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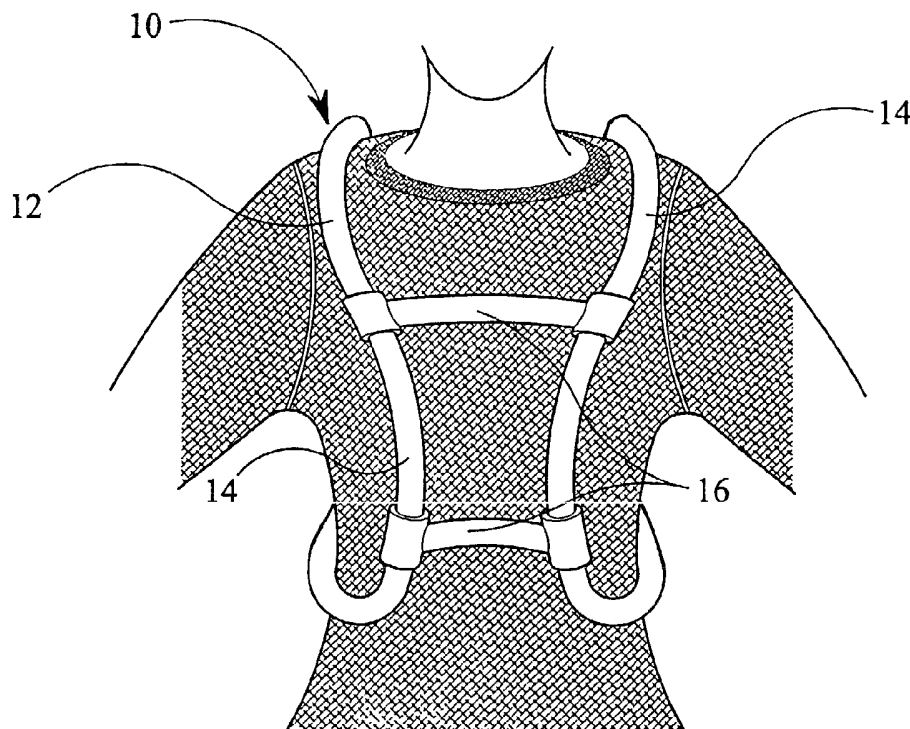
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(54) Title: PERSONAL PROTECTION DEVICE



(57) Abstract: A personal protection device (10) comprises a resilient structure (12) which, in use, surrounds a bodypart of the user. The energy from an impact by a first surface is thus transmitted through the structure (12) from the impact side to the other side(s) and dissipated to an external second surface with which the structure (12) is in contact.

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PERSONAL PROTECTION DEVICE

This invention relates to a personal protection device.

5 The use of impact resistant body protectors in sports, working environments and even travelling, such as when riding a horse, motorbike or bicycle, is common and widespread. These typically take the form of helmets, padded jackets/vests, padded trousers and the like.

10 The fundamental problem with this type of protector is that it operates on the principle of absorbing the energy, generated during an impact, into the padding of the garment in an attempt to cushion the user and thereby minimise bruising and other minor injuries.

15 However, this type of protector does little to prevent injury when the user is caught between an immovable surface, such as the ground, on one side and the application of a large impact or crushing force from the other side. In one particular example, padded body protectors are ineffective in preventing serious injury and even fatality when a horse falls, trapping the rider beneath it.

20

The present invention seeks to overcome this problem.

According to the present invention, there is provided a personal protection

device comprising a resilient structure which, in use, surrounds a bodypart of the user, the energy from an impact by a first surface being transmitted through the structure from the impact side to the other side(s) and dissipated to an external second surface with which the structure is in contact.

5

Preferably, the resilient structure is a rigid frame.

The resilient structure may be a one piece structure. Alternatively, the resilient structure may comprise two or more interconnectable parts.

10

Preferably, the structure is contoured to the bodypart.

Preferably, the bodypart is the upper torso.

15 The invention will now be more particularly described, by way of example, with reference to the accompanying drawings, wherein :

Figure 1 is a front perspective view of a first embodiment of a personal protection device, in accordance with the present invention;

20

Figure 2 is a side perspective view of the personal protection device shown in Figure 1;

Figure 3 is a rear perspective view of the personal protection device shown in Figure 1; and

Figure 4 is a perspective view of a second embodiment of the personal protection device, in accordance with the present invention.

