March 7, 1939. F. MAIELLANO 2,149,701

METHOD OF MAKING SHOES

Filed Aug. 14, 1935 2 Sheets-Sheet 1

Fig. 1

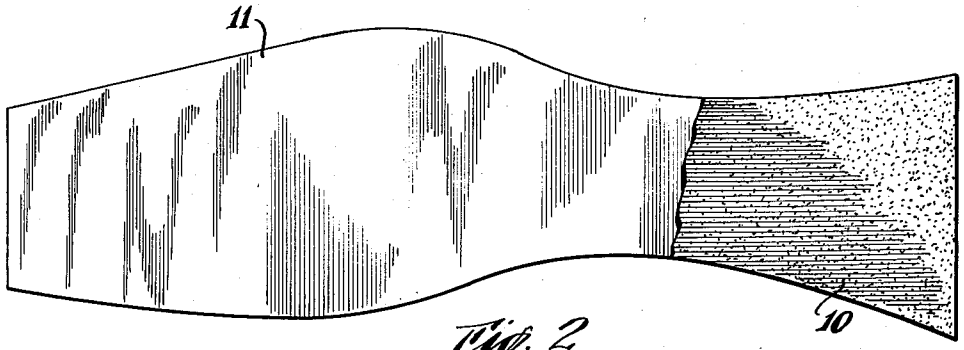


Fig. 2



Fig. 3

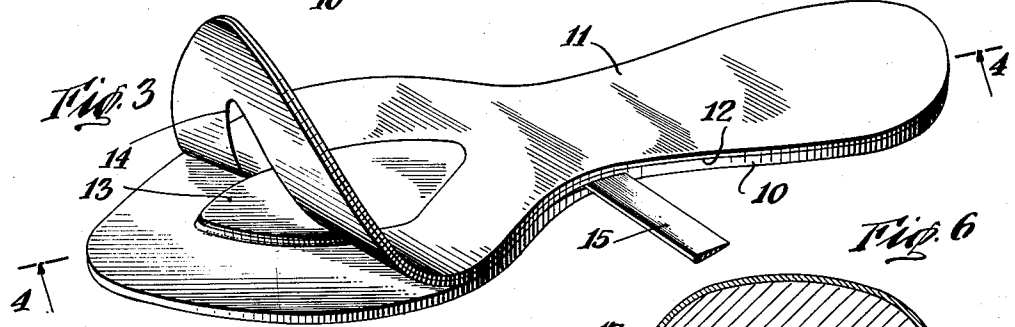


Fig. 6

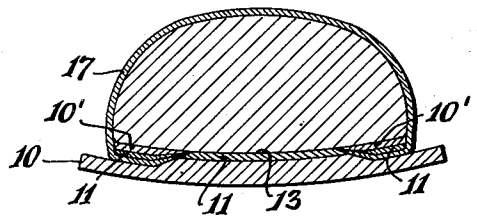


Fig. 4

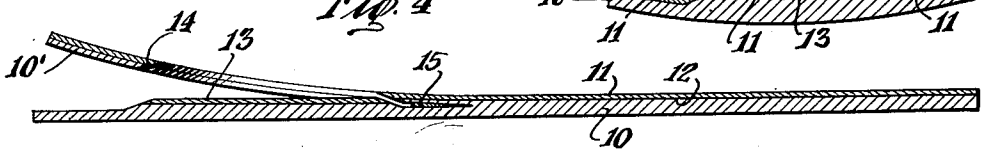
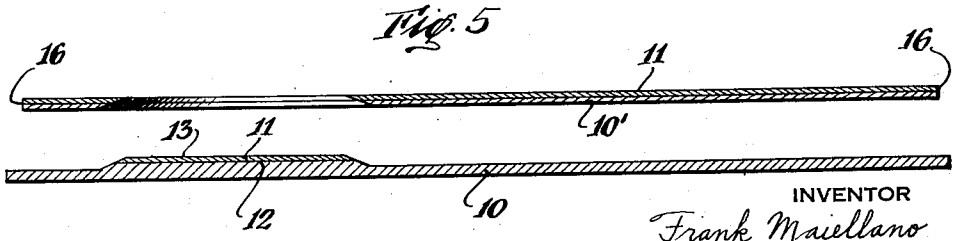


