Aug. 3, 1943. A. L. JALBERT 2,325,682

METHOD OF MAKING PREWELT SHOES

Original Filed June 16, 1941

Fig.1.



Fig.2.

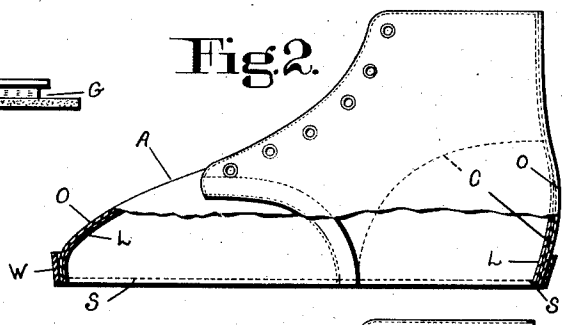


Fig.3.

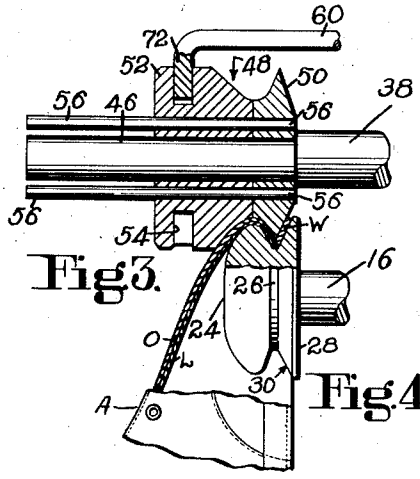


Fig.4.

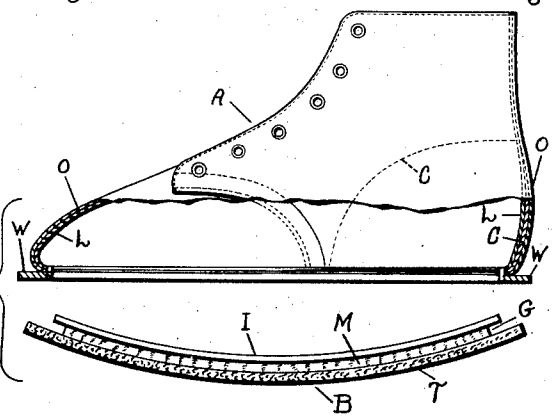


Fig.5.

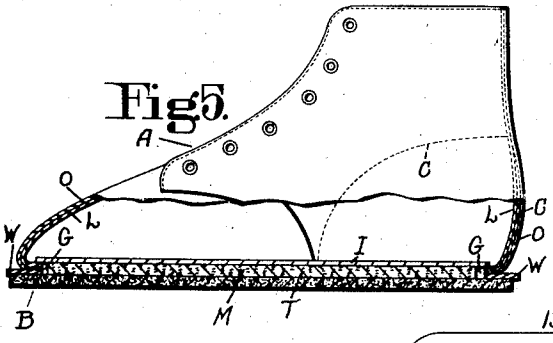


Fig.6.

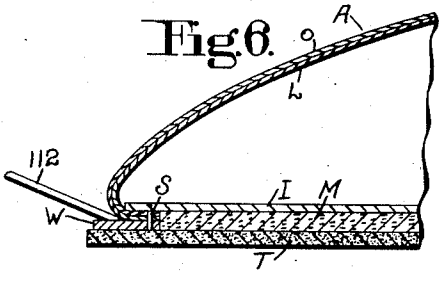


Fig.7.

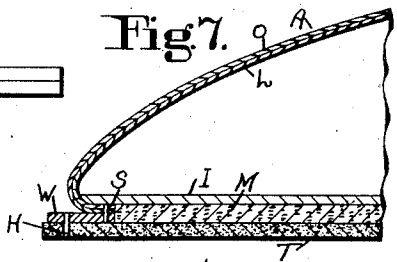
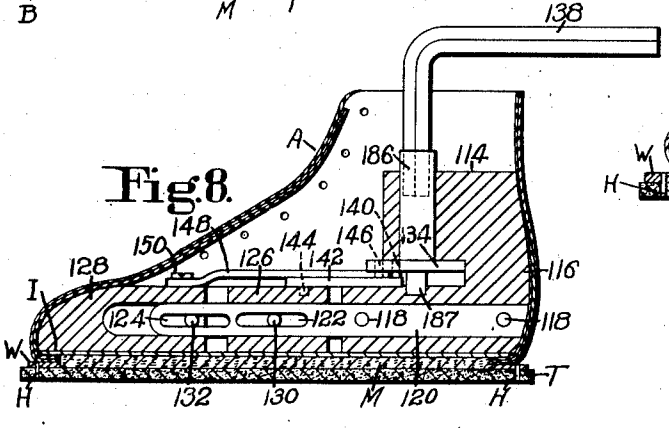


