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(54) **TORSO PROTECTOR FOR CYCLISTS**

(57) Torso protector for cyclists, comprising: at least a first protector element configured to be arranged on a back of a person and to protect back; at least one bag for storing items; at least one fastening element for fastening the bag on a surface of the first protector element, wherein the surface faces away from the back; wherein the fastening element comprises a first part attached to the bag and a second part attached to the first protector element, the first part configured to engage with the second part so as to fasten the bag on the surface of the first protector element.

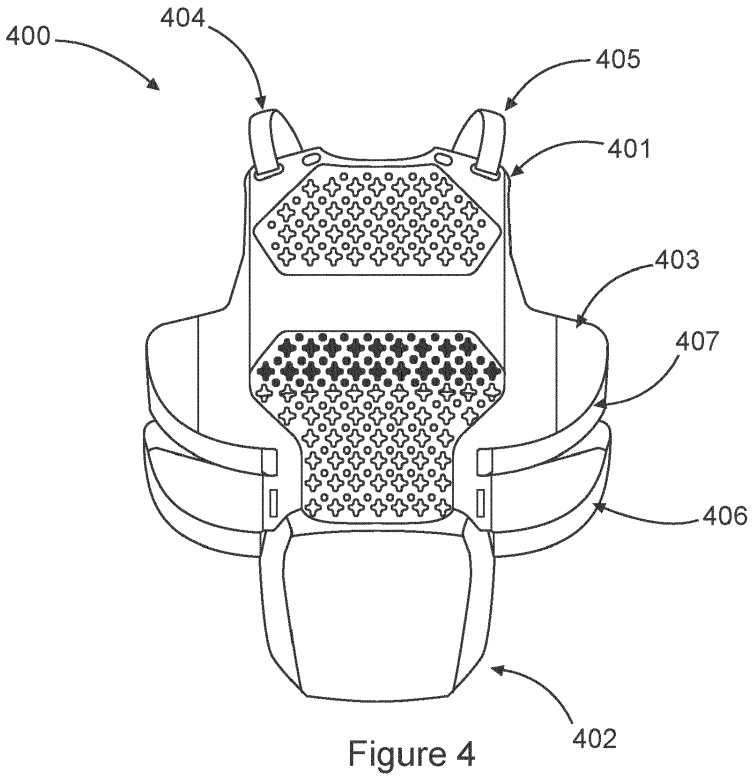

Figure 4

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Description

FIELD OF THE INVENTION

[0001] The invention relates to a torso protector for cyclists and to a use of magnet-based fastening elements in a torso protector for cyclists.

BACKGROUND OF THE INVENTION

[0002] Torso protectors in sports area are well known in the state-of-the-art. The object of torso protectors for cyclists is the prevention of injuries caused by bicycle crashes. However, such torso protectors have to be convenient for the user and have to fulfil further functions than only protecting the user.

[0003] It is now become apparent that there is a further need to provide a torso protector for cyclists.

SUMMARY OF THE INVENTION

[0004] In view of the above, it is an object of the present invention to provide a torso protector that allows an improved protection of the cyclist.

[0005] These and other objects, which become apparent upon reading the following description, are solved by the subject matter of the independent claims. The invention provides the torso protector for cyclists and a use of a magnet based fastening element in such a torso protector. The dependent claims refer to preferred embodiments of the invention.

[0006] The inventors found that most cyclists wear a torso protector in the mountains or in the forest. However, they also carry bags with them. The bag may be a backpack, a fanny pack or a belt bag. This kind of bags leads to at least the following disadvantages for cyclists wearing a torso protector: the torso protector and the bag in general do not fit together and therefore result in a reduced wearing comfort. In case of a bicycle crash or accident, the cyclist may fall onto the bag, wherein the bag may comprise hard elements. This may result into severe injuries. In the worst case, the bag may slip between the back of the cyclist and the torso protector and may therefore cause even more severe injuries.

