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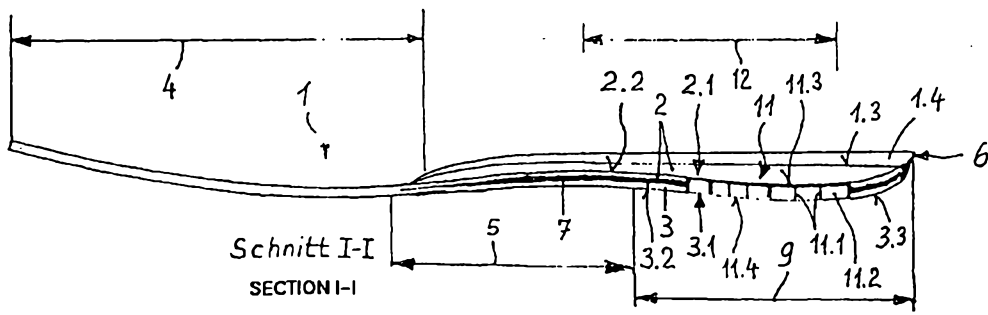
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(54) Title: INSOLE OF A SHOE

(54) Bezeichnung: SCHUH-INNENSOHLE



(57) Abstract

The invention relates to the insole (1) of a shoe that consists, at least from the zone of the arch of the foot (5) to the heel end (6), of a top layer (2) and a bottom layer (3). The aim of the invention is to improve such an insole in such a manner that it guarantees a good cushioning effect even if the shoes have thin soles that have only a poor cushioning effect. To this end, at least in the heel zone (9), the top layer (2) and/or the bottom layer (3) are provided with a recess (2.1; 3.1) into which a cushioning element (11) is stably integrated.

(57) Zusammenfassung

Eine Schuh-Innensohle (1), die zumindest ab dem Beginn der Fußwölbung (5) bis zum Fersenende (6) aus einem Deckblatt (2) und aus einem Bodenblatt (3) besteht, soll so verbessert werden, daß ein guter Dämpfungseffekt auch bei Schuhen mit dünnen, dämpfungsarmen Schuhsohlen gewährleistet ist. Dies wird dadurch erreicht, daß zumindest im Fersenbereich (9) das Deckblatt (2) und/oder das Bodenblatt (3) mit einer Ausnehmung (2.1; 3.1) versehen ist, in der ein Dämpfungsglied (11) fest integriert ist.

INNER SOLE OF A SHOE

The present invention relates to an inner sole for a shoe.

Such a shoe inner sole prepared as an insole consists of a cover sheet and a base sheet made of hard-elastic material. Around the front foot area up to
5 the middle of the foot arch, this insole consists of a uniform, compact material. In the adjoining rear section, a synthetic layer is injected through a hole in the base sheet between the cover sheet and the base sheet. Around the edges, the synthetic layer is raised in a dish-like manner.

Such insoles can be used with good results in shoes, in particular sports
10 shoes with shock absorbing runner soles. For the use in shoes with thin sole material, as found in football shoes, the shock absorbing effect is only small, and often not sufficient, even if such an insole is used.

With the aforementioned in mind it is an object of the invention to further develop a shoe inner sole that provides an improved shock absorbing effect even
15 for shoes with thin, low shock absorbing shoe soles, in particular sports shoes. The shoe inner sole as per the present invention may be applicable also for other types of shoe.

With this object in view, the present invention provides a shoe inner sole, more particularly an inlay sole or insole, which at least from the start of the foot
20 arch rearwards to the heel end includes a cover sheet and a base sheet, wherein the space between the cover sheet and the base sheet is filled with a moulded-in synthetic layer, and wherein, at least in the heel area, the cover sheet and/or the base sheet are/is provided with a recess into which a shock absorbing element is firmly integrated either by having the shock absorbing element inserted into the
25 recess and fixed in place by the synthetic layer, or by the shock absorbing element being directly formed of the synthetic material of the synthetic layer.

As a result of the invention, the shock of the heel 5 impact force in the rear area of the shoe can be absorbed relatively well even if the shoe sole, or the outsole, has only low, insufficient shock absorbing characteristics.

