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(54) Title: ADJUSTABLE NECK PROTECTIVE COLLAR IN PARTICULAR FOR MOTORCYCLE RIDERS

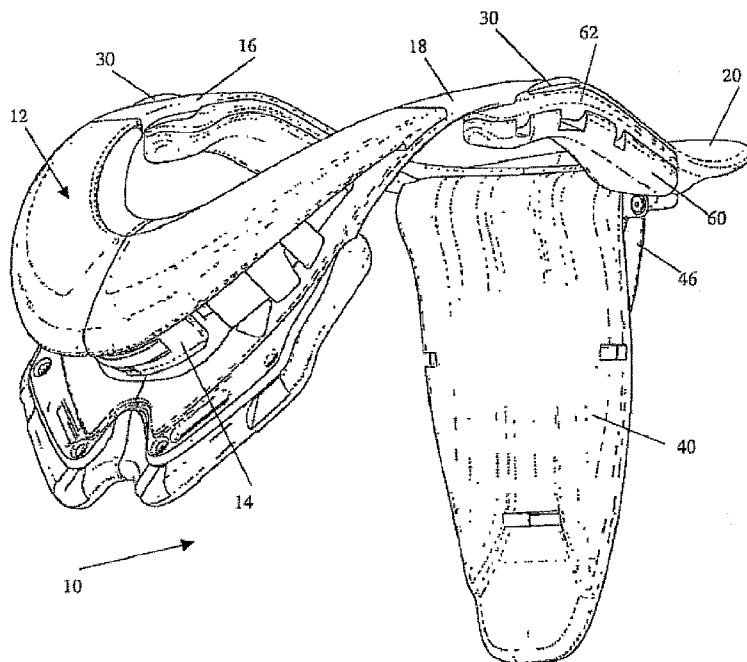


Fig. 1

(57) Abstract: A collar for protecting the neck of a user, useful in particular for motorcycle riders, is envisaged, said collar comprising two half-collars which are pivotably hinged together at one end so as to be rotatable in a substantially horizontal plane and which can be connected together by means of a fastening and release lever, a plate which at the rear extends downwards from the bottom edge of the collar so as to be centred with respect to the spinal column of the user, and a protective shield which extends downwards at the front. The collar is provided with removable padding means where the collar rests on the user's shoulders.

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— *with international search report (Art. 21(3))*

“Adjustable neck protective collar in particular for motorcycle riders “

This invention relates to a neck protective collar, useful during sporting activities, especially when riding motorcycles.

5 Various protective collars intended for persons who practise sporting activities are known and are commercially available. The obvious objective is to protect a part of the human body, such as the neck, which is extremely delicate and prone to fractures and knocks. In the event of a fall, for example from a motorcycle travelling at speed, it is known that the neck often suffers damage, despite the fact that the rider is wearing a conventional protective
10 helmet.

An example of a collar for motocross is described in the international patent application No. WO 2005/051251 in the name of Leatt.

This collar consists of two sections which are releasably connected together by means of a side hinge. The collar has surfaces which are directed upwards and limit the inclination of
15 the head in all directions when the helmet is worn.

The collar rests on the user's shoulders by means of a padding permanently fixed to its bottom edge and has a plate extending at the rear downwards from its rear edge, with the function of transferring to the sides of the spinal column loads acting on the user's back, so that they are unable to act on the spine itself.

20 This type of collar, as well as other collars which are known from the prior art, however, have various problems and drawbacks.

In particular, empty spaces remain under the side parts of the collar and in particular the side hinge such that the collar is less stable on the user's body. This is especially noticeable on users which have a longer or shorter neck than average.

25 The object of the invention is to provide a collar which solves substantially the abovementioned problems and drawbacks and is easy to use, in addition to protecting the user in an effective manner.

In particular, object of the present invention is to provide a protective collar which can be easily adapted to the user's body and neck length.

