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PLASTIC FOOTWEAR WHEREIN A SELECTED AREA OF THE BOTTOM IS OF A MATERIAL MORE RESISTANT TO WEAR THAN THE MATERIAL FORMING THE BOOT UPPER

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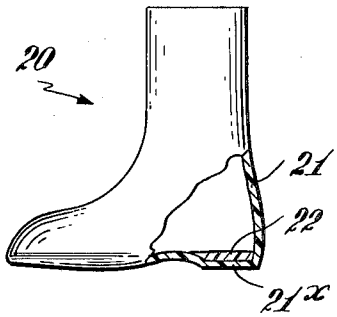


Fig. 1

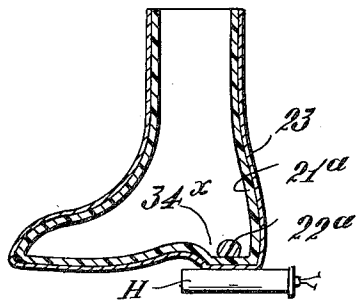


Fig. 2

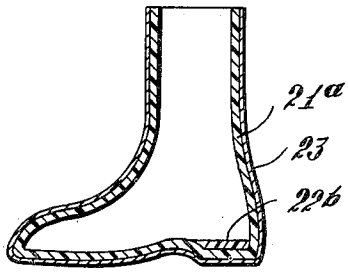


Fig. 3

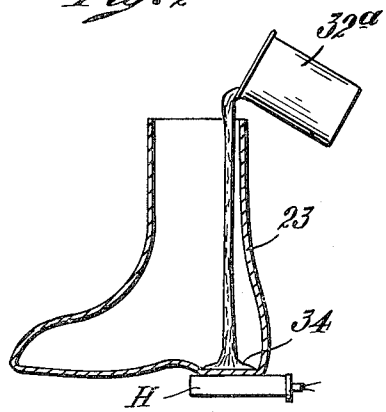


Fig. 4

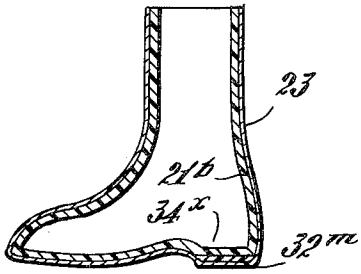


Fig. 5

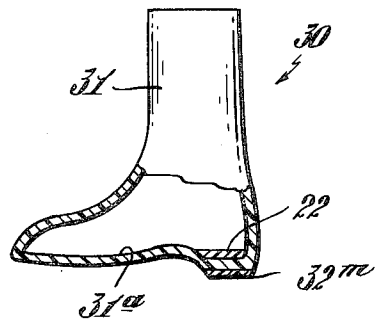


Fig. 6

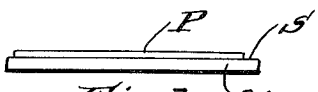


Fig. 7



Fig. 8

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PLASTIC FOOTWEAR WHEREIN A SELECTED AREA OF THE BOTTOM IS OF A MATERIAL MORE RESISTANT TO WEAR THAN THE MATERIAL FORMING THE BOOT UPPER

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5 Claims. (Cl. 18—58)

This invention pertains to rainproof footwear and more especially to footwear of the kind wherein at least the outer sole (including the heel) is of a synthetic plastic, and relates more especially to a method of increasing the resistance to abrasion or puncture of the heel and/or sole of such an article of footwear, and to a boot resultant from the practice of said method. For convenience herein, but without limiting intent in the following description and in the drawings, the invention will be described as embodied in a boot to be worn over a shoe.

The bottom or tread of the heel of a woman's waterproof boot, made of synthetic plastic, is particularly prone to rapid deterioration in use because of the very small area of the metal top-lift now commonly used on the spike heels of a woman's shoe, whereby the pressure is concentrated on a small area of the bottom of the heel of the waterproof boot, with the result that the heel bottom is worn or cut through after a very short period of wear. Somewhat similar abnormally rapid wear has been observed with reference to waterproof rubber footwear.