[0007] In one aspect of the present disclosure, a torso protector for cyclists is provided, comprising: at least a first protector element configured to be arranged on a back of a person and to protect back; at least one bag for storing items; at least one fastening element for fastening the bag on a surface of the first protector element, wherein the surface faces away from the back; wherein the fastening element comprises a first part attached to the bag and a second part attached to the first protector element, the first part configured to engage with the second part so as to fasten the bag on the surface of the first protector element.

[0008] The term protector element, as used herein, is to be understood broadly and may relate to any structural element configured to protect a torso, in particular a back or a chest of a person, in case of a cyclist crash. The protector element may be a single entity or comprise several entities. The protector element may be connected with a further protector element in order to prevent damages. The protector element may comprise any shape or form, preferably the protector comprises a flat shape or form. The protector element may comprise a structure configured to receive and dissipate crash energy. The protector element may cover at least a part of the chest or the back. The protector element comprises preferably two surfaces, wherein the first surface is directed to a torso of a person wearing the torso protector and the second surface is directed away from the torso.

[0009] The term bag, as used herein, is to be understood broadly and may relate to any structural element configured to store one or more items in the inside of the structural element. The bag may comprise any form, for example a cubic shaped, a free-form shape, a ball shape and/or a mixture thereof. The bag may comprise a closure mechanism for opening the bag in order to put items into the bag.

[0010] The term item, as used herein, is to be understood broadly and may relate to any structural element. The item may be a tool, food, beverage, medicine, and a shirt.

[0011] The term fastening element, as used herein, is to be understood broadly and may relate to any structural element configured to fasten a first structural element on a second structural element. The fastening element may be based on a mechanical principle (e.g. a clip, Velcro fastener), electro-magnetic principle, or a magnetic principal. The fastening element comprises a first part and a second part, wherein the first part or the second part may be arranged on a protector element or on a bag. The term first part and second part, as used herein, are to be understood broadly and relate to any structural element configured to engage with a corresponding first part or second part in order to provide a mechanical connection.

[0012] In other words, the basic idea of the invention may entail a use of a fastening element for a secure arrangement of a bag on a first protector element. The secure arrangement of the bag on the surface of the protector element is achieved by a multi piece fastening element, wherein one part is arranged at the protector element and the other part is arranged at the bag. This may be advantageous in terms of wearing convenience as the back remains its position after the fastening element applies its fastening mechanism. This may be advantageous in terms of secure positioning of the bag as the bag does not touch the back of the cyclist because the protector element is arranged between the back of the cyclist and the bag. Hence, even in a cyclist crash the back of the cyclist is protected before hard or sharp items stored in the bag. The secure and convenient arrangement of the bag on the protector element further increases advantageously the functionality of the torso protector, namely to carry a bag in a secure manner

during a cycling tour in the mountains.

[0013] According to an embodiment, the first part may be a magnet element and the second part may a corresponding metal element, particularly a metal pin; or wherein the second part may be a magnet element and the first part may be a corresponding metal element, particularly a metal pin. The magnet element and the metal element use a magnetic principal for the fastening element. This may be advantageous in terms of efficiency and convenience, as the user needs no force for closing the fastening element. The magnet element and the corresponding metal element may be chosen in such a way that a crash force doesn't open the fastening element. The magnet element and the corresponding metal element may be chosen in such a way that a vibration caused by a cycling tour doesn't open the fastening element. However, as the magnetic force is directed parallel in direction between the magnet element and the metal element, only a little force is necessary for the user to open the fastening element when pulling the bag perpendicular to said direction. This may be advantageous in terms user friendliness.

[0014] According to an embodiment, the first part may be a receiving element configured to receive the second part; or wherein the second part may be a receiving element configured to receive the first part. The term receiving element, as used herein, is to be understood broadly and may relate to any structural element that at least partially mechanically encloses or surrounds the corresponding second part or first part. The receiving element may be a hole, a slotted hole, a hole with a partially opened side wall configured to arrange the first part or second part through the hole opening or through the partially opened sided wall. The receiving element may further comprise an undercut. The corresponding first part or second part may comprise the corresponding geometry configured to fit to the respective receiving element, for example a pin for hole, a pin with a protrusion. This may be advantageous in terms of a guided closing or opening of the fastening element. This may increase the reliability or security of the fastening element.

