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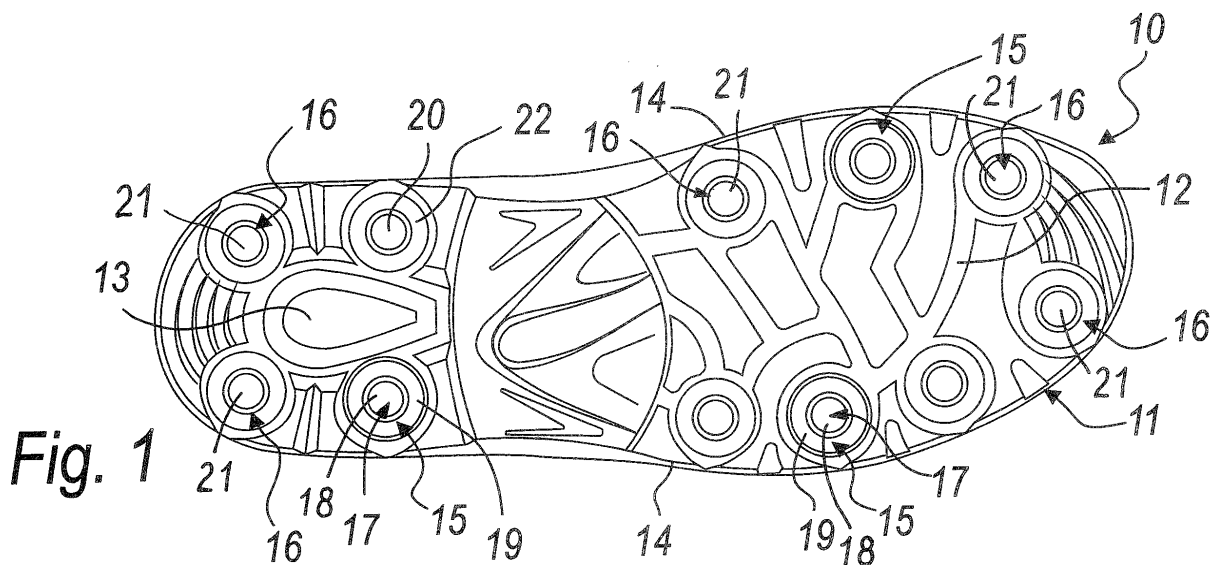
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(54) **Sole for shoes**

(57) A sole for shoes, of the type made of moldable plastics, which comprises a tread (11) that has a plurality of non-slip elements (15) along the edges (14) of the sole. Each one of the non-slip elements (15) comprises a cylindrical stud (17) with a head (18) that has an in-

troflexed surface, so as to form in practice a suction cup. The non-slip elements (15) are made of a plastic material with a different density than the rest of the tread (11). Conveniently, the non-slip elements (15) can be provided as mold inserts or optionally injected onto the tread (11).



**Description**

**[0001]** The present invention relates to a sole for shoes.

**[0002]** The sole according to the invention is particularly but not exclusively useful in the field of safety shoes.

**[0003]** As it is known, the various characteristics that safety shoes must have include non-slip properties.

**[0004]** It is in fact essential for anyone who works in "risky" work environments to always have control of the stability of his/her body in order to avoid unpleasant accidents caused by slips.

**[0005]** This is particularly true for all operators who are at a certain height from the ground but also for all those who work on smooth or wet surfaces, and who by slipping might strike machines or other items and thus be injured.

**[0006]** Currently there are various types of non-slip safety shoe.

**[0007]** The non-slip property is generally provided by the type of material that composes the tread.

**[0008]** Typically, the softer the tread, the higher its grip on the ground.

**[0009]** However, soft materials are generally more likely to deteriorate due to mechanical wear.

**[0010]** The aim of the present invention is to provide a sole for shoes that is of the non-slip type.

**[0011]** Within this aim, an object of the present invention is to provide a sole for shoes that is of the non-slip type and at a same time maintains an adequate overall hardness of the tread.

**[0012]** Another object of the present invention is to provide a sole for shoes that does not wear down easily.

**[0013]** A further object of the present invention is to provide a sole for shoes that can be manufactured with known systems and technologies.

