extent of this rib depending upon the manner in which it is desired to last the shank and heel seat portions of the shoe. As shown, the rib 2 is formed of a strip of fabric or tape 3 folded together at a portion intermediate its width to produce a double layer at 4, terminating in oppositely directed side flanges 5 and 6. These flanges 5 and 6 are secured in any suitable way to the face of a blank 1. For example, as shown in Figure 3, these flanges are

cemented to this face, while in Figure 15 the flanges are secured by lines of stitching, and of course if desired, both cementing and stitching may be employed.

Lying in the fold between the layers 4 is a reinforcing element 10. As shown this is circular in cross section but it may be any shape desired and it may well be formed as a paper or other cheap cord. This produces an outer marginal or bead portion of the stitch receiving rib, bulbous in cross section, which acts to stiffen the rib and is spaced from the face of the innersole by a thin neck portion formed by the double layer 4.

This rib may be formed up progressively and then presented to the blank by means such as is shown in Figures 9 to 12. Referring to these figures, a guide member 15 is shown, comprising a block 16 and a cover plate 17 secured to its upper face as by the screws 14. At the entering end of the rib material the block 16 is provided with an arcuate depression formed by a wall portion 18 which is bridged over at the top by the cover plate 17, as shown best in Figure 11. This wall portion 18 gradually comes together to form a narrowed passage 19 (see Figure 12) terminating in outwardly extended channels 20 and 21 so that the strip of tape, preferably provided with a pressure sensitive adhesive on its inner face, which is first laterally curved to conform to the wall member 18, is progressively bent up until it forms the double walls 4 and the outwardly extended flanges 5 and 6 of general T form. Opposite to the flanges 5 and 6, the block 16 is provided with vertical slots 22 and 23 within which may ride pusher rods 25 and a pair of feeding pins 26, which may form portions of a tape applying mechanism of the well known Puritan type. The innersole blank 1 may be held down against the top face of the block 16 and a beveled end portion 25 of the cover plate 17 by a suitable presser foot 27. By operating the feeders in four-motion feed relation, as is well known, the pins 26 engaging in the fabric or tape strip, feed this tape strip forwardly. With it is also fed the filler 10 which is presented to the top face of the tape 3 through a bore 30 of a dividing fin 31 projecting downwardly from the cover plate 17 and extending sufficiently far into the guide block to properly direct the filler 10 into position so that it lies closely within the fold of the tape at the extremity of the stem of the T formation and spaced from the flanges 5 and 6 and thus from the adjacent face of the blank 1. If desired, the folding and feeding mechanism may be a portion of a multiple needle sewing machine which places the lines of stitching as shown in Figure 15, or where the tape is pre-coated as with pressure sensitive cement, its flanges 5 and 6 need only be pressed into contact with the face of the blank, which also may be pre-treated with cement, in order to secure the parts together.

When a pre-cement coated tape is employed, the action of the folding mechanism, comprising the block 16 and its cover plate 17, insures the positioning of the filler strip in the extreme edge of the folded tape, but it may be found quite unnecessary to provide any particular means for insuring that it remain in this position, if the tape is not pre-cement coated, as the work guiding and feeding mechanism of the inseaming machine whether a sewing machine, or other fastener setting machine such as a stapling machine, all tend to force the filler away from the innersole surface as far as is permitted by the fold in the tape. If desired, however, stitching may be placed at 32 through the double layer 4 to retain the filler in the desired position (see Figures 13 to 16, inclusive), or through the filler and strip as shown at 33 in Figures 14*a* and 14*b*.

In Figures 3, 4 and 5, the stitch receiving rib is positioned somewhat close to the outer margin of the blank, although as is usual, it may be spaced further from the edge in the shank portion of the shoe, as shown in Figure 1. This arrangement is particularly suitable for welt shoes, the welt and upper materials, including the outer 35 and the lining 36, being secured as by the inseam stitching 37 to the stitch receiving rib. It will be noted that the inseam stitches pass through the rib between the reinforced bulbous edge portion and the top face of the innersole. The innersole itself may be overlaid with a fabric reinforcing layer 40, which preferably is brought up to substantially the top of the bead, or if the tape employed is wide so as to form a wide inner flange 6, as shown in Figure 4, such a reinforcing fabric layer may not be required. Whichever construction is employed, however, during the inseam trimming operation the welt, upper material margins and the rib, are all trimmed off, that portion of the rib being trimmed off, including the stiffened or bulbous portion at its margin. This line of trimming is shown in Figure 6. This leaves only the relatively soft unreinforced portion of the innersole rib which is compressed flat in the finished shoe, as shown in Figure 7, so that the innersole rib presents no stiff and hard ridge which may cause a projecting ridge on the top face of the inner sole where it is unsightly and may be uncomfortable to the wearer.

