Aug. 27, 1940. W. H. MANSFIELD 2,212,612

MANUFACTURE OF SHOES

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Fig.1

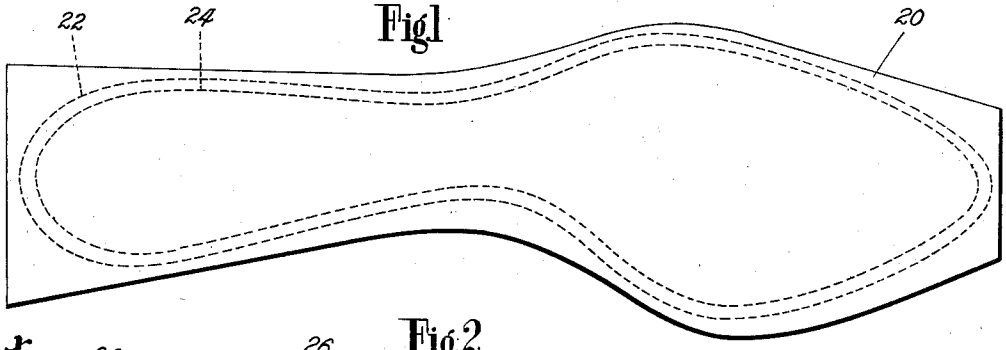


Fig.2

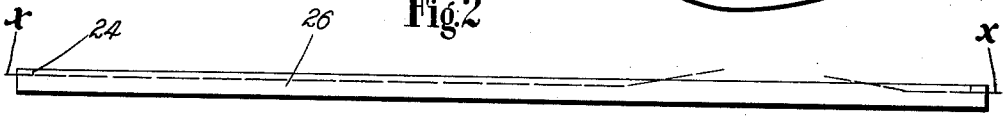


Fig.3

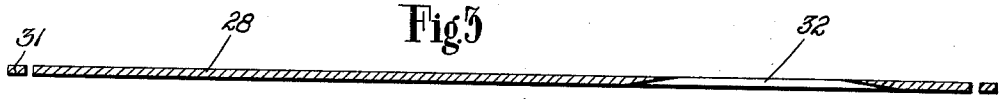


Fig.4

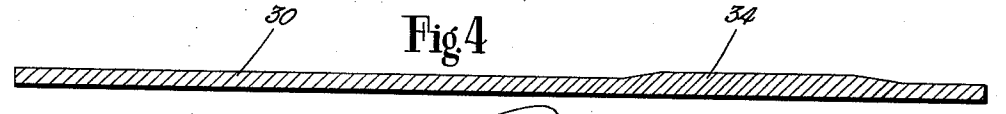


Fig.5

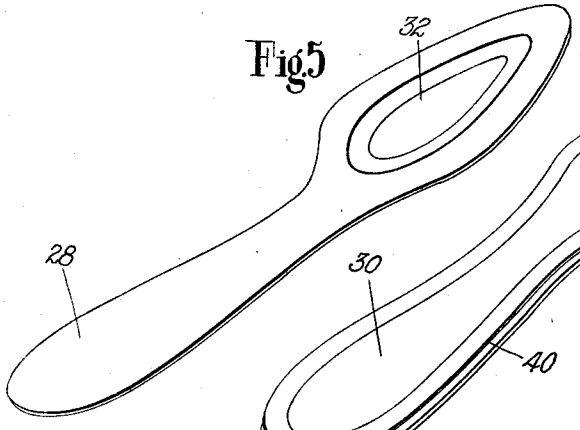


Fig.6

Fig.9

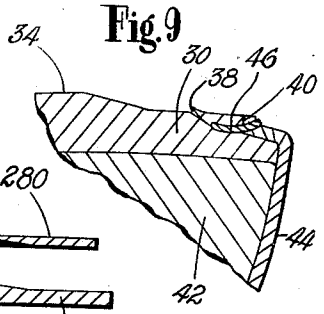


Fig.7

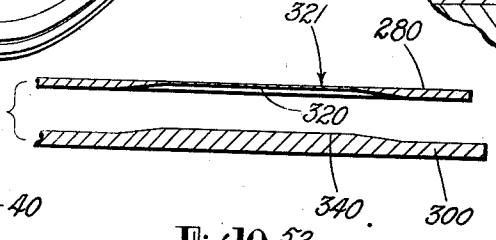


Fig.8

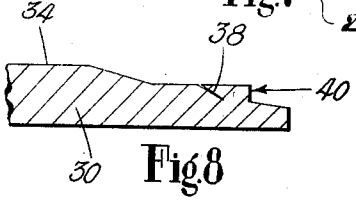
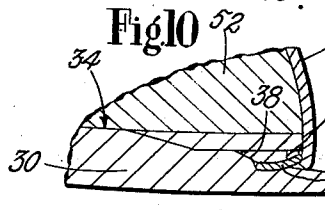