**[0014]** This aim and these and other objects that will become better apparent hereinafter are achieved by a sole for shoes, of the type made of moldable plastics, which comprises a tread that has a plurality of non-slip elements along the edges of the sole, characterized in that each one of said non-slip elements comprises a cylindrical stud with a head that has an introflexed surface, said non-slip elements being made of plastic material with a different density than the rest of said tread.

**[0015]** Further characteristics and advantages of the present invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a plan view of a sole according to the invention;

Figure 2 is a sectional view of a first detail of the sole of Figure 1;

Figure 3 is a sectional view of a second detail of the

sole of Figure 1.

**[0016]** With reference to the figures, a sole for shoes according to the invention is generally designated by the reference numeral 10.

**[0017]** The sole 10 is of the type made of moldable plastic material and comprises a tread 11, which has a sole provided with an appropriate grip pattern.

**[0018]** In particular, in this embodiment the tread 11 forms a front part 12 of the sole 10 that is clearly separated from the rear part 13 of the sole, which corresponds to the heel region.

**[0019]** Along the edges 14 of the sole there are a plurality of non-slip elements 15 and a plurality of protrusions 16.

**[0020]** In this embodiment, the non-slip elements 15 and the protrusions 16 substantially have the same external shape and the same dimensions.

**[0021]** The non-slip elements 15 are made of plastic material with a different density than the tread and the protrusions 16, such as for example a plastic material that is softer than the second non-slip elements, in order to ensure higher grip in certain preset points of the tread with respect to others.

**[0022]** The protrusions 16 are instead made of the same material as the rest of the tread 11.

**[0023]** In particular, the non-slip elements 15 are provided as inserts formed monolithically (as shown in Figure 3) and then inserted in the mold for forming the sole 10 before distributing into the mold the plastic material that forms most of the tread 11.

**[0024]** It is also technologically possible to provide the non-slip elements 15 not as mold inserts but by injecting them all directly onto the tread 11.

**[0025]** The protrusions 16 are formed during the molding of the tread 11 and from a monolithic piece of the same material with it.

**[0026]** In particular, the plurality of non-slip elements 15 and of protrusions 16 is distributed in a horseshoe-like arrangement on the front part 12 of the sole 10.

**[0027]** Each one of the non-slip elements 15 comprises a cylindrical stud 17, in which the surface of the head 18 is introflexed, in practice so as to form a concave surface.

**[0028]** Further, the non-slip elements 15 comprise a tubular projection 19, which in this embodiment has a circular contour, surrounds the cylindrical stud 17 and has substantially the same height as said stud.

**[0029]** As mentioned, the shape and dimensions of the protrusions 16 in this embodiment are substantially similar to those of the non-slip elements 15 (as shown in Figures 1 and 2).

**[0030]** In practice, they too are constituted by cylindrical studs, termed here second cylindrical studs 20, in which the surface of their heads, termed second heads 21, is introflexed so as to generate in practice concave surfaces, and by corresponding tubular projections, which are termed second tubular projections 22 and in

this embodiment have a circular contour and surround the second cylindrical studs 20; with respect to said studs, they have substantially the same height.

[0031] Each second cylindrical stud 20 is hollow, in this embodiment, in its internal and central part 23.

[0032] In particular, in this described embodiment the sole 10 has seven elements, between the protrusions 16 and the non-slip elements 15, on the front part 12, respectively three on the inner edge 14 and four on the outer edge 14. On the rear part 13 there are four elements, between protrusions 16 and non-slip elements 15, respectively two for each edge.

[0033] Of these elements provided on the tread, only three, in this embodiment, are non-slip elements 15, while all the others are protrusions 16.

[0034] Of these three non-slip elements 15, two are arranged, one for each edge 14, on the front part 12 of the sole 10, and one is arranged on the rear part 13, as shown in Figure 1.

[0035] It is evident that both the number and position of the non-slip elements 15 can vary according to requirements.

[0036] Moreover, the protrusions 16 may also have different shapes with respect to the non-slip elements 15.

[0037] In particular, all the elements that are present on the tread 11 may be non-slip elements 15 and therefore there may be no protrusions made of the same material as the rest of the tread.

