March 27, 1962 D. E. SLADE 3,026,635

OVERSHOE

Filed March 24, 1960 2 Sheets-Sheet 1

Fig. 1

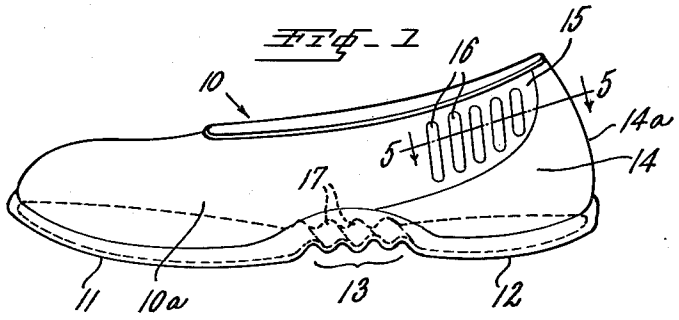


Fig. 2

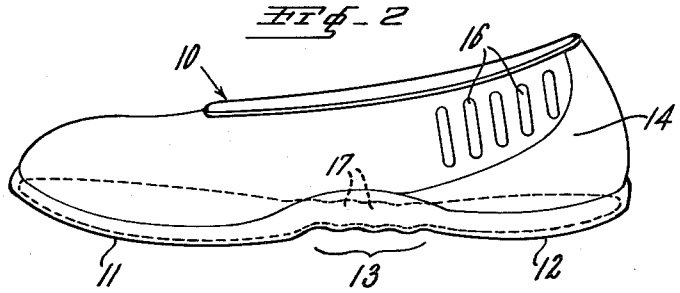


Fig. 3

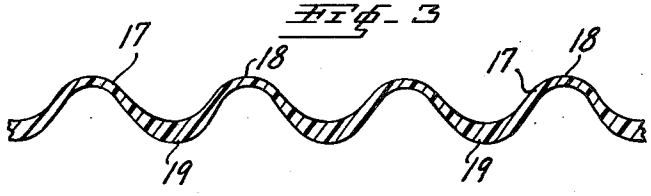


Fig. 4

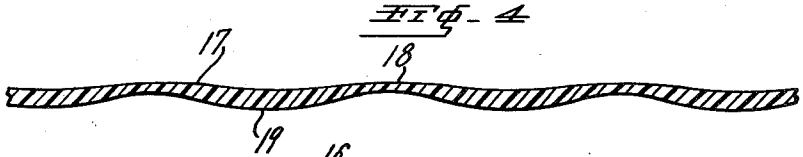
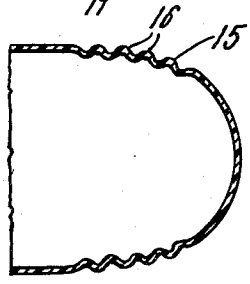


Fig. 5



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Fig. 6

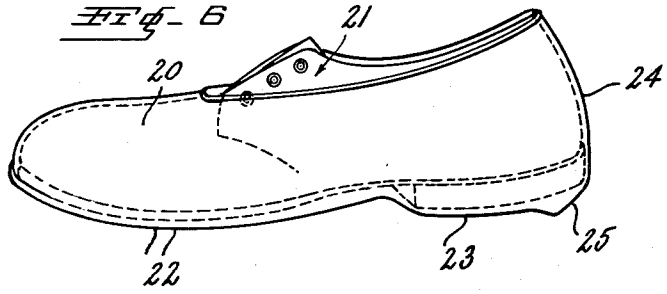
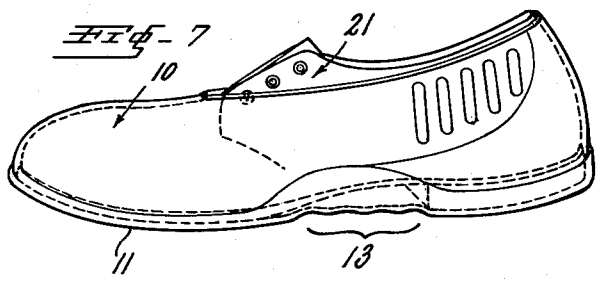


