Jan. 31, 1939. W. M. PAGE 2,145,818

SHOEMAKING

Filed Feb. 21, 1936

Fig. 1.

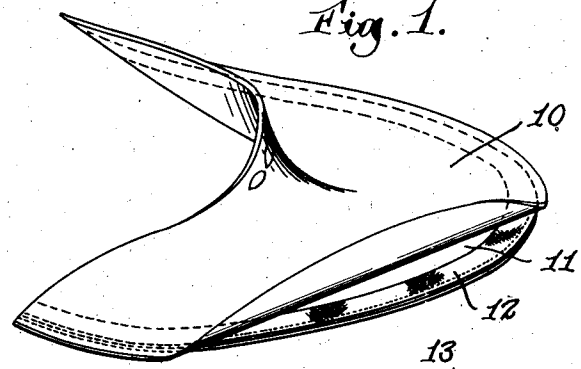


Fig. 2.

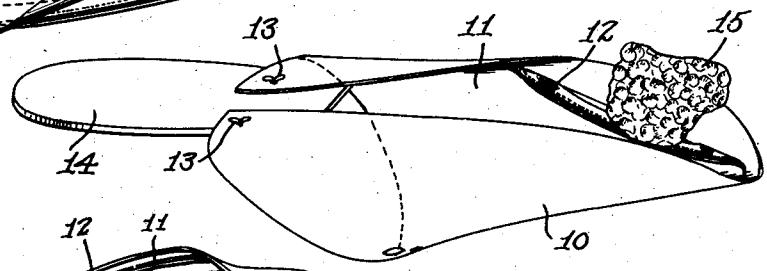


Fig. 3.

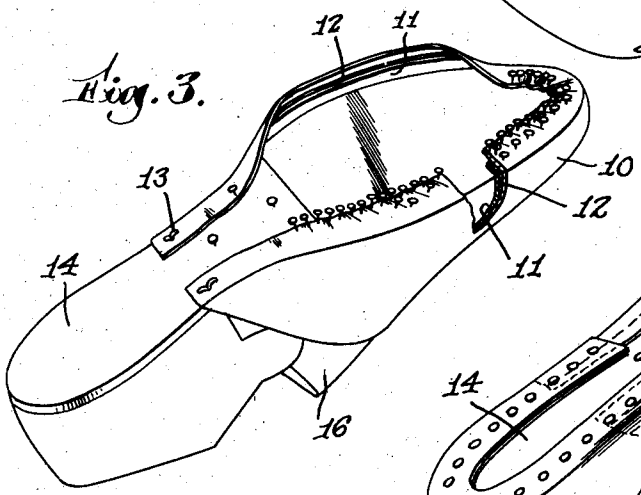


Fig. 4.

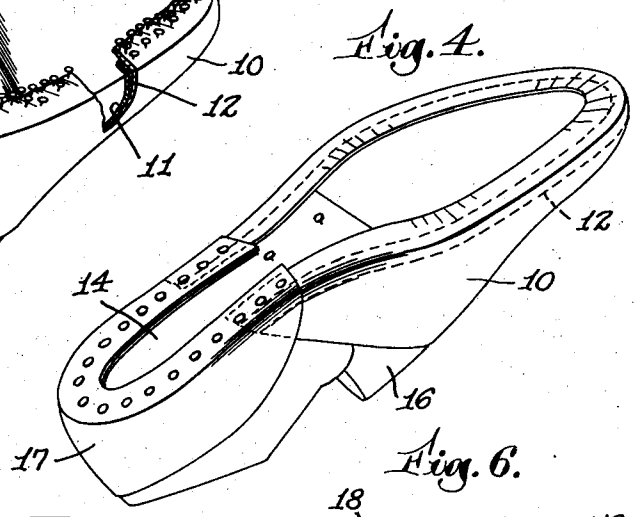


Fig. 5.

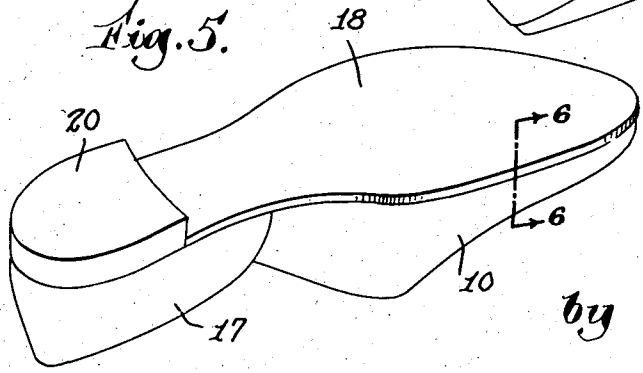
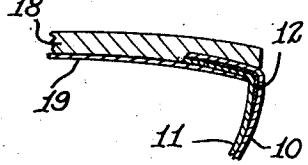


Fig. 6.



