Nov. 10, 1942. G. A. MINER 2,301,311

MANUFACTURE OF WELT SHOES

Filed Oct. 5, 1940 2 Sheets-Sheet 1

Fig.1.

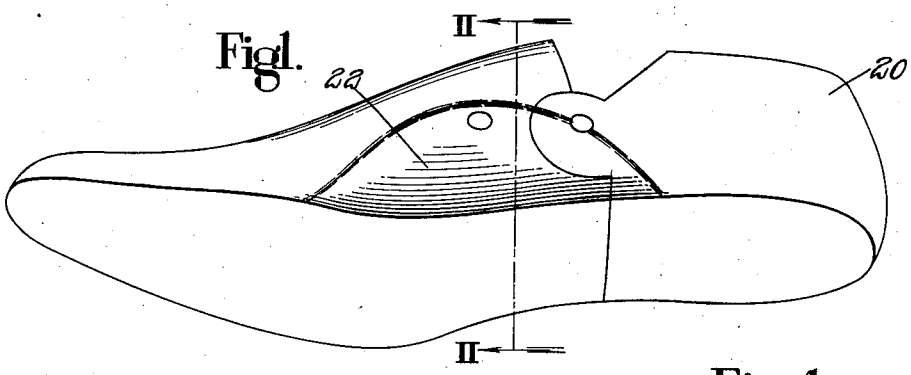


Fig.4.

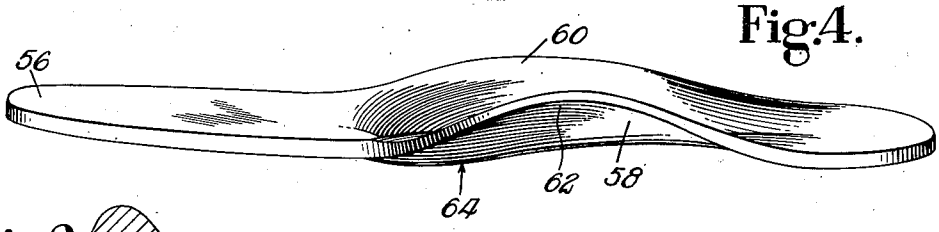


Fig.2.

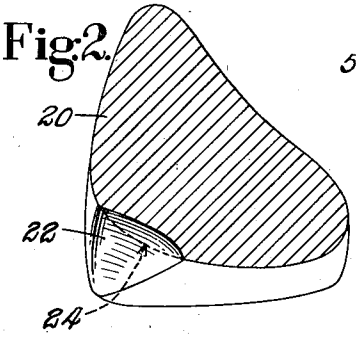


Fig.5.

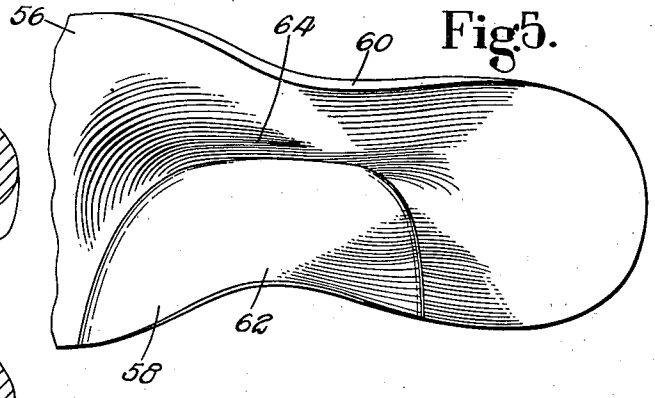


Fig.3.

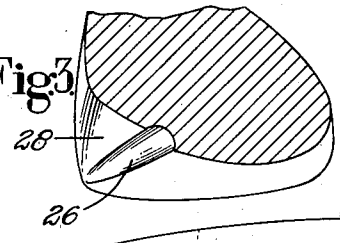
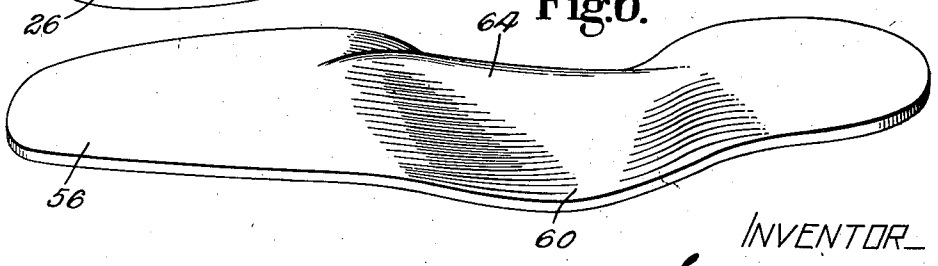


Fig.6.



