This invention relates to bottom fillers for the forepart cavity of shoes and consists in a novel shoe bottom structure possessing certain advantages which have been long sought by the industry.

For many years the shoemaking industry has contended against two incompatible requirements in the endeavor to produce a perfect shoe bottom. In the first place the forepart, which is repeatedly and severely flexed in every step taken by the wearer, must be highly flexible if the shoe is to be worn with comfort. In the second place, the bottom must be thick enough and have enough strength and body to protect the foot of the wearer from the discomfort of feeling every under-foot roughness. I have discovered a satisfactory solution for this old and difficult problem by making a new combination from shoemaking elements that have been heretofore available but never before combined as I propose to combine them, and never before used to accomplish the highly desirable results achieved by my invention.

Plastic fillers have been used for many years, and while these are satisfactory from a standpoint of flexibility, they tend to become deformed and displaced in the shoe bottom by a process of slow flow so that the insole does not remain flat under the foot of the wearer but develops objectionable hollows and cavities. On the other hand, a multitude of different fillers of solid sheet material have been used of every conceivable composition and in a great many different physical shapes, but all of these sheet fillers have tended to stiffen the shoe bottom by the well known plywood effect and this has been the case even though the material of the sheet filler has been flexible itself and even though perforated or transversely grooved.

I have discovered, however, that all of the objections above discussed may be avoided and certain positive advantages achieved by employing sole filler blanks prepared from a composite sheet of insole and cushion stock. Going more into detail, I propose to form a composite filler consisting of two united plies, one ply being a continuous elastic sheet material, and the other being of tough fibrous sheet material transversely slashed and longitudinally expanded. Blanks of suitable size may be prepared from sheet stock and then secured to the outer face of the insole within the overlasted margin of the upper.

In preparing the filler of my invention, I start with a firm solid piece of insole material. It is then slashed in the manner explained, and during or subsequent to the slashing operation the material is expanded, that is, the slashes are opened so that their opposed edges are spaced slightly from each other in the finished product. The usual procedure is to over-expand this material and then permit it to relax to some extent but not to go back to its original condition. This slashed sheet is then united in face to face contact with a continuous sheet of elastic cushion material such as cork composition in sheet form. A filler of this composite construction, cut to size, is then inserted in the shoe with its slashed ply in this expanded condition and attached to the elastic cushion ply or layer. The composite blank will accordingly bend without resistance and in no way impairs the flexibility of the insole with which it is associated. Moreover, it introduces into the shoe bottom a cushion effect which is a notable factor of comfort to the wearer.

The filler of my invention can be used in any type of shoe that carries a filler and can be designed to provide the same thickness of material as that of the overlasted margin of the upper or of the rib in a Welt shoe and so prevent the insole from sagging in when worn. The filler holds the insole up to the level of the marginal portions of the sole when the shoe is worn.

The material of the filler is selected for its depression-resisting property, that is to say, it should be of sufficiently firm texture to eliminate the possibility of local flow under conditions of heat and pressure in wear, or of matting down as might occur in a loosely felled structure. Suitable materials are available on the market under the trade names of "Onco," "Texon" and "Darex." These all comprise porous paper stock impregnated with a rubber composition. Any other tough fibrous sheet material may be used in the construction of the filler of my invention. For the cushion ply of my filler, ground cork composition in sheet form is readily available upon the market. In some cases the composite filler may be cut off at the toe end as being unnecessary in the manufacture of the shoe.

The features and characteristics of my invention will be best understood and appreciated from the following description of preferred embodiments thereof, selected for purposes of illustration and shown in the accompanying drawings, in which:

Fig. 1 is a view in perspective of a composite sheet of filler material showing a single filler blank cut therefrom.

Fig. 2 is a view in perspective of the same filler.
blank, showing a portion of the cushion layer as broken away.

Fig. 3 is a fragmentary view in perspective of the forepart of a cement lasted shoe embodying my invention,

Fig. 4 is a similar view of a welt shoe,

Fig. 5 is a view in perspective of a filler blank of modified construction, and

Fig. 6 is a fragmentary view in perspective of the forepart of a cement lasted shoe in which is included the filler of Fig. 5.

In preparing the filler of my invention a sheet 10 of insole stock, fibreboard, "Onco" or the like, is selected of the thickness required in the filler. This sheet is then slashed by rows of closely adjacent short slashes 11 extending entirely through the material from side to side, the individual slashes intersecting the edges of the sheet wherever they happen to fall. The slashes 11 are accurately aligned in their respective rows and the individual slashes are staggered in adjacent rows. The material of the sheet 10 is expanded in such manner as to space the opposed edges of each individual slash or slit from each other to such an extent that they do not make contact when the sheet, or a filler including the sheet, is flexed even to an extent greater than that at which it is flexed in ordinary wear. The step of expanding the material may be effected after the slashing operation, or it may be effected simultaneously with the slashing operation by using a beveled edge slashing knife sufficiently obtuse to stretch the stock wherever it remains unsevered between the ends of adjacent slashes 11.

