June 10, 1941. E. W. DUNBAR 2,244,868

MANUFACTURE OF SHOES

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Fig. 1

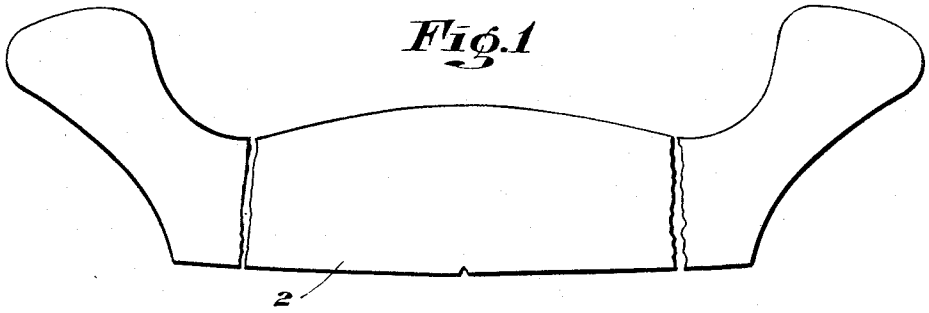


Fig. 2

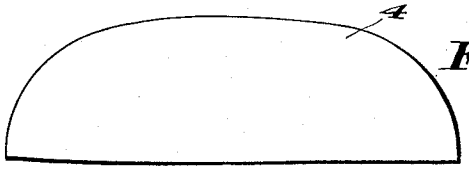


Fig. 3

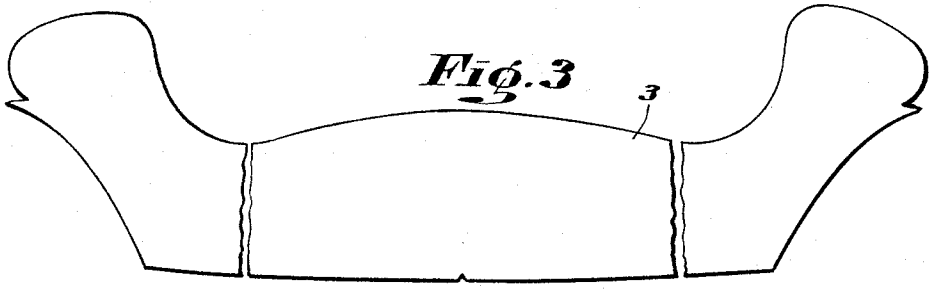


Fig. 4

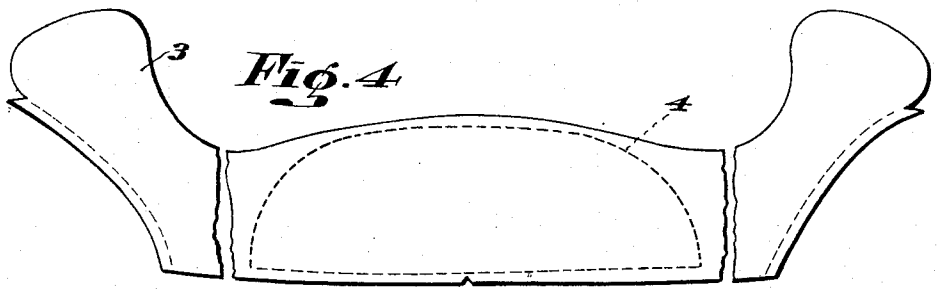
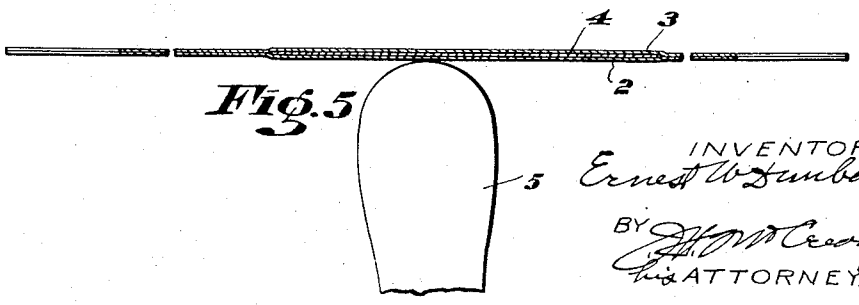


Fig. 5



INVENTOR:
Ernest W. Dunbar,
BY
ATTORNEY.

