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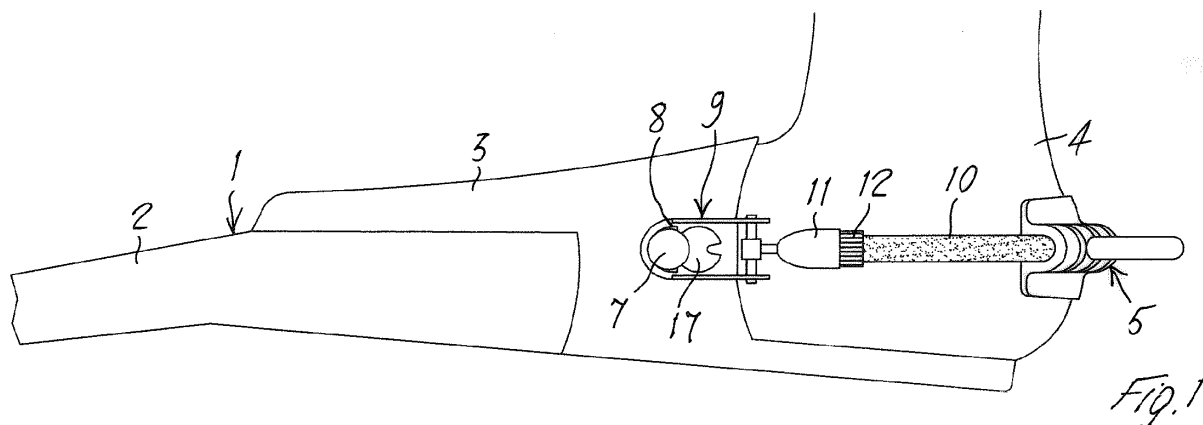
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(54) **Heel strap for swimming flippers of the open-shoe type**

(57) Heel strap (5) for swimming flippers (1) of the open shoe type (3), comprising a tubular resilient element (10), with a round cross section, connected to each end

and connected removably to means (12, 11) for supporting a rigid eyelet (9) which can be attached removably to a corresponding pivot pin (6, 7) projecting laterally from the flipper (1).



Description

[0001] The present invention relates to a heel strap for swimming flippers of the open-shoe type.

[0002] As is known, a swimming flipper of the open-shoe type is provided in its front part with a blade and in its rear part with an open shoe made from rubber or similar elastomeric material, into which the diver, who is provided with suitable footwear with a sole, inserts his foot. A flipper of this type is particularly suitable for scuba diving, and is provided in the rear part of the shoe with a strap which secures the diver's heel, in order to retain the foot correctly in the flipper. These straps can be made in different types, and may for example include a rubber belt provided at both ends with buckles which are fixed to the sides of the flipper shoe. These buckles, into which the ends of the strap are inserted, allow a degree of adjustment of the capacity and tension of the strap. However, these straps have a number of drawbacks, such as the fact that both ends of the strap must be inserted into the corresponding buckles whenever the flipper is put on and must be removed whenever the flipper is taken off. The belts can suffer from wear over time as an inevitable result of these continued operations of insertion into the buckles and removal therefrom, and are subject to a certain loss of tension in the long term, which is detrimental to their effectiveness.

[0003] The object of the present invention is therefore to provide a heel strap for swimming flippers of the open-shoe type which overcomes the drawbacks of the known straps described above, which can be customized, and which advantageously has a markedly greater effectiveness and durability than the known straps.

[0004] This object is achieved by the present invention by means of a heel strap for a swimming flipper of the open-shoe type, characterized in that it comprises a tubular resilient element with a round cross section connected removably at each end to means for supporting a rigid eyelet which can be attached removably to a corresponding pivot pin projecting laterally from the flipper.

[0005] According to a further aspect of the present invention, the tubular resilient element with a round cross section is an elastic element used in underwater guns of the crossbow type.

[0006] Further characteristics and advantages of the present invention will be made clear in the course of the following description, to be considered as a non-limiting example, referring to the attached drawings, in which:

- Fig. 1 shows a partial view in lateral elevation of a typical swimming flipper of the open-shoe type on which a heel strap according to the present invention is to be used;
- Fig. 2 shows a view from above of the flipper of Fig. 1;
- Fig. 3 shows a view in lateral elevation of the heel strap according to the present invention; and
- Fig. 4 shows a view from above of the strap according to the present invention.

[0007] With reference to the appended drawings and with particular reference to Fig. 1, the number 1 indicates a flipper having a blade 2 in its front part and having an open shoe 3 made from rubber or similar elastomeric material in its rear part. The diver, wearing suitable footwear 4 with a sole, inserts his foot into this open shoe 3, and the foot is kept in the correct position in the flipper 1 by means of a heel strap 5 according to the present invention. At the sides of the shoe 3 (see also Fig. 2 of the appended drawings) there are provided two projecting pivot pins 6 in diametrically opposite positions, each pivot pin having a head 7 of larger diameter in its upper part. These pivot pins 6 can be made, for example, in one piece with the shoe 3. One end of the heel strap 5 is engaged in each of these pivot pins 6, by means of suitable metal attachment eyelets 9.

