



(12) **EUROPEAN PATENT APPLICATION**  
published in accordance with Art. 153(4) EPC

(43) Date of publication:  
**25.08.2010 Bulletin 2010/34**

(51) Int Cl.:  
**A43C 13/14 (2006.01) A43B 23/00 (2006.01)**

(21) Application number: **08861593.5**

(86) International application number:  
**PCT/ES2008/000713**

(22) Date of filing: **14.11.2008**

(87) International publication number:  
**WO 2009/077629 (25.06.2009 Gazette 2009/26)**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR**  
Designated Extension States:  
**AL BA MK RS**

(71) Applicant: **Tecnotac, S.L.**  
**Alicante (ES)**

(72) Inventor: **RIERA PEREZ, José**  
**E-03600 Elda**  
**Alicante (ES)**

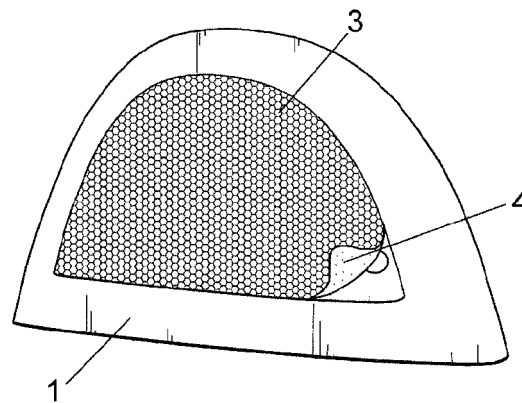
(30) Priority: **14.12.2007 ES 200702593 U**  
**10.07.2008 ES 200801489 U**

(74) Representative: **Sempere Massa, Iván Luis**  
**C/Gerona, 15-17, 1<sup>o</sup>**  
**03001 Alicante (ES)**

(54) **SAFETY TOE CAP FOR FOOTWEAR**

(57) The toe cap is formed by a rigid piece (1) providing protection for the toes, in such a way that it is made of a suitable material of great strength, has a plurality of small holes (2) allowing the passage of air, and the holes are covered with a membrane (3) duly fixed over the body

of the toe cap (1). This membrane (3) is permeable to air but forms a barrier against moisture and water. This membrane (3) remains positioned in a small recess (5) of the piece (1), and said membrane (3) remains fixed in the recess by means of a suitable adhesive.



**FIG. 2**

## Description

### PURPOSE OF THE INVENTION

[0001] The present invention refers to a toe cap to be integrated into safety footwear such as, for example, footwear used in workshops or work centres, where the toes are at more or less risk of impact by different types of objects.

[0002] The toe cap that is revealed in this invention, while providing the same protection as any conventional toe cap from the point of view of safety, has the object of providing a higher degree of comfort for the user, specifically improving transpiration in the footwear of which it forms a part.

[0003] The object of the invention is also to provide this increase in transpiration for the foot without sacrificing impermeability to water, as this type of safety footwear is often used in very moist or flooded environments.

### BACKGROUND OF THE INVENTION

[0004] As is well known, some safety footwear incorporates a toe cap under the upper as a protective element for the toes. This toe cap is made of a very hard material such as steel, which is highly resistant to both impacts and piercing.

[0005] Whether this piece is made of steel or an extra-strong plastic, and irrespective of its ability to act as a barrier from the point of view of safety, this type of toe cap presents the problem that the footwear of which it is a part is not comfortable as it does not allow the foot to transpire through the front part where the footwear is sealed and waterproof at the safety toe cap.

[0006] This type of toe cap can sometimes include a piece of plastic material in its back border to prevent the foot from rubbing on the edge of said border. This piece of plastic material is assembled by using glue, which implies drawbacks that are fundamentally defined in the following aspects:

- The assembly time by the operatives for these pieces is high with the consequent financial repercussions involved.
- It is equally necessary to wait for a specific period of time for the glue to dry before the operatives can perform subsequent manual work.
- This type of join has a restricted useful life which it would be desirable to increase.
- Lastly, the harm to the environment by the use of industrial glues should also be mentioned.

### DESCRIPTION OF THE INVENTION

[0007] The toe cap, which is revealed in this invention,

fully and satisfactorily resolves the above mentioned drawbacks, ensuring perfect aeration or transpiration of the footwear, including in the area around the toe cap and despite the presence of said safety toe cap.