[0038] As mentioned, it is technologically possible also to provide the non-slip elements 15 not as mold inserts but by injecting them all directly on the tread 11.

[0039] Merely by way of example, the sole can be made of polyurethane (PU) and the inserts that form the non-slip elements 15 may be made of thermoplastic polyurethane materials (TPU), rubber or other materials. What matters is that the plastic material of the non-slip elements 15 has particular characteristics of non-slip grip that are more effective than the plastic material that composes the rest of the tread (for example is softer by being for example less dense). Optionally, it is possible to add an additive (of a per se known type) to the basic plastic material that composes the non-slip elements 15, allowing to make the material used abrasion-resistant.

[0040] In practice it has been found that the invention thus described solves the problems noted in known types of sole for shoes; in particular, the present invention provides a sole for a shoe that is of the non-slip type.

[0041] This result has been achieved by combining an appropriate arrangement of non-slip elements conveniently provided with studs with an introflexed head, so as to form in practice small suction cups that ensure optimum grip, particularly on smooth and possibly wet surfaces.

[0042] The arrangement chosen for the non-slip elements, i.e., the horseshoe arrangement, is further considered ideal for grip.

[0043] Advantageously, the grip elements with suction-cup effect are made of a material having a different density, for example softer, or in any case of a material that has optimum non-slip properties.

5 [0044] In this manner, the non-slip elements with different density have a more effective grip than the rest of the tread, increasing the overall non-slip grip of the sole. However, as a whole most of the sole is made of a material that ensures adequate properties of hardness and wear resistance and optionally, depending on the material used, a hardness that assists piercing-resistance properties.

10 [0045] The operation of obtaining a sole by using two materials is achieved for example by using said soft non-slip elements as mold inserts.

15 [0046] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; all the details may further be replaced with other technically equivalent elements.

20 [0047] In practice, the materials employed, so long as they are compatible with the specific use, as well as the dimensions, may be any according to requirements and to the state of the art.

25 [0048] The disclosures in Italian Patent Application No. PD2004A000140 from which this application claims priority are incorporated herein by reference.

30 [0049] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

### Claims

- 35 1. A sole for shoes, of the type made of moldable plastics, comprising a tread (11) that has a plurality of non-slip elements (15) along the edges (14) of the sole, **characterized in that** each one of said non-slip elements (15) comprises a cylindrical stud (17) with a head (18) that has an introflexed surface, said non-slip elements (15) being made of plastic material with a different density than the rest of said tread (11).
- 40 2. The sole for shoes according to claim 1, **characterized in that** each one of said non-slip elements (15) comprises a tubular projection (19), which surrounds said cylindrical stud (17) and substantially has the same height as said stud (17).
- 45 3. The sole for shoes according to one or more of the preceding claims, **characterized in that** said non-slip elements (15) are associated with said tread (11) as inserts, which are inserted into a mold before

molding said sole (10).

