Nov. 3, 1936. E. F. ROBERTS 2,059,747

ELASTIC MULTI-PLY MATERIAL AND ELASTIC SHOE EMBODYING THE SAME

Filed Feb. 19, 1936

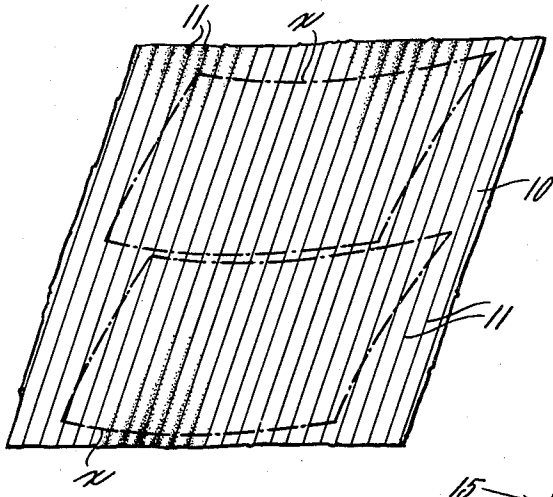


Fig. 1.

Fig. 2.

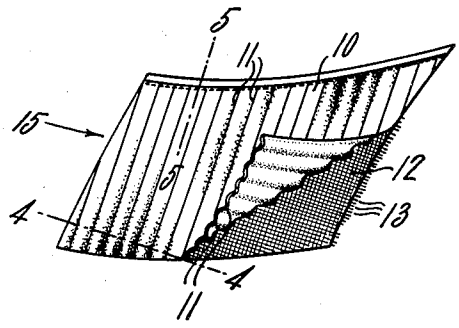
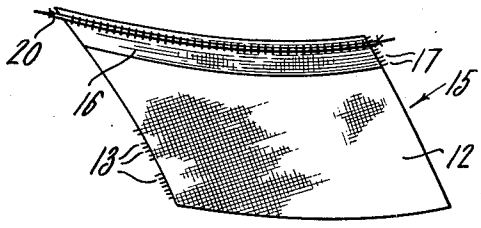


Fig. 3.



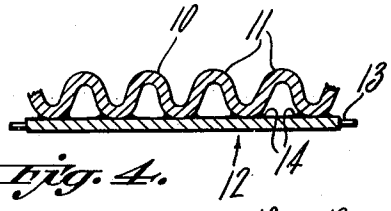
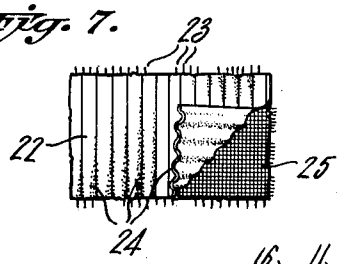


Fig. 4.

Fig. 7.



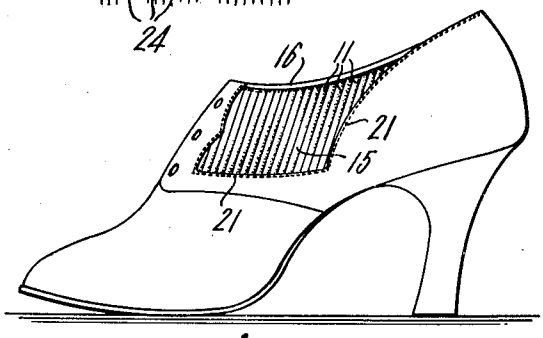


Fig. 6.

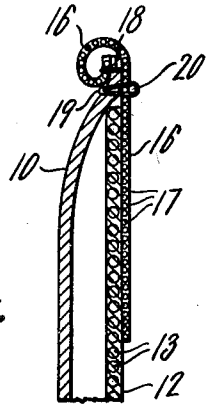


Fig. 5.

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Patented Nov. 3, 1936 2,059,747

UNITED STATES PATENT OFFICE

2,059,747

ELASTIC MULTI-PLY MATERIAL AND ELASTIC SHOE EMBODYING THE SAME

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Application February 19, 1936, Serial No. 64,662

2 Claims. (Cl. 36—51)

This invention relates to elastic materials designed more particularly for use in the upper portion of shoes to impart elastic properties thereto, and to shoes having this material embodied therein so as to impart both elastic and ornamental properties to the shoes.