Where no welt is desired, it is usually desirable to position the rib somewhat further spaced inwardly from the margin of the innersole, as shown in Figure 8, whereupon the upper materials may be pulled over the last and their margins secured to the innersole rib as illustrated in Figure 8 without a welt, after which the upper margins and the reinforced or bulbous portion of the stitch-receiving rib are trimmed off in the manner shown in Figure 6. Whether or not a welt is used no stiff portion of the innersole rib is left, and no bottom filler is usually necessary, as shown in Figure 7 the outer sole being indicated at 45.

Where the rib is stitched as at 32 to hold the reinforcement 10 in position, as shown in Figures 13 to 17, inclusive, this stitching operation will ordinarily be done before the rib is fed to the innersole blank, the stitched rib being shown in Figure 14. The guide 50 by which this prestitched rib is presented to the blank has only to spread the margins of the fabric strip to form the flanges 5 and 6, and as when the stitching 32 is used, the fabric will commonly be free from any cement coating, means such as rows of stitching 51 may be employed to secure the rib to the innersole blank. The guide 50 which directs the rib to the blank and to the two needle sewing machine may, therefore, have a slot 52 to receive the rib and be provided with a plow portion 53 on a cover plate 54 shaped to enter between the fabric margins and spread them out to form the flanges 5 and 6 in the emerging contour portions 55 (Figure 21) of the guide slot. A supplemental holder arm 56 secured to the guide 50 and having an up-turned end portion

57 slotted at 58 to receive the reinforced or bead portion of the strip acts to present the strip correctly to the guide.

When such an innersole is employed, the inseam stitching 37, or other inseam fastenings, passes through the rib beneath the stitching 32, as shown in Figure 16, and the inseam trimming operation removes the reinforcement 10 and the fabric of the rib along a line beneath the stitching 32, as shown in Figure 17.

In some cases it may be found undesirable to stitch the two layers of fabric of the inseam rib together, as where the stitching holes would unduly weaken the rib adjacent to the inseam securement. This may be avoided, while maintaining the filler in proper position, by stitching or otherwise securing the filler strip 10 directly to the fabric strip or fabric tape 3, as at 33, as shown in Figures 14*a* and 14*b*. The filler strip may be secured while the fabric strip or tape is flat, as shown in Figure 14*a*, after which the sides of the strip may be brought toward each other, as shown in Figure 14*b*, and presented within the slot 58 of the holder arm 56 and then to the guide 50, for further forming, and presentation for securement to the sole blank, as hereinbefore described.

From the foregoing description of certain embodiments of this invention, it should be evident to those skilled in the art that various modifications and changes might be made without departing from the spirit or scope of this invention.

I claim:

1. An innersole having a stitch receiving rib comprising a layer of fabric folded on itself intermediate to its side edges to form a double layer rib intermediate to side flanges, which side flanges are secured to one face of said innersole, and a reinforcing element lying in the fold of said double layer and spaced from said face by a thin neck formed by said double layer of fabric.

2. An innersole having a stitch-receiving rib, comprising a soft flexible layer folded on itself intermediate to its side edges to form a double layer rib intermediate to side flanges, which side flanges are secured to one face of said innersole, and a reinforcing element lying in the fold of said double layer and secured thereto by a line of stitches passed through said element and layer only.

3. An innersole having a stitch-receiving rib, comprising a layer of fabric folded on itself intermediate to its side edges to form a double layer rib intermediate to side flanges, which side flanges are secured to one face of said innersole, and a reinforcing element lying in the fold of said double fabric layer, said fabric layers being secured together beneath said element by a line of stitching.

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