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MANUFACTURE OF WELT SHOES

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Fig.7.

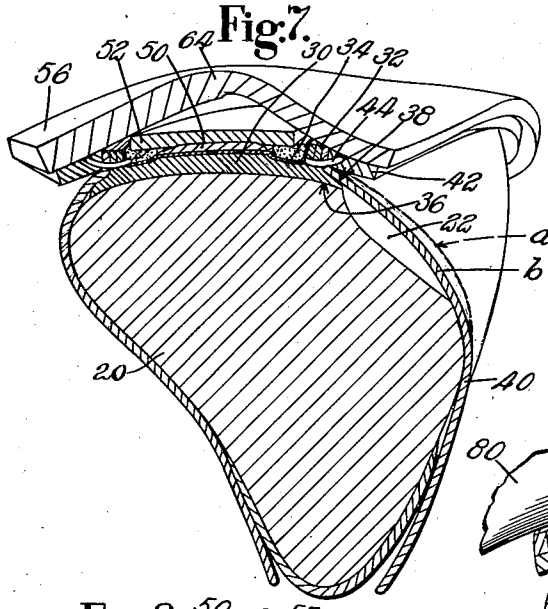


Fig.9.

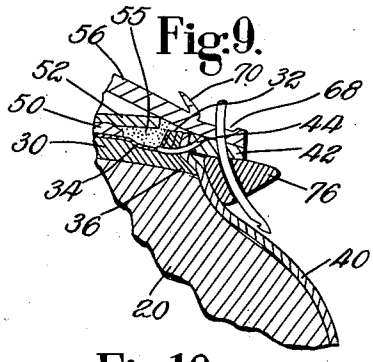


Fig.10.

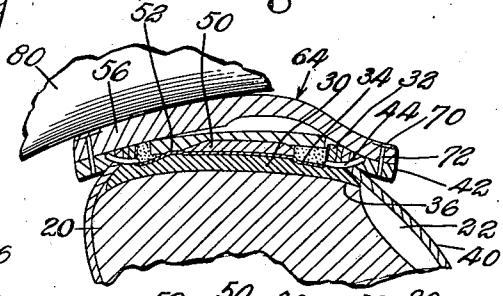


Fig.8.

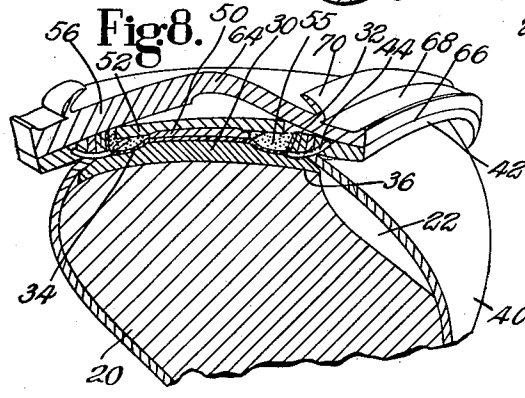


Fig.11.

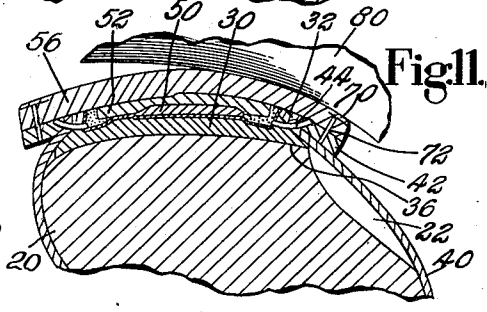


Fig.13.

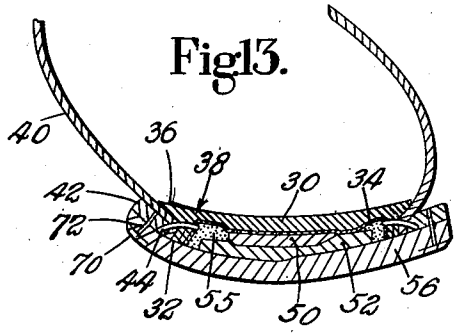
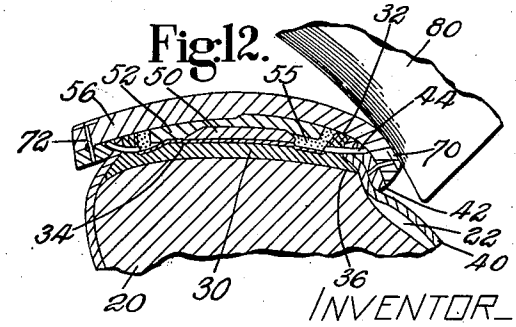


Fig.12.



