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RUBBER FOOTWEAR

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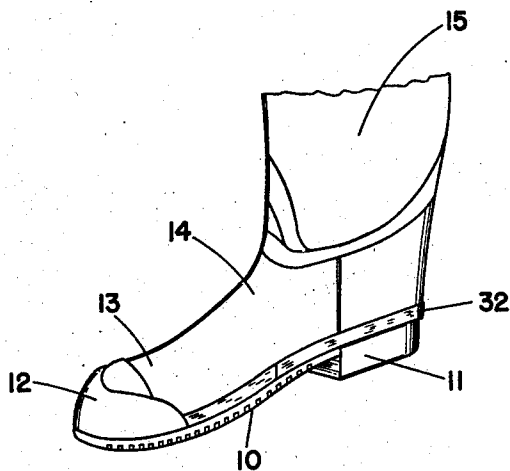


FIG. 1

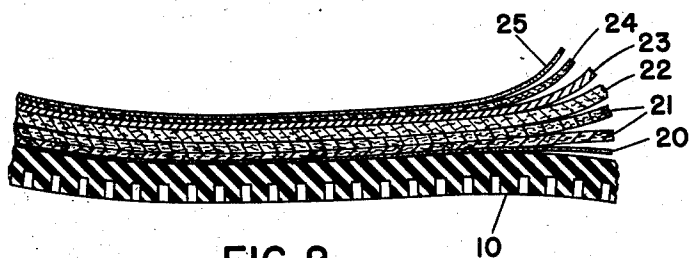


FIG. 2

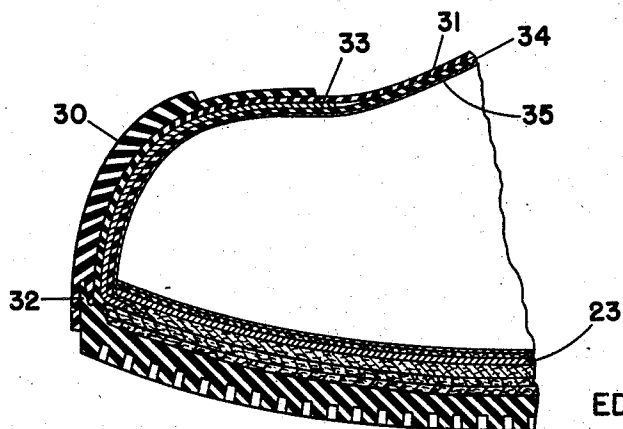


FIG. 3

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## UNITED STATES PATENT OFFICE

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## RUBBER FOOTWEAR

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5 Claims. (Cl. 36-4)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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This invention relates to rubber footwear and in particular to the construction of the sole, heel and toe portions of a rubber boot.

One object of the invention is to provide a rubber boot provided with a non-skid, non-inflammable, oil and solvent resistant sole and heel. Another object is to provide a boot having a foot protecting metallic layer interposed in the composite structure of the sole and heel portions. Another object is to provide a boot provided with a metallic toe cap interposed in the structure of the toe which is not integral with the metallic layer in the sole structure. A further object is to provide a boot having a layer of rubber of contrasting color to that of the other rubber of the boot vulcanized to the outside surface of the toe or any other readily visible portion.

It is known in the art to provide rubber footwear having an interposed layer of metal in the sole of the boot or an integral layer extending through heel and sole portion and up into toe cap but this latter type of construction is not very satisfactory because of the stiffness imparted to the structure by the curved metallic plate. Such construction does not provide a boot which is as comfortable for the wearer as footwear constructed according to applicant's invention.

In order to have a clearer conception of one embodiment of the present invention, reference is made to the drawings in which:

Figure 1 is an isometric view of the foot portion of the boot.

Figure 2 is an enlarged sectional view in the sole of the boot showing applicant's composite structure.

Figure 3 is a longitudinal sectional view through the toe of the boot.

