



(11) **EP 1 779 742 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
02.05.2007 Bulletin 2007/18

(51) Int Cl.:
A43B 23/08 (2006.01)

(21) Application number: **06022093.6**

(22) Date of filing: **20.10.2006**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**
Designated Extension States:
AL BA HR MK YU

(72) Inventor: **Leite, Teófilo Óscar Ribeiro Gonçalves
4810-781 Guimarães (PT)**

(74) Representative: **Pereira da Cruz, Jorge Afonso
J. Pereira da Cruz, S.A.
Rua Vitor Cordon, 14
P-1249-103 Lisboa (PT)**

(30) Priority: **24.10.2005 PT 10337105**

(71) Applicant: **I.C.C. Indústrias De Comércio E
Calçado, S.A.
Sol-Pinheiro
Guimarães
4810-781 Guimarães (PT)**

(54) **Toecap for safety footwear**

(57) The invention comprises a toecap 1 for safety footwear, which is closed at the bottom and forms a base 2 extending from edge 3 to edge 4 for supporting the lower surface of the toes, offering total resistance to any

type of perforation. It increases the protection of this part of the foot and facilitates the release of the foot from inside the safety footwear in the event of impact or compression. It benefits from greater dimensional stability.



Fig. 1

EP 1 779 742 A1

Description

Technical field and prior art

[0001] Toecaps are components that are placed onto the tip of footwear in order to reproduce the format of the shape as manufactured and maintain this format with use.

[0002] In safety footwear, toecaps have to comply with the safety regulations laid down in standard EN 12568: 1998 "Foot and leg protectors. Requirements and test methods for toecaps and metal penetration resistant inserts", in accordance with the definitions contained in standard EN ISO 20344:2004.

[0003] Among other characteristics, toecaps for safety footwear must be able to withstand an energy impact of 200 joules and a compression force of 20 kN.

[0004] These values are ensured by a structure in the shape of the tip of the footwear, ending in a lip or rim at the bottom of a maximum dimension of 10 mm, as shown in figures 1 and 2.

[0005] Toecaps with this format are manufactured in the following materials:

- steel (represented in the right-hand toecap in the abovementioned figures);
- nylon of the polymer family (represented in the toecap in figure 2).

[0006] The format of the toecaps manufactured to date has the following inconveniences, namely:

- although the toecap is able withstand the tests required under standard EN 12568:1998, in case of accident, the rim may penetrate the material of a low density sole, reducing the foot-protecting cavity and causing injury;
- the inside of the rim needs to be filled with a protective material that is able to resist penetration.

[0007] Examples of toecaps in prior art are those constituting the subject matter of patents EP 1502518, US 2003041479 and DE 19928503.

[0008] Patent EP 1502518 relates to a toecap for safety shoes, comprising on the one hand a rigid protection shell delimiting a cavity opened at least towards the back and on the other hand a flexible lip which extends the shell towards the back, characterised in that the shell and the flexible lip constitute a single piece.

[0009] Patent US 2003041479 relates to a shoe with a steel toe, in which an insole forepart is attached to the bottom of the sock liner. An upper having a vamp lining with a toe part is provided where the toe part is stitched to the sock liner such that the vamp lining and the sock liner together define a volume for receiving the wearer's foot. A steel toe is positioned substantially around the toe part of the vamp lining. An outsole having a forward

portion formed of a material having a first resiliency characteristic is provided. A stiffener is positioned between the forward portion of the outsole and the insole forepart where the stiffener is formed of a material having a second resiliency characteristic less than the first resiliency characteristic.

[0010] Patent DE 19928503 relates to a safety shoe with a protective cap in the toe. The back top edge of the cap has a cushion component which continues its curve.

Summary of the invention

[0011] The present invention relates to a toecap for safety footwear which is closed at the bottom, unlike the traditional known toecaps, which are open at the bottom.

Brief description of the drawings

[0012] The following description is based on the attached drawings, which represent without any restrictive character the subject matter of the invention. In the drawings:

Figure 1 represents a rear view of traditional known toecaps;

Figure 2 represents a front view of traditional known toecaps;

Figures 3 a-d represent various views of the toecap of the invention;

Figures 4 a-c represent a cross-section, an elevation and a plan view respectively of the toecap represented in figures 3 a-d.

Detailed description of the invention

[0013] As may be observed from the figures attached hereto, the subject matter of the invention comprises a toecap 1 for safety footwear where the lip of traditional toecaps of a maximum dimension of 10 mm is substituted by a base 2 extending from edge 3 to edge 4, for supporting the lower surface of the toes. The toecap 1 is manufactured as a single piece in synthetic material with an opening for the user to insert his toes and it has a configuration suitable for being attached onto the tip of the shoe, in order to reproduce the format of the shape as manufactured and maintain this format with use.

[0014] From the rear part of the base 2, a rim 5 extends backwards having slightly less thickness than the base 2.

