Aug. 1, 1939. S. WEXLER 2,167,858

SHOE AND METHOD OF MAKING SAME

Filed Sept. 16, 1936 3 Sheets-Sheet 1

Fig. 1

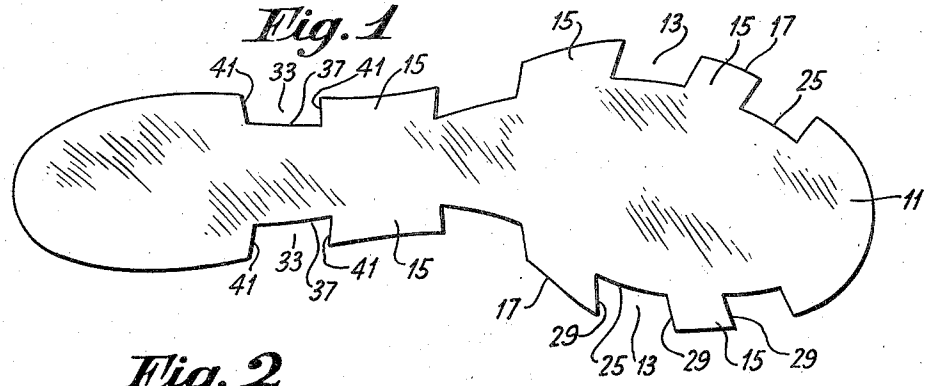


Fig. 2

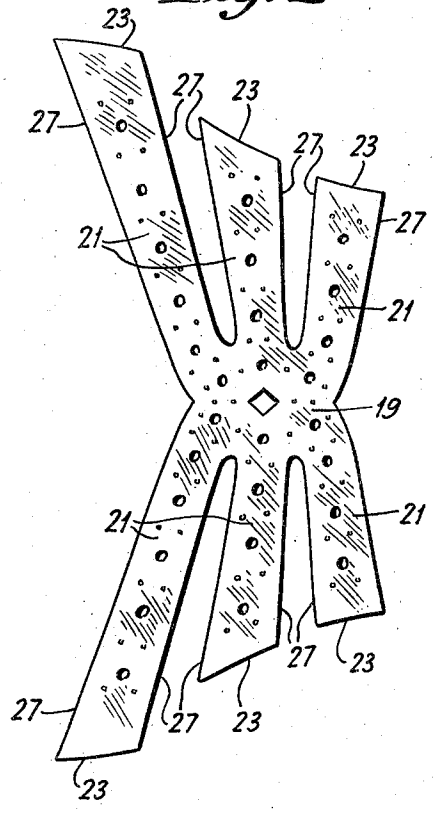
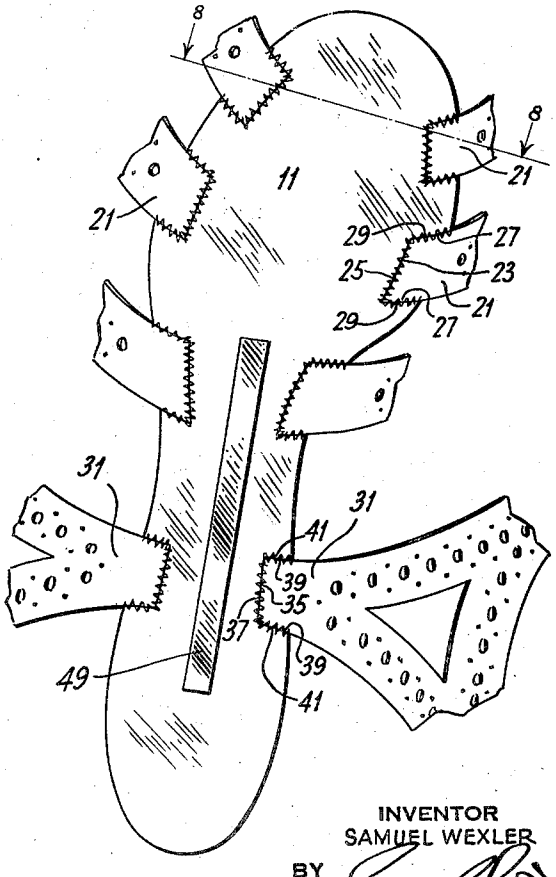


