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(54) **TREAD STRUCTURE IN RUBBER OR IN PLASTIC MATERIAL FOR SOLES OF SHOES**

(57) A tread structure in rubber or in plastic material (10) for soles of shoes, of the type comprising a sheet-like body (11) from which anti-skid raised portions (12) extend, the sheet-like body (11) being provided with a plurality of lightening recesses (13), such lightening recesses (13) being defined on the exposed surface (14) of the sheet-like body (11) from which the anti-skid raised portions (12) extend.

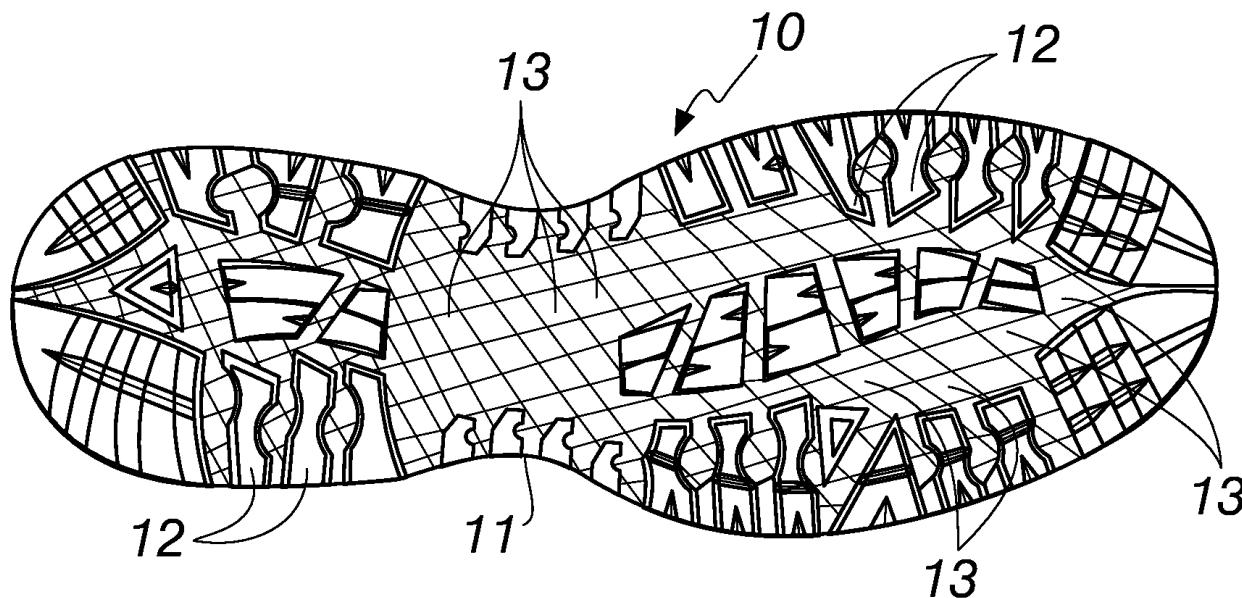


Fig. 1

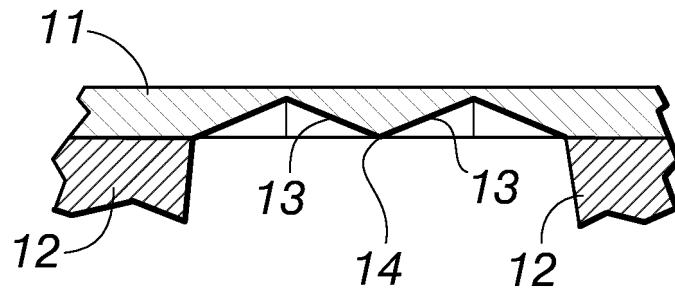


Fig. 3

Description

[0001] The present invention relates to a tread structure in rubber or in plastic material for soles of shoes.

[0002] Such tread structure is intended in particular for soles designed for sectors where the rubber sole is usually characterized by considerable volume and weight, such as for example the soles of trekking shoes and outdoor footwear in general, of safety shoes and of utility shoes in general, and the like.

[0003] A detail of a conventional tread for soles of shoes is shown schematically, in cross-section, in Figure 2; such a tread A comprises a flat body B from which anti-skid raised portions C extend.

[0004] Nowadays rubber soles that are used in the trekking and outdoor sector can reach a weight of 500 grams per pair, a weight which is relatively non-negligible if one considers the peculiar application on shoes for activities that require the user to apply a continuous and very prolonged effort over time, i.e. effort that can last for many hours over the course of a day, such as for example an endurance run or an excursion or a day of work for a firefighter.