Inventor
William M. Page.
by Kenway & Witter.
Attorneys

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SHOEMAKING

William M. Page, Marblehead, Mass.

Application February 21, 1936, Serial No. 65,025

3 Claims. (Cl. 12—145)

This invention consists in an improved process of shoemaking characterized by the step of uniting the forepart of the upper to a shank piece or insole member before assembling them on the last. An advantage of this sequence of operations is that the two parts may be accurately united off the last as a stock fitting operation so that little skill is required on the part of the operator. The accuracy and strength of the connection may also be improved, and if headed fasteners are used the smooth headed end may be located next the last and consequently next the foot of the wearer keeping the inside of the shoe smooth and comfortable at the points of attachment.

In order to stiffen the upper into the exact shape imparted to it by the last I propose to incorporate in it a strip or coating of material which may be employed in a soft pliable condition during the lasting operation and which is capable of setting or hardening in a short time in the lasted upper. For example, I may employ a celanese textile fabric or a fabric impregnated with a pyroxylin compound, such as that disclosed in U. S. Letters Patent No. 1,256,240 and sold under the trade name of "Celastic". Preferably a strip of this material is stitched to the margin of the lining of the upper and may be softened or conditioned by the operator immediately before the lasting operation which may then be carried out exactly as if the strip were not present in the upper. Other stiffening agents capable of being temporarily softened and made adhesive by the application of heat or solvents may be employed with good results, although for purposes of illustration celanese material will be referred to in the present disclosure of my invention.

Additional advantages result if the upper is lasted directly to the bare last without the interposition of the usual insole. In the first place the lasting of the upper directly to the wood of the last brings out the fine lines of the last in the finished shoe with a degree of accuracy and prominence not otherwise attainable. This is specially true of the lines imparted to the shoe by the marginal edge of the last bottom. By lasting the upper directly over the bottom edge of the last a sharper and cleaner line than heretofore is secured in the shoe, and the inaccuracies due to variations in thickness, contour or location of the insole are entirely avoided.

As herein shown the stiffening strip is about half an inch wide or of sufficient width to extend over the bottom marginal angle of the last. Thus in lasted position the stiffening material lies partly over the last bottom and partly over the side walls of the last, it being particularly desirable that it should include the whole of the fold vertex formed in the upper about the margin of the last.

The lasting operation may be carried out according to any standard practice and will be facilitated because of the absence of the usual insole and because the laster is dealing with the solid wood of the last to which the upper is conformed and into which the lasting tacks may be directly driven. One satisfactory method of procedure is to pull over the upper immediately after the stiffening strip has been softened, then side last both sides of the shoe with the assistance of a step by step, hand-method machine and then last the toe in a bed machine. The shank may then be tack lasted or otherwise secured in accordance with the type of shoe being dealt with.

Upon the completion of the lasting operation the stiffening strip is set or hardened in the lasted upper and this may be effected by merely drying the upper without in any way disturbing its lasted condition. Where a celanese material is used for the stiffening medium, a drier may be employed, and in any case after a short interval of time, the stiffening medium hardens into shape in the upper, and the upper, stiffening medium and lining are all united or fused into a single composite sheet and molded in that condition into a stiff integral frame fitting the marginal edge of the last as perfectly as the bark on a tree. The lasting tacks may now be removed without disturbing the conformity of the frame thus produced, and from this point on the shoe retains permanently its lasted shape regardless of subsequent shoemaking operations to which it may be subjected.

After the removal of the lasting tacks the inner marginal edge of the lasted upper, now transformed into an integral flange, may be trimmed, and this is important because a preformed filler is to be used in the finished shoe. A particularly accurate trimming operation may be performed by gauging the cutter from the contour of the last, it being remembered that the upper material lasted over the last edge is uniform of thickness. The trimming operation results in the formation of a clean cut aperture in the shoe bottom of accurate size, uniform shape and predetermined relation to the last contour. Provision may be conveniently made for filling such an aperture with a preformed filler comprising a part of the sole.

From this point forward the process of my invention may be modified in accordance with the character of the shoe it is desired to produce. The lasted upper, including as it does a stiff accurately shaped frame, may be removed from the last and McKay or Littleway sewed, or a welt may be sewed to the edge of the frame by a straight needle machine, or the bottom of the shoe may be completed by directly cementing an outsole thereto.