Fig.10



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MANUFACTURE OF SHOES

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Fig.12

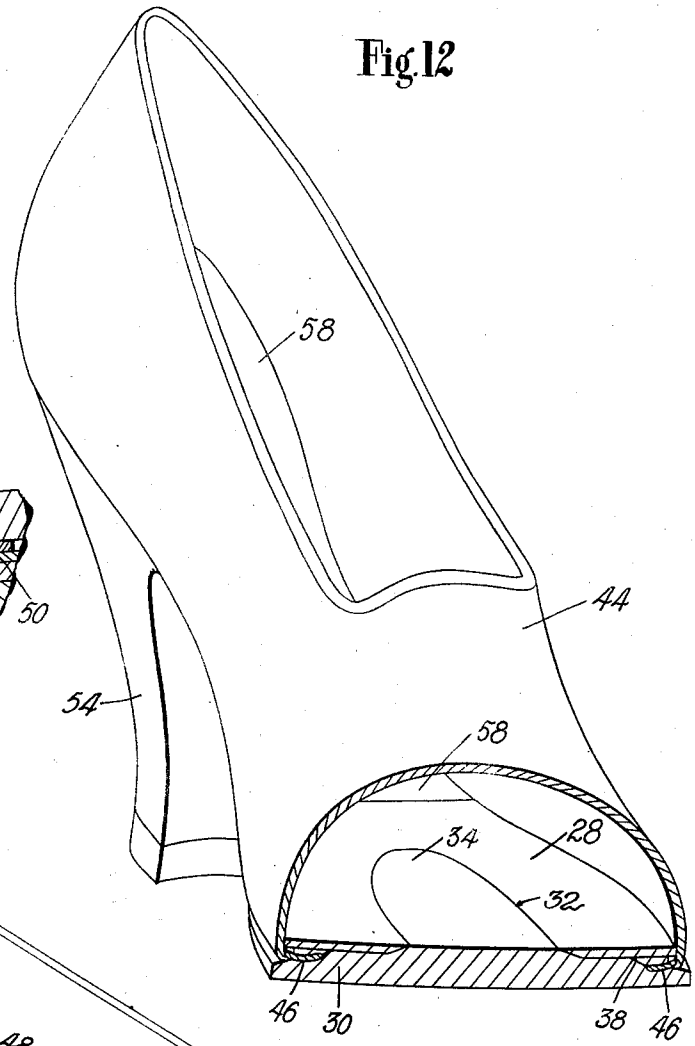
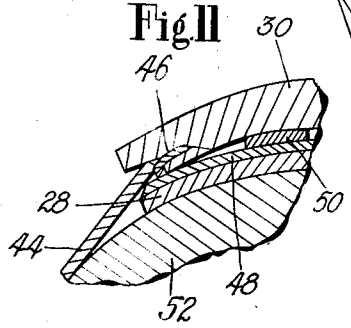