In the rubber shoe industry, it has been common, for the above reason, to provide, by die-cut, properly shaped inserts of hard material, for example of rag stock, hard rubber compound, or even of metal, which are incorporated at those portions of the rubber boot bottom which are particularly subject to wear; but, such a practice is expensive and not easy of accomplishment in the manufacture of plastic footwear because of the difference in the methods commonly used in making such plastic footfear as compared with that used in making rubber footwear.

The present invention has for an object the provision of a novel method, useful in connection with the manufacture of plastic footwear whereby, without requiring any substantial modification of the usual process for adding substantially to the expense of manufacture, selected areas of the outer sole, either at the forepart, at the heel, or throughout the entire extent of the botom may be made more resistant to wear than is the material which forms the remainder of the boot. Another object is to provide a method whereby it is readily possible to locate the harder and more wear-resistant material, either at the interior or the exterior of the boot as may be found most desirable.

A further object is to provide a method which is less expensive than that employed in the rubber shoe industry for making a selected bottom-area of the boot more resistant to wear than is the material forming the remainder of the boot. A further object is to provide a novel method of increasing the wear-resistance of a selected area of the boot bottom without recourse to the employment of die-cut pieces of wear-resistant material and whereby the more resistant area comprises material which is integrally joined, as by fusion, with the material employed in making the remainder of the boot bottom. A further object is to provide a novel method of increasing the resistance to wear of a selected area of the boot bottom which is readily practiced as an additional step in the manufacture of plastic boots by the use of a hollow mold. A further object is to provide a waterproof boot wherein the waterproof material is of a synthetic plastic and whose bottom

comprises a selected area of a material which is more resistant to abrasion than the waterproof plastic and which is integrally fused with the latter.

Other and further objects and advantages of the invention will be pointed out in the following more detailed description and by reference to the accompanying drawings wherein:

FIG. 1 is a diagrammatic, side elevation partly broken away, showing a boot made in accordance with the present method;

FIG. 2 is a vertical, front-to-rear section through a hollow mold such as is used in the manufacture of plastic footwear, showing the interior surface of the mold as coated with a semi-fused, waterproof plastic and with a mass of wear-resistant plastic disposed in the heel cavity of the plastic coating;

FIG. 3 is a view similar to FIG. 2, but showing the mass of wear-resistant plastic as having been liquified by heat so that it has flowed and substantially filed the heel cavity of the plastic coating;

FIG. 4 is a vertical, front-to-rear section through a mold, such as is used in the manufacture of plastic footwear, illustrating a procedure whereby the heel cavity of the mold, itself, is filled with a wear-resistant plastic before any other plastic is introduced into the mold cavity;

FIG. 5 is a view similar to FIG. 4, but illustrating the results of a subsequent step whereby the interior of the mold cavity has received a coating of partially fused, waterproofing plastic which overlies the wear-resistant plastic in the heel cavity;

FIG. 6 is a side elevation partly broken away, illustrating a boot resultant from the method indicated in FIGS. 4 and 5;

FIG. 7 is a diagrammatic, side elevation illustrating a step in the preparation of a plastic material useful in the practice of the method illustrated in FIGS. 2 and 3; and,

FIG. 8 is a view, similar to FIG. 7, but showing a further step in the preparation of this plastic material.

Referring to the drawings, the numeral 20 designates a waterproof boot whose upper and the major portion of whose bottom consists of a layer or ply 21 of a suitable waterproof plastic such as, for example, is customarily used in the manufacture of plastic footwear. While this boot is shown as without any lining, it is contemplated that it may have a lining, if desired, and that it may be furnished with other features commonly embodied in such boots, for example a suitably located opening provided with a slide fastener for closing it.

The plastic customarily employed as a waterproof material in boots of this type is not especially resistant to abrasion so that, as above pointed out, it is subject to rapid wear, particularly at the bottom surface of the heel where the pressure of the foot is confined to a small area. In accordance with one embodiment of the present invention, the boot is provided with a layer 22 of plastic which is more resistant to cutting or puncturing than is that which is employed in making the rest of the boot, this layer 22 overlying the plastic 21^x which forms the actual tread surface of the heel, but being fused with the latter to form an integral structure. This more wear-resistant layer 22 is desirably of a plastic which makes a good bond with the plastic of the boot proper, but which is inherently more wear-resistant. One such material is nylon, although this is suggested merely by way of example. If desired, this wear-resistant plastic may have inclusions of material such, for example, as fibreglass or mineral powder so that, when fused, it is much harder than the material forming the rest of the boot and is thus capable of resisting abrasion or puncture.