[0005] The aim of the present invention is to provide a tread structure for soles of shoes which can be used with less exertion and less effort by a user.

[0006] Within this aim, an object of the invention is to devise a tread structure that offers levels of technical performance that are not lower than similar conventional treads.

[0007] Another object of the invention is to provide a tread structure that can be mounted on conventional shoes without particular contrivances or limitations in the step of assembly/mating with the overlying components of a sole.

[0008] This aim and these and other objects which will become better apparent hereinafter are achieved by a tread structure in rubber or in plastic material for soles of shoes, of the type comprising a sheet-like body from which anti-skid raised portions extend, characterized in that said sheet-like body is provided with a plurality of lightening recesses, said lightening recesses being defined on the exposed surface of said sheet-like body from which said anti-skid raised portions extend.

[0009] Further characteristics and advantages of the invention will become better apparent from the description of a preferred, but not exclusive, embodiment of the tread structure according to the invention, which is illustrated by way of non-limiting example in the accompanying drawings wherein:

- Figure 1 is a plan view of a tread structure according to the invention;
- Figure 2 is a cross-sectional view of a detail of a conventional tread;
- Figure 3 is a cross-sectional view of a detail of a tread structure according to the invention;
- Figure 4 is a plan view from below of a detail of a

tread structure according to the invention in a variation of embodiment;

- Figure 5 is a plan view from below of a detail of a tread structure according to the invention in a further variation of embodiment.

[0010] With reference to the figures, a tread structure in rubber or in plastic material for soles of shoes according to the invention is generally designated with the reference numeral 10.

[0011] The tread structure 10 is of the type comprising a sheet-like body 11 from which anti-skid raised portions 12 extend.

[0012] The peculiarity of the tread structure 10 consists in that the sheet-like body 11 is provided with a plurality of lightening recesses 13.

[0013] The lightening recesses 13 are defined on the exposed surface 14 of the sheet-like body 11 from which the anti-skid raised portions 12 extend.

[0014] In particular, in the present embodiment, the recesses 13 are distributed in an ordered manner on the exposed surface 14 between the anti-skid raised portions 12.

[0015] The tread structure 10 in rubber or in plastic material is preferably made of vulcanized rubber, for example with a process of vulcanization of rubber with compression presses, or by way of injection molding.

[0016] The lightening recesses 13 define an ordered matrix of bas-reliefs shaped like pyramids or frustums of pyramids.

[0017] In the embodiment in Figures 1 and 3, the lightening recesses 13 are pyramid-shaped based on a quadrangular-based pyramid.

[0018] In the variation of embodiment in Figure 4, on the exposed surface 114 lightening recesses 113 are defined which are pyramid-shaped based on a triangular-based pyramid.

[0019] In the further variation of embodiment in Figure 5, on the exposed surface 214 lightening recesses 213 are defined which are pyramid-shaped based on a hexagonal-based pyramid.

[0020] Obviously, the recesses 13, 113, 213 can have any useful shape, for example hemispherical, and a main direction of extension so as to define a slotted or channelled profile, extending straight or in a broken line or in a curved line or in a mixed line.

[0021] Thanks to the recesses 13, 113 and 213, a tread structure 10 according to the invention is lighter by 15% - 25% with respect to a similar tread that does not have lightening recesses.

[0022] The sheet-like body 11 at the points of lesser thickness, at the deeper points of the recesses 13, 113, 213, has a minimum thickness of 0.5 mm, such as to ensure the tread has characteristics of long life and resistance to stress.

[0023] In practice it has been found that the invention fully achieves the intended aim and objects.

[0024] In fact, with a tread structure 10 according to

the invention there is a reduction in the portion of weight of a shoe attributed to the sole, and in particular to a sole in rubber.

[0025] Furthermore, with the invention a tread structure has been devised which lightens a sole in rubber while maintaining the performance of the final product and adding the advantages of lightness and comfort.

[0026] The use of a tread structure according to the invention benefits the end consumer who has less weight on the shoe for the same technical performance.

[0027] With the invention in fact the tread structure in rubber is lightened by way of an emptying of what is known as the 'meat', i.e. the flat body 11, and such emptying of the meat is obtainable by defining cavities of different dimensions and geometric shapes, arranged in different solutions that enable a reduction of the weight and of the volume of the sole of which the tread structure is part.

[0028] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims. Moreover, all the details may be substituted by other, technically equivalent elements.

[0029] In practice the materials employed, provided they are compatible with the specific use, and the contingent dimensions and shapes, may be any according to requirements and to the state of the art.