30 This object is achieved with a collar for protecting the neck of a user, useful in particular for motorcycle riders, of the type comprising two half-collars which are pivotably hinged together at one end so as to be rotatable in a substantially horizontal plane and which can be connected together by means of a fastening and release lever, a plate which at the rear extends downwards from the bottom edge of the collar so as to be centred with respect to
35 the spinal column of the user, and a protective shield which extends downwards at the front,

characterized in that it comprises padding means being able to be removably connected to the bottom surface of said two half-collars in lateral zones intended to engage with the user's shoulders.

According to a further characteristic feature of the collar of the present invention, the
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aforementioned plate extending at the rear and resting on the user's back has a structure designed to break or collapse in a programmed manner in a direction parallel to the spinal column of the user following an impact.

The advantages of the invention will be explained more fully by the following
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description, intended purely by way of a non-limiting example, of a preferred embodiment of a collar, shown in the accompanying drawings in which:

Figure 1 shows a three-dimensional front view of the collar;

Figure 2 shows a three-dimensional rear view of the collar according to Fig. 1;

Figure 3 shows the straps connected to the collar according to Fig. 1;

Figure 4 shows a top plan view of Fig. 3;

15
Figure 5 shows cushioning pads removed from the collar;

Figure 6 shows the inner side of the pads according to Fig. 5.

With reference first of all to Figures 1 and 2, there is shown a collar 10 which has a symmetrical structure and consists of a front part 12, which rests on the chest, closed by a fastening lever 14, two side segments 16, 18 which are nearly flat, and a rear part 20.

20
The segments 16, 18 are hinged together by means of a rear pin 70 and may be opened wide apart so that the neck can be inserted inside the collar 10. The fastening lever 14 has the function of fastening together the segments 16, 18 in the closed position such that, during use, the collar 10 has an annular structure which surrounds the neck completely.

The segments 16, 18 have a cross-section in the form of a rounded rectangle and each
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of them has, mounted on the edge towards the outside of the collar 10, a tongue 30 which is formed by a central body 34 which terminates in a right-angled extension 32 widened in the form of a mushroom head.

Two pads 60, 62 are mounted underneath each of the segments 16, 18, being arranged
on top of each other.

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A user U (Fig. 3) who wishes to fix the collar 10 may use two elastic straps S1, S2 which are arranged so as to cross over each other on the chest.

Considering now Figures 3-6, the pads 60, 62 (see Fig. 5) have a special structure. They are both curved so as to follow the profile of the associated segment 16, 18 and the
shoulder.

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The pad 62 is attached in a fixed manner to the bottom surface of the respective

segment 16, 18. The other pad 60 is engaged inside the first one by means of a form fit so as to form a single unit.

Preferably the pads are made of a foamed material, such as foamed polypropylene, with a density of between 65 and 75 g/l or polystyrene, with a density of between 65 and 75 g/l.

The form fit is achieved by means of interlocking engagement of three projections 64, present on the surface of the pad 60, having preferably inverse tapered shape. The projections 64 are inserted inside corresponding cylindrical cavities 68 which are formed in the pad 62. The joining is further assisted by the use of an inverse taper on the cylindrical projections 64 with the widest part presented to the underside of the pad 60. The widest part of projections 64 is of a diameter slightly larger than the cylindrical cavities 68. When the pad 60, 62 are pushed together, the expanded foam material permits a small deformation allowing the wider part of the projection 64 to pass through the cavity 68 whereby it can then re-expand. This prevents the pad 60 from separating from the pad 62 unless a significant pulling force is applied to pad 60 by the user U.

It is possible and feasible to use pads of varying thickness, which the user selects depending on the shape of the shoulders when purchasing the collar, or to use more than one pad, associating a second pad and optionally a third pad with the first one. In this case, the first pad may have, in a position opposite to that of the projections 64, cylindrical cavities (and possible grooves) similar to those 68 which are provided in the pad 62. Owing to their removable and/or stackable property, the pads allow the collar 10 to be easily adapted to the body of the user U. It is sufficient to apply the pads with the most suitable size and/or shape in order to adapt the collar to one's personal needs. In particular, by means of the addition or replacement of one pad with another one it is possible to reduce the final distance between the upper surface of the segments 16, 18 and the helmet of the user U. Recent studies show that if, during an impact, the helmet does not readily make contact with the collar so as to transmit to it the axial pressure (i.e. the pressure which may cause permanent damage to the neck), the collar loses a lot of its effectiveness.