Fig.8.



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2,325,682

METHOD OF MAKING PREWELT SHOES

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Original application June 16, 1941, Serial No. 398,291. Divided and this application November 28, 1941, Serial No. 420,835

12 Claims. (Cl. 12—142)

This invention relates to methods for use in the manufacture of shoes and is illustrated herein with reference to methods of making prewelt shoes, the present application being a division of a copending application Serial No. 398,291 filed June 16, 1941 in my name and covering a machine for use in making prewelt shoes.

An object of the invention is to provide an improved method of making prewelt shoes off lasts in the practice of which the manufacture of such shoes will be simplified and facilitated.

To this end the invention provides, in accordance with one aspect, an improved method in which a single sole is provided having a peripheral channel in its edge face and adapted to be assembled off a last with a prewelt shoe upper. The welt on the upper is first straightened, for example, by utilizing cooperating rolls to cause it to assume the substantially flat position relatively to the upper that it will assume in a shoe, the cooperating rolls being also arranged simultaneously to conform the upper to the shape of said rolls around the forward portion of the upper but not around its rear or heel portion. In assembling the sole and the prewelt shoe upper off a last, the sole is bent or arched to shorten it lengthwise and it is introduced while in this bent condition into the opening at the bottom of the upper until the outer side of the channel in the sole engages the attaching face of the straightened welt, thereby positioning the welt and upper with reference to the sole. The sole is then released from its bent condition to permit it to spring back through resiliency to its normal substantially straight position, thereby causing it to assume its full length which, in turn, causes the sole to engage the upper and welt around the entire lower margin of the upper and which also positions or draws the upper and welt into or partially into the channel in the sole, the shoe parts having first been treated with cement so that they will be in condition to become cement attached when they have been properly positioned with respect to each other.

The upper and welt may then be tucked into the channel in the sole for the full depth thereof and the cement allowed to set to cause the sole to become cement attached to the upper and welt around the entire shoe, after which the sole may be permanently attached to the shoe by outseam stitches passing through the welt and sole, the stitches being spaced outwardly from the channel in the sole.

With the above and other objects and aspects in view, the invention will now be described in connection with the accompanying drawing and will thereafter be pointed out in the claims.

In the drawing,

Fig. 1 illustrates a sole comprising inner, outer and intermediate layers with the layers arranged so that a channel is provided around the edge face of the sole;

Fig. 2 is a side elevation, partly broken away and in section, of a prewelt shoe upper;

Fig. 3 is a view partly in side elevation and section illustrating cooperating rolls which may be used to shape the upper and straighten the welt thereon, the rolls being shown operating upon the toe portion of the prewelt upper;

Fig. 4 shows the upper after it has been shaped and the welt straightened, the sole of Fig. 1 being also shown in position for assembly off a last with the upper;

Fig. 5 shows the upper and sole after they have been assembled, the sole and lower portion of the upper being shown in section;

Fig. 6 is an enlarged sectional view of the toe portion of the shoe, illustrating the completion of the assembling operation;

Fig. 7 is a view similar to Fig. 6 showing the sole attached to the welt by stitches; and

Fig. 8 is a sectional view showing the upper being conformed or shaped by an expansible last in the shoe.

In carrying out the present method as herein illustrated, a prewelt shoe upper A (Fig. 2) is provided comprising a lining L and an outer layer O with a welt W attached to its lower edge by stitches S. The upper also has a counter stiffener C of fiber or similar material incorporated in its heel portion and preferably secured in place between the lining and outer layer by cement and also by the welt attaching stitches S. As herein illustrated, the upper A is a small sized upper for children's high shoes or cacks but it might obviously be an upper for a low shoe or, if desired, a large sized upper for men's or women's shoes.