Fig.11



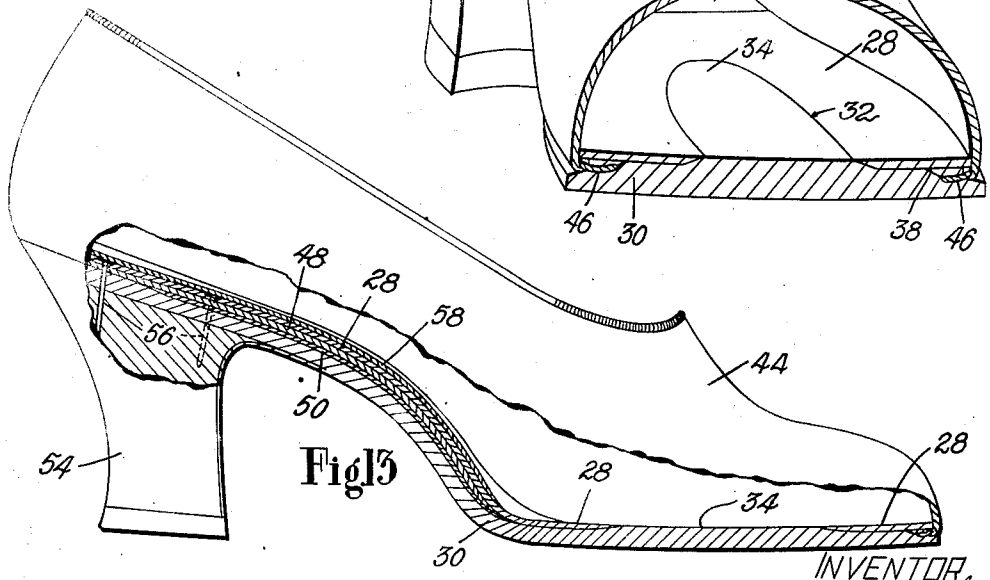


Fig13

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Patented Aug. 27, 1940

2,212,612

UNITED STATES PATENT OFFICE

2,212,612

MANUFACTURE OF SHOES

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Application March 21, 1938, Serial No. 197,066

8 Claims. (Cl. 12—142)

This invention relates to methods of making shoes having flexible foreparts and to improvements in such shoes as articles of manufacture.

For the purpose of securing flexibility in the forepart of shoes it is a well-known practice to employ in the shoe a so-called complemental insole-outsole combination consisting of an insole having a central forepart opening or recess and an outsole having a forepart projection which is complemental to the insole opening or recess and thus to provide for the securing of single sole thickness, or substantially single sole thickness, in the central ball portions of the shoes. In making such a shoe in accordance with methods heretofore practiced, the shoe is lasted and the margin of its upper secured in overlasted position upon the insole and thereafter the outsole is laid and attached to the upper. Usually pyroxylin cement is utilized for attaching the outsole although in some instances the outsole is stitched to a welt which has been inseamed to the upper or the outsole is secured to the upper and to the insole by means of through-and-through stitching. In all such cases, however, the flexibility of the shoe is impaired more or less seriously by the means employed in attaching the outsole.

One object of the present invention is to provide for obtaining a maximum amount of flexibility in shoes the inner and outer soles of which have complemental interfitting foreparts without sacrificing security of attachment of the outsoles and without producing any inherent weakness or incorporating unreliable or disadvantageous features of construction in the shoes.

With this object in view the invention provides an improvement in methods of shoemaking which, as herein illustrated, involves providing an insole having a central forepart recess and an outsole having a central forepart projection complemental to said insole recess and having also an inner marginal channel and an outer marginal shoulder of the type customarily employed in a sole for a turn shoe, securing an upper wrong-side out to the outsole by stitches laid in the channel and holding the upper against the shoulder, turning the shoe, and thereafter securing the insole within the shoe with its foreport recess receiving the outsole projection and with the margin of the insole covering the shoulder and the channel of the outsole.

The complemental insole-outsole combination may be produced by splitting a sole blank so as to provide an insole having an aperture extending entirely through its ball portion or which extends nearly but not quite through the insole.

The shoe produced by my improved method is of novel construction, having the flexibility and other advantageous features of turn shoe construction and, in addition, it embodies an innersole which covers the channel and shoulder in the tread sole and protects the foot from the ridge formed by the inseam but which on account of being skeletonized or recessed in its ball portion has no substantial tendency to stiffen the forepart of the shoe bottom.

The invention will now be explained with reference to the accompanying drawings, which form part of the specification.

In the drawings,

Fig. 1 is a plan view of a sole blank employed in the practice of my improved method, the outlines of the sole members to be formed from the blank being indicated in dotted lines;

Fig. 2 is an edge view of the blank as it appears after it has been rounded to outsole size and shape and incised to outline an insole at one side of the blank;

Fig. 3 is a longitudinal sectional view of the skeleton insole produced from the sole blank showing the waste strip produced by the incising operation;

Fig. 4 is a longitudinal sectional view of the outsole produced from the blank;

Fig. 5 is a bottom perspective view of the skeleton insole;

Fig. 6 is a top perspective view of the outsole as it appears after the channeling and shoulder forming operations have been performed;

Fig. 7 is a longitudinal sectional view of an insole-outsole combination illustrating a modified construction of the complemental portions of the soles;

Fig. 8 is a fragmentary cross-sectional view on the line VIII—VIII of Fig. 6, illustrating the character of the channel and shoulder formed on the outsole;

Fig. 9 is a fragmentary cross-sectional view of the shoe in process of construction, illustrating the appearance of the shoe after the upper has been lasted inside-out and stitched to the outsole;

Fig. 10 is a fragmentary cross-sectional view of the shoe as it appears after it has been turned and after the skeleton insole has been secured in place within the shoe and the second last has been inserted;

Fig. 11 is a fragmentary cross-sectional view of the shank portion of the shoe on the second last;

Fig. 12 is a view, partially in perspective and

partially in cross-section, of the finished shoe; and

Fig. 13 is a view, partially in longitudinal section and partially in side elevation, of the finished shoe.

