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(54) ORTHOPAEDIC HEEL FOR SHOE AND RELATED ORTHOPAEDIC FOOTWEAR

(57) Orthopaedic heel (1) for shoe (100) comprising a rubber sole (101) having an outer lower surface (101a), wherein said sole and said heel are shaped so that the user's foot is tilted with respect to the ground by a predetermined angle (β), said heel comprising a main rubber body (2) provided with a lower surface (2a) contacting the ground, characterized in that said main body (2) of said heel is further provided with an upper surface (2b) combinable to said shoe at said outer lower surface (101a) of said sole (101), wherein said upper surface (2b) of said heel is, at least in part, tilted with respect to said lower contacting surface of said heel by an angle (γ) equal to said predetermined angle (β), and in that it comprises constraining means (3) to reversibly constrain said heel to said shoe.

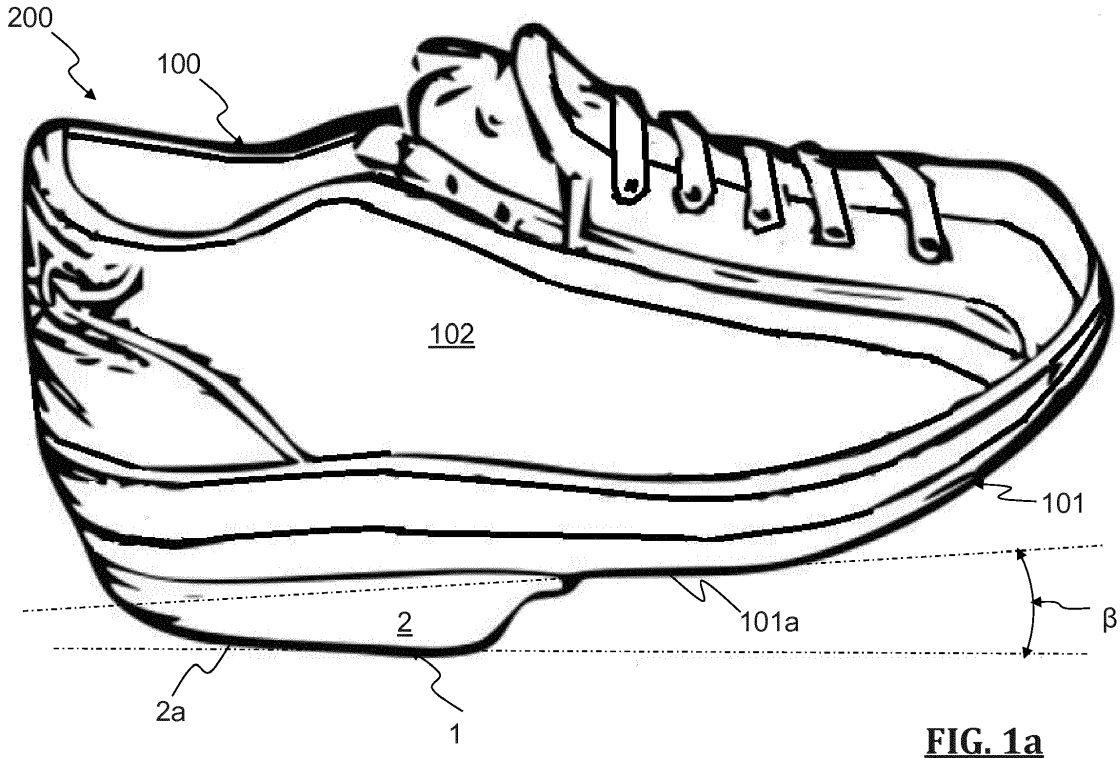

FIG. 1a

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Description

[0001] The present invention relates to an orthopaedic heel for shoe and respective orthopaedic footwear.

[0002] According to the known art, the orthopaedic footwear used in the field of rehabilitation upon forefoot surgery provide for the requirement of using a sole that, in cooperation with the heel, allows the foot to be tilted by about 8° with respect to the ground while the user walks, such that the weight acting on the foot is directly unloaded on the rear portion thereof, i.e. on the heel. As a consequence of this, the user has to buy and use footwear with the afore described characteristics just for the rehabilitation duration, i.e. for about two/three weeks only. The footwear is therefore made and is like a single body, with the heel not removably combined with the sole of the footwear provided, in turn, with sole and upper. This is economically detrimental for the user since once that period is expired, he/she cannot use that particular rehabilitative footwear any more, unless in case of a possible and undesired relapse with subsequent new forefoot surgery.