Fig. 7



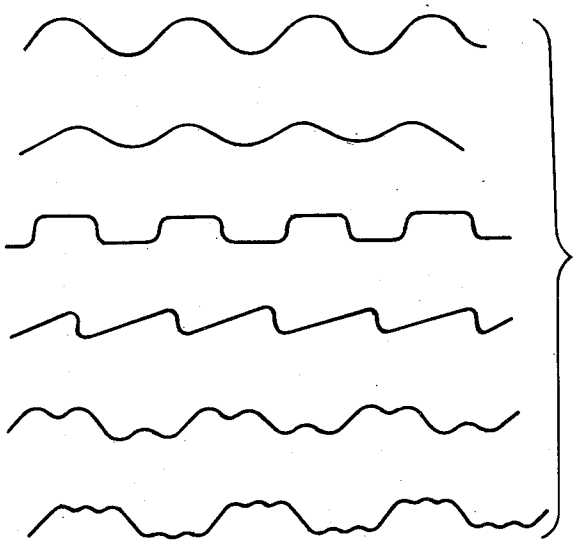


Fig. 8

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3,026,635

OVERSHOE

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Filed Mar. 24, 1960, Ser. No. 17,292
7 Claims. (Cl. 36—7.3)

This invention relates to an improved elastomeric overshoe which can be easily donned and doffed. More particularly, it relates to an improved overshoe which is adapted to comfortably fit many sizes of shoes without greatly stretching the material constituting the overshoe upper.

Various types of stretchable overshoes have been used to fit many sizes of shoes as well as to provide a comfortable fitting overshoe for a particular size, but these overshoes have generally depended either upon the stretchability of the material or through the use of corrugations or other mechanical elements formed at a particular location on the overshoe. Such overshoes are deficient in that the stretchability has been developed only at a fixed location and the overshoe as a whole has not been carefully considered.

One object of this invention is to provide a practical, effective expandable overshoe being expandable at particular portions of the sole and upper so as to enable the overshoe to be donned and doffed with great facility over many sized shoes.

A second object of this invention is to provide an expandable overshoe having corrugations which not only flatten out but will also expand before the other material of the overshoe stretches.

Other objects and advantages of this invention will become apparent from the following description taken in connection with the accompanying drawings, wherein are set forth by way of illustration and example certain embodiments of this invention.

In the drawings:

FIG. 1 shows an expandable overshoe according to this invention in the unexpanded position;

FIG. 2 shows this overshoe in the expanded position;

FIG. 3 is an enlarged drawing of the shank of the overshoe illustrating the shape of the corrugations in the unexpanded position;

FIG. 4 shows the same corrugations in the expanded position;

FIG. 5 is a top view of a section along 5—5 of FIG. 1;

FIG. 6 shows a conventional overshoe as applied over a conventional shoe;

FIG. 7 shows the expandable overshoe of this invention worn over the conventional shoe; and

FIG. 8 contains numerous patterns which may be used to form the corrugation pattern for the shank.

Referring now to the drawings, there is shown at FIG. 1 an expandable elastomeric overshoe according to this invention **10** having a vamp portion **10***a*, an outer sole **11**, a heel portion **12**, and a shank portion **13** located as shown between the heel and the outer sole **11**. The quarter portion of the overshoe **14**, extends from the heel of the overshoe at the rear thereof to the vamp **10***a* and includes a wide margin **15** located on both sides of the quarter comprising a pattern of substantially vertical corrugations **16**.

The shank **13** comprises a number of corrugations **17** which, when flattened provide a greater area allowing the entire quarter to be extended. As shown, each corrugation **17** has a relatively thick base **19** with a much thinner connecting web **18**. When the overshoe is in its expanded position, the corrugations have flattened to increase the effective shank length as shown in FIG. 4 and if it is necessary to stretch the overshoe further, the connecting web **18** being of much thinner width will stretch before the thicker portion **19** and before the outsole **11** or heel **12**.

In order to provide an effective expandable overshoe, it is necessary during donning and doffing to stretch the circumference of the overshoe about 20 to 25% beyond its normal position. Merely providing an expandable portion in the sole of the overshoe without considering the importance of providing an expandable area in the quarter area is not entirely satisfactory. Further, to provide the sole of the overshoe with an expandable portion and to rely entirely upon the stretchability of the material constituting the upper of the overshoe is not conducive to providing an overshoe which will fit many sizes of shoes.