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2,301,311

UNITED STATES PATENT OFFICE

2,301,311

MANUFACTURE OF WELT SHOES

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Application October 5, 1940, Serial No. 359,930

7 Claims. (Cl. 12—142)

This invention relates to improvements in the manufacture of welt shoes having close edge shanks, i. e., welt shoes in which the welt lies in close fitting relation to the upper along the shank portion of the shoe. Although not limited thereto, the invention is herein illustrated with reference to the securing of a close edge relation of the welt to the upper (or what is commonly termed a closed welt crease) at the inner shank portion only of the shoe.

In the manufacture of welt shoes in accordance with conventional methods there are many factors tending to make it difficult to secure and permanently retain the desired close edges in the shank portions of the shoes. The outsoles are usually of substantial thickness and although they are shaped by molding or otherwise to conform to the curvatures of the shank portion of the shoe bottom, the shaping involves considerable stretching of the marginal shank portions of the sole and subsequent reaction of the sole material tends to decrease the curvature of the sole and thus to pull the welt away from the upper. This is particularly true at the inner shank portion of the sole where the longitudinal arch is higher than at the outside shank portion. The outsole margin and the welt may be positioned close to the upper at the completion of the sole laying operation but in the subsequent operations of rough rounding and channeling the outsole and stitching the outsole to the welt, work guiding and supporting instrumentalities are introduced into the welt crease, with the result that the welt and the sole margin are bent outwardly and away from the upper and they are stitched together while in that bent condition. During the bending of the sole margin and the welt these elements slip or creep somewhat relatively to each other so that they become relatively displaced in an edgewise direction and, inasmuch as they are secured together by the stitches while thus bent and relatively displaced, they become quite positively locked in that condition and it is exceedingly difficult to bend them back toward the upper. Moreover, even if the welt is temporarily forced back toward the upper, as by pounding the shoe bottom or applying heavy pressure thereto, the tension of the stitches and the reaction of the outsole material invariably causes the welt to spring away from the upper shortly after the shoe has been finished.

The present invention provides an improved method by the practice of which superior results are accomplished in the manufacture of shoes having close edge shanks, and shoes are produced in which the welt is permanently maintained in the desired close edge relation to the upper in the shank portion of the shoe. As herein exemplified, the practice of this improved method involves the use of a last having a recess in its inside shank portion and the forcing of the upper of the shoe into this recess by the work guiding and supporting means of the machine by which the outsole is stitched to the welt. Thus the work guiding means is enabled to enter and operate within the welt crease without causing the welt and the adjacent margin of the outsole to be bent outwardly to any appreciable extent and consequently these parts are unbent and relatively undisplaced edgewise while they are being secured together by the outseam. The method involves also the use of an outsole which has been preshaped to provide an outward bulge or projection in its intramarginal shank portion but is otherwise conformed to correspond to the bottom contour of the last. After the outsole has been stitched to the welt the bulge in the outsole is depressed by pressure applied progressively from the outer to the inner marginal shank portions thereof. By depressing the bulge in this manner the welt is bent toward the upper, and the insole rib and the attached margin of the upper are tipped or displaced outwardly more or less along the inner marginal shank portion of the shoe. As the corresponding marginal portion of the outsole bends with the welt, the surplus or fullness of outsole material which initially constituted the bulge is disposed of in the conforming of the shank portion of the outsole to the cross-sectional contour of the shoe bottom, in such a way that the welt is quite positively held in its position of engagement with the upper. The extreme inner marginal shank portion of the outsole is finally bent abruptly to such an extent as to force adjacent portions of the welt and upper into the recess in the last and to bend the outsole margin to an even greater extent than that which it is intended to assume in the finished shoe. This "overbending" of the outsole margin allows for a certain amount of reaction of the material therein while insuring that the sole margin will remain bent sufficiently to keep the welt crease tightly closed and to maintain the welt in the desired close relation to the upper throughout the lift of the shoe.

The invention will be explained with reference to the accompanying drawings, in which

Fig. 1 is a perspective view of a last used in the practice of my improved method;

Fig. 2 is a cross-sectional view of the last taken along the line II—II of Fig. 1;

Fig. 3 is a fragmentary cross-sectional view of a last of modified construction, the section being taken in the same plane as in Fig. 2;

Fig. 4 is a perspective view of an outsole as prepared for use in the practice of my method, the view showing the upper or attaching face of the sole;

Fig. 5 is a fragmentary plan view of the outsole;

Fig. 6 is a perspective view of the outsole showing the lower or tread face thereof;

Fig. 7 is a cross-sectional view of a welt shoe in course of construction, the view being taken in a plane extending through the shank portion of the shoe and showing the shoe as it appears at the completion of the outsole laying operation;