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MANUFACTURE OF SHOES

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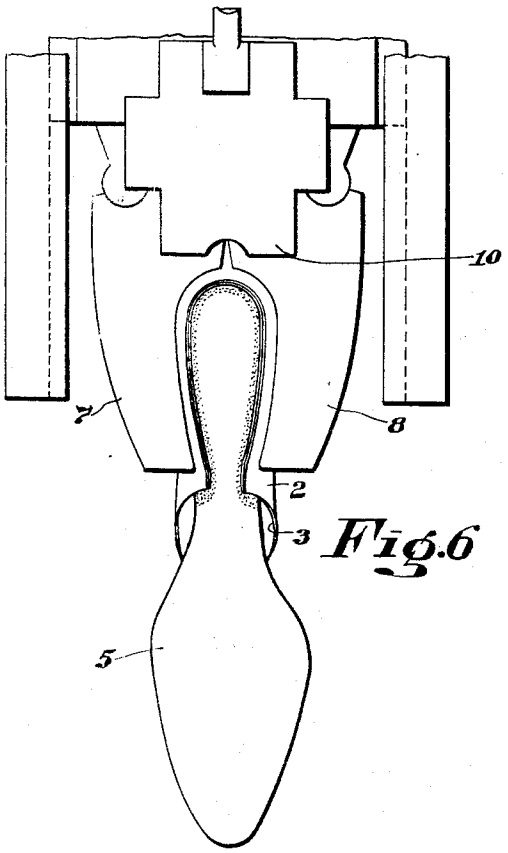


Fig. 6

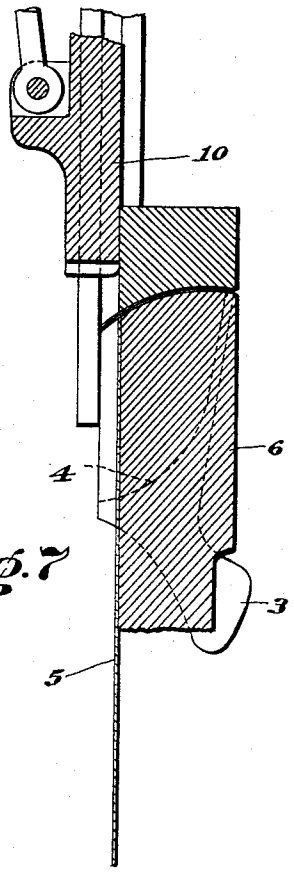


Fig. 7

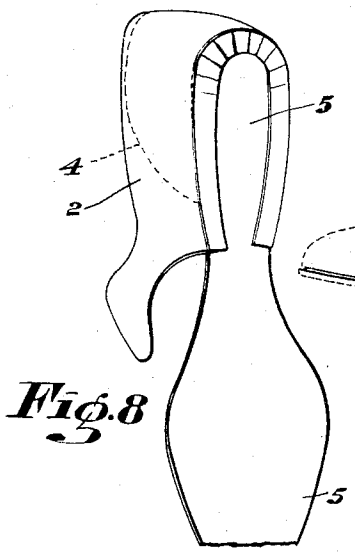


Fig. 8

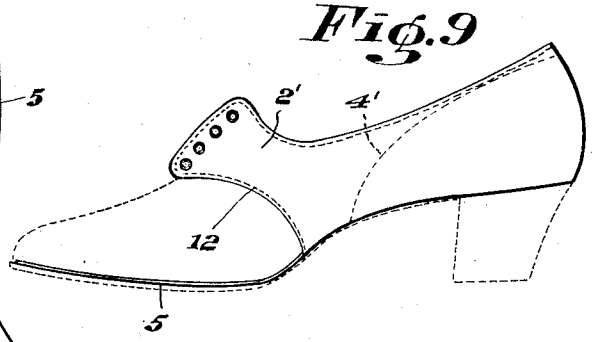


Fig. 9

INVENTOR:
Ernest W. Dunbar,
BY J. H. McCready,
his ATTORNEY.

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UNITED STATES PATENT OFFICE

2,244,868

MANUFACTURE OF SHOES

Ernest W. Dunbar, Hudson, Mass., assignor to Cambridge Rubber Co., Cambridge, Mass., a corporation of Massachusetts

Application February 9, 1935, Serial No. 5,709

4 Claims. (Cl. 12—146)

This invention relates to shoes, sandals, and other footwear, hereinafter included generically in the term "shoes." It aims to improve both the construction and methods of manufacture of shoes with a view to reducing the expense involved, while at the same time producing an entirely satisfactory product. The invention is more especially, but not exclusively, concerned with the method of manufacture of the heel portion of a shoe.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings, and the novel features will be particularly pointed out in the appended claims.

