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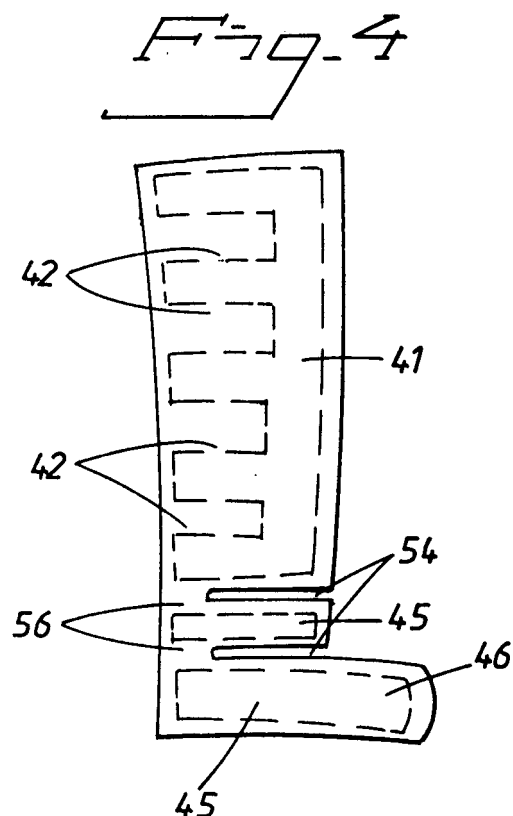
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(54) **Lower leg protection**

(57) Protection for a lower portion, in particular the Achilles' tendon at the back of a lower leg, comprising an elongate stiff element (41) having a longitudinal recess for said portion, a U-shaped substantially stiff bracket (45) being connected to one of the ends of the element (41) facing the foot. The recess of the bracket (45) is aligned with the recess of the element (41), and the bracket (45) is turnably connected to the element for turning around an axis (56) that extends along the web of the bracket (45) in the connection area between the bracket (45) and the element (41).



Description

[0001] The invention relates to a protection for a lower portion, in particular an Achilles' tendon portion of the back side of a fibula, of the kind that is seen in the preamble of the appended claim 1.

[0002] Such protections, for instance for football players, are previously known and comprise an elongate stiff element having a longitudinal recess, which is placed over said portion and is detachably connected with the lower leg.

[0003] Previously known protections of the kind in question should be stiff in order to afford a satisfactory protection, but will then become uncomfortable, particularly in connection with the ankle joint where the foot has to be turnable in relation to the lower leg without being blocked by the protection.

[0004] It is well known to attach such a protection to the lower leg using tightening straps that extend around the lower leg, at the upper as well as the lower end of the protection, but such an arrangement is often uncomfortable, particularly at the lower part of the protection. Furthermore, in connection to such a protection, it is cumbersome to also provide protection for the laterally projecting end portions of the ankle joint, since interference with the Achilles' tendon protection easily arises.

[0005] Furthermore, in known constructions, it is cumbersome to combine the Achilles' tendon protection with a conventional protection for the front side of the lower leg.

[0006] Therefore, an object of the invention is to provide a protection by means of which one or more of the mentioned drawbacks can be obviated entirely or partly.

[0007] The object is attained by the invention.

[0008] The invention is defined in the broadest aspect thereof in the appended independent claim.

[0009] Embodiments of the invention are defined in the appended dependent claims.

[0010] In the following, the invention will be described by way of examples, reference being made to the appended drawing.

Fig. 1 schematically shows a side view of a protection according to the invention such as applied to a user's lower leg.

Fig. 2 shows a view taken along the line II-II in Fig. 1.

Fig. 3 shows a view taken along the line III-III in Fig. 2.

Fig. 4 schematically shows a side view taken along the line IV-IV in Fig. 2.

Fig. 5 schematically shows a separate side view of a foot sock to which the Achilles' tendon protection can be connected.

[0011] In Fig. 1, a lower leg 1 is shown together with

a foot 2. On the back side of the lower leg 1, a protection 4 is shown, which surrounds the back side of the lower leg 1, in particular in the area of the Achilles' tendon.