Fig. 5



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Fig. 7

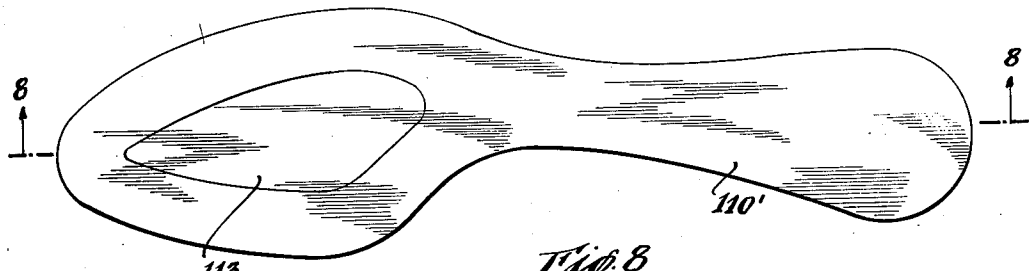


Fig. 8



Fig. 9

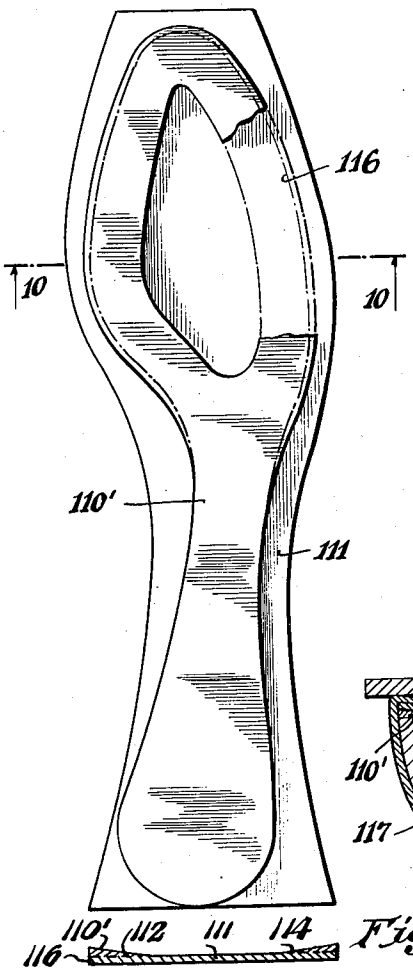
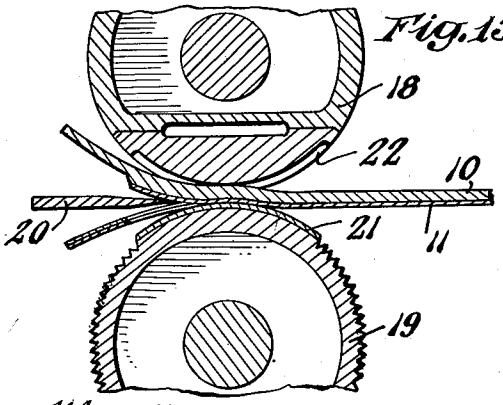


Fig. 10.

Fig. 13.



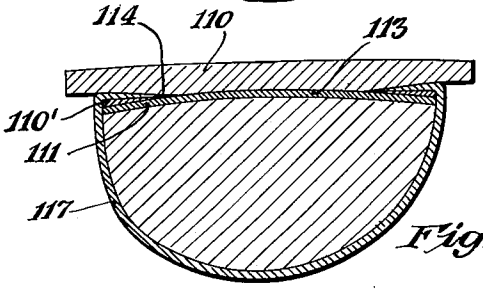


Fig. 11.

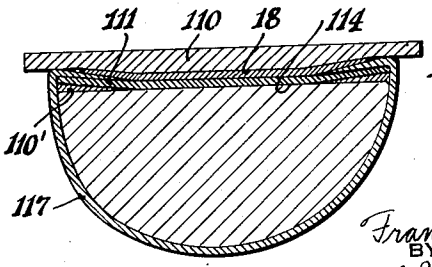


Fig. 12

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Patented Mar. 7, 1939 2,149,701

UNITED STATES PATENT OFFICE

2,149,701

METHOD OF MAKING SHOES

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Application August 14, 1935, Serial No. 36,057

3 Claims. (Cl. 12—142)

This invention relates to the manufacture of footwear and more particularly to the manufacture of insoles and outsoles usable in such footwear.