According to one method of making such a boot, there is provided a mold 23 (FIG. 2) usually of metal having the desired interior configuration. This mold, in accord-

ance with customary practice, is filled with plastic in fluid form which is to form the major portion of the boot including the upper and bottom; the mold is then warmed sufficiently to cause this plastic to coagulate in contact with the interior surface of the mold and form the coating 21^a; when this coating is of sufficient thickness, the mold is inverted and the still liquid plastic is drained out and the coating may be allowed to air-dry or, if desired, the mold may be further heated so as to fuse this coating to a greater degree but not completely.

In accordance with a preferred procedure, a quantity of the plastic which is to form the wear-resistant layer is spread upon a horizontal surface S, as indicated in FIG. 7, to form a layer P which is allowed to set by exposure to the air or, if desired, by applying a low degree of heat to the support 24 having the surface S; and, after this plastic layer has thickened, it is scraped up from the surface S by means of a suitable tool 25, FIG. 8, and collected as a mass of putty-like consistency. Plastic in this physical condition is useful for various purposes, for example for patching defective footwear, but for the present purpose is of a character such that when fully fused it is hard and relatively inflexible. A suitable quantity 22^a (FIG. 2) of this putty-like plastic is then dropped into the heel cavity of the coating 21^a in the mold 23, this operation being easy of performance and requiring no special appliance or great skill in its accomplishment. The heel portion of the mold is then desirably placed upon a heater H and heated until the mass 22^a flows and spreads so as to form a layer 22^b, FIG. 3, of substantially uniform thickness within the cavity on the coating 21^a. The entire mold is now subjected to external heat thereby to complete the fusion of coating 21^a and, at the same time, to fuse the layer 22^b in the heel cavity and integrally bond the latter to the layer 21^a, thereby providing the wear-resistant layer 22. Thereafter, the coating 21^a is withdrawn from the mold cavity, thus producing a boot such as shown in FIG. 1, it being understood that any usual finishing operations may thereafter be performed.

In accordance with the method, above described, the wear-resistant layer 22 is at the inside of the boot where it receives the direct impact of the metal top-lift of the spike heel of a shoe and thus protects the actual tread surface 21^x from puncture. However, it is manifest that such a wear-resistant layer might, if desired, be located in the forepart portion of the boot bottom, by a similar procedure, or in fact if desired, the entire bottom of the boot may similarly be provided with such a wear-resistant layer.

As shown in FIG. 6, the boot 30, having the upper 31 and the bottom 31^a of a waterproofing plastic, has a wear-resistant layer 32^m at the underside of its heel. It is also shown as provided with a wear-resistant layer 22 at its interior, like that of the boot shown in FIG. 1. The external wear-resistant layer 32^m is conveniently formed, as illustrated in FIGS. 4 and 5, by first pouring into the heel cavity 34 of the mold 23, a suitable quantity of the wear-resistant plastic which, for example, may be placed in a suitable container 32^a which, if desired, may have a delivery pipe extending downwardly into the heel cavity. The plastic thus introduced fills or partially fills the heel cavity 34 of the mold and may then be partially fused by placing the heel portion of the mold upon a heater H. When this layer 32^m, FIG. 5, has thus been partially fused, which is quickly done, the mold is filled with the plastic which is to form the remainder of the boot and the entire mold is warmed so as to form a jelled coating 21^b of this plastic whereupon the surplus liquid plastic is poured out and the entire mold is then warmed so as to complete the fusion of the plastic material 32^m and the coating 21^b while concomitantly bonding these two plastics to form an integral union. Before this final step of completing the fusion, a lump of the putty-like plastic, as shown in FIG. 2, may be placed within the heel cavity 34^x of the coating 21^b so that, when the final fusion takes place, there results a boot as shown in FIG. 6 having wear-resistant layers both at its inside and outside. However, the formation of the inside wear-resistant layer may be omitted, if desired.