[0012] The protection 4 is formed of a generally rectangular sheet-metal piece 41 of, for instance, pure aluminium, which has been bent into a generally U-shaped cross-section, such as is illustrated in Fig. 3. The sheet-metal piece 41 is provided with horizontally elongate rectangular openings 42, which are spaced-apart along the protection, so that the sheet-metal plate 41 has an unbroken circumference edge and thereby an integrated portion 43 between the openings 42. Furthermore, the protection 4 contains two U-shaped sheet-metal elements 45, which are aligned with the U-shaped curved sheet-metal plate 41 in the longitudinal direction of the protection 4. The sheet-metal plate 41 as well as the elements 45 are interconnected by a lining layer 51, 52 on the inside as well as the outside of the protection. In Fig. 1, it can be seen that the linings 51, 52 have slots 54 in the area between the elements 45 as well as between the sheet-metal plate 41 and the adjacent element 45 thereof, the slots 54 extending from the branch of the protection 4 all the way in to the web part of the protection. The web parts 56 remaining between the pairs of slots 54 form hinges that allow the elements 45 to turn in relation to each other and afford a joint connection along the web of the U-profile of the protection 4, in the area between the elements 45 and between the sheet-metal plate 41 and the adjacent element 45 thereof, respectively.

[0013] It can be seen that the element 45 being lowermost in Fig. 2 has extended branch ends 46, which cover the laterally projecting joint portions of the ankle joint 60. In Fig. 1, it can be seen that the protection 4, at the upper portion thereof, is pressably connected with the leg 1 by means of a Velcro coupling surrounding the leg 1.

[0014] On the foot 2, a sock 20 is shown, the heel portion and front foot portion of which are shown cut away. At the back of the Achilles' tendon, the ankle portion of the sock 20 has a Velcro coupling part 21, which detachably can adhere to an appurtenant Velcro coupling part 22 on the inner lining 51 on the web part of the protection 4.

[0015] Furthermore, the upper fastening strap 48 of the protection 4 is shown to have an externally exposed Velcro coupling part 61 on the front side of the leg 1, and furthermore, the sock is shown 20 to have an outwardly exposed Velcro coupling part 64 on the front side. In that connection, a possible front protection 50 may have appurtenant Velcro coupling parts 62, 63 on the inside thereof for detachable connection with the coupling parts 61 and 64, respectively.

[0016] Instead of the extended branch portion 46 of the lowermost bracket element 45 according to Fig. 4, the sock 20 may be provided with a separate protection 46', which is fastened to the proper sock 20 in a position centred to the axis 60, such as is outlined in Fig. 5. The

user of the protection 4 begins with putting on the sock 20, and then continues with mounting the protection 4 with the Velcro coupling 21, 22 and the strap 48, respectively, after which the possible front protection 50 is mounted on the coupling parts 61, 64 by means of the appurtenant inner Velcro coupling parts 62 and 63, respectively. Then an outer sock can be pulled on over the foot, the sock and the protections 4, 50.

[0017] The sheet-metal plate 41 as well as the brackets 45 formed of a sheet-metal material are suitably formed of pure sheet aluminium having a thickness of 2 mm.

[0018] Since the recesses 42 in the element 41 have a height of approx. 1 cm and the intermediate bands 43 likewise have a height of approx. 1 cm, and furthermore the circumference border of the sheet-metal plate 41 47 has a width of approx. 1 cm, an expedient stiffness is afforded to the protection at the same time as the U-shape of the protection can be altered manually for shaping reasons, while the impact-protecting effect of the sheet-metal plate 41 and the brackets 45 is expedient.

that an elastic cover (51, 52) bridges the element and the two brackets, the cover having slots in the area between the brackets (45) along the branches thereof, and that slots are provided between the element and the adjacent bracket (45) thereof, along the branches of said bracket.

