April 27, 1937. E. SCHLEICH, JR 2,078,346

MANUFACTURE OF SANDALS

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Fig.1.

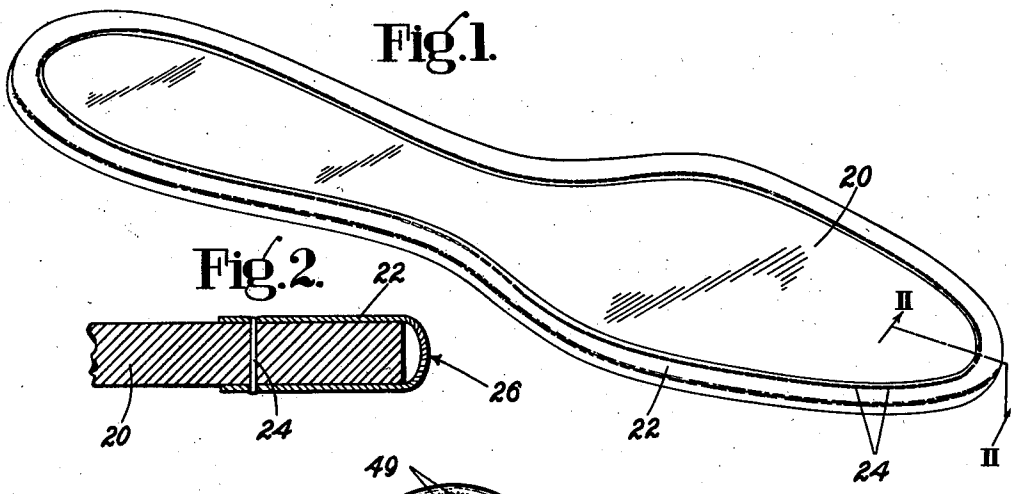


Fig.2.

Fig.3.

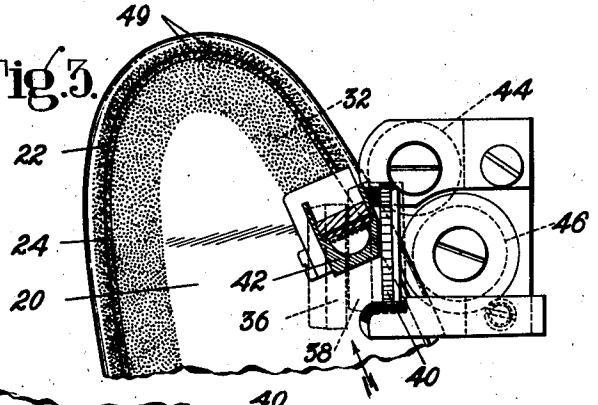
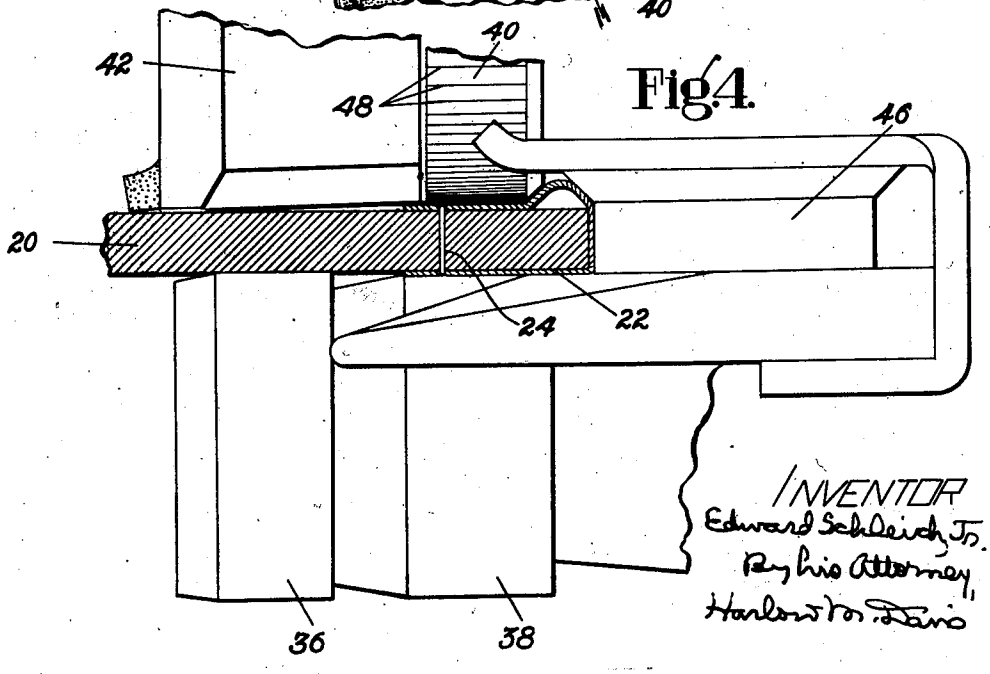


Fig.4.