Fig. 8 is a fragmentary cross-sectional view of the shoe, the view being taken in the same plane as in Fig. 7 but showing the shoe as it appears after it has been rough rounded and channeled;

Fig. 9 is a fragmentary cross-sectional view corresponding to Fig. 8 but illustrating the operation of stitching the outsole to the welt;

Fig. 10 is a cross-sectional view of the shoe after the outsole has been stitched to the welt, the view illustrating the first step in the application of leveling pressure to the shank portion of the shoe;

Fig. 11 is a view corresponding to Fig. 10 but illustrating a further step in the operation of leveling the shank portion of the shoe;

Fig. 12 is a cross-sectional view of the shoe illustrating the final step in the operation of leveling the shank portion of the shoe; and

Fig. 13 is a fragmentary cross-sectional view through the shank portion of a completed shoe.

Referring to the drawings, I have shown in Figs. 1 and 2 a last 20 of a type which I prefer to use in the manufacture of shoes in accordance with my invention. The last 20 differs from a conventional last in that the inner side of its shank portion has been cut away to form a recess 22 to permit the welt and the margin of the outsole of a shoe made on the last to be bent or displaced into the recess beyond the positions those parts are desired to assume in the finished shoe. As shown, the recess 22 extends throughout the length of the shank portion of the last and from the edge of the last bottom outwardly beyond the area which will underlie the margin of the outsole. In Fig. 2 the dotted line 24 indicates the cross-sectional contour of the inside shank portion of a conventional last, thus making apparent the extent to which the material of the illustrated last has been cut away in forming the recess 22. The cut-away portion or recess may, however, be formed as indicated in Fig. 3 so as to provide a relatively deep groove or channel 26 contiguous to the inside edge of the shank portion of the last bottom and a beveled surface 28 which extends outwardly from the outer edge of the groove 26.

I employ a ribbed insole which may be of any type suitable for use in the manufacture of Goodyear welt shoes. The insole 30, herein illustrated, is made of leather and has the usual sewing rib 32 comprising the upturned lips of inner and outer channels, the rib being reinforced by a layer 34 of material such as canvas which is cemented to the inner side of the rib and overlies the insole surface at the inner side of the rib. The insole may be made of other material than leather, however, and the rib may, for example, be formed from a strip of tape and stitched or cemented to the insole. As shown, I may reduce the insole feather 36 somewhat along the inside shank portion of the insole, so as to provide in that locality a feather having a relatively thin edge and a beveled lower surface 38.

In making a shoe the insole 30 is tacked upon the bottom of the last 20 and the upper materials 40 are assembled, pulled over and lasted. The inseam stitching operation is performed whereby (as shown in Fig. 7) the upper materials, together with a welt 42, are attached to the insole rib 32 by inseam stitches 44 after which the inseamed materials are trimmed and the welt is beaten down, all these operations being performed in the usual way, although greatly improved results are obtained in the side lasting, the inseam stitching and trimming, and the welt beating operations because of the presence of the recess 22 in the last, as will now be explained.

In side lasting the inside shank portion of a shoe upon a conventional last, the corresponding portion of which is not recessed but presents a surface which is convex in directions heightwise of the last, it is practically impossible to pull the upper into actual contact with the surface of the last inasmuch as the heightwise pull of the side lasting instrumentalities is opposed by a strong tension or draft upon the upper in directions lengthwise of the last where the upper bridges the fore and aft convexity of the last surface in this locality. By employing a last which is recessed or cut away in its inside shank portion, as hereinbefore described, however, the upper tensioning instrumentalities of the side lasting machine are enabled to exert a more direct pull upon the upper and consequently the upper will be tightened until its girth is substantially lessened. This will be better understood by reference to Fig. 7 wherein the dotted line *a* indicates the contour of the outer surface of an upper which has been lasted over a conventional or unrecessed last and wherein the upper is represented by full lines at *b* in the position into which it is brought as a result of the side lasting operation when a last is employed which is recessed as indicated at 22. By lasting the upper over the recessed portion of the last, the upper is shaped to correspond quite closely to the heightwise curvature of the inside shank portion of a conventional unrecessed last, although if it were actually lasted over a conventional last the upper could not be brought into such a position for the reason above explained but would have an undesirable slackness or fullness where it failed to hug the wood of the last. By decreasing the girth of the upper in the shank portion of the shoe by side lasting the shoe over a recessed last, the upper is made to fit the foot better than would be possible with the use of a conventional last. It is, in fact, practicable by employment of a last having a suitably shaped recess to decrease the girth of the upper in the side lasting operation to an even greater extent than indicated in Fig. 7 and thus to provide a shoe the upper of which will be adapted to exert substantial pressure against the inside shank portion of the foot and thus to perform an effective arch supporting function.