In the drawings,

Figs. 1, 2 and 3 are plan views of the quarter, counter stiffener and quarter lining, respectively, of a shoe;

Fig. 4 is a similar view showing these parts assembled;

Fig. 5 is a sectional view longitudinally of the assembly shown in Fig. 1, and illustrating its relationship to the heel end of the insole;

Fig. 6 is a front view showing the molding of the parts at the heel end of the shoe;

Fig. 7 is a vertical, central, sectional view of the structure shown in Fig. 6;

Fig. 8 is a perspective view of the parts at the completion of the molding step; and

Fig. 9 is a side view of a shoe embodying features of this invention.

Preliminary to a detailed description of the method provided by this invention, it may be pointed out that in the ordinary method of making a shoe the parts of the upper are first assembled and stitched together. These operations also are performed with the lining, and at some convenient stage in the process the quarter lining is secured to the quarter by the so-called "top stitching" operation. In connection with the assembling of these parts on a last preparatory to the lasting operation, a counter stiffener, usually molded to shape, is inserted between the lining and the quarter.

The present invention provides a more economical method of bringing certain of these parts of the upper together and securing them in their cooperative relationship to each other in a shoe.

According to the method of this invention the quarter 2, Fig. 1, the quarter lining 3, and the counter stiffener 4 are superposed one on another while these parts are in their flat condition, both sides of the counter stiffener 4 being first coated with a suitable adhesive, and this member being interposed between the quarter and the quarter lining. After being so assembled the parts are smoothed out and sufficient pressure is applied to them to cause both the quarter and the lining to adhere firmly to the opposite faces of the counter stiffener.

After the parts have been so assembled, and while the adhesive is still in a soft and relatively plastic condition, the assembly is taken to a counter molding machine and is there molded, and preferably, also, united to the rearward end of an insole. As shown in Figs. 6 and 7, the operator places an insole 5 flatwise against the outer face of the center mold 6 of the molding machine, the outer margin of the heel end of the insole being coated with cement, as indicated by the stipling in Fig. 6. The assembly above described is bent into a U-shape and inserted between the center mold and the side molds 7 and 8, with the desired margin of the upper material projecting beyond the outer face of the insole. The treadle of the machine is then tripped, whereupon the said molds move inwardly until they compress the sheet material between them firmly around the center mold and make it conform to the contour of the latter, and the wiper plate 10 then comes down across the faces of all three molds and crimps the projecting margins of the parts 2, 3 and 4 inwardly and irons them down flat against the outer surface of the insole, causing this inturned margin to be secured firmly to the edge portion of the heel end of the insole by the cement previously applied. As soon as the molds recede, the work may be removed from between them. At this time the parts are secured together in the relationship shown in Fig. 8.

In this molding step, therefore, the entire assembly illustrated in Fig. 4 is molded to the contour of the heel end of the last on which the shoe is to be made (since the center mold 6 is made of the same contour as the heel portion of said last) and, in addition, this assembly is correctly secured to the insole. Thus the counter molding and heel lasting operations are combined.

It should be understood that the entire assembly to be molded is properly moistened, "mulled," or "tempered" preparatory to this operation. Preferably, also, an adhesive of a plastic or pliable nature is used in securing the parts 2, 3 and 4 together. Such an adhesive may consist of a rubber cement, or, more preferably, of concentrated vulcanized rubber latex, or an adhesive compound in which it is the predomi-

nating constituent. Other elastic or plastic waterproof adhesives can, however, be substituted for it.

The vamp may next be secured to these parts of the shoe in the conventional manner by running the vamp seam 12, Fig. 9. A sewing machine of the Post type may conveniently be used in performing this operation. Subsequently a last may be slipped into this assembly, the vamp may be lasted over upon the insole and secured in its lasted position by cement, the outsole may be laid and secured to the upper and insole, the heel attached, and the other shoe making operations performed in any convenient manner. If desired, the vamping operation may be performed prior to the molding step, the point in the process at which the vamp is secured to the quarter being solely a matter of convenience. However, when the shoe is vamped before the counter portion of it is molded, it may be necessary, particularly with certain styles of shoes, to use a special center mold, the lower end of which will be cut away to avoid interference with the placing of the heel end of the shoe properly between the molds.

Whether or not the quarter lining and quarter are top stitched before these parts are cemented to the opposite surfaces of the counter stiffener 4, will depend a good deal upon the style and character of the shoe, and the manner in which it is desired to finish the upper edges of the quarters. If these parts are to be bound or folded, it probably would be preferable to perform these operations before securing the quarter to the counter stiffener.

