Feb. 16, 1937. E. W. DUNBAR 2,071,298

SHOE

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Fig. 1

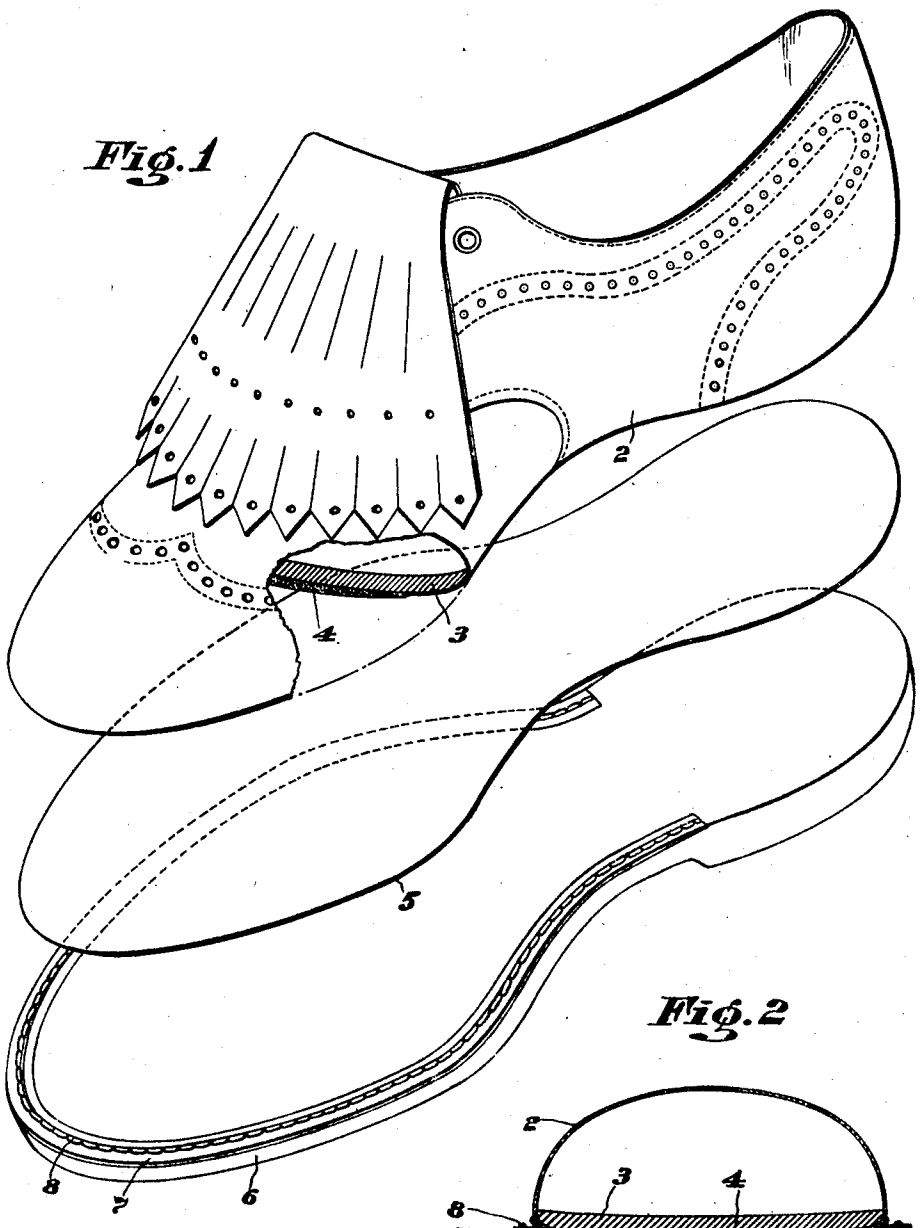


Fig. 2

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SHOE

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4 Claims. (Cl. 36—14)

This invention relates to shoes and is more especially concerned with shoes manufactured by methods similar to those used in making rubber footwear.