Having suggested these modifications of my novel process, I will proceed, for purposes of illustration only, to describe its application to the manufacture of single sole slippers. Where their scope will warrant, the appended claims are intended to cover the process as applied to the manufacture of single sole, smooth bottom shoes of any of the types suggested. The manner in which the invention may be carried out in the manufacture of a single sole slipper is illustrated in the accompanying drawing in which,—

Fig. 1 is a view in perspective of a lined vamp having a stiffening strip incorporated therein,

Fig. 2 is a view in perspective illustrating the softening of the stiffening strip preparatory to the lasting operation,

Fig. 3 is a view in perspective of an upper partially lasted, a portion being broken away to show the location of the stiffening strip,

Fig. 4 is a view in perspective of the upper as it appears after the trimming operation upon the last,

Fig. 5 is a view in perspective of a finished slipper made in accordance with the illustrated process and

Fig. 6 is a fragmentary sectional view on the line 6—6 of Fig. 5.

The upper 10 and its lining 11 are first cut out to the required shape and size. As herein shown, the stiffening strip 12 comprises Celastic material, that is to say, a sheet of textile material impregnated with a pyroxylin compound which has the property of softening and becoming adhesive under the application of a suitable solvent and of setting in hard stiff condition when the solvent passes off by evaporation. As herein shown the Celastic strip 12 is cut out in a curved shape to conform to the contour of the lining blank 11 and is stitched to the latter by a marginal line of stitching. In the present instance the stiffening strip 12 is about one half inch wide, and is located with its outer edge flush with the edge of the lining. While the stiffening strip is herein shown as comprising a continuous member, it will be understood that in practice it may be applied in the form of separate strips, slashed or pinked if desired, and located appropriately. In many cases the stiffening strip need not extend continuously around the toe portion of the upper.

Having prepared the lined vamp as indicated in Fig. 1, it may be made ready for the lasting operation by securing its two rearmost corners to a shank piece 14 by means of fastenings, such as split rivets 13 smoothly headed on the inner face of the shank piece. The stiffening strip 12 is then softened by the application of a liquid solvent and this may be conveniently applied by means of a sponge 15 as suggested in Fig. 2. The lined vamp with its attached shank piece is then slipped upon a last 16, the shank piece is tacked in place on the last bottom and the assembled parts immediately passed to the operator of the pulling over machine. The forepart of the vamp is then pulled over, being thus properly positioned on the last and tacked at the toe and both sides. The pulled-over slipper then goes to the side laster and then to the bed laster where the side and toe lasting operations are carried out while the stiffening strip 12 remains in its limp, pliable condition. The nature of the lasting operations is indicated in Fig. 3 although it will be understood that it is customary to last both sides of the shoe prior to toe lasting on the bed machine.

It is clear from Fig. 3, however, that the vamp and its lining with the stiffening strip incorporated between them, are drawn tightly over the last bottom and secured under tension by partially driven lasting tacks. The stiffening strip is so located that at the conclusion of the lasting operation approximately half of its width overlies the bottom of the last 16 and approximately half its width lies over the side walls of the last. The upper material, however, is lasted directly upon the solid wood of the last and the sharp cleancut lines of the marginal edge of the last are transferred to the lasted upper and appear therein clearly and distinctly. The presence of the softened stiffening strip 12 in no way complicates the lasting operation. The strip is securely stitched in place and cannot be displaced and there is no liquid cement or other free liquid present in the upper at the time of the lasting operation. It is effected in a particularly clean manner, the finished face of the upper is not daubed or smeared, and no cleaning up operation is necessitated at any stage of the process. The stiffening strip itself is completely limp and pliable, it offers no resistance to the conforming of the upper to the contour of the last, and being of sheet material and of uniform thickness, it introduces no irregularities into the finished contour of the shoe.

At the conclusion of the lasting operation the Celastic strip, which has now become fused into the upper and lining, uniting them into an integral composite sheet, and being molded with them, is allowed to set and this merely calls for a drying operation sufficient to remove the liquid solvent. It may be effected in a few minutes with the assistance of a drier or will take place by natural evaporation at room temperature within a short period of time. In any case the effect is to stiffen and harden the lasted margin of the upper into a continuous integral frame molded accurately to the desired shape and capable of permanently retaining its shape throughout the further treatment of the upper.

At the conclusion of the drying operation, when the molded frame has acquired its stiffened character, the lasting tacks may be withdrawn and the overlasted margin of the upper trimmed upon the last bottom. The slipper, in this condition, is illustrated in Fig. 4. The inner margin of the upper has been trimmed on a line parallel to the contour of the last and a clean cut aperture of definite area is thus provided in the shoe bottom which may be subsequently filled by a preformed filler, as will be presently explained. While the shoe is in this condition a heel pocket 17 may be heel seat lasted in position upon the last, overlapping at its forward ends the rear corners of the vamp 10.

