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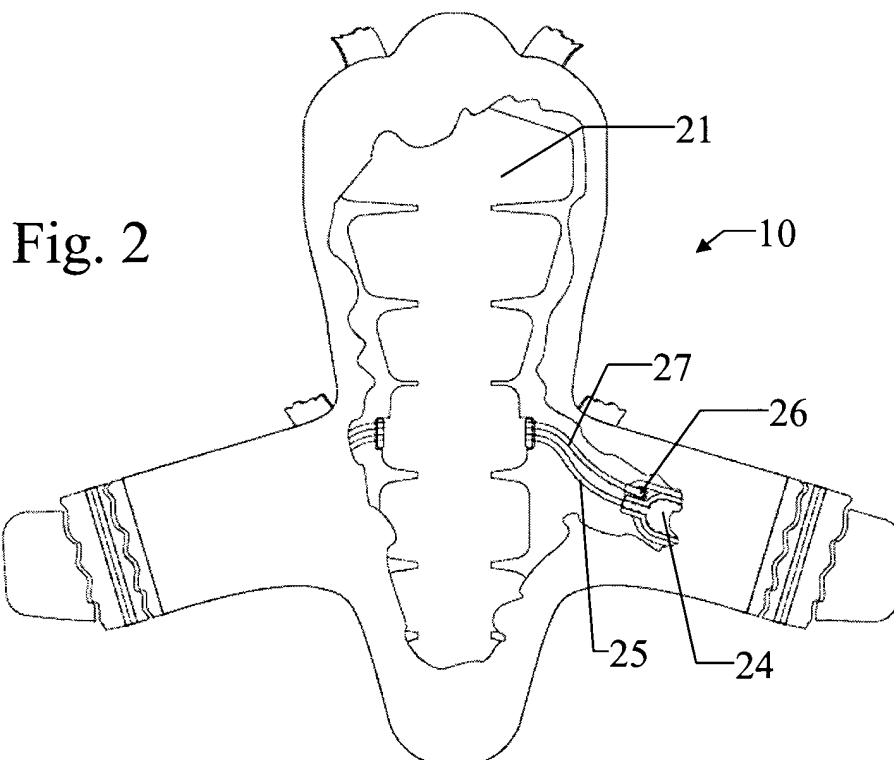
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(54) **Protection device**

(57) A protection device comprising a rigid or semi-rigid shell, characterised by comprising an inflatable and deflatable bag associated with said shell; said bag comprising at least one inflating pump connected to said bag

by a conduit; said inflatable bag comprising a central bag from which a plurality of pairs of bags branch symmetrically about a central vertical axis thereof and are connected together.



Description

[0001] The present invention relates to a protection device, in particular for protecting a person's back.

[0002] It is generally known that a motorcyclist is exposed to greater danger than a motorist in the case of an accident.

[0003] This is due to the fact that motorcyclists are not normally equipped with protection systems.

[0004] More or less rigid protection devices are known for motorcyclists, which protect the motorcyclist against falls or accidents.

[0005] Devices are also known comprising elements inflated with air or gas which ensure greater impact absorption.

[0006] An object of the present invention is to provide a protection device which gives a motorcyclist a variable degree of protection adequate for the current needs thereof.

[0007] Another object is to provide a protection device which adapts to the user's anatomy, which varies from user to user.

[0008] A further object is to provide a protection device which is of simple construction.

[0009] These and other objects are attained according to the present invention by a protection device in accordance with claim 1.

[0010] Further characteristics of the present invention are described in the dependent claims.

[0011] The device according to the present invention, when integrated into the structure of a back protector, determines a more effective dissipation of the impact energy, hence a greater protection against accidental events such as falls, impacts or other dangerous situations which can arise during sporting or working activity.

[0012] The device is positioned in the interior of the back protector structure, this latter having any form or structure and constructed with any type of material appropriate for its function.

[0013] This device is positioned in contact with the back, protected by a first layer of fabric or other type of material, and with the first inner wall of the structure of the back protector itself.

[0014] In this manner, when the device is inflated by the user, it goes to rest perfectly against the back, adapting itself homogeneously to the profile of the spine by covering the entire zone of the spine from the base of the cervical vertebrae to the coccyx.

[0015] Moreover, when the device is inflated, it perfectly stabilizes the entire back protector structure, ensuring stability of the structure in the correct position.

[0016] The protection device is worn by tying it correctly as in the normal procedure, then when preparations are made to take part in any sporting activity, such as a ski descent, and it is decided that greater protection is required than that of a normal protector, the internal bag is inflated to guarantee greater safety and better stability of the structure.

