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(54) **Ankle protection means for shoes or boots**

Knöchelschutzmittel für Schuhe oder Stiefel

Moyen de protection des chevilles pour chaussures ou bottes

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Description

[0001] The present invention relates to an ankle protection means suitable to be incorporated into a shoe or boot. The invention also relates to a shoe or boot comprising an ankle protection means as described in detail below. The invention also comprises a method of manufacturing an ankle protection means to be incorporated into a shoe or boot. Finally, the invention also relates to a method of manufacturing a shoe or boot comprising such an ankle protection means.

[0002] The human foot, due to its adaptation to the erect movement of a human, is an anatomically and functionally highly complex part of the body. Even minor mechanical influences to the muscles or bones of the feet result into major discomfort or even pain, and a physical injury to the feet may even have the consequence that a person has to refrain from walking, and thereby loses the possibility of movement, for the time of completely healing the injury. Having these facts in view, the working environment always emphasized protecting the feet of workers reliably, for example by suitable shoes. Wearing safety shoes or safety boots is, hence, an obligatory requirement in many areas where a risk exists that the feet may be harmed, for example in the steel industry, building industry, in the gardening and landscaping fields, for firefighters and rescue service people as well as for soldiers.

[0003] Safety shoes usually are midheight footwear made of leather and/or rubber or other polymers as, for example, polyurethane or thermoplastic polyurethane. Safety boots reach a height sufficient for protecting the foot including a part of the lower leg including the ankles; they are made, in most of the cases, either of leather or of rubber (where protection against water is needed). From the safety point of view, the toes are the best protected part of the foot: Safety shoes or safety boots are usually provided with a protective cap made of steel, aluminum or high-strength plastics at their forepart in order to protect the toes against injuries resulting from heavy objects falling down. The sole of safety shoes/boots usually has an exposed profile for preventing the wearer from slipping and is often made of a high strength material in order to give the person wearing the shoe/boot a safe stand. In many cases, additional strengthening and puncture-preventing materials as, for example, steel plates or hard polymer parts made of, for example, Kevlar^R or ParaAmide^R are incorporated into the soles of safety shoes or safety boots.

[0004] In humans, the ankle joint belongs to the lower leg and is formed where the foot and the leg meet. The ankle joint is a synovial hinge joint connecting the distal ends of the tibia and the fibula in the lower limb with the proximal end of the talus bone of the foot. Due to the anatomic situation, the ankle joint bears most of the body weight and, thus, is decisive for the overall movement of a human. The ankles form a bone protuberance at each of the two sides of each of the lower limbs. Ankle injuries (in many cases sprains) are the most frequent (> 40 %) injuries in the sports fields. However, the ankles have also to be protected against impact, knocks and pushes from either sides, due to the fact that the ankle joints are bound by several ligaments essential for the proper movement of the feet. Hence, also shoes for all types of sports, and ideally also safety shoes or safety boots, need to protect the ankles against injuries.

[0005] Document US-A 2007/0,068,043 discloses various features and combinations thereof for use with articles of footwear such as boots. Particularly, an ankle protection is disclosed which consists of an outer cover or shell, a padding made of a foam or a felt in combination with leather and an inner lining. Materials of the shell and lining are not disclosed. The boots are especially adapted for use on construction projects, and provide protection, support and comfort to the wearer.

[0006] The problem in providing such a protection is that a suitable material has to be found which, on the one hand, provides sufficient stiffness to dissipate the impact energy expected but, on the other hand, also may be included into a shoe - usual shoe, safety shoe or safety boot, sports shoe, shoe for handicapped persons etc. - without causing discomfort.

[0007] Moreover, any such protection, when incorporated into a shoe, has to consider that the ankle on the outer sides of the feet is in a lower position ("lower" means in this description and in the claims: in a smaller distance from the ground) than the ankle on the inner side of the feet. In addition, the individual ankles of each person are different in their convex and acute shapes, which fact requires adaptation of an ankle protection to such individual situation.

[0008] Hence, in view of the above, it was a first object of the invention to provide an ankle protection means as a composite of at least three shaped articles of different materials suitable to protect the ankles, particularly to protect the ankles against impact, knocks and pushes from either side.

[0009] It was a further object of the invention to provide the foot within the shoe comprising the ankle protection with a better hold.

[0010] Another object of the invention was to provide an ankle protection means allowing to reliably protect a multiplicity of individual ankle positions.

[0011] Furthermore, it was an object of the invention to provide an ankle protection means by which a protection of the ankles is achieved while preventing pressure marks at the feet from occurring.

[0012] Another object of the invention was to provide an ankle protection means not impeding the natural motion of the feet or making such natural motion uncomfortable.

[0013] Furthermore, it was an object of the invention to provide a shoe comprising at least one such ankle protection means and preferably two such ankle protection means.

[0014] Finally, it was an object to provide a way of manufacturing such ankle protection means as well as such shoes comprising at least one such ankle protection means in a commercially and technically satisfactory manner.

[0015] In view of the above objects, the invention relates to a protection means for a human ankle suitable to be incorporated into a shoe or boot, said means comprising

- a convex outer shell having an outer side being applied with a protective material and having in inner side, which houses
- a convex dish-shaped reinforcing means of a rigid material and lower in cross-diameter than the shell, which, in turn, houses
- a flat piece of a resilient material and suitable to afford a shock-absorbing and dissipating effect towards the ankle, once positioned above it.

[0016] Preferred embodiments of such an ankle protection means are claimed in dependent claims 2 to 10.

[0017] The invention also relates to a shoe or boot comprising at least one ankle protection means according to the detailed description below.

[0018] The invention also relates to a method of manufacturing an ankle protection means, said method comprising the steps of

- providing a convex outer shell having an outer side being applied with a protective material and having in inner side, on which is provided
- a convex dish-shaped reinforcing means of a rigid material and lower in cross-diameter than the shell, on which, in turn, is provided
- a flat piece of a resilient material and suitable to afford a shock-absorbing and dissipating effect towards the ankle, once positioned above it.

[0019] Finally, the invention also relates to a method of manufacturing a shoe or boot having at least one ankle region thereof protected against impact, knocks and pushes, said process comprising the step of providing at least one ankle region of said shoe or boot with an ankle protection means according to the following detailed description, and optionally additionally providing an additional lining between the at least one ankle protection means and the foot within the shoe or boot.

[0020] The invention is now in detail described by referring to the enclosed Figures, wherein

- Figure 1 shows a shoe 100 or boot 200 from the left side thereof;
- Figure 2 shows a detailed view to a shoe 100 or boot 200 from the right side thereof, particularly showing the ankle protection means 1 applied to the right-side ankle area of the shoe 100 or boot 200;
- Figure 3 shows a plan view to the ankle protection means 1 according to the invention on its outer side 21;
- Figure 4 shows a plan view to the ankle protection means 1 according to the invention on its inner side 27, allowing to recognize the inner side 27 of the convex outer shell 2, the convex dish-shaped reinforcing means 3 applied to the inner (concave) side 27 of the convex outer shell 2, and the flat piece 4 of resilient material applied to the innermost (concave) side of the dish-shaped reinforcing means 27;
- Figure 5 shows a plan view to the convex dish-shaped reinforcing means 3;
- the Figures 6A and 6B show plan views to the inner side 27 of the convex outer shell, specifically showing the three shock absorption-capable inlets 24 of a resilient material and the combination of convex dish-shaped reinforcing means 3 and flat piece 4 of a resilient material, respectively, all from their inner or back sides;
- the Figures 7A and 7B show a plan view to the ankle protection means 1 according to the invention on its outer side 21 and to the convex dish-shaped reinforcing means 2, separately;
- Figure 8 shows a rear side view to a shoe 100 or boot 200 from which the position of the ankle protection means 1

applied to the two ankle areas of a shoe 100 or boot 200 can be recognized;

- Figure 9 shows a side view of the ankle protection means 1 according to the invention from which, illustratively and not restricting, the convexity of the ankle protection means 1 (in terms of distance between its base and its apex), on the one hand, and the relative position of the shock absorption-capable inlets 24, on the other hand, may be derived; and
- Figure 10 shows a side view, similar to Figure 9 for the whole ankle protection means 1, of the convex dish-shaped reinforcing means 3 from which, illustratively and not restricting, the convexity of the reinforcing means 3 (in terms of distance between its base and its apex) may be derived.

[0021] The Figures, and the following description as well, relate to preferred embodiments of the invention which are given as illustrative examples only, and it is not intended that the invention is restricted to the embodiments shown in the Figures and explained in the following detailed description of the invention.

[0022] The term "ankle protection means" 1, as used in the present specification and claims, is meant to refer, in its broadest sense, to any means protecting the ankle of a human positioned in a shoe or boot against impact, knocks and pushes, particularly from either side. The shape of such ankle protection means is not restricted to the one shown in the Figures and explained in the specification, as long as the means is capable of providing a satisfactory protection against such mechanical impact.

[0023] Reference is now made to the Figures, particularly to Figures 1, 2, 3, 9 and 10. In accordance with a preferred embodiment of the present invention, the ankle protection means 1 is suitable to be incorporated into a shoe 100 or boot 200.

[0024] Shoes 100 or boots 200, in the frame of the present invention, are not restricted to those shown in the Figures and include, in the broadest sense, all types of shoes and boots. Specifically, shoes and boots may include normal walking shoes, safety shoes, safety boots, particularly safety shoes and safety boots as they are required by law for several professions and are recommended for all other professions where the risk of injuries at the feet or lower legs may arise or has to be avoided for maintaining the function of said profession (e. g. firemen, soldiers, alpine rescue services etc.), sports shoes and sports boots (e. g. for football, soccer, basketball, volleyball etc.).