As illustrated in Fig. 2, the welt W lies closely against the adjacent portion of the upper after it has been attached thereto by the stitches S and, in order to facilitate carrying out the method, the welt should first be straightened or turned down to the relatively flat position it will assume in a shoe, as shown in Fig. 4, and the adjacent or lower portion of the upper should preferably be shaped or conformed more closely to the shape desired in the shoe. The welt straightening and upper shaping operations may be carried out, for example, as illustrated in Fig. 3, with the aid of a

pair of cooperating rolls 24 and 48 such as those in the machine disclosed in the copending application above referred to, the lower roll 24 being the work supporting roll and the upper roll 48 comprising the welt turning or straightening roll. The rolls 24, 48 are mounted respectively on shafts 16 and 38 which are geared together in the machine for rotation at equal speeds in opposite directions, the shaft 16 being driven by a pulley (not shown) secured thereon.

The supporting roll 24 has a circumferential groove 26 rearwardly of its rounded portion adapted to receive the lower edge of the upper and, in the case of a prewelt shoe upper as herein illustrated, to receive also the inner edge of the welt W attached to the upper. The roll 24 then increases in diameter to provide an annular flange 28 having a rearwardly inclined surface 30 thereon adapted to be engaged by the welt W to position the welt in a predetermined angular relation to the adjacent portion of the upper, this angular position being such that, after the upper has been operated upon, the tendency of the welt to react and return to its original position will have been overcome sufficiently to cause the welt to assume the substantially straight or flat position which it will assume in a finished shoe.

The shaft 38 has a reduced portion 46 at its forward end and the roll 48 is mounted on this reduced portion above the supporting roll 24 and is arranged to cooperate with the supporting roll in operating upon the shoe upper.

The cooperating roll 48 is made up of two separate portions or sections, an inner or rear portion 50 which is fixed to the reduced shaft 46 by any usual means so that it rotates therewith, and a forward portion 52 which, as herein illustrated, is loose and slidable on the shaft 46. As illustrated in Fig. 3, the rear portion 50 of the roll 48 is positioned opposite the supporting roll 24 and has inclined surfaces thereon which converge to a thin edge and are so positioned and shaped that the portion 50 is complemental to the rear or grooved portion of the supporting roll.

The forward portion 52 of the roll 48 conforms substantially in shape to the corresponding portion of the roll 24, the portion 52, however, terminating in a cylinder in which is formed an annular groove 54 by means of which the portion 52 may be slid axially along the shaft 46, as will be later explained. The fixed portion 50 has rigidly secured therein a plurality of horizontal rods 46 which extend forwardly and pass slidingly through holes in the slidable portion 52 so that this latter portion is always connected to the fixed portion 50 regardless of its position on the shaft 46 and is caused to rotate with the portion 50 whenever the shaft 38 is rotated.

The upper A is mounted on the supporting roll 24 preferably so that the roll initially engages it at one side thereof about opposite the heel breast line of the shoe and in such a position that the forward portion of the upper, from breast line to breast line, will be fed between the rolls before the heel portion is fed therebetween.

The roll 48 is brought yieldingly against the upper to press it against the supporting roll 24, thereby conforming the upper to the shape of said roll and causing the thin edge portion 50 of the roll 48 to enter the space between the welt and upper and bend the welt over against the inclined surface 30 on the flange 28, the inner edges of the welt and upper being seated in the groove 26, as shown in Fig. 3. The rolls are rotated by power to cause them to feed the upper between them by friction around the forward portion of the upper. The rolls conform this forward portion to the shape of the supporting roll 24 and bend the welt downwardly simultaneously with the feeding thereof, the position or angle into which the welt is bent relatively to the adjacent upper, as stated, being such that, after the operation is completed and the welt tends to react and return to its original position against the upper, the welt will return only part way to such position or into the substantially straight or flat position illustrated in Fig. 4.