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Fig. 5.

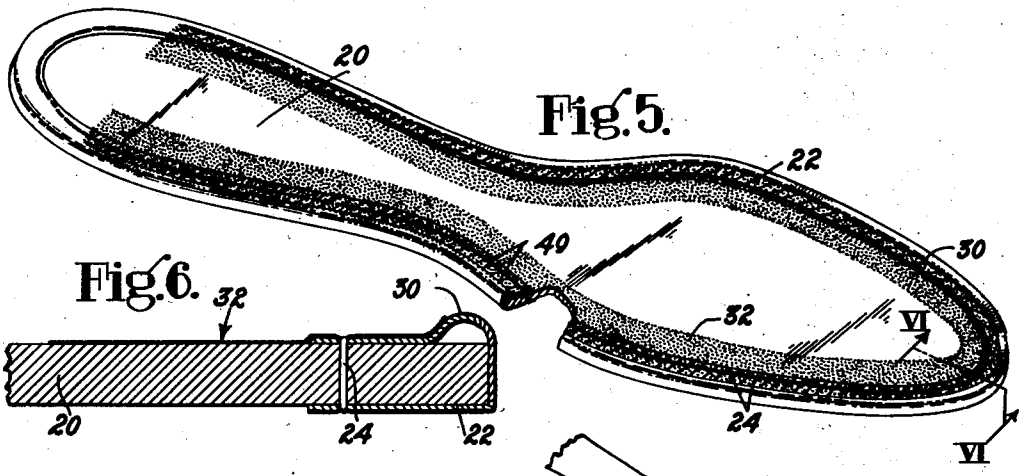
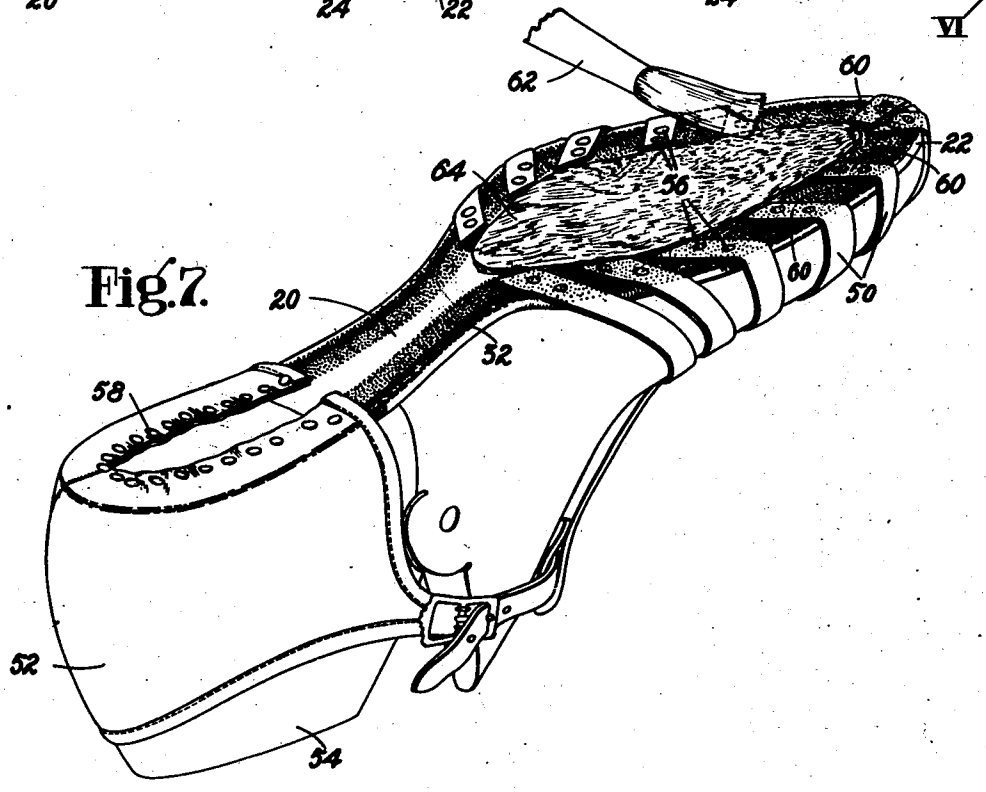


Fig. 6.