From the above description it is clear that the collar according to the present invention has characteristics such as to solve advantageously the problems and drawbacks of the devices according to the prior art.

It should also be noted that the top part of the collar is shaped with a particular curvature of the segments 16 and 18 such that the helmet worn by the user is able to rest readily laterally on the upper surface of the collar.

The present invention has been described with reference to a preferred embodiment, but

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conceptually and structurally equivalent solutions can be foreseen within the scope of the appended claims. For instance, the coupling of the lower pad 60 to the upper, fixed pad 62 can be obtained in different ways, such as by using additional or fewer cylindrical projections, or by the use of deliberate undercut features or dovetail joints to engage the two pieces together.

5

CLAIMS

1. Collar (10) for protecting the neck of a user, useful in particular for motorcycle riders, of the type comprising two half-collars (16, 18), which are pivotably hinged together at one end so as to be rotatable in a substantial horizontal plane and which can be
5 connected together by means of a fastening and release lever (14), a plate (42) which at the rear extends downwards from the bottom edge of the collar such as to be centred with respect to the spinal column of the user, and a protective shield (12) which extends downwards at the front, characterized in that it comprises padding means (60, 62) which can be removably connected to the bottom surface of said two half-collars (16, 18) in the lateral
10 zones intended to engage with the user's shoulders.

2. Protective collar (10) according to Claim 1, characterized in that said padding means comprise a first pad (62) permanently fixed to the said bottom surface and a second pad (60) removable from said first pad (62) and provided with means (64) for fixing to said first pad (62).

3. Protective collar (10) according to Claim 2, characterized in that said fixing means comprise projections (64) formed on said second pad (60) and able to co-operate with cavities (68) formed in the opposite surface of said first pad (62).

4. Protective collar (10) according to Claim 1, characterized in that several pads (60, 62) which are stacked together, in particular by means of projections (64) and cavities (68) formed on the mutually facing surfaces, are envisaged.

5. Protective collar (10) according to any preceding claims, characterized in that said pads are shaped with a curvature corresponding to the profile of the underlying shoulder of the user.

6. Protective collar (10) according to any preceding claims, characterized in that said pads (60, 62) are made of foamed plastic.

7. Protective collar (10) according to claim 6, characterized in that the projections (64) have a diameter slightly larger than of the corresponding cavities (64); the foam material permitting a small deformation which allows the projections (64) to pass through the cavities (68).

8. Protective collar (10) according to claim 4, characterized in that said projections (64) have an inverted taper shape.

9. Protective collar (10) according to Claim 6, characterized in that said foamed plastic is selected among foamed polypropylene with a density of between 65 and 75 g/l and foamed polystyrene with a density of between 65 and 75 g/l.

10. Protective collar (10) according to any preceding claims, characterized in that said

pads can have different thickness.