[0008] To achieve this and more specifically, said safety toe cap is made of an anti-perforation piece of any suitable very hard material just like any conventional safety toe cap, but with the special feature that it has a plurality of small holes suitably distributed to allow the passage of air. Said holes are complemented with a membrane duly fixed over the body of the toe cap, which is permeable to air but forms a barrier against moisture and water.

[0009] This membrane is preferably housed in a small recess of the piece making up the safety toe cap and affixed thereto using a suitable adhesive.

[0010] Logically, the passage of air through the holes is assisted by the movement of the foot and the continuous changes in relative positions of the foot and the footwear and also during their movement.

[0011] Where the toe cap includes a piece of plastic material in correspondence with the back border, it is arranged that in said border there is a step-wise reduction in thickness determining a perimeter wing in which a series of through holes are suitably distributed in such a way that said wing is intended to receive the piece of plastic material, which is light and flexible, and which remains immovably fixed to the toe cap. This piece of plastic material is obtained by moulding on the toe cap in two phases: a first phase in which a thin laminate of plastic material is established over the internal and external face of the wing, equally provided with holes that coincide with those previously described; and a second phase in which said laminate is covered, together with the through holes distributed over the cited wing, by a highly flexible plastic material, the thickness of which progressively reduces towards the back.

[0012] In this way, a single-piece toe cap is provided, with a long useful life and a significantly reduced the assembly time, for the footwear in which it will be included.

### DESCRIPTION OF THE DRAWINGS

[0013] In order to complement the description below and with the aim of improving understanding of the characteristics of the invention and a practical embodiment, a series of illustrative and non-limiting figures is appended as an integral part of the description. The figures show the following:

Figure 1 shows an top perspective view of a safety toe cap for footwear made according to the present invention, but without the membrane that covers the holes, in order to illustrate the holes.

Figure 2 shows a view similar to that of Figure 1, but including the membrane on the toe cap in the final phase of sticking with glue, also in order to illustrate

the structure with greater clarity.

Figure 3 shows a perspective view of the safety piece furnished with a perimeter wing for mounting and positioning the flexible piece.

Figure 4 shows a view similar to that above where the piece of the toe cap appears at the point of final assembly, that is, with the piece of flexible plastic assembled over the step-wise reduction in thickness defining the front perimeter wing.

Figure 5 shows detail of the cross section corresponding to the line of the upper A-B of the previous figure.

## PREFERRED EMBODIMENT OF THE INVENTION

**[0014]** Reviewing the figures, it can be observed how the toe cap that is revealed in the invention is constituted by a firm piece (1) that is dimensionally suitable for protecting the toes, made of a material that is highly resistant against impacts and piercing, that participates in the conformation of the toe cap of the footwear in which it is duly integrated, fully in accordance with any conventional safety toe cap.

**[0015]** Starting from this basic structure, the toe cap that is revealed is **characterised in that** the cited body (1) of the piece incorporates a plurality of small holes (2) that establish direct communication between the upper face and the lower or internal face and that is logically permeable to air.

**[0016]** These holes are hidden by a membrane (3), which appears incorporated into the body (1) in Figure 2. This membrane is permeable to air so that the holes (2) are operative, and is impermeable to water, forming a barrier against moisture and water.

**[0017]** Although an adhesive (4) established on the inside face of the membrane (3) can be sufficient to maintain said membrane (3) established over the body base (1), it is intended that the area of the piece (1) for receiving and housing the membrane (3) is slightly recessed, defining a slight recess (5) in which said membrane (3) is encased and positioned with full stability.

**[0018]** It only remains to indicate that in the example of practical embodiment shown in figures 1 and 2, the holes (2) are in an area that is approximately in the form of a circular segment and are six in number. Both the configuration and design of said area and the size and number of holes can change greatly to meet any constructive criterion without this affecting the essence of the invention.

**[0019]** In the variation of the embodiment shown in figures 3, 4 and 5, the piece (1') of the toe cap, with the same features as the piece shown in figures 1 and 2, presents the feature of including a strip of flexible plastic (6) in correspondence with the back part of said piece of the toe cap (1'). To accommodate this strip, the wall of

said piece (1') presents a step-wise reduction in thickness (7), both internally and externally, where such reduced thickness areas may or may not be aligned, so that in the example of practical embodiment shown in figures 3, 4 and 5, the lower reduced thickness area is wider than the upper reduced thickness area, both of them defining a wing (8) on which a plurality of through holes (9) are conveniently distributed, which are square prismatic in shape in the embodiment shown, but logically can have any other configuration without affecting the essence of the invention.