Fig. 7.



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MANUFACTURE OF SANDALS

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Fig. 8.

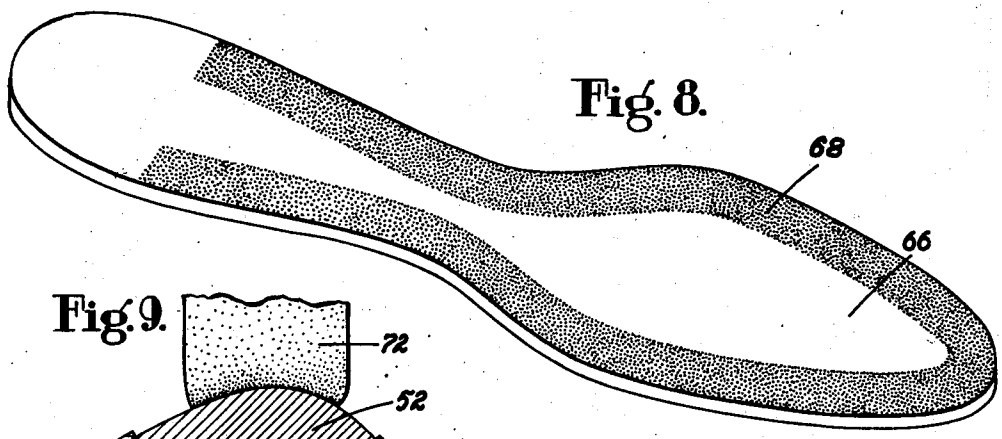


Fig. 9.

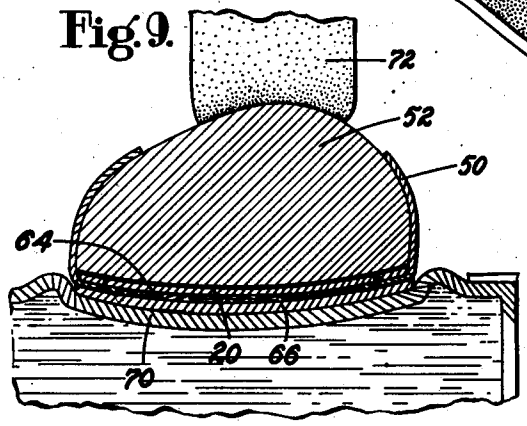


Fig. 10.