[0025] The term "incorporated into a shoe or boot", as meant in the present specification and claims, refers to the fact that the ankle protection means of the present invention is incorporated into a shoe or boot when manufacturing it (as a new product) or may also means applying it to a ready-for-use shoe or boot originally not containing such an ankle protection device or even applying it to a shoe or boot already used by the user.

[0026] In accordance with the invention, the protection means 1 for a human ankle comprises at least the following three pieces:

- a convex outer shell 2 having an outer side 21 being applied with a protective material 22 and having in inner side 27, suitable to house
- a convex dish-shaped reinforcing means 3 of a rigid material and lower in cross-diameter than the shell 2, in turn suitable to house
- a flat piece 4 of a resilient material and suitable to afford a shock-absorbing and dissipating effect towards the ankle, once positioned above it.

[0027] The term "convex outer shell" as used in the specification and claims is intended to mean a larger shell covering the other parts and serving not only to bring all the other pieces of the ankle protection means into a correct and functional position, but also fixing the ensemble of these pieces to the shoe 100 or boot 200 in the area where the ankle(s) of the wearer may be expected. In accordance with search results recently made by the PFI (Prüf- und Forschungsinstitut in Pirmasens, Germany, dealing with testing shoes and their properties, particularly in cases where such properties have to satisfy certain standardized specifications) the statistics of ankles of a statistically relevant number of humans shows that the ankles of the persons tested are in a certain range of positions so that shoes may be manufactured to reflect the majority, for example 90 %, of all ankle positions, and suitably designed ankle protection means 1 according to the invention are suitably positioned in shoes 100 or boots 200 to protect the majority of human ankles reliably. By applying the outer shell 2 of the ankle protection means 1 according to the invention, together with the other two pieces (convex dish-shaped reinforcing means 3 and flat piece 4 of a resilient material, as described specifically below), and placing it appropriately, the ankles of most of the humans may be protected effectively, while preventing any pressure marks at the feet and discomfort in walking from occurring.

[0028] In accordance with the invention, as can be seen from the Figures 3, 6A and 7A, in the ankle protection means

1 of the invention, the convex outer shell 2 has an outer side 21 being applied with a protective material 22. Furthermore, the convex outer shell 2 has an inner side 27; the term "inner" means, in this connection throughout the specification and claims, that said (inner) side 27 shows towards the inner part of the shoe 100 or boot 200, when the ankle protection means 1 is applied to the shoe 100 or boot 200.

[0029] The material of the convex outer shell 2 may be any suitable material a skilled person in this field may select in accordance with the circumstances, e. g. in accordance with the intended use of the shoe 100 or boot 200 or in accordance with esthetic reasons. Particularly, the material may be the same as the outer material of the rest of the shoe 100 or boot 200. In a preferred embodiment of the invention, the convex outer shell 2 is provided with a protective material selected from the group consisting of polyurethane, preferably thermoplastic polyurethane, polyamide, preferably nylon-6.6, and polyvinylchloride, on its outer side 21. However, said selection is made only for illustrative, not for restrictive purposes, and a skilled person may select suitable commercially available protective materials, particularly of the above group, in accordance with the intended use and/or with other criteria.

[0030] One particular criterion for the selection of the above materials, particularly with safety shoes or safety boots or with sports shoes for high demand purposes, may be the hardness of the material. A skilled person in this field may select the hardness of the material useable in accordance with specific requirements in a broad range. In a preferred embodiment of the invention, the convex outer shell 2 is made of a material having a Shore A hardness in the range of from 65 to 95. Suitable materials which may have a Shore A hardness in this range are, for example, (natural or synthetic) rubber, polyamides and, in particular, nylon-6.6, thermoplastic polymers and polyvinylchloride.

[0031] The shape of the convex outer shell 2 may be any shape conceivable by a skilled person in this field. The term "convex" as used in the present specification and claims, means that the shell 2 is bent to form a dome or similar shape (seen from the inner side) directed to the outside. The distance from the "basis" of the dome to its apex may be as considered suitable by a skilled person in this field for any example of an ankle. In a preferred embodiment of the invention, and considered for the radius of the shell 2 in the preferred embodiments of the invention, the distance (seen in Figure 9 as a side view) is within a range of 5 mm to 20 mm, preferable within a range of 7 mm to 15 mm.

[0032] In further preferred embodiments, the outer shell 2 is in such a convex shape that it provides sufficient space to the ankle is has to cover so that there is no pressure contact between the shell 2 and the ankle which may be felt as uncomfortable. In any case, the convexity has to be on such a low level or at such a low value that, when walking with two shoes or boots having an ankle protection according to the invention on their inner ankle sides, no touching of the ankle protection means 1 occurs when the feet (or respective ankle areas) pass each other. In any case, the shape, particularly the convexity, of the convex outer shell 2 is such that it is adapted to the convexity of the human ankle to be protected. Due to the above statistic researches, 95 % of all human ankles may be reliably protected by a shoe or boot having the ankle protection means 1 of the invention without causing any discomfort to the wearer of the shoe 100 or boot 200.

[0033] In another preferred embodiment of the invention, the convex outer shell 2, as a section, has an approximate heart shape 23 when observed in the form applied to a shoe 100 or boot 200, as it may be seen from Figures 2, 6A and 7A, although this is not compulsory.

[0034] In another preferred embodiment of the invention, the convex outer shell 2 has integrated at least three shock absorption-capable inlets 24 of a resilient material, as may be derived from Figures 2, 3, 6A and 7A. Even more preferred, the resilient material of the shock absorption-capable inlets 24 may be selected from the group consisting of, for example, (natural or synthetic) rubber, polyamides and, in particular, nylon-6.6, thermoplastic polymers and polyvinylchloride. The shock absorption-capable inlets 24 may have any desirable and conceivable form and shape without any restriction. In a preferred embodiment of the invention, they may have fork shape or arrow shape as shown, particularly in Figures 2, 3, 7A and 9. Their height is, in further preferred embodiments, in a range between 1 mm and 20 mm, more preferred between 2.5 mm and 10 mm, and even more preferred between 3 mm and 7 mm. It is utmost preferred that they are arranged in an angle relative to each other which is (360° divided by the number of absorbers), for the example of 3 absorbers: 360° divided by 3 = 120° ; this is, however, not compulsory and may be changed in accordance with a skilled person's experience and in accordance with the circumstances.

[0035] The function of the absorbers is to enlarge the shock-absorbing surface area, when pushes, knocks or impact are impinging onto the ankle protection means 1 according to the invention so that energy is absorbed. This is also one of the reasons why the absorbers are not touching each other in the middle of the shell 2 but leave a certain space free. Of course, more than 3 shock absorbers may be provided, for example four or five of them; this is within the skill of a person having to design the ankle protection means 1 of the invention in detail.

[0036] In general, the outer shell 2 may be fixed to the outside of a shoe 100 or boot 200 by any suitable means a skilled person may have available for fixation. In any case, in order to have the shell 2 brought to a reliable fixation to the shoe or boot, a strong fixing means is needed, as a skilled person has them available. Adhesives may be suitable in the same way as mechanical fixing means. In a particularly preferred embodiment of the invention, the fixation may be made by sewing the shell 2 to the outside surface of a shoe or boot in an area where the ankle(s) of a wearer is/are positioned.

[0037] In accordance with another preferred embodiment of the invention, the convex outer shell 2 has at least two parallel grooves 25, 25' along its outer rim. The two grooves 25, 25' preferably run in parallel not only to each other, but also in parallel to the outer rim of the shell 2 and serve for connecting the outer shell 2 to a shoe 100 or boot 200 by sewing. In other words the sewing is done preferably along the course of the grooves 25, 25' and through the rim of the shell onto the outside area of the shoe or boot. This is particularly advantageous since the fissure resulting from the sewing additionally absorbs impact energy applied to the ankle area.

[0038] Reference is now made to Figures 4, 5, 6A, 6B, 7A and 7B: From these Figures, it may be seen that the convex outer shell 2, on its inner side 27, houses the convex dish-shaped reinforcing means 3. The reinforcing means 3 has a shape very similar to the shape of the convex outer shell 2, but is in any case smaller in diameter of its shape, and is preferably also lower in its convexity so that it may be housed in the inner part of the outer shell 2, as shown in Figures 4 and 6A and 6B. In a preferred embodiment of the invention, the convex dish-shaped reinforcing means 3 of a rigid material is lower in size and/or lower in convexity than the convex outer shell 2. More preferably, the convex dish-shaped reinforcing means 3 of a rigid material is lower in size by 35 % and lower in convexity than the convex outer shell (2), preferably (but not restricting) by 30 %, more preferably by providing a distance between the base of the reinforcing means 3 and its apex in a range between 3 and 15 mm, more preferably between 5 and 10 mm.

[0039] Basically, the convex disk-shaped reinforcing means 3 may be made of any rigid material a skilled person may know for reinforcing a surface. Hence, all rigid materials which may be formed to a suitable convex shape may be used in accordance with a skilled person's discretion. However, in particularly preferred embodiments of the invention, the convex dish-shaped reinforcing means 3 is made of a material selected from the group consisting of, for example, (natural or synthetic) rubber, polyamides and, in particular, nylon-6.6, thermoplastic polymers, polyurethane and polyvinylchloride. Moreover, the convex dish-shaped reinforcing means 3 preferably may have a thickness in the range of from 0.1 to 2 mm, more preferably of 0.6 to 1.5 mm, in order to achieve a reinforcement suitable for a reliable ankle protection.