[0015] The innovation of the toecap proposed in the present invention lies in the fact that the area between the edges is filled in, thus removing the inconveniences of traditional toecaps but maintaining all the characteristics required under the safety standards.

[0016] The toecap presented herein can only be manufactured in a material of the polymer family.

[0017] The toecap offers total resistance to any type of perforation, in accordance with the additional requirements specified in standard EN ISO 20345:2004.

[0018] With these characteristics, the functional performance of the toecap is clearly improved. In the event of impact or compression, there is a significant increase in the degree of protection of the toe area and the degree of ease in releasing the foot from inside the safety footwear, since it is possible to guarantee that the space in the toe area is maintained by preventing the sole from collapsing, as well as total protection against perforations in the toe area.

[0019] Furthermore, the dimensional stability of the toecap is clearly enhanced by its actual geometry, which makes it possible to use soles with a lower density.

[0020] In view of the fact that it is manufactured in a synthetic material, this toecap can be used with safety footwear in industries where the demagnetisation of equipment can occur. Also due to the material used to manufacture the toecap of the invention, when it is fitted onto safety footwear it is not sensitive to the metal detectors that are normally installed in airports, thus avoiding the well-known inconveniences.

Claims

1. Toecap for safety footwear offering total resistance to any type of perforation, **characterised in that** it consists of a single piece which is closed at the bottom by means of a base 2 extending from the inside edge 3 to the outside edge 4, the said base acting as a support for the lower surface of the user's toes.
2. Toecap for safety footwear, according to claim 1, **characterised in that** from the rear part of the base 2 a rim 5 extends backwards having slightly less thickness than the base 2.
3. Toecap for safety footwear, according to the previous claims, **characterised in that** it is manufactured in a synthetic material which can be recycled, preferably a material of the polymer family.



