



A RELAXATION SOLE AND A SHOE FITTED WITH SUCH A SOLE

The present invention relates to a relaxation sole suitable for providing the user with a sensation of well-being. The sole is intended to be placed in a shoe.

5 The present invention seeks in particular to improve existing relaxation soles, in particular the sole described in French patent No. 2 765 779.

The invention achieves this by a novel relaxation sole, characterized by the fact that it comprises:

10 - a sole body having a top face and a bottom face and including a housing in the sub-calcaneum support region, said housing opening out at least into the bottom face;

- an elastically deformable structure disposed in
15 the housing of the sole body; and

- a skin covering the top face of the sole body and the elastic structure.

In a preferred embodiment of the invention, the housing of the sole body also opens out into the top face
20 of the sole body, and the elastic structure is configured to co-operate with the skin covering the sole body to form a slight bulge.

The presence of the elastic structure in the housing of the sole body makes it easier to obtain sub-calcaneum
25 support that generates a rebound effect, which corresponds to the back of the foot being projected forwards, thus creating a dynamic effect that contributes to the user's well-being.

In particular, when the housing is a through
30 housing, it is possible to place an elastic structure therein which extends over at least the entire thickness of the sole body. In patent No. FR 2 765 779, the elastic properties of the sub-calcaneum support are conferred by an elastomer element overmolded on the sole
35 body. As a result, in order to benefit from a large rebound effect, the thickness of this element needs to be relatively large. If, for manufacturing reasons, the



element presents less resilience than is required, then the sole becomes uncomfortable, which is contrary to the intended object.

5 In the invention, the elastic structure may present a thickness that is relatively large, being capable of conferring a large rebound effect, while avoiding that problem. Even if the elastic structure should accidentally present resilience that is less than that intended, that does not give rise to any discomfort in
10 the absence of a bulge of significant height.

The elastic structure may be constituted by a block of elastically deformable material, for example. In a variant, the structure may be a multilayer structure, e.g. a two-layer structure, with at least one layer of
15 elastically deformable material.

In an embodiment of the invention, the elastic structure comprises an elastically deformable material made up of a latex foam and particles of cork dispersed in the latex foam. This material presents hardness that
20 is less than that of the sole body.

The elastic structure may be held in the housing of the sole body by adhesive, however other methods of fastening may be used without thereby going beyond the ambit of the present invention.

25 The height of the bulge in the sub-calcaneum support region may lie, for example, in the range 0.1 millimeters (mm) to 3 mm, and is preferably about 1 mm.

In an embodiment of the invention, the sole includes one or more inserts sandwiched between the sole body and
30 the skin in a support region beneath the first two metatarsal bones or in a support region beneath the heads of the last three metatarsal bones, or in both regions simultaneously.

Said insert(s) may comprise one or more sheets of
35 agglomerated cork.

The sole body may be made of a plastics material foam, for example a polyethylene foam having hardness on

the Shore A scale lying in the range 30 to 35, and a density close to 100 kilograms per cubic meter (kg/m^3).

In an embodiment of the invention, the skin comprises a layer of foam, in particular of polyurethane, covered in a film, in particular a film of a washable non-woven fabric.

The skin may be subjected to antibacterial or antifungal treatment.

In cross-section in a plane perpendicular to the longitudinal axis of the sole, the thickness of the sole body may be substantially constant.

In the heel region, the sole may present a top face that is substantially plane, possibly excepting a bulge associated with the presence of the elastic structure.

The invention also provides a shoe fitted with a relaxation sole as specified above.

The invention can be better understood on reading the following detailed description of a non-limiting embodiment, and on examining the accompanying drawing, in which:

- Figure 1 is a diagrammatic and fragmentary plan view of a sole in accordance with the invention;
- Figure 2 is a diagrammatic and fragmentary side view of the Figure 1 sole;
- Figure 3 is a diagrammatic and fragmentary section view on III-III of the Figure 1 sole; and
- Figure 4 is a diagrammatic and fragmentary cross-section view of the skin of the Figure 1 sole.