As shown in FIG. 1 and FIG. 5, the wide expandable margin **15** comprises a plurality of corrugations **16**, each corrugation being of similar shape and dimension as corrugation **17**, and located in the quarter of the overshoe. Each corrugation **16** is positioned in substantially a vertical manner so as to provide expandability in the horizontal direction, the horizontal direction being the long dimension of the overshoe. The corrugations are substantially uniformly spaced and are located immediately forward of the counter **14***a* and as shown, such corrugations are limited to the upper half of the quarter.

It is important to locate the corrugations in the quarter portion of the overshoe because of the manner in which an overshoe of this type is habitually gripped by the wearer's hand in donning and doffing in which the fingers exert tension directly on the counter; the tension initially flattens out the corrugated margin **15** because it is exerted directly in back of the corrugated area and this has a very noticeable effect in facilitating donning and doffing.

While the corrugations are shown as being substantially vertical, their position could be altered somewhat and certainly the corrugations could be extended upwardly and curved to the rear or may be positioned at a slight angle to the rear. Those skilled in the art will recognize the many variations that may be developed in using the corrugations in the quarter portion.

Some of the overshoes of the prior art purport to stretch and fit more than one size shoe; however because the area which is in contact with the ground is under tension due to its being stretched beyond its normal dimension, the overshoe is more exposed to cutting from pebbles, bulk glass particles, and other jagged objects which are always present to some degree on streets and sidewalks.

Referring now to FIG. 6, there is shown a conventional overshoe **20** which is worn over a conventional leather shoe **21** having a sole portion **22** and a heel portion **23**. As shown, the back of the heel **24** has been extended to fit shoe **21** and as a result, the bottom region **25** rides under the heel of the shoe **21**. This is a condition whereby any tension placed on the outsole, either by fitting with the leather shoe which is longer than the interior of the overshoe or by the action of walking, causes the leather shoe to shift backwards in the overshoe to the extent that the rear extremity of the leather shoe heel treads on the counter area **25** rather than on the heel area of the outsole. As shown in FIG. 7, this condition is prevented inasmuch as the shank portion **13** and the expansible quarter region **15** has been expanded.

The particular corrugation shown at FIG. 3 comprising continuous rising and falling arcs may be replaced by patterns well within the ordinary skill of the art for example as shown at FIG. 8. All of these patterns have the common feature that when the pattern is flattened, it provides a greater area which eliminates the necessity of stretching the particular material. As used herein, the word "stretch" and its cognates refers to the elastic ex-

tension of the material itself upon the application of tension, and the word "expand" and its cognates refers to the movement of parts of the material to effect a lengthening thereof without actually stretching the material. Therefore, a corrugated area will expand first upon the application of tension, and once the parts or corrugations have moved to provide a flattening effect, upon the continued application of tension, the material forming the corrugations will stretch.

While the overshoe of this invention may be made with any suitable elastomeric materials, such as rubber, rubber-like materials or rubber-like plastics, it has been found advantageous to make this overshoe by using slush molding methods. The elastomeric material used to produce such slush molded footwear is preferably a vinyl plastisol prepared by dispersing finely divided polyvinyl resin powder in a liquid plasticizer. The "slush molding" technique and the preparation of plastisols is discussed in Patent No. 2,880,467 granted April 7, 1959 the disclosure of which may be considered to be incorporated in this patent. The shape of the mold will vary with the overall desired shape of the overshoe. An example of the satisfactory compound used with the above-mentioned method is here given:

	Parts by weight
Resin (polyvinyl chloride)	100
Plasticizer (dioctyl phthalate)	110
Epoxidized soya oil	5
Stabilizer	3

Those skilled in the compounding art may readily vary the particular parts of plastisol, plasticizer and stabilizer as seen fit, except that it should be noted that the parts of plasticizer exceed the parts of resin to increase the stretchability and abrasion resistance of the overshoe. The particular stabilizer used in the above example was an organic barium-cadmium compound marketed by the Harshaw Chemical Company as code 12B63, but other stabilizers will give satisfactory results. The above compound will give a modulus of elasticity of one at 350–450 pounds per square inch, meaning that this compound will stretch its own length upon the application of 350–450 pounds per square inch.

While a preferred embodiment of the expandable overshoe has been disclosed, it is not intended that the invention be limited to the particular embodiment as many changes may occur to those skilled in the art without departing from the essence of the invention.