Fig. 3



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Fig. 4

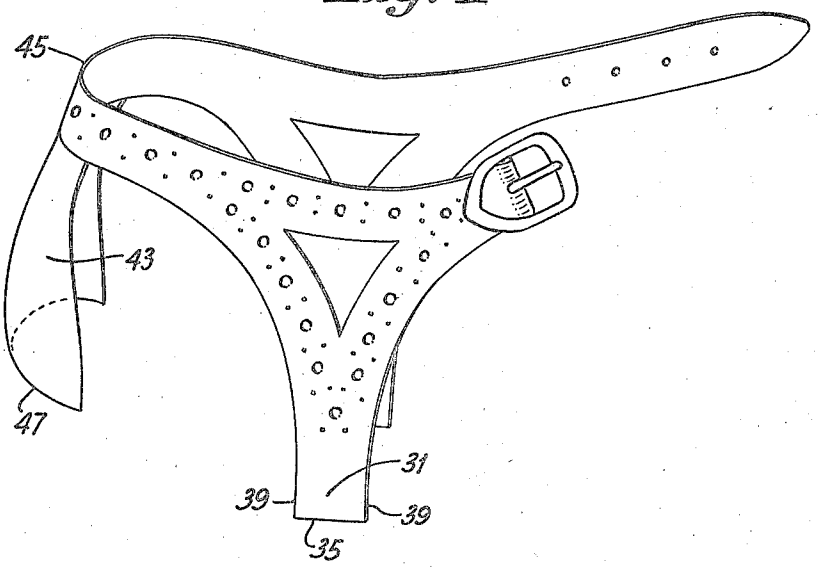
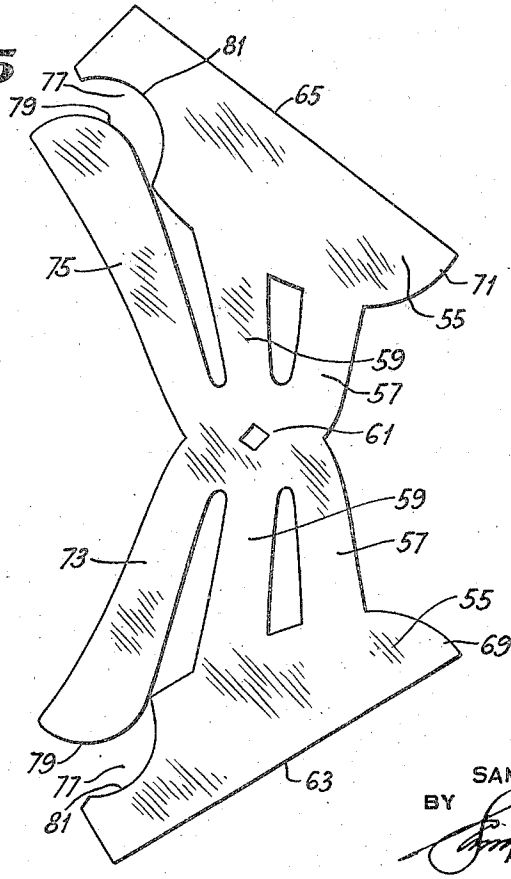