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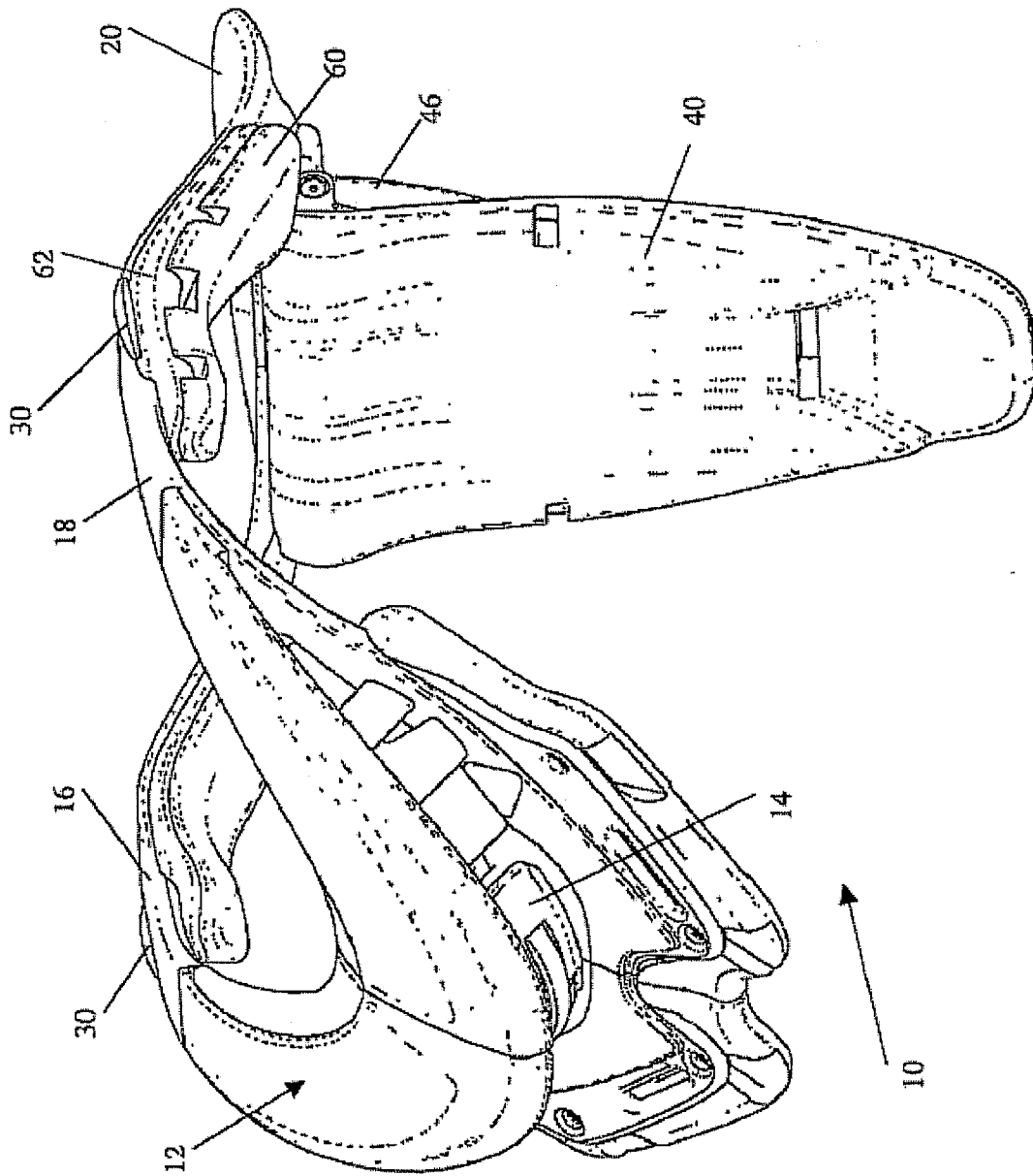