In manufacturing any shoe in which an extension edged sole is used, whether of leather or rubber, it is the universal practice, so far as I have been able to learn, to secure such a sole in place by stitching. This is the practice followed in making shoes by the Goodyear welt, McKay, stitchdown, and other methods. In making rubber soled shoes by methods which involve the elimination of stitching, a very different practice is followed, and this is true regardless of the nature of the material from which the upper is made. In these shoes the adhesiveness of the rubber must be relied upon to secure the sole in place, and experience has proved that a union so produced cannot be depended upon in a shoe having an extension edged sole. For this reason close edges are always used in shoes of this type and the sole is secured partly by the adhesion of its upper surface to the other parts of the shoe, but chiefly by a binder strip or foxing which is secured to the edge face of the outsole and is also united to the lower margin of the upper. Such a foxing performs both the function of securing the sole to the upper and also that of protecting the adhesive union between the flat upper face of the outsole and the upper. While attempts have been made heretofore to avoid the use of a foxing, none of these attempts has, so far as I have been able to learn, been commercially successful, and consequently, in extension-edge, rubber soled shoes the outsole is always secured in place by stitching. Leather soles have never been used heretofore, so far as I have been able to learn, on shoes made by these methods.

The present invention aims to improve shoe constructions and methods of making them with a view to avoiding the use of a foxing in shoes made by methods similar to those used in the manufacture of rubber shoes.

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

In the drawing,

Figure 1 is a perspective view of the different elements of a shoe of relatively simple construction illustrating approximately the manner in which they are connected together; and

Fig. 2 is a vertical, transverse, sectional view through the fore part of the shoe.

In a typical method of manufacturing a shoe in accordance with this invention, the various parts of the upper are stitched, or otherwise secured, together in any suitable manner. The upper may be made of leather, fabric, or the like, and it may be either lined or unlined. In order to simplify the drawing, the shoe there shown is not provided with a lining. After the parts of the upper have been secured together, the upper is assembled on a last with an insole **3**. This insole, as in the case of the upper, may be made of any suitable material. I prefer, however, to use an insole made of leather or of some of the other fibrous and porous insole materials which are less liable to cause undue sweating of the foot than is rubber, and which, in addition, avoid the objection which many people make to a rubber insole.

The lasting operation is next performed, which consists in pulling the lower marginal portions of the upper **2** over the bottom of the insole so as to make the upper conform accurately to the contour of the last, and securing the pulled over margins in their lasted positions. Preferably both the margins of the insole and the inner surfaces of the lasting allowance of the upper are coated with a cement, such as a latex cement, which will penetrate these parts and will hold the upper securely in its lasted position without the use of metallic fasteners. Usually it is necessary to apply some filling material **4** to the bottom of the insole after the lasting operation has been performed in order to fill the space inside the lasted over margins of the upper and to level the bottom of the assembly preparatory to laying the outsole. This filler may consist of a cut-out piece of material of essentially the same composition as the insole, or it may be of a plastic composition, or of some other suitable form.

Next a gum rubber binder sheet **5**, cut to shape, is applied to the bottom of the assembly and is bonded securely to it by means of some high-grade rubber cement, such as latex cement. Preferably, although not necessarily, the binder extends entirely across the bottom of the insole and covers the entire lower face of the assembly. It is preferable, also, to have it extend upwardly along the lower margins of the upper to a point slightly above the region ordinarily referred to in a welt shoe as the welt line. At the proper stage in the setting of the cement the binder is pressed hard into contact with the surfaces of the upper and insole or of the filler, if one is used, and which, so far as this feature of the invention is concerned, may be regarded as a

part of the insole. This pressing operation may conveniently be done by placing the shoe in a press having a yielding surface to engage the bottom of the assembly and conforming to the contour of said bottom, a relatively high degree of pressure being used so that the cement will be driven into the pores of the upper material and the gum sheet will not only be made to conform closely to the contour of the parts with which it is in contact, but will be united securely to them. In referring to the binder as made of gum rubber, this term is used in its ordinary trade sense. It does not necessarily designate a pure gum rubber, although it does include a binder of such a composition. Ordinarily, however, the term is used to designate a high-grade rubber product which will have the essential characteristics of gum rubber. It is used in this relationship because of the fact that a secure union or bond can be made in the manner above described between it and the lasted over margins of the upper and the adjacent surfaces of the insole, and the binder may be made of any grade of rubber which will answer these requirements.