In Figure 1, 10 represents the sole of the boot, 11 the heel and 12 the toe thereof, 13 the vamp, 14 the instep and 15 the shank. In referring to Figure 2, the sole of the boot is represented by 10 to which is cemented a layer of fabric 20. Over this fabric and cemented thereto are two layers of impregnated felt or filler 21. Immediately above this impregnated felt or filler is a layer of felt 22 to which is cemented a flexible steel plate 23 which extends approximately the full length of the sole and heel. Immediately above the steel plate and cemented thereto is a layer of felt 24 to which is cemented the conventional Osnaburg lining 25. Referring to Figure 3, the sole components are the same as just above described, but in the construction of the upper part of the toe, 30 represents the outside rubber cap which is of contrasting color to the

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other rubber in the boot. 31 is the outside ply of rubberized fabric which extends down to the sole of the boot at the base of the toe. 32 is the tape which extends around the upper part of the sole and heel and covers, as a sealing medium, the juncture of the sole and the upper. 33 is the steel protective cap which is separate from the steel plate in the sole. 34 is the inside ply of rubberized fabric extending down to the base of the toe. 35 is a conventional Osnaburg lining which is cemented to ply 34.

The construction above described provides a boot which is very useful in such operations as fire fighting, mining, quarrying and general excavation work wherein the wearer is subject to such hazards as projecting nails, pieces of glass and other sharp fragments. The function of the contrasting colored layer of rubber on the toe is two fold, first, as a better quality of rubber, it increases resistance to abrasion at this critical wearing point. Secondly, it affords a means of ready identification of the particular boot. This feature is very important under conditions such as exist on ship board where boots of different types are stowed and where time is of the essence in getting ready to fight fires. The particular construction described for the sole affords a relatively flexible structure which is comfortable for the wearer and which, because of the steel plate, affords protection.

While the embodiment herein disclosed by applicant shows a composite sole structure of several layers of felt in conjunction with the steel plate, it is not desired to be limited to the particular or specific proportions disclosed as it is obvious that more or less felts could be used without departing from the spirit or scope of the invention. The essential features are the particular type of sole and heel disclosed with felt interposed between the sole and the steel plate and the innersole of felt and lining above the steel plate. It should be noted that there are no layers of felt in the toe structure as obviously no cushioning effect is there required.

The invention described herein may be used by or for the Government of the United States for governmental purposes without the payment to me of any royalties thereon or therefor.

What is desired to be secured by Letters Patent of the United States is:

1. A laminated sole structure for rubber footwear used in hazardous operations comprising an outer sole and heel member of synthetic rubber provided with a non-skid tread, a layer of impregnated felt cemented to said outer sole mem-

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ber, a felt layer cemented to said impregnated felt layer, a flexible steel plate extending approximately the length of said outer sole and heel member, and a layer of felt carrying on its upper side a sole lining member cemented to said steel plate.

2. Rubber footwear for use in hazardous operations comprising an outer sole and heel member, an inner metallic toe cap, and a flexible metallic innersole member extending approximately the length of said outer member and yieldingly connected to said metallic toe cap through fibrous material and a flange integrally extending from said metallic toe cap beneath said fibrous material and the front edge of said metallic inner sole member.

3. A laminated sole structure for footwear used in hazardous operations comprising an outer sole and heel member of non-metallic flexible sheet material, a layer of impregnated felt cemented to said outer sole member, a felt layer cemented to said impregnated felt layer, a flexible metal plate extending approximately the length of said outer sole and heel member, and a layer of felt carrying on its upper side a sole lining member cemented to said metal plate.

4. Rubber footwear for use in hazardous operations including an outer sole member and heel member of synthetic rubber provided with a non-skid tread, a layer of impregnated felt cemented to said outer sole member, a felt layer cemented to said impregnated felt layer, a flexible steel plate

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extending approximately the length of said outer sole and heel member, and a steel toe protective cap having a flange integrally extending therefrom beneath the edge of said steel plate but separated therefrom by fibrous material.

5. Footwear for use in hazardous operations including an outer sole member and heel member of non-metallic flexible sheet material, a layer of impregnated felt cemented to said outer sole member, a felt layer cemented to said impregnated felt layer, a flexible metal plate extending approximately the length of said outer sole and heel member, and a metallic toe protective cap having a flange integrally extending therefrom beneath the edge of said metallic plate but separated therefrom by fibrous material.

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