Fig. 1

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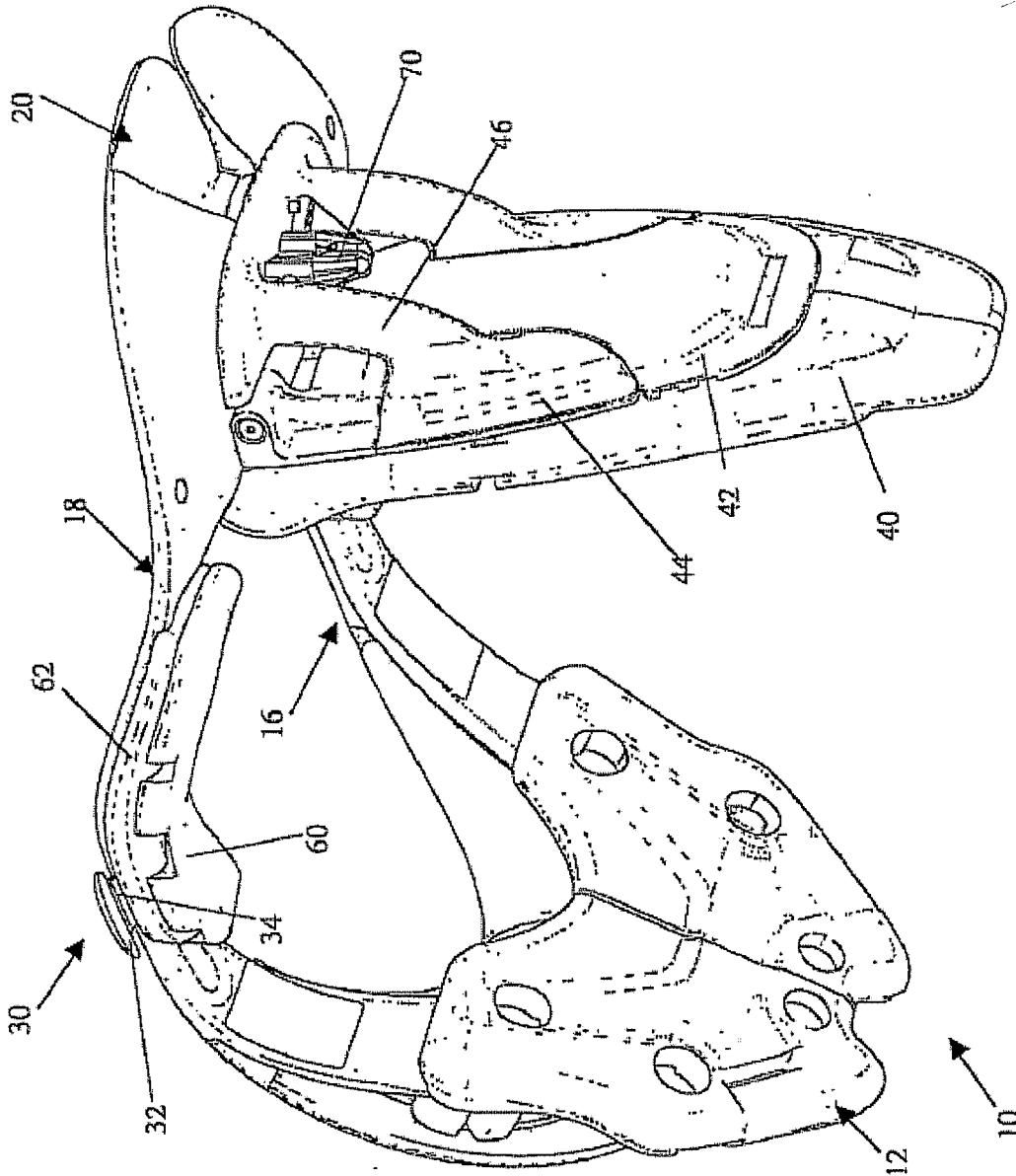


Fig. 2

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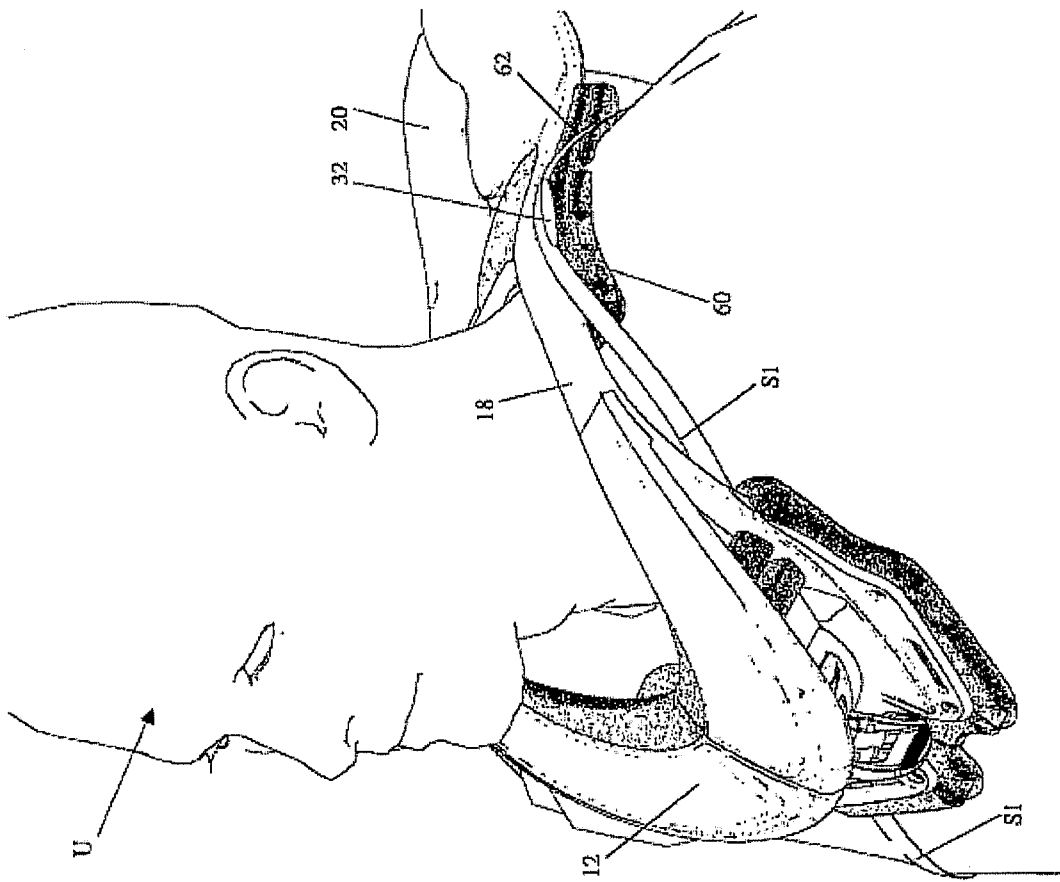