[0017] The characteristics and advantages of the present invention will be apparent from the following detailed description of one embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, in which:

Figure 1 shows schematically a protection device seen from the outside, in accordance with the present invention;

Figure 2 shows schematically a protection device seen from the inside (back side), in accordance with the present invention;

Figure 3 is a schematic front view of an internal bag of the protection device, in accordance with the present invention;

Figure 4 is a schematic lateral deflated view of an internal bag of the protection device, in accordance with the present invention;

Figure 5 is a schematic lateral inflated view of an internal bag of the protection device, in accordance with the present invention;

Figure 6 is a schematic sectional deflated view of an internal bag of the protection device, in accordance with the present invention;

Figure 7 is a schematic sectional view of an article of clothing including a protection device, in accordance with the present invention.

[0018] With reference to the accompanying figures, a protection device 10 in accordance with the present invention comprises a central body having a structure which is symmetrical about its central vertical axis and is in the form substantially of a downwardly directed truncated isosceles triangle 11, to be positioned against a user's spine. In proximity to its (truncated) vertex there are two portions 12 which extend laterally and terminate with horizontal fixing means 13 which are fixed together (for example by Velcro) after surrounding the user's body.

[0019] It also comprises other vertical fixing means 14, in particular straps (shown partially).

[0020] The protection device 10 is formed and dimensioned such that when worn by a user it ensures protection for the user's back.

[0021] The protection device 10 comprises mainly and preferably a base structure formed normally as a rigid plastic shell 20 (for example of polypropylene) and an inflatable and deflatable bag 21 facing the shell 20 (in contact therewith) or inserted into a cavity provided in the shell and having dimensions and shape similar to those of the bag 21.

[0022] The inflatable bag 21 is structured such as to comprise a central bag 22 from which a plurality of pairs of bags 23 branch symmetrically about its central vertical axis and are preferably connected together, but with the connection between an upper pair and the lower pair of the central bag 22 undergoing a width reduction. In this manner a bending flexibility of the bag 21 about horizontal axes is achieved. The bag 21 comprises one or more

inflating pumps 24 connected to the bag 21 by a conduit 25 (including a unidirectional pneumatic valve). It also comprises one or more air discharge valves 26 connected to the bag 21 via a conduit 27. Alternatively, the pump or pumps and the valve or valves can also be incorporated directly into the bag.

[0023] Starting from the side in contact with the back, the protection device 10 is formed with a fabric layer 30 of the jersey or mesh type, followed by the bag 21. This is then preferably followed by a foam layer 31 (such as expanded polyurethane, foam rubber, XPS foam, polystyrene, phenolic foam, and various other foam types), this is followed by a further fabric layer 32 of the jersey or mesh type, and then preferably a shock absorber layer 33 (for example of foam rubber), and finally a rigid plastic shell 20, of classic structure type, of thermoformed or injection-moulded rigid or semirigid material, or a shaped piece of expanded polyurethane, foam rubber or other material.

[0024] The protection device 10 is preferably formed with a plurality of compartments enabling the bag 21 to be inserted and inflated.

[0025] The user, typically a sports person, puts on the protection device 10 and fixes it to himself/herself by the straps 14 and the horizontal fixing means 13. With the device worn in this manner, he/she already possesses partial back protection. When however a sporting activity is to be initiated and greater protection is required, the bag 21 is inflated by the inflating pump 24 to the desired pressure, to hence achieve greater protection and an attenuation of any knocks received. On termination of the sporting activity the bag 21 can be deflated by the discharge valve 26 and the protection device can then remain worn as it is not bothersome, even though providing traditional protection.

[0026] In an alternative embodiment of the present invention, the protection device is fixed (for example sewn, riveted or fixed by other fixing systems) to an article of clothing 40 either of sporting or of working use such as a jacket or a motorcyclist's suit, a ski suit or a working suit.

[0027] For example the horizontal fixing means 13 and the vertical fixing means 14 can be sewn to the article of clothing.

[0028] By virtue of the present invention, an independent inflatable protection device is obtained to be inserted into a back protector structure, which is either removable, as in the case for example of the classical back protector, or fixed, as in the case of a suit, and consisting of one or more fixable bags formed of materials suitable for the task, with one or more inflating pumps integrated into the bag/bags or connected by connection conduits, one or more discharge valves integrated into the bag/bags or into the pump/pumps or connected by connection conduits, formed of materials suitable for the task. In the case of a jacket or suit, the bags can also be inserted into further zones, for example the shoulders and elbows or the like, depending on the parts to be protected and the particular utilization requirements, they being connected

together by inflation and deflation conduits connected to the system, as aforescribed.