**[0020]** On both sides of the wing (8) defined on the cited piece of the toe cap (1'), two thin strips (6) of plastic material are established by moulding, furnished with firm holes and coincident in position with the holes (9) in the wing, in such a way that by a second moulding phase said wing (8) and the laminates (6) and the holes (9) are covered by a highly flexible plastic material that extends back defining an elastic flap (10) by way of prolongation of the piece of the toe cap (1'), preventing the foot rubbing on the edge of the rigid material defined by the opening of said piece (1'), the thickness of which decreases progressively towards the back. Once this process is complete, a single-piece toe cap is obtained whose elements are solidly linked through the holes (9) and which has a long useful life.

## Claims

1. Safety toe cap for footwear, of the type that has a rigid body with a high degree of resistance to both impacts and perforations, in the form of a firm casing and of a suitable size to be set into and internally fixed to the upper of the footwear in the area of the toe cap, **characterised in that** said rigid piece (1) has a plurality of small holes (2), suitably distributed to enable the passage of air through it and consequently to encourage transpiration through the footwear in the area of its toe cap.
2. Safety toe cap for footwear according to claim 1, **characterised in that** the area of the rigid body (1) with the holes (2) is covered by a membrane (3) made of a material that is permeable to air, but constitutes a barrier against water and moisture.
3. Safety toe cap for footwear according to claim 2, **characterised in that** the rigid body (1) includes in the area of the holes (2), more specifically in the area of the location and size of the membrane (3), a slight external recess (5) to encase and protect said membrane (3).
4. Safety toe cap for footwear according to any of the previous claims, **characterised in that** along the back border, both internally and externally, two step-wise reductions in thickness (7) are established de-

fining a wing (8) along which there are a series of through holes (9) in such a way that both sides of this wing (8) are furnished with thin strips of plastic material (6) with firm holes that are coincident with those positioned on the wing (8), with these strips (6) and the wing (8) and the holes (5) being covered with a piece in the form of a highly flexible, plastic flap (10), which extends from said wing (8) towards the back, with the whole assembly appearing as a single-piece.

5. Safety toe cap for footwear according to claim 4, **characterised in that** the wing (10) of flexible material is of decreasing thickness towards the back.

