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(54) **REMOVABLE PROTECTIVE INSOLE FOR SAFETY FOOTWEAR**

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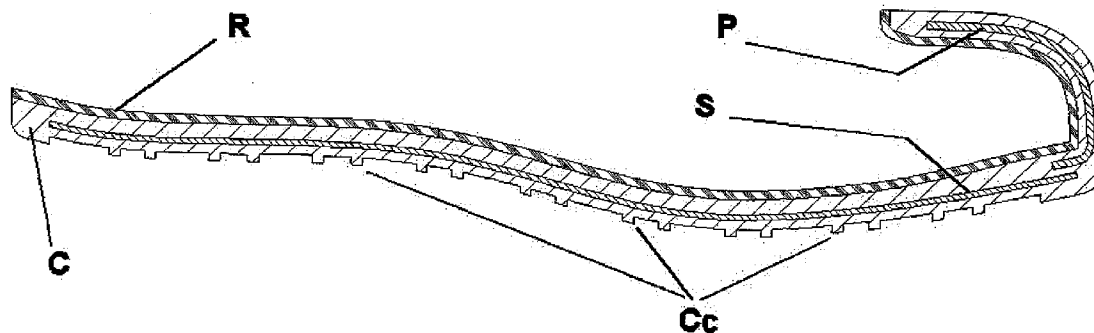
(57) **ABSTRACT**

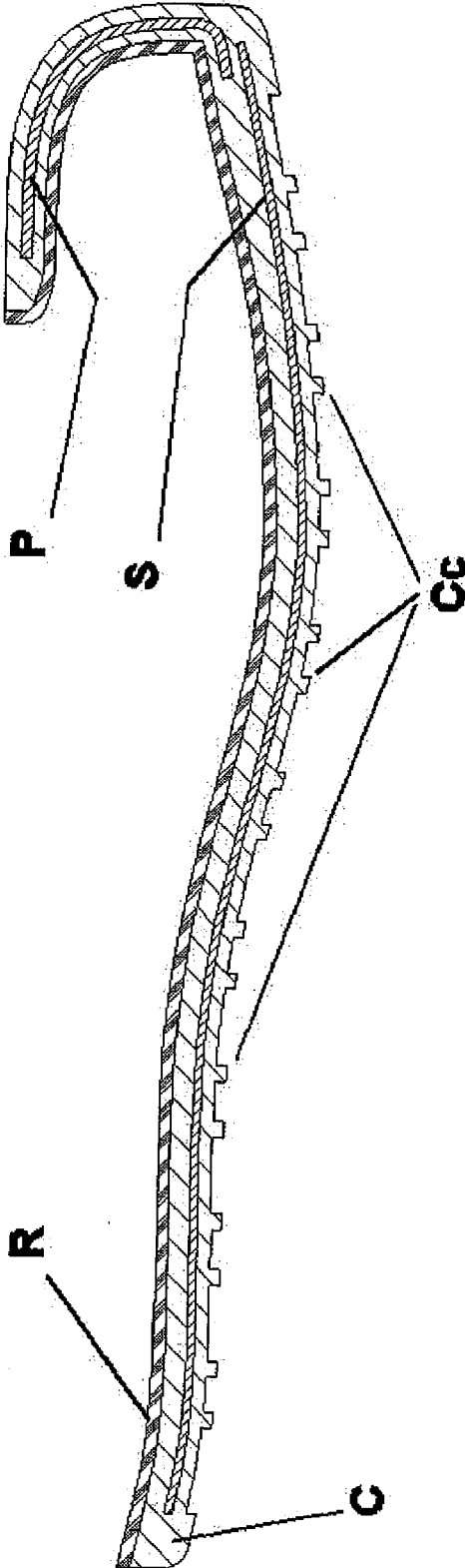
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A removable protective innersole for safety footwear includes a body made of a plastic material, a puncture-resistant sheet made of metal or plastic, a protective toe-cap made of metal or plastic, and a lining. The lower part of the body is provided with protrusions and/or grooves, suitable for creating a series of recesses between said protective insole and the midsole of the shoe.

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**REMOVABLE PROTECTIVE INSOLE FOR SAFETY FOOTWEAR**

**FIELD OF THE INVENTION**

[0001] The present invention relates to safety footwear and in particular concerns the protective insoles of safety footwear.