Shoe manufacturers and especially manufacturers of stylish women's shoes have long striven to provide stylish shoes that will fit the wearer snugly and at the same time comfortably but they have found it difficult to provide a shoe that will retain its neat, stylish appearance without confining the foot to an uncomfortable degree. The reason why comfort has been difficult to obtain in a stylish, neat-fitting shoe is that the leather and fabric heretofore used in shoes are non-elastic and while pliable do not contract and expand to accommodate themselves to the rigorous movements of the foot.

The present invention contemplates shoes which will present a neat, stylish and ornamental appearance and at the same time will be capable of stretching and contracting to accommodate the foot movement.

It has been proposed heretofore to provide shoes with elastic gores but such gores gave the shoes more or less of a patched and unattractive appearance and the fabric face of the gore always presented a marked contrast in appearance to the leather portions of the shoe.

The present invention also contemplates an elastic multi-ply material which is peculiarly well adapted for use in high grade shoes of stylish appearance to impart both ornamental and elastic properties thereto and relates more specifically to elastic multi-ply material formed with a pleated or puckered leather face and elastic fabric back. The invention further resides in the method of making the fabric.

The present invention also resides in means for imparting a smooth rounded elastic edge to the elastic multi-ply sheet material.

The present invention further resides in a shoe having said elastic multi-ply material embodied therein so that it presents an outer face that is formed of pleated or puckered leather that may resemble closely in color and finish the leather of the rest of the shoe.

The above and other features of the invention will be more fully understood from the following description when read in connection with the accompanying drawing which illustrates good practical forms thereof.

In the drawing:

Fig. 1 is a plan view of a sheet of elastic multi-ply material constructed in accordance with the present invention and having indicated thereupon portions to be cut therefrom;

Fig. 2 is a plan view of a piece of elastic material which has been cut from the sheet of Fig. 1, the leather being partly turned back to show the underlying elastic fabric;

Fig. 3 is a plan view of the opposite face of the multi-ply sheet shown in Fig. 2;

Fig. 4 on an enlarged scale is a section taken on the line 4—4 of Fig. 2;

Fig. 5 on an enlarged scale is a section taken on the line 5—5 of Fig. 2;

Fig. 6 is a side elevation of a shoe having embodied therein the piece of elastic material shown in Fig. 2; and

Fig. 7 is a plan view of a modified type of multi-ply elastic material one sheet thereof being partially turned back.

The elastic multi-ply material of the present invention may be employed in men's, women's and children's shoes but has been shown and described herein in connection with women's shoes due to the emphasis of style and snugness of fit in women's shoes. This multi-ply fabric may however be employed for other purposes.

Referring first to Fig. 1, the material 10 shown therein, it is assumed, comprises a sheet of relatively thin flexible leather which has been pleated or corrugated as at 11 by treating the leather in a pleating machine of well known construction. To the inner face of the sheet of pleated or corrugated leather of Fig. 1 is secured a one-way stretch backing sheet of elastic fabric 12 arranged so that the pleats will be extended as the fabric stretches. The fabric 12 is preferably a comparatively thin tightly woven material having a short strong stretch so that it will not be too thick or bulky in the shoe and will not stretch too easily. This elastic fabric is preferably formed of relatively fine elastic yarn 13 consisting of a rubber core having a textile cover wound thereupon so as to hold the core under tension when the yarn is at rest, and the yarn 13 may be introduced in the fabric either as warp or weft.

It is important that the sheets 10 and 12 be firmly united and this may be accomplished by applying to a face of the elastic fabric 12 a coating of latex or other strong cement 14 and then pressing the pleated leather sheet 10 firmly thereagainst, and the corrugated sheet is preferably secured to the elastic fabric while the latter is in an unstretched or only slightly stretched condition.

The multi-ply sheet material shown in Fig. 1

may be made as large as can be secured from the skin from which the leather is formed and after this leather sheet has been pleated and backed with the elastic fabric 12, as above described, sections of various sizes and shapes may be cut therefrom as indicated by the dotted lines x in Fig. 1 and as shown in full lines in Figs. 2 and 3. These sections may have straight or curved edges, as desired, and the lines of cut may extend longitudinally and transversely or in any other desired direction with respect to the weave of the fabric 12 due largely to the fact that the elastic fabric 12 is so tightly woven that the elastic yarn 13 when cut will not slip or pull back in the fabric.

It will be seen from the foregoing that as a result of the present invention a piece of elastic two-ply material, such as designated by 15 in Figs. 2, 3, and 6 and of any desired size and configuration and having straight or curved edges may be provided by simply cutting the desired section from the larger sheet of Fig. 1. This is of great importance because it enables sections 15 to be cut to any desired shape or size for use in various portions of a shoe, or in other desired fields of use. It also permits the upper edge of the section 15 to be cut to conform to the desired curvature of the upper edge of the shoe as will be apparent from Fig. 6.

