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(71) Applicant: **Dainese S.p.A.**
36060 Molvena (IT)

(72) Inventor: **Ronco, Luigi**
36060, Molvena (IT)

(74) Representative: **Manfrin, Marta et al**
Società Italiana Brevetti S.p.A.
Stradone San Fermo 21 sc. B
37121 Verona (VR) (IT)

(54) **Wearable protection device**

(57) A wearable shoulder-blade protector (3, 103), comprising a plate (30) for protecting a shoulder blade of a user (100), said plate (30) having a first face (31) intended to be directed towards a shoulder blade of the user (100) and a second face (32) opposite thereto.

A wearable protection device (1) for protecting against impacts the back of a user (100), comprising a central protection member (2, 82), or so-called spine protector, able to be arranged opposite at least one portion of the spine of the user (100), and two protective appendages (3, 103) which extend from opposite sides (2a, 2b; 82a, 82b) of said central member (2, 82) and are able to be arranged opposite the shoulder-blade region of the user (100).

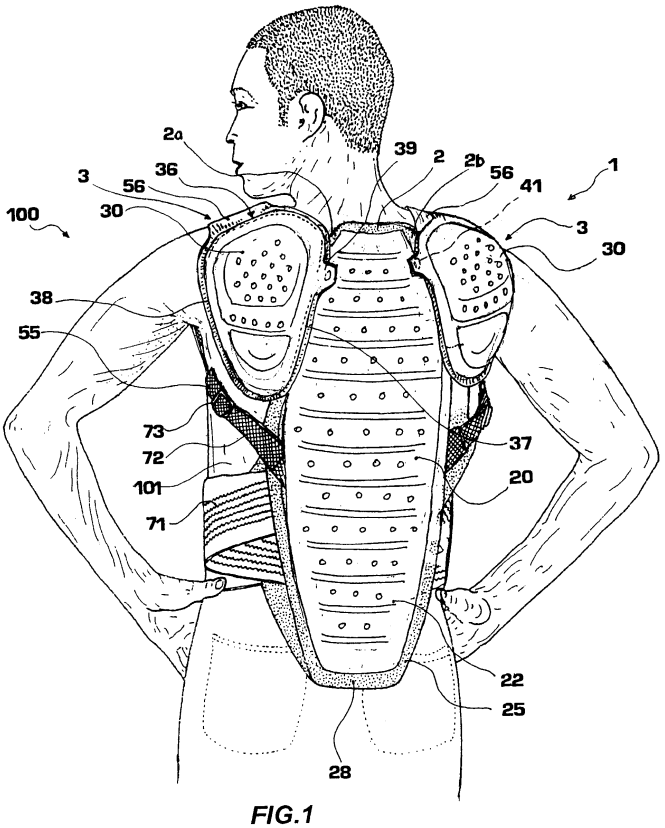

FIG.1

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Description

[0001] The present disclosure relates generally to the clothing sector, preferably the sector of sports clothing for sporting activities or activities of a dynamic nature. More particularly, the present disclosure relates to a protection device, in particular a wearable personal protection device for protecting a user's body against impacts when practising said dynamic sport or similar activity. For example, said device is used to protect a passenger or a rider of a motorcycle, or a cyclist, or a skier, or a person who is performing a working activity where there is the risk of impacts.

[0002] Known wearable protection devices include, for example, spine protectors for motorcycling use, which comprise a substantially rigid plate worn in close contact with the user's body so as to protect it in the event of an impact. The protection efficiency of these devices depends both on the material used and on the thickness of said plate, which must be as large as possible to maximize the protective capacity.

[0003] These spine protectors are intended in particular to protect the user's spine since injuries to the spine may have very serious consequences for the person. Therefore, the spine protectors according to the prior art are essentially formed by a member with an elongated form arranged opposite the spine and parallel thereto. These spine protectors have proved, however, to be incapable of ensuring adequate protection in the event of the user falling and suffering an impact.

[0004] According to the present state of the art, therefore, there exists a need to improve the protective characteristics of the wearable devices of the prior art so as to provide a wearable device able to improve the protective capacity of the device itself.

[0005] The present disclosure is therefore based on the technical problem of providing a wearable protector which is able to satisfy at least the abovementioned requirement with respect to the prior art and provide further advantages.

[0006] This is achieved by providing a wearable shoulder-blade protector, comprising a plate for protecting a shoulder blade of a user, said plate having a first face intended to be directed towards a shoulder blade of the user and a second face opposite thereto.

[0007] Secondary characteristic features of the abovementioned shoulder-blade protector are defined in the corresponding dependent claims.

[0008] The abovementioned technical problem is moreover solved by a wearable protection device according to claim 14, by a protection kit according to claim 20 and by a method for increasing the protection surface of a wearable protection device according to claim 23.

[0009] Secondary characteristic features of the subject of the present disclosure are defined in the corresponding dependent claims.

[0010] According to the subject of the present disclosure a wearable protector which offers a greater protective capacity compared to the prior art is provided. In fact, it is able to ensure adequate protection also of the shoulder-blade region of the user's back, since said plate in the event of impact with a contusive object remains positioned between the shoulder blade of the user and the contusive body itself so as to absorb the energy of the impact and/or distribute the impact force over as wide an area as possible.

[0011] In one embodiment, the shoulder-blade protector comprises a padding layer associated with the first face of the plate, in particular having a surface area greater than the first face itself; in other words, the padding layer is arranged between the plate and the body of the user. The padding layer is able to absorb further the energy of the impact and increase the comfort for the user, protecting him/her from any contact with the plate and/or from direct impact against it.

[0012] In one embodiment, the first face of the plate has a concave shape and in a further embodiment the plate has a substantially triangular or trapezoidal shape; this is advantageous and comfortable for the user since the plate has a form similar to that of the part of the back to be protected and therefore allows greater freedom of movement and better distribution of the impact force.

[0013] In one embodiment, the shoulder-blade protector comprises fastening means associated with the plate, for performing fastening to a spine protector. In the preferred embodiment, a wearable protection device comprises two shoulder-blade protectors which are arranged on opposite sides of the spine protector, in the form of lateral appendages thereof.

[0014] More particularly, these fastening means comprise for example a fastening tooth and/or half-button of a snap button fastener.

[0015] By means of these fastening means, the shoulder-blade protector may be associated with the single spine protector, thereby increasing the protection surface of the latter.

[0016] Preferably, in one embodiment, these fastening means are reversible, such as to allow removal of the shoulder-blade protector in the case where they must be replaced because of damage or removed because they are not required for a specific use by the user.

[0017] In another embodiment, these fastening means comprise a deformable connecting flap or deformable connecting strip. This deformable connecting flap has a first portion associated with (for example sewn onto) the shoulder-blade protector and a second portion associated with (for example sewn onto) the spine protector. In a preferred embodiment, this deformable flap is elastic, i.e. is deformable elastically, in particular along the section situated between said first portion and said second portion.

[0018] In one embodiment, at least one of said fastening means is able to cooperate with fastening countermeans arranged on the spine protector.

[0019] The fastening countermeans is structured so as to cooperate both with said plate fastening means and

with other fastening means of a strap suitably provided for constraining the protection device to the user.

[0020] In other words, depending on needs, the user may fix a strap to said fastening countermeans, obtaining a protection device including the spine protector, but without protection for the shoulder blades, or may remove the strap and fix a shoulder-blade protector to the same fastening countermeans of the spine protector.

[0021] In addition to greater flexibility of use, the compatibility of the shoulder-blade protector fastening means with the fastening countermeans already designed for a strap allows the shoulder-blade protector to be easily added to a single spine protector, thus increasing the protection surface in a simple, reliable and low-cost manner.