**BACKGROUND OF THE INVENTION**

[0002] Safety footwear is classified as personal protective equipment, produced in different types and forms (shoes, boots, etc.), according to the intended use thereof, and protects workers' feet from various types of risk such as shocks, collisions, impact, thermal and chemical burns, puncturing and crushing, cuts and abrasions, heat, flames and cold.

[0003] Safety footwear is provided with a protective toe-cap, to protect the feet in the event of material falling on the foot, and a puncture-resistant sole, consisting of a steel plate which protects the foot from sharp materials which could penetrate the sole such as nails, sharp-edged blades or other.

[0004] Safety footwear is furthermore provided with a non-slip rubber outsole, which also protects against the risk of electrocution, and a heat insulating insole.

[0005] According to the current technique for production of safety footwear, the puncture-resistant insole and protective toe-cap are incorporated in the sole and upper during manufacture of the shoe, obtaining, at the end of a known process, the shoe finished and ready for use.

[0006] All this involves various drawbacks and problems.

[0007] Insoles, toe-caps and shoes have to be made for the various sizes with high production and storage costs.

[0008] If one of the parts such as the insole, toe-cap or shoe is defective, the entire article has to be discarded without being able to re-use the non-defective parts for producing a new item of footwear.

[0009] Each shoe size requires preparation of the related molds, lasts and patterns with expenditure of materials for preparation and space for storage. Said variety of sizes furthermore involves the possibility of error consisting in the use of a specific part for a shoe of one size in the production of a shoe of another size.

[0010] Safety footwear, and in particular the soles and insoles thereof, cannot be made of EVA as said material expands considerably after injection when the mold is opened and the material comes into contact with the air. In fact, the production of EVA objects requires molds smaller than the object to be obtained. It is not possible to produce EVA soles with incorporated insoles and toe-caps.

[0011] If the insole and/or toe-cap of the shoe sustains damage which limits the general safety of the shoe without permanently damaging the shoe itself, for example a heavy object which deforms the toe-cap or a sharp element which deforms the insole without substantially damaging the rest of the shoe, the entire shoe has to be discarded without the possibility of replacing the insole and/or toe-cap.

[0012] The production process described above, therefore, requires all the production operations to be performed in the same place and in direct sequence.

**SUMMARY OF THE INVENTION**

[0013] To remedy all the above-mentioned drawbacks, a new type of removable protective insole for safety footwear has been designed and produced.

[0014] One object of the new insole is to make production of the insole independent of production of the other parts of the shoe.

[0015] A further object of the new insole is to be able to produce different types of shoes with the same insole.

[0016] A further object of the new insole is to allow the use thereof also with shoes of larger sizes near the nominal size of the insole.

[0017] A further object of the new insole is to permit a discarding of the insole only and not the entire shoe if the insole is defective.

[0018] A further object of the new insole is to permit the replacement thereof when damaged, worn or simply no longer hygienic with a new insole offering maximum safety and hygiene.

[0019] These and further objects, direct and complementary, are achieved by the new removable protective insole for safety footwear comprising a plastic body, a puncture-resistant insole, a protective toe-cap and a lining.

[0020] The body of the new insole has form and dimensions that incorporate both the puncture-resistant insole and the protective toe-cap. Substantially, said body comprises a generically flat part corresponding to the sole of the foot, the thickness of which incorporates the puncture-resistant insole, and a dome-shaped front part, the thickness of which incorporates the protective toe-cap.

[0021] Said body can be made of various plastic materials, preferably antistatic polyurethane plastic materials.

[0022] The puncture-resistant insole consists of a plate made preferably of metal, or of composite plastic materials.

[0023] The protective toe-cap is a generically dome-shaped element suitable for protecting the front part of the foot and consists of a plate made preferably of metal, or of composite plastic materials.

[0024] The lower part of said body of the new protective insole is provided with protrusions and/or grooves, for example reticulated, suitable for creating a series of recesses between said protective insole and the midsole of the shoe. Said recesses have the purpose of collecting the condensed humidity, emitted by the foot, so that the foot stays drier.

[0025] The lining has the job of improving wearer contact and feel and can be made of fabric, leather or other suitable synthetic materials. Said lining is preferably applied on the upper part of the insole and on the concave or internal portion of the dome-shaped part of the protective toe-cap.