[0015] According to an embodiment, the receiving element may comprise a guide for directional opening the fastening element. The term guide, as used herein, is to be understood broadly and relates to any mechanical structural characteristic that guides the first or second element of the fastening element during the opening process. The guide may be realized by an slotted hole. The guide may also be realized by a hole with opening in a side wall. This may be advantageous in terms of a prevention of an unintentional opening of the fastening element. For example, the opening direction may be oblong to the vertical direction of the first protector element. Hence, a vertical vibration caused by cycling will probably not open the fasting element.

[0016] According to an embodiment, the second part, particularly the magnet element or the metal element, maybe detachably attached to the first protector element. The term detachably attached, as used herein, means that the second part can be retrofitted to the first protector element. This may be realized by a mechanical joining, a friction looking, a clamp connection. The mechanical joining may comprise for example a screw connection or a click connection. This may be advantageous in terms of flexibility for the arrangement of the fastening element on the first protector element.

[0017] According to an embodiment, the second part may be at least partially arranged in the first protector element and/or may extend through the first protector element. The protector element may comprise a hole in which the second part is arranged.

[0018] According to an embodiment, the second part may be at least partially arranged in the first protector element so as not to protrude towards the back of the person. This may be advantageous in terms of security of the health of the person.

[0019] According to an embodiment, the second part, particularly the magnet element or the metal element, may be attached to the first protector element by means of a screw connection. This may be advantageous in terms of flexibility, efficient production of the protection torso and retrofitting capability.

[0020] According to an embodiment, the torso protector may be made of an elastic material and comprises a rib structure and the second part may be at least partially arranged between ribs of the rib structure and/or may be attachable through the rib structure. The elastic material may advantageously increase the shock absorption. The rib structure may advantageously increase the shock absorption. The arrangement of the second part between ribs of the rib structure may advantageously provide a spatial separation of the second part from the back of the person wearing the protection torso.

[0021] According to an embodiment, the first protector may comprise two fastening elements. This may advantageously increase the torsion resistance of the arrangement of the bag on the first protector element.

[0022] According to an embodiment, the bag may be arranged on the surface of the first protector element such that the first protector element prevents a direct contact between the bag and the back. This may advantageously increase the safety of the person wearing the torso protector.

[0023] According to an embodiment, a torso protector may be provided, wherein the inside of the bag may comprise a net for secure storing. This may advantageously increase the safety of the person wearing the torso protector.

[0024] According to an embodiment, the torso protector may comprise a second protector element configured to be arranged on a chest of the person and to protect the chest. The first protector element and the second protector element may comprise a similar structure as described above. The first and the second protector element may be connected to each other by one or more

straps.

[0025] According to an embodiment, the torso protector may comprise a further fastening element for fastening the bag or a further bag on a surface of the second protector element, wherein the surface of the second protector element faces away from the chest, and wherein the further fastening element corresponds to the fastening element described above. This may advantageously increase the storage functionality of the torso protector.

[0026] A last aspect of the present disclosure relates to a use of a magnet-based fastening element in a torso protector as described above for fastening the bag to the first protection element and/or the second protection element.

[0027] It is noted that the above embodiments may be combined with each other irrespective of the aspect involved.

[0028] These and other aspects of the present invention will become apparent from and elucidated with reference to the embodiments described hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029] Exemplary embodiments of the invention will be described in the following drawings.

Figure 1 shows a schematic view of an exemplary first protector element;

Figure 2 shows a schematic view of an exemplary bag;

Figure 3 shows a schematic view of an exemplary second protector element; and

Figure 4 shows a schematic view of an exemplary assembled torso protector.