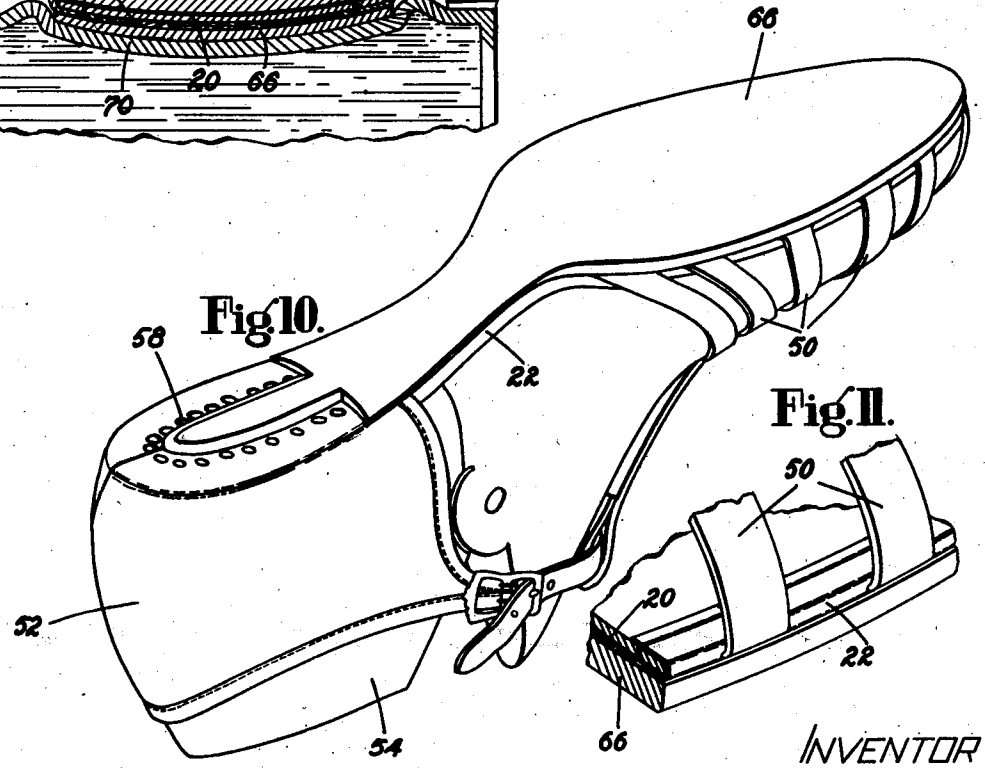


Fig. 11.

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UNITED STATES PATENT OFFICE

2,078,346

MANUFACTURE OF SANDALS

Edward Schleich, Jr., Bellerose, N. Y., assignor to United Shoe Machinery Corporation, Paterson, N. J., a corporation of New Jersey

Application July 11, 1936, Serial No. 90,217

15 Claims. (Cl. 12—142)

This invention relates to improvements in methods of making strap sandals and methods of making insoles therefor and to improvements in sandals and insoles as articles of manufacture. The invention is herein illustrated with reference to its application to the manufacture of sandals having cement-attached outsoles, although in certain of its aspects it is not necessarily restricted thereto.

In making strap sandals it is a common practice to employ an insole having a strip of binding material stitched thereto so as to cover its edge, to assemble the insole on a last together with an upper comprising a plurality of cross-straps, to tension the cross-straps over the last and over the bound edge of the insole and secure the end portions of the straps in overlasted positions upon the insole by means of suitable fastenings such as tacks, and to attach an outsole by means of cement to the overlasted end portions of the straps and to the marginal portions of the insole which are located between the straps. In preparing for the cement attachment of the outsole it is customary to roughen the overlasted end portions of the straps and thereafter to apply liquid cement to the roughened surfaces of the straps and to the portions of the lower surface of the insole between the straps by drawing a brush wet with the cement along the insole margin and across the ends of the straps. Such an application of the cement is a rather slow and unsatisfactory operation, however, inasmuch as it is difficult to cause the cement to reach the portions of the insole surface which are between the straps and which are, therefore, substantially below the plane of the roughened surfaces of the straps. Moreover, if sufficient care is taken to insure that the insole areas which are to receive cement are adequately covered surplus quantities of cement are bound to accumulate in the corners between the edges of the straps and the surface of the insole. Such an operation is time consuming and wasteful of cement, and the accumulations of surplus cement referred to are also undesirable inasmuch as when hardened they have a tendency unduly to stiffen the bottom of the sandal. Furthermore, the extreme edge portions of the insoles are frequently held away from the outsoles in the localities near the edges of the straps by the thickness of the strap material so that unsightly gaps are formed between the soles which detract from the finished appearance of the sandal.

For the purpose of overcoming certain of the undesirable conditions above referred to the present invention, considered in one aspect, provides an improvement in methods of making strap sandals, which consists in precoating a marginal portion at one side of an insole with cement and allowing the cement to dry, securing the end portions of a plurality of cross-straps to the insole in spaced positions overlying the dry cement, applying cement to the end portions of the straps, laying over said strap portions an outsole having on its attaching side a marginal stripe of cement in condition to adhere to the cement on the insole, and pressing the outsole against the end portions of the straps and against portions of the insole between the straps thereby attaching the outsole to the straps and causing the cement on the insole to coact with the cement on the outsole in attaching the outsole to the insole. In the practice of this method, as herein exemplified, an insole having a stripe of hardened cement upon its lasting side is positioned upon a last and an upper comprising a plurality of cross-straps is worked over the last and the end portions of the straps are secured to the insole as by means of tacks or staples. After the overlasted end portions of the straps have been suitably trimmed and roughened, liquid cement is applied to their roughened surfaces, no attempt being made, however, to cause any of this cement to reach the precoated portions of the insole between the straps. Thereafter, an outsole having a marginal stripe of hardened cement upon its attaching surface is laid upon the bottom of the sandal, a suitable solvent having first been applied to the hardened cement. This solvent functions to soften not only the cement on the outsole but also that on the insole between the overlasted end portions of the straps. The shoe bottom is then subjected to pressure in a sole-attaching press and as a result the outsole is firmly attached to the end portions of the straps and to the portions of the insole which are located between the straps.