Referring firstly to Figures 1 to 3 of the drawings, a first embodiment of a personal protection device, generally referenced at 10, is shown therein.

10 The personal protection device 10 comprises a resilient, typically rigid frame, structure 12 which is adapted to house a bodypart of a user. The resilient structure 12 may be formed from metal material or any other suitable material which is light weight and able to withstand relatively high compressive forces.

15 In this embodiment, the resilient structure 12 is a unitary one-piece structure, and the bodypart is the upper torso.

The resilient structure 12 comprises two continuous hoop elements 14, and two pairs of integral cross-member elements 16 which set the hoop elements 14 in relative spaced-apart relationship. The cross-member elements 16 typically extend in parallel or substantially in parallel with each other. The pairs of cross-member elements 16 are positioned on the hoop elements 14 to be diametrically or substantially diametrically opposed, and each cross-member element 16 in the pair is spaced from the other

cross-member element 16.

One or more further cross-member elements (not shown) may extend at an angle between the hoop elements 14, and typically between the cross-member
5 elements 16, to aid in the rigidity of the resilient structure 12.

The hoop elements 14 are contoured and/or shaped to fit a user. The cross-member elements 16 may also be contoured and/or shaped. Some or all of the elements 14 and 16 may include padding.

10

In use, the personal protection device 10 is slid over the head and onto the body of the user so that the upper torso is, essentially, surrounded by an external cage. Each hoop element 14 is supported on a respective shoulder of the user and extends around and under the arm. One pair of cross-member elements 16 extends across the
15 back of the user, and the other pair extends across the chest.

Consequently, if the user is crushed or squeezed between two resilient surfaces, such as between a falling horse and the ground or fence, the energy from the impact by the first surface is transmitted through the resilient structure 12 from the
20 impact side, which may be the front, back or side of the structure 12, to the other side(s) and is dissipated to the second surface with which the resilient structure 12 is in contact, with no or substantially no deformation of the structure 12.

With reference now to Figure 4, a second embodiment of the personal protection device 10 is shown therein. This structure 12 comprises two parts 12' which are interconnectable. In this case, each cross-member element 16 is formed with fastening means, typically in the form of a snap-lock fastener 18, part way along
5 its length.

In use, the fasteners 18 are initially separated, the user inserts a respective arm through each opening in the hoop elements 14, and the hoop elements 14 are hung from the shoulders. The fasteners 18 are then engaged, fastening the cross-member
10 elements 16 across the back and the chest.

It should be noted, however, that fasteners 18 need not necessarily be provided on all cross-member elements 16. For example, one pair of the cross-member elements 16 could be formed with hinges, thereby allowing hinged opening of the
15 structure 12. Equally, the cross-member elements 16 could remain as unitary constructions and the hoop elements 14 could be provided with hinges and fastening means.

The structure 12 may also comprise more than two parts. These parts would
20 typically all be interconnectable. This would facilitate the use of a resilient structure intended to protect more than one bodypart.

The structure 12 could also be used in conjunction with existing padded

protectors. In this case, the structure 12 and the padded protector may be securable together, and the structure 12 and/or the padded protector would include suitable securing means (not shown).

5 In a modification to the embodiments, the hoop elements 14 and/or the cross-member elements 16 may be adjustable. This would enable a user to optimise the fit of the device 10.

 With the personal protection device described above, it is possible to protect at
10 least the vital organs housed in the upper torso of a user when the body is crushed or squeezed between two resilient surfaces, without limiting or restricting the freedom of movement of the user. This is of benefit in at least the field of horse riding, and in particular event riding, where a thrown rider caught between the ground and a falling horse can sustain serious and even fatal injuries.

15

 The embodiments described above are by way of examples only and various modifications will be apparent to persons skilled in the art without departing from the scope of the invention. For example, the resilient structure may not be a frame or may only be part-framework.

20

CLAIMS

1. A personal protection device comprising a resilient structure which, in use, surrounds a bodypart of the user, the energy from an impact by a first surface being transmitted through the structure from the impact side to the other side(s) and
5 dissipated to an external second surface with which the structure is in contact.
2. A personal protection device as claimed in claim 1, wherein the resilient structure is a rigid frame.
- 10 3. A personal protection device as claimed in claim 1 or claim 2, wherein the resilient structure is a one piece structure.
4. A personal protection device as claimed in claim 1 or claim 2, wherein the resilient structure comprises two or more interconnectable parts.
15
5. A personal protection device according to any one of the preceding claims, wherein the structure is contoured and/or shaped to the bodypart.
6. A personal protection device according to any one of the preceding claims,
20 wherein the bodypart is the upper torso.
7. A personal protection device according to Claim 6, wherein the device comprises first and second rigid hoops each of which, in use, passes over one of a

user's shoulder and beneath the user's arms.