DETAILED DESCRIPTION OF EMBODIMENTS

[0030] Figure 1 shows a schematic view of an exemplary first protector element.

[0031] The first protector element 100 is shown in a top view. The first protector element 100 is configured to protect the back of a person wearing the torso protector 400 as described further below in figure 4. The first protector element 100 comprises in the present example 2 fastening elements 101 and 102, wherein each fastening element comprises a first part (not shown) and a second part 103 and 104. The fastening elements 101 and 102 are arranged in a lower area of the first protector element 100. The fastening elements 101 and 102 are arranged on the surface 103 of the of the first protector element 100 that faces away from the back of a person wearing the torso protector. The second parts 103 and 104 are each configured to engage with first parts of the fastening element. The second parts 103 and 104 are in the present example each metal pins. The first parts (not shown) are in the present example each magnet elements. It should be noted that the solution also works with only one fastening element or with more than two. The second parts 103 and 104 are in the present example detachably attached to the first protector element by means of a screwing connection. The second parts 103 and 104 extend at least through a layer of the first protector element. However, the second parts 103 and 104 are arranged the first protector element 100 such that they are not in direct physical contact with a back of person wearing the torso protector. This may be advantageous in terms safety of the person. The first protector element 100 comprises in the present example a rib structure. The second parts 103 and 104 are in the present example at least partially arranged between the ribs such that there is a free space between the second elements 103 and 104 and the back of a person wearing the torso protector. The first protector 100 is in the present example made of an elastic material (e.g. one of the following Styrene butadiene rubber (SBR), nitrile rubber (NBR), chloroprene rubber (CR), fluoropolymer rubber (FKM), butadiene rubber (BR), ethylene propylene diene rubber (EPDM)). Alternatively, the first protector 100 may be made of a material with a high stiffness, e.g. special plastic, carbon fibres or metal. The first protector element may be made at least partially of a soft foam. The first protector element 100 may comprise one or more openings 105, 106, 107 and 108 for connecting the first protector element to a second protector element by means of straps (not shown). The first protector element 100 may also comprise structural elements 109 such as slots, holes for increasing a mobility the person wearing the protector element 100. The protector element 100 has in the present example a length that corresponds to a length of the person wearing the torso protector. The second parts 103 and 104 on the fastening elements 101 and 102 are arranged on the surface 103 such that a bag with corresponding first parts (not shown) that is fasted to the first protector element 100 doesn't extend over the surface of the first protector element. This may be advantageous in terms of safety during a crash event.

[0032] Figure 2 shows a schematic view of an exemplary bag 200.

[0033] The bag 200 is shown in a top view. The bag 200 comprises in the present example two first parts 201 and 202 that correspond to the fastening elements 101 and 102 and the second parts 103 and 104. The first parts 201 and 202 are arranged on a surface of the bag 200, wherein the surface faces towards the surface 103 of the first protector element 100 when the first parts 201 and 202 are engaged with the second parts 103 and 104. The first parts 201 and 202 are in present example parts of the fastening elements 101 and 102. The first parts 201 and 202 comprise each receiving elements 203 and 204 in the present example. The receiving elements 203 and 204 are in the present example slotted holes. The slotted holes comprise in a first area 204 of a bottom area in the present example a magnet. The slotted holes comprise in a second area 205 of the bottom area in the present

example no magnet. The slotted hole with a magnet area and a non-magnet area enable a guide for directional opening of the fastening element as an opening is directed through mechanical slotted hole and a drop a the magnetic force when the metal pin is moved from the magnet area to the non-magnet area.

[0034] Figure 3 shows a schematic view of an exemplary second protector element 300.

[0035] The second protector element 300 comprises in the present example openings 303, 304, 305 and 306 for connecting the second protector element 301 with the first protector element 100 by means of straps. The second protector element 300 is configured to protect a chest. The second protector element 300 may be made of the same material as the first protector element 100. The second protector element 300 may comprise the same structure as the first protector element 100. However, the second protector element 300 may also comprise a different structure and or may be made of a different material. The second protector element 300 may comprise further second parts 301 and 302 of fastening elements. In the present example, these second parts 301 and 302 are the same as the second parts 101 and 102 described in figure 1. Hence, in the present example the bag 200 may also be arranged on the second protector element 300.