Considered in another aspect, invention is to be recognized as residing in an insole having its edge and the adjacent marginal portions of its upper and lower sides covered by a binding strip, and having upon its lower side a marginal stripe of hardened cement which overlies the adjacent portion of the binding strip and is adapted to be activated or softened, after the upper has been lasted, so as to function in the cement attachment of an outsole to the shoe. Preferably, and as illustrated, the binding strip has an upstanding finishing bead formed in that portion which overlies the lower or lasting side of the insole and a

portion of which is stiffened by the cement so that the bead tends to retain its original upstanding formation but will collapse in those portions only where the cross-straps are lasted over it thereby enabling the straps to sink into and become embedded in depressions in the bead while the portions of the bead between the straps will remain upstanding or uncollapsed and in close fitting engagement with the outsole thereby avoiding the presence of any unsightly gaps in those localities.

The invention further consists in improvements in the manufacture of insoles for use in making strap sandals.

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

Fig. 1 is a perspective view of an insole of the type employed in making a strap sandal;

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

Fig. 3 is a plan view of a portion of the forepart of the insole illustrating the operation of applying a stripe of outsole-attaching cement thereto;

Fig. 4 is a view partially in vertical section and partially in elevation, and on an enlarged scale, of the parts shown in Fig. 3;

Fig. 5 is a perspective view of the insole as it appears after the outsole-attaching cement has been applied thereto and a bead has been formed in the edge binding;

Fig. 6 is a fragmentary sectional view taken along the line VI—VI of Fig. 5;

Fig. 7 is a perspective view of a strap sandal in course of construction showing the insole and the upper members of the sandal as they appear after they have been assembled on a last and the the upper members have been lasted and secured in overlasted positions upon the insole;

Fig. 8 is a perspective view of an outsole having a hardened stripe of sole-attaching cement upon its marginal portion;

Fig. 9 is a cross-sectional view of the sandal as it appears after the outsole has been laid and the shoe has been introduced into a sole-attaching press;

Fig. 10 is a perspective view of the shoe as it appears after the outsole has been applied but before the heel has been attached; and

Fig. 11 is a perspective view of a portion of the completed sandal.

Referring to the drawings, an insole **20** is provided with an edge binding **22** comprising a tape or narrow strip of fabric which extends entirely around the sole, the tape being secured in place by means of stitches **24** after having first been folded over the sole edge so as to cover the latter and to overlie the adjacent marginal portions of the upper and lower surfaces of the insole. The edge binding strip **22** may be applied by a tape-applying machine of the type commonly employed for binding the edges of insoles, such machines generally being adapted to apply the binding strip or tape so that the portion which overlies the edge of the insole will not actually engage the edge but will be curved more or less in cross-section, as indicated at **26** in Fig. 2, so that instead of lying flat against the sole edge it will stand away from the latter and thus a small amount of fullness or surplus material will be left in the edge binding in that location. This fullness is to be utilized in the formation of a marginal bead at the lower side of the insole (such as the bead **30** shown in Figs. 5 and 6) as will be hereinafter explained.

In practicing my improved method, an insole, such as the insole **20**, with the edge binding **22** thereon is prepared in a manner to facilitate the cement attachment of an outsole to a shoe in which the insole is incorporated by having a stripe **32** of outsole-attaching cement, for example pyroxylin cement, applied along the marginal portion of the lower or lasting side of the insole and permitted to become dry and hardened before the insole is assembled with the straps or other portions which are to constitute the upper of the shoe. This stripe of cement **32** is made of a width approximately equal to that of the cement bond which it is desired to obtain between the outsole and the shoe bottom and preferably, as shown, the stripe **32** is located so that its outer portion extends over the edge binding strip **22** nearly but not quite to the extreme edge of the insole.