A general object of the invention is to provide a novel method of making insoles and outsoles usable in an improved form of shoe, which affords marked economies as to cost of materials and operations as compared with practices heretofore followed in making shoes of commensurate general quality and construction.

In the United States patent to Sbicca No. 1,902,725 there is disclosed a method of shoe construction in which complementary insoles and outsoles are split from a single blank of sole stock having the combined thickness of the required insole and outsole. The outsole is formed with a raised or landed central forepart portion, and the insole has an opening in its central forepart which exactly fits the landed portion of the outsole by virtue of its having been split or cut therefrom. This method calls for the use of thicker sole leather than would be used for the outsole per se, of an ordinary shoe. These thicker grain leathers are more expensive than those which are a few irons thinner. While material savings are effected through cutting Sbicca-type insoles from outsole stock because it eliminates the cost of extra insoles which otherwise would have to be provided, it has been found by the present inventor that even further net savings can be effected by making possible the use of outsole leather of ordinary thickness in a Sbicca-type shoe.

It therefore is a particular object of this invention to provide a method of making complementary insoles and outsoles in accordance with the principles of the mentioned Sbicca invention, and of using them in the manufacture of shoes having substantially the advantages as to flexibility, neat and accurate construction, etc., which characterize Sbicca-type shoes, while effecting economies in the net cost of manufacture, by providing sole units formed of outsole leather of thinner stock, which units are built up to the requirements for Sbicca type operations by adding thereto a ply of inexpensive insole material, such as, e. g. "flexible split" leather.

Further, there are available on the market various kinds of manufactured materials such as plant fiber compositions and the like, which are usable as insole material and are even less expensive than ordinary "flexible split" or else possess qualifications as to texture and strength which make their use very desirable.

It is a further object of the invention to provide a method of making shoes having complementary interfitting insoles and outsoles of the type shown in the mentioned Sbicca patent, wherein such manufactured composition materials may advantageously be employed in constructing the insole.

Another object of the invention is to provide complementary interfitting insoles and outsoles having advantages such as those described above as to economy and/or accuracy of fit, and to provide a shoe of improved and economical construction involving use of such insoles and outsoles.

Yet another object of the invention is to provide a shoe construction having an outsole landed at its central forepart portion, and an insole including stock removed from the surface of said outsole adjacent its landed portion, which is adapted to be strongly and compactly lasted and assembled without the need of loose filler material or the like between the insole and outsole.

A still further object of the invention is to provide a shoe and method of making the same, which has a landed outsole and a plied insole, is compactly and strongly lasted, has the characteristic appearance of a Sbicca type shoe, and which may be lasted on a flat bottomed last, if desired.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the several steps and the relation of one or more of such steps with respect to each of the others, and the article possessing the features, properties, and the relation of elements, which are exemplified in the following detailed disclosure, and the scope of the invention will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

Fig. 1 is a top plan view of a composite sole unit embodying principles of the present invention, parts thereof being broken away better to show the construction;

Fig. 2 is a side elevation of the unit shown in Fig. 1;

Fig. 3 is a perspective view showing the formation of an insole and outsole from a sole blank rounded from the unit of Fig. 1;

Fig. 4 is a longitudinal sectional view taken along line 4—4 of Fig. 3;

Fig. 5 is a longitudinal sectional view similar

to Fig. 4 but showing an insole completely separated from an outsole;

Fig. 6 is a transverse vertical sectional view taken through the forepart of a shoe constructed in accordance with the principles of this invention;

Fig. 7 is a plan view of a rounded and split sole blank used in another form of the invention;

Fig. 8 is a longitudinal vertical sectional view taken along line 8—8 of Fig. 7;

Fig. 9 is a plan view showing a step in the construction of a plied insole in accordance with this form of the invention;

Fig. 10 is a transverse vertical sectional view taken through a completed insole in the vicinity of the line 10—10 of Fig. 9;

Fig. 11 is a transverse vertical sectional view through the forepart of another form of shoe constructed in accordance with the principles of this invention;

Fig. 12 is a transverse vertical sectional view through yet another form of shoe constructed in accordance with the principles of this invention; and

Fig. 13 is a fragmentary sectional view showing a unitary laminated sole blank being separated into an insole and outsole in a splitting machine.