Fig. 3

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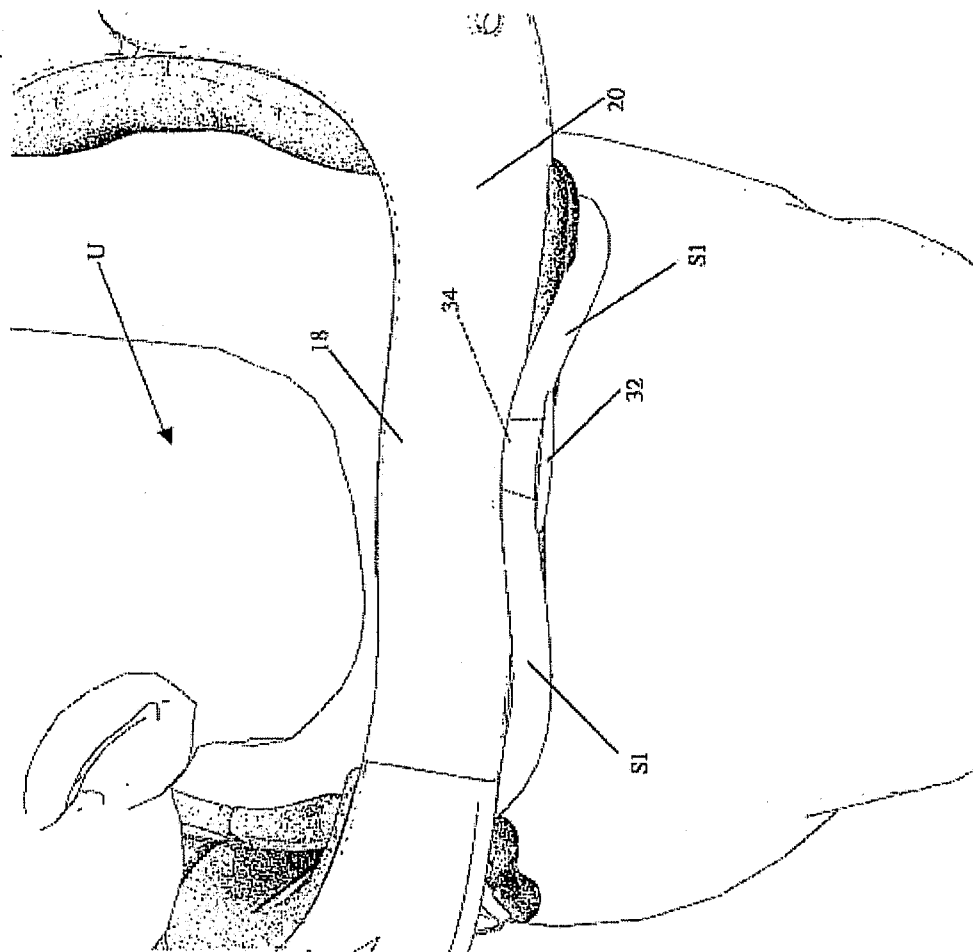