[0040] In accordance with the invention, it is possible that the convex dish-shaped reinforcing means 3 is fixed to the convex outer shell 2 by any suitable means, e. g. by means of an adhesive or by means of any mechanical fixation.

[0041] In accordance with the invention, it is preferred that the convex dish-shaped reinforcing means 3 is not specifically fixed to the convex outer shell 2 by separate fixation means, but is fixed to the inner side 27 of the convex outer shell 2 due to the fixation, preferably due to the stitching, of the composite of convex outer shell 2, convex dish-shaped reinforcing means 3 and flat piece 4 of resilient material to the outer sides of a shoe 100 or boot 200. In other words: There is no specific fixation between the convex outer shell 2 (particularly its inner side 27) and the convex dish-shaped reinforcing means 3 of a rigid material; quite to the contrary: the reinforcing means 3 may slightly "float" within the inner side 27 of the convex outer shell 2 in order to adapt its specific position to the position of the wearer's ankle, but is prevented from escaping due to the fact that the outer shell 2 is fixed, preferable stitched, as a cover of the reinforcing means 3, to the outside of the shoe or boot.

[0042] As may be seen from Figures 4 and 6A and 6B, at least one other part of the ankle protection means 1 is a flat piece 4 of a resilient material which preferably is housed on the inner side of the convex dish-shaped reinforcing means 3 of a rigid material. Such a flat piece 4 of a resilient material is suitable to afford a shock-absorbing and dissipating effect towards the ankle, once positioned above it, and it is also used in order to prevent pressure marks of the (hard and) rigid material to the foot from occurring.

[0043] In particularly preferred embodiments of the invention, the flat piece 4 of a resilient material is made of a material selected from the group consisting of closed-cell foam latex rubber, silicone rubber, closed-cell polyurethane foam, soft polyvinylchloride and a gel of any suitable gel material which may be filled into a small sealable bag or pouch. In further preferred embodiments of the invention, the flat piece 4 of a resilient material has a specific space weight of from 50 to 500 g/m³, preferably of from 70 to 300 g/m³.

[0044] As may be derived from the above, the ankle protection means 1 of the invention preferably is constructed as a "sandwich" of the above three parts which are together applied and fixed to the outer side of a shoe or boot. Of course, further parts or layers may be included into the "sandwich" as, for example, one or more further cushioning layer(s), linings, protective layer(s) etc..

[0045] The invention also relates to a shoe 100 or boot 200 comprising at least one of the ankle protection means 1 illustrated above. In preferred embodiments of the invention, a shoe 100 or boot 200 may comprise at least two, even more preferred exactly two, ankle protection means 1 in accordance with the invention. Usually, such two ankle protection means are applied on two opposite parts of a shoe 100 or boot 200 of the invention in an area/height of the ankle of the wearer of the shoe or boot, which is usually an area/height different for the outer and the inner ankle: Usually, the inner ankle is found at a lower position, while the outer ankle is found at a higher position.

[0046] In a particularly preferred embodiment of the invention, the shoe 100 or boot 200 of the invention is provided with an additional lining between the at least one or two ankle protection means 1 and the foot within the shoe 100 or boot 200. In other words: With the aim of improving the wearer's comfort when walking with the shoe/boot and even better protecting the ankle(s) also on the inner side of the shoe/boot closest to the foot, the lining applied provides a soft feeling and contributes to preventing pressure marks and discomfort for the wearer from occurring.

[0047] The invention also relates to a method of manufacturing a protection means 1 for a human ankle as it is described above in detail. The method of the invention comprises the steps of

- providing a convex outer shell 2 having an outer side 21 being applied with a protective material 22 and having in inner side 27 on which is provided
- a convex dish-shaped reinforcing means 3 of a rigid material and lower in cross-diameter than the shell 2, on which, in turn, is provided
- a flat piece 4 of a resilient material and suitable to afford a shock-absorbing and dissipating effect towards the ankle, once positioned above it.

[0048] Details of the parts used in the above method are in detail described above in connection to the ankle protection means 1, and the disclosure may easily be applied to the method by a person skilled in the present field of the art.

[0049] The invention finally relates to a method of manufacturing a shoe or boot and, in particular, a shoe or boot having at least one ankle region thereof protected against impact, knocks and pushes. Such manufacturing method may comprise all steps for shoe or boot manufacturing which a skilled person would usually take, particularly when such a shoe or boot has at least one ankle region thereof protected against impact, knocks and pushes from either side. However, in addition to such conventional shoe manufacturing steps, the present method also comprises the step of providing at least one ankle region of said shoe 100 or boot 200 with an ankle protection means 1 according to the present invention as it is described in detail above.

[0050] In a preferred embodiment, such a process of the invention comprises the additional step of providing an additional lining 5 between the at least one ankle protection means 1 and the foot within the shoe 100 or boot 200. The latter embodiment is particularly preferred due to the fact that the aim of improving the wearer's comfort when walking with the shoe/boot and of better protecting the ankle(s) also on the inner side of the shoe/boot closest to the foot is best met since the lining 5 applied provides a soft feeling and contributes to preventing pressure marks and discomfort for the wearer from occurring.

[0051] The invention is even more in detail explained by the following examples which are given to illustrate the invention but not to restrict the scope of the invention.

Examples

[0052] The ankle protection tests of professional shoes (for example: working shoes) of the prior art (F 0064 Kalindi, navy/black; Size (French): 42 = Size (English): 8) without the ankle protection of the invention) and of the invention (shoes of the same size and material and from the same manufacturer as the shoes of the prior art, but having the ankle protection of the invention) were tested in accordance with the Standard Test Procedure of ISO EN 20 344, and the test of an ankle protection was carried out in accordance with the Standard Test Procedure ISO EN 20 345. In both cases, only the right shoe was tested.

[0053] The results can be seen from the subsequent Table.

Table of ankle protection test results

Parameter tested	Unit	Shoe of the invention with ankle protection		Shoe of the Prior Art W/O ankle protection	
		Average Value	No.1	Average Value	No.1
Impact outer side	kN	4.81	4.81	4.82	4.82
Impact inner side	kN	4.82	4.81	4.85	4.85

[0054] The above values show a superior test result for the shoe provided with the ankle protection means 1, compared to the shoe of the prior art having no ankle protection means of the invention provided.

Claims

1. Ankle protection means (1) suitable to be incorporated into a shoe (100) or boot (200), said means comprising

- a convex outer shell (2) having an outer side (21) being applied with a protective material (22) and having an inner side (27), which houses
- a convex dish-shaped reinforcing means (3) of a rigid material and lower in cross-diameter than the shell (2), which, in turn, houses
- a flat piece (4) of a resilient material and suitable to afford a shock-absorbing and dissipating effect towards the ankle, once positioned above it.

2. The ankle protection means (1) according to claim 1, wherein the convex outer shell (2) is provided with a protective material selected from the group consisting of polyurethane, preferably thermoplastic polyurethane, polyamide, preferably nylon-6.6, and polyvinylchloride on its outer side (21).

3. The ankle protection means (1) according to claim 1 or claim 2, wherein the convex outer shell (2) is made of a material having a Shore A hardness in the range of from 65 to 95.

4. The ankle protection means (1) according to any of the claims 1 to 3, wherein the convex outer shell (2) has an approximate heart shape (23) when observed in the form applied to a shoe (100) or boot (200).

5. The ankle protection means (1) according to any of the claims 1 to 4, wherein the convex outer shell (2) has integrated at least three shock absorption-capable inlets (24) of a resilient material, preferably of the material selected from the group consisting of (natural or synthetic) rubber, polyamides and, in particular, nylon-6.6, thermoplastic polymers and polyvinylchloride.

6. The ankle protection means (1) according to any of the claims 1 to 5, wherein the convex outer shell (2) has at least two parallel groves (25, 25') along its outer rim serving for connecting the outer shell (2) to a shoe (100) or boot (200) by sewing.

7. The ankle protection means (1) according to any of the claims 1 to 6, wherein the convex dish-shaped reinforcing means (3) of a rigid material is lower in size and lower in convexity than the convex outer shell (2); preferably wherein the convex dish-shaped reinforcing means (3) of a rigid material is lower in size by 35 % and/or lower in convexity than the convex outer shell (2) by 30 %.

8. The ankle protection means (1) according to any of the claims 1 to 7, wherein the convex dish-shaped reinforcing means (3) is made of a material selected from the group consisting of natural or synthetic rubber, polyamides and, in particular, nylon-6.6, thermoplastic polymers, polyurethane and polyvinylchloride and/or has a thickness in the range of from 0.1 to 2 mm, preferably of 0.6 to 1.5 mm.

9. The ankle protection means (1) according to any of the claims 1 to 8, wherein the convex dish-shaped reinforcing means (3) is fixed to the inner side (27) of the convex outer shell (2) due to the fixation, preferably due to the stitching, of the composite of convex outer shell (2), convex dish-shaped reinforcing means (3) and flat piece (4) of resilient material to the outer sides of a shoe (100) or boot (200).

10. The ankle protection means (1) according to any of the claims 1 to 9, wherein the flat piece (4) of a resilient material is made of a material selected from the group consisting of closed-cell foam latex rubber, silicone rubber, closed cell polyurethane foam, soft polyvinylchloride and gel material which may be filled into a small sealable bag or pouch and/or has a specific space weight of from 50 to 500 g/m³, preferably of from 70 to 300 g/m³.

11. Shoe (100) or boot (200) comprising at least one the ankle protection means (1) according to any of the claims 1 to 10.