[0022] In one particular embodiment, the fastening means is arranged near to one side of the shoulder-blade protector so as to maximize the increase in the overall protection surface since the area overlapping with the central member is kept to a minimum.

[0023] In one embodiment, the shoulder-blade protector is substantially pivotably mounted on the central member or spine protector so that they are able to perform an angular displacement with respect to each other; in this way it is possible to obtain a displacement of the shoulder-blade protector away from or towards the spine, following the movements of the shoulder blades relative to the spine and in general of the user's back and arms, thereby increasing the comfort for the user.

[0024] In particular, the shoulder-blade protector comprises two fastening elements arranged aligned with each other for performing fastening to the central member which is provided with corresponding fastening countermeans; said two fastening elements are arranged in a mutually spaced relationship and, when they cooperate with the respective fastening countermeans, define a hinging line for said angular displacement. In other words, a line passing through the two fastening elements and/or the respective fastening countermeans defines a hinging line which is substantially coplanar with the first face of the shoulder-blade protector and/or of the central member and relative to which the shoulder-blade protector and the central member are able to perform a limited extent of relative rotation.

[0025] In one embodiment, the shoulder-blade protector comprises a constraining strap for constraining the shoulder-blade protector to the user's body. In a preferred embodiment, said constraining strap is associated with an extension of the padding layer which has a length such that it may be arranged across a user's shoulder; in particular, the extension has an elongated form and has a first region in the vicinity of the plate and a second region, opposite to the first region in the direction of its length, to which the strap is joined.

[0026] The strap associated with the shoulder-blade protector facilitates fixing of the device to the user's body and also allows the shoulder-blade protector to cooperate and be combined easily with a spine protector of the prior art, replacing fully the strap should it already be present on the latter.

[0027] The extension of the padding layer results in greater stability of the device on the user's body and better distribution of the weight and forces over the user's shoulders.

[0028] Preferably, the central member also comprises a substantially rigid sheet or plate and, when the shoulder-blade protector is associated with the central member, the plate of the shoulder-blade protector partially overlaps the plate of the central member. Therefore, the device thus designed offers more effective protection since there are no zones without rigid protection at the interface between the shoulder-blade protector and the central member and an impact on one of them may cause transmission of energy to the other one and therefore greater absorption of the impact energy.

[0029] This is particularly effective when the shoulder-blade protector partially overlaps the central member, i.e. when a peripheral portion of the central member is arranged between a peripheral portion of the shoulder-blade protector and the user's body; this configuration can be obtained, for example, by providing the fastening means on the first face of the shoulder-blade protector.

[0030] In an alternative embodiment, the shoulder-blade protector plates are integral, namely are formed as one piece, with the central member; in other words, they extend from opposite sides of the central member and comprise substantially rigid plates which are rigidly associated with or even form one piece with a plate of the central member.

[0031] The wearable shoulder-blade protector and/or the wearable protection device may be incorporated in a garment, for example a motorcyclist's jacket or riding suit.

[0032] Therefore, the present disclosure also refers to a garment including the wearable shoulder-blade protector and/or wearable protection device.

[0033] Further advantages, characteristic features and the modes of use of the protection device of the present disclosure will become clear from the following detailed description of preferred embodiments thereof, provided by way of a non-limiting example.

[0034] It is clear, however, that each embodiment described in the present disclosure may have one or more of the advantages listed above; in any case it is not required that each embodiment should have simultaneously all the advantages listed.

[0035] Reference shall be made to the figures in the accompanying drawings in which:

- Figure 1 is a perspective view of a wearable protection device according to the present disclosure, worn by a user;
- Figure 2 is a perspective view of a detail of the device according to Figure 1;
- Figure 3 shows a cross-sectional side view of the detail of Figure 2, along the cross-sectional line III-III;
- Figure 4 shows a cross-sectional side view of the

detail of Figure 2, along the cross-sectional line IV-IV;
- Figure 5 shows a partially sectioned detailed view of a step for assembly of the device according to Figure 1;
- Figure 6 shows a partially sectioned detailed view of another step for assembly of the device according to Figure 1;
- Figure 7 shows a perspective view of a detail of a second embodiment of a wearable protection device according to the present disclosure;
- Figure 8 shows a cross-sectional side view of the detail of Figure 7, along the cross-sectional line VIII-VIII;
- Figure 9 shows a cross-sectional side view of the detail of Figure 7, along the cross-sectional line IX-IX;
- Figures 10 to 13 show perspective views of successive steps for assembly of the device according to Figure 1.

[0036] With reference to the figures, a wearable protection device according to the present disclosure is indicated by the reference number 1. The wearable protection device 1 is intended to protect, against impacts, the body of a user 100, for example a motorcyclist, a skier, a cyclist, or more generally a person who is practising a dynamic sport or is performing a working activity which involves the risk of the body suffering knocks or impacts. As shown in Figure 1, said wearable protection device 1 is in particular intended to protect the shoulder blades and, in the example, the spine of the back 101 of the user 100.

[0037] The protection device 1 comprises a central protection member 2, or spine protector, which has an elongated form and is intended to be arranged opposite at least one portion of the spine of the user 100, in particular arranged aligned with the spine, so as to protect it from knocks and impacts, and two lateral appendages 3 which extend from opposite sides 2a, 2b of the central member 2, in particular along a top region of the central member 2. The lateral appendages 3 are intended to be arranged opposite the shoulder-blade region of the user 100. These lateral appendages 3, since they are intended to protect the shoulder blades, will also be referred to below as "shoulder-blade protectors".

[0038] The central member 2 comprises a protection plate 20 which is substantially rigid and is made preferably of plastic, for example polypropylene, which may be combined with metal reinforcements (not shown in the figures). The protection plate 20 has a first face 21 which is intended to be directed towards the back 101 of the user 100, and a second face 22 opposite to the first face 21. The first face 21 of the protection plate 20 is associated with a padding layer 25 which is formed for example by means of two sheets of fabric 26, 27 arranged on top of each other and sewn together along the edges 28, a foam-rubber filling 29 being arranged between said sheets of fabric 26, 27.

[0039] The central member 2 may comprise, instead of a single protection plate 20, a plurality of substantially rigid plates or sheets which are arranged alongside each other and pivotably mounted together.

[0040] The central member 2 is also provided with a stomach band 71 for fixing to the stomach of the user 100 and constraining strap portions 72, provided with buckles 73, for constraining or fixing the protection device 1 to the body of the user 100. In particular, two straps 72 are provided on opposite sides 2a and 2b of the central member 2.

[0041] Each shoulder-blade protector 3 comprises a plate 30 which is substantially rigid and is made preferably of plastic, for example polypropylene, which may be combined with metal reinforcements (not shown in the figures).

[0042] The plate 30 has a first face 31 which is intended to be directed towards the shoulder blade of the user 100 and a second face 32 opposite to the first face 31. The first face 31 of the plate 30 is associated with a padding layer 50 which is formed for example by means of two sheets of fabric 51, 52 arranged on top of each other and sewn together along respective edges 53, a foam-rubber filling 54 being arranged between said sheets of fabric 51, 52.

[0043] In the example, the surface area of the padding layer 50 is greater than the surface area of the plate 30 and therefore the padding layer 50 protrudes from the plate 30 along its periphery. In the example, the plate 30 is associated with the padding layer 50 by means of stitching 33 along the peripheral edges of the plate 30.

[0044] The first face 31 has preferably a concave shape so as to follow the anatomical curvature of the shoulder blade of the user 100, while the second face 32 correspondingly has a convex shape.

[0045] The plate 30 has a substantially triangular or trapezoidal shape in plan view: it has a first top side 36 which is intended to be arranged opposite and substantially parallel with a shoulder of the user 100 and from which a second side 37 and a third side 38 extend at an relative angle, converging towards each other.