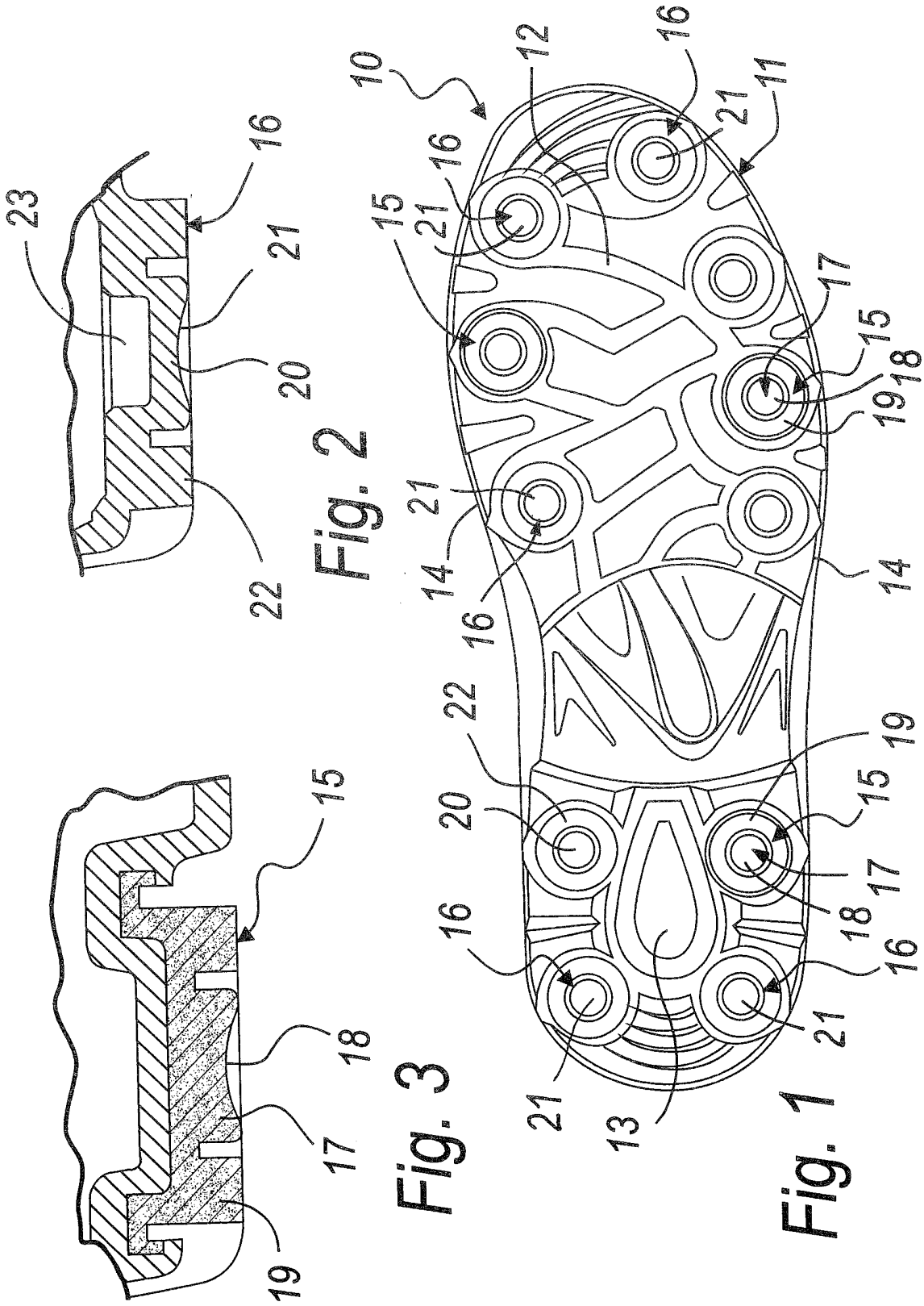
4. The sole for shoes according to claim 3, **characterized in that** said non-slip elements (15) are mold inserts provided monolithically. 5
5. The sole for shoes according to claims 1 to 3, **characterized in that** said non-slip elements (15) are injected onto said tread. 10
6. The sole for shoes according to one or more of the preceding claims, **characterized in that** said non-slip elements (15) are distributed according to a horseshoe-like arrangement. 15
7. The sole for shoes according to one or more of the preceding claims, **characterized in that** it comprises protrusions (16), which protrude from said tread (11) and are combined with said non-slip elements (15) according to a horseshoe-like arrangement. 20
8. The sole for shoes according to claim 7, **characterized in that** said protrusions (16) substantially have the same external shape and the same dimensions as said non-slip elements (15). 25
9. The sole for shoes according to one or more of the preceding claims, **characterized in that** it comprises three of said non-slip elements (15), two of which are arranged, one for each edge (14), on the front part (12) of said sole (10), one being arranged instead on the rear part (13) of said sole (10). 30
10. The sole for shoes according to one or more of the preceding claims, **characterized in that** said non-slip elements (15) are made of "softer" plastic material than said protrusions (16). 35

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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The present search report has been drawn up for all claims			
Place of search <b>Munich</b>		Date of completion of the search <b>27 July 2005</b>	Examiner <b>Herry, M</b>
<b>CATEGORY OF CITED DOCUMENTS</b> 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	

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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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  
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