In the side lasting operation, also, if a conventional last is used, there is a tendency for the operator to tip the last while operating along the inside shank portion of the shoe until the outside edge of the shoe bottom is raised con-

siderably above the inside edge thereof. This is because the pincers of the lasting machine can operate more effectively to grasp the upper when the shoe is thus tipped. However, if a recessed last is used there will be no bulge at the inside shank portion of the last to hold the upper away from the pincers and consequently it will be easier for the pincers to grip the upper and it will be unnecessary for the operator to tip the last. Such tipping of the last results in "stapling high" along the insole rib, i. e., causing the lasting staples to be inserted too far from the base of the rib. This is recognized as being objectionable and is avoided by the use of my recessed last.

In the inseam stitching, inseam trimming and welt beating operations the use of my recessed last enables the work guiding and supporting instrumentalities of those machines to displace the upper into the recess in the last, thus forcing it away from the welt and in effect opening the welt crease without any substantial bending of the welt away from the upper. This is distinctly advantageous for reasons which will be explained hereinafter in connection with the performance of subsequent shoemaking operations.

After the various operations above referred to have been completed, a shank stiffener is applied such as the composite shank piece herein shown which comprises a stiffener 50 and a filler piece 52, the latter being of such thickness and being so shaped in lateral edge contour that it will fill the bottom cavity inside the insole rib in the shank portion of the shoe bottom and thus provide an outsole-receiving surface that is substantially flush with the trimmed edges of the inseamed materials and the outsole-facing surface of the welt. The bottom cavity in the forepart of the shoe may be filled with plastic or other suitable filling material in accordance with conventional practice and, as shown at 55, some such filling material may also be employed in the shank portion.

The shoe is now ready to receive an outsole and preferably the outsole will have been prepared in the following manner before it is laid upon a shoe bottom. A leather outsole 56 (which may have been rounded or died out approximately to outsole size and shape, as shown in Figs. 4, 5 and 6, or which may be of block form) is reduced in thickness along its inside shank portion by the removal of a skiving of substantial thickness from its flesh side. As shown, an area of reduced thickness 58 is formed which extends throughout the length of the shank of the outsole and inwardly approximately to the central shank portion of the sole. The marginal shank portions of the outsole are then molded or conformed substantially to the longitudinal curvatures of the corresponding marginal shank portions of the shank bottom (i. e., the surface of the welt and the trimmed inseamed materials) so as to form longitudinally arched portions 60 and 62 at the outside and inside shank portions respectively of the outsole. An outward bulge or protuberance 64 is also formed between the conformed marginal portions 60 and 62, the bulge extending throughout the length of the central shank portion and into the ball portion of the sole. Advantageously, this preliminary outsole-shaping operation may be performed by means of a sole-conforming machine, such for example as that disclosed in Letters Patent of the United States No. 2,230,368, granted Feb. 4, 1941, upon an application, Serial No. 247,241, filed December 22, 1938, in the name of E. E. Winkley. The outsoles are conformed while in a moistened or tempered condition and it is desirable to maintain them in this condition until they have been laid and attached and the shoe bottoms have been leveled.

The conformed outsole is laid upon the shoe bottom and attached to the latter by means of cement, this operation being performed by a sole-laying machine which may be of conventional construction in all respects, except that provision is made for preventing the application of sole-laying pressure to the bulged portion of the sole so that the bulge 64 will not be flattened or depressed to any extent by the pressure, it being intended, as will hereinafter appear, that the bulge be retained until the shoe bottom is being leveled. The laying of the marginal shank portions into conforming relation to the curve of the shoe bottom is, of course, greatly facilitated by the reducing and preshaping of the marginal shank portions of the outsole.

After the outsole has been laid, the shoe will appear as shown in Fig. 7, the marginal shank portions of the outsole conforming to the longitudinal curvature of the shoe bottom but the bulged portion 64 being spaced a substantial distance away from the shoe bottom.

The next operation performed upon the shoe is the rough rounding and channeling operation. This operation is performed in the usual manner and it results in trimming the edges of the outsole and the welt into flush relation with one another, as indicated at 66 in Fig. 8, and forming a marginal stitch-receiving channel 68 in the tread surface of the outsole. Thereafter, the leaf or flap 70 of the channel 68 is raised and turned backwardly, as shown in Fig. 8, so as to prepare the channel for the reception of the outseam stitches. The outsole-stitching operation is then performed and thereby the outsole 56 is attached by stitches 72 (Fig. 10) to the welt 42.

The rough rounding and channeling operation may be performed by a machine of the type disclosed in United States Letters Patent No. 1,030,606, granted June 25, 1912, upon application of F. H. Perry. Such a machine is provided with a crease guide which extends into the crease between the upper and the welt and which assists in supporting and guiding the work.