[0046] The second side 37, i.e. the side closest to the central member 2, has a lateral extension 39 which extends beyond the corresponding edge 53 of the padding layer 50 and has first fastening means for joining the shoulder-blade protector 3 to the central member 2. In the example, said first fastening means comprises a fastening tooth 41 which extends from the first side 31 and at right angles thereto.

[0047] The fastening tooth 41 has the form of a mushroom with a stem 42 and an end-piece or cap 43 with a substantially flat shape perpendicular to the stem 42. The end-piece 43 has a surface area greater than the cross-section of the stem 42 and has a first dimension in a first direction of extension which is greater than a second dimension in a second direction of extension perpendicular to the first direction of extension. In other words, the end-

piece 43 is shaped so as to have lateral projections.

[0048] The fastening tooth 41 co-operates with fastening countermeans provided on the central member 2, in particular a seat 61. In the example, the seat 61 is a through-opening formed in the plate 20 of the central member 2, said opening having a shape which is substantially rectangular or generally having a first dimension La in a first direction of extension which is greater than a second dimension Lb in a second direction of extension perpendicular to the first direction of extension. The dimensions of the seat 61 are comparable to the dimensions of the end-piece 43 of the fastening tooth 41; in particular the seat 61 and the end-piece 43 have shapes which substantially complement each other. In other words, the seat 61 is shaped so as to have two recesses corresponding to the lateral projections of the end-piece 43.

[0049] The dimensions of the seat 61 and the tooth 41 are such that the end-piece 43, in a first relative position shown in Figure 5, is able to engage inside the seat 61, passing through it and being arranged between the plate 20 of the central member 2 and its padding layer 25. Subsequent rotation of the shoulder-blade protector 3 about an axis 45 perpendicular to the first face 31 moves the end-piece 43 into a second relative position where the larger dimension of the end-piece 43 is substantially aligned with the smaller dimension of the seat 61. In this second relative position, which corresponds to an operative position of the shoulder-blade protector 3 (Figures 1, 2 and 3), extraction of the end-piece 43 from the seat 61 is prevented by the end-piece 43 itself which, inside the seat 61, makes contact against the first face 21 of the plate 20; therefore the shoulder-blade protector 3 remains joined to the central member 2.

[0050] Essentially, the shoulder-blade protector 3 comprises a bayonet-type connection comprising a movable part and a fixed part, where the fastening tooth 41 forms the movable part, while the seat 61 forms the fixed part of the bayonet connection.

[0051] The shoulder-blade protector 3 also has second means for performing fastening to the central member 2, in particular comprising a first member 58 or half-button (in the example male half-button) of a snap button fastener provided on the first sheet or face 51 of the padding layer 50, i.e. on the face intended to be directed towards the shoulder blade of the user 100.

[0052] Correspondingly, the central member 2 has a second member or half-button 68 (in the example female half-button) of a snap button fastener, said second half-button 68 being compatible with said first member 58, i.e. said first half-button 58 and second half-button 68 being able to engage reversibly with each other.

[0053] In the example, said second half-button 68 is associated with a portion 65, or tongue, of flexible fabric which extends laterally from the edge 28 of the central member 2 to which it is joined by means of stitching. In the vicinity of the second half-button 68, the central body 2, and in particular the padding layer 25, is optionally provided with a corresponding additional half-button 69 (in the example male half-button) of a snap button fastener, which is compatible with the second half-button 68, so as to allow the portion 65 of fabric to be folded over and fixed onto the central body 2 by means of engagement of the second half-button 68 with the additional half-button 69 in those situations where the shoulder-blade protector 3 is not joined to the central member 2.

[0054] The distance between the fastening tooth 41 and the first half-button 58 is equal to the distance between the seat 61 and the second half-button 68 so that the shoulder-blade protector 3 may be joined to the central member 2 simultaneously at two different connection points.

[0055] In other words, each appendage or shoulder-blade protector 3 comprises, on a respective side, two fastening elements, i.e. in the example the fastening tooth 41 and the first half-button 58, which are arranged in a mutually spaced relationship, while the central member 2 comprises fastening countermeans, i.e. in the example the seat 61 and the second half-button 68, in the same mutually spaced relationship.

[0056] In the example, the plate 30 of the shoulder-blade protector 3 partially overlaps, in the vicinity of its second side 37, the plate 20 of the central member 2.

[0057] Moreover, a hinging line 70 is defined, in particular being defined by a line passing through the fastening tooth 41 and the first half-button 58 and/or the corresponding fastening countermeans formed by seat 61 and second half-button 68.

[0058] Each appendage 3 has a degree of rotation about the respective hinging line 70 with respect to the central member 2, i.e. the appendage 3 is able to perform an angular displacement with respect to the central member 2.

[0059] This degree of rotation is possible owing to the flexibility of the fabric portion 65 and the play of the fastening tooth 41 inside the seat 61. Moreover, the play of the tooth 41 inside the seat 61 is limited and at the same time the shoulder-blade protector 3 partially overlaps the central member 2; this limits the degree of rotation of the shoulder-blade protector 3 with respect to the central member 2, allowing an angular displacement only within a certain angular range.

[0060] Therefore, when the appendage 3 is joined to the central member 2, the plane of the shoulder-blade protector 3 may assume different angles of inclination with respect to the plane of the central member 2; this is advantageous and comfortable for the user 100 since the protection device 1 is able to adapt to the movements of the shoulder blades following the movements of the back 101 and the arms of the user 100.

[0061] A strap 55 for constraining to the body of the user 100 extends from the top of the shoulder-blade protector 3, i.e. from a region in the vicinity of the first top side 36 of the plate 30. In the example, from said side 36 the padding layer 50 extends over a substantially triangular extension 56 intended to be arranged across a

shoulder of the user 100; the strap 55 is fixed to an end region 56a of the triangular extension 56, i.e. an end of the strap 55 is associated with a region of the extension 56 which is opposite to the edge 36 of the plate 30.

[0062] The other end of the strap 55 is associated for example with a corresponding buckle 73. The strap 55 is therefore intended to be positioned opposite the chest and the side of the user 100.

[0063] The stability of fastening of the protection device 1 to the body of the user 100 can be adjusted by operating the buckle 73 which allows adjustment of the operating length of the strap 55.

[0064] A second embodiment of a shoulder-blade protector according to the present disclosure is shown in Figures 7 to 9 where it is indicated by the reference number 103. Parts which have the same function and structure retain the same reference number as in the embodiment previously described and therefore are not described again in detail.

[0065] The shoulder-blade protector 103 comprises first fastening means for joining the shoulder-blade protector 103 to the central member, in the example comprising a fastening tooth 141, which extends from the first face 31 of the plate 30 and at right angles thereto; said fastening tooth 141 is substantially similar to the fastening tooth 41 of the first embodiment; it cooperates with fastening countermeans provided on the central member 2, in particular with the seat 61 already described with reference to the first embodiment.

[0066] The shoulder-blade protector 103 also has second means for performing fastening to the central member 2, the second means being spaced from the first fastening means. In particular, the second fastening means comprises a deformable connecting flap 158. This deformable flap or strip 158 has a first portion 158a associated with the shoulder-blade protector 103, for example sewn onto the respective padding layer 50, and a second portion 158b associated with the central member 2, for example sewn onto the respective padding layer 25. In this embodiment, the shoulder-blade protector 103 is joined to the central member in a preferably non-reversible manner, i.e. such that it cannot be removed as required by the user 100.

[0067] In the example, the deformable flap 158 is elastic. In other words, it is deformable elastically, in particular along the section situated between said first portion 158a and said second portion 158b. For example, the deformable flap 158 is an elastic strip or elasticized fabric portion.