Further advantageous details of the invention are listed in the sub-claims, and they are described in more detail in the description and in the exemplary embodiments shown in the drawing.

The illustrations are:

5 Fig. 1 A plan view of a shoe inner sole with a honeycomb section moulded to it;

Fig.2 The shoe inner sole of Fig. 1 as per Section I — I of Fig. 1;

Fig.3 and 3A An enlarged view of the heel area of the shoe inner sole as per Fig. 2 with differing embodiment of the honeycomb section;

10 Fig. 4 A side view of the heel area of a shoe inner sole with a pre-fabricated, inserted honeycomb section;

Fig. 5 The honeycomb section of Fig. 4 in a plan view;

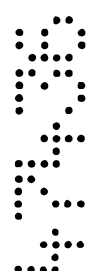


Fig. 6 The plan view of a shoe inner sole with further insertion areas for a honeycomb section, shown in broken lines, and

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Figs. 7 to 9 Execution options of cell structures of a honeycomb section inserted as per the invention.

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In Figs. 1 and 2, item 1 refers to a shoe inner sole, in particular for a sport, leisure or rehabilitation shoe, for example an insole or an inlay sole. For a large part of its length, it consists of a cover sheet 2 and a base sheet 3. In the front foot area 4, these components 2 and 3 can be permanently joined via an adhesive joint, for example. In the front foot area 4, the shoe inner sole 1 can also consist of a uniform, compact material.

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In the continuation, from about the start of area 5 of the foot arch up to the heel end 6, a synthetic layer 7 is injected between the cover and base sheets 2 and 3 where they are not joined. This injection takes place, for example, via an injection hole 8 available in the exemplary embodiment in the base sheet 3, as shown in Figs. 3 and 3A. The injection hole 8 or further injection holes 8 can also be provided at other locations and also in the cover sheet of the shoe inner sole 1.

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In the heel area 9 of the shoe inner sole 1, recesses 2.1 and 3.1 respectively are provided in the cover sheet 2 and in the base sheet 3 in the impact area 10 of the

user's heel. Into these recesses 2.1 and 3.1, a shock absorbing element 11 is moulded during injection of the synthetic layer 7, which takes the shape of a honeycomb section with honeycomb cell walls 11.1 pointing downwards and open honeycomb cells 11.2. The surface 11.3 of the element 11 in this case is flush with the surface 2.2 of the cover sheet 2. The virtual underside 11.4 of the shock absorbing section 11 is flush with the underside 3.3 of the base sheet 3.

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During injection of the synthetic layer 7, a firm joint is maintained inside the honeycomb section (shock absorbing element 11) with the cover sheet 2 as well as with the base sheet 3 because the synthetic material used bonds well with the materials of these inner sole components 2 and 3. The synthetic material used is preferably thermoplastic or a thermoplastic elastomer (TPE) such as polypropylene (PP) thermoplastic rubber, thermoplastic polyurethane (TPU), TR material, or polyvinylchloride (PVC).

20

The honeycomb cell walls 11.1 can also point upwards so that a honeycomb section (shock absorbing element 11) results, which is open at the top. This honeycomb section (shock absorbing element 11) can be closed with a special cover sheet not shown here, which would be attached with adhesives or welded-on with ultrasound, for example.

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Fig. 3A shows the heel section of a shoe inner sole 1 whose cover sheet 2 does not have a recess 2.1. Consequently, the top 11.3 of the honeycomb section (shock absorbing element 11) is placed against the

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bottom side 2.3 of the cover sheet 2, and it follows its contours and/or is bonded to it. Apart from that, this exemplary embodiment shows a honeycomb section (shock absorbing element 11) whose honeycomb cell walls 11.1 project beyond the underside 3.3 of the base sheet 3. Thus, with the dimensions being otherwise the same and with the synthetic material the same, a greater shock absorbing path results, which also means a greater shock absorbing effect.

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Analogous to the exemplary embodiment described, the base sheet 3 can be without a recess, and the honeycomb cell walls 11.1 can point upwards and can project upwards if necessary.