Advantageously the stripe of cement **32** may be applied to the insole by means of a cementing machine such as that disclosed in a copending application for United States Letters Patent Serial No. 754,891, filed November 26, 1934, in the name of Carl A. Newhall. As shown in Figs. 3 and 4, the cementing machine referred to comprises an idle lower feed roll **36** and a driven lower feed roll **38** which together support the insole to which the cement is to be applied, an upper toothed feed roll **40** for cooperating with the lower roll **38** to grip and feed the marginal portion of the insole, a cement extruding nozzle **42** for applying the cement, and two idle rollers **44** and **46** for engaging the edge of the insole as it is being fed and gaging the location of the stripe of cement relatively to the sole edge. For further details of the construction and mode of operation of the parts referred to reference may be had to the above-mentioned application. In the use of the illustrated cementing machine the continuity of the surface of the binding strip at the lower side of the insole (which is positioned uppermost as the insole is being fed through the machine) is interrupted at intervals by slight indentations or incisions **49** (Figs. 3 and 5) made by the teeth **48** of the feed roll **42** and cement is extruded through the nozzle **42** so that a stripe of cement **32** of the desired width is applied to the marginal portion of the insole. This stripe **32** is so located that its outer portion extends over the indented or incised edge-binding strip beyond the line of stitching **24** and to within a short distance of the outer edge of the folded-over strip. Furthermore, as the insole is advanced past the nozzle **42** the sole edge will be urged against the rollers **44** and **46** so that the portion of the binding strip which covers but stands away from the sole edge will be laid flat against the sole edge by the action of the rollers. The surplus material contained in this outstanding portion of the binding strip will be displaced to the upper side of the insole due to the fact that the lower portion of the binding is held against the lower side of the insole by the lower feed roll **38** (which engages nearly if not quite to the extreme edge of the insole), whereas the upper feed roll **40** is located at a substantial distance from the sole edge and thus space is provided to receive the surplus binding strip material. As this surplus material is displaced it naturally assumes the curved cross-sectional shape shown in Fig. 4, thus producing the rounded formation hereinbefore referred to as the bead **30**.

The stripe of cement applied by the nozzle **42** overlies the stitched portion of the binding strip

and extends outwardly at least as far as the bead **30**. In fact, due to the absorbent quality of the fabric constituting the binding strip, the cement works its way a short distance outwardly from the inner extremity of the bead. The character of the cement is such that the cement dries and hardens very quickly and thus before the binding strip has had an opportunity to react from its deformed condition so as to permit the bead to collapse, the hardened cement along the inner marginal portion of the bead stiffens that portion of the bead sufficiently to keep it upstanding and thus effectively to maintain the desired rounded formation of the bead in the absence of the application of any pressure tending to collapse it.

The precemented insole with a partially stiffened bead formed in the edge binding along the marginal portion of the lower side of the insole is now ready to be assembled on a last with an upper. As herein shown, the insole is first assembled with the upper materials which, as herein disclosed, comprise the forepart straps **50** and the quarter **52**. After the parts have been assembled on a last the straps **50** are worked over the last and their end portions are secured in overlasted positions upon the insole by suitable means such as tacks **56** or staples. The quarter **52** is lasted and secured in place upon the insole as by means of tacks **58** or staples. During the overlasting of the upper materials upon the insole the hardened stripe of outsole-attaching cement **32** upon the insole performs no function, except in so far as it tends to maintain the rounded form of the bead **30**. In those localities where the end portions of the straps **50** overlie the bead **30** the bead will collapse so that the strap ends will lie in depressions in the bead. Between the strap ends, however, the bead will retain substantially its full rounded formation and thus will insure against the formation of any gaps between the edges of the inner and outer soles in the localities between the straps and thus add materially to the finished appearance of the shoe.

In preparation for the attachment of an outsole the overlasted end portions of the straps **50** and the overlasted margin of the quarter **52** are trimmed and roughened in the usual way and their roughened portions are thereafter coated with liquid cement, as indicated at **60** in Fig. 7, the cement being applied by means, for example, of a brush **62**. In applying the cement **60** to the end portions of the straps **50** no attempt is made to reach those portions of the insole which are located between the straps, the brush being manipulated so that it merely engages the straps themselves. Thus the cement will be easily and quickly applied without danger of any surplus cement accumulating in the corners between the edges of the straps and the insole in such a way as to waste the cement. After this cement has been applied as just described the stripe of cement **32** which was previously applied to the insole remains dry and hard and is entirely unaffected by the application of the liquid cement to the straps. As shown in Fig. 7, a suitable filler, such as the filler piece **64**, is applied to the forepart of the insole so as to fill the space bounded by the trimmed edges of the overlasted portions of the straps.