[0003] It is therefore an object of the present invention to implement an orthopaedic heel for shoe that can avoid the drawbacks linked with the use of orthopaedic footwear ad hoc made for the forefoot rehabilitation after a surgery.

[0004] It is a further object of the present invention to implement such a heel such that it is simple to be manufactured and easy to be applied to the shoe.

[0005] These and other objects are achieved by an orthopaedic heel for shoe comprising a rubber sole having an outer lower surface, wherein said sole and said heel are shaped such that the user's foot is tilted with respect to the ground by a predetermined angle, said heel comprising a main rubber body provided with a lower surface contacting the ground, characterized in that said main body of said heel is further provided with an upper surface combinable with said shoe at said outer lower surface of said sole, wherein said upper surface of said heel is, at least partially, tilted with respect to said lower surface contacting the ground of said heel by an angle equal to said predetermined angle, and in that it comprises constraining means to reversibly constrain said heel to said shoe.

[0006] Specifically, the upper surface of the heel is at least partially tilted by an angle between 6 and 10°, preferably 8°. According to such a solution the outer surface of said sole is substantially planar, i.e. flat, at least at the rear portion of said shoe at which said heel is combined. In practice, thus, once the heel is removed the shoe can be used as being normal footwear, i.e. a non-orthopaedic shoe since the outer lower surface of the sole is substantially planar, or flat, thus having a substantially horizontal surface.

[0007] It has to be noticed that, in order to promote the clarity of reading, in the text for "shoe", footwear lacking of any type of orthopaedic function will be meant, while for "orthopaedic footwear", footwear provided with orthopaedic heel and, thus, having an orthopaedic function will be meant.

[0008] Still according to the invention, said reversibly constraining means further comprise one or more through-holes and one or more self-tapping screws, the latter being combinable with said one or more holes and having such a length to be screwed to said sole of said shoe at least when said upper surface of said heel is combined with the outer lower surface of said sole of said shoe.

[0009] In addition, said one or more through holes comprise at least one countersunk end portion for accommodating the head of said one or more self-tapping screws. This allows the head of the self-tapping screws, also countersunk, to be housed inside the respective hole.

[0010] Still, said reversibly constraining means comprise one or more locking rings arranged concentrically to said one or more holes, wherein said one or more locking rings are included inside said main body of said heel. In particular, said main body is obtained by molding. This promotes the inclusion of such locking rings inside the heel, concentrically to the holes, such that the self-tapping screws can remain in place without the chance of unscrewing and the heel of detaching from the shoe. In addition, such a solution allows a heel comprising such locking rings to be created, without any chance that these can be detached from the heel.

[0011] Still according to the invention, said main body of said heel comprises an upper edge protruding with respect to said upper surface of the main body such that said edge covers at least partially the end portion of the sole of said shoe that is at said upper protruding edge, i.e. at the user's foot heel, at least when said heel is reversibly combined with said shoe. This makes the coupling between the heel and the shoe aesthetically more pleasant since an external observer is not able to distinguish whether the heel is carried or not in the shoe.

[0012] According to a preferred embodiment of the invention, said holes and said self-tapping screws are three and are arranged at 120° from one another.

[0013] The invention also allows protecting orthopaedic footwear including a shoe provided with rubber sole having an outer lower surface, and an orthopaedic heel according to one or more of claims 1 to 9, wherein said sole and said heel are shaped such that the user's foot is tilted with respect to the ground by a predetermined angle. Still according to such a solution, the thickness of said sole of said shoe is greater than 15 mm, and preferably, greater than 20 mm.

[0014] For illustration purposes only and without limitation, several particular embodiments of the present invention will be now described referring to the accompanying figures, wherein:

figure 1a is an axonometric view of the orthopaedic footwear according to the invention;

figure 1b is an axonometric view of the shoe before

the orthopaedic heel is combined with the same;
figure 2a is a side view of the heel according to the invention;
figure 2b is a bottom view of the heel according to the invention;
figure 3a is a longitudinal section of the heel of figure 2b;
figure 3b is a first cross section of the heel of figure 2b;
figure 3c is a second cross section of the heel of figure 2b.