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Furthermore, a pre-fabricated honeycomb section (shock absorbing element 11), for example a closed, in particular a gas tight honeycomb section or a shock absorbing element 11 consisting of foam with closed pores, can be placed into a mould and enveloped by the injected synthetic material of the synthetic layer 7; it can thus be fixed in its location and firmly bonded to the cover sheet 2 as well as to the base sheet 3.

The dimensions of the shock absorbing element 11 to be located in the heel area 9 and the recess 2.1 in the cover sheet 2 and the recess 3.1 in the base sheet 3 are advantageously selected such that the shock absorbing element 11 extends over about 25% to 90%, in particular over about 40% to 80%, of the heel impact area.

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As per Fig. 4, a closed honeycomb section (shock absorbing element 11) or one that is open to one side

can project above the shoe inner sole 1 on both sides. The height of this projection can be about 1 mm to 10 mm, in particular about 2 mm to 5 mm. The overall thickness of such a honeycomb section (shock absorbing element 11) can thus be about 6 mm to 25 mm, in particular about 10 mm to 20 mm.

The hardness of the material for the honeycomb section (shock absorbing element 11) is about 60 to 95 Shore A.

If the shoe inner sole 1 is made up as an insole, its hardness is about 40 to 80 Shore A. It preferably consists of a leather fibre material, hard cardboard or a felt material.

If the shoe inner sole 1 is made up as an inlay sole, its hardness is about 30 to 60 Ascer C. The preferred material for the cover sheet 2 is a textile material, and for the base sheet 3 a foam material, in particular a material with closed pores, felt material or fleece.

As per an advantageous embodiment of the invention, transparent or translucent synthetics can be used as a material for the pre-fabricated, inserted shock-absorbing element 11 and/or for the synthetic layer 7.

It is not a deviation from the basic concept of the invention if there is no fixed joint between cover sheet 2 and base sheet 3 in the front foot area 4. In this case, the synthetic layer 7 can extend across the front foot area 4.

It is also possible, as indicated in Fig. 6 by the broken lines 13, 14, and 15, to also provide a shock absorbing element 11 in the front foot area (line 13) or the toe balls (line 14) or the big toe ball (line 15).

5 In this case, the two sheets 2 and 3 can either not be bonded together or preferably in the front point area, but also firmly joined in area 5 of the foot arch of the shoe inner sole 1.

10 In a further development of the invention, the synthetic layer 7 can project beyond the side edge 1.3 of the shoe inner sole 1 on the inner side 1.1 and/or on the outer side 1.2 of the shoe inner sole 1 in the shank area 12 as well as preferably in the heel area 9, too. There,
15 the synthetic layer 7 follows an arch shape to the outside and up, thus forming a supportive edge 1.4 for the foot or the foot arch or the heel. This supportive edge 1.4 is raised to about 2 mm to 25 mm, in particular 5 mm to 20 mm. A supportive edge 1.4 is envisaged at
20 least along the inner side 1.1 in the area of the foot arch.

As required, the shape of the honeycomb cells 11.2 can be shaped to suit the desired shock absorbing effect.
25 Fig. 1 and Fig. 5 can be viewed as an example. In Fig. 5, an edge 11.5 around the circumference is visible. It is expedient to apply such an edge 11.5 to a pre-fabricated and inserted honeycomb section (shock absorbing element 11) in order to avoid distortion of
30 the honeycomb cell walls 11.1 during the synthetic injection process for the synthetic layer 7.

Further adjustment options of the shock absorbing effect of a shock-absorbing element 11 in the shape of a honeycomb section are shown in Figs. 7 to 9. As is apparent, this can be achieved, for example, by slanting the honeycomb cell walls 8 (Fig. 7) and/or by using different cross-sectional shapes (Figs. 8 and 9).