[0030] The disclosures in Italian Utility Model Application No. PD2015U000018 (202015902338763) from which this application claims priority are incorporated herein by reference.

[0031] 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.

cesses (13) are distributed in an ordered manner on said exposed surface (14) between said anti-skid raised portions (12).

- 5 **4.** The tread structure according to one or more of the preceding claims, **characterized in that** said lightening bas-relief areas (13) define an ordered matrix of recesses shaped like pyramids or frustums of pyramids.

Claims

1. A tread structure in rubber or in plastic material (10) for soles of shoes, of the type comprising a sheet-like body (11) from which anti-skid raised portions (12) extend, **characterized in that** said sheet-like body (11) is provided with a plurality of lightening recesses (13), said lightening recesses (13) being defined on the exposed surface (14) of said sheet-like body (11) from which said anti-skid raised portions (12) extend.
2. The tread structure in rubber or in plastic material (10) according to claim 1, **characterized in that** it is made of vulcanized rubber.
3. The tread structure according to one or more of the preceding claims, **characterized in that** said re-

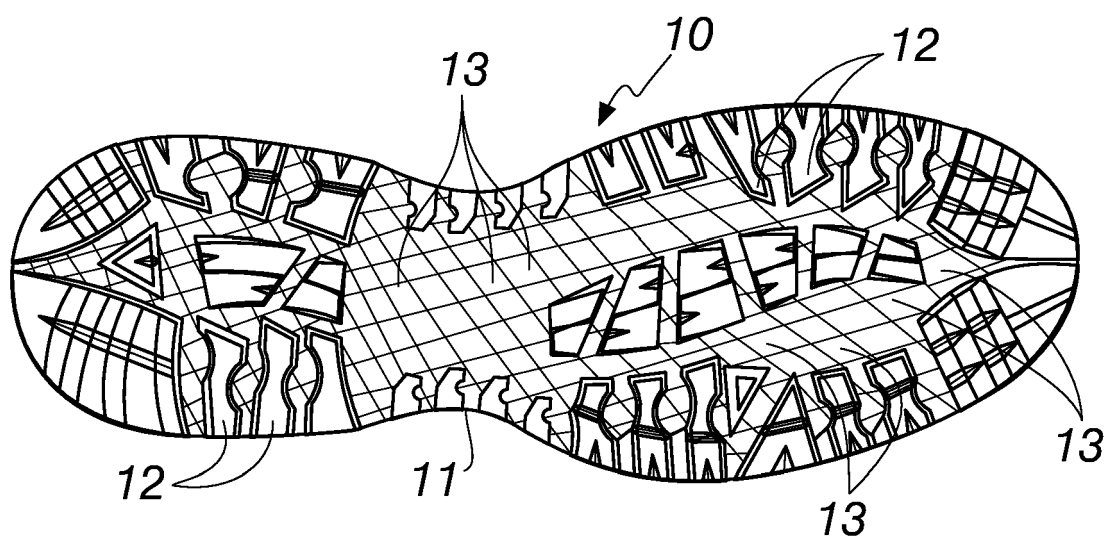


Fig. 1

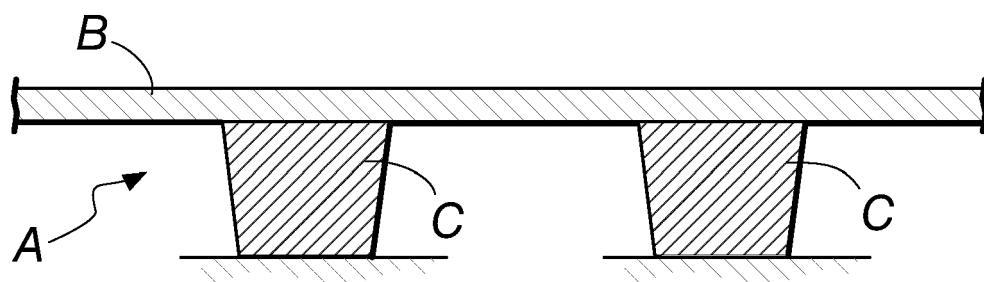


Fig. 2

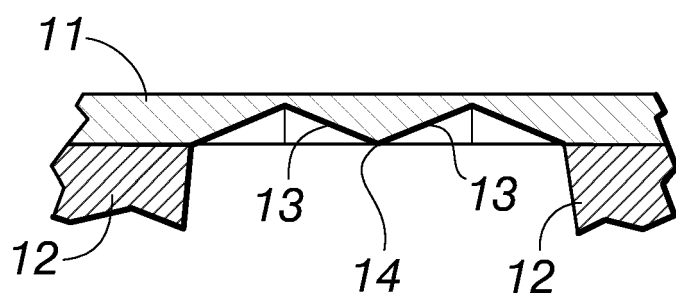


Fig. 3

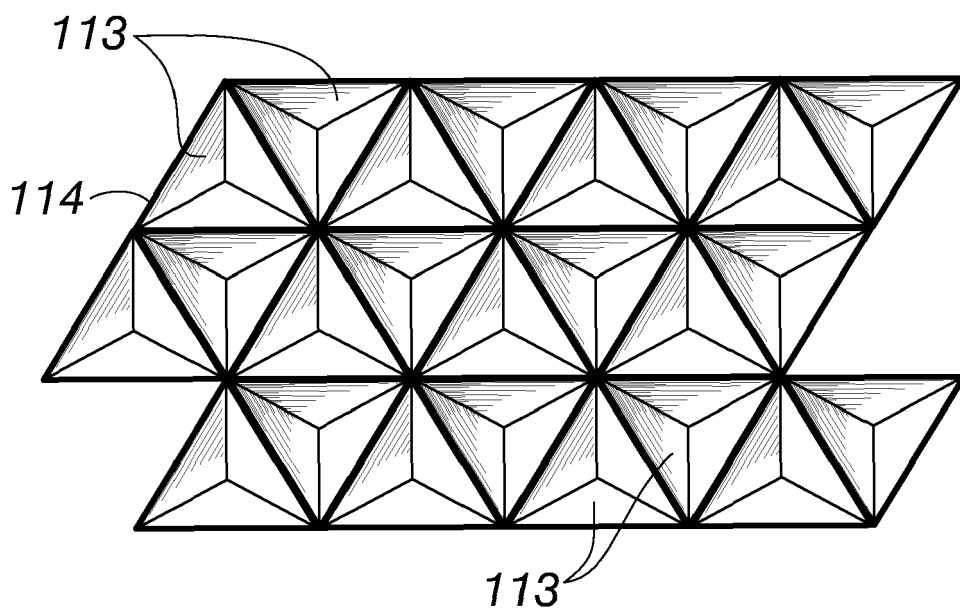


Fig. 4

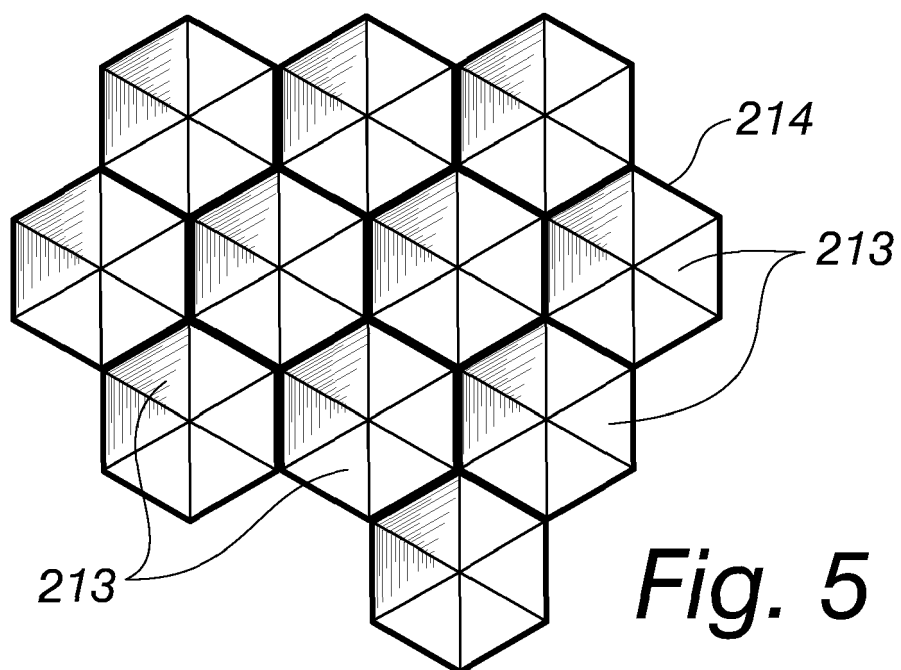


Fig. 5



EUROPEAN SEARCH REPORT

Application Number
EP 16 16 0598

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EPO FORM 1503 03.82 (P04C01)

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			TECHNICAL FIELDS SEARCHED (IPC)
			A43B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 11 July 2016	Examiner Chirvase, Lucian
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 16 16 0598

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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- IT 202015902338763 [0030]