After the binder strip has been secured in place, the outsole 6 may be laid. In order to simulate more closely the appearance of a welt or McKay shoe, and also to improve the union between the outsole and the upper, it is desirable to combine a welt strip 7 with the outsole, this welt preferably having a mock seam 8 stitched through it. This welt strip may be laid upon the margin of the cut sole, as illustrated in Fig. 1, and the combined sole and welt then vulcanized, or these parts may be assembled and then applied to the shoe, in the event that the entire shoe is to be vulcanized. In either case the bottom of the binder and the upper surfaces of the combined outsole and welt should be coated with cement and allowed to dry to the right point before the outsole is laid. In this way a secure union of the outsole to the binder can be produced.

If the shoe is not to be vulcanized, it is preferable to use a vulcanized latex cement so that the various parts will be adhesively joined to each other by a vulcanized union. On the other hand, if the shoe is to be vulcanized, then I prefer to use a latex cement which may have vulcanizing constituents mixed with it, if desired.

This process produces a shoe in which the edge of the outsole is free and exposed, as in a shoe made by the Goodyear, McKay, or other common processes. In such a shoe the edge may be extended laterally, more or less, beyond its junction with the binder, exactly as in the case of shoes made by the processes employed in the manufacture of leather shoes.

I attribute the success in securing the outsole permanently to the upper in this shoe, without stitching, very largely to the fact that the process above described produces a reliable union of the binder 5 to the upper. This union having been made, it is then a much simpler matter to bond the outsole securely to the rubber binder. A further important feature which contributes very substantially to this result is the fact that the junction of the outsole or the welt, when one is used, with the binder, terminates along a line below the upper edge of the binder. If this junction occurred at the edge of the binder, or if the outsole joined the upper at a point above the extreme lateral edge of the binder, then the union between the outsole and the upper would not be nearly as strong as in the arrangement described, and it would be practically certain that when such a shoe is worn the outsole, after a time, would tear away from the upper. This difficulty is avoided, however, by the construction shown. The reason for this improved result is not entirely clear, but I believe it is due to the fact that a downward localized strain on the margin of the outsole or the welt (when one is used) tending to tear one or both of these members away from the upper, is distributed over a much wider area than otherwise would be the case. In addition, the extension edge constructions have been so designed heretofore that such a force or strain exerted on the welt or outsole was largely concentrated at the adjacent point in the crease between the upper and the welt or outsole. But whatever may be the reason for this result, the important fact is that this construction has proved successful, whereas prior attempts in this direction have not done so.

In the shoe above described the outsole is made of rubber or contains a high proportion of rubber so that the peculiarities of this material can be utilized in securing the sole to the upper. I have found, however, that it is entirely feasible to secure a leather outsole to the upper in exactly the manner above described, a sole of this material simply taking the place of that shown at 6 in the drawing. In such a shoe also, an imitation welt, with or without the mock stitching 8, may be secured to the upper margin of the outsole prior to cementing the outsole to the upper. In these constructions the upper may be made of leather, fabric, or any of the common upper materials. However, in any of these shoes in which a leather sole or a leather upper, or both, are used, I prefer to attach the sole to the upper with a vulcanized latex cement. In making a leather soled shoe having a fabric upper, or any other material which will stand vulcanizing, I prefer to assemble the upper with the insole, using latex cement to vulcanize this assembly, and thereafter to cement the outsole to the vulcanized assembly. If the shoe has a fabric upper and a rubber sole, then all of the parts can be assembled while the rubber constituents are in an unvulcanized condition, and the entire shoe may then be vulcanized. In leather upper shoes, however, whether they have a leather or rubber bottom, I have found it entirely satisfactory to secure the parts together with a vulcanized latex cement and thus to avoid any vulcanizing operation.