[0068] Preferably, the first portion 158a of the deformable flap 158a is fixed to the shoulder-blade protector 103 in the vicinity of the edge 53 along said third side 38 of the plate 30, i.e. along the edge furthest from the central member 2. Moreover, the deformable flap 158 extends over the first face 31 of the plate 30 or the first sheet or face 51 of the padding layer 50, i.e. over the face intended to be directed towards the shoulder blade of the user 100.

[0069] In this embodiment also, each shoulder-blade protector 103 has a degree of rotation with respect to the central member 2, i.e. the shoulder-blade protector 103 is able to perform an angular displacement with respect to the central member 2 about a hinging line 70.

[0070] In particular, this hinging line 70 is defined by a line passing through the fastening tooth 141 and the deformable flap 158. In this case, however, a plurality of hinging lines 70 exist, all passing through the fastening tooth 141, since the flexibility of the deformable flap 158 over its entire length allows numerous possible directions and positions for flexing and angular displacement.

[0071] Moreover, owing to the elasticity of the deformable flap 158 in the direction of its length, the shoulder-blade protector 3 is able to perform a further rotational movement, this time in the plane of the plate 30. In fact, the elastic extension of the deformable flap 158 in direction 170 allows a certain degree of rotation of the shoulder-blade protector 3 about the axis 45 of the fastening tooth 141.

[0072] This increases the comfort of the protection device 1 since it allows the latter to follow even better the movements of the shoulder blades with respect to the spine and, in general, the movements of the back 101 and the arms of the user 100.

[0073] Fixing of the first portion 158a of the deformable flap 158 to the edge 53 furthest from the central member 2 allows the length of the deformable flap 158 to be maximized and therefore the degree of elastic deformation thereof to be maximized for the same force applied, thereby favouring the adaptability of the device 1 to the movements of the user 100.

[0074] The shoulder-blade protector 3, in particular in the first embodiment, may be provided separately from the central member 2 or spine protector, for example in the form of a kit comprising a spine protector 2 and two shoulder-blade protectors 3 able to be joined to opposite sides 2a, 2b of the spine protector 2.

[0075] In other words, the shoulder-blade protector 3 may be supplied as an accessory for increasing the protection surface of a spine protector 2 without shoulder-blade protection. The protection surface is understood as being the body surface of the user 100 which the device is able to protect effectively and which approximately corresponds to the total surface covered by plates, in particularly substantially rigid plates.

[0076] Figure 10 shows an example of a spine protector 82 without shoulder-blade protection, which is entirely similar to the central member 2 described above.

[0077] Parts which have the same function and structure retain the same reference number as in the embodiment previously described and therefore are not described again in detail.

[0078] The spine protector 82 comprises two constraining straps 85 for constraining to the user's body, which straps have a first end 86 associated with a respective buckle 73 and a second end 87 which has fastening means, in the example a fastening tooth 91, able to cooperate with fastening countermeans, in the exam-

ple a seat 92, provided on said spine protector 82.

[0079] In particular, the fastening tooth 91 is substantially identical to the fastening tooth 41 already described for the shoulder-blade protector 3, while the seat 92 is substantially identical to the seat 61 already described for the central member 2.

[0080] In the initial condition, the straps 85 are joined to the spine protector 82 at both the ends 86, 87 by means of said buckles 73 and said teeth 91 and seats 92. Moreover, each flexible fabric portion 65 is folded over and fixed in position by means of engagement of the female second half-button 68 with the respective male additional half-button 69.

[0081] In order to join the shoulder-blade protectors 3 to the spine protector 82, a first step envisages removing the straps 85, extracting the first end 86 from the respective buckle 73 and disengaging the tooth 91 from the respective seat 92. Moreover, the fabric portions 65 are released by disengaging the female second half-button 68 from the respective male additional half-button 69.

[0082] A second step envisages associating the fastening tooth 41 of the shoulder-blade protector 3 with the respective seat 92, which has been freed of the strap 85. As already shown in Figure 5, the tooth 41 is inserted inside the seat 92 and then the shoulder-blade protector 3 is rotated about the axis 45 through a suitable angle so as to fix in position the end-piece 43 inside the seat 61. At this point, the first half-button 58 is engaged with the respective second half-button 68, and the free end 55a of the strap 55 is joined to the respective buckle 73, which has been freed from the strap 85. It is thus possible to obtain a wearable protection device 1 with a larger surface area able to protect also the shoulder blades by means of the two shoulder-blade protectors 3 which extend from opposite sides 82a, 82b of spine protector 82.

[0083] This is possible in particular as a result of the form of the seats 92, each of which allows joining, removably and alternatively, with the fastening tooth 91 at the end 87 of the constraining strap 85 or the fastening tooth 41 of the shoulder-blade protector 3.

[0084] The subject of the present disclosure has been described hitherto with reference to preferred embodiments thereof. It is understood that other embodiments relating to the same inventive idea may exist, all of these falling within the scope of protection of the claims which are provided hereinbelow.

Claims

1. A wearable shoulder-blade protector (3, 103), comprising a plate (30) for protecting a shoulder blade of a user (100), said plate (30) having a first face (31) intended to be directed towards a shoulder blade of the user (100) and a second face (32) opposite thereto.

2. The shoulder-blade protector (3, 103) according to claim 1, wherein said first face (31) has a concave shape.

3. The shoulder-blade protector (3, 103) according to claim 1 or 2, comprising a padding layer (50) associated with said first face (31).

4. The shoulder-blade protector (3, 103) according to claim 1, 2 or 3, wherein said padding layer (50) has a surface area greater than said first face (31) of said plate (30).

5. The shoulder-blade protector (3, 103) according to any one of the preceding claims, wherein said plate (30) has a substantially triangular or trapezoidal shape.

6. The shoulder-blade protector (3, 103) according to any one of the preceding claims, comprising fastening means (41, 58; 141, 158) for fastening to a spine protector (2, 82).

7. The shoulder-blade protector (3, 103) according to the preceding claim, wherein said fastening means comprises at least one fastening tooth (41; 141) and/or a half-button (58) of a snap button fastener.

8. The shoulder-blade protector (103) according to claim 6 or 7, wherein said fastening means comprises at least one deformable connecting strip (158).

9. The shoulder-blade protector (3, 103) according to claim 6, 7 or 8, wherein said fastening means comprises at least two fastening elements (41, 58; 141; 158) arranged in a mutually spaced relationship.

10. The shoulder-blade protector (3, 103) according to any one of claims 6 to 9, wherein said fastening means (41, 58; 141, 158) is arranged on said first face (31).

11. The shoulder-blade protector (3) according to any one of claims 6 to 10, wherein said fastening means (41, 58) is arranged near to one side (37) of said shoulder-blade protector (3).

12. The shoulder-blade protector (3, 103) according to any one of the preceding claims, comprising a constraining strap (55) for constraining to the user (100).

13. The shoulder-blade protector (3, 103) according to the preceding claim when dependent at least on claim 4, wherein said padding layer (50) comprises an extension (56) intended to be arranged across a shoulder of the user (100), said constraining strap (55) being associated with a region (56a) of said extension (56) opposite to said plate (30).

14. A wearable protection device (1) for protecting against impacts the back of a user (100), comprising a central protection member (2, 82), or so-called spine protector, able to be arranged opposite at least one portion of the spine of the user (100), and two protective appendages (3, 103) which extend from opposite sides (2a, 2b; 82a, 82b) of said central member (2,82) and are able to be arranged opposite the shoulder-blade region of the user (100).

15. The wearable protection device (1) according to the preceding claim, wherein said two protective appendages are two shoulder-blade protectors (3, 103) according to any one of claims 1 to 13, said two shoulder-blade protectors (3, 103) being associated with said central member (2, 82).