It is an advantage if the shoe inner sole 1 has a dish-like depression at least in the heel area. It is expedient to adapt this dish-like shape to the shape of a heel. It is preferable to obtain this dish-like shape during the injection process of the synthetic layer 7 by providing a suitably shaped injection mould so that even flat, straight cover sheets 2 and base sheets 3, which have been punched out of plate stock, can be used.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. Shoe inner sole, more particularly an inlay sole or insole, which at least from the start of the foot arch rearwards to the heel end includes a cover sheet and a base sheet, wherein the space between the cover sheet and the base sheet is filled with a moulded-in synthetic layer, and wherein, at least in the heel area the cover sheet and/or the base sheet are/is provided with a recess into which a shock absorbing element is firmly integrated either by having the shock absorbing element inserted into the recess and fixed in place by the synthetic layer, or by the shock absorbing element being directly formed of the synthetic material of the synthetic layer.
2. Shoe inner sole according to claim 1, wherein the synthetic layer extends across the entire shoe inner sole and the cover sheet as well as the base sheet are completely separated from each other by the synthetic layer.
3. Shoe inner sole according to claim 1 or 2, wherein the cover sheet and base sheet are firmly bonded together in the area or areas which are filled or not filled with the synthetic layer.
4. Shoe inner sole according to any one of claims 1 to 3 wherein the shock-absorbing element includes a closed, honeycomb section.
5. Shoe inner sole according to any one of claims 1 to 3, wherein the shock absorbing element includes a honeycomb section open on one surface side thereof.
6. Shoe inner sole according to any one of claims 1 to 5, wherein the synthetic layer, at least in the shank area on the inner side and/or on the outer side, projects beyond the side edge of the shoe inner sole where it forms an upwardly and outwardly directed supportive edge for the foot
7. Shoe inner sole according to claim 6, wherein the supportive edge extends upwardly from 0.5 cm to 2 cm.

8. Shoe inner sole according to any one of claims 1 to 7, wherein the shock absorbing element is an inserted honeycomb section having open honeycomb cells on one surface side thereof
9. Shoe inner sole according to any one of claims 1 to 8, wherein the shock absorbing element has a closed edge around its circumference.
10. Shoe inner sole according to any one of claims 1 to 9, wherein the shock absorbing element projects above the upper side of the cover sheet and/or below the underside of the base sheet
11. Shoe inner sole according to claim 9 or 10, wherein the shock absorbing element projects from 1mm to 10mm, above the upper side of the cover sheet and/or below the underside of the base sheet.
12. Shoe inner sole according to claim 10 or 11, wherein the thickness of the shock absorbing element is from 6mm to 25mm,
13. Shoe inner sole according to any one of the claims 1 to 12, wherein the shock-absorbing element includes a foam material with closed pores.
14. Shoe inner sole according to any one of the claims 1 to 13, wherein the hardness of the material of the shock absorbing element is 60 to 95 Shore A.
15. Shoe inner sole according to any one of claims 1 to 14, wherein the shock-absorbing element consists of one of the following materials: polypropylene, thermoplastic rubber, thermoplastic 30 polyurethane, TR material, or polyvinylchloride.
16. Shoe inner sole according to any one of claims 1 to 15, including, when as an insole, a material with a hardness of from 40 to 80 Shore A.
17. Shoe inner sole according to claim 16, wherein the insole includes one of the following materials: leather-fibre material, hard cardboard or a felt material.

18. Shoe inner sole according to any one of claims 1 to 15, wherein, when arranged as an inlay sole, the cover sheet consists of a textile material, and the base sheet consists of one of the following materials: open or closed cell foam material, felt material or fleece.

19. Shoe inner sole according to claim 18, wherein the hardness of the material used is from 30 to 60 Ascerc.

20. Shoe inner sole according to any one of claims 1 to 19, wherein the synthetic layer consists of transparent or translucent material.

21. Shoe inner sole according to any one of claims 1 to 20, wherein, the shock—absorbing element in the heel area, covers from 25% to 90%, of the heel impact area.

22. Shoe inner sole according to any one of claims 1 to 21, wherein at least one further shock absorbing element is provided in the front foot area, or in the area of the ball of the toes or in the area of the ball of the big toe .

23. Shoe inner sole according to any one of claims 1 to 22, wherein the base sheet and/or the cover sheet has/have an injection aperture.

24. Shoe inner sole according to any one of claims 1 to 23, including a dish-like depression, at least in the heel area, adapted to the shape of a heel.

25. Shoe inner sole according to any one of the preceding claims for sport, leisure or rehabilitation shoes.

26. Shoe inner sole according to claim 4, wherein the closed honeycomb section of the shock absorbing element is gas tight.