Fig. 5



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Fig. 6

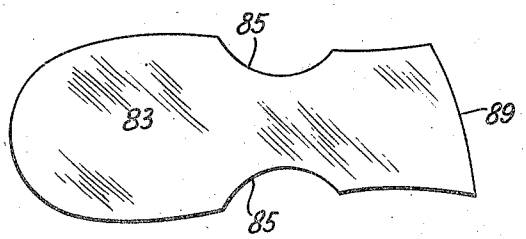


Fig. 7

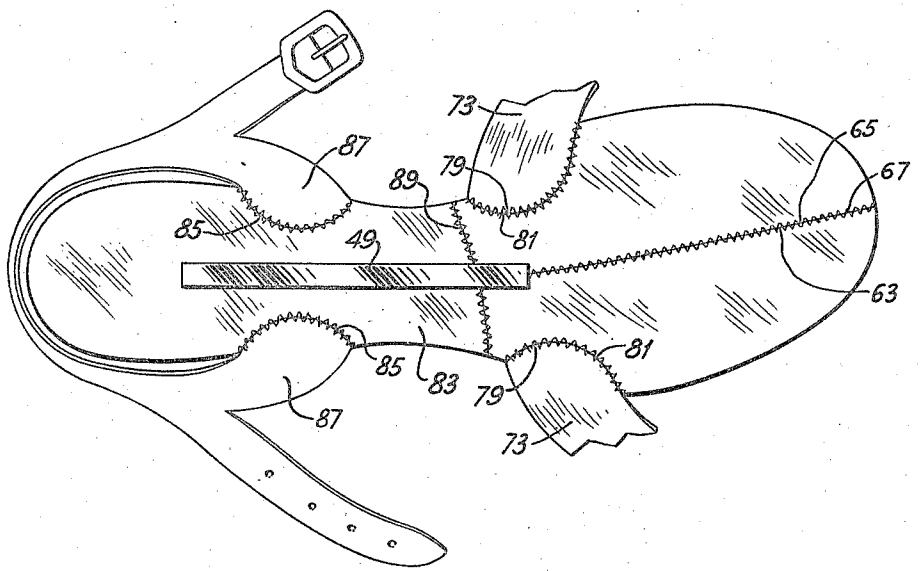
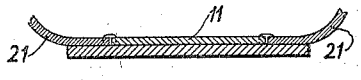


Fig. 8



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UNITED STATES PATENT OFFICE

2,167,858

SHOE AND METHOD OF MAKING SAME

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Application September 16, 1936, Serial No. 100,979

2 Claims. (Cl. 12—142)

The present invention relates to the manufacture of footwear. Among the forms of footwear to which the present invention is particularly applicable insofar as a new process which will improve the manufacture of shoes is concerned are the types of shoes which embody a substantial amount of so-called open work. Such shoes include evening slippers, sandals, Oxfords and scuffs, and, in fact all types of open work shoes, although, as will be apparent from the description which is to follow, the invention is by no means restricted specifically to these forms of footwear.

In the manufacture of footwear, it has, in the past, been customary to form or build shoes in such a manner that the time consuming and expensive lasting process could not well be avoided if the final product was to be of a type which would retain its shape, and, at the same time, be comfortable to the wearer at all times and still always be neat in appearance.

By the prior art the shoes are customarily formed from an upper or vamp portion which is fastened to an inner sole and after the shoe is suitably lasted, the main sole is attached to the lasted upper. In the case of open work shoes the strap ends, according to known methods of manufacture, are suitably fastened, usually by tacking, in the lasting process to the under surface of the inner sole. When so formed, the strap portions of the upper then overlap the under surface of the inner sole and in the lasting process the strap ends are stretched tightly over the edges of the inner sole prior to fastening. After the strap ends are fastened a suitable filler is pressed between the overlapped strap portions and the inner sole, so that a final uniform thickness surface results. However, when so manufactured, the thickness of the sole portion of the shoe which is to be attached to the main sole is then equal to the thickness of the inner sole plus the thickness of the strap ends and/or the filler.

After the strap ends have been fastened to the under surface of the inner sole in the lasting process and secured thereto by tacking or the equivalent, the completely lasted shoe is placed in a suitable machine, which is operated usually under high air pressure, to cause the main sole to adhere to the lasted inner sole and shoe upper. Prior to this operation a suitable adhesive material has been spread across the adjoining surfaces of the assembled shoe upper and inner sole and the main sole, or either of them. Such a machine to assemble and press together the shoe upper and main sole may be, for example, one of the type known and sold under the trade name "Compo", although any other similar type machine may be used equally as well. For convenience of reference such a machine will herein be referred to as a pressure machine.

In order to form the heel and counter portion of the shoe, just prior to the placing of the lasted shoe in the pressure machine which is to press the main sole to the assembled upper a shank iron is usually placed in the area corresponding to the arch. Under the influence of the air pressure from the pressure machine the leather forming the main sole assumes the shape of the shank iron and the arch of the shoe is rigidly supported by the shank iron.

