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(54) **HAND PROTECTION STRAP**

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(57) **ABSTRACT**

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(21) **Appl. No.: 10/920,257**

The present invention concerns a hand protection strap (1), having a flexible, substantially planar body (2) whose upper side forms a support surface for the palm and fingers of a user's hand. An attachment device (3, 4) is provided at one end region of the body (2) in order to attach the hand protection strap (1) to the user's wrist and/or forearm. Finger retention elements (5) are provided at the lower end region of the body (2) in order to retain the hand protection strap (1) on at least two fingers. A projection (6) is provided on the finger region of the support surface, in order to afford better grip and security to the fingers in particular in the region of the proximal finger joint. The planar body (2) is equipped, at least in the palm region of the support surface, with at least one reinforcing layer (7).

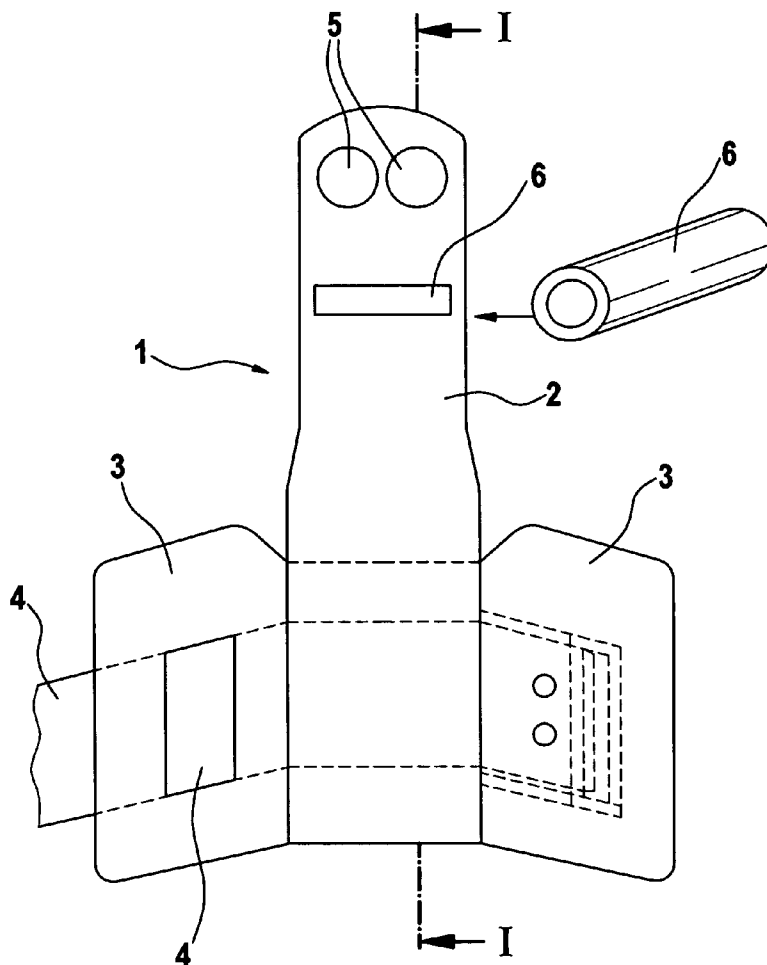
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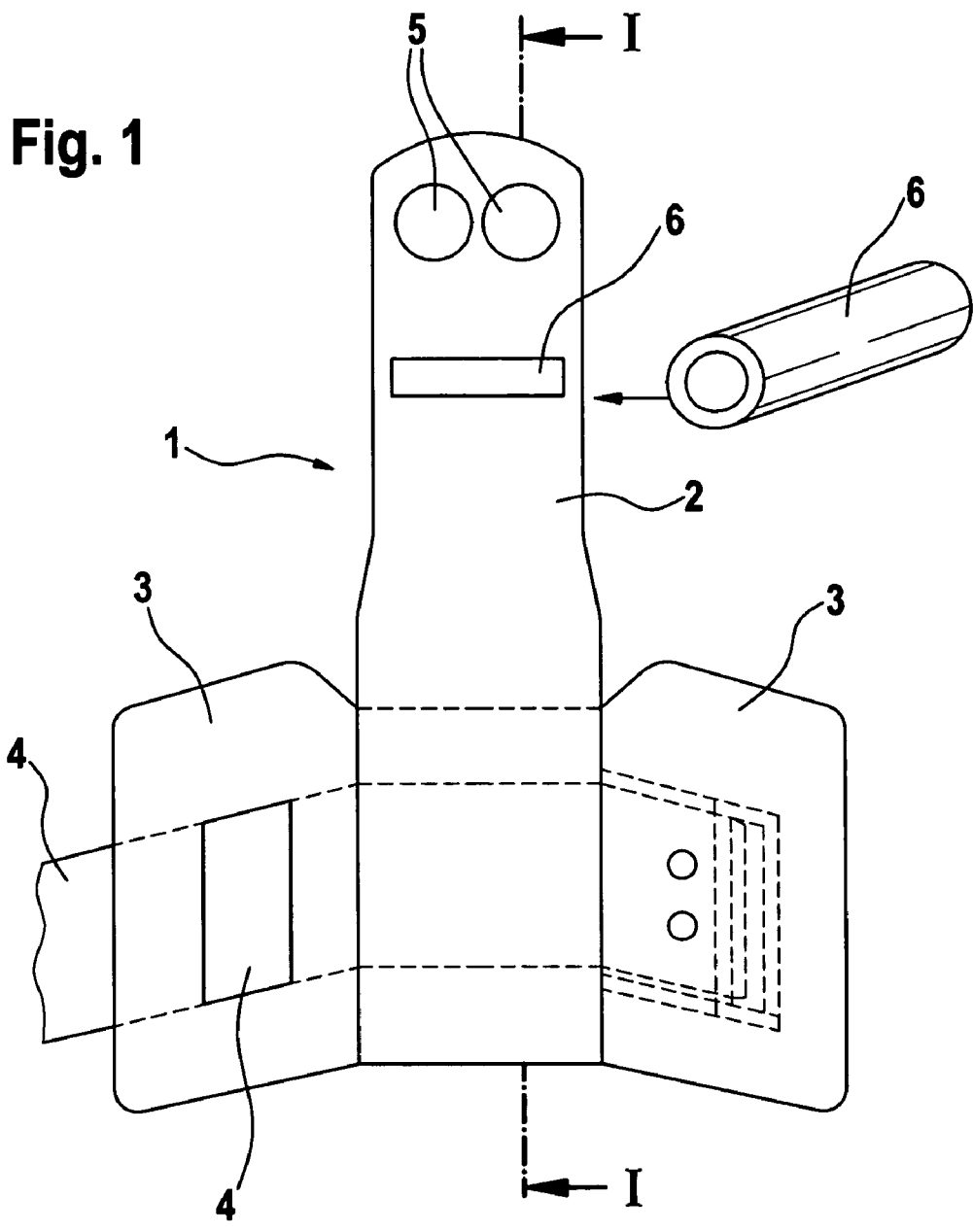