27. Shoe inner sole according to claim 6, wherein the synthetic layer further projects beyond the side edge in the heel area.

28. Shoe inner sole according to any one of claims 1 to 7, wherein the shock absorbing element is an integrally moulded honeycomb section having honeycomb cell walls facing downwardly and/or upwardly which form honeycomb cells.

29. Shoe inner sole according to claim 11, wherein the shock absorbing element projects from 2mm to 5mm above and the upper side of the cover sheet and/or below the underside of the base sheet.

30. Shoe inner sole according to claim 29, wherein the thickness is from 10mm to 20mm.

31. Shoe inner sole according to claim 21, wherein the shock absorbing element covers from 40% to 80% of the heel impact area.

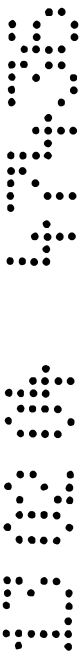
32. A shoe including an inner sole according to any one of the preceding claims.

33. Shoe inner sole substantially as hereinbefore described with reference to the accompanying Figures.

DATED this 12th day of February 2004

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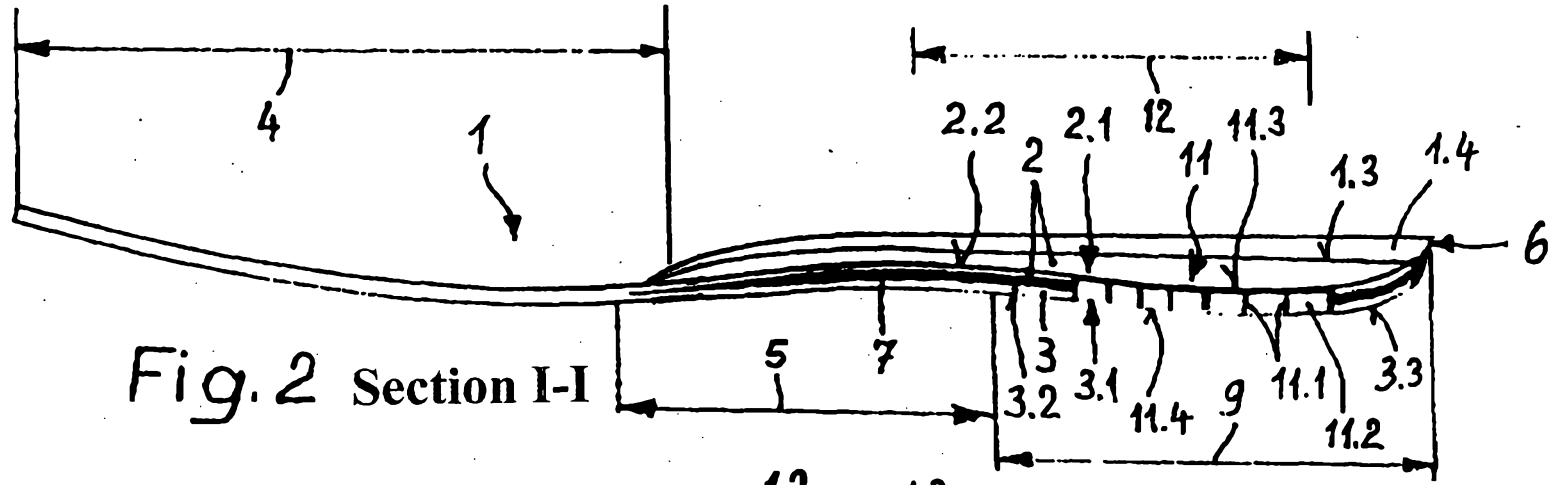