This process of the prior art is expensive due to the time consumed in the lasting process and the capital investment therein due to the many and varied lasts required. It requires great care in manufacturing to provide shoes of uniform size, since slight differences in the tension to which the shoe upper portion is stretched over the inner sole in lasting will change the size of the finally manufactured shoe. At the same time, due to the necessity of tacking the upper to the inner sole, if the lasting processs is followed, manufacturing expense is involved and this can be avoided by the invention to be described herein.

The uniformity of size of a shoe manufactured by the prior art processes can be obtained only provided identical strap lengths are tacked or otherwise fastened to the lower or under surface of the inner sole, but, due to stretching with different tension and non-symmetrical tacking, the shape of the finally manufactured shoe may be slightly distorted with a resultant loss due to inability to sell such shoes except as "seconds." Further than this, the shoe may be completely ruined in the manufacturing process due to damage resulting from stretching too tightly in the lasting process, and, such shoes as are not entirely damaged but are sold as "seconds" are a loss to the manufacturer and to the buyer because they fit poorly, fail to maintain proper shape, and do not give the comfort to be expected. Thus, any process by which such difficulties can be overcome will be of benefit to manufacturers and to the consuming market.

According to the present invention, it is an object to overcome these objectionable features of the prior art and also to provide a shoe which will give greater comfort to the wearer and at the same time to provide a shoe manufacturing

process which will permit the buyer to be able to purchase shoes more cheaply, while still being assured of good wearing qualities and trim appearance.

Another object of the invention is to provide a shoe which shall have a smooth inner sole surface even after long periods of wear.

A further object of the invention is to provide an improved method of manufacturing shoes which will permit the complete omission of the lasting process, and thus reduce manufacturing expense.

Another object of the invention is to provide a shoe which will have a more flexible sole than those shoes which are built accordiing to the usual and commonly used process of shoe manufacture.

A further object of the invention is to provide a shoe in which it is necessary in the manufacturing process to design only a single width upper for any one shoe length irrespective of the width of the finally manufactured shoe.

A further object of the invention is to provide a process of manufacturing shoes which will be considerably quicker than the presently known process.

A still further object of the invention is to provide a process of manufacturing shoes in which the use of a filler between the main sole and the inner sole is entirely unnecessary.

A still further object of the invention is to provide a shoe which can be manufactured more cheaply, which will maintain a trim and neat appearance, which can be manufactured with great savings in stock materials and which will provide utmost comfort for the wearer.

Still another object of the invention is to provide a shoe manufacturing process wherein damage of shoes in manufacture will be substantially eliminated due to the complete avoidance of the lasting step in the manufacturing process.

Another object of the invention is that of saving manufacturing expense due to purchasing of lasts. Lasts are expensive and styles change rapidly so that by avoiding the requirements and needs of lasts the expense to the manufacturer and the capital investment in lasts is substantially eliminated.

An additional object of the invention is to provide a process for manufacturing shoes which when utilized will reduce substantially the stock of upper materials which the manufacturer must keep on hand and available, and further to reduce the number of cutting dies for forming the uppers, since, as will be apparent from the following specification, for any one shoe length the same design and style and size of upper may be used for all shoe widths within any specific length.

Still other and further objects of the invention will become apparent and at once suggest themselves to those skilled in the art to which this invention is directed, by reading the following specification and claims in connection with the accompanying drawings, wherein—

Fig. 1 schematically represents an inner sole cut in one of the many suitable forms required for manufacturing shoes in accordance with the present invention;

Fig. 2 illustrates one form of shoe upper which may be assembled with the inner sole of Fig. 1;

Fig. 3 illustrates the manner of assembling the upper portion of Fig. 2 to the inner sole of Fig. 1 prior to the attachment of the main sole;

Fig. 4 illustrates schematically the rear or heel portion of the shoe which is to be attached to the inner sole of Fig. 1;

Fig. 5 illustrates a modified form of shoe upper;

Fig. 6 illustrates a modified form of inner sole;

Fig. 7 illustrates the manner of assembling the modified upper of Fig. 5 with the modified inner sole of Fig. 6; and

Fig. 8 illustrates schematically a section on the line 8—8 of Fig. 3, it being assumed, however, that the main sole has been attached to the inner sole.