[0008] The heel strap 5 (see also Figures 3 and 4 of the appended drawings) comprises a tubular resilient element 10 having a round cross section and suitable thickness, for example a length of elastic used in underwater guns of the crossbow type. Each end of this resilient element is fixed to a plastic bush 12 which has a threaded part (not visible in the drawings) onto which is screwed a plastic cap 11 for supporting the metal attachment eyelet 9. The end of the cap 11 is fixed to a metal pivot pin 13 provided with a head 14 in which is formed, in a direction orthogonal to the pivot pin 13, a through hole into which is inserted a further pivot pin 15 whose ends are fixed to two parallel side pieces 16 which support the metal eyelet 9. This pivot pin 15 can rotate with respect to the head 14, and therefore each of the metal eyelets 9 can be rotated with respect to the cap 11 to which it is fixed and with respect to the tubular resilient element 10. Each of the metal eyelets 9 also comprises a first suitably shaped hole 17 for fitting onto the head 7 of the corresponding pivot pin 6, and a second suitably shaped hole 8 adapted to be positioned under the head 7 of the corresponding pivot pin when the strap has been attached. The strap 5 according to the invention is completed by a rubber element 18 comprising, on the one hand, a flat part 19 for supporting the diver's heel and, on the other hand, a grip ring 20. A through hole 21, into which the tubular resilient element 10 of the strap 5 is inserted, is formed in the central part of the rubber element 18.

[0009] The present strap is advantageously highly customizable, since it can be made simply by obtaining a tubular resilient element 10 with a round cross section, such as an elastic element for underwater guns of the crossbow type, cutting it to size according to the characteristics of the user's foot and/or of the user's footwear, and inserting this resilient element 10 into the through hole 21 of the rubber element 18 provided with the heel support part 19. At this point, the bushes 12 with the threaded parts on their outer ends are fixed to the ends of the resilient element 10, and then the cap 11, provided with the metal eyelet 9 which is rotatable with respect to it, is screwed onto each bush.