Referring more particularly to the drawings, there is shown in Figs. 1 and 2 a blank, comprising a ply of outsole leather 10 and a ply of insole material 11 bonded to its flesh surface by a layer of cement or other suitable adhesive 12. The combined thickness of the plies 10 and 11 is equivalent to the combined thicknesses of an ultimately formed insole and outsole, the ply 11 being slightly thinner than the desired insole thickness. The ply 10 therefore is only slightly thicker, or may be of the same thickness as that of an outsole in an ordinary McKay or similarly lasted shoe. For example, the combined thickness of the entire blank comprising piles 10 and 11 may be on the order of 11 or 12 irons for a woman's shoe, and the outsole ply 10 may make up from 7 to 9 irons of this entire thickness. Such stock is less expensive than outsole leather having the entire 11 or 12 iron thickness would be. The insole ply 11 may be made of any suitable inexpensive material, such as "flexible split" leather or any of the commercially available manufactured composition insole material having characteristics fitting them for use in the presently described construction, such for example as those made from fibrous pulps.

A number of these blanks are formed, and the plies 10 and 11 may, if desired, be superposed while in sheet form and later divided into separate blanks such as those shown in Fig. 1. A required number of right and left sole units of a given size are then rounded out from these blanks, a right unit for example being shown in Fig. 3. Each unit, comprising the bonded plies 10 and 11, is separated along a plane extending only slightly, say one or two irons, below the joining surfaces of the plies 10 and 11 as defined by the cement bond 12. Preferably, in order to provide the full advantages of this invention, this separation of the stock is effected in accordance with the teaching of the above mentioned Sbicca patent by splitting the unit from the heel to the ball line and around the marginal portions of the forepart along the above described plane which is located just below the cement bond 12, while leaving a raised or landed area 13 at the central forepart portion of the outsole and a cut away opening 14 at the central forepart portion of the insole which exactly complements the shoulders defining the landed area 13. This method of splitting the sole unit may preferably be effected by means of special sole splitting apparatus of the kind disclosed in a copending application of William C. Card, Jr., Serial No. 748,979. The apparatus disclosed in such Card application includes a pair of pressure rolls 18 and 19 and a straight-edged splitting knife 20, as shown in Fig. 13. The roll 19 has a projecting die 21 which is shaped to contact and flex the central forepart portion of a rounded sole blank into a complementary matrix or recess 22 on the opposite pressure roll. As a composite sole blank passes between these rollers, its central forepart area is temporarily flexed out of the plane of the remainder of the sole stock by the die and matrix, and as the rolls rotate, they urge this portion of the sole blank past the straight-edged knife while the sole blank is in its flexed condition. This enables the knife to pass over the central forepart portion of the sole blank while splitting the remainder of the blank in the ordinary manner, preferably at a plane within the ply 10 and closely adjacent the mating faces of the two plies 10 and 11. Passage of the sole blank between such rollers and past the knife splits it into an insole and outsole respectively having a perforated central forepart portion and a complemental raised land. If desired, this separating operation may be effected by utilizing the three cut process described in the Sbicca patent. The knife designated 15 which is shown in Figs. 3 and 4, is only intended diagrammatically to indicate the nature of the contemplated separation of the sole unit into separate insole and outsole parts.

The insole thus formed comprises the original ply 11 of insole material and a thin split 10' comprising stock removed from the flesh side of the outsole leather 10. The outsole throughout most of its extent is formed of a single ply of grain sole leather having a landed area 13 at its central forepart portion, which area comprises the original stock 10 plus a cut off portion of the ply 11 which is cemented thereto.

The insole next is preferably trimmed around its marginal edges as indicated at 16 so that it is of less extent than the corresponding outsole, as is customary and desirable for the assembly of these parts in a shoe. The split surfaces comprising the under side 10' of the insole and the upper side of the outsole, after separation of these parts, are generally smooth and well finished, and free from marks such as are usually imposed by the feed wheel or pressing equipment of rounding machines, trimming machines, and the like. For this reason, in assembling an insole and outsole in a shoe, it is preferred to take the insole which has been split from a right sole unit and reverse it, assembling it with an outsole which has been split from a left sole unit. That is, a right insole, after splitting, is turned over so that its upper ply 11 faces or opposes the outsole in the assembled shoe (Fig. 6) and its smoothly shaved upper ply 10' is faced uppermost in the finished shoe. This procedure is desirable when the ply 11 is formed of "flexible split" leather in that it turns down the rough flesh surface of such leather out of sight and substitutes therefor a smooth split surface comprising grain stock from the outsole 10. It also is a desirable procedure when manufactured compositions of plant fiber or the like are used for the ply 11, since by fol-

lowing it the latter is concealed, except at the landed area in the forepart of the shoe, and a smooth split surface comprising grain stock from the outsole 10 is exposed at the heel, shank and marginal forepart portions of the interior of the shoe. Even when so reversed, these soles are adapted to retain their characteristic close fit, especially if they have been separated on a splitting machine of the kind shown in the mentioned Card application.