In practicing my invention, a sole blank or block sole **20** is rounded to outsole size and shape, as indicated by the dotted line **22** (Fig. 1), and the blank is incised, as indicated by the dotted line **24**, to outline at one side of the blank an insole of a size and shape appropriate for use with the said outsole in the manufacture of a shoe. The rounding operation results in forming the blank **26** which is shown in edge view in Fig. 2. The incision **24** in the blank **26** extends to a depth corresponding to the thickness of a required insole. Advantageously, the rounding and incising operations may be performed by means of a so-called double knife rounding machine, such for example as that disclosed in United States Letters Patent No. 2,057,665, granted October 20, 1936, upon application of F. E. Bertrand. The rounded and incised blank **26** is divided along the dotted line X—X (Fig. 2) into an insole **28**, an outsole **30**, and a marginal waste strip **31**, see Figs. 3 and 4, the insole **28** having a central opening **32** extending entirely through its forepart and the outsole **30** having a central forepart elevation or projection **34** which is complemental to the insole opening **32**. Alternatively, the blank **26** may be divided into an insole **280** (Fig. 7) having a central recess **320** extending only part way through its forepart and an outsole **300** having a central forepart projection **340** complemental to the insole recess **320**. The dividing operation may conveniently be performed by a means of a matrix roll type splitting machine of the general type of that disclosed in United States Letters Patent No. 2,053,304, granted September 8, 1936, upon application of W. D. Thomas, such a machine having a straight edged splitting knife against which the sole blank is fed edgewise by means of cooperating matrix rolls which temporarily deform or distort the blank by depressing its central forward portion so that the knife will emerge around the periphery of the depressed portion of the blank if a recessed insole is to be formed or will cut nearly but not quite through the depressed portion.

At the completion of the splitting operation the insole **28** is ready for use in the shoe. However, inasmuch as the upper is to be lasted over and permanently secured directly to the outsole the latter is fitted to receive the upper, preferably and as herein illustrated by having formed therein an inner marginal channel **38** and an outer marginal shoulder **40** (see Figs. 6 and 8), the channel and the shoulder being of the type ordinarily formed in the sole of a turn shoe.

In making the shoe the outsole **30** is temporarily secured on the bottom of a first last **42**, an upper **44** is mounted wrong-side out upon the last and the upper is pulled over, the shoe lasted, and the margin of the upper temporarily secured in overlasted position against the shoulder **40** of the outsole, after which the upper is permanently secured to the outsole by means of stitches **46** which are laid in the channel **38** and which hold the upper against the shoulder **40**, the above operations being substantially in accordance with the usual procedure in the manufacture of a turn shoe. Thereafter, the last **42** is removed and the shoe is turned. The insole **28** is then inserted within the turn shoe and secured in place with the opening **32** in the forepart of the insole registering with and receiving the projection **34** of the outsole **30**. The outsole projections will then be interfitted within the insole recess so as to fill the latter and to provide in the shoe a so-called complemental insole-outsole combination in which the central ball portion of the shoe bottom is of single sole thickness. Instead of using the outsole **30**, the outsole **300** may be used in which case after the shoe has been turned the insole **280** will be inserted and secured in place with the outsole projection **340** interfitting within the recess **320** in the insole and supporting the exceedingly thin central ball portion **321** of the recessed insole. In this case, also, a complemental insole-outsole combination is provided in which the central ball portion of the shoe bottom is of substantially single sole thickness, the central ball portion **321** of the insole being so thin that its presence will not stiffen the shoe.

Preferably the insole is secured in place by means of rubber cement, such as latex, which is initially applied to the outsole facing side of the insole and which will not harden or stiffen so as to interfere with the flexibility of the shoe. Prior to securing of the insole, a shank piece is laid upon the insole in the heel and shank portions of the shoe and temporarily secured in place in any well-known manner. As shown, this shank piece may be of the type commonly known as a turn shank piece comprising a leather or fiber piece **48** corresponding in outline to that of the heel and shank portion of the interior of the shoe bottom and a metallic stiffener strip **50** which is secured in any suitable manner to the fiber piece. A last **52** corresponding to the second last ordinarily employed in the manufacture of a turn shoe in next inserted within the shoe (see Fig. 10) after which the shoe is pounded up and leveled. Thereafter, the heel seat portion of the outsole is fitted for the reception of a heel, and a heel, such as the wood heel **54**, is attached, for example, by means of nails **56** which are driven from the inside of the shoe and which serve also permanently to secure the shank piece **48** in place. Finally, a sock lining, such as the three-quarter length lining piece **58**, is cemented in place over the heel and shank portion of the insole.