5. Protection according to any one of claims 1-4, **characterized in that** one of the two brackets (45) has extended branch ends (46), which are arranged to overlap the ankle-joint buttons on the inside and outside of the foot.
6. Protection according to any one of claims 1-5, **characterized in that** the element is formed of a sheet having a plurality of spaced-apart substantially parallel slots (42), the longitudinal direction of which is substantially perpendicular to the side edges of the element, the slots being terminated at a distance from the respective side edge of the element.

Claims

1. Protection for a lower portion, in particular the Achilles' tendon at the back of a lower leg (1), comprising an elongate stiff element (41) having a longitudinal recess for said portion, **characterized in that** a U-shaped substantially stiff bracket (45) is connected to one of the ends of the element (41) facing the foot (2), the recess of the bracket (45) being aligned with the recess of the element (41), and that the bracket (45) is turnably connected to the element for turning around an axis (56) that extends along the web of the bracket (45) in the connection area between the bracket (45) and the element (41).
2. Protection according to claim 1, **characterized in that**, in addition to said, first bracket (45), a second bracket (45) is provided, the first bracket and the second bracket having the recesses aligned with each other and the brackets being turnably connected to each other around a second axis (56) in the area between the webs of the two brackets, the second turning axis (56) being substantially parallel to the first one.
3. Protection according to claim 1, **characterized in that** an elastic cover (51, 52) bridges the element (41) and the bracket (45), the cover having slots (54) along the respective branch of the bracket (45), in the area between the bracket and the element, the elastic cover between the web of the bracket and the web of the element forming a turnable connection for the turning of the bracket in relation to the element.
4. Protection according to claim 2, **characterized in**