The slipper in this condition may be removed from the last without danger of being misshapen, although under the present instance I prefer to secure a single outsole directly thereto without removing it from the last. Under

these circumstances it is desirable to roughen the overlasted margin of the upper so that the cement will form a good bond therewith. An outsole 18 is provided with a marginal channel of the proper width to receive the overlasted margin of the upper and to present a projecting filler portion coinciding in contour with the aperture of the shoe bottom. The sole 18 and the overlasted margin of the upper are then provided with the cement and the two members brought into the proper relation and maintained under substantial pressure until the cement is dried and a permanent bond formed between the two. The slipper may be completed by attaching a heel 20 and providing a slip sole or sock lining 19.

An important advantage which appears conspicuously in the manufacture of slippers or other cement sole shoes by the process of my invention is that the stiffened frame formed in the margin of the upper holds the roughing line in place, there being no danger of the upper spreading or squatting outwardly so as to expose any portion of the upper from which the surface finish has been removed by the roughing operation. That is, the roughing operation may be accurately confined to the surface defined by the stiffened inturned flange presented by the united upper material. Preferably the bottom of the outsole channel is inwardly inclined in accordance with the invention of my prior Patent No. 2,048,562, granted July 21, 1936, and on this account there is no outward leakage or extrusion of cement in the finished shoe, and no requirement for cleansing operation on this account.

From the foregoing description it will be apparent to those skilled in the art that various additional advantages flow from the process of my invention. When the stiffening material is employed in the form of a textile material such as drilling or buckram, it not only strengthens the upper while the latter is being subjected to the strains of the lasting operation, but also strengthens and improves the wear of the finished shoe by reinforcing it along the lasting line. By reason of the added strength supplied in this manner, it is safe to skive down the margin of a leather lining so as to secure uniform thickness of material in leather lined shoes. All of these factors contribute to bring about perfect lasting conditions in the shoe and adapt it to be made by the cheapest lasting methods known to the industry.

In addition to the manufacturing advantages incident to the process of my invention, the resulting shoe presents many advantages in style and appearance. It presents the perfect lasting line and close shank characteristics so much prized in fine shoe making. The process affords an economical procedure for manufacturing single sole flexible bottom shoes like turns, but without involving all the troubles of and difficulties of turn manufacture. It also eliminates the troubles encountered in cement lasting and provides a process which is clean from start to finish. Uppers lasted in accordance with the process of my invention present a definite clean-cut line at which the roughing operation may be terminated and therefore obviate the danger of blemishes arising from an irregular roughing operation. Moreover, the shape and contour of the last are so perfectly reproduced in the finished shoe that no subsequent treeing operations are required and important saving in this respect accordingly results. Further, on account of the improved accuracy of the shoemaking it is possible in many cases to employ a pre-finished sole and so realize further savings.

While I prefer, in practising the process of my invention, to last the upper directly upon the bare last, the advantages of incorporating an adhesive and stiffening medium into the upper and thus securing a stiff, molded frame in the lasted upper are no less apparent in an upper lasted over an insole. Such modification of the process is within the scope of my invention. It will be apparent moreover, that the process may be usefully applied to the manufacture of unlined shoes or slippers, and in this case the stiffening medium is secured to, or incorporated in the upper itself. Further, while I prefer to distribute the stiffening medium on both sides of the vertex determined by the marginal edge of the last bottom, satisfactory results are secured in some instances by limiting the stiffening medium to the overlasted margin of the upper. The flat stiff frame which is formed on the last bottom is effective in maintaining the lasted shape of the shoe because it positively positions the lasted margin of the upper and holds the upper in its conformed shape.

While I have shown the shaped and stiffened upper as united to a sole channeled to fill the space defined by the overlasted margin, it may be desirable in some instances to use a preformed filler or commercial sole filler for this purpose.

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

1. An improved process of shoemaking including the steps of fastening the two rearmost corners respectively of a vamp to the opposite edges of a loose shank piece, drawing the connected vamp and shank piece upon a last, tacking the shank piece to the last bottom, and then lasting the margin of the vamp over the last bottom.

2. An improved process of shoemaking including the steps of fastening the rearmost corners of a vamp to a loose shank piece by headed fasteners, drawing the connected vamp and shank piece upon a last with the heads of the fasteners next to the last, securing the shank piece in place on the last bottom, and then lasting the vamp.

3. An improved process of shoemaking including the steps of fastening two rearwardly disposed portions of a vamp to the opposite edges of a loose shank piece, drawing the connected vamp and shank piece upon a last, securing the shank piece in place on the last bottom, lasting the margin of the vamp, and then heel-seat lasting a heel pocket in place upon the last overlapping at its forward ends the rear portions of the vamp.

WILLIAM M. PAGE.