12. Shoe (100) or boot (200) according to claim 11, comprising two ankle protection means (1) according to any of the claims 1 to 10.

13. Shoe (100) or boot (200) according to any of the claims 11 or 12, wherein the shoe (100) or boot (200) is provided with an additional lining between the at least one or two ankle protection means (1) and the foot within the shoe (100) or boot (200).

14. A method of manufacturing an ankle protection means (1), said method comprising the steps of

- providing a convex outer shell (2) having an outer side (21) being applied with a protective material (22) and

having an inner side (27) on which is provided

- a convex dish-shaped reinforcing means (3) of a rigid material and lower in cross-diameter than the shell (2), on which, in turn, is provided

- a flat piece (4) of a resilient material and suitable to afford a shock-absorbing and dissipating effect towards the ankle, once positioned above it.

15. A process of manufacturing a shoe (100) or boot (200) having at least one ankle region thereof protected against impact, knocks and pushes, said process comprising the step of providing at least one ankle region of said shoe (100) or boot (200) with an ankle protection means (1) according to any of the claims 1 to 10, and optionally additionally providing an additional lining between the at least one ankle protection means (1) and the foot within the shoe (100) or boot (200).

Patentansprüche

1. Knöchelschutzelement (1), geeignet zum Aufnehmen in einen Schuh (100) oder Stiefel (200), umfassend

- eine konvexe äußere Schale (2) mit einer Außenseite (21), auf die ein Schutzmaterial (22) aufgebracht ist, und mit einer Innenseite (27), die aufnimmt

- ein konvexes schalenförmiges Verstärkungselement (3) aus einem starren Material und kleinerem Querdurchmesser als die Schale (2), das wiederum aufnimmt

- ein flaches Stück (4) aus einem elastischen Material und geeignet, eine stoßdämpfende und ableitende Wirkung gegenüber dem Knöchel zu ermöglichen, sobald es darüber positioniert ist.

2. Knöchelschutzelement (1) nach Anspruch 1, wobei die konvexe äußere Schale (2) mit einem schützenden Material, ausgewählt aus der Gruppe bestehend aus Polyurethan, vorzugsweise thermoplastischem Polyurethan, Polyamid, vorzugsweise Nylon-6,6 und Polyvinylchlorid, auf ihrer Außenseite (21) vorgesehen ist.

3. Knöchelschutzelement (1) nach Anspruch 1 oder 2, wobei die konvexe äußere Schale (2) aus einem Material mit einer Shore-A-Härte im Bereich von 65 bis 95 hergestellt ist.

4. Knöchelschutzelement (1) nach einem der Ansprüche 1 bis 3, wobei die konvexe äußere Schale (2) eine ungefähre Herzform (23) aufweist, wenn sie in der Form betrachtet wird, die bei einem Schuh (100) oder Stiefel (200) eingesetzt wird.

5. Knöchelschutzelement (1) nach einem der Ansprüche 1 bis 4, wobei die konvexe äußere Schale (2) mindestens drei stoßdämpfungsfähige Einlässe (24) aus einem elastischen Material, vorzugsweise aus dem Material ausgewählt aus der Gruppe bestehend aus (natürlichem oder synthetischem) Gummi, Polyamiden und insbesondere Nylon-6,6, thermoplastischen Polymeren und Polyvinylchlorid, integriert hat.

6. Knöchelschutzelement (1) nach einem der Ansprüche 1 bis 5, wobei die konvexe äußere Schale (2) mindestens zwei parallele Nuten (25, 25') entlang ihrem äußeren Rand aufweist, die zum Verbinden der äußeren Schale (2) mit einem Schuh (100) oder Stiefel (200) durch Nähen dienen.

7. Knöchelschutzelement (1) nach einem der Ansprüche 1 bis 6, wobei das konvexe schalenförmige Verstärkungselement (3) aus einem starren Material eine kleinere Größe und eine kleinere Außenwölbung aufweist, als die konvexe äußere Schale (2), vorzugsweise wobei das konvexe schalenförmige Verstärkungselement (3) aus einem starren Material eine um 35% kleinere Größe und/oder eine um 30% kleinere Außenwölbung aufweist, als die konvexe äußere Schale (2).

8. Knöchelschutzelement (1) nach einem der Ansprüche 1 bis 7, wobei das konvexe schalenförmige Verstärkungselement (3) aus einem Material hergestellt wird, das aus der Gruppe bestehend aus natürlichem oder synthetischem Gummi, Polyamiden und insbesondere Nylon-6,6, thermoplastischen Polymeren, Polyurethan und Polyvinylchlorid ausgewählt wird und/oder eine Dicke im Bereich von 0,1 bis 2 mm, vorzugsweise von 0,6 bis 1,5 mm, aufweist.

9. Knöchelschutzelement (1) nach einem der Ansprüche 1 bis 8, wobei das konvexe schalenförmige Verstärkungselement (3) an der Innenseite (27) der konvexen äußeren Schale (2) aufgrund der Fixierung befestigt ist, bevorzugt durch das Nähen der Zusammensetzung aus der konvexen äußeren Schale (2), des konvexen schalenförmigen

Verstärkungselements (3) und des flachen Stücks (4) aus elastischem Material an die Außenseiten eines Schuhs (100) oder Stiefels (200).

10. Knöchelschutzelement (1) nach einem der Ansprüche 1 bis 9, wobei das flache Stück (4) aus einem elastischen Material aus einem Material besteht, das aus der Gruppe bestehend aus geschlossenzelligem Latex-Schaumstoff, Silikon-Gummi, geschlossenzelligem Polyurethanschaum, weichem Polyvinylchlorid und Gelmaterial ausgewählt wird, das in eine kleine siegelbare Tasche oder in einen kleinen siegelbaren Beutel gefüllt werden kann, und/oder eine spezifische Dichte von 50 bis 500 g/m³, vorzugsweise von 70 bis 300 g/m³ aufweist.

11. Schuh (100) oder Stiefel (200) mit mindestens einem Knöchelschutzelement (1) nach einem der Ansprüche 1 bis 10.

12. Schuh (100) oder Stiefel (200) nach Anspruch 11, umfassend zwei Knöchelschutzelemente (1) nach einem der Ansprüche 1 bis 10.

13. Schuh (100) oder Stiefel (200) nach einem der Ansprüche 11 oder 12, wobei der Schuh (100) oder Stiefel (200) mit einer zusätzlichen Auskleidung zwischen dem mindestens einen Knöchelschutzelement oder den zwei Knöchelschutzelementen (1) und dem Fuß im Schuh (100) oder Stiefel (200) vorgesehen ist.

14. Verfahren zur Herstellung eines Knöchelschutzelements (1), wobei das Verfahren die folgenden Schritte aufweist:

- Bereitstellen einer konvexen äußeren Schale (2) mit einer Außenseite (21), auf die ein Schutzmaterial (22) aufgebracht ist, und mit einer Innenseite (27) auf der vorgesehen ist
- ein konvexes schalenförmiges Verstärkungselement (3) aus einem starren Material und kleinerem Querdurchmesser als die Schale (2), auf dem wiederum vorgesehen ist
- ein flaches Stück (4) aus einem elastischen Material und geeignet eine stoßdämpfende und ableitende Wirkung gegenüber dem Knöchel zu ermöglichen, sobald es darüber positioniert ist.

15. Verfahren zur Herstellung eines Schuhs (100) oder Stiefels (200), wobei mindestens ein Knöchelbereich davon gegen Stöße, Schläge und Druck geschützt ist, wobei das Verfahren den Schritt des Bereitstellens mindestens eines Knöchelbereichs des Schuhs (100) oder Stiefels (200) mit einem Knöchelschutzelement (1) nach einem der Ansprüche 1 bis 10 aufweist, und gegebenenfalls zusätzlich eine zusätzliche Auskleidung zwischen dem mindestens einen Knöchelschutzelement (1) und dem Fuß innerhalb des Schuhs (100) oder Stiefels (200) vorgesehen ist.

Revendications

1. Moyen de protection des chevilles (1) approprié pour être incorporé dans une chaussure (100) ou dans une botte (200), ledit moyen comprenant :

- une enveloppe externe convexe (2) possédant un côté externe (21) sur lequel vient s'appliquer une matière de protection (22) et possédant un côté interne (27), dans laquelle vient se disposer
- un moyen de renforcement en forme d'assiette convexe (3) réalisé en un matériau rigide et dont le diamètre en section transversale est inférieur à celui de l'enveloppe (2), dans lequel vient se loger à son tour
- un morceau plat (4) d'un matériau résilient et approprié pour conférer un effet de dissipation et d'absorption des chocs à la cheville, dès que le moyen en question a été placé par-dessus celle-ci.

2. Moyen de protection des chevilles (1) selon la revendication 1, dans lequel l'enveloppe externe convexe (2) est munie d'un matériau de protection choisi parmi le groupe constitué par du polyuréthane, de préférence du polyuréthane thermoplastique, du polyamide, de préférence du nylon-6.6 et du chlorure de polyvinyle sur son côté externe (21).

3. Moyen de protection des chevilles (1) selon la revendication 1 ou 2, dans lequel l'enveloppe externe convexe (2) est réalisée en un matériau dont la dureté Shore se situe dans la plage de 65 à 95.

4. Moyen de protection des chevilles (1) selon l'une quelconque des revendications 1 à 3, dans lequel l'enveloppe externe convexe (2) possède une configuration (23) qui rappelle approximativement celle d'un cœur lorsqu'on regarde dans son état appliqué à une chaussure (100) ou à une botte (200).