8. A personal protection device according to Claim 7, wherein the first and second hoops are rigidly interconnected.

5

9. A personal protection device according to Claim 8, further comprising front and rear cross-members interconnecting the first and second hoops.

10. A personal protection device according to Claim 9, wherein at least one of the cross-members includes a releasable coupling releasable to allow relative movement of the first and second hoops.

11. A personal protection device substantially as hereinbefore described with reference to Figures 1 to 3 and/or Figure 4 of the accompanying drawings.

15

FIG 1

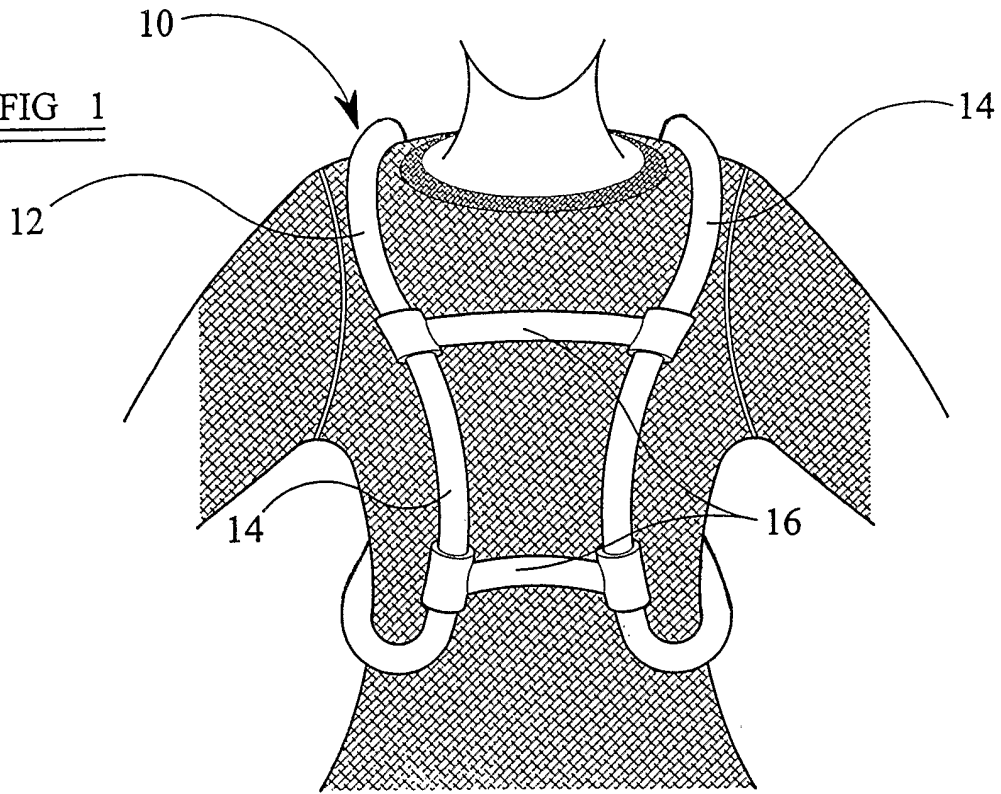
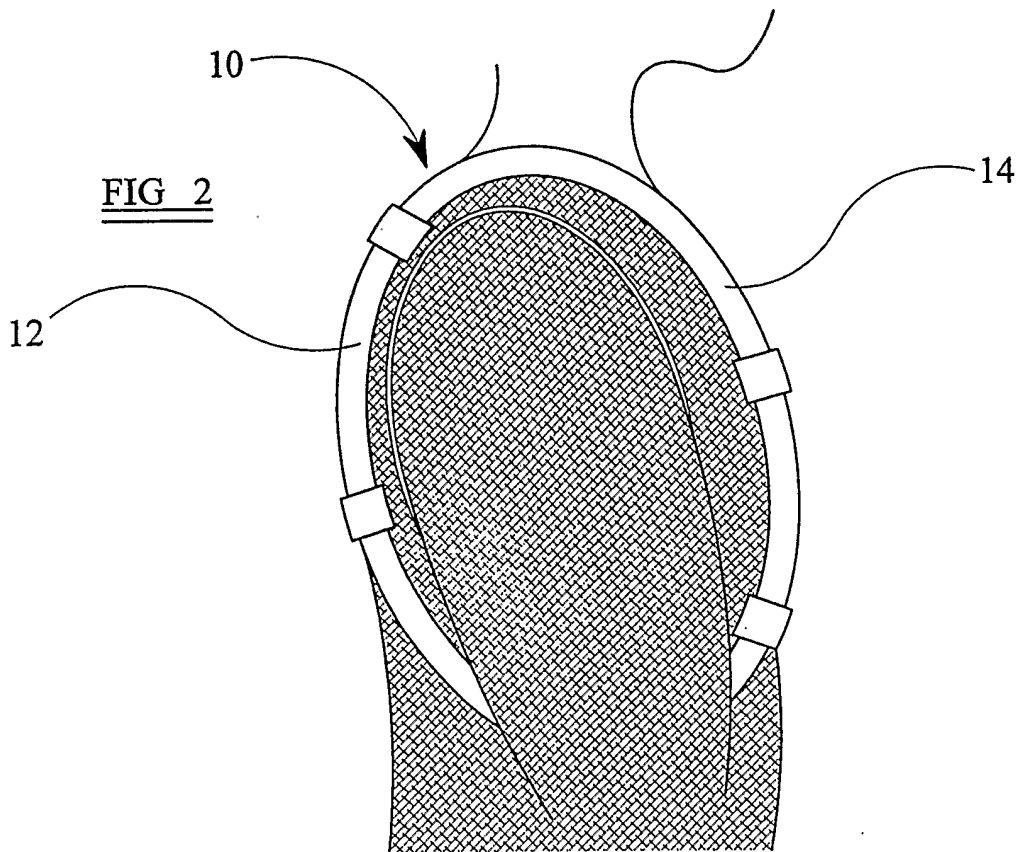