16. The wearable protection device (1) according to claim 15, wherein said central member (2, 82) comprises at least one plate (20), said plate (30) of said shoulder-blade protector (3, 103) at least partially overlapping said plate (20).

17. The wearable protection device (1) according to claim 15 or 16, wherein said shoulder-blade protector (3, 103) is able to perform an angular displacement relative to said central member (2, 82) about a hinging line (70).

18. The wearable protection device (1) according to claim 15, 16 or 17, when dependent at least on claim 6, wherein said central member (2, 82) comprises fastening countermeans (61, 68, 92) able to cooperate with said fastening means (41, 58; 151; 158).

19. The wearable protection device (1) according to claims 17 and 18 and at least claim 9, wherein said hinging line (70) is defined by a line passing through said at least two fastening elements (41, 58; 141, 158) and/or respective fastening countermeans (61, 68, 92).

20. A protection kit comprising a spine protector (2, 82) able to be arranged opposite at least one portion of the spine of a user (100) and two shoulder-blade protectors (3) according to any one of claims 1 to 13, wherein said shoulder-blade protectors (3) are able to be associated with opposite sides (2a, 2b; 82a, 82b) of said spine protector (2, 82).

21. The protection kit according to the preceding claim when dependent at least on claim 6, wherein said spine protector (2, 82) comprises a constraining strap (55) for constraining to the user (100) and is able to allow joining, alternatively and removably, of said constraining strap (85) and said shoulder-blade protector (3), said spine protector (2, 82) comprising fastening countermeans (61, 92) able to cooperate alternatively with a portion (87, 91) of said constraining strap (85) and said fastening means (41) of said shoulder-blade protector (3).

22. The protection kit according to the preceding claim, wherein said fastening countermeans comprises a seat (61, 92) and said fastening means comprises a tooth (41).

23. A method for increasing the protection surface of a wearable protection device (1, 2, 82), comprising the steps of:

- providing a protection kit according to claim 21 or 22;
- removing said constraining strap (85) from said spine protector (2, 82) by removing said portion (87, 91) of the constraining strap (85) from said fastening countermeans (61, 92);
- joining said shoulder-blade protector (3) to said spine protector (2,82) by associating said respective fastening means (41) with said fastening countermeans (61, 92).