5. Moyen de protection des chevilles (1) selon l'une quelconque des revendications 1 à 4, dans lequel, dans l'enveloppe externe convexe (2), sont intégrés au moins trois orifices d'entrée (24) pour une matière résiliente, capables d'absorber les chocs, de préférence d'une matière choisie parmi le groupe constitué par du caoutchouc (naturel ou synthétique), des polyamides et en particulier du nylon-6.6, des polymères thermoplastiques et du chlorure de polyvinyle.
6. Moyen de protection des chevilles (1) selon l'une quelconque des revendications 1 à 5, dans lequel l'enveloppe externe convexe (2) possède au moins deux rainures parallèles (25, 25') le long de son bord externe qui servent à relier l'enveloppe externe (2) à une chaussure (100) ou à une botte (200) par couture.
7. Moyen de protection des chevilles (1) selon l'une quelconque des revendications 1 à 6, dans lequel le moyen de renforcement (3) en forme d'assiette convexe réalisé en un matériau rigide possède une dimension inférieure et une convexité inférieure à celles de l'enveloppe externe convexe (2), de préférence dans lequel le moyen de renforcement (3) en forme d'assiette convexe réalisé en un matériau rigide possède une dimension inférieure à concurrence de 35 % et/ou une convexité inférieure à celle de l'enveloppe externe convexe (2) à concurrence de 30 %.
8. Moyen de protection des chevilles (1) selon l'une quelconque des revendications 1 à 7, dans lequel le moyen de renforcement (3) en forme d'assiette convexe est réalisé en un matériau choisi parmi le groupe constitué par du caoutchouc naturel ou synthétique, des polyamides et en particulier du nylon-6.6, des polymères thermoplastiques, du polyuréthane et du chlorure de polyvinyle et/ou possède une épaisseur dans la plage de 0,1 à 2 mm, de préférence de 0,6 à 1,5 mm.
9. Moyen de protection des chevilles (1) selon l'une quelconque des revendications 1 à 8, dans lequel le moyen de renforcement (3) en forme d'assiette convexe est fixé au côté interne (27) de l'enveloppe externe convexe (2) via la fixation, de préférence via la piqure du composite de l'enveloppe externe convexe (2), du moyen de renforcement (3) en forme d'assiette convexe et du morceau plat (4) réalisé en un matériau résilient aux côtés externes d'une chaussure (100) ou d'une botte (200).
10. Moyen de protection des chevilles (1) selon l'une quelconque des revendications 1 à 9, dans lequel le morceau plat (4) réalisé en un matériau résilient est réalisé en un matériau choisi parmi le groupe constitué par du caoutchouc latex sous la forme d'une mousse à alvéoles fermées, du caoutchouc silicone, de la mousse de polyuréthane à alvéoles fermées, du chlorure de polyvinyle mou et une matière sous forme de gel que l'on peut utiliser pour remplir un petit sac ou une petite poche scellable et/ou qui possède une masse volumique de 50 à 500 g/m³, de préférence de 70 à 300 g/m³.
11. Chaussure (100) ou botte (200) comprenant au moins un moyen de protection des chevilles (1) selon l'une quelconque des revendications 1 à 10.
12. Chaussure (100) ou botte (200) selon la revendication 11, comprenant deux moyens de protection des chevilles (1) selon l'une quelconque des revendications 1 à 10.
13. Chaussure (100) ou botte (200) selon l'une quelconque des revendications 11 ou 12, dans laquelle la chaussure (100) ou la botte (200) est munie d'une doublure supplémentaire entre lesdits au moins un ou deux moyens de protection de chevilles (1) et le pied à l'intérieur de la chaussure (100) ou de la botte (200).
14. Procédé de fabrication d'un moyen de protection des chevilles (1), ledit procédé comprenant les étapes dans lesquelles :
 - on procure une enveloppe externe convexe (2) possédant un côté externe (21) sur lequel vient s'appliquer une matière de protection (22) et possédant un côté interne (27), sur laquelle on procure
 - un moyen de renforcement en forme d'assiette convexe (3) réalisé en un matériau rigide et dont le diamètre en section transversale est inférieur à celui de l'enveloppe (2), sur lequel on procure à son tour
 - un morceau plat (4) d'un matériau résilient et approprié pour conférer un effet de dissipation et d'absorption des chocs à la cheville, dès que le moyen en question a été placé par-dessus celle-ci.
15. Procédé de fabrication d'une chaussure (100) ou d'une botte (200) dont au moins une zone située au niveau des chevilles est protégée contre les chocs, les coups et les poussées, ledit procédé comprenant l'étape dans laquelle on munit au moins une zone de ladite chaussure (100) ou de ladite botte (200), située au niveau des chevilles, d'un

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moyen de protection des chevilles (1) selon l'une quelconque des revendications 1 à 10, et dans laquelle on prévoit de manière facultative en outre une doublure supplémentaire entre ledit au moins un moyen de protection des chevilles (1) et le pied à l'intérieur de la chaussure (100) ou de la botte (200).