FIG 2



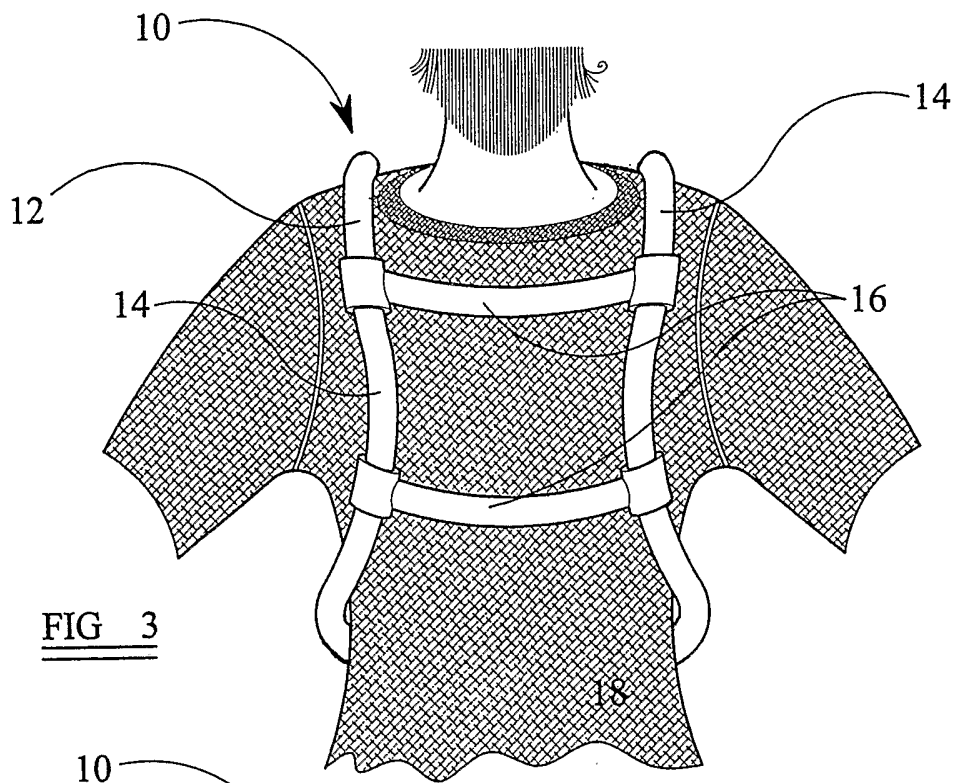


FIG 3

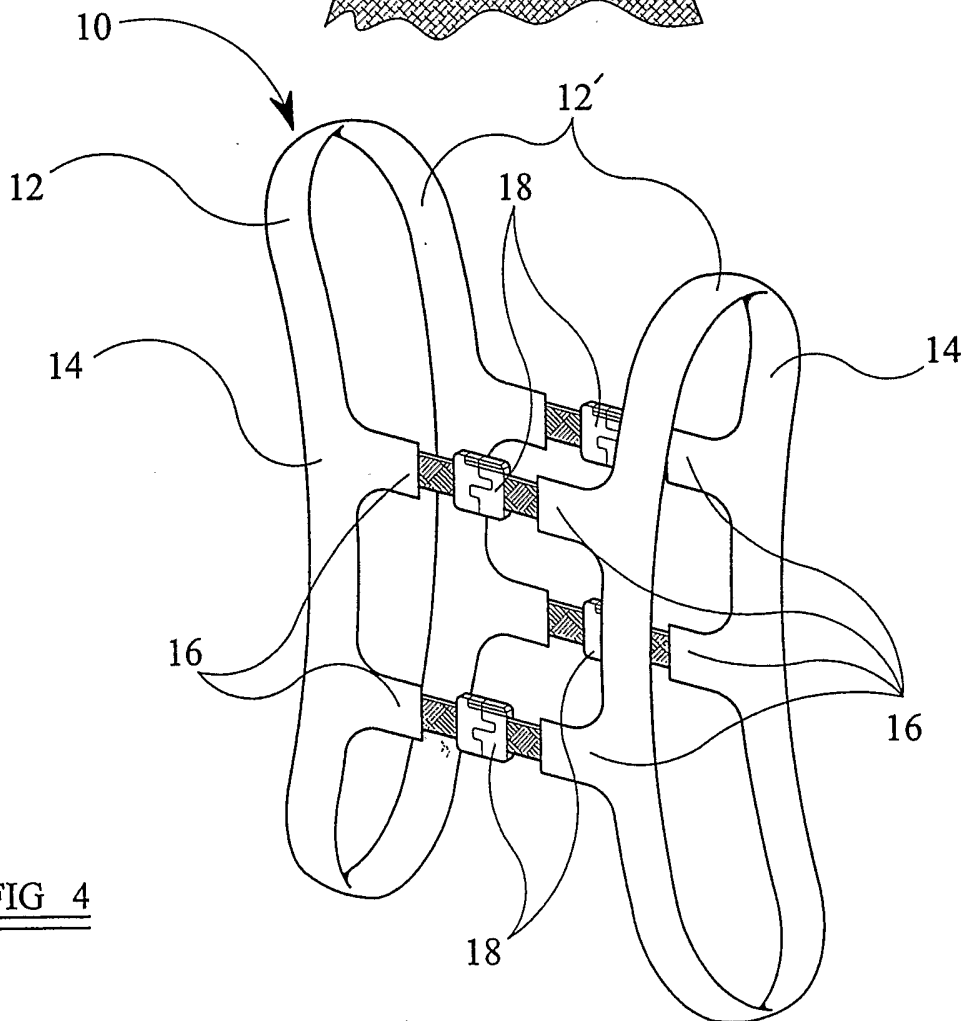


FIG 4

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 02/03223

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 A41D13/015

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)

IPC 7 A41D

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, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category ^o	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 44814 A (N. BARKER) 15 October 1998 (1998-10-15) claim 1; figures 1,2 ---	1,4-6
X	US 3 991 421 A (C.L. STRATTEN) 16 November 1976 (1976-11-16) abstract; figures -----	1,3,5,6

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

^o Special categories of cited documents:

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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Patent document cited in search report	Publication date	Publication date	Patent family member(s)	Publication date					
WO 9844814	A	15-10-1998	AU 7248198 A	30-10-1998					
			US 5978961 A	09-11-1999					
			WO 9844814 A2	15-10-1998					
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">US 3991421</td> <td style="width: 5%;">A</td> <td style="width: 20%;">16-11-1976</td> <td style="width: 20%;">NONE</td> <td style="width: 25%;"></td> </tr> </table>					US 3991421	A	16-11-1976	NONE	
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