[0015] Referring in particular to such figures, an orthopaedic heel according to the invention has been denoted by numeral 1.

[0016] In figure 1a the orthopaedic footwear 200 is shown that comprises a shoe 100 provided with a rubber sole 101 having an outer lower surface 101a and an upper 102, and an orthopaedic heel 1. The sole 101 and the heel 1 are shaped such that the user's foot is tilted with respect to the ground by a predetermined angle β preferably of 8°, however between 6 and 10°. This way the user, when standing up, will unload his own weight on the heel and not on the forefoot that, on the contrary, will be raised from the ground and never contacting the ground.

[0017] According to the herein described embodiment, the orthopaedic heel 1 for such a shoe 100 comprises a rubber main body 2 provided with a lower surface 2a contacting the ground and an upper surface 2b combinable with the sole 101 of the shoe 100 at the outer lower surface 101a of the sole 101 itself and, in particular, at the rear portion 101b of the sole 101, above which the user's heel rests. The heel 1 comprises in turn means 3 for reversibly constraining the orthopaedic heel 1 to the shoe 100. The upper surface 2b is, at least partially, tilted with respect to the lower contacting surface 2a of the heel 1 by an angle γ equal to the afore mentioned predetermined angle β. In view of the above, therefore, the shoe 200, once separated from the heel 1, will be normal footwear, i.e. daily usable without performing any type of orthopaedic function since the lower surface 101a of the sole 101 is substantially planar.

[0018] In particular, the upper surface 2b of the main body 2 comprises a front portion 25 tilted with respect to the lower contacting surface 2a of the heel by an angle γ equal to the afore mentioned predetermined angle β. Note that the upper surface 2b further comprises a rear portion 26 that is designed such to perfectly accommodate the ending curvature 105 of the rear portion 101b of the sole 101 of the shoe 100.

[0019] Still according to the invention, said reversibly constraining means 3 further comprise three through-holes 31 and three self-tapping screws 32 combinable with the through-holes 31 and having such a length to be screwed to the rubber sole 101 of the shoe 100 at least when the upper surface 2b of the heel 1 is combined with the outer lower surface 101a of the sole 101 of the shoe 100, at its rear portion 101b.

[0020] The through-holes 31 and the self-tapping screws 32 are arranged at 120° from one another, i.e. are arranged such that two holes 31 out of three are positioned aligned along an axis transverse to the longitudinal axis of the heel 1, symmetrically to the latter, in a position more inside the body 2 of the heel 1, and one through-hole 31 in a position more outside of the body 2 of the heel 1, with center along said longitudinal axis of the heel 1.

[0021] Still, the through-holes 31 comprise an end portion 31a countersunk in order to accommodate the head of the respective self-tapping screw 32 with which the holes are coupled.

[0022] Still according to the invention, the reversibly constraining means 3 further comprise three locking rings 33 arranged each concentrically to the respective through-hole 31. In addition, each locking ring 33 is included within the main body 2 such that the rings can not be pulled out of the main body 2.

[0023] The main body 2 is advantageously obtained by molding. Such a manufacturing process therefore allows the locking rings 33 also to be included in the body 2 of the heel 1.

[0024] Still according to the invention, the main body 2 comprises an upper edge 21 protruding with respect to the upper surface 2b at least for a perimetrical part of the main body 2 such that, at least when said heel 1 is reversibly combined with the shoe 100, at the rear portion 101b of the sole 101, the upper protruding edge 21 can cover at least partially the portion of the sole 101 of the shoe 100 that is at the upper protruding edge 21.

[0025] In particular, the protruding edge 21 runs along three sides of the main body 2 of the heel 1, so as to cover the sole 101 at its rear part 101b, for the whole ending curvature 105 thereof and for part of the two sides 105a of the sole 101 that are at the user's heel, when the orthopaedic footwear 200 is worn and thus the heel 1 is combined with the shoe 100.