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Figure 1

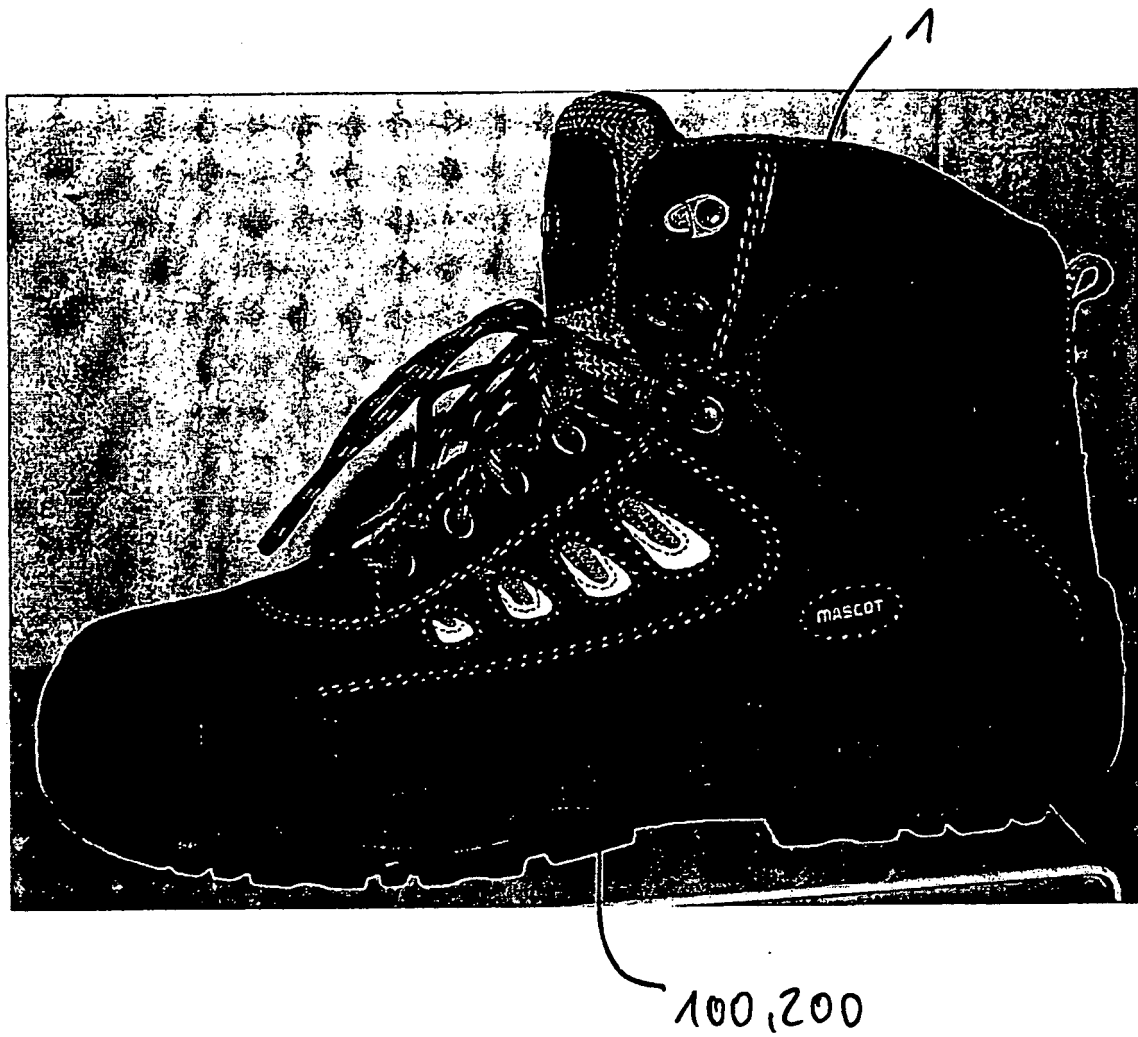


Figure 2

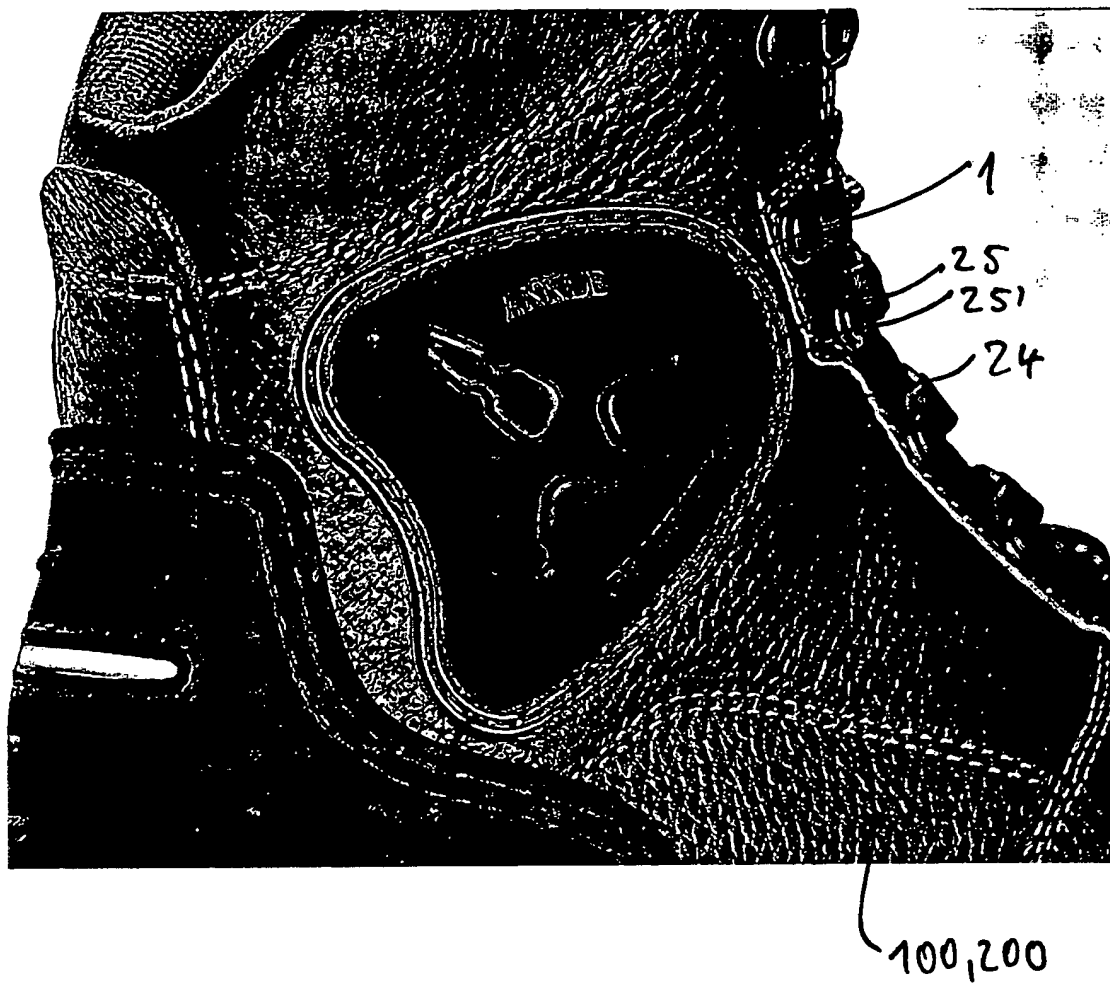


Figure 3

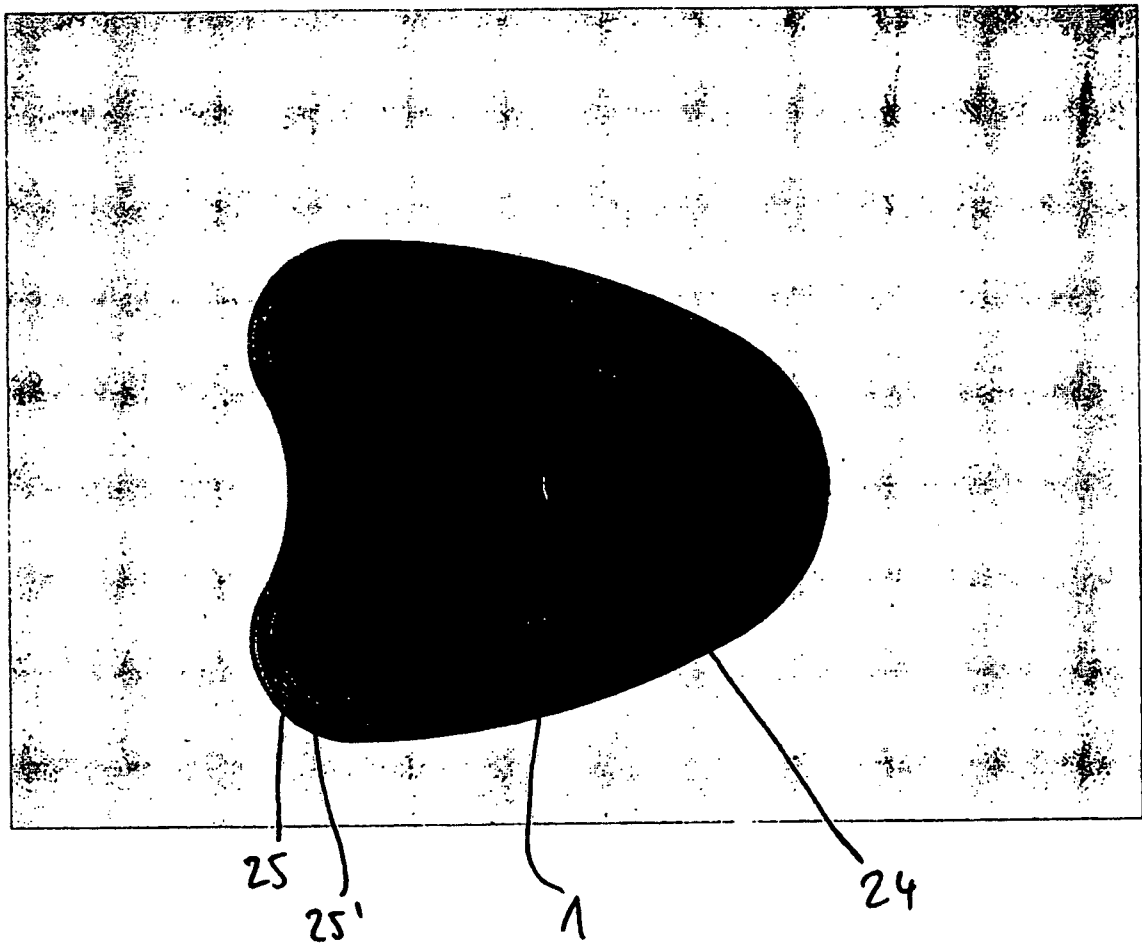


Figure 4