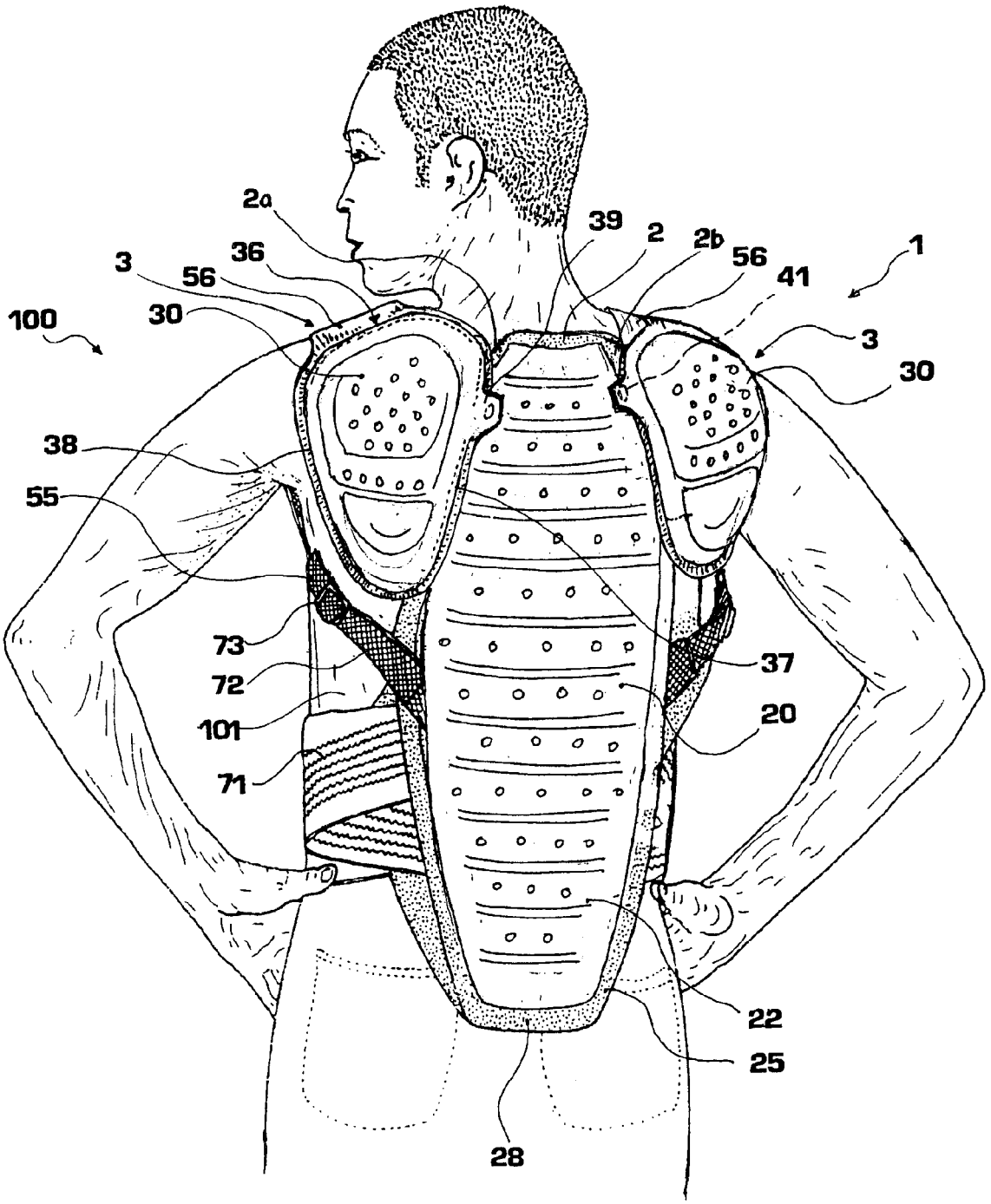

FIG.1

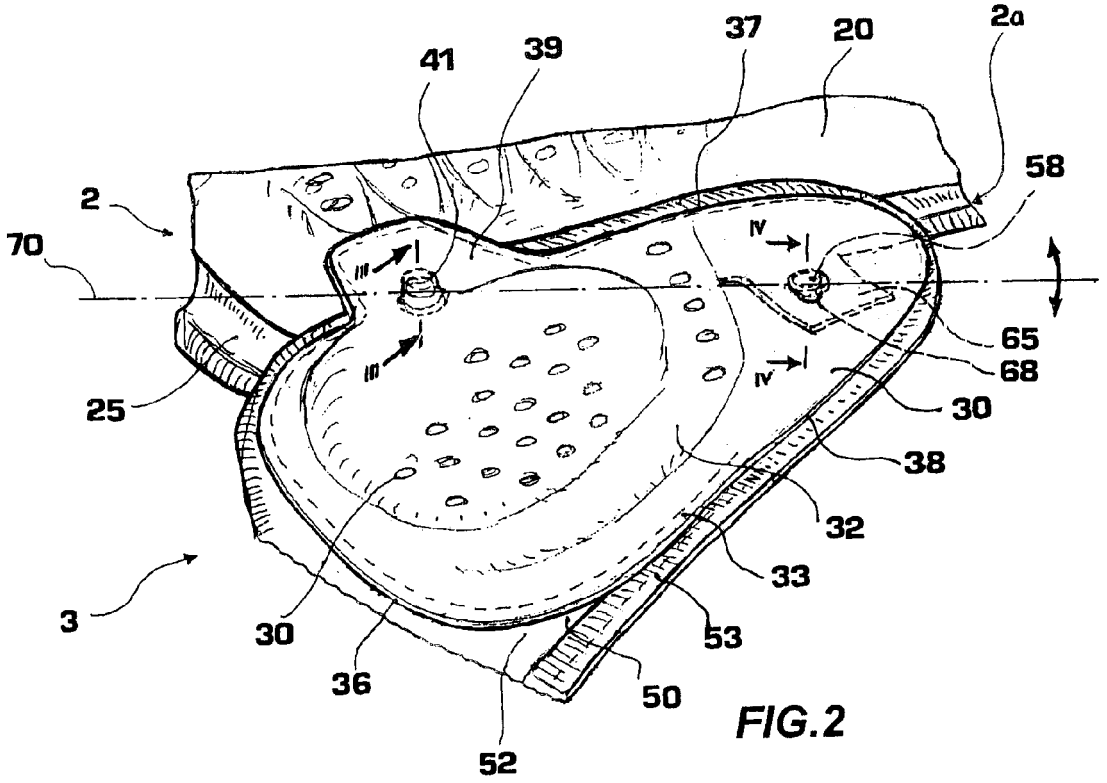

FIG.2

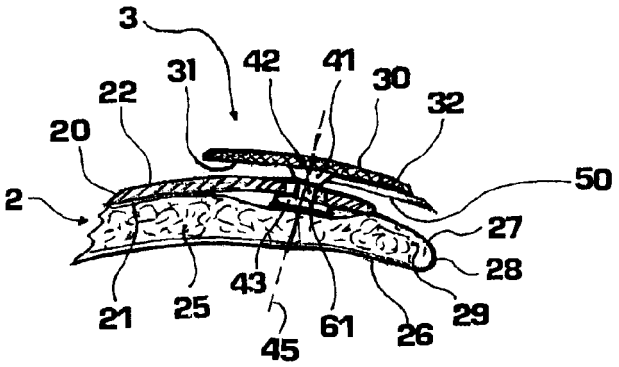

FIG.3

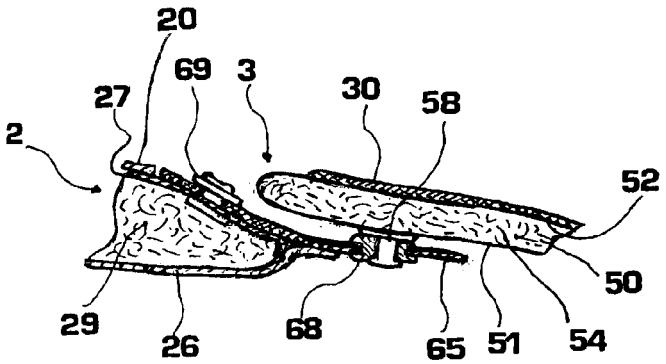

FIG.4

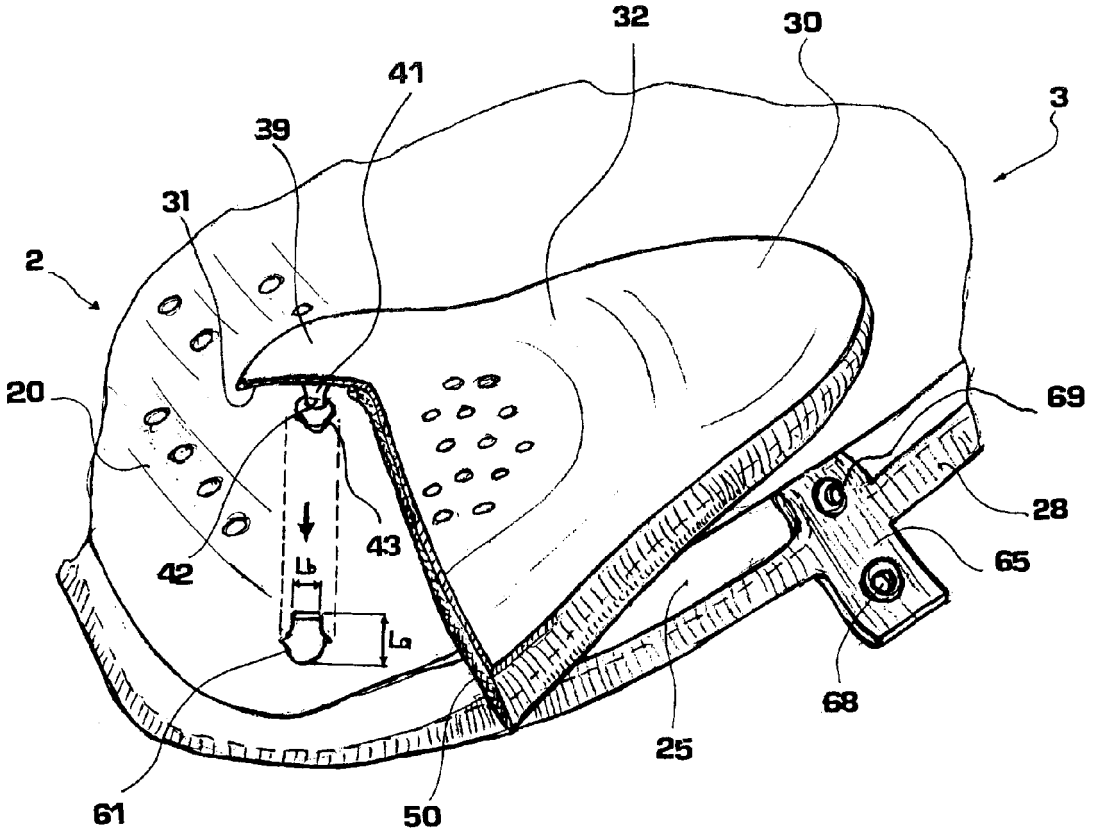
32
30
41
3
39
31
2
20
69
28
43
42
65
68
25
61
50

FIG.5

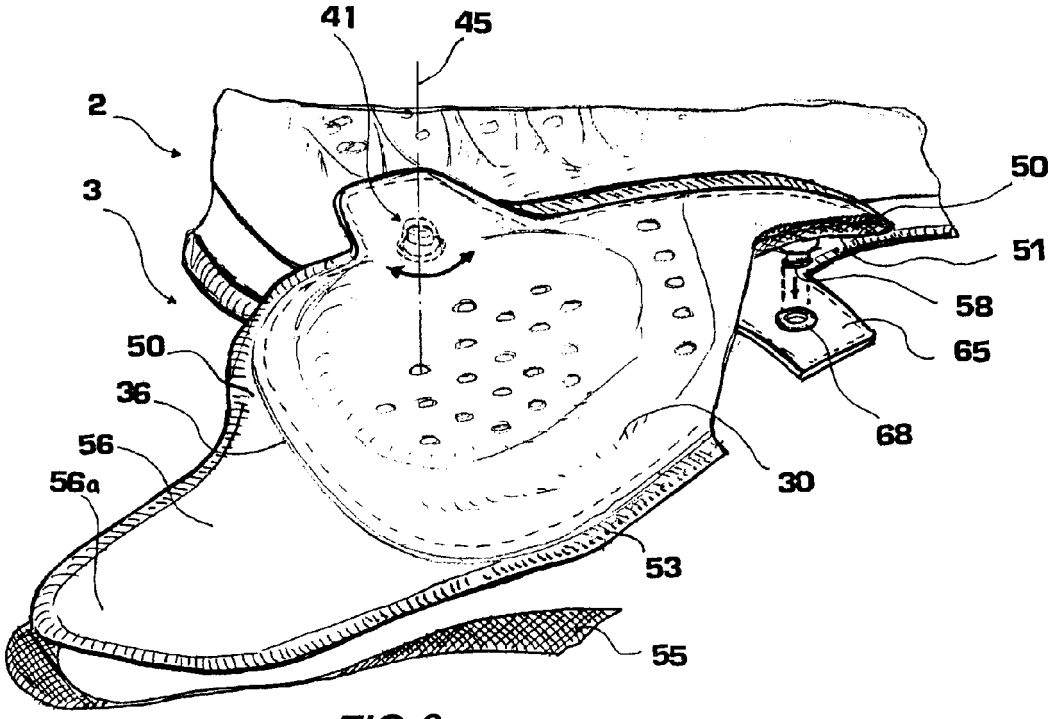
41
45
2
3
50
51
58
65
50
36
56
56a
68
30
53
55