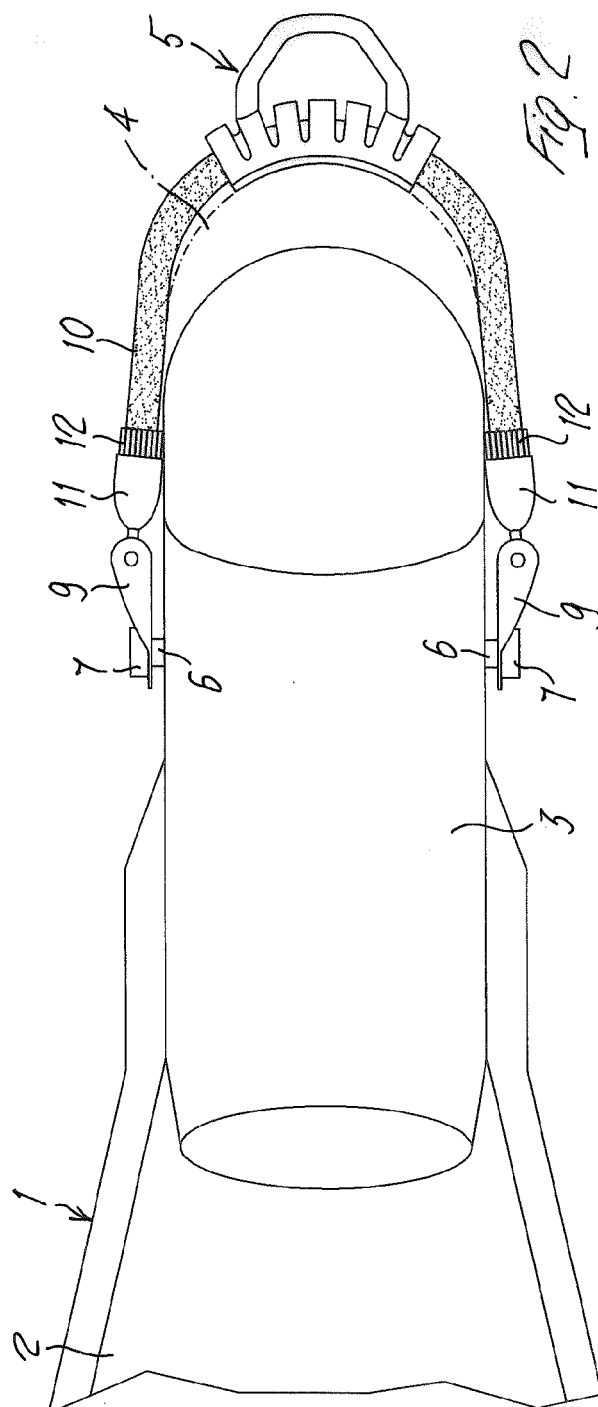
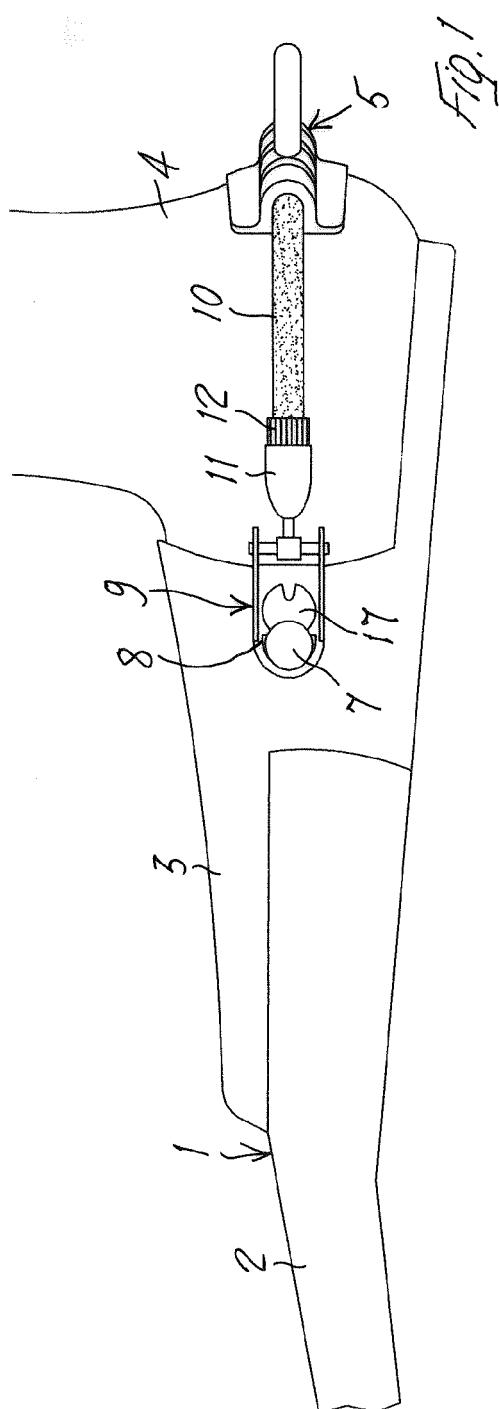
[0010] The strap is attached in a simple and effective