Fig. 2 Section I-I

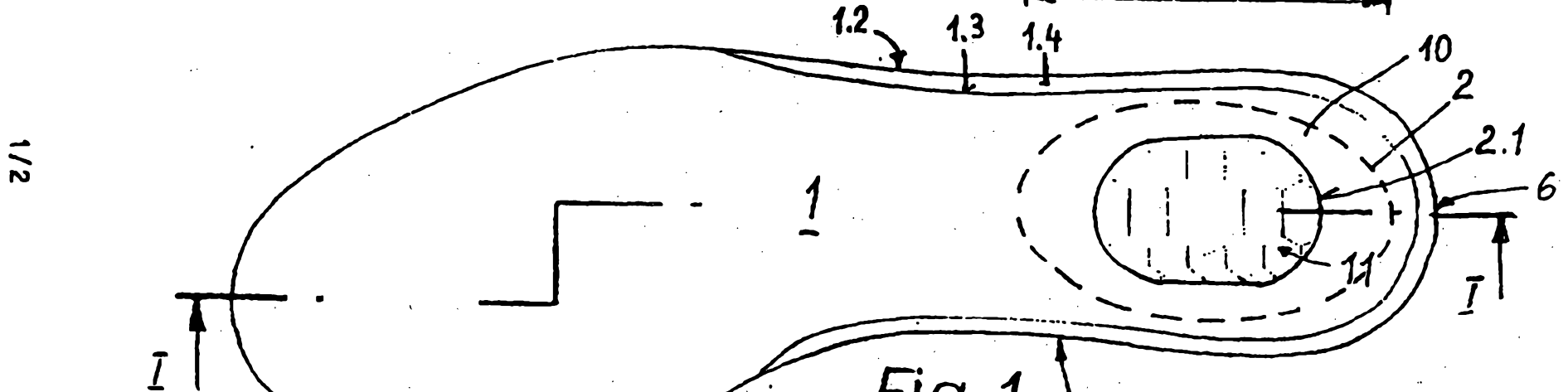


Fig. 1

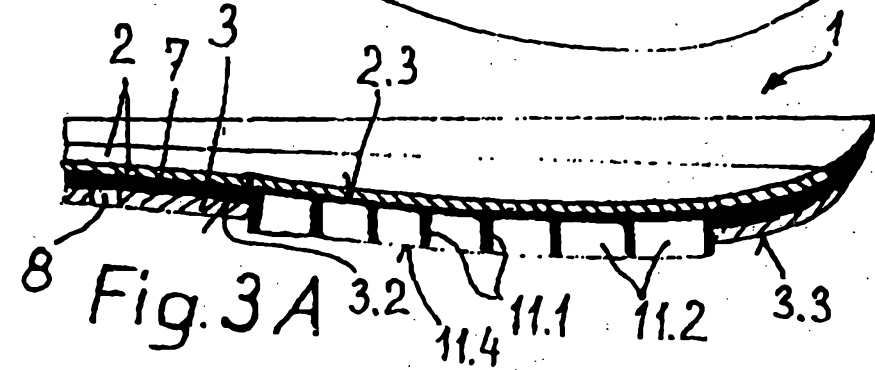


Fig. 3 A

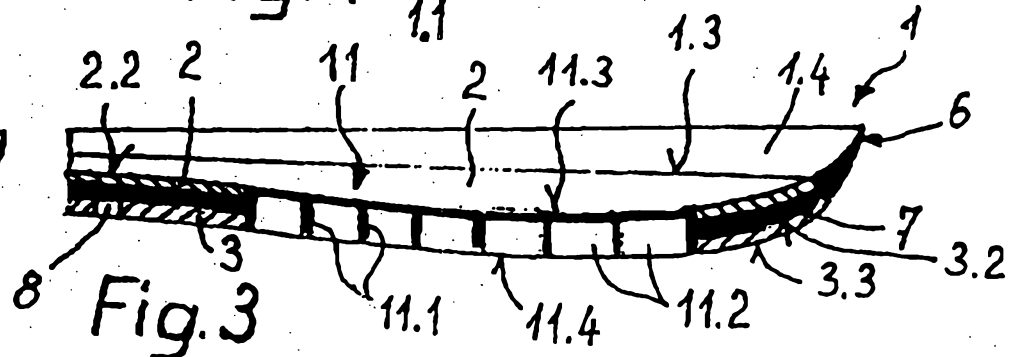


Fig. 3

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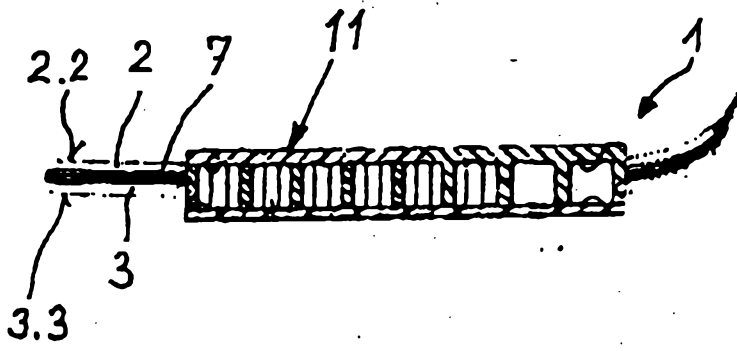