Fig. 2

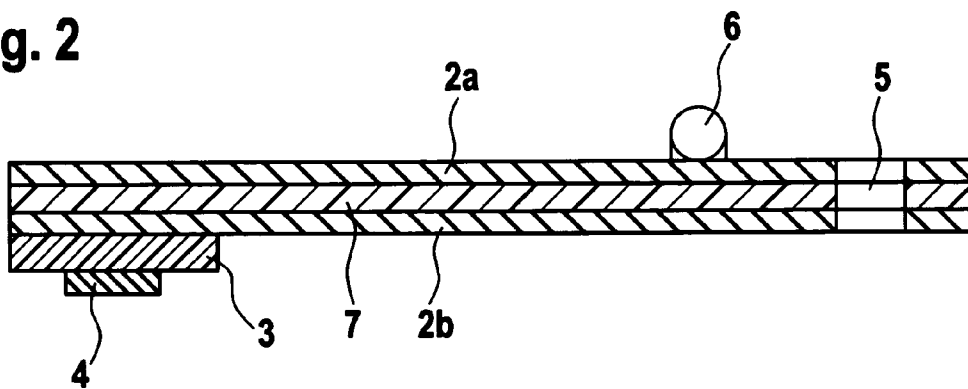
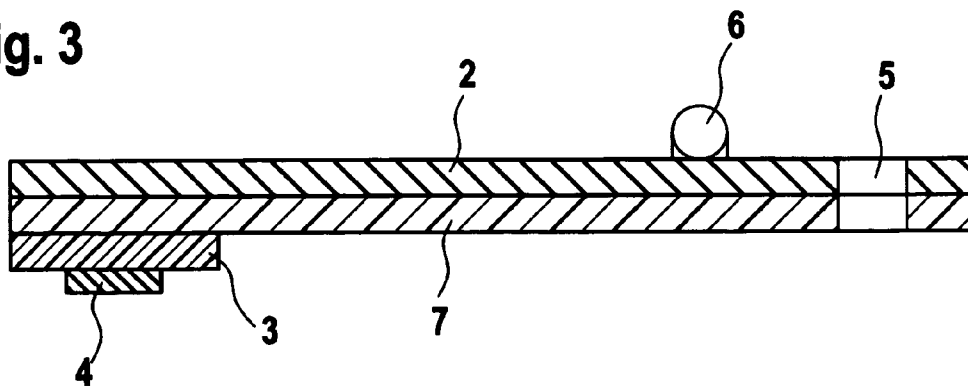