As above described, a gum rubber binder is preferably used in any of the shoes above described equipped with a rubber outsole. If a leather outsole is used, then I prefer to replace the gum rubber binder with a fabric binder heavily impregnated and coated with vulcanized latex cement. Such a binder may be made of bleached cotton fabric and has the advantage of holding a heavy body of cement between the upper and the outsole. Also, if it extends entirely across the bottom of the shoe, as in the preferred construction, it strengthens the shoe against lateral spreading.

I am thus enabled to produce shoes by methods similar to those heretofore used in the manufacture of rubber footwear, while making these shoes with either leather or fabric uppers, or combinations of them, with or without the addition of rubber, and to provide soles with extension edges so that such shoes can be modeled and styled in ways that have never been possible heretofore in a product made by the rubber shoe

processes. Since this is a more economical method of construction than the Goodyear and McKay processes, I am enabled to produce a shoe having a wide sales appeal and possessing good wearing qualities at a relatively low cost. In addition, this method produces a shoe having a smooth insole, avoiding the presence of stitches on the upper surface of the insole which comes in contact with the foot.

In connection with the cementing of a leather outsole to the upper, it is preferable to scour or roughen the upper surfaces of the outsole in order to facilitate the penetration of the cement into the leather. For the same reason, it is desirable to scour the lasted over margins of the upper before applying the binder to them and thus to remove the glazed or finished surfaces of the upper leather so that the cement can freely penetrate these parts. By properly preparing these surfaces and using a cement composed essentially of latex or vulcanized latex, as the nature of the shoe may require, an entirely reliable union of the rubber parts to the leather elements may be produced. The use of a rubber cement, however, in which the rubber particles are in a finely divided condition, is essential to the attainment of this result. It may here be pointed out, also, that the impregnated fabric binder above described may be used in any of these shoe constructions instead of the gum rubber binder, although in some of these shoes better results are obtained by using a binder of the latter type.

While I have herein shown and described a typical embodiment of my invention, it will be understood that this disclosure has been made rather by way of explanation than limitation, and that the invention may be embodied in a wide variety of forms without departing from the spirit or scope thereof. In fact, minor modifications necessarily will be made in the details of construction and in the processes of manufacture to suit the requirements of different styles and constructions of shoes.

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

1. A shoe comprising an upper of fibrous nonvulcanizable material, an insole, the upper being lasted over the margin of the insole, a binder having a high rubber content extending over the bottom of the insole and adhesively bonded securely to said upper upon the overlasted margin of the forepart thereof, and an outsole adhesively and permanently bonded to said binder and to said insole, the edge of said outsole extending laterally beyond its junction with said binder and said binder extending upwardly along, and being bonded to, the sides of the upper of the shoe to a level above that of said outsole.

2. A shoe comprising an upper of fibrous nonvulcanizable material, an insole, the upper being lasted over the margin of the insole, a binder having a high rubber content extending over the bottom of the insole and adhesively bonded securely to said upper upon the overlasted margin of the forepart thereof, and an outsole having a welt combined therewith, both said outsole and welt being permanently bonded to said binder, the edges of said welt and outsole projecting laterally beyond their junction with said binder and said binder extending upwardly along, and being bonded to, the sides of the upper of the shoe to a level above the welt.

3. A shoe comprising an upper of fibrous nonvulcanizable material, an insole, the upper being lasted over the margin of the insole, a binder of gum rubber extending over the bottom of the insole and adhesively bonded securely to said upper upon the overlasted margin of the forepart thereof and extending up to a line in the neighborhood of the welt line, and an outsole having a high rubber content and also having a welt combined therewith, both said outsole and welt being permanently bonded to said binder, the edges of said welt and outsole projecting laterally beyond their junction with said binder.

4. A shoe comprising an upper of fibrous nonvulcanizable material, an insole, the upper being lasted over the margin of the insole, a binder having a high rubber content extending over the bottom of the insole and adhesively bonded securely to said upper upon the overlasted margin of the forepart thereof, and an outsole having a welt combined therewith, said outsole being adhesively and permanently bonded to said binder and to said insole, the edge of said outsole extending laterally beyond its junction with said binder, and said binder extending upwardly along and being bonded to the sides of the upper of the shoe to a level above the welt.

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