The Goodyear outsole-stitching operation may be performed by a machine of the type disclosed in United States Letters Patent No. 1,048,719, granted December 31, 1912, upon application of W. C. Meyer. Such a machine is provided with a so-called work-supporting table, such as the table or support 76 (Fig. 9) which, like the crease guide of the rounding and channeling machine, extends into the welt crease of the shoe and functions to position and guide the work with respect to the operating instrumentalities of the machine.

When a conventional or unrecessed last is employed in the shoe which is being operated upon, the upper of the shoe has little opportunity to yield at the inside shank portion of the shoe where it lies close to the bulging side of the last. Consequently, both the crease guide of the rounding and channeling machine and the work-supporting table of the outseam stitching machine operate to bend the welt and the outsole margin away from the upper. Similar conditions are also caused by the work-guiding and -supporting instrumentalities of the machines which perform the various other operations hereinbefore

referred to. Inasmuch as these parts are stiff, considerable force is required to bend them and thus a substantial amount of resistance is offered to the feed of the work through these machines. The bending of the welt and the outsole margin also imposes undue strain upon the inseam stitches and tends to weaken them. When my improved last is employed, however, there is no such bending of the welt and consequently no tendency to weaken the inseam stitches or to affect adversely the permanence of the close fitting relation of the welt to the upper. Moreover, in the practice of my improved method, the upper is so supported where it bridges the recess 22 at the inside shank portion of the shoe that it is capable of yielding inwardly to a substantial extent. Consequently, in the rounding and channeling machine, and in the outsole stitching machine, as well as in such other machines as those referred to heretofore, if my improved last is employed in the shoe, the upper will be displaced into the recess in the last by the work-guiding and -supporting instrumentalities of the machine and there will be no bending of the welt and the outsole margin away from the last. No substantial amount of force need be exerted, however, to effect this displacement of the upper and consequently it is much easier to feed the work and the output of the machines is accordingly increased. Moreover, the recess in my improved last provides additional clearance for the needle and the awl of the outsole-stitching machine and thus enables the shoe to be positioned relatively thereto so that the stitches will extend in a desired substantially perpendicular relation to the face of the outsole and thus will offer a minimum amount of resistance to the bending of the outsole margin toward the upper.

In performing the outsole-stitching operation upon a shoe having an unrecessed last the outward bending of the welt and the outsole margin by the work-supporting table of this machine causes these parts of the shoe bottom to slip or creep relatively to each other as they are being bent and, inasmuch as they are secured together by the outseam stitches in their bent and relatively displaced positions, relative slipping or creeping movement between these parts is positively prevented when it is later desired to close the welt crease. Consequently, it is exceedingly difficult to close the crease and, although the closing may be effected by the use of a sufficient amount of pressure, the welt will spring away from the upper when this pressure is relieved, and it will be impossible to maintain the welt in close relation to the upper. With the use of my recessed last the welt crease is opened, as above explained, by forcing the upper away from the welt and into the recess of the last. Thus there is no outward bending of the welt and the outsole margin and no stitching of these parts together in outwardly bent and relatively displaced relationship. It will be appreciated that this is a condition which greatly facilitates the securing and maintaining of the welt in a permanent close relation to the upper.

After the outsole has been stitched to the welt the channel flap 70 is laid to cover the outseam stitches and then the shoe is ready to be leveled. In the application of the leveling pressure to the shank portion of the shoe bottom the outward bulge 64 in the shank portion of the outsole is flattened and the marginal portions of the outsole are laid close to the upper, the latter operation being greatly facilitated by the leveling of the bulge 64.

