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MATERIAL FOR SHOE CONSTRUCTIONS

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ABSTRACT OF THE DISCLOSURE

A shoe construction having heel and sole portions attached to an upper. The heel and sole portions define wearing surfaces, and the material forming these wearing surfaces consists of polyurethane in combination with a reinforcing composition selected from the group of materials consisting of glass fiber and polyester fiber. The reinforcing composition is located at least in the area immediately adjacent the wearing surfaces, and this combination improves gripping action, particularly during nailing and stitching operations.

Specification

This invention relates to an improved material which is ideally suited for shoe constructions. The invention is particularly concerned with a material which is adapted to be employed in the manufacture of shoe portions comprising wearing surfaces of the shoes, such as heel and sole portions.

In the usual manufacture of shoes, means are provided for attaching heels and soles to the upper portion of the shoes. Leather, rubber and composition materials are normally employed for purposes of forming the heel and sole portions. The materials are selected to provide a certain resiliency, particularly in the case of the sole and, in addition, the ability of the materials to withstand wear is quite important. Attempts are also made to provide materials which will not mar floors upon which individuals walk. Finally, the cost of the materials comprises a highly important consideration.

It is a general object of this invention to provide an improved material for use in shoe constructions.

It is a more specific object of this invention to provide a material for shoe constructions which is ideally suited for use in forming wearing surfaces on the shoe constructions.

It is a further object of this invention to provide a material for shoe constructions which combines a variety of characteristics previously sought in other materials, including wear characteristics, flexibility, non-marking properties, and relatively low cost.

These and other objects of this invention will appear hereinafter and it will be understood that the specific embodiments of the invention hereinafter set forth are provided solely for purposes of illustration and not by way of limitation.

The material of the instant invention is designed for use in forming portions of shoe constructions which are subject to severe wear conditions. Specifically, the material of this invention is adapted to be employed for the manufacture of highly satisfactory heel and sole members. In this connection, it will be appreciated that use of the material for a wide variety of shoe designs is contemplated. The material can be employed in shoes for men, women and children, and the material can be utilized in separate pieces in a given shoe or a heel and sole combination could be manufactured in a single operation for attachment to a shoe.

The instant invention provides for the use of a combination of different ingredients for purposes of forming the improved material. Specifically, polyurethane is combined with a reinforcing composition which is distributed within the polyurethane. The reinforcing composition can be selected from natural and synthetic materials and glass fiber, and polyester fibers comprise the ideal elements for this purpose.

The polyurethane may comprise any of the known group of compositions classed under this name. The major criteria for the polyurethane is that it have a suitable combination of wear resistance and flexibility. The latter property can vary considerably depending upon the application desired. For example, in the case of a top lift for a woman's shoe. flexibility is not an important factor. Accordingly, a hard polyurethane can be readily employed for this application.

In the case of soles for shoes, it is necessary to provide a certain degree of flexibility. In this instance, a softer polyurethane is selected.

The reinforcing materials are included within the polyurethane in various ways. For example, glass fiber or polyester fiber can be provided in the form of a fabric sheet, and the fabric can be molded within a polyurethane composition. Dacron, manufactured by Du Pont, comprises an example of a polyester material which can be similarly molded within the polyurethane. Where fabrics are employed, it is preferred that the fabric be disposed close to the wearing surface of the material.

Materials of the type contemplated can also be provided in particle form, for example chopped strands of glass fiber or Dacron. The reinforcing composition is provided in amounts sufficient to extend throughout the body of the polyurethane. It has been found that the amounts of reinforcing composition are not particularly critical and the use of between five and 85 percent by weight of such compositions is contemplated.

Polyurethane is known to have substantial wear resistance; however, this material has not previously been adaptable for use in shoe constructions on an efficient basis. Polyurethane alone cannot be bonded to an upper in an efficient manner, particularly since the polyurethane will not retain nails or stitching normally used in shoe manufacture. Thus, polyurethane does not have a proper consistency, and nails and stitching do not grip properly whereby the polyurethane will stay in place.

By adding the so-called reinforcing compositions to polyurethane, it has been found that the desired gripping takes place. Thus, polyurethane containing these compositions can be successfully attached to an upper. Furthermore, the ideal wearing characteristics of the polyurethane are not in any way lost by the addition of the compositions.