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

1. An elastomeric overshoe comprising an outsole, a vamp integrally formed over the outsole, a shank portion connected to said outsole, and a heel connected to said shank, a quarter positioned above the shank and heel and integrally formed with the vamp to complete the entire overshoe, said shank having a plurality of spaced corrugations, said quarter having a wide expandable margin on each side thereof being formed of a pattern of spaced substantially vertical corrugations, said expandable margin being located at, and limited to the upper half of said quarter, said corrugations being adapted to expand without the material thereof stretching, said corrugations in the shank having a relatively thick base and a relatively thin connecting web, said web forming the upper part of said corrugations, whereby after the corrugations have been completely flattened, the connecting web is stretched before any other portion of the overshoe is stretched.

2. An elastomeric overshoe comprising an outsole, a vamp integrally formed over the outsole, a shank portion connected to said outsole, and a heel connected to said shank, a quarter positioned above the shank and heel and integrally formed with the vamp to complete the entire overshoe, said shank having a plurality of spaced corrugations, said quarter having a wide expandable margin on each side thereof being formed of a pattern of spaced substantially vertical corrugations, said expandable margin being located at, and limited to the upper half of said quarter, said corrugations being adapted to expand without the material thereof stretching, said corrugations in the shank having a relatively thick base and a relatively thin connecting web, said web forming the upper part of said corrugations, whereby after the corrugations have been completely flattened, the connecting web is stretched before any other portion of the overshoe is stretched, the elastomeric material of the overshoe comprising polyvinyl chloride resin and plasticizer in which the plasticizer content by weight exceeds the resin content by weight by about 10 parts for every 100 parts of resin, said material having a modulus of elasticity of one at about 350–450 pounds per square inch.

3. An overshoe formed of stretchable material, said material being capable of elastic extension upon the application of tension and having an outsole, a vamp over said outsole, a shank region and a quarter region, a heel connected to said shank region, said outsole, vamp, shank region, quarter region and heel made of said stretchable material to form a homogeneous article, said shank and quarter regions being expandable without the material thereof stretching and each region including a plurality of spaced apart corrugations, said quarter region being expandable substantially along the long dimension of the overshoe.

4. An overshoe formed of stretchable material, said material being capable of elastic extension upon the application of tension, an outsole, a vamp over said outsole, an expandable shank region and an expandable quarter region, a heel connected to said shank region, said outsole vamp, expandable quarter region and heel made of said stretchable material to form a homogeneous article, said shank and quarter regions being expandable without the material thereof stretching, said quarter region being expandable substantially along the long dimension of the overshoe, said expandable shank region and said expandable quarter region being stretchable after said regions have expanded and said regions including spaced apart corrugations having thick bases and thin upper connecting webs, whereby the thin webs stretch before the bases, the elastomeric material of the overshoe comprising a plastic formed of polyvinyl chloride resin and plasticizer in which the plasticizer content by weight exceeds the resin content by weight by about 10 parts for every 100 parts of resin, said material having a modulus of elasticity of one at about 350–450 pounds per square inch.

5. An overshoe formed of stretchable material, said material being elastically extensible upon the application of tension and having an outsole, a vamp over said outsole, means forming the shank adapted to expand said shank without the material thereof stretching, means forming the quarter sections adapted to expand said quarter sections without the material thereof stretching, a heel connected to said shank means, said outsole, vamp, shank means, quarter means and heel forming a homogeneous article, and said means forming the quarter sections being expandable substantially along the long dimension of the overshoe.

6. An overshoe formed of stretchable material, said material being elastically extensible upon the application of tension and having an outsole, a vamp over said outsole, means forming the shank to expand said shank without the material thereof stretching, means forming the quarter sections to expand said quarter sections without the material thereof stretching, a heel connected to said shank means, said outsole, vamp, shank means, quarter means and heel forming a homogeneous article, and said means forming the quarter sections being expandable substantially along the long dimension of the overshoe.

7. The overshoe of claim 6 in which the expandable quarter means is located at and limited to substantially the upper half of said quarter, and the material of the

overshoe comprises polyvinyl chloride resin and plasticizer in which the plasticizer content by weight exceeds the resin content by weight by about 10 parts for every 100 parts of resin, said material having a modulus of elasticity of one at about 350–450 pounds per square inch.

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