Fig. 3



HAND PROTECTION STRAP

CROSS-REFERENCE TO RELATED APPLICATIONS AND CLAIM TO PRIORITY

[0001] This application claims priority under 35 U.S.C. § 119 to patent application number 103 49 227.5-15, filed Oct. 20, 2003, in the Federal Republic of Germany, the disclosure of which is incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The present invention concerns a hand protection strap, having a flexible, substantially planar body whose upper side forms a support surface for the palm and fingers of a user's hand; having an attachment apparatus that is provided at one end region of the body in order to attach the hand protection strap to the user's wrist and/or forearm; having finger retention elements that are provided at the other end region of the body in order to retain the hand protection strap on at least two fingers; and having a projection, provided on the finger region of the support surface, in order to afford better grip and security to the fingers in particular in the region of the proximal finger joint.

BACKGROUND OF THE INVENTION

[0003] Hand protection straps of this kind are commonly known and are used by athletes in apparatus gymnastics in order to enhance grip on, for example, the rings, horizontal bar and uneven parallel bars. Conventional hand protection straps possess a flexible, substantially planar body made of natural leather. In order to retain the hand protection strap on the athlete's hand, a cuff is mounted on the rear end region of the body and is attached with a strap to the athlete's wrist. Additionally provided, at the front end region of the body, are finger openings into which the user can insert the fingers so that the hand protection strap is also secured at its front end to the hand. Conventional hand protection straps are furthermore equipped, in the finger region of the leather, with a cylindrical pin that is mounted transversely to the support surface in order to afford better grip and security to the fingers in the region of their proximal finger joints.

[0004] These hand protection straps are exposed to large stresses in practical use. At peak stresses, tearing of the hand protection straps can even occur. This can result in serious falls and wrist injuries to athletes.

SUMMARY OF THE INVENTION

[0005] It is therefore the object of the present invention to make available hand protection straps of the aforesaid kind that ensure excellent safety for the athlete.

[0006] This object is achieved according to the present invention in that the planar body is equipped, at least in the palm region of the support surface, with at least one reinforcing layer. The configuration according to the present invention offers the advantage that a breaking strength never before attained (1300+/-265 N/cm) is achieved for the reinforced body. This minimizes the probability that the hand protection strap will tear, and at the same time prevents the stressed hand protection strap from elongating so severely that the athlete loses his or her grip on the gymnastic apparatus during the exercise. As a result, the athlete's safety is distinctly enhanced by the invention. Furthermore, the service life of the hand protection strap according to the

present invention is extended as compared with that of the conventional hand protection strap.

[0007] The reinforcing layer can be provided on the body in different ways. For example, it is possible to provide the reinforcing layer on the upper and/or the lower side of the body. Alternatively or additionally, the body can be embodied in multi-layer fashion and a reinforcing layer can be arranged in a sandwich construction between two layers of the body. In all cases the reinforcing layer can, for example, be attached to the body with adhesive. This ensures sufficient load capacity for the hand protection strap equipped with the reinforcing layer.

[0008] It may in principle be sufficient to provide the reinforcing layer only in the palm region of the support surface, since the greatest stresses occur in this region. Alternatively, however, the reinforcing layer can also extend over the entire region of the support surface, with the result that production can be simplified, especially in the context of an arrangement of the reinforcing layer in a sandwich construction between two layers of the body.

[0009] Polyamide, in particular, has proven very favorable as a material for the reinforcing layer according to the present invention. It meets the requirement in terms of breaking strength and elongation, and is easy to process.

[0010] The remainder of the body of the hand protection strap is made—in usual fashion—of leather. According to the present invention, it can be made of leather and/or vulcanized rubber and/or natural rubber and/or a plastic material (carbon fiber).

DESCRIPTION OF THE FIGURES

[0011] With regard to additional advantageous embodiment of the invention, reference is made to the dependent claims and to the description below of exemplary embodiments with reference to the appended drawings, in which:

[0012] **FIG. 1** shows a plan view of a hand protection strap **1** in accordance with the present invention;

[0013] **FIG. 2** is a cross section along line **1-1** through an embodiment of hand protection strap **1** according to the present invention; and

[0014] **FIG. 3** is an alternative cross section of a hand protection strap **1** according to the present invention, in a view corresponding to **FIG. 2**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

[0015] The drawings depict a hand protection strap **1** in accordance with the present invention, which can be used by athletes in the context of apparatus gymnastics in order to prevent wrist injuries and to enhance grip on the apparatus, for example on the rings or on the bars of a set of bars.