The following comprise specific examples of the practice of the instant invention:

EXAMPLE I

A thin layer of polyurethane was poured into a mold having a substantially flat surface. The polyurethane comprising Cyanaprene D–6 manufactured by American Cyanamid formed a layer about 1/32 inch thick. A Dacron fabric sheet was deposited over the polyurethane, and additional polyurethane was added to the mold. The total thickness was about 3/8 inch thick and after molding of the polyurethane to form a solid article, soles for shoes were fashioned from the article. The surface having a fabric adjacent thereto provided the wearing surface for the soles and the material was readily adaptable for stitching to the upper of a shoe.

EXAMPLE II

An amount of polyurethane sufficient to form a layer about 1/32 inch thick was disposed in a mold. The polyurethane comprised Cyanaprene D–6 manufactured by American Cyanamid. A glass fiber fabric sheet was dis-

posed over the polyurethane, and additional polyurethane of the same type was added to the mold and the molding operation was completed. The resulting product was about ¼ inch thick. Material was cut from the molded product for purposes of forming top lifts for women's shoes.

EXAMPLE III

Adiprene L–167 manufactured by Du Pont was molded in combination with chopped glass fiber strands. The strands were present in an amount of about 20 percent by weight of polyurethane. The molded material was cut to form soles for shoes.

The reinforcing composition serves to add body and consistency to the polyurethane whereby a gripping action on nails and stitching can be achieved. The use of a sheet fabric is convenient from a manufacturing standpoint and, in this case, the reinforcing composition is not distributed throughout the polyurethane but is instead located adjacent a wearing surface. On the other hand, uniform distribution of the fibers is suitable to provide the unique characteristics in the completed product.

It will be understood that various changes and modifications may be made in the above described compositions and methods which provide the characteristics of this invention without departing from the spirit thereof particularly as defined in the following claims.

That which is claimed is:

1. In a shoe construction comprising an upper portion, and heel and sole portions attached to said upper portion and defining wearing surfaces for said construction, the improvement wherein said wearing surfaces comprise a material consisting essentially of polyurethane and a reinforcing composition disposed within said polyurethane at least in those areas immediately adjacent said wearing surface, said reinforcing composition being selected from the group of materials consisting of glass fiber and polyester fiber.

2. A construction in accordance with claim 1 wherein said reinforcing composition comprises Dacron disposed within said polyurethane in the form of a sheet of fabric.

3. A construction in accordance with claim 1 wherein said reinforcing composition comprises fiber particles substantially uniformly distributed throughout the polyurethane.

4. In a method for forming a shoe construction wherein heel and sole portions defining the wearing surfaces of the construction are attached to an upper portion, the improvement comprising the step of forming said attached portions from a material consisting essentially of polyurethane and a reinforcing composition disposed within said polyurethane at least in those areas of the polyurethane immediately adjacent said wearing surfaces, said reinforcing composition being selected from the group of materials consisting of glass fiber and polyester fiber.

5. A method in accordance with claim 4 wherein said reinforcing material comprises fiber particles, and including the step of substantially uniformly distributing said particles throughout the polyurethane in the course of molding said material.

6. In a shoe construction comprising an upper portion, and heel and sole portions attached to said upper portion and defining wearing surfaces for said construction, the improvement wherein said wearing surfaces comprise a material consisting essentially of polyurethane in combination with a reinforcing sheet disposed within said polyurethane and located closely adjacent said wearing surface, said reinforcing sheet comprising a fabric formed from the group of materials consisting of glass fiber and polyester fiber.

7. In a method for forming a shoe construction wherein heel and sole portions defining the wearing surfaces of the construction are attached to an upper portion, the improvement comprising the steps of forming said attached portions by distributing a thin layer of polyurethane in a mold, disposing a fabric formed from a composition selected from the group of materials consisting of glass fiber and polyester fiber over said layer of polyurethane, filling the mold with polyurethane, solidifying the polyurethane, and attaching said molded article to said upper portion to form said heel and sole portions, said fabric being located closely adjacent one surface of the molded article, said surface of the molded article being disposed to provide said wearing surfaces.

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