The present invention is more particularly directed to the above type of shoe wherein the laminated split off insole is reversed prior to its assembly with a mating outsole in the shoe. These laminated Sbicca type complementary insoles and outsoles, together with a shoe embodying the same, are disclosed and claimed in a copending application of Frank Sbicca, Serial No. 42,902, filed September 30, 1935.

In forming the shoe, the insole comprising layers 11 and 10' is located on a last with the layer 10' facing the last bottom. An upper 17 is pulled over and lasted to the insole in any suitable manner, preferably by means of cement. The overturned lasting allowance of the upper is trimmed, roughed, etc., in accordance with the usual procedure so as not to encroach on the opening 14 in the insole, and the outsole 10 is thereafter attached thereto with its landed area 13 fitted within the opening in the insole so that its upper surface extends flush and even with the upper surface of the insole on the finished shoe, and closely fits therewith entirely around its boundary. The sole is preferably cement affixed to the upper, although other affixing means may be employed if desired.

The adhesives or cements used may be of any suitable kind. Preferably the cement bond 12 between the sole unit plies 10 and 11 is a permanent rubber cement, as this lends itself well to the splitting operations at the forepart and also is not subject to dissolution when solvents for pyroxylin cement are applied to adjacent shoe parts during lasting and/or sole affixing operations. Pyroxylin cement is preferably used in lasting the upper and in affixing the outsole to the lasted upper. However, as explained, other forms of adhesive or other kinds of affixing means may be used for these operations.

A shoe constructed in this manner possesses substantially all of the advantages that characterize "single sole" shoes having a perforate insole and mating landed outsole, while providing substantial net economies over processes heretofore used to make such a shoe.

In Figs. 7 to 11 there is shown another form of construction involving the provision of a landed outsole, made from stock of approximately conventional thickness, and a mating plied insole. Here there is provided a rounded outsole 110 which has a very thin insole layer 110' split therefrom, preferably by means of a splitting machine such as that shown in the above mentioned Card application, so as to leave a slightly raised landed portion 113 in the central forepart area of the outsole. The stock removed at 110' may be quite thin, say on the order of two irons or less in thickness.

The layer 110', which has a looped centrally perforate forepart portion, is laid over a blank comprising a ply of insole material 111, which may be of "flexible split" or any suitable manufactured composition and which may be somewhat thinner than an ordinary insole. These parts are placed together between the pattern and clamp of a rounding machine (not shown) and are rounded to insole size along the marginal boundary 116, indicated in dotted lines. The layer 110' and the ply 111 are then attached to each other over their adjacent surfaces by a bond 112 of suitable cement, such as rubber cement or pyroxylin. This forms a composite insole assembly having a concave forepart portion indicated at 114 which complements a landed portion 113 of the outsole.

This composite insole assembly is located on the bottom of a last with its concave side facing outwardly. In Fig. 11 a round bottom last is shown, as this facilitates the assembling of the shoe parts and enables the upper lasting allowance to be accommodated without requiring roughing or trimming operations to remove material from the outsole margin. If such operations are employed, however, a flat bottom last may be used with satisfactory results. An upper 117 is then pulled over the last and its lasting allowance is lasted to the portion 110' of the insole assembly. It is trimmed and roughed so as to present a feathered edge adjacent the margin of depression 114, the trimming being such as to assure termination of the lasting allowance at or outwardly beyond the edge of such depression. The central forepart portion of the ball of the lasted upper accordingly presents a concave depression, and the outsole 110 is located on the bottom of such lasted upper with its land 113 mated in and substantially entirely occupying such depression. The concavity of the round bottom last enables the outsole to be pressed and fitted tightly against the upper until the top boundary of this landed portion substantially coincides with the inner edge of the opening of insole layer 110 at the point designated 114 in Fig. 11, despite presence of the extra upper material comprising the lasting allowance between the insole and outsole. This construction affords a shoe having compactly interfitted parts which does not necessitate the provision of a loose cork filler or the like at the ball portion, since the depression there occurring is filled by the landed area in the outsole. Such shoe has much of the flexibility of the first described form and is strong and neat in appearance.