To the fibrous ply prepared as above outlined is now added a cushion ply 12. This may be of ground cork composition and is procurable in any thickness which will result in fillers of the desired thickness from the composite stock. The two plies are cemented together in a continuous face to face engagement. The cushion ply tends slightly to push up the underlying slashed ply in its expanded condition but permits it to flex without hindrance and to contract or expand within the necessary limits.

The sole filler blanks may now be cut from the composite sheet 10-12 by dies or by means of patterns giving the filler the size and outline of the cavity of the shoe bottom wherein the filler is to be used. A filler blank is shown in Fig. 2 as removed from the sheet shown in Fig. 1.

In Fig. 3 is shown a cement lasted shoe having an insole 13, an upper 14 having its margin 15 overlapped about the forepart of the insole and secured in place by cement. The filler 10-12 is cut to fit the cavity formed by the overlapped margin of the upper and inserted with its cushion ply 12 in contact with the outer face of the insole 13. The filler may be cemented in place either by a continuous cost or by spots of cement.

In Fig. 4 is shown sections of a welt shoe having an insole 16, an upper 17 with its margin overlapped on the insole and stitched to a welt 18. The insole rib 19 is partially concealed by the welt 18. In this instance the rib and welt define the forepart cavity which is to be occupied by the filler 10-12. After the welt 18 has been sewn and trimmed, the composite filler blank is fastened in place upon the outer face of the insole with its cushion ply innermost and lies with its outer face substantially flush with the surface of the welt. The forepart cavity is thus filled with solid material but of such character that it in no way impairs the flexibility of the insole with which it is associated.

It is in some instances desirable to stiffen the extreme toe portion of the shoe bottom as compared with the forepart in which flexing naturally occurs, and in Fig. 5 I have illustrated a modification of my sole filler in which the fibrous ply 20 is left intact and unslashed in the toe region. The formation of this filler requires the fibrous ply to be slashed in definite longitudinal bands separated by unslashed bands and the individual fillers to be cut so as to include the solid portion of the sheet in the interior of the filler. Otherwise the filler illustrated in Fig. 5 may be produced as above explained and will have the characteristics already discussed.

In Fig. 6 the filler of Fig. 5 is shown as placed in the cavity of a cement lasted shoe, but in this case the fibrous ply 20 is placed in contact with the insole 12. It will be understood that the composite filler of my invention may be placed either side up in the shoe bottom although the best results will be usually found when the cushion layer is placed next to the insole as suggested in Fig. 5.

While as already pointed out the composite filler of my invention is not subject to local flow and caving in under the foot of the wearer, it does exhibit the capacity of self-adjustment in wear so that it always fills the cavity size of the shoe bottom in which it is placed. This is a very important advantage from the standpoint of commercial shoemaking because it is desirable, particularly in manufacturing shoes of moderate price, to utilize sole fillers of one predetermined size and shape in shoes of slightly different sizes. For example, it has been found entirely practical to cut fillers of one size which will serve satisfactorily in shoes of three contiguous sizes and all widths. This is so because the composite filler as a whole is free to contract or to expand slightly in superfluous areas. If the filler is slightly short for the bottom cavity in which it is placed, it will be found to expand and lengthen when flexed in the shoe bottom so that it will completely fill the cavity.

Having thus disclosed my invention and described an illustrative embodiment thereof, I claim as new and desire to secure by Letters Patent:

1. A shoe having in its bottom an outsole, an insole, an upper lasted over the insole and forming a cavity thereon within its margin, and a filler of composite sheet material located in said cavity and including a cushion ply of cork composition and a tough flexible fibrous ply slashed transversely of the shoe, united to the cushion ply in face to face relation and disposed in contact with the inner face of the outsole in the shoe bottom.

2. In a shoe having an outsole and an insole in its bottom enclosing a cavity of substantial area, a composite filler located in said cavity and including a cushion ply of yieldable sheet material, and an underlying ply bonded thereto and consisting of a blank of fibrous material slashed transversely from edge to edge throughout the central area of the filler and being unslashed and so of stiffer texture in its toe portion.

3. In a shoe having an outsole and an insole, an upper lasted over the insole and presenting a cavity within its margin, a composite filler located in said cavity and consisting of two fibrous overlapped blanks of similar size and shape, united to each other in face to face contact, one blank being...
continuous and comprising a yieldable cushion material, and the other blank being of tough fibrous material transversely slashed and thus rendered flexible in wear.

4. In a shoe having an outsole and an insole, an upper over-lasted and forming a cavity within its margins on the insole, a composite filler located in said cavity and consisting of two united plies, one ply being of continuous elastic sheet material, and the other being of tough fibrous sheet material transversely slashed and longitudinally expanded, whereby the filler as a whole has the capacity of contraction or expansion in wear to fill the cavity size of the shoe bottom.

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