Referring now to the drawings for a further understanding of this invention, in building a shoe of the type herein described, an inner sole 11 of the general form shown by Fig. 1 is first formed with a serrated edge which has been illustrated schematically in one form by the notched recesses 13, so that tab portions 15 extend outwardly from the innermost portion of the inner sole. It, of course, will be appreciated from what is to follow, that it is unnecessary that the serrated edge portion of the inner sole be formed from notches of regular formation to practice the present invention, since the serrated edge may be formed with V-shaped notches, scalloped, semi-circular recesses, or for that matter, any desired type of irregular contour, into which the upper portion of the shoe may be fitted. The edges 17 of the tabs correspond to the normal outer boundary of the inner sole prior to forming the serrated edges and the recesses 13, so that the shoe size, insofar as length and width are concerned, will be in conformity with the size of the inner sole and, as will herein become apparent, the depth to which the recesses 13 are cut.

After the serrated inner sole has been formed, the upper portion of the shoe shown by Fig. 2 must be assembled therewith. According to the prior art, this assembling process would require a lasting operation, but in accordance with the present invention, the shoe upper which comprises the vamp 19, has extending from either side thereof strap portions 21 which when formed into a finished shoe have a symmetrical appearance. In cutting the strap portions 21 opposite strap portions are generally of unequal length, that is, the inner ends are usually shorter, in conformity with foot formations, although it will be appreciated that for a specially designed shoe to fit a peculiar foot formation, these straps may be of equal length.

In assembling the shoe, the ends 23 of straps 21 are cut or shaped in a manner which is complementary to the recesses 13 insofar as the inner sole is concerned and thus the upper when assembled with the inner sole will fit exactly into the recesses 13 of the inner sole 11 when the ends of the shoe upper are placed in the inner sole recesses so as to form abutting edges with the edges of the recesses. In this manner, it will be appreciated that with the form of recess shown for the inner sole in Fig. 1 the end edges 23 of the straps 21 will abut the inner edges 25 of the recesses 13 and the side edges 27 of the straps 21 will then fit exactly against the side edges 29 of the recesses 13.

After the shoe upper has thus been fitted into the notches or recesses 13 in the inner sole and held securely in this position the inner sole and the upper is then placed in a stitching machine, such as that known in the art as a "Zigzag" stitching machine, and the abutting edges of the insole and shoe upper are suitably attached to each other by stitching, as shown by the dotted lines of Fig. 3 of the drawings. In the process of

stitching the upper to the inner sole the stitching machine itself forces the tabs of the shoe upper closely against and into the serrated portions of the inner sole so that the size of the shoe, insofar as the width is concerned, will be determined by the depth to which the recesses of the inner sole are cut or the length of the straps 21. Once the upper is stitched into the inner sole, the upper will be held securely thereto by the stitching process.

It will be understood that other means of fastening the upper to the inner sole may be relied upon where desired. Such forms of fastening may include stapling, gluing, the pasting of a separate auxiliary inner sole (that is, an inner sole lacking any serrations) completely over the lower portion, or by other desired means.

It has been above suggested that only one size shoe upper portion is required for all shoe widths within any given shoe length. Accordingly, to illustrate this step in the process, where it is desired, for example, to form a shoe of an "A" width, the recesses 13 in the inner sole may be cut deeper into the inner sole than the recesses shown in Fig. 1, whereas, where it is desired to form a wider shoe such, for example, as a "D" width shoe, the recesses 13 of Fig. 1 will not be cut as deep as that shown, it being assumed for the purpose of illustration that the drawings illustrate the usual model width "B".