After the forward portion of the upper has been conformed as described and the welt W has been straightened, the heel portion of the upper, containing the counter stiffener C, reaches the rolls. At this point, while the rolls continue to rotate and operate upon the upper, the separable or slidable portion 52 of the cooperating roll 48 is moved axially along the reduced shaft 46 by engaging the annular groove 54 by an arm or slide 60 provided with a forked end portion 72 arranged to enter the groove 54, the arm 60 being reciprocated horizontally at the proper time by any usual means such, for example, as a manually operable eccentric or crank (not shown). The separable portion 52 is thus moved at will away from the fixed portion 50 and out of position to engage the heel or counter portion of the upper and conform it to the supporting roll 24, this axial movement taking place while the separable portion 52 is rotating due to its connection to the fixed portion 50 by the rods 56.

Accordingly, as illustrated in Fig. 4, the heel portion of the prewelt upper will have its welt bent down and straightened as desired but the portion of the upper above the welt will not be engaged by the separable roll portion 52 and therefore will not be affected thereby. When the upper has had its lower portion shaped and the welt straightened around the entire upper, the upper may be removed from the supporting roll 24 after which it is ready for use in constructing the prewelt shoe in accordance with the further steps of the method disclosed herein.

A sole is provided for use with the prewelt upper A, this sole comprising, as herein illustrated, a single laminated sole B made up of an inner layer I, preferably composed of leather or fiber, a leather outer or tread layer T, and a filler or midsole M composed of cork or other yieldable material. The three layers are cut to the desired shape and size, the inner layer I, as illustrated in Fig. 1, being cut a predetermined amount larger than the midsole M, and the outer layer T being cut larger than the inner layer I, so that, when the three layers are properly positioned one upon the other and are secured together by cement, such as latex or other suitable cement, to produce the laminated sole B, the sole has a peripheral groove or channel G in its edge face equal in height to the thickness of the midsole M and of sufficient depth widthwise of the sole to receive the inner marginal or edge portions of the upper and welt which have been turned inwardly by the conforming rolls substantially in position to enter the channel G, as shown in Fig. 4.

In proceeding with the method, cement, preferably rubber cement, is applied to the outer or attaching face of the welt W, to the inner edges of the welt and rubber, and also to the inner side of the inturned portion of the upper. Cement is also applied to the channel G in the sole

B so that it covers the surfaces thereof including the relatively wide lower surface formed by the outer layer T.

In assembling the parts, the upper is preferably held as illustrated in Fig. 4 so that the welt is substantially flat. The sole B is held opposite the opening at the bottom of the upper. The sole is then bent or arched to shorten it lengthwise and, while thus bent, it is introduced into the opening in the upper until the inner surface of the outer layer T, which forms the outer side of the channel G, engages the attaching face of the welt in which position the inner edges of the welt and upper are located substantially opposite or in line with the channel.

The sole is then released to permit it to spring back through resiliency to its original flat condition and thus cause it to assume its full length which, as shown in Fig. 5, causes the sole to engage the upper around its entire margin and to exert a tension or pull thereon which tends to draw the inner edges of the upper and welt into or partially into the channel G. Accordingly, upon the release of the sole B the sole and prewelt upper A become at once assembled in proper relation to each other while off a last with the upper fixed or "locked" against displacement with respect to the sole because the upper and welt are now located in or partially in the channel completely around the sole.

The upper and welt are next tucked into the channel G for the full depth thereof either by hand or by a suitable tool 142, as illustrated in Fig. 6. After the upper and welt have been tucked fully into the channel G so that they engage the edge of the midsole M completely around the shoe, the cement applied to the channel, upper and welt is allowed to set to cause the sole to become cement attached to the prewelt shoe upper A.

While the cement securing the sole to the upper and welt will hold sufficiently during the construction of the shoe, it is not usually safe to rely upon cement alone to secure the sole permanently to the upper. The shoe may, therefore, be stitched in the same manner as a regular welt shoe by inserting outseam stitches H, these stitches, as shown in Fig. 7, being spaced outwardly from the upper and passing through only the welt and sole to attach the sole permanently to the welt and upper.