It is further to be understood that instead of pouring a liquid plastic into the cavity 34 of the mold, a lump of putty-like plastic, such as above described, may be placed in the heel cavity of the mold and this lump caused to flow and fill the cavity to the desired level and partially fused before the coating 23 is formed.

If the shoe does not have a distinctive heel cavity, the fluid wear-resistant material will be confined to the rear portion of the shoe by tipping the toe end of the latter upwardly enough to confine the plastic to the desired area.

While, as above suggested, the present invention is applicable, without substantial modification, to the induration of the entire outer sole or to other portions of the boot, it is herein specifically described but merely for convenience in illustration in its application to the provision of a wear-resistant area in the heel of the boot.

While certain desirable embodiments of the invention have herein been disclosed by way of example, it is to be understood that the invention is broadly inclusive of any and all modifications falling within the scope of the appended claims.

I claim:

1. That method of making a rainproof boot to be worn over a shoe and having a portion of the inner surface of its bottom which is more resistant to damage by the shoe than is the remainder of the boot bottom, said method comprising as steps: providing a hollow mold; providing a first plastic, in fluid condition, which is suitable, when fused, to constitute the major portion of the boot; providing a second plastic which, when fused, is more wear-resistant than said first-named plastic; providing the mold with a partially fused inner coating of the first-named plastic; then disposing a quantity of the more wear-resistant plastic, in partially fused condition, in the mold at the location of the desired reinforced area, causing said more wear-resistant plastic to spread over that area only of the boot bottom which is desired to be more wear-resistant and then completely fusing both kinds of plastics so as integrally to unite them, characterized in that the wear resistant plastic is introduced into the mold in the form of a properly sized lump of putty-like consistency which is placed in that part of the cavity, defined by said inner coating, which will be occupied by the heel of the shoe when the boot is worn, and wherein the mold is then heated sufficiently to cause said lump to flow and assume the horizontal dimensions of the area which is to be made more wear resistant than the remainder of the boot bottom.

2. That method of making a rainproof boot to be worn over a shoe and having a portion of the inner surface of its bottom which is more resistant to damage by the shoe than is the remainder of the boot bottom, said method comprising as steps: providing a hollow mold; providing a first plastic, in fluid condition, which is suitable, when fused, to constitute the major portion of the boot; providing a second plastic which, when fused, is more wear-resistant than said first-named plastic; providing the mold with a partially fused inner coating of the first-named plastic; then disposing a quantity of the more wear-resistant plastic, in partially fused condition, in the mold at the location of the desired reinforced area, causing said more-resistant plastic to spread over that area of the bottom of the boot which is desired to be more wear-resistant and then completely fusing both kinds of plastics so as integrally to unite them.

3. The method according to claim 2, wherein, after the more wear-resistant plastic has been introduced, the entire mold cavity is filled with plastic and heated thereby providing a coating of the last-named plastic which covers

the more wear-resistant plastic and constitutes a lining for the entire boot.

4. The method according to claim 2, further characterized in that, before the first-named plastic is introduced into the mold, the heel cavity of the mold is at least partially filled with a plastic which, when fused, is more wear-resistant than the first-named plastic, and heating the mold thereby partially to cure said wear-resistant plastic before the first-named plastic is introduced whereby the boot, when completed, has a wear-resistant layer both at the inside and outside of its heel portion.

5. That method of making a rainproof boot to be worn over a shoe and having a portion of its bottom structure stiffer and more resistant to wear than the remainder of the boot, said method comprising as steps: providing a hollow mold; providing a first plastic, in fluid condition, which is suitable, when fused, to constitute the major portion of the boot; providing the mold with a partially fused inner coating of said first-named plastic; providing a partially cured plastic of putty-like consistency which, when fully cured, is hard and substantially inflexible, disposing a mass of the putty-like plastic within the cavity defined by said inner coating at that point at which the bottom structure of the boot is to be made stiffer and more wear-resistant, causing said mass of putty-like plastic to spread over a predetermined area of said inner coating, and concomitantly completing the curing of the inner coating and said putty-like plastic thereby integrally uniting them.

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