[0036] Figure 4 shows a schematic view of an assembled exemplary torso protector 400.

[0037] The torso protector 400 comprises a first protector element 401 configured to be arranged on the back of a person and to protect the back. The torso protector comprises further at bag 402 for storing items. The torso protector 400 comprises in the present example two fastening elements (not visible as covered by the bag 402) for fastening the bag 402 on a surface of the first protector element 401, wherein the surface faces away from the back. The fastening elements comprise a first part attached to the bag and a second part attached to the first protector element (not visible as covered by the bag 402). The first parts are configured to engage with the second parts so as to fasten the bag 402 on the surface of the first protector element 401. The torso protector 400 comprises in the present example a second protector element 403 configured to protect the chest of a person. The first protector element 401 and the second protector element 403 are connected to each by straps 404, 405, 406 and 407.

LIST OF REFERENCE SIGNS:

[0038]

100, 401	first protector element
101, 102	fastening element
103, 104, 301, 302	second part of fastening element
105, 106, 107, 108	opening in first protector element
109	structural element
110	surface
200,402	bag
201, 202	first part of fastening element
203, 203	receiving element
205	magnet area
206	non magnet area
300, 402	second protector element
303, 304, 305, 306	opening in second protector element
400	torso protector
404, 405, 406, 407	strap

Claims

1. Torso protector for cyclists, comprising:

at least a first protector element configured to be arranged on a back of a person and to protect back;
at least one bag for storing items;
at least one fastening element for fastening the bag on a surface of the first protector element, wherein the surface faces away from the back;
wherein the fastening element comprises a first part attached to the bag and a second part attached to the first protector element, the first part configured to engage with the second part so as to fasten the bag on the surface of the first protector element.

2. The torso protector according to claim 1,

wherein the first part is a magnet element and the second part is a corresponding metal element, particularly a metal pin; or
wherein the second part is a magnet element and the first part is a corresponding metal element, particularly a metal pin.

3. The torso protector according to claim 1 or 2,

wherein the first part is a receiving element configured to receive the second part; or
wherein the second part is a receiving element configured to receive the first part.

4. The torso protector according to claim 3, wherein the receiving element comprises a guide for directional opening the fastening element.

5. The torso protector according to any one of the preceding claims, wherein the second part, particularly the magnet element or the metal element, is detachably attached to the first protector element.

6. The torso protector according to any of the preceding claims, wherein the second part is at least partially arranged in the first protector element and/or extends through the protector element.

7. The torso protector according to claim 6, wherein the second part is at least partially arranged in the first protector element so as not to protrude towards the back of the person.

8. The torso protector according to any one of the preceding claims, wherein the second part, particularly the magnet element or the metal element, is attached to the first protector element by means of a screw connection.

9. The torso protector according to any one of the preceding claims, wherein the protector is made of an elastic material and comprises a rib structure and the second part is at least partially arranged between ribs of the rib structure and/or is attachable through the rib structure.

10. The torso protector according to any one of the preceding claims, wherein the first protector comprises two fastening elements.

11. The torso protector according to any one of the preceding claims, wherein the bag is arranged on the surface of the first protector element such that the first protector element prevents a direct contact between the bag and the back.

12. The torso protector according to any one of the preceding claims, wherein the inside of the bag comprises a net for secure storing.

13. The torso protector according to any one of the preceding claims, wherein the torso protector comprises a second protector element configured to be arranged on a chest of the person and to protect the chest.

14. The torso protector according to claim 13, comprising. a further fastening element for fastening the bag or a further bag on a surface of the second protector element, wherein the surface of the second protector element faces away from the chest, and wherein the further fastening element corresponds to the fastening element according to any one of the claims 1 to 8.