[0026] Finally, the thickness of the sole 101 of the shoe 100 is greater than 20 mm such that the self-tapping screw can penetrate into the sole 101 of the shoe 100 still remaining tight thereto. In other embodiments of the invention, such a thickness of the sole 101 is however always greater that 15 mm, without thereby departing from the protection scope of the present invention.

Claims

1. Orthopaedic heel (1) for shoe (100) comprising a rubber sole (101) having an outer lower surface (101a), wherein said sole and said heel are shaped so that the user's foot is tilted with respect to the ground by a predetermined angle (β), said heel comprising a main rubber body (2) provided with a lower surface (2a) contacting the ground, **characterized in that** said main body (2) of said heel is further provided

with an upper surface (2b) combinable to said shoe at said outer lower surface (101a) of said sole (101), wherein said upper surface (2b) of said heel is, at least in part, tilted with respect to said lower contacting surface of said heel by an angle (γ) equal to said predetermined angle (β), and **in that** it comprises constraining means (3) to reversibly constrain said heel to said shoe.

2. Orthopaedic heel according to claim 1, **characterized in that** said reversibly constraining means (3) further comprise one or more through-holes (31) and one or more self-tapping screws (32), the latter being combinable with said one or more through-holes and having such a length to be screwed to said sole of said shoe at least when said upper surface (2b) of said heel (1) is combined with the outer lower surface (101a) of said sole (101) of said shoe (100).

3. Orthopaedic heel according to claim 1 or 2, **characterized in that** said upper surface (2b) of said heel (1) is at least partially tilted by an angle between 6 and 10°, and preferably 8°, with respect to the outer lower surface (101a) of said sole (101).

4. Orthopaedic heel according to claim 2 or 3, **characterized in that** said one or more through holes (31) comprise at least one end portion (31a) countersunk for accommodating the head of said one or more self-tapping screws.

5. Orthopaedic heel according to one of claims 1 to 4, **characterized in that** said reversibly constraining means (3) comprise one or more locking rings (33) arranged concentrically to said one or more holes (31), said one or more locking rings being included inside said main body (2).

6. Orthopaedic heel according to one of the preceding claims, **characterized in that** said main body (2) is obtained by molding.

7. Orthopaedic heel according to one of the preceding claims, **characterized in that** said main body (2), comprises, for at least part of its perimeter, an upper edge (21) protruding with respect to said upper surface (2b) so that said edge (21) covers at least partially the portion of sole of said shoe at said upper protruding edge (21), at least when said heel (1) is reversibly combined with said shoe.

8. Orthopaedic heel according to claim 7, **characterized in that** said upper protruding edge (21) is made on three sides of said main body (2) such to cover said sole (101) at its rear part (101b), for its whole ending curvature (105) and for at least part of two sides (105a) of said sole (101) that are at the user's heel, at least when said heel (1) is combined with said shoe (100).

9. Orthopaedic heel according to one of the preceding claims, **characterized in that** said holes and said screws are three and are arranged at 120° from one another.

10. Orthopaedic footwear (200) including a shoe (100), provided with rubber sole (101) having an outer lower surface (101a) and an orthopaedic heel (1) according to one or more of claims 1 to 9, wherein said sole (101) and said heel (1) are shaped so that the user's foot is tilted with respect to the ground by a predetermined angle (β).

11. Orthopaedic footwear (200) according to claim 9, **characterized in that** the thickness of said sole (101) of said shoe (100) is greater than 15 mm, preferably greater than 20 mm.