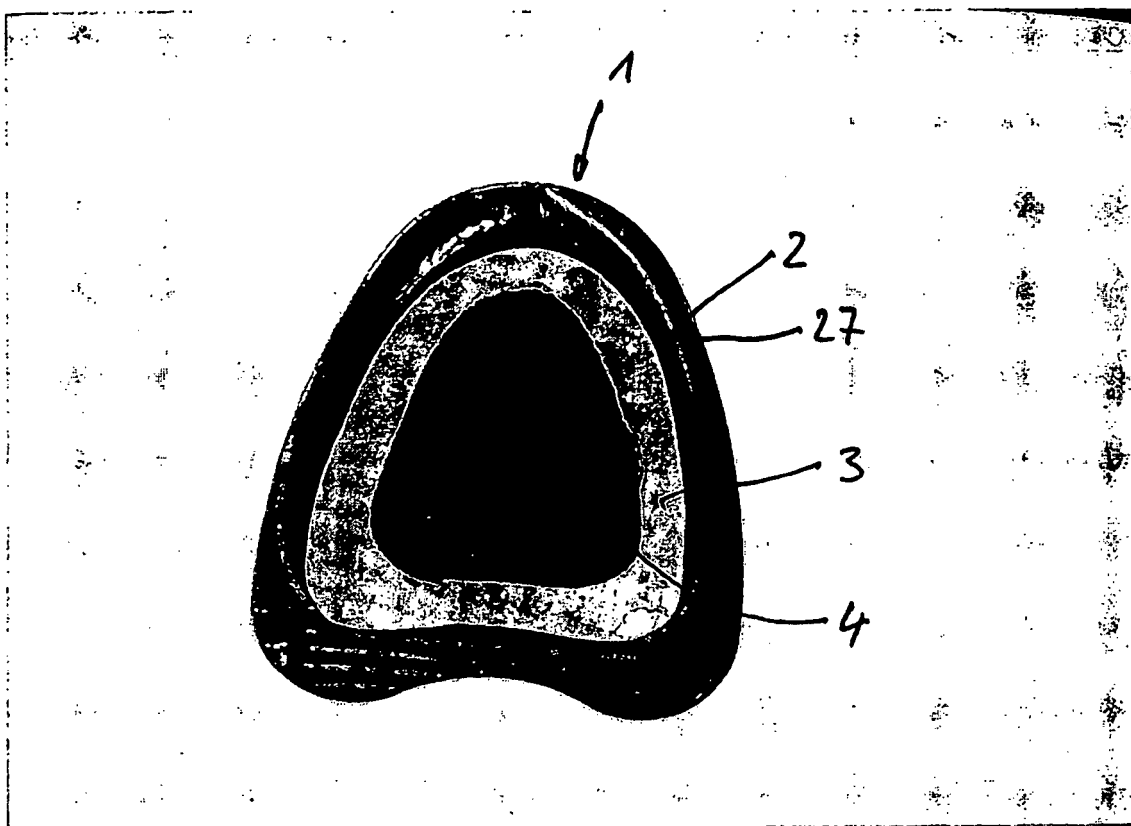


Figure 5

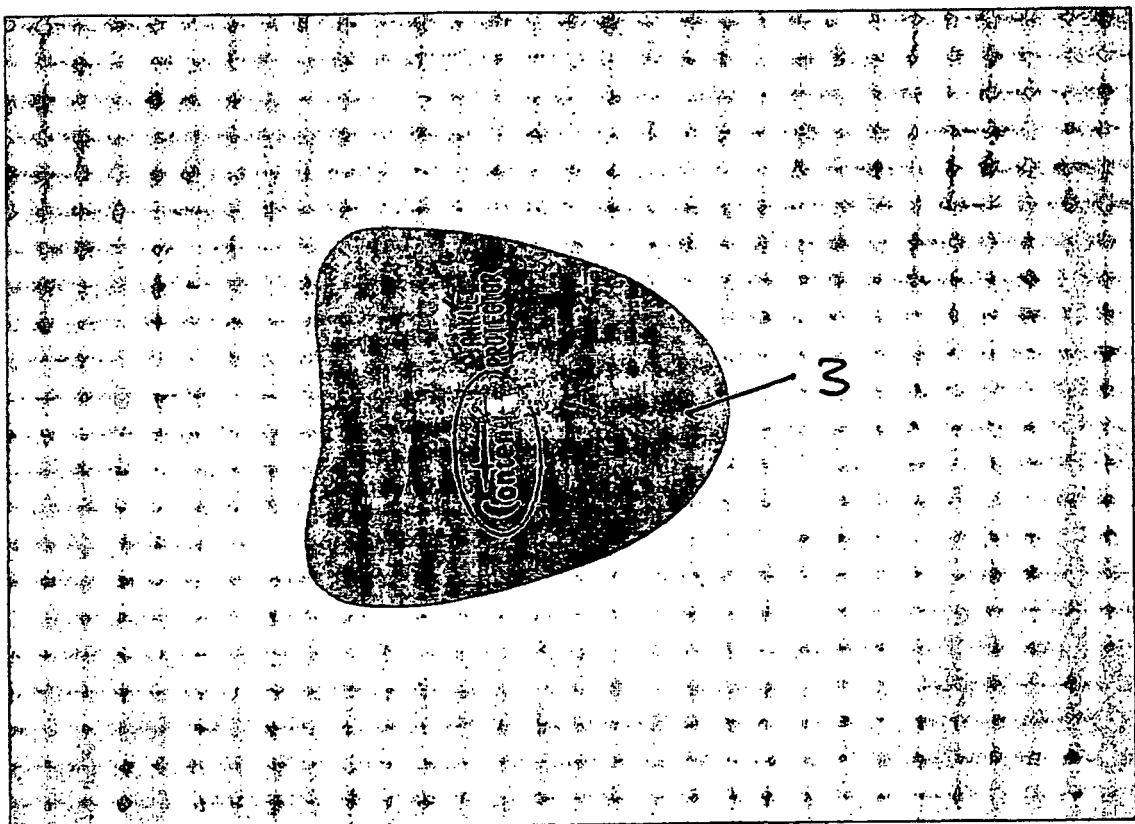


Figure 6 A

Figure 6 B

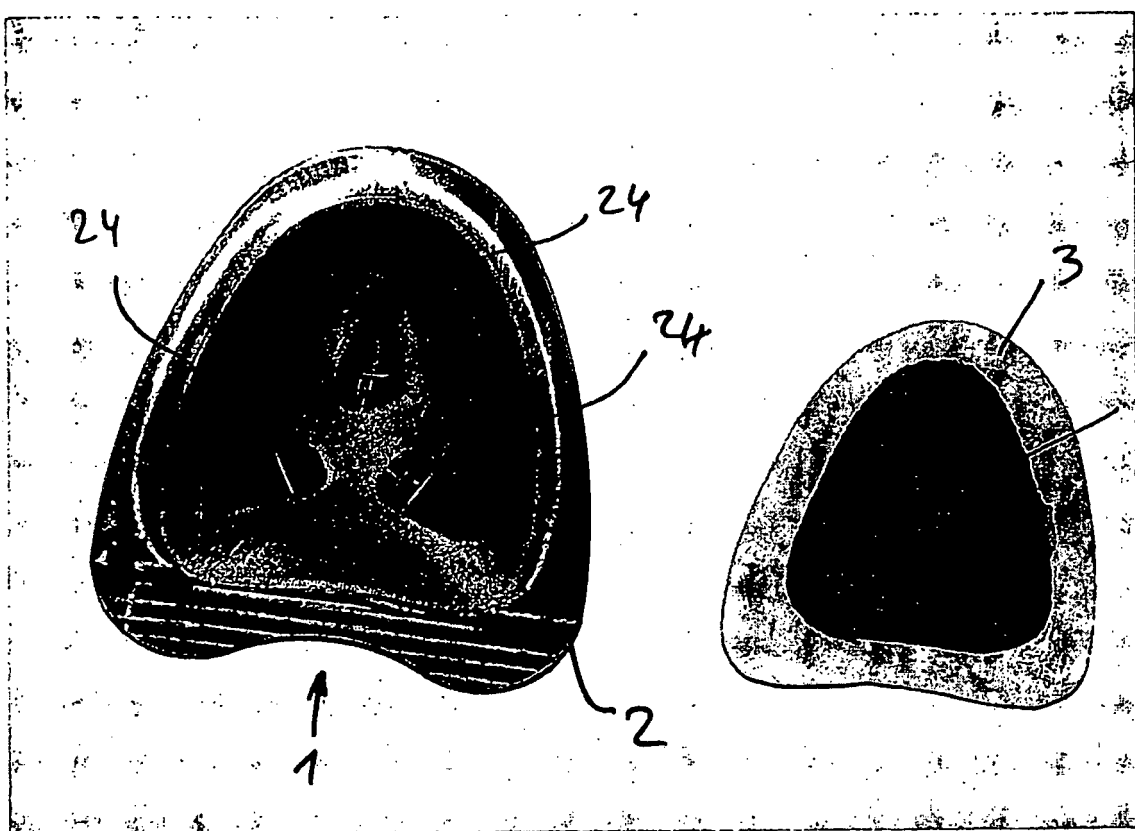


Figure 7 B

Figure 7 A

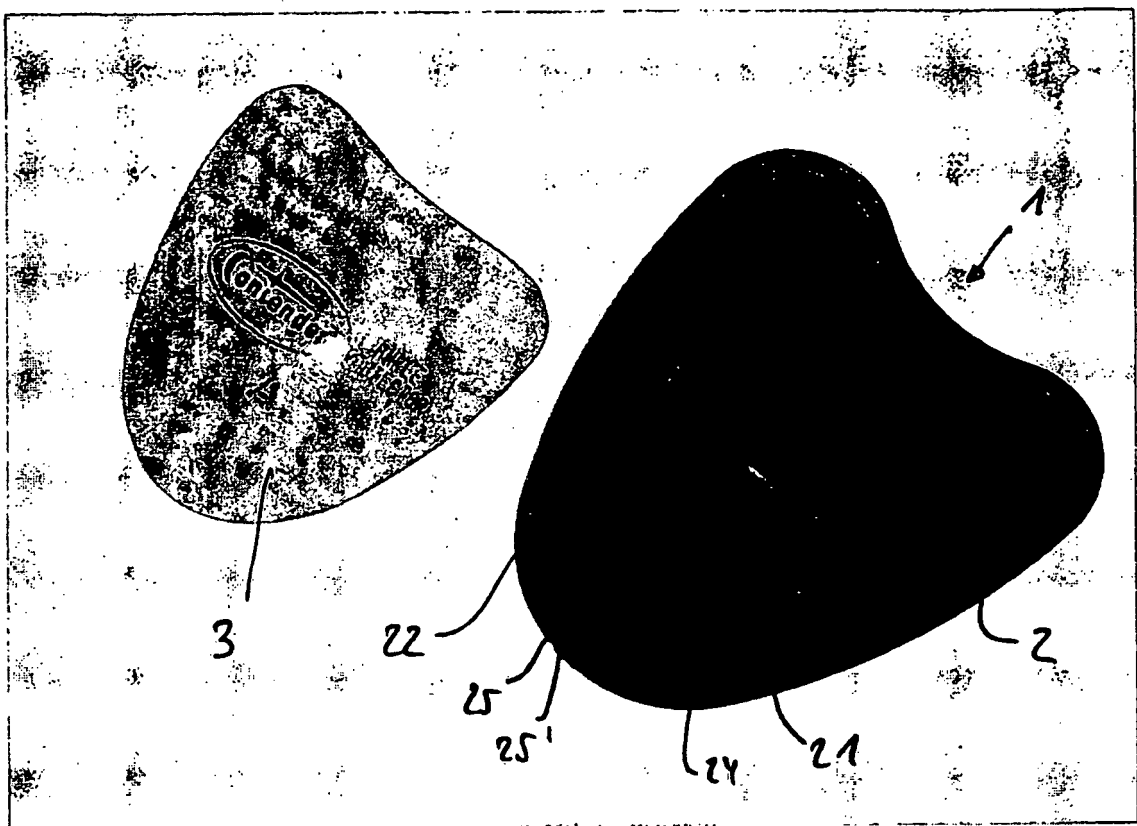


Figure 8