FIG.6

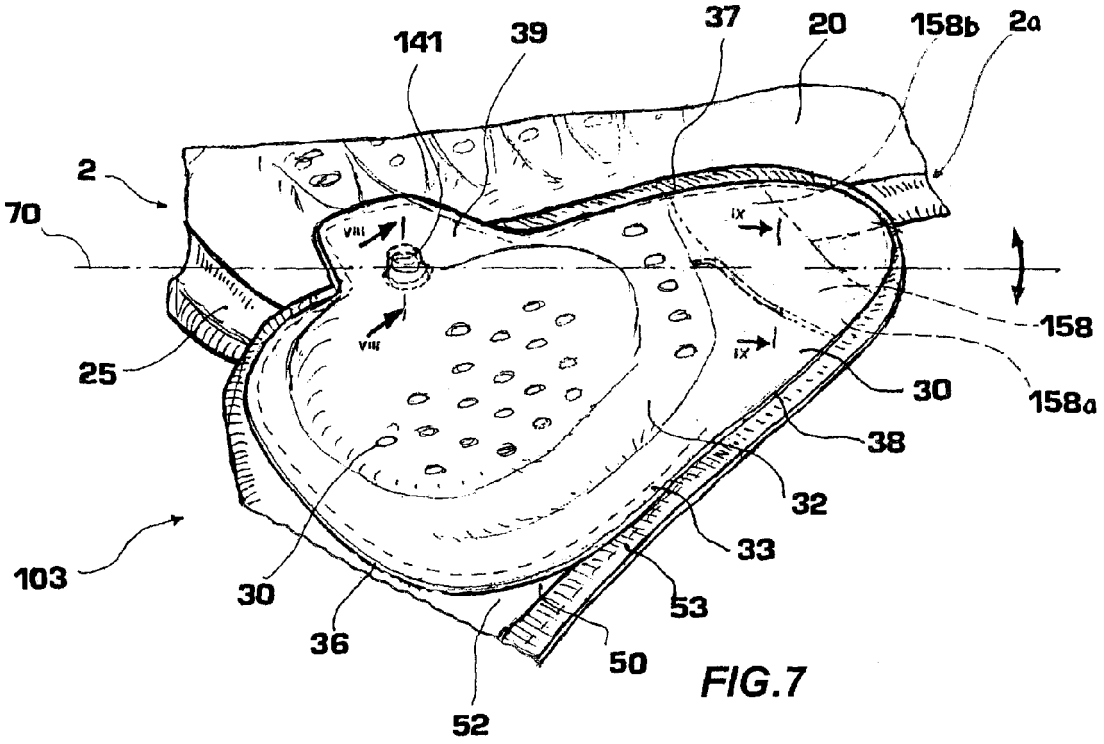

FIG.7

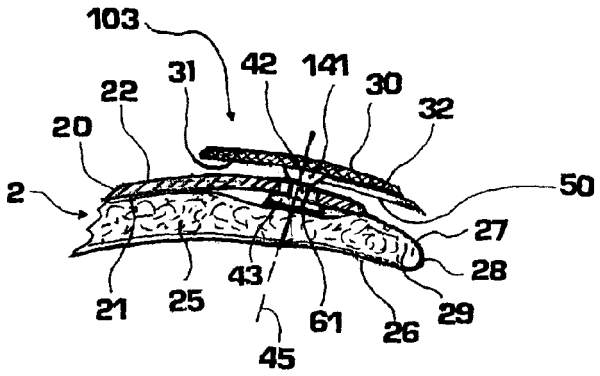

FIG.8

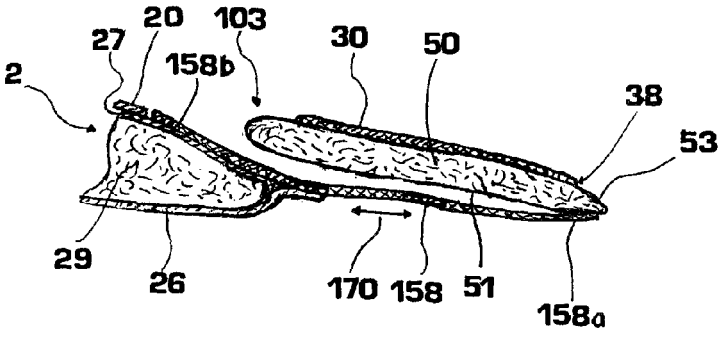

FIG.9

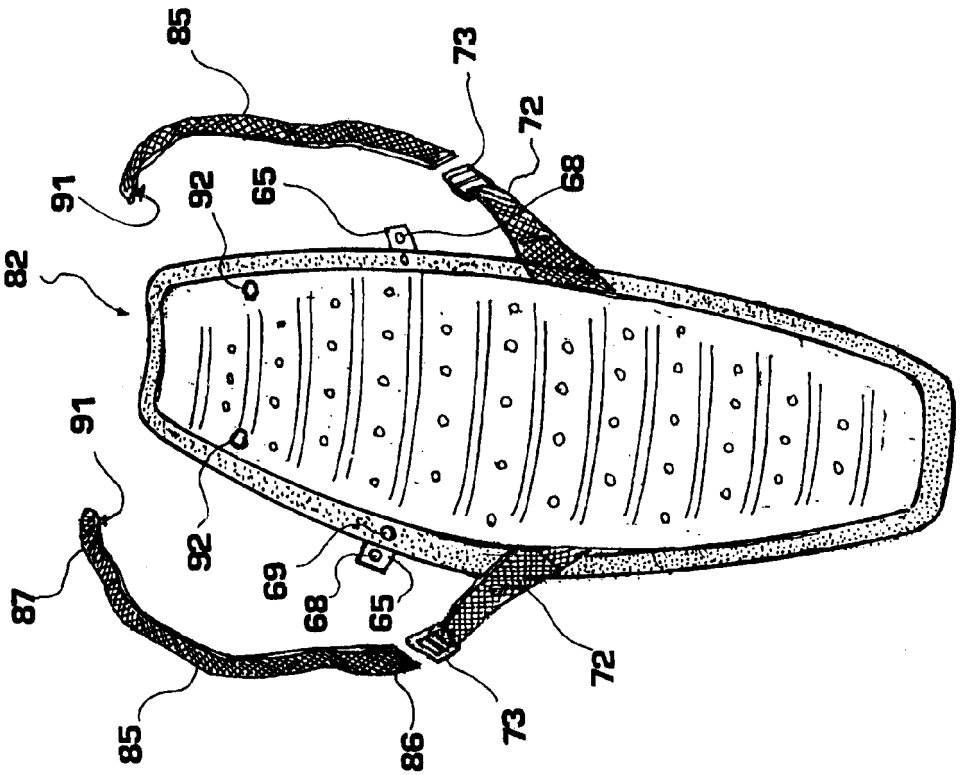
85
73
72
68
91
92
65
82
91
92
69
68
65
87
72
85
86
73