It will be apparent that the finished shoe has the flexibility and other desirable features of a turn shoe and that furthermore certain disadvantageous characteristics of turn shoe construction have been eliminated. For example, in a turn shoe as customarily made the inner stitch-receiving channel and the marginal shoulder together with the trimmed margin of the upper materials are exposed or are covered only by a sock lining and in either case an unsightly marginal ridge is formed inside the shoe bottom which is liable to cause discomfort to the wearer of the shoe. In my improved shoe the marginal channel and shoulder and the inseamed marginal portions of the upper are covered by an insole in such a manner that no objectionable ridge is formed and a smooth finished surface is provided for engagement with the foot around the marginal portion of the shoe bottom. Moreover, inasmuch as the central portion of the insole is removed in the forepart of the shoe or has been thinned so that the only remaining portion in that area is of substantially sock lining thickness and is secured in place only by means of rubber cement or the like, it has no tendency to stiffen the shoe bottom or to interfere with the flexi-

bility which results from the turn shoe features of construction.

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 shoemaking which consists in providing an insole having a forepart aperture and an outsole having a forepart projection complemental to said aperture, securing an upper inside-out to said outsole about its entire periphery, turning the shoe, securing said insole in place within the shoe with said outsole projection interfitting within and filling said insole aperture, and thereafter inserting a second last and finishing the shoe.

2. That improvement in methods of shoemaking which consists in providing an insole having a forepart recess and an outsole having a forepart projection complemental to said recess and having also an inner marginal channel and an outer marginal shoulder, securing an upper inside-out to said outsole about its entire periphery by means of stitches laid within said channel and holding the lower margin of the upper against said shoulder, turning the shoe, securing said insole in place within the shoe with said outsole projection interfitting within and filling said insole recess, and thereafter inserting a second last and finishing the shoe.

3. That improvement in methods of shoemaking which consists in providing an outsole having a forepart projection, an inner marginal channel and an outer marginal shoulder each extending entirely around the outsole, and providing an insole having a forepart recess complemental to said outsole projection, said insole being smaller than said outsole but larger than the portion of the outsole that is within said shoulder, securing an upper inside out to said outsole about the entire periphery of the latter by means of fastenings positioned within said channel and holding the lower margin of the upper against said shoulder, turning the shoe, positioning said insole within the shoe with said recess receiving said outsole projection and with the margin of said insole covering said channel and extending outwardly beyond said shoulder, permanently securing the insole in place, and thereafter inserting a second last and finishing the shoe.

4. A turned shoe comprising an outsole having a forepart projection and having also an outer marginal shoulder and an inner marginal channel, an upper having its lower margin secured against said shoulder by stitches laid in said channel, and a separate, full-length insole covering said shoulder and said channel and having an aperture in the mid portion of its forepart which is complemental to said outsole projection and within which the latter is interfitted.

5. A shoe comprising an outsole having a forepart projection and having also an outer marginal shoulder and an inner marginal channel, an upper having its lower margin secured against said shoulder by stitches laid in said channel, and a separate skeleton insole covering said shoulder and said channel and having a forepart opening complemental to said outsole projection within which the latter is interfitted.

6. A shoe comprising a separate skeleton insole having a central forepart opening, an outsole having a central forepart projection complemental to said opening and interfitting within the latter, said outsole having also an inner marginal channel and an outer marginal shoulder, an upper having its margin inturned between said insole and said outsole, stitches extending through the substance of the outsole between said channel and said shoulder and holding the lower margin of said upper against said shoulder, and a shank piece between said soles coextensive with the heel and shank portions of said insole.

7. A shoe comprising an outsole having a central forepart projection upon its foot-facing side, an upper having its margin inturned and secured by stitches to said outsole only, a separate skeleton insole overlying the inturned portion of the upper and having a central forepart opening complemental to said outsole projection within which the latter interfits, and a shank piece coextensive with the heel and shank portions of said insole located between said soles.

8. As an article of manufacture, a turn sole reduced in thickness about the margin of its forepart so as to leave in the center of its ball portion an integral elevation having a beveled margin and having an inner channel spaced outwardly a substantial distance from said elevation, and a shoulder channel spaced outwardly from said inner channel and forming a feather of less thickness than the portion of the sole margin in which said inner channel is formed.

WILLIS H. MANSFIELD.