To form the counter and heel portion of the shoe, reference may be had to Fig. 4 which illustrates in elevation the rear fastening strap and counter. This portion of the shoe is preferably assembled separately from the vamp portion and the inner sole, and when so assembled, has the strap portions 31 fitted into the notches 33, formed similarly to the notches 13, so that the edges 35 abut the edges 37 of the recesses or notches 33. Similar to the manner of attaching the vamp to the forward portion of the inner sole, the edges 39 of the strap 31 fit against the edges 41 of the recesses 33. The manner of attaching the strap ends 31 to the inner sole is also accomplished by the use of a stitching machine, the stitching being indicated in Fig. 3 and accomplished by a machine such as that known in the art as a "zigzag" machine, or like the fastening of the forward portion of the upper to the inner sole this may be stitched by hand or attached in any one of the ways above suggested. The counter portion 43, while shown by Fig. 4, may, where desired, be completely omitted, since the portion or strap 45 is sufficient to hold the shoe securely to the wearer's foot. If the counter portion 43 is required, however, it is desirable, in view of the length and extent of the lower portion 47 thereof, which must fit beneath the inner sole in order to make a smooth and uniform backing for the shoe to last this portion of the shoe in the usual manner. This lasting step requires only a very simple operation and it is always customary in making shoes to place the shoe over a last in order to add the heel. However, if the back or counter portion of the shoe is narrower than that illustrated so that there is not a large expanse of leather which must be molded into a smooth fitting form, then it will be appreciated that the same method used for attaching the strap portions 31 of the rear portion of the shoe or the straps 21 of the vamp portion may be utilized and the stitching or stapling or gluing process again followed. In any event, if the counter portion of the shoe is lasted it will be appreciated that the operation is quickly accomplished and each last is in use but a small fraction of the time per shoe as contrasted with prior art methods for lasting a complete shoe.

Still further because of this fact very few lasts would be required for large factory output where only the counter and heel portion of the shoe is lasted and, thus, only a small capital investment need be made in lasts and replacements are a minimum as the style of the shoe counter does not change appreciably with time.

After the complete shoe upper has been attached to the inner sole according to the foregoing description, the shoe is completely formed, except for the necessity of adding the main sole and heel. The main sole then is attached by the previously described usual and known processes and the manufacturing step embodies coating the bottom surface of the inner sole with an adhesive material and also, although perhaps not always necessary, coating the inner or upper surface of the main sole with a similar adhesive material. After this step has been accomplished, the upper portion is placed within a compressing or pressure machine above described which also supports the main sole and under the application of air pressure, the main sole is pressed against the inner sole and secured permanently thereto. Since the arch and heel portion of the inner sole must be elevated relative to the forward portion of the sole in the manufacturing process just prior to placing the assembled upper and inner sole within the compressing machine, a shank iron 49 is positioned between the main sole and the inner sole and is also pressed into place by the application of air pressure.

After this operational step has been completed, the shoe is entirely formed, except for the addition of the heel, which may be of any desired type. The heel is secured to the rear portion of the main sole and heel portion of the inner sole in the manner customarily adopted in shoe manufacture.

From the foregoing description, it will be seen, due to the fact that the upper or vamp portion of the shoe is merely fitted within the recesses 13, which recesses need not be cut to any substantial depth within the inner sole, that considerable material and stock may be saved in the manufacturing process.

If a lasting process is resorted to in the formation of the shoe counter then the upper strap portions must be overlapped to a considerable extent and the edges skived to provide for uniformity and to prevent unevenness, and further, filler material is required between the underlapped edges of the upper and inner sole.

According to the method above described, since the thickness of the inner sole and the straps 21 and 31, for example, are substantially identical, it will be appreciated that the thickness at the insole of the assembled upper and inner sole will be exactly the same and no filler material will be required. This has been shown, for example, in Fig. 8 of the drawings, although Fig. 8, while being indicated as a section through Fig. 3, is assumed to be a section cut after the main sole has been assembled with the upper and inner sole attached to each other.

Turning now to a modified form of the invention, reference may be had to Figs. 5, 6, and 7, where the inner sole has been shown as being in part integral with the shoe upper. When so arranged, the inner sole portions 55 extend outwardly on either side of the two forward straps 57, 59 of the vamp 61. When these two portions

are folded back and their edges 63 and 65 are stitched together by means of stitches 67, as shown more particularly in Fig. 7, to form the forward part of the insole the combined upper and inner sole have been formed so far as the forward portion of the shoe is concerned.