It will be observed that, in constructing the prewelt shoe in accordance with the present method, no last has been utilized to facilitate the assembling of the shoe parts or for shaping or conforming the upper to the shape desired in the finished shoe. Moreover, although the forward portion of the upper is conformed by the rolls before the upper is assembled with the sole, the shape imparted to the upper at that time is not intended to be its final shape but is rather an initial or preliminary shaping of the upper. Furthermore, some of the shape imparted by the conforming rolls will obviously be lost or altered during the subsequent operations of assembling, stitching, and so forth without a last in the shoe so that, after the sole B has been permanently attached by the stitches H, the upper, especially at its forward or toe portion, has usually been drawn into a relatively low or flat shape by the strains exerted in making the shoe so that this toe portion, as illustrated in Figs. 6 and 7, is too low or flat to constitute a well shaped shoe.

In accordance with the present invention, therefore, the upper A is next shaped or conformed, particularly at its lower portion, to impart to it the shape desired in the finished shoe. As illustrated, this conforming operation is accomplished by utilizing an expansible member 114 (Fig. 8) such as an extensible form or last which is arranged to be inserted inside the shoe and to be expanded therein to engage the upper and give it the shape desired in the finished shoe.

The expansible last 114, as illustrated in Fig. 8, comprises a main or heel section 116, shaped in accordance with the shape desired in the heel portion of the shoe and having formed in its lower portion a horizontal slot extending lengthwise thereof. Fastened in this slot by pins 118 is an arm or tongue 120 which extends forwardly and is provided at its forward portion with horizontal slots 122 and 124. Arranged for sliding movement on this forward portion of the arm 120 are a middle or intermediate section 126 and a forward or toe section 128, these sections likewise being shaped in accordance with the shape desired in the finished shoe, the toe section 128, in particular, being curved and rounded to form a suitably shaped toe on the shoe. The two forward sections 126, 128 are provided with horizontal slots through or into which the arm 120 passes, the slot in the forward section 128 terminating short of its front end. The section 126 is slidably connected to the arm 120 by a pin 130 passing through the slot 122 and the toe section is similarly connected to the arm by a pin 132 passing through the slot 124, so that both forward sections can slide along the arm toward or away from the heel section 116, their sliding movement being limited by the slots.

The two forward sections of the expansible last are caused to slide on the arm 120 by an eccentric comprising a horizontal disk 134 rotatably mounted in an opening in the heel section 116 by an upwardly extending shank 136 on the disk and by a pin 137 extending downwardly therefrom, the shank 136 having a square socket formed in its upper end arranged to be engaged by any suitable means, such as the tool 138, for rotating the disk. Projecting downwardly from the disk is an eccentric pin 140 which is connected to the middle section 126 by a link 142 pivotally engaging a pin 144 on said middle section. Another eccentric pin 146 mounted in the disk 134, farther off center than the pin 140, is connected to the forward section 128 by a link 148 positioned above the link 144 and pivotally secured to the forward section by a screw 150. Since the pin 146 is more eccentric than the pin 140, the forward section 128 will travel farther than the middle section 126 when the disk 134 is rotated to expand or contract the last, the arrangement preferably being such that the middle section moves about half the distance that the forward section moves so that the spaces between the several sections will remain substantially equal at all times.

To complete the construction of the prewelt shoe in accordance with the present method, the expansible last 114 is inserted in the shoe while contracted and it is then expanded lengthwise to cause it to engage the inner side of the upper and exert sufficient pressure thereon to conform the upper to the shape of the last, thereby imparting to the upper, particularly at its toe and heel portions, the shape desired in the finished shoe. The expansible last is permitted to remain in the shoe for a sufficient time to cause the upper to be conformed to the shape thereof, which may be from ten to twenty minutes. During this

time, however, such finishing operations as may be necessary or desirable, such, for example, as edge trimming, setting, and so forth, may be performed to complete the construction of the prewelt shoe after which the last may be contracted and removed from the shoe.

Having thus 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 prewelt shoes which consists in assembling a sole with a prewelt shoe upper off a last by bending the sole lengthwise to shorten it, inserting the upper and welt into a channel in the edge face of the sole, releasing the sole to permit it to straighten and to assume its full length, attaching the sole to the upper by fastening means including stitches which pass through the sole and the welt, thereby completing the assembly and attachment of the shoe parts while off a last, and utilizing an expansible member for shaping the upper as desired around the entire shoe.