This process effects a substantial economy in the manufacture of certain types of footwear, more especially those made by the method heretofore used in making rubber footwear and other types of shoes in which the union of the upper materials to one or both of the soles is of an adhesive character. It is well adapted to the manufacture of certain sport shoes, women's sandals, and the like, and is useful in making shoes having leather uppers as well as those in which the uppers consist of fabric or other sheet materials. Generally the counters incorporated in all of this footwear are made of fibre board, sole leather, or other relatively heavy materials, like those used in the manufacture of molded counters.

In some cases it will be found preferable, instead of uniting the counter assembly to the heel end of an insole, to secure the assembly to a heel shaped pad which is subsequently inserted between the insole and heel. Also, other fastenings, such as staples, can be used in securing the pad or the insole to the counter assembly. So far as this invention is concerned, however, such a pad may be regarded as the equivalent of the insole.

While I have herein shown and described a typical embodiment of my invention, it will be understood that minor changes may be made within the spirit and scope of the invention.

Having thus described my invention, what I desire to claim as new is:

1. As an article of manufacture and sale, a complete shape-retaining, finished shoe quarter ready for assembly as a unit with other portions of an open-shank shoe after the lasting operation has been completed, said quarter comprising side and end walls, the side walls merging smoothly with the end wall, the side walls having free downwardly extending edges of such a finish as to be acceptable to constitute exposed free edges in a completed shoe, the side and end walls having substantially the exact curved contour, in vertical planes at least, of the quarter of a completed shoe, and consisting of integrated layers of material, one of which is of a nature appropriate to constitute the outer finished surface of the quarter, one of which is of a nature appropriate to constitute the exposed inner or lining surface of the quarter, and one of which is of mouldable material normally stiff and which is capable of permanently retaining a contour imparted thereto by moulding pressure, and a moulding attaching flange at the lower edge of the quarter

2. That method of making, as an article of manufacture, a unitary finished end portion of a shoe upper ready for assembly with other parts of an open-shank shoe after the lasting operation has been completed, said method comprising as steps providing a blank of predetermined appropriate contour and consisting of lameller sheet material including plies, two of which are of a nature appropriate to constitute the exposed inner or outer surfaces respectively of said end portion of the shoe upper and one of which is normally of a shape retaining nature capable of permanently retaining a contour imparted thereto by molding pressure, causing said blank to become mouldably plastic, moulding said blank under pressure to form a shoe upper end portion having side walls and an end wall, the side walls merging integrally and smoothly with the end wall, the molding operation also forming an attaching flange joined integrally to the lower edges of the side and end walls, the molding operation also imparting to the side and end walls substantially the exact curved contour, in vertical planes at least, of the end portion of the upper of a fully completed shoe, causing the material of the moulded end portion to become stiff and permanently retentive of the moulded shape imparted thereto, and at any suitable stage in the process finishing the other edges of the rear and side walls by securing binding material thereto thereby to make such edges acceptable for exposure as free edges in a completed shoe.

3. The process of making a complete unitary finished quarter of a shoe ready for assembly as a unit with an insole, said method comprising the steps of providing a composite quarter blank of predetermined appropriate contour and including plies of sheet material with adhesive interposed between them and adapted to secure said plies together, two of said plies being of a nature appropriate to constitute the exposed inner and outer surfaces, respectively, of said quarter and one of which is a stiffener ply of a mouldable shape-retaining nature, normally stiff, and capable of permanently holding a contour imparted thereto by moulding perssure, tempering said composite blank to make it mouldably plastic, moulding said tempered blank under pressure to form side and end walls and to impart to the end wall and to the major part at least of the side walls substantially the exact curved contour, in vertical planes at least, of the quarter of a completed shoe with the side walls merging integrally and smoothly with the end wall, during said moulding operation forming an attaching flange joined integrally to the lower edges of said side and end walls, allowing the material of said stiffener ply to become stiff and permanently retentive of the moulded shape imparted thereto, and at any convenient stage in the process finishing the edges of said rear and side walls which are to be exposed in the completed shoe in such

a manner as to make them acceptable for such exposure.

4. As an article of manufacture and sale, a complete shape-retaining finished shoe quarter ready for assembly as a unit with an insole, said quarter comprising side and end walls, the side walls merging smoothly with the end wall, the side walls having edges finished in a manner acceptable to constitute exposed edges in the completed shoe, the end walls and the major part at least of the side walls having substantially the exact curved contour, in vertical planes at least, of the quarter of a completed shoe, the quarter comprising integrated layers of material, one of which is of a nature appropriate to constitute the outer finished surface of the quarter, one of which is of a nature appropriate to constitute the exposed inner or lining surface of the quarter, and one of which is of a mouldable material, normally stiff, and capable of permanently retaining a contour imparted thereto by moulding pressure, and a moulded attaching flange at the lower edge of the quarter.

ERNEST W. DUNBAR.