5 Claims

1. A protection device comprising a rigid or semirigid shell, **characterised by** comprising an inflatable and deflatable bag associated with said shell; said bag comprising at least one inflating pump connected to said bag by a conduit; said inflatable bag comprising a central bag from which a plurality of pairs of bags branch symmetrically about a central vertical axis thereof and are connected together.
2. A device as claimed in claim 1, **characterised in that** said inflatable bag comprises at least one air discharge valve.
3. A device as claimed in claim 1, **characterised in that** said device comprises in succession, starting from the side in contact with a user's back: a fabric layer; said bag; a foam layer; a fabric layer; a shock absorber layer; and said rigid or semirigid shell.
4. A device as claimed in claim 1, **characterised in that** said device comprises straps for its fixing to a user's shoulders.
5. A device as claimed in claim 1, **characterised in that** said device comprises horizontal fixing means which surround the user's body and are then fixed together.
6. A device as claimed in claim 1, **characterised in that** said device is fixed to an article of clothing.

Fig. 1

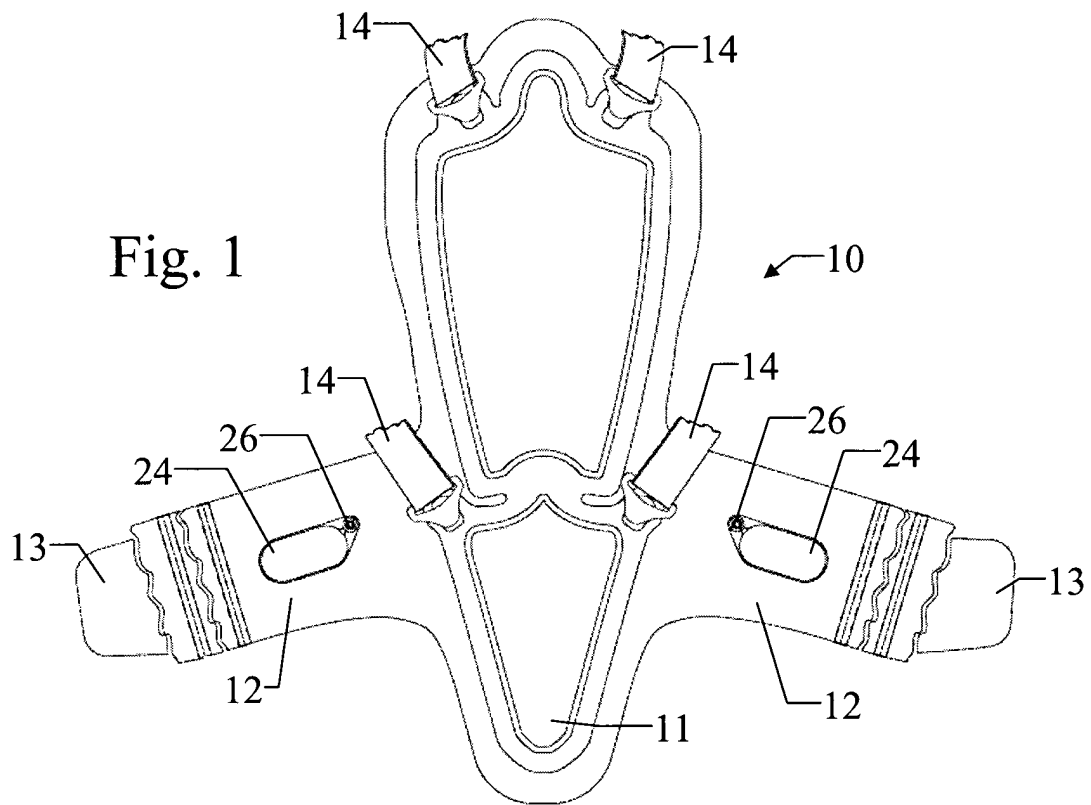