[0016] Hand protection strap **1** comprises a flexible, substantially planar body **2** whose upper side forms a support surface for the user's palm and fingers. The elongated body **2** is approximately 22 cm long and approximately 5-7 cm wide.

[0017] A cuff **3** is attached in the rear end region of body **2**. Cuff **3** can be secured on a user's wrist, in a manner

known per se, using a strap 4 that is attached to cuff 3 and is equipped with a Velcro® fastener.

[0018] Two finger openings 5 are provided in the front end region of body 2 and allow hand protection strap 1 to be secured to two fingers of the hand by insertion of the two fingers into the two finger openings 5. Alternatively, three finger openings 5 can also be provided instead of two finger openings 5. In the embodiment having three finger openings 5, body 2 is widened in the front end region by approximately 1-2 cm over a length of approx. 4 cm.

[0019] Also provided is a cylindrical pin 6 that is arranged transversely to the support surface and extends approximately over its entire width, and is sheathed in the same material of which body 2 is also made. Pin 6 serves to afford better grip and security to the fingers in the region of their respective proximal finger joints.

[0020] In hand protection strap 1 that is depicted, body 2 is made in a manner known per se of leather. It can be also made of vulcanized rubber, natural rubber, or plastic material. Additionally provided according to the present invention, however, is a reinforcing layer 7 that here is made of polyamide. Reinforcing layer 7 can, as in the embodiment depicted in FIG. 3, be mounted, for example adhesively bonded in place, on the lower side (which comes into contact with the gymnastic apparatus) of body 2. Alternatively or additionally, it is also possible to provide a reinforcing layer 7 on the upper side (which forms the support surface) of body 2. If body 2 is of multi-layer configuration, reinforcing layer 7 can also be arranged in a sandwich construction between two body layers 2a, 2b, as depicted in FIG. 2. Combinations of the embodiments depicted in FIGS. 2 and 3, in which one or more reinforcing layers in a sandwich construction and additionally a reinforcing layer 7 on the upper and/or lower side of body 2 are provided, are of course possible.

[0021] In both embodiments that are depicted in FIGS. 2 and 3, reinforcing layer 7 is arranged along the entire body 2 and is secured to body 2 or to body layers 2a, 2b by means of an adhesive. Also conceivable, however, are embodiments in which reinforcing layer 7 is arranged only in the region of the support surface for the palm of body 2.

[0022] The embodiment according to the present invention offers the advantage, as compared with conventional hand protection straps 1, that the elongation of the reinforced part of hand protection strap 1 is low and breaking strength is increased; as a result, the service life of the hand protection strap is extended, and safety for the athlete is enhanced.

I claim:

- 1. A hand protection strap (1) comprising
 - a flexible, substantially planar body (2) whose upper side forms a support surface for the palm and fingers of a user's hand;
 - an attachment device (3, 4) at one end region of the body (2) for attaching the hand protection strap (1) to a user's wrist and/or forearm;
 - finger retention elements (5) at the lower end region of the body (2) for retaining the hand protection strap (1) on at least two fingers; and
 - a projection (6) on the finger region of the support surface, for affording better grip and security to the fingers in particular in the region of the proximal finger joint, wherein the planar body (2) is equipped, at least in the palm region of the support surface, with at least one reinforcing layer (7).
- 2. The hand protection strap (1) as defined in claim 1, wherein the reinforced portion of the hand protection strap (1) has a breaking strength of 1300+/-265 N/cm.
- 3. The hand protection strap (1) as defined in claim 1, wherein the reinforcing layer (7) comprises a plastic material.
- 4. The hand protection strap (1) as defined in claim 1, wherein the reinforcing layer (7) is provided on the upper and/or the lower side of the body (2).
- 5. The hand protection strap (1) as defined in claims 1, wherein the body (2) is embodied in multi-layer fashion, and said reinforcing layer (7) is arranged in a sandwich construction between two layers of the body (2).
- 6. The hand protection strap (1) as defined in claim 1, wherein the reinforcing layer (7) is adhesively attached to the body.
- 7. The hand protection strap (1) as defined in claim 1, wherein the body (2) is made from a member selected from the group consisting of leather, vulcanized rubber, natural rubber and plastic.
- 8. The hand protection strap (1) as defined in claim 1, wherein the attachment device includes a cuff (3) for attachment to the user's wrist and/or forearm.
- 9. The hand protection strap (1) as defined in claim 1, wherein at least two finger openings (5) are formed in the body.
- 10. The hand protection strap (1) as defined in claim 1, wherein the projection includes a pin (6) extending transversely to the finger support direction and is sheathed with the material of the body (2).

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