Fig. 1

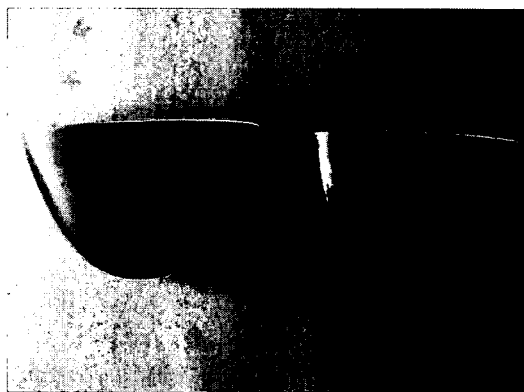


Fig. 2

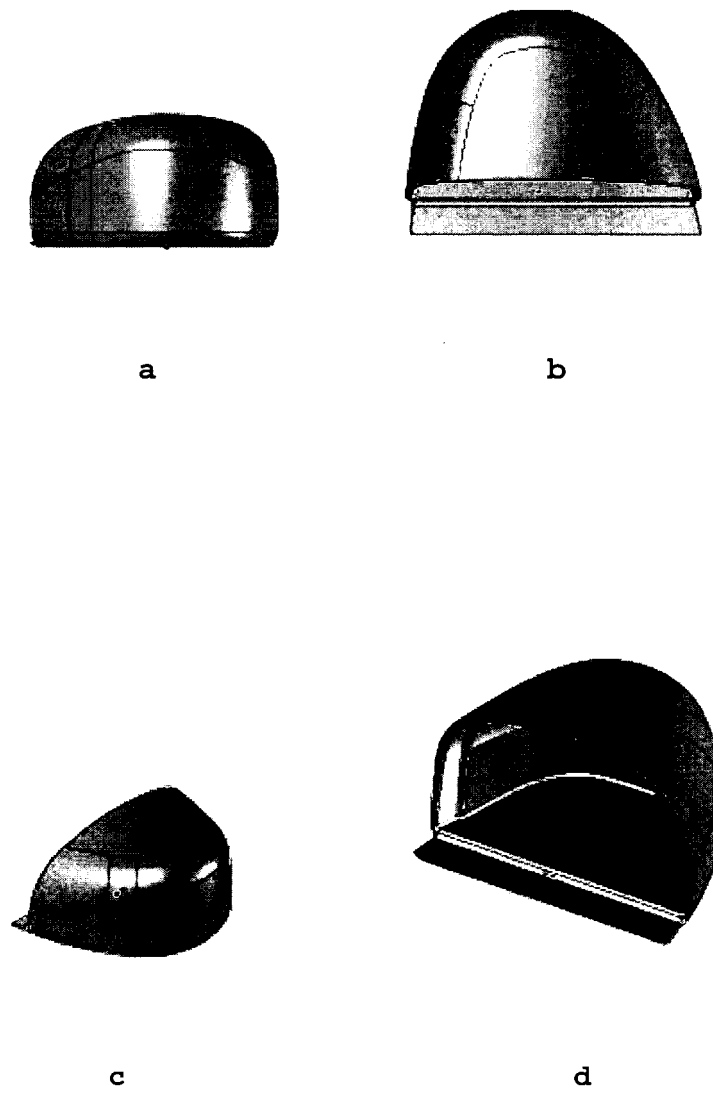


Fig. 3

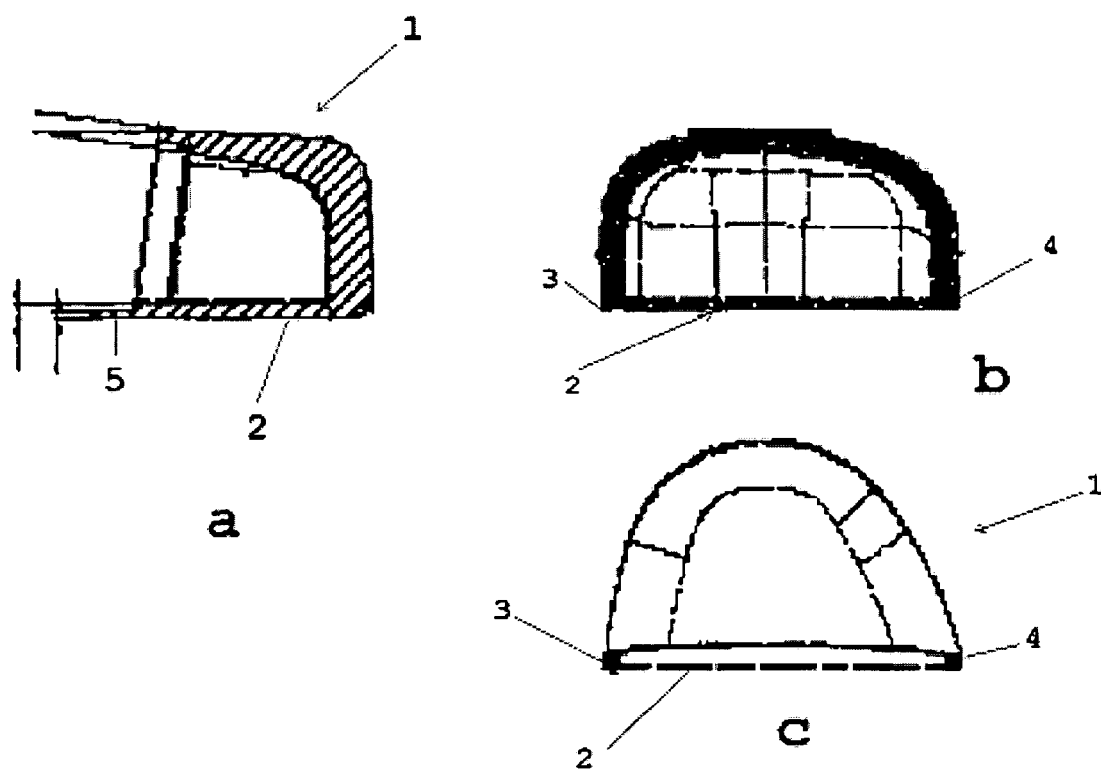


Fig. 4



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 5 878 511 A (KRAJCIR DEZI [CA]) 9 March 1999 (1999-03-09) * figures 1-3,8,9 * * column 2, lines 43-48 - column 5, lines 5-11 *	1,3	INV. A43B23/08
X	FR 2 525 443 A1 (AGULHON MICHEL [FR]) 28 October 1983 (1983-10-28) * figures * * page 1, lines 34-36 - page 2, lines 11-19 *	1,3	
X	DE 297 12 881 U1 (HAIMERL EWALD [DE]) 19 November 1998 (1998-11-19) * page 2, line 30 - page 3, line 7; figure *	1,3	
X	GB 2 176 992 A (CANADA MINING IND RES ORG MINING IND RES ORG CANADA) 14 January 1987 (1987-01-14) * the whole document *	1,3	
X	US 1 826 645 A (BERGQUIST JOHN U) 6 October 1931 (1931-10-06) * page 1, lines 59-79; figures *	1	
D,A	EP 1 502 518 A (MECELEC SA [FR]) 2 February 2005 (2005-02-02) * the whole document *	2	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 23 January 2007	Examiner Herry, Manuel
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 06 02 2093

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

23-01-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5878511 A	09-03-1999	AU 729395 B2	01-02-2001
		AU 9149498 A	12-04-1999
		WO 9915042 A1	01-04-1999
		EP 1014821 A1	05-07-2000
		JP 2004500128 T	08-01-2004
		NO 20001376 A	16-03-2000
FR 2525443 A1	28-10-1983	NONE	
DE 29712881 U1	19-11-1998	NONE	
GB 2176992 A	14-01-1987	CA 1239535 A1	26-07-1988
		US 4656761 A	14-04-1987
US 1826645 A	06-10-1931	NONE	
EP 1502518 A	02-02-2005	FR 2858185 A1	04-02-2005

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 1502518 A [0007] [0008]
- US 2003041479 A [0007] [0009]
- DE 19928503 [0007] [0010]