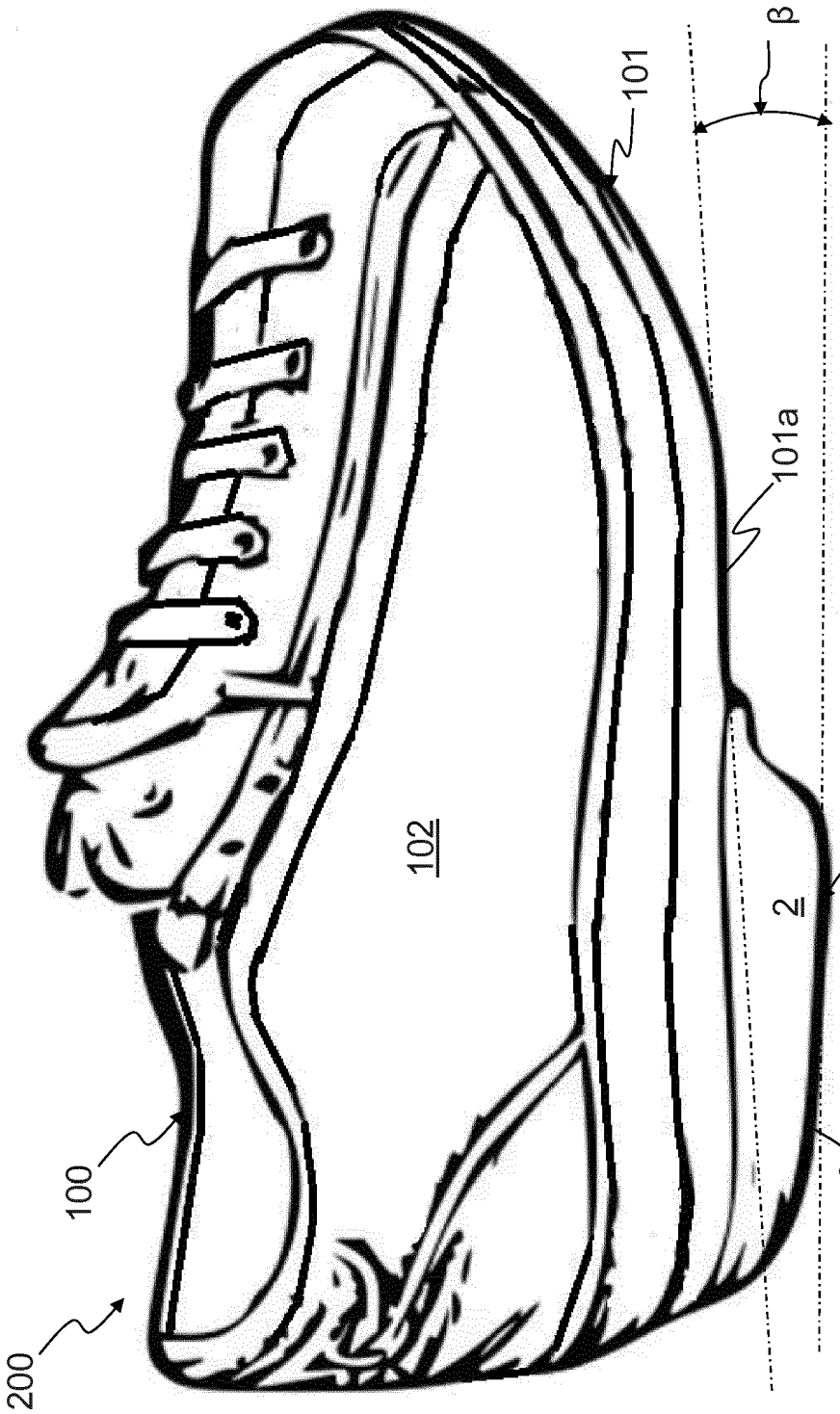

FIG. 1a

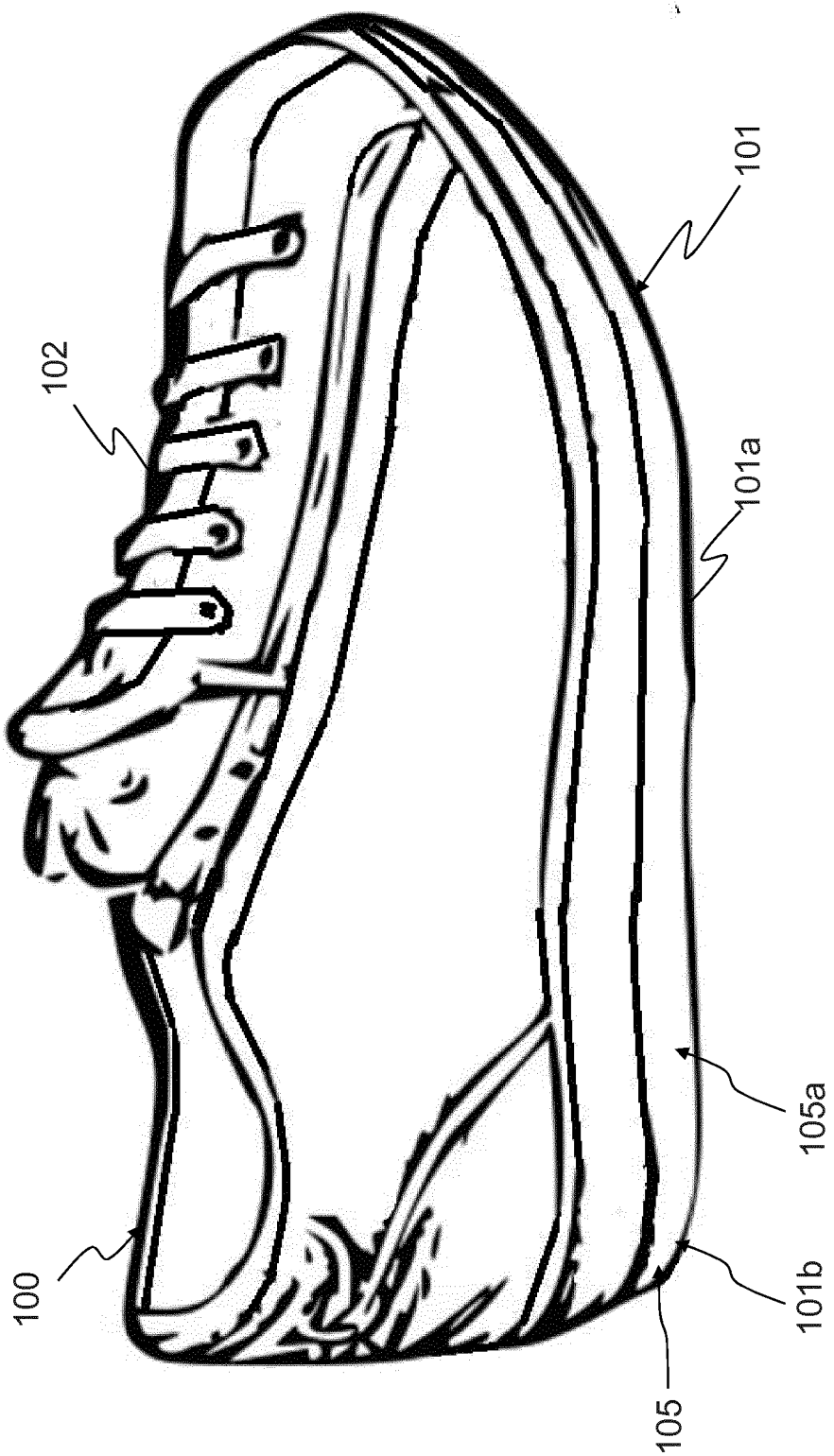

FIG. 1b

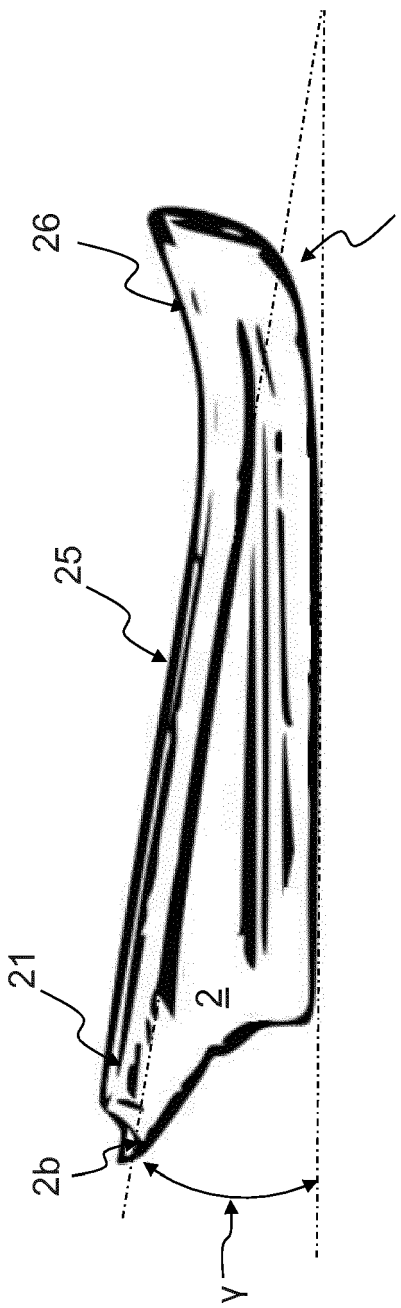

FIG. 2a