**BRIEF DESCRIPTION OF THE DRAWING**

[0026] The characteristics of the new removable protective insole for safety footwear will be better illustrated by the following description with reference to FIG. 1, which illustrates a non-limiting example of a removable protective insole according to the invention.

**DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION**

[0027] FIG. 1 illustrates a section of an insole according to the invention comprising a body (C) made of plastic, a puncture-resistant insole (S), a protective toe-cap (P) and a lining (R).

[0028] The puncture-resistant insole (S) and the protective toe-cap (P) are fixed or in any case coupled so that the toe-cap is positioned in the area of the tip of the insole (S), i.e. in its position of use.

[0029] The body (C) of the new insole incorporates and combines both said insole (S) and said toe-cap (P) with the result that they are connected and lined, constituting one single body.

[0030] Said body (C) can be made of various plastic materials, preferably antistatic polyurethane plastic materials.

[0031] The puncture-resistant insole (S) consists of a plate or layer which is preferably metallic or made of composite plastic materials resistant to puncturing.

[0032] The protective toe-cap (P) is a generically dome-shaped element consisting of a plate or layer which is preferably metallic or made of composite plastic materials resistant to crushing.

[0033] In the lower part of said body (C), protrusions and/or grooves (Cc), for example reticulated, are provided suitable for creating a series of recesses between said protective insole and the midsole of the shoe. The condensed humidity, emitted by the foot, is collected in said recesses thus leaving the foot drier.

[0034] The lining (R), applied on the upper part of the insole (S) and on the concave or inner portion of the dome-shaped part of the protective toe-cap (P), can consist of fabric, leather or other appropriate synthetic materials. The new removable protective insole for safety footwear constituted as above has considerable advantages.

[0035] The new insole can be produced independently of the production of the other parts of the shoe.

[0036] The new insole permits reduction of the operations for the production of safety footwear. In fact, since the insole is removable, it is possible to produce footwear in one single size on which insoles of the same size or even one or two sizes smaller can be applied. Substantially in a shoe of a certain size, protective insoles can be inserted specific for the size of the shoe or insoles one size smaller or, for example, even two sizes smaller. The difference in size between insole and shoe is compensated for by filler elements which are removable or, preferably, joined permanently to the protective insole. Consequently, it is possible to produce shoes of a certain size, for example 42, and insert in them protective insoles for the same size, in this case 42, or one or two sizes smaller, in this case 41 or 40, having one or more filler elements on the tip and/or on the sides, thus fitting the smaller sizes without having to produce shoes for said smaller sizes.

[0037] The new protective insole reduces the cost of rejects or protective footwear not suited to the technical protection required or to a new design. In fact, if a protective insole is not

suitable or is defective, only the insole is discarded without discarding the entire protective shoe; in the same way, if a shoe has defects which make it unusable, the protective insole originally intended for it is used for another shoe without defects.

[0038] The new insole can be replaced, in the case of wear or damage, by simply taking it out of the shoe and inserting a new one. In this way the user only has to purchase a new pair of insoles and not a more expensive pair of safety shoes.

[0039] Therefore, with reference to the preceding description and the accompanying drawing, the following claims are made.

The invention claimed is:

1. An insole for safety footwear comprising:

a body shaped to accommodate wholly or partly at least a lower area and a front area of a foot,

wherein said body incorporates and encloses a puncture-resistant insole and a protective toe-cap, and wherein said insole is removable, replaceable, and suitable for insertion in a shoe.

2. The insole according to claim 1, wherein said removable and replaceable insole is suitable for insertion in a safety shoe.

3. The insole according to claim 1, wherein said body is provided in a lower part with one or more of protrusions or grooves suitable for creating a series of recesses between said protective insole and a midsole of the shoe.

4. The insole according to claim 1, further comprising filling elements at one or more of tip or sides, thus fitting accurately also in larger size shoes.

5. The insole according to claim 1, further comprising a lining applied on an upper part of the insole and on a concave or inner portion of a dome-shaped part of the protective toe-cap (P).

6. The insole according to claim 1, wherein said puncture-resistant insole comprises metal, a composite plastic material, or another material suitable for protecting against puncturing.

7. The insole according to claim 1, wherein said protective toe-cap comprises a metal, a composite plastic material, or another material suitable for protecting against crushing.

8. The insole according to claim 1, wherein said body comprises one or more plastic materials.

9. The insole according to claim 5, wherein said lining comprises fabric, leather or other suitable synthetic materials.

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