The shoe is now ready to receive an outsole, such as the outsole **66** in Fig. 8, which has been previously prepared by having a stripe of hard cement **68** applied to the marginal portion of its upper surface. Before the outsole is applied to the shoe, however, the hardened cement thereon is softened and activated by the application of a suitable softening medium, for example a high viscosity softener such as that disclosed in United States Letters Patent No. 1,959,321, granted May 15, 1934, upon application of W. H. Wedger.

After the outsole prepared as above described has been laid in place upon the bottom of the shoe the shoe is placed in a cement-attaching press which, as shown in Fig. 9, comprises a lower yieldable sole-engaging pad **70** and an upper pressure-applying member **72** constructed and arranged to engage and apply pressure to the upper portion of the last.

Under the pressure incident to the outsole-attaching operation the outsole will be conformed to the surface contour of the bottom of the shoe and the softened cement on the outsole will cooperate with the liquid cement that has been applied to the overlasted ends of the straps **50** and to the overlasted margin of the quarter **52** in establishing a firm bond of adhesion between the outsole and the other members just mentioned. In addition the softener or activating agent applied to the stripe of hardened cement on the outsole will attack the precoating of hardened cement **32** on the insole in those localities where the latter is exposed between the straps **50** and along the margins of the open shank portion of the sandal and will soften and condition the cement of the precoating so that it will cooperate with the softened cement on the outsole to secure the outsole directly to the marginal portions of the insole between the straps **50** and along the shank portion of the shoe. The attachment of the outsole will be effected without having any accumulations of unsoftened cement present in the corners between the edges of the straps and the surface of the insole to stiffen unduly the forepart of the sandal. Also, because of the method of applying the cement as hereinbefore described, a substantial saving in cement will be effected. It should be noted that added security in the attachment of the outsole will be obtained as a result of the presence in the binding strip of the stitch holes and the slight indentations or incisions **49** made by the teeth of the upper feed wheel of the cementing machine which will enable the cement to penetrate more readily into the material of the binding strip and thus insure the establishment of a more secure cement bond between the outsole and the binding strip. Moreover, the cement will also penetrate more or less into the stitches themselves so as still further to facilitate firm adhesive attachment of the outsole to the shoe.

The sandal is then removed from the last and completed by the attachment of a heel in any suitable manner.

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 strap sandals which consists in precoating a marginal portion at one side of an insole with cement and allowing the cement to dry, securing the end portions of a plurality of cross-straps to the insole in spaced positions overlying said cement, applying cement to the end portions of said cross-straps, laying over said strap portions an outsole having on its attaching side a marginal stripe of cement in condition to adhere to the cement on the insole, and pressing the outsole

against said strap portions and against portions of the insole between said strap portions, thereby attaching the outsole to the straps and causing the cement on the insole to coact with the cement on the outsole in attaching the outsole to the insole.

2. That improvement in methods of making strap sandals which consists in precoating a marginal portion at one side of an insole with cement and allowing the cement to dry so as to form a marginal stripe of hard cement on the insole, securing the end portions of a plurality of cross-straps to the insole in spaced positions overlying said stripe, applying cement to the end portions of said cross-straps, laying over said strap portions an outsole having a marginal stripe of softened cement on its attaching side, and pressing the outsole against said strap portions and against portions of the insole between said strap portions, thereby attaching the outsole to the straps and causing the softened cement on the outsole to soften portions of the hardened cement on the insole and to coact with the latter in attaching the outsole to the insole.

3. That improvement in methods of making strap sandals which consists in precoating a marginal portion at one side of an insole with cement and allowing the cement to dry so as to form a stripe of hard cement, securing the end portions of a plurality of cross-straps in spaced-apart overlasted positions overlying said stripe on the insole, applying soft cement to said portions of the cross-straps, coating with a solvent a stripe of hard cement on an outsole thereby softening said outsole cement, and while the cement on the outsole and on the cross-straps remains soft laying the outsole over the insole and pressing the outsole against the overlasted portions of the straps and the intervening portions of the marginal surface of the insole thereby attaching the outsole to the straps and enabling said solvent to soften portions of the hard cement on the insole whereby the latter is caused to coact with the cement on the outsole in attaching the outsole to the insole.