15

20

25

30

35

40

45

50

55

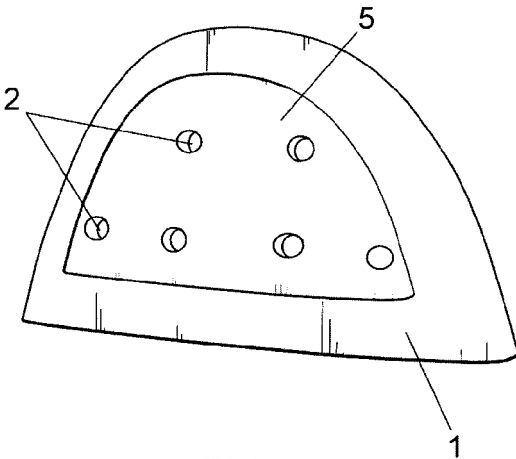


FIG. 1

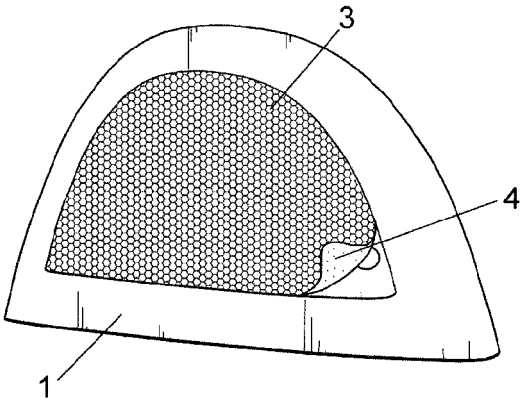


FIG. 2

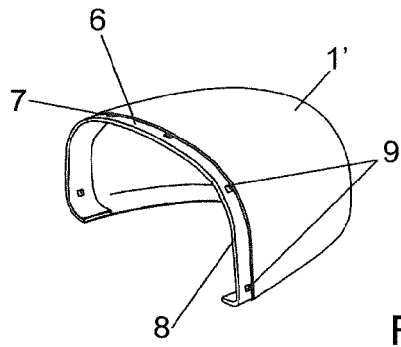


FIG. 3

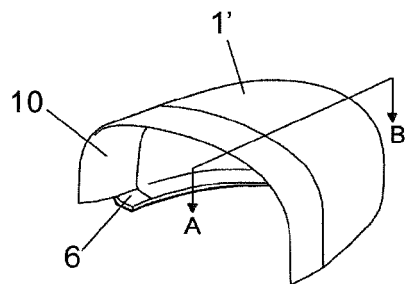


FIG. 4

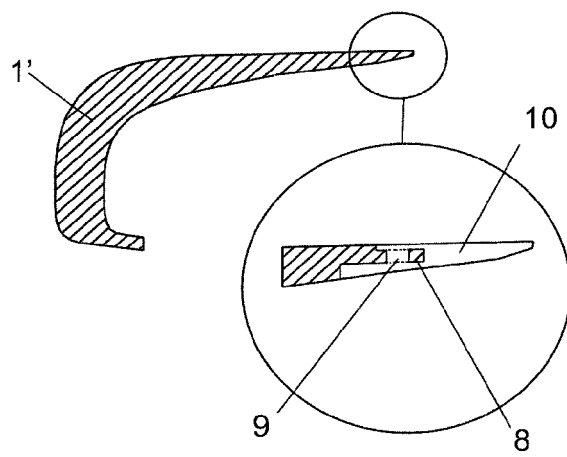


FIG. 5

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/ ES 2008/000713

## A. CLASSIFICATION OF SUBJECT MATTER

see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A43C, A43B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

INVENES,EPODOC,WPI

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|------------------------------------------------------------------------------------|-----------------------|
| X<br>A    | ES 1065081 U (MAIN STYLE, S.L.) 16.06.2007,<br>column 4, lines 11-39; figures.     | 1<br>4,5              |
| X         | FR 2496424 A (JALLATTE S.A.) 25.06.1982, the whole<br>document.                    | 1                     |
| A         | JP 8080202 A (MIDORI ANZEN CO LTD.) 26.03.1996,<br>abstract; figures.              | 1,4,5                 |
| A         | WO 2006099911 A1 (NOVATION S.P.A.) 28.09.2006,<br>claims; figures.                 | 1,4,5                 |

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance.

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure use, exhibition, or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other documents, such combination being obvious to a person skilled in the art

"&amp;"

document member of the same patent family

Date of the actual completion of the international search

23 January 2009 (23.01.2009)

Date of mailing of the international search report

(25/03/2009)

Name and mailing address of the ISA/  
O.E.P.M.Paseo de la Castellana, 75 28071 Madrid, España.  
Facsimile No. 34 91 3495304

Authorized officer

C. Peñafiel García

Telephone No. +34 91 349 54 98

Form PCT/ISA/210 (second sheet) (July 2008)



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/ ES 2008/000713

| Patent document cited<br>in the search report | Publication<br>date | Patent family<br>member(s)                                         | Publication date                                     |
|-----------------------------------------------|---------------------|--------------------------------------------------------------------|------------------------------------------------------|
| ES 1065081 U                                  | 16.06.2007          | ES 1065081 Y                                                       | 16.09.2007<br>16.09.2007<br>16.09.2007               |
| FR 2496424 A B                                | 25.06.1982          | NONE                                                               | -----                                                |
| JP 8080202 A                                  | 26.03.1996          | JP 2821515 B                                                       | 05.11.1998<br>05.11.1998<br>05.11.1998               |
| WO 2006099911 A                               | 28.09.2006          | ITPD 20050084<br>EP 1860967 A<br>EP 20060706611<br>US 2008163519 A | 23.06.2005<br>05.12.2007<br>03.02.2006<br>10.07.2008 |

Form PCT/ISA/210 (patent family annex) (July 2008)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ ES 2008/000713

CLASSIFICATION OF SUBJECT MATTER

**A43C 13/14** (2006.01)

**A43B 23/00** (2006.01)