Fig. 1

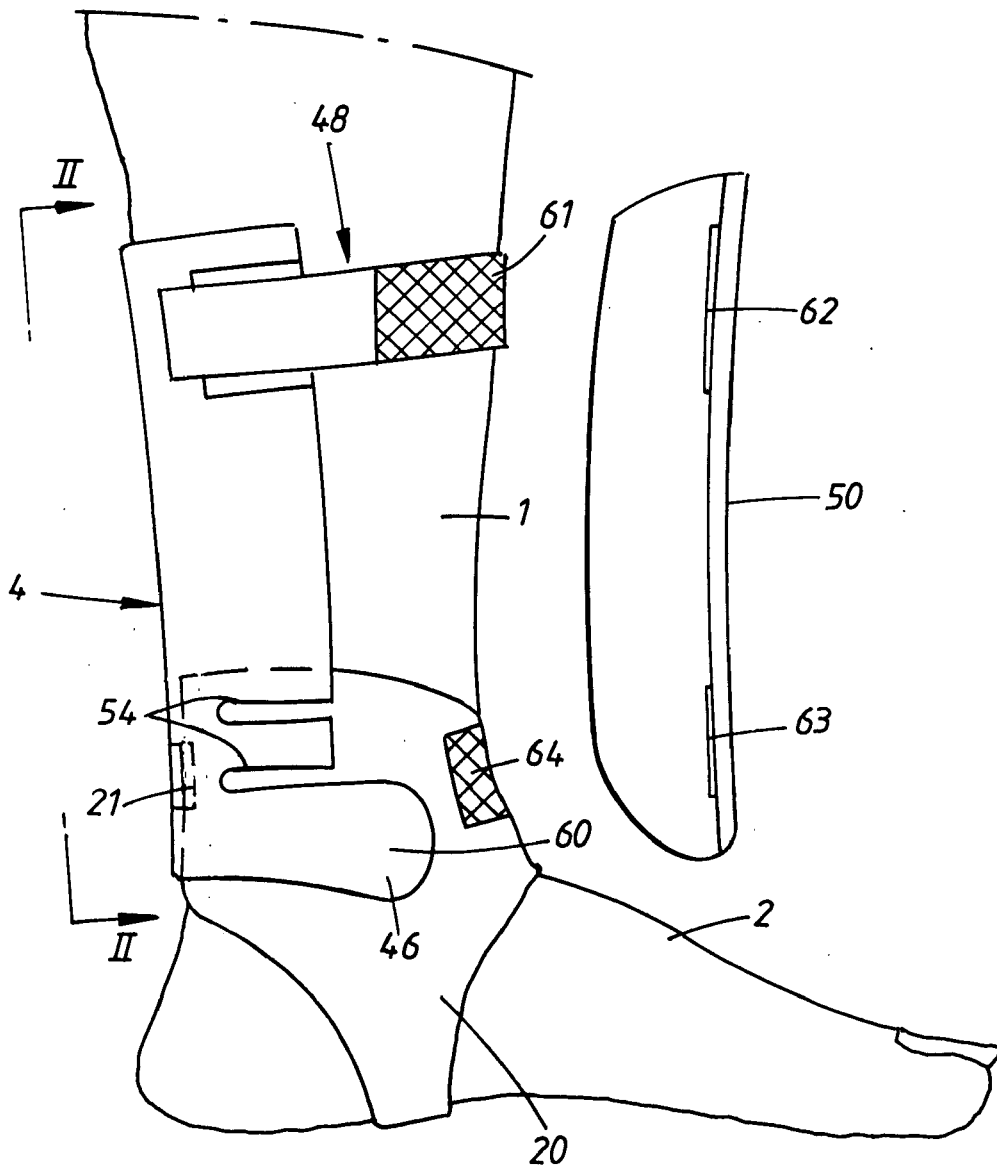


Fig. 2

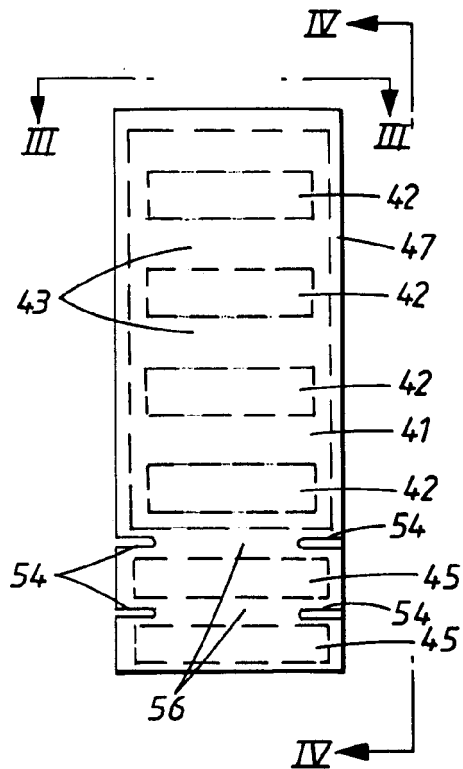


Fig. 3

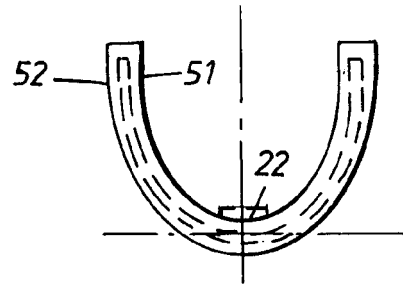


Fig. 4

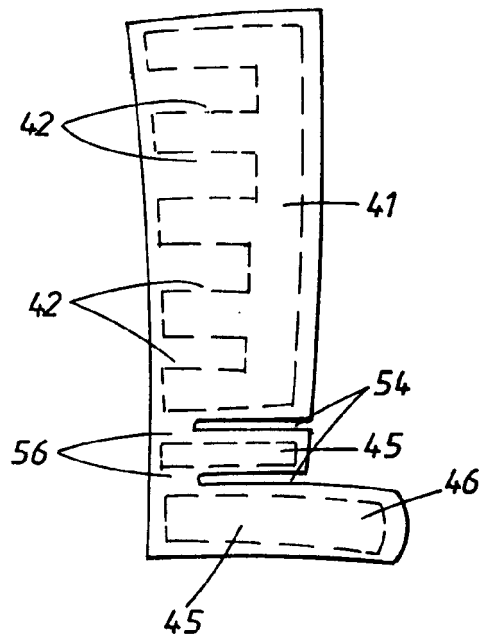


Fig. 5