Figure 1 shows a sole 1 in accordance with the invention comprising a sub-calcaneum support 2, a support 3 beneath the first two metatarsal bones, and a support 4 beneath the heads of the last three metatarsal bones. For greater detail concerning the locations of the supports 2, 3, and 4, reference may be made to patent FR 2 765 779 whose content is incorporated into the present specification by reference.

In the example shown, the sub-calcaneum support region 2 is substantially egg-shaped with its long axis directed towards the front of the support.

As shown in Figure 3 in particular, the sole 1 comprises a sole body 5 made of polyethylene foam, for example the foam sold under the name Podofoam® XA 800 by the supplier Podofrance, which is washable and rot-proof, presenting good support and flexibility properties, good mechanical strength, good thermal insulation, good resistance to chemical agents, and provides a sensation of softness to the touch.

The sole body 5 has a through housing 6 in the sub-calcaneum support region 2, said housing opening out into its bottom face 5a and its top face 5b.

The housing 6 receives an elastically deformable structure 7 conferring a large rebound effect to the support 2.

In the example described, the structure 7 is constituted by a block of latex foam containing particles of cork.

As can be seen in Figure 3, the structure 7 co-operates with a skin 10 which adheres to the top face 5b of the sole body 5 to form a bulge 8 of a height h that is about 1 mm.

The skin 10 comprises a non-woven fabric 11 lined with a fine layer 12 of polyurethane foam, as shown diagrammatically in Figure 4. This skin 10 is relatively insensitive to variations in humidity, presents good resistance to sweat, and presents antibacterial and antifungal properties.

The structure 7 is inserted in the housing 6 and is held therein by adhesive.

The supports 3 and 4 are obtained by disposing two sheets of agglomerated cork 15 in the corresponding regions, which sheets are sandwiched between the sole body 5 and the skin 10, as shown in Figure 2.

Naturally, the invention is not limited to the embodiment described above.

Instead of inserting the structure 7 in the housing 6, it is possible, for example, to inject foam directly
5 therein.

CLAIMS

1/ A relaxation sole (1), characterized in that it comprises:

- a sole body (5) having a top face and a bottom face and including a housing in the sub-calcaneum support region (2), said housing opening out at least into the bottom face (5a);
- an elastically deformable structure (7) disposed in the housing of the sole body; and
- 10 - a skin (10) covering the top face (5b) of the sole body and the elastic structure.

2/ A sole according to the preceding claim, characterized by the fact that the elastic structure (7) is constituted
15 by a block of elastically deformable material.

3/ A sole according to the preceding claim, characterized by the fact that the elastically deformable material is constituted by a latex foam containing particles of cork.
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4/ A sole according to any preceding claim, characterized by the fact that the elastic structure is held in the housing (8) by adhesive.

25 5/ A sole according to any preceding claim, characterized by the fact that the elastic structure (7) co-operates with the skin (10) to form a bulge (8) in the sub-calcaneum support region, the height (h) of the bulge lying in the range 0.1 mm to 3 mm, and preferably being
30 about 1 mm.

6/ A sole according to any preceding claim, characterized by the fact that it includes one or more inserts sandwiched between the sole body and the skin in a
35 support region (3) beneath the first two metatarsal bones or in a support region (4) beneath the heads of the last

three metatarsal bones, or in both regions simultaneously.

7/ A sole according to the preceding claim, characterized
5 by the fact that the insert(s) comprise one or more sheets (15) of agglomerated cork foam.

8/ A sole according to any preceding claim, characterized
by the fact that the sole body (5) is made of a plastics
10 material foam, in particular a polyethylene foam having hardness on the Shore A scale lying in the range 30 to 35, and having a density of about 100 kg/m³.

9/ A sole according to any preceding claim, characterized
15 by the fact that the skin comprises a fine layer of foam (12), in particular of polyurethane foam, covered by a film (11), in particular a film of non-woven fabric.

10/ A sole according to any preceding claim,
20 characterized by the fact that the cross-section of the sole body in a plane perpendicular to the longitudinal axis of the sole presents a thickness that is substantially constant.