Preferably the leveling of the shoe will be effected by a leveling machine of the type which comprises a sole leveling roll, a shoe supporting jack, mechanism for oscillating the jack to move the shoe back and forth in a lengthwise direction while the roll applies leveling pressure to the sole, and roll tipping mechanism for changing the angular relation of the axis of the roll to the shoe during the oscillation of the jack to vary the action of the roll upon the sole in different portions thereof, a machine of this type being disclosed, for example, in United States Letters Patent No. 1,667,761, granted May 1, 1928, upon application of E. E. Winkley. It will be desirable, however, to modify the oscillatory movements of the jack and the tipping movements of the leveling roll to obtain the desired results. I prefer to modify these movements to cause the relative traversing movement of the roll and the sole to start at the toe of the sole and to cause the area of contact of the roll with the sole to progress backwardly and forwardly twice along the inside marginal portion of the forepart only of the sole, then around the toe to the outside marginal portion, then backwardly and forwardly along the outside marginal portion of the sole from toe to heel, then backwardly to the heel, and then forwardly and backwardly four or five times throughout the length of the shank portion only of the sole, the area of contact of the roll with the sole gradually progressing from the outside to the inside of the sole during operation upon the shank portion thereof. Finally the area of contact of the roll with the sole is shifted to a location centrally of the shank portion of the sole at the heel end and then caused to progress forwardly to the toe to complete the leveling operation. As a result of the above-described relative movement of the roll and the shank portion of the sole of the projection or bulge 64 is depressed and the inner marginal shank portion of the sole is forced toward the upper of the shoe. Referring now to Figs. 10, 11 and 12 of the drawings, wherein the roll of the leveling machine is indicated at 80, the roll is shown in Fig. 10 in operation upon the outsole at the outer side of its longitudinal median line, the roll having partially leveled that portion of the sole and having displaced the bulge 64 toward the inner marginal portion of the sole. In Fig. 11 the roll 80 is shown as operating upon the portion of the sole at the inner side of its median line, the roll having completed the flattening of the bulge 64 and caused the welt to be bent into intimate engagement with the upper. In Fig. 12 the roll is shown as operating in an excessively tipped position to bend the extreme inner marginal shank portion or inner extension edge of the sole quite abruptly so as to force adjacent portions of the welt and the upper into the recess 22 in the last.

As a result of the depression of the bulge 64, as illustrated in Fig. 11, the material at the tread side of the inner shank portion of the outsole becomes expanded more or less transversely (without being stretched) and the surplus or fullness of outsole material initially constituting the bulge is disposed of by conforming the shank portion of the outsole to the shoe bottom (the transverse convexity of which has been increased by the bending of the welt toward the upper). During such further bending of the inner edge portion of the outsole as that which is illustrated

in Fig. 12, the portion of the upper which underlies the welt is pressed against the beveled surface 38 of the insole feather and forced into the recess 22 in the last, the recess functioning to permit the outsole margin, together with the attached welt to be "overbent," that is, to be bent somewhat beyond the position it is desired to have these parts assume in the finished shoe. Subsequently there will be some reaction of the overbent material which, however, will result merely in reducing the overbent condition until just the desired amount of bend remains in the sole margin. This condition is shown in Fig. 13 wherein it will be seen that the welt is in intimate contact throughout its full width with the upper of the shoe. Inasmuch as none of the parts of the shoe in the vicinity of the inner marginal shank portion of the outsole are subject to any further reaction during the life of the shoe this "close edge shank" condition will be permanently retained.

My improved method has been herein described in its application to the manufacture of shoes having "close edge shanks" at their inner sides only. In many cases, however, it is desired to make shoes having "close edge shanks" at both the inner and the outer sides of the shoes and such results may be accomplished in accordance with my invention by the use of a last having a recess in its outer marginal shank portion corresponding to the recess in the inner marginal shank portion of the last herein illustrated. In carrying out my method in the manufacture of shoes having "close edge shanks" at both their inner and outer sides the various operations above described as being performed at the inner marginal shank portion of the shoe are substantially duplicated at the outer marginal shank portion of the shoe. In the leveling of the shoe, however, the sequence of operations hereinbefore described is modified to the extent that in the shank portion of the shoe the leveling pressure will be applied first in the central shank portion to depress the bulge and thereafter the pressure will be applied first to one and then to the other lateral marginal portion of the shank of the outsole.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. That improvement in methods of making welt shoes having close fitting outsole margins in their shank portions which consists in providing a last having a deep recess extending from the inner edge of the shank portion of the last bottom upwardly a substantial distance toward the top of the last, working an upper over an insole on said last and securing the upper together with a welt to the insole, stitching an outsole to the welt by means of an outsole stitching machine and, while operating along the inner side of the shank portion of the shoe and holding the shoe in a position in which it is substantially untilted transversely, pressing the shoe laterally against the work support of the machine thereby causing said support to force a portion of the side of the upper extending from the edge of the welt a substantial distance toward the top of the shoe into said recess to provide clearance between the upper and the operating instrumentalities of the machine and to enable the work support to function without appreciably bending the sole margin and the welt away from the upper, and thereafter pressing the inside shank portion of the outsole margin toward the last sufficiently to force adjacent portions of the welt and the upper into said recess, thus bending said portion of the sole margin beyond an ultimately desired position to allow for subsequent reaction of the bent material.