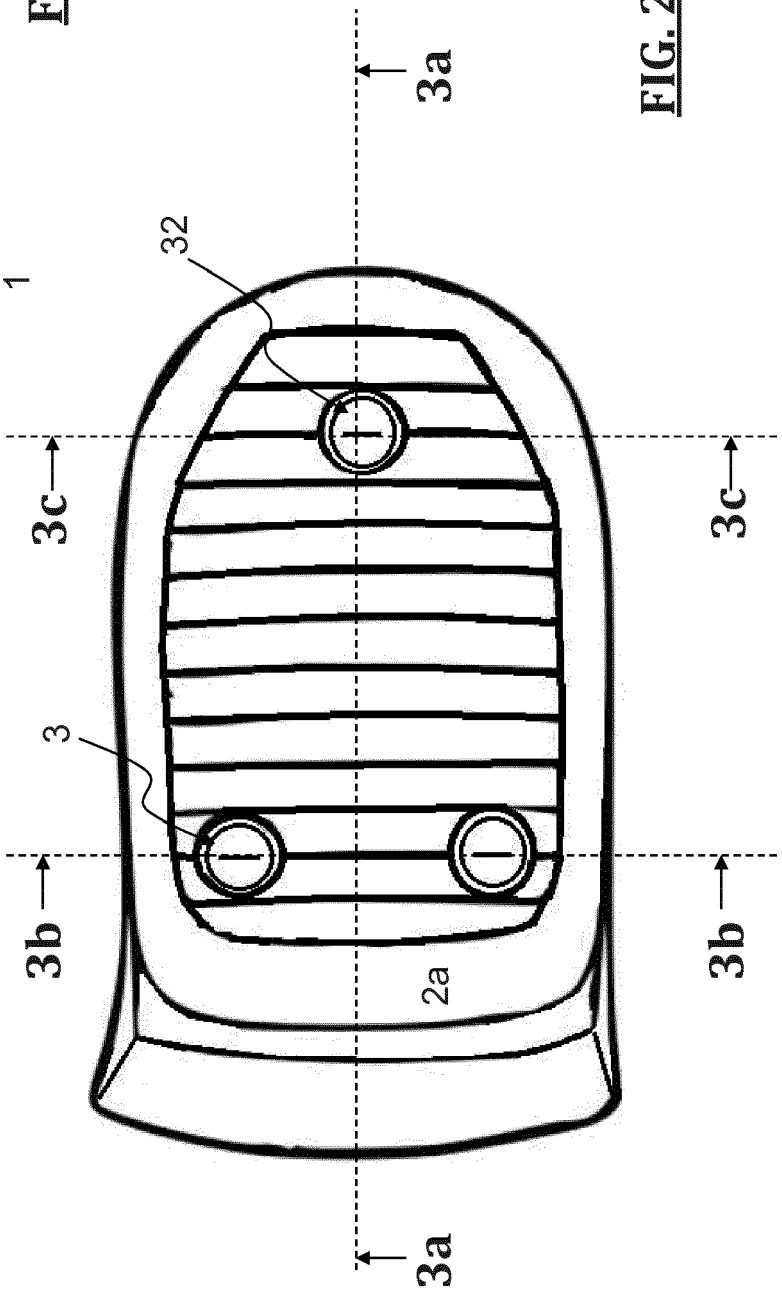

FIG. 2b

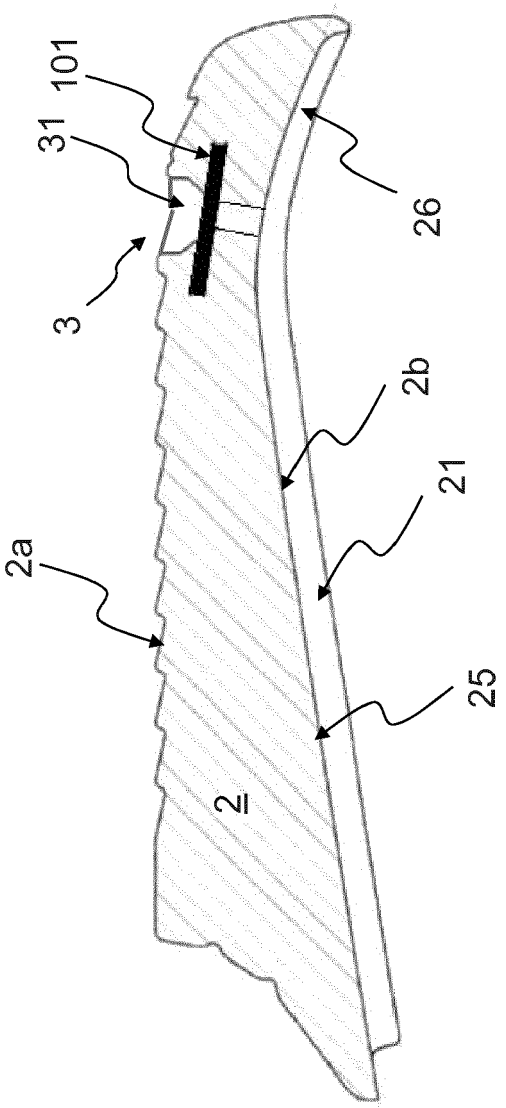

FIG. 3a

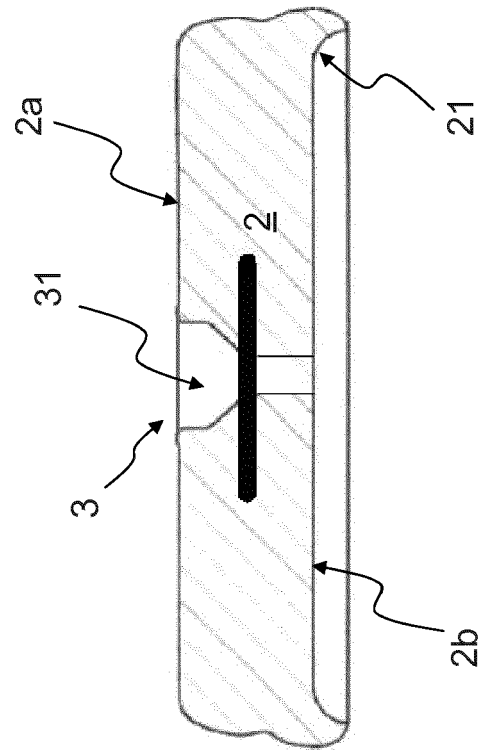

FIG. 3c

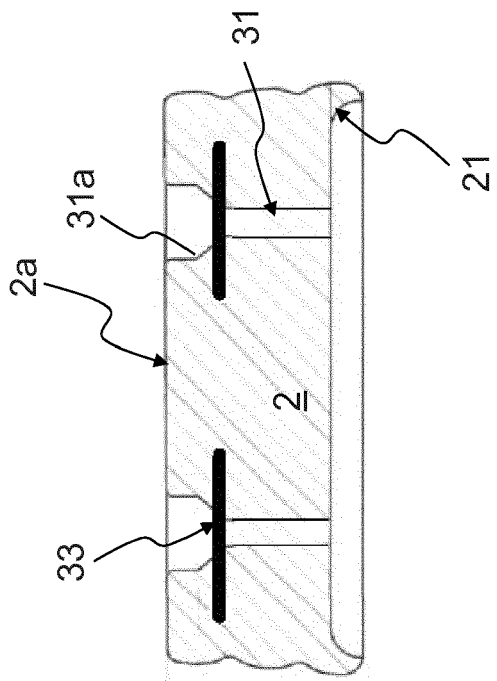

FIG. 3b

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EUROPEAN SEARCH REPORT

Application Number
EP 18 21 1908

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	8 April 2019	Cianci, Sabino

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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