2. That improvement in methods of making prewelt shoes which consists in providing a sole having a groove in its edge face, assembling the sole with a prewelt shoe upper off a last by bending the sole lengthwise and introducing it into the opening at the bottom of the upper, releasing the sole to cause it to straighten and to press against the upper and welt, and attaching the sole to the upper by tucking the welt and upper into the groove in the sole and securing them therein by cement and by stitches which pass through the sole and the welt on said upper, thereby completing the assembling and attaching together of the shoe parts while off a last.

3. That improvement in methods of making prewelt shoes which consists in providing a sole having a channel in its edge face, assembling the sole with a prewelt shoe upper off a last by bending the sole to shorten it lengthwise and introducing it into the opening at the bottom of the upper in position to be attached together, releasing the sole to permit it to straighten and to press the upper and welt into the channel therein, attaching the sole to the upper and welt by cement and stitches which secure the upper and welt permanently in said channel to complete the assembly and attachment of the shoe parts while off a last, inserting in said shoe an expansible last shaped in accordance with the shape desired in the finished shoe, and expanding said last lengthwise to stretch the upper and simultaneously to conform it to the shape of said last around the entire shoe.

4. That improvement in methods of making prewelt shoes which consists in providing a sole having a channel in its edge face for assembly off a last with a prewelt shoe upper, bending the sole to shorten it lengthwise, introducing the sole while thus bent into the opening at the bottom of the upper until the outer side of said channel engages the attaching face of the welt on the upper, thereby positioning the welt and upper relatively to said channel, releasing the sole to permit it to spring back to its normal condition and assume its full length, thereby causing the sole to engage the upper around its entire margin with said margin and welt positioned in or opposite said channel, tucking the welt and upper margin fully into said channel around the entire shoe, and permanently attaching the sole to the welt and upper.

5. That improvement in methods of making prewelt shoes which consists in providing a sole having a peripheral channel in its edge face parallel to the plane of the sole for assembly off a last with a shoe upper having a welt attached to its lower margin, straightening the welt into the substantially flat position it will assume in a shoe, arching the sole to shorten it lengthwise, introducing the sole while thus arched into the opening at the bottom of the upper with the outer surface of the channel engaging the attaching face of the welt, thereby positioning the welt and lower margin of the upper opposite said channel, releasing the sole to permit it to return through resiliency to its original flat condition and to assume its full length, thereby causing the sole to engage the upper around the entire margin thereof so that portions of the upper and welt are forced into or partially into said channel, tucking the upper and welt into the full depth of the channel around the entire sole to complete the assembly of the shoe off a last, and attaching the sole to the welt by cement and stitches.

6. That improvement in methods of making prewelt shoes which consists in providing a sole having a channel in its edge face for assembly with a prewelt shoe upper off a last, straightening the welt on said upper with the aid of cooperating rolls into the substantially flat position it will assume in a shoe and simultaneously conforming the upper to the shape of said rolls, applying cement to said channel and to the attaching face of the welt and the inner margin of the upper, bending the sole lengthwise to shorten it, introducing the sole while thus shortened into the opening at the bottom of the upper with a marginal portion of the sole remaining outside said opening, releasing the sole from its bent condition to permit it to straighten and assume its full length, thereby causing the sole to engage the lower margin of the upper and the welt around the entire shoe and to position said margin and welt in or in alinement with said channel, forcing said lower margin and said welt fully into the channel around the entire sole to complete the assembly of the shoe off a last, thereby causing the sole to become attached to the upper and welt by the cement thereon, and attaching the sole directly to the welt by stitches.

7. That improvement in methods of making prewelt shoes without the aid of lasts which consists in providing a single sole having a channel in its edge face for assembly off a last with a shoe upper having a welt attached thereto, turning the welt downwardly away from the upper with the aid of cooperating rolls to cause it to assume the substantially flat position it will assume in a shoe, bending the sole into a curve lengthwise to compress its inner surface and stretch its outer surface, thereby reducing the length of said sole, introducing the sole while thus bent into the opening at the bottom of the upper with the outer surface of said channel engaging the attaching face of the welt, releasing the sole to permit it to straighten and assume its full length, thereby causing the sole to engage the margin of the upper and the welt around the entire shoe so that the upper margin and welt are positioned in or partially in said channel completely around the shoe, forcing said margin and welt into the channel for the full depth thereof and securing them therein by cement, and attaching the sole to the welt by stitches spaced outwardly from the upper.