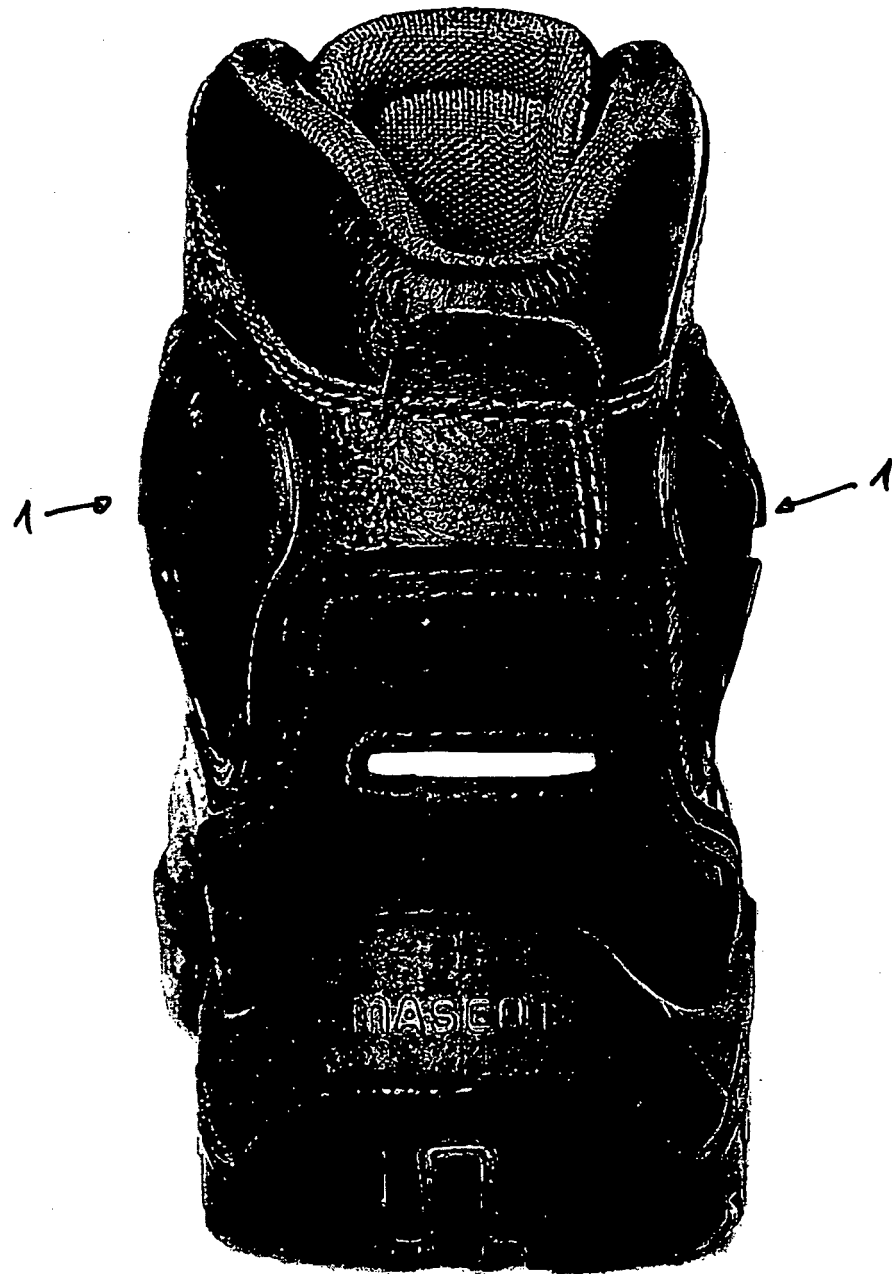


Figure 9

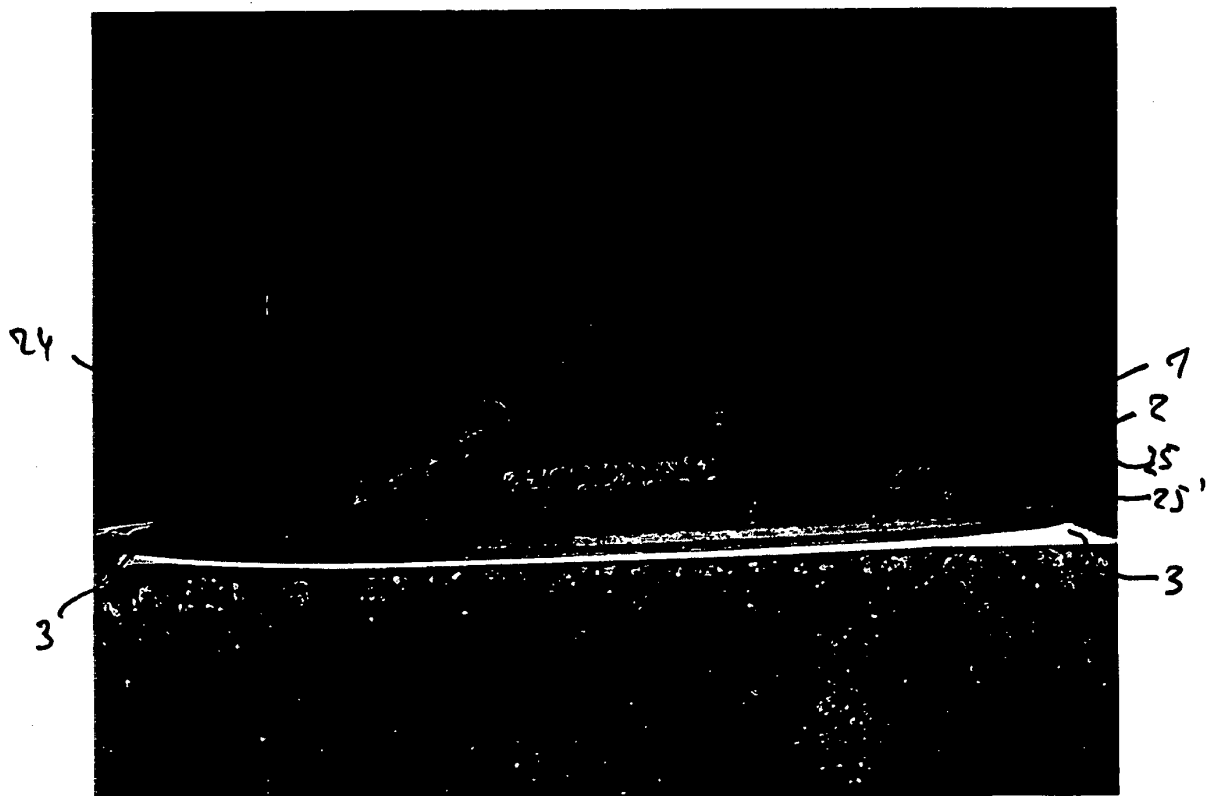
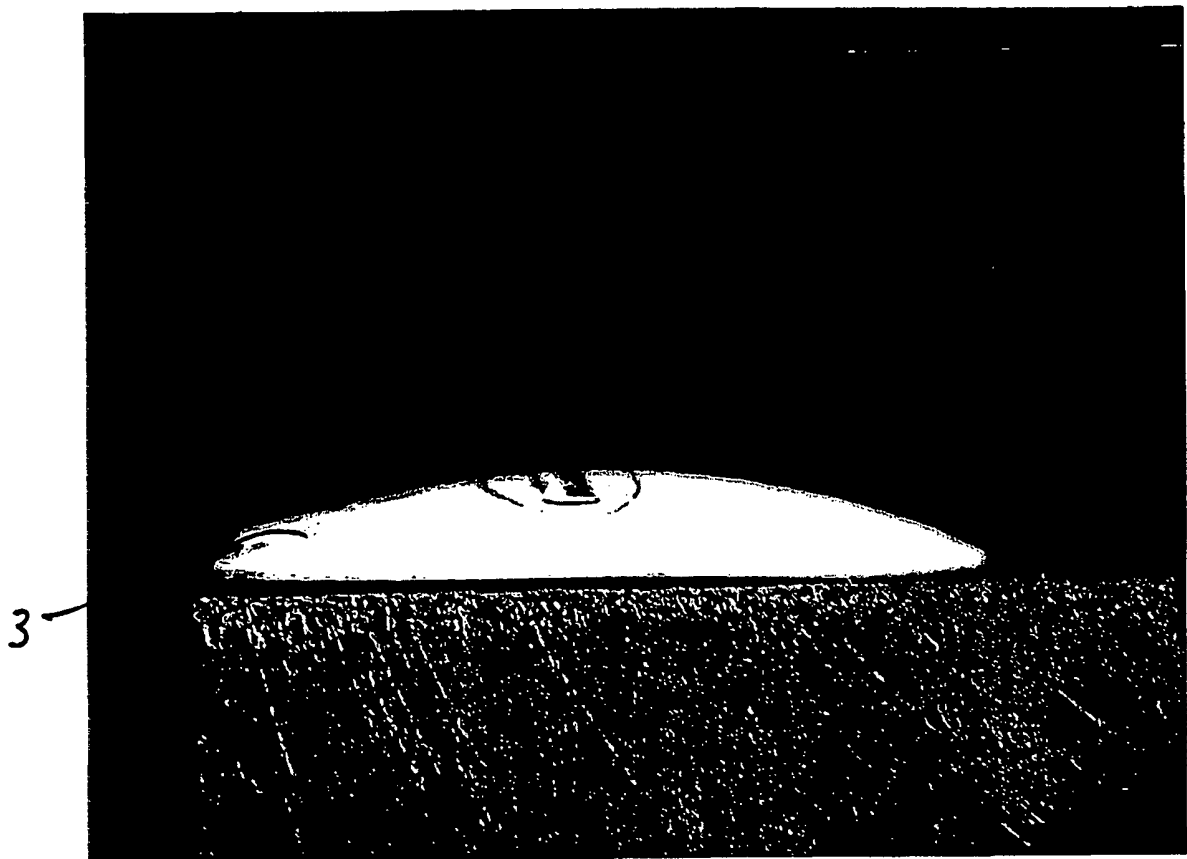


Figure 10



REFERENCES CITED IN THE DESCRIPTION

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