4. That improvement in methods of making strap sandals which consists in assembling upon a last an insole having a precoating of hardened cement upon the marginal portion of its lasting side, an upper comprising a plurality of cross-straps, tensioning the cross-straps over the last and securing their end portions in overlasted positions upon the precoated portion of the insole by means other than said cement, laying upon and pressing against the bottom of the sandal an outsole having thereon a marginal stripe of soft cement thereby attaching the outsole to the overlasted portions of said straps, and causing the hardened cement on the marginal portions of the insole between said straps to become softened and to cooperate with the cement on the outsole in attaching the outsole to the insole in the localities between the straps.

5. That improvement in methods of making strap sandals which consists in securing the end portions of a plurality of cross-straps to an insole in overlying relation to a marginal stripe of hardened cement on the insole, and pressing against said end portions of the straps and against the marginal portions of the insole between said straps an outsole having thereon a marginal stripe of soft cement thereby attaching the outsole to said strap portions by means of said soft cement and causing the hardened cement on the marginal portions of the insole between the straps to cooperate with said soft cement in attaching the outsole to the insole.

6. That improvement in methods of making strap sandals which consists in forming a collapsible marginal bead at the lower side of an insole, embedding portions of a plurality of cross-straps in said bead and securing the end portions of the straps in overlasted positions to the insole, and attaching an outsole to said insole and said overlasted strap portions with the marginal portions of the outsole in localities between said straps engaged with said bead.

7. That improvement in methods of making insoles which consists in applying a binding strip to the edge of an insole and to the adjacent narrow marginal portions of the upper and lower sides of the insole, and applying a stripe of cement to the marginal portion at the lower side of the insole in position to overlie the insole substance inside said binding strip and to overlie also an adjacent portion of the binding strip itself.

8. That improvement in methods of making insoles which consists in applying a binding strip to the edge of an insole and to the adjacent narrow marginal portions of the upper and lower sides of the insole, forming incisions at intervals in the exposed surface of said binding strip at the lower side of the insole, and precoating with cement the exposed marginal surface of the insole inside said binding strip and also the incised surface of said binding strip.

9. That improvement in methods of making insoles which consists in applying a binding strip to the edge of an insole and to adjacent narrow marginal portions of the upper and lower sides of the insole, thereafter forming a marginal bead in said binding strip at the lower side of the insole, and applying a stripe of cement to said side of the insole in position to overlie the insole substance inside said binding strip and to overlie also an adjacent portion of the binding strip including a portion of said bead.

10. That improvement in methods of making insoles which consists in applying a binding strip loosely to overlie the edge face of an insole and to cover adjacent narrow marginal portions of the opposite sides of the insole and advancing the marginal portion of the insole progressively past cement-applying means located at one side of the insole while supporting the edge portion of the opposite side of the insole and urging that portion of the binding strip which overlies the edge face of the insole against said face thereby displacing surplus binding strip material into position to form a bead in the binding strip at the opposite side of said insole, and applying a stripe of cement to that side of the insole in position to overlie the insole substance inside the binding strip and also an adjacent portion of the binding strip including a portion of said bead.

11. A precemented insole having an edge binding and having a marginal stripe of hardened cement located partially upon the surface of the insole inside of the binding and partially upon the binding itself.

12. A precemented insole having a binding strip covering its edge and overlapping narrow marginal portions of its upper and lower sides, said strip having the continuity of its exposed surface interrupted at intervals at the lower side of the insole and said insole having a marginal stripe of hardened cement located partially upon the surface of the lower side of the insole inside of

said binding strip and partially upon said interrupted surface portion of said binding strip.

13. A precemented insole having a binding strip covering the edge and overlapping narrow marginal portions of the upper and lower sides of the insole, said binding strip having a marginal bead formed therein at the lower side of the insole, and a marginal stripe of hardened cement at the lower side of the insole, said cement being carried partially by the insole substance inside said binding strip and partially by the adjacent beaded portion of said binding strip.

14. A precemented insole having a binding strip covering its edge and overlapping narrow marginal portions of its upper and lower sides, and a marginal stripe of hardened cement upon the lower side of the insole carried partially by the insole substance and partially by said binding strip, said binding strip having a longitudinal bead at the lower side of the insole stiffened by means of said cement.

15. A cross-strap sandal comprising an insole having a collapsible marginal bead, a plurality of cross-straps the end portions of which are secured in overlasted positions upon the insole and embedded in collapsed portions of said bead, and an outsole secured to said overlasted strap portions, the portions of said bead between said straps remaining substantially uncollapsed and engaging said outsole.

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