After the edges 63 and 65 have been stitched together, it will be seen that the portions 69 and 71 of the inner sole sections 55 form the toe portion of the shoe, and the straps 57 and 59 together form the forward portion of the shoe upper. The rear straps 73 and 75 respectively are then fitted into the notched portions 77 formed on the rear ends of the inner sole sections 55. When the edged contour 79 of straps 73 and 75 fit exactly with the edged contour 81 of recesses 77 of the inner sole sections 55, they are then stitched as indicated by Fig. 7. The small sectional inner sole 83 shown by Fig. 6 also has notches 85 cut therein and into these notches the strap members 87 for the shoe counter are fitted and stitched similarly to the manner of stitching the other strap portions already described and at this time the forward edge 89 of the inner sole 83 is then fastened by stitching or stapling or in similar manner to the formed complete inner sole made from the separate sections 55 so that there is then assembled solely by a stitching process a complete shoe formed to size in substantially the same identical manner as was described in Figs. 1 through 4. The assembled shoe is then ready for attachment of the main sole. The process followed to attach the main sole is that process already described in connection with the description of Figs. 1 to 3.

In connection with the modified form shown by Figs. 5, 6 and 7, it will, of course, be appreciated that changes in the shoe width cannot be made by variation in the depth of the notches alone, such as was shown by Fig. 1, but in this connection, the width of the shoe is controlled by varying the edges 63 and 65 of the inner sole sections 55. For the purpose of designing one form of combined upper and inner sole which shall be adaptable to all widths of shoes, it has been found most convenient to design the shoe for the maximum width and then by cutting the edges 63 and 65 backward from that shown, narrower widths of shoes may be formed in the assembly.

In practice, these varying widths may be readily cut in any desired type of cutter. The measurement process for gauging the different width shoes is of extreme simplicity and is not, per se, a part of the present invention.

While the invention has been described herein as if the main sole were always to be required it will be obvious to those skilled in the art that the main sole may be dispensed with in some instances. This would be particularly the case where the shoe is not built for street usage or other hard wear and would apply particularly in the case of sandals, scuffs, bedroom slippers, moccasins or the like. The omission of the main sole portion is possible because the strap or tab portions of the upper form with the inner sole of the first described modification a uniform thickness sole portion for the shoe, and, similarly, with the second described modification the upper being formed to form the forward portion of the inner sole to which the rear portion of the inner sole is attached makes a member of uniform thickness. If a lasting process of shoe formation were to be resorted to the combined thickness of the underlayed upper and inner sole would not be of the same thickness and thus a shoe having a flat sole could not be used unless a filler be inserted, but this defect is overcome fully by the present invention.

From the foregoing description, it will be appreciated that many and varied modifications of the principles herein disclosed may be made and resorted to without departing from the spirit and scope of the present disclosure, and, therefore, I believe myself to be entitled to make and use any and all modifications which fall fairly within the scope of the hereinafter appended claims.

Having now described my invention, what is claimed and desired to secure by Letters Patent is the following:

1. A shoe blank for forming both the upper and inner-sole portion of a shoe comprising a pair of inner-sole forming members and at least one upper forming member joined to the inner-sole forming members, said inner-sole forming members each having outer edges of substantially complementary pattern, each of said inner-sole forming members also having a recess in its inner edge, and at least two upper forming members each having one end connected with the upper forming member joined to the inner-sole forming members and each having its opposite end of a configuration complementary to the corresponding recess in the inner-sole forming member.

2. The method of fabricating shoes which comprises preparing a blank having a pair of substantially similar outer sections with substantially complementary shaped outer peripheries and a plurality of strap-like upper forming members joining together said outer members and a plurality of strap-like members extending from the central portion of the first named strap-like formation and having the ends thereof free, folding the blank into a substantially looped shaped configuration to bring the complementary shaped outer peripheries of the two outer sections into substantial abutting engagement, securing the outer sections in the substantial abutting relationship so that the outer sections form an inner sole section and the joining members form a shoe upper portion, securing the free end of each of the free-ended strap members to substantially an extreme end portion of the adjacent one of said outer sections of the formed inner sole section, fastening an outer sole section to the outer surface of the formed inner sole to provide for shaping the shoe upper and for providing a substantially flat wearing surface for the formed inner sole and fastening the assembly to a heel section.

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