15. Use of a magnet-based fastening element in a torso protector according to any one of the claims 1 to 14, for fastening the bag to the first protection element and/or the second protection element.

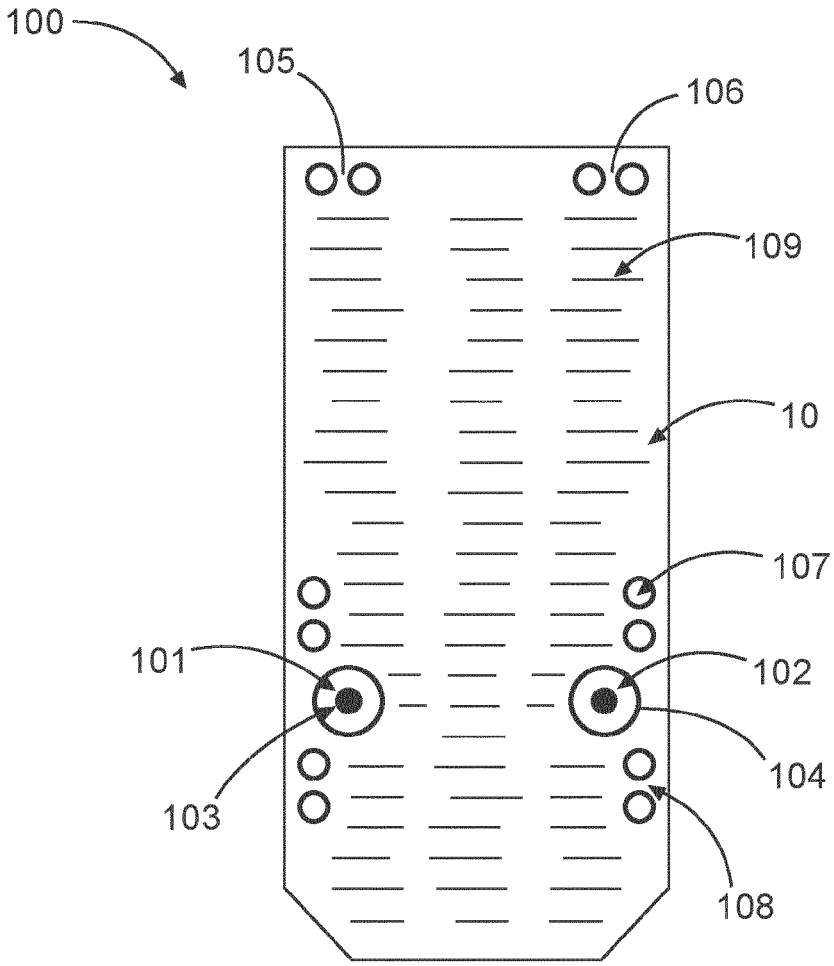

Figure 1

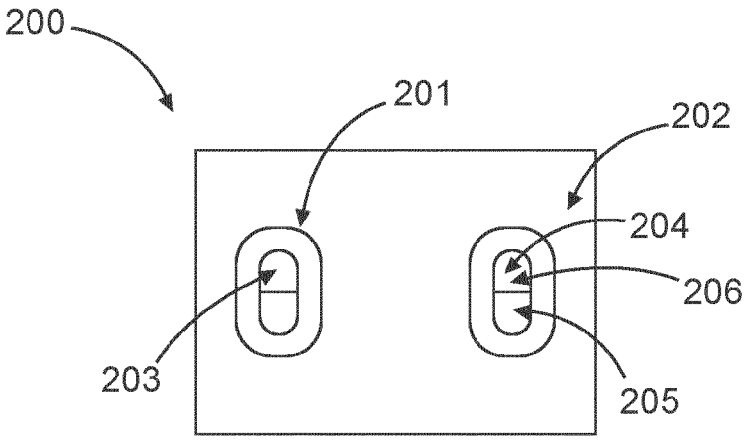

Figure 2