FIG.11

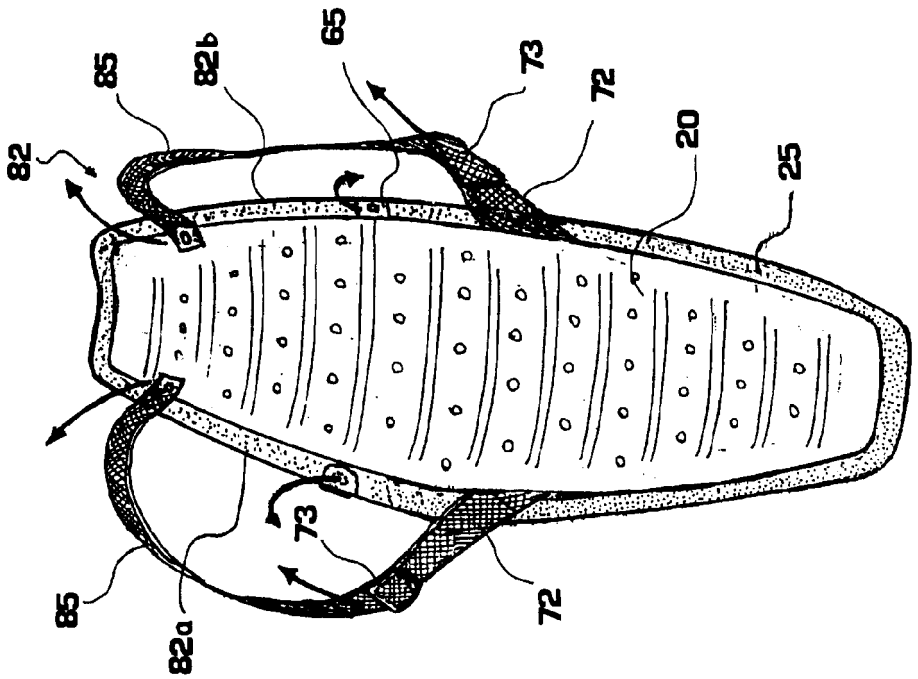
65
85
82b
73
72
20
25
82
73
85
82a
72

FIG.10

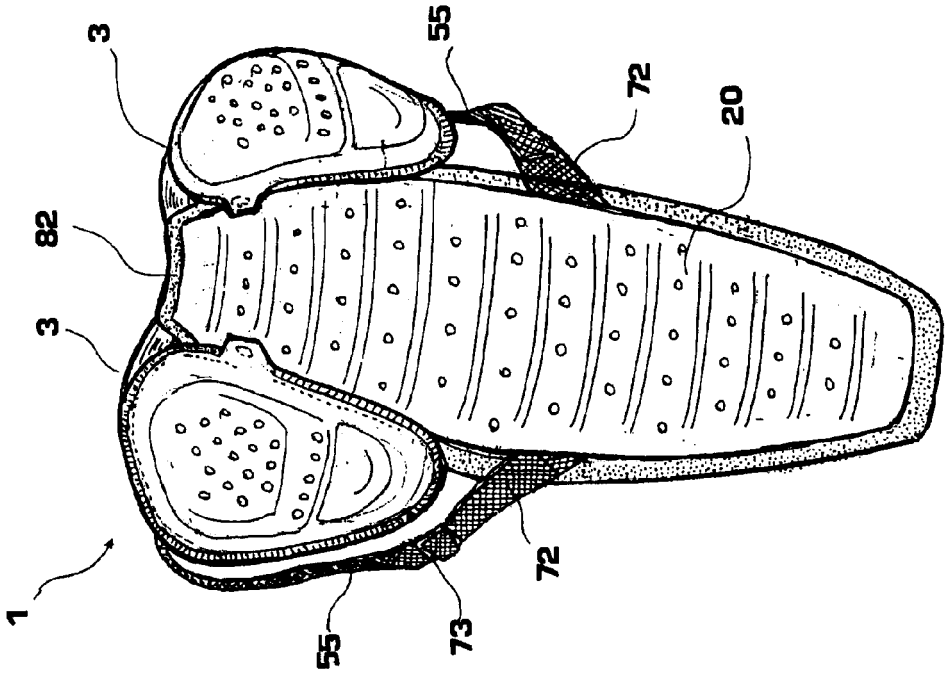
3
55
72
20
82
3
1
55
73
72

FIG.13

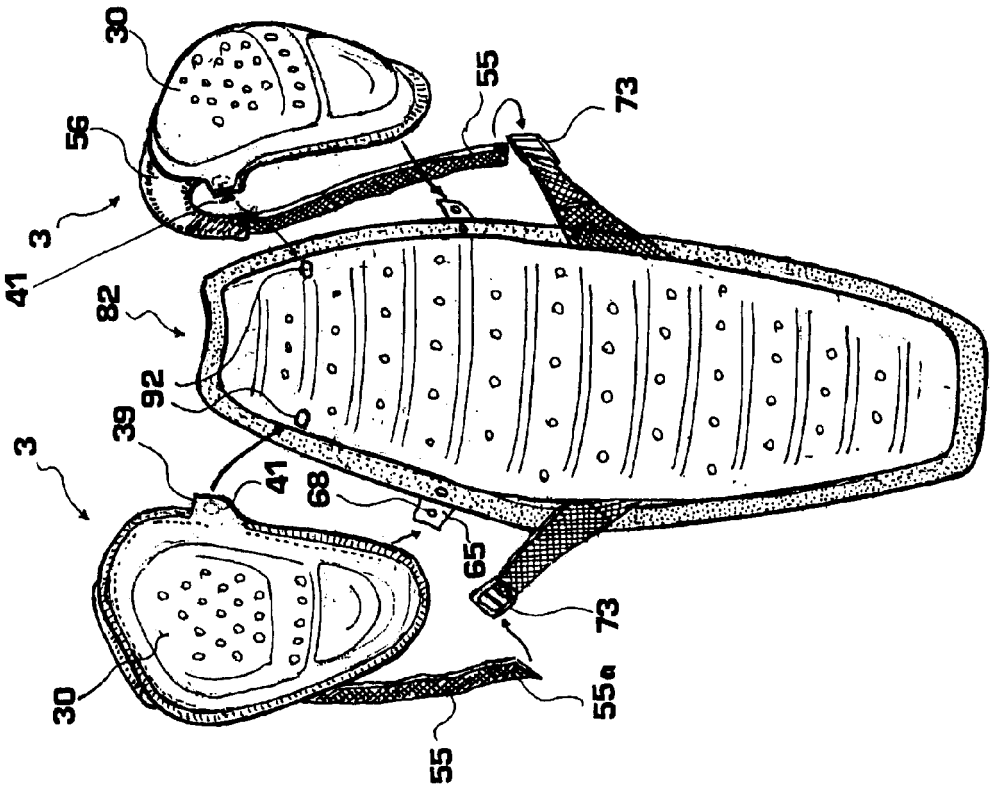
30
56
3
41
82
92
39
3
41
68
65
55
73
73
55a
30
55

FIG.12

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EUROPEAN SEARCH REPORT

Application Number
EP 10 15 6682

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X	JP 2 922880 B (KOMINE AUTO CENTER KK) 26 July 1999 (1999-07-26) * the whole document *	1-16,18, 20-23	INV. A41D13/05
X	GB 2 225 708 A (FISHER HOWARD W) 13 June 1990 (1990-06-13) * page 5; figure 8 *	1-16,18, 20-23	
X	DE 34 01 111 A1 (HABER GYULA [DE]) 18 July 1985 (1985-07-18) * abstract; figure 1 *	1	
A	US 2007/050884 A1 (CONTANT MATHIEU [CA] ET AL) 8 March 2007 (2007-03-08) * abstract *	1	
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A41D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	26 July 2010	Fonseca Fernandez, H

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1

EPO FORM 1503 03.82 (P04C01)

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26-07-2010

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