The upper lasting and sole affixing operations are preferably carried out with a suitable adhesive such as pyroxylin cement or the like.

In Fig. 12 there is shown another form of shoe having many of the characteristics of that shown in Fig. 11, but which may be lasted on a flat bottom last without roughing or otherwise removing material from the outsole to accommodate the lasting allowance. Since many factories are now equipped with these lasts and are consequently unwilling to incur the expense of replacing them with the round bottom lasts which are perhaps better suited to the Sbicca-type of operations, it is desirable to provide a construction with which such present equipment may be utilized. Also, shoes having a landed outsole and a mating perforate insole are now very popular in the trade. An arrangement such as that shown in Fig. 12 provides a shoe having the appearance of such a landed and apertured sole construction when the interior of the shoe is viewed, as well as certain other characteristics of such a construction. This arrangement comprises a composite insole comprising plies 111 and 110' constructed in the same manner as the insole shown in Figs. 10 and 11. This insole is located on the bottom of a last with its ply 110' facing the last bottom,

or in a reversed position from that shown in Fig. 11. The interior of the ultimately completed shoe therefore has the appearance of the interior of a Sbicca-type shoe, with a marginal insole portion showing around the forepart which is flush with the portion of ply 111 that shows through the aperture in ply 110'. If desired the lasting, from this point onward, may be completed on a round bottom last, as in Fig. 11, by pulling over and lasting the upper to the insole, and locating and affixing a landed outsole, which is formed when making the ply 110', to the shoe bottom with its landed portion registering with the thin single ply portion at the forepart of the composite insole.

When a flat bottom last is to be used, however, the upper lasting allowance is preferably lasted to the ply 111 of the insole, and a filler piece 18, of composition, leather stock, or the like is placed in the central forepart area of the shoe bottom. This piece has a thickness approximately the same as that of the upper materials located between the insole and outsole, so that the outsole, which has only a small land, may be pressed against the shoe bottom with its land seated against and supported by the filler piece, as shown in Fig. 12. The filler piece may also be attached to the insole ply 111, in this same relative position, prior to the lasting operations, in which case the upper lasting allowance will overlie its edge portions.

While preferred illustrative embodiments of the invention have been described and illustrated in detail, it is to be understood that these are illustrative and that various changes may be made without departing from the purview of the invention. Thus, the order of steps particularly described need not be strictly adhered to so long as the shoemaking methods taught are generally followed. The plies of the insole, for example may be cemented together before the outsole units such as 10 and 110 are split, or after, as desired. Also, a laminated unit such as that shown in Fig. 2 may be made up of more than two plies, if desired, in which case the severing split may be made at any chosen plane. Even with a two ply unit, as in Fig. 2, the insole separating split may be made above instead of below the cemented bond 12, in which case the outsole would be laminated so as to show a welt-like construction at its margin, when assembled in a completed shoe.

It will be seen that there has been provided a method and a shoe construction which are well adapted to fulfill their intended functions.

Since certain changes in carrying out the above process, and certain modifications in the article which embody the invention may be made without departing from its scope, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

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

1. In a method of making shoes, the steps comprising forming composite sole blanks by cementing a ply of insole material to a ply of outsole leather, rounding sole units from said blanks suitable for the right and left feet, splitting each of said units along a plane below the cemented bond between said plies to form a two-ply insole and an outsole, reversing an insole from a sole unit rounded for one foot, and assembling it in a shoe with an outsole from a sole unit rounded for the other foot with the split face of said reversed insole uppermost in the finished shoe.

2. In a method of making shoes, the steps comprising forming composite sole blanks by cementing a ply of insole material to a ply of outsole leather, rounding right and left sole units from said blanks, separating the heel, shank, and marginal forepart portions of each of said units along a plane below that of the cemented bond between said plies to form a two ply insole and an outsole, while leaving a raised landed area at the central forepart portion of the outsole and a corresponding cut away opening at the central forepart portion of the insole, reversing an insole from a right sole unit and assembling it, in a shoe, with an outsole from a left sole unit with the split face of the insole uppermost in the finished shoe.

3. A method according to claim 2, in which a manufactured composition is provided as the ply of insole material.

FRANK MAIELLANO.