Fig. 2

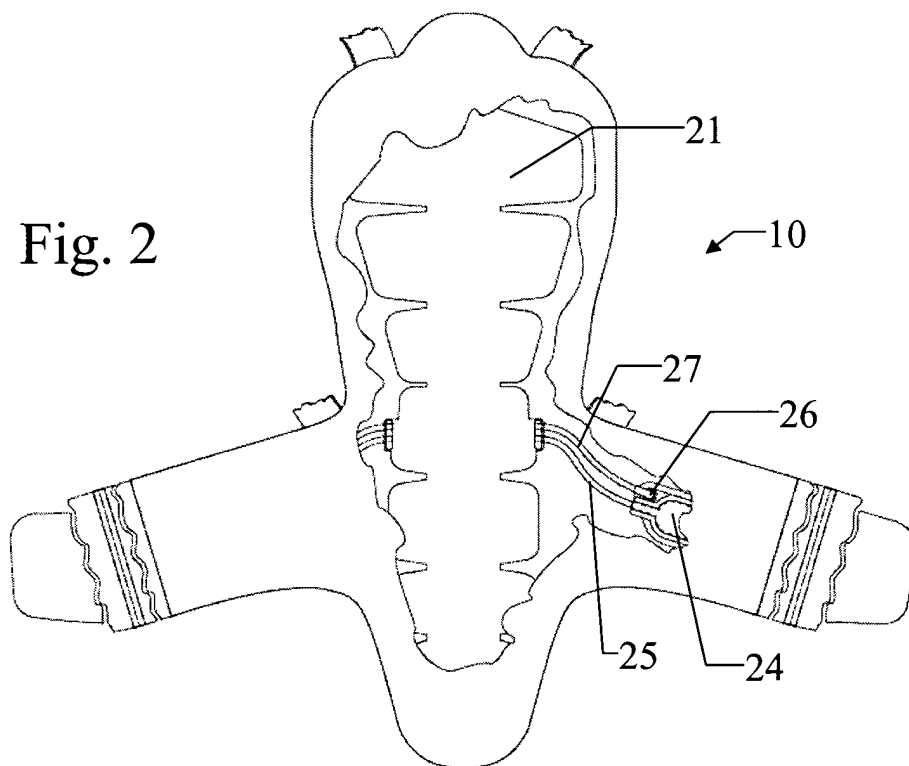


Fig. 3

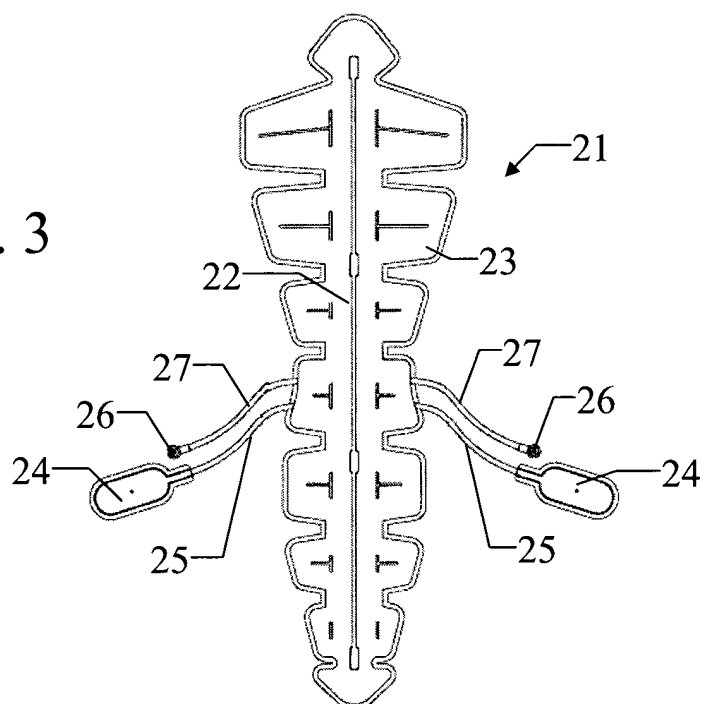


Fig. 4

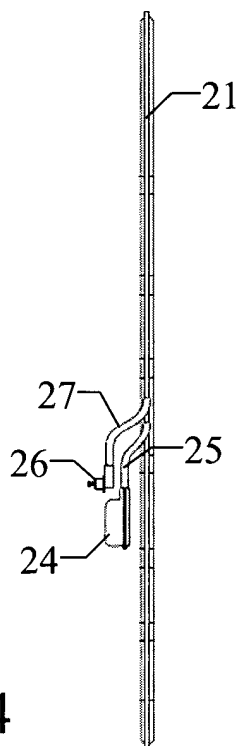


Fig. 5

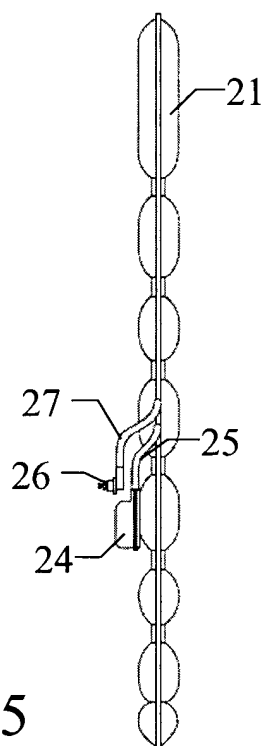
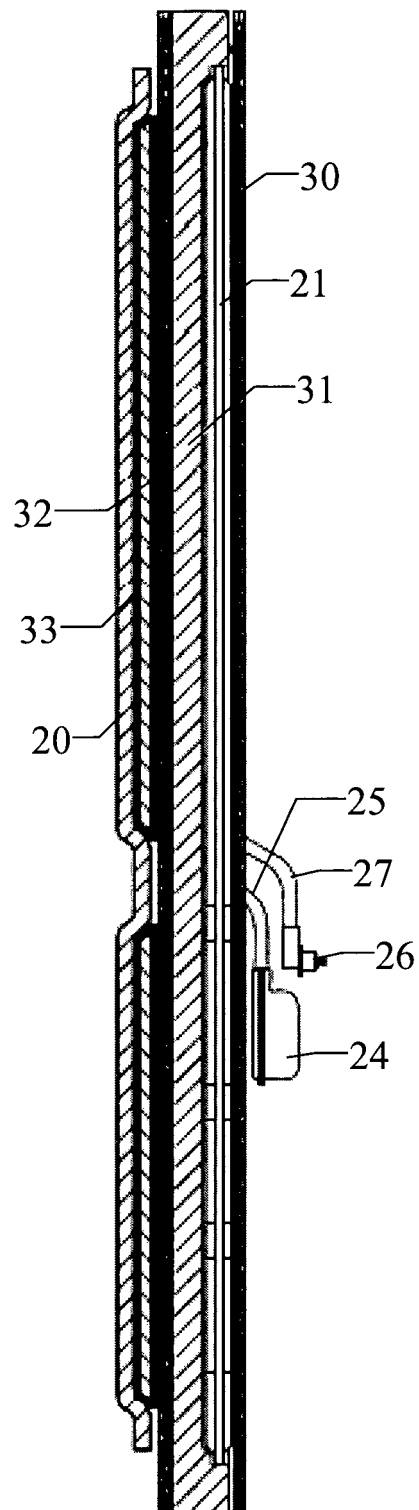


Fig. 6



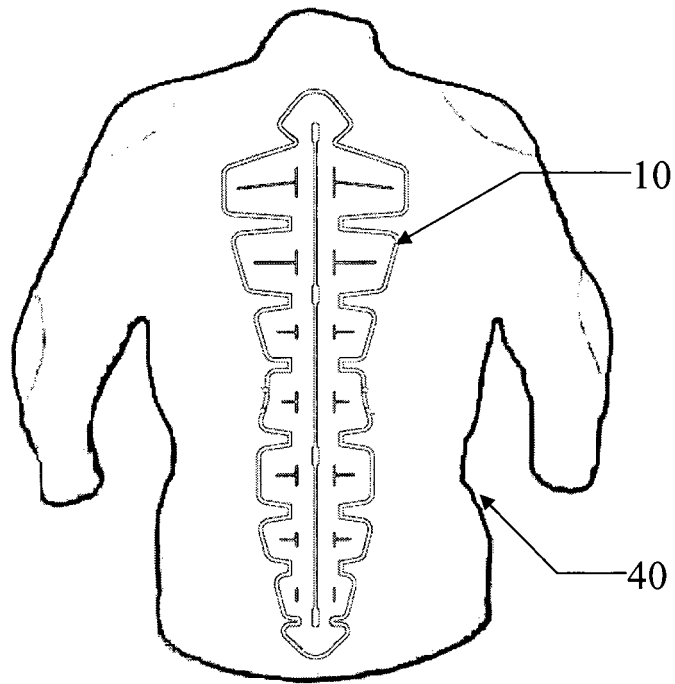


Fig. 7



EUROPEAN SEARCH REPORT

Application Number
EP 12 42 5200

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26 March 2013	Examiner Monné, Eric
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			

**ANNEX TO THE EUROPEAN SEARCH REPORT
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