Fig. 4

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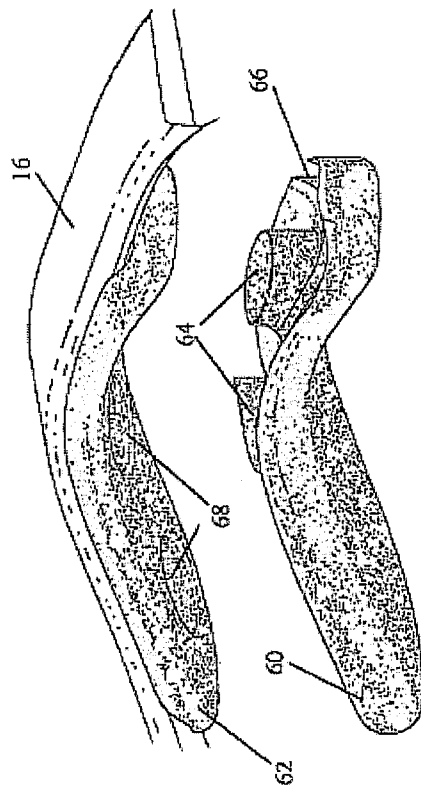


Fig. 5

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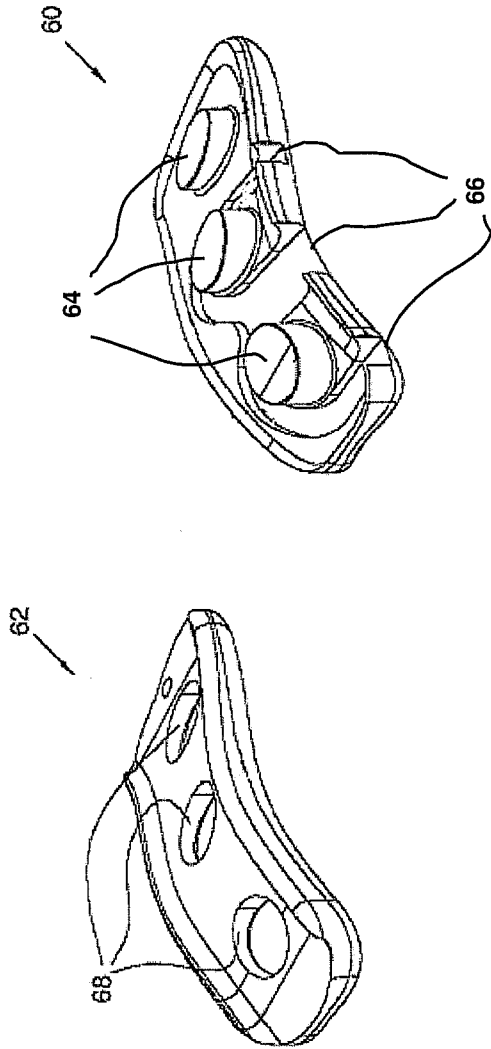


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2009/050936

A. CLASSIFICATION OF SUBJECT MATTER INV. A61F5/05		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) A61F		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2005/051251 A (LEATT CHRISTOPHER JAMES [ZA]) 9 June 2005 (2005-06-09) cited in the application	1,5,6,9,10
Y	page 5, line 14 - page 6, line 6; figures 1-6	2-4,7,8
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<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
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A document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family	
Date of the actual completion of the international search <p style="text-align: center; font-size: 1.2em;">12 May 2009</p>	Date of mailing of the international search report <p style="text-align: center; font-size: 1.2em;">03/06/2009</p>	
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer <p style="text-align: center; font-size: 1.2em;">Sánchez y Sánchez, J</p>	

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Information on patent family members

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