8. That improvement in methods of making prewelt shoes which consists in providing a flat laminated sole having a channel in its edge face

adapted for assembly off a last with a prewelt shoe upper, bending the sole to shorten it lengthwise, introducing the sole while thus bent into the opening at the bottom of the upper with the outer side of the channel engaging the attaching face of he welt, thereby positioning the welt and upper margin opposite said channel, releasing the sole to permit it to spring back to its original flat shape and assume its full length, thereby causing the sole to engage the upper around its entire margin with said margin and welt drawn into or partially into said channel, forcing said margin and welt fully into the channel around the entire shoe, permanently attaching the sole to the upper and welt by cement and stitches, and utilizing an expansible member adapted to be inserted in the shoe for engaging the upper and conforming it to the shape desired in the finished shoe.

9. That improvement in methods of making prewelt shoes which consists in providing a flat sole having a peripheral channel in its edge face for assembly off a last with a shoe upper having a welt attached thereto, straightening the welt relatively to the upper to locate the welt in substantially the flat position it will assume in a shoe, simultaneously shaping the forward portion of the upper, applying cement to said channel and to the attaching face of the welt and the inner margin of the upper, bending the sole lengthwise to shorten it and thereby to compress its inner portion and stretch its outer portion, introducing the sole while thus bent into the opening at the bottom of the upper until the outer side of the channel engages the attaching face of the welt, thereby positioning the welt and upper margin in alinement with said channel, releasing the sole to permit it to spring back through its resiliency to its flat condition and lengthen to engage the welt and upper around the entire margin of the upper, the lengthening of the sole causing the welt and upper to be pulled into or partially into said channel, tucking the welt and upper fully into said channel and permitting them to become attached to the sole by the cement thereon, stitching the sole to the welt by stitches located outwardly of the upper, and utilizing an expansible last to shape the upper by inserting said last into the shoe and expanding it therein to impart to the upper the shape desired in the finished shoe.

10. That improvement in methods of making prewelt shoes which consists in providing a sole having a channel in its edge face, bending the sole to shorten it lengthwise, introducing the sole while thus bent into the opening at the bottom of a prewelt shoe upper off a last, and releasing the sole to permit it to straighten and to assume its full length and thereby to press against the lower edges of the upper and welt around the entire margin of the upper to force the upper and welt into, or partially into, the channel in the edge face of the sole, thereby causing the upper and sole to become assembled and positioned relatively to each other while off a last.

11. That improvement in methods of making prewelt shoes which consists in providing a sole having a peripheral channel formed in its edge face, bending the sole in a manner to shorten it lengthwise, introducing the sole while thus bent into the opening at the bottom of a shoe upper off a last and having a welt attached to its lower margin, releasing the sole to permit it to straighten and to assume its full length, thereby causing the sole to press outwardly against the upper and welt around the lower margin of the upper and thereby to force the upper and welt into, or partially into, the channel in the edge face of the sole, and attaching the sole to the prewelt shoe upper off a last by tucking the upper and welt fully into the channel in the sole and securing them permanently in said channel.

12. That improvement in methods of making prewelt shoes which consists in providing a sole having formed in its edge face a channel which is parallel to the plane of the sole and the outer side of which is wider than its inner side, bending the sole lengthwise to shorten it in that direction, introducing the bent sole into the opening at the bottom of a prewelt shoe upper off a last until the wider outer side of the channel engages the welt on said upper, thereby positioning the sole and upper relatively to each other, releasing the sole from its bent condition to permit it to spring back into its substantially straight, normal condition and thus to assume its full length, thereby causing the sole to press against the lower edges of the upper and welt to force them into, or partially into, the channel in the sole, and tucking the upper and welt fully into said channel to complete the assembling of the prewelt upper and sole while off a last.

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