Fig. 4

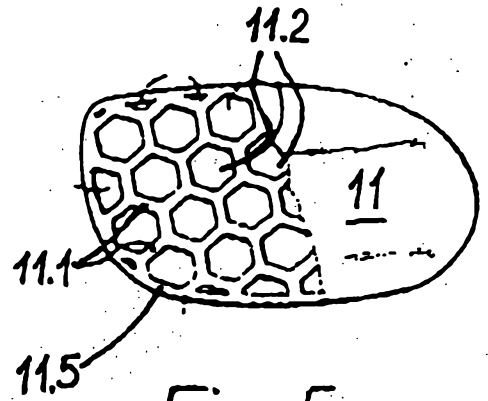


Fig. 5

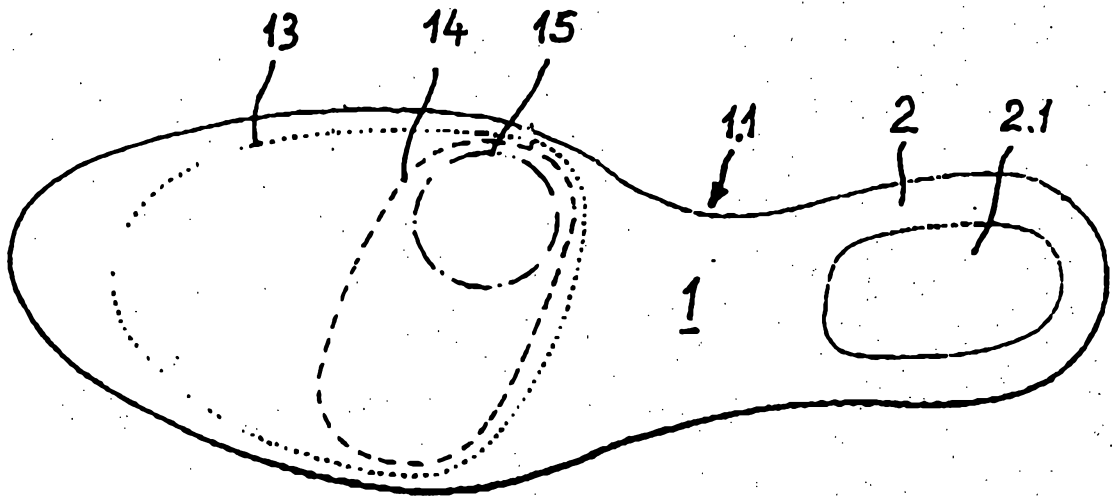
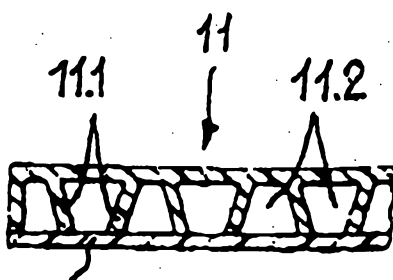


Fig. 6



Cover Sheet

Fig. 7

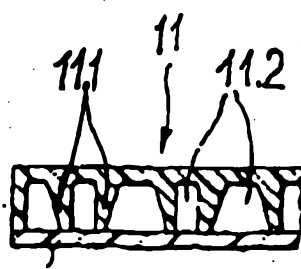


Fig. 8

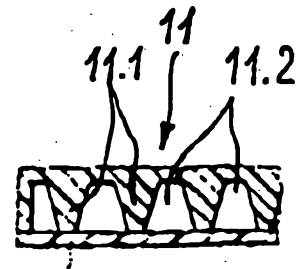


Fig. 9