It is important that this upper edge be so finished that it will provide a smooth, well rounded edge and at the same time will contract and expand to accommodate the contraction and expansion of the multi-ply material in the shoe. This is accomplished in accordance with the present invention by providing along the upper edge of the elastic multi-ply section 15 a narrow ribbon of woven elastic fabric 16 having embodied therein the very fine elastic warps 17. This elastic ribbon may be folded over the upper edge of the multi-ply fabric, as best shown in Fig. 5 wherein it will be noted that one edge of the ribbon is secured to the upper edge of the leather sheet 10 by elastic stitching 18, whereupon the ribbon is folded over and about the multi-ply fabric, as shown, and it is preferably secured in this position by cementing it to the underlying fabric 12 and also by the elastic stitching 19 which may be formed on the ordinary sewing machine by using non-elastic thread in the needle and elastic yarn 20 in the bobbin. The elastic binding 16 provides a smooth, round finished edge without appreciably restricting the stretch of the elastic multi-ply material.

The two-ply elastic section 15 consisting of a pleated leather face 10 and an elastic backing fabric 12, is cut in the construction shown, for use in the side or quarter area of the shoe near the front thereof, as shown in Fig. 6. A similar elastic section may be provided in the wall at the opposite side of the shoe, and these sections may be sewed in place in the shoe by ordinary stitching 21. The rows of pleats 11 are shown in Fig. 6 as extending at approximately right angles to the upper edge 16 of the shoe, and these rows or pleats of leather add materially to the pleasing appearance of the shoe in addition to their primary function of permitting this portion of the shoe to contract and expand to improve the fit of the shoe and accommodate the foot movement.

While the sheet 10 has been shown and described as pleated or corrugated, it may be puckered or otherwise treated to cause it to accommodate the contraction and expansion of the backing fabric 12, and while it is desirable in many cases to employ leather as the pleated material 10, it will be understood that imitation leather, woven fabric, and other sheet material may if desired be pleated or puckered and employed in place of the fabric 10 in forming elastic multi-ply material such as herein contemplated.

Should it be desirable to provide a two-way stretch multi-ply material, this may be done by employing a one-way stretch elastic fabric 22 such as shown in the modified construction of Fig. 7 and which is provided with the elastic yarns 23 shown as extending vertically in this view. The fabric 22 is pleated as shown in this view so that these pleats 24 extend substantially parallel to the yarns 23. The effect of this is to impart to the fabric 22 the property of stretching vertically and of extending transversely. If the sheet 22 is then cemented to a two-way stretch elastic backing sheet 25 a multi-ply two-way stretch elastic material will be produced. A two-way stretch, multi-ply elastic material may also be produced by puckering or otherwise distorting a non-elastic sheet so that it will be capable of extending both longitudinally and transversely, and then securing this puckered sheet to a two-way stretch elastic fabric.

It is to be understood that the invention is not limited to the specific construction shown in the drawing and described in the specification, as various modifications may be made without departing from the spirit thereof, and that the invention is not to be limited except as required by the state of the art and as defined by the appended claims.

Having thus described my invention what I claim and desire to protect by Letters Patent is:

1. A shoe having the upper thereof formed at least in part of stretchable multi-ply sheet material comprising a sheet of pleated leather backed with elastic fabric to yieldingly retain the leather in the pleated condition, the pleated leather being attached to the elastic fabric by an adhesive binder that secures only the spaced ribbed portions thereof to the fabric, said elastic multi-ply material having its upper edge cut on a curved line, and said upper edge being provided with a finishing bead formed of a narrow strip of elastic binding fabric having one edge positioned under the body of said strip to conceal this edge at the outer face of the multi-ply material.

2. A shoe having the upper thereof formed at least in part of stretchable multi-ply sheet material comprising a pleated sheet backed with elastic fabric to yieldingly retain such sheet in the pleated condition, the pleated sheet being attached to the elastic fabric by an adhesive binder that secures only the spaced ribbed portions thereof to the fabric, said elastic multi-ply material having its upper edge cut on a curved line, and said upper edge being provided with an elastic finishing bead formed of a narrow strip of elastic binding fabric having one edge positioned under the body of said strip to conceal this edge at the outer face of the multi-ply material, to thereby finish this elastic portion of the shoe along its upper edge.

EDWARD F. ROBERTS.