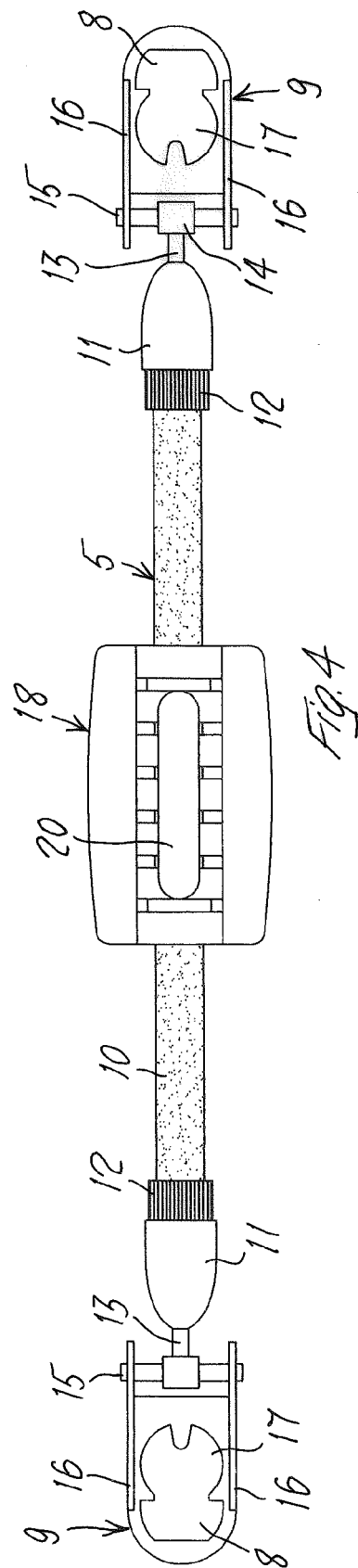
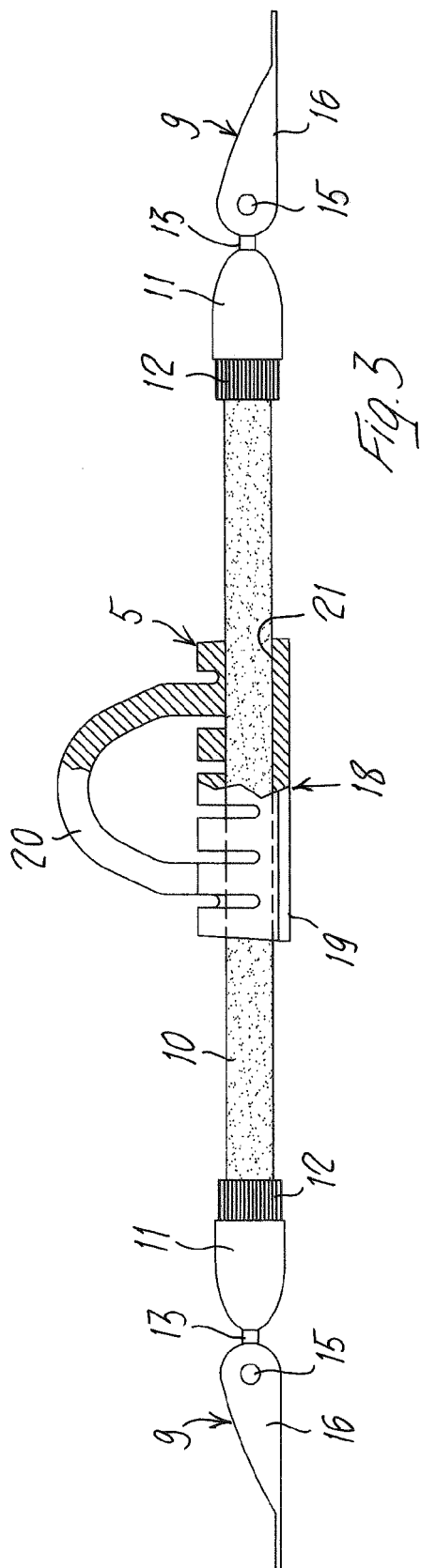
way to the pivot pins 6 provided at the sides of the flipper 1, by fitting the first hole 17 of greater diameter of the metal eyelet 9 onto the head 7 of each pivot pin, and then positioning the eyelet in such a way that the second hole 8 of smaller diameter is placed, on completion of the attachment, around the pivot pin 6 and therefore under the head 7. In order to insert his foot into the flipper 1, the diver simply has to grip the ring 20 and pull the strap 5 which is elastically elongated, and, when the foot has been inserted, release the ring 20 in such a way that the part 19 comes into contact with the heel, thus providing a suitable pressure on the heel. In order to remove the foot from the flipper 1, it is simply necessary to grip the ring 20 again and to pull the strap 5 again in such a way that the strap 5 is elastically elongated and allows the foot to be taken out.

7. Strap (5) according to Claim 1, **characterized in that** it comprises a rubber element (18) having a central through hole (21) into which the tubular resilient element (10) is inserted, a substantially flat or slightly curved support part (19) for the heel, and a grip ring (20).

Claims

1. Heel strap (5) for swimming flippers (1) of the open shoe type (3), **characterized in that** it comprises a tubular resilient element (10) having a round cross section connected to each end and connected removably to means (12, 11) for supporting a rigid eyelet (9) which can be attached removably to a corresponding pivot pin (6, 7) projecting laterally from the flipper (1).
2. Strap (5) according to Claim 1, **characterized in that** the tubular resilient element (10) with a round cross section is a length of elastic used in underwater guns of the crossbow type.
3. Strap (5) according to Claim 1, **characterized in that** the rigid eyelet (9) is connected to the support means (12, 11) with the aid of elements (13, 14, 15) which allow it to rotate to a certain extent.
4. Strap (5) according to Claim 1, **characterized in that** a bush (12) is fitted on each end of the tubular resilient element (10), each bush comprising a threaded part onto which a corresponding cap (11) can be screwed, this cap being connected to the eyelet (9).
5. Strap (5) according to Claims 3 to 4, **characterized in that** the cap (11) comprises a pivot pin (13) provided with a head (14) having a through hole positioned in a direction substantially orthogonal to the pivot pin (13), through which it is possible to pass a pivot pin (15) for the rotation of the eyelet (9) with respect to the cap (11).
6. Strap (5) according to Claim 1, **characterized in that** the eyelet (9) comprises a first suitably shaped hole (17) of greater diameter and a second suitably shaped hole (8) of smaller diameter.







EUROPEAN SEARCH REPORT

Application Number
EP 11 17 9894

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 14 October 2011	Examiner Lundblad, Hampus
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 17 9894

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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14-10-2011

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