2. That improvement in methods of making welt shoes having close fitting outsole margins in their inner shank portions which consists in providing a last having a recess at the inner side of its shank portion adjacent to the edge of the last bottom, securing upon the bottom of said last an insole having a sewing rib and having a feather beveled from maximum thickness at the outer side of the rib to a thin edge along the inner shank portion of the insole, working an upper over said insole on said last and stitching the upper together with a welt to said sewing rib, providing an outsole having its shank portion substantially reduced in thickness from its longitudinal center line to its inner edge, conforming the reduced portion of the outsole to the curvature of the shoe bottom, stitching said outsole to said welt, and thereafter bending the margin of the reduced shank portion of the outsole margin toward the last and thereby pressing the upper against the beveled portion of the insole feather and bending the outsole margin, the welt and the portion of the upper which extends outwardly beyond the thin edge of the insole abruptly about the edge of the last bottom thereby forcing the upper into said recess.

3. That improvement in methods of making welt shoes having close fitting outsole margins in their inner shank portions which consists in working an upper over an insole on a last having a recess in the inner side of its shank portion adjacent to the edge of the last bottom and securing the upper together with a welt to the insole, positioning upon the bottom of the shoe an outsole the shank portion of which is outwardly convex transversely to a greater extent than the shoe bottom, permanently attaching the outsole to the welt, leveling the shank portion of the outsole in a manner progressively to displace outsole material toward the inside edge only of the outsole and thereby forcing the inner margin thereof toward the upper, and finally bending said margin and the adjacent portions of the welt and upper into said recess and pressing said parts while the upper is supported by the bottom of said recess.

4. That improvement in methods of making welt shoes having close fitting outsole margins in their shank portions which consists in working an upper over an insole on a last having a recess in one side of its shank portion adjacent to the edge of the last bottom and securing the upper together with a welt to the insole, positioning upon the bottom of the shoe an outsole having an outward bulge in its intramarginal shank portion and laying the outsole without depressing the bulge, permanently attaching the outsole to the welt, and thereafter depressing the bulge in the outsole in a manner progressively to displace outsole material toward the inside edge only of the outsole and applying bending pressure to the inside shank portion of the outsole margin thereby forcing the adjacent portions of the welt and the upper into said recess and pressing said portions of the outsole margin, the welt and the upper while the upper is seated upon the bottom of the recess in the last.

5. That improvement in methods of making welt shoes having close fitting outsole margins

in their inside shank portions which consists in working an upper over an insole on a last having a recess in the side of its shank portion adjacent to the inner edge of the last bottom and securing the upper together with a welt to the insole, positioning upon the bottom of the shoe an outsole having an outward bulge extending from its outer to its inner marginal shank portions and laying the outsole without depressing said bulge, thereafter depressing said bulge by applying pressure thereto progressively from the outer to the inner marginal portions of the outsole thereby expanding the sole material edgewise in the inner marginal shank portion only thereof, and finally bending said expanded portion of the outsole margin toward the last thereby forcing the adjacent portion of the upper into said recess to an extent determined by engagement of the upper with the bottom of said recess.

6. That improvement in methods of making welt shoes having close fitting outsole margins in their inside shank portions which consists in working an upper over an insole on a last having, in the side of its shank portion adjacent to the inner edge of the last bottom, a recess the bottom of which is defined by a single continuously curved surface extending upwardly from said edge, and securing the upper together with a welt to the insole, positioning upon the bottom of the shoe an outsole having an outward bulge in its intramarginal shank portion and laying the outsole without depressing said bulge, and thereafter leveling the shoe and in the course of the leveling operation flattening said bulge progressively from the outer to the inner side of the shank portion of the shoe, thereby displacing the material of the shank portion of the outsole toward the inner side only of the shoe, and thereafter, and while maintaining the sole material thus displaced, pressing the inside marginal shank portion of the outsole toward the recessed portion of the last sufficiently to force the adjacent portions of the welt and the upper into said recess and to seat the upper against said curved surface constituting the bottom of the recess.

7. That improvement in methods of making welt shoes having close fitting outsole margins in their inner shank portions which consists in working an upper over an insole on a last having a recess in the side of its shank portion adjacent to the inner edge of the last bottom and securing the upper together with a welt to the insole, positioning upon the bottom of the shoe an outsole having its shank portion substantially reduced in thickness from its inner edge throughout at least half the width of the outsole and having an outward bulge in its intramarginal shank portion, laying said outsole without depressing said bulge, stitching the outsole to the welt, applying leveling pressure to the relatively thick outer shank portion of the outsole, thereby displacing said bulge toward the margin of the relatively thin inner shank portion of the outsole, applying leveling pressure progressively transversely of said relatively thin shank portion toward the inner edge thereof, thereby depressing said bulge displacing the material of the outsole toward the inner side of the shoe, and conforming said portion to the transverse curvature of the shoe bottom without stretching the outsole material, and finally bending the margin of the reduced inner shank portion of the outsole and the adjacent portions of the welt and the upper toward the top of the last until the upper seats against the bottom of said recess and the outsole margin has been bent beyond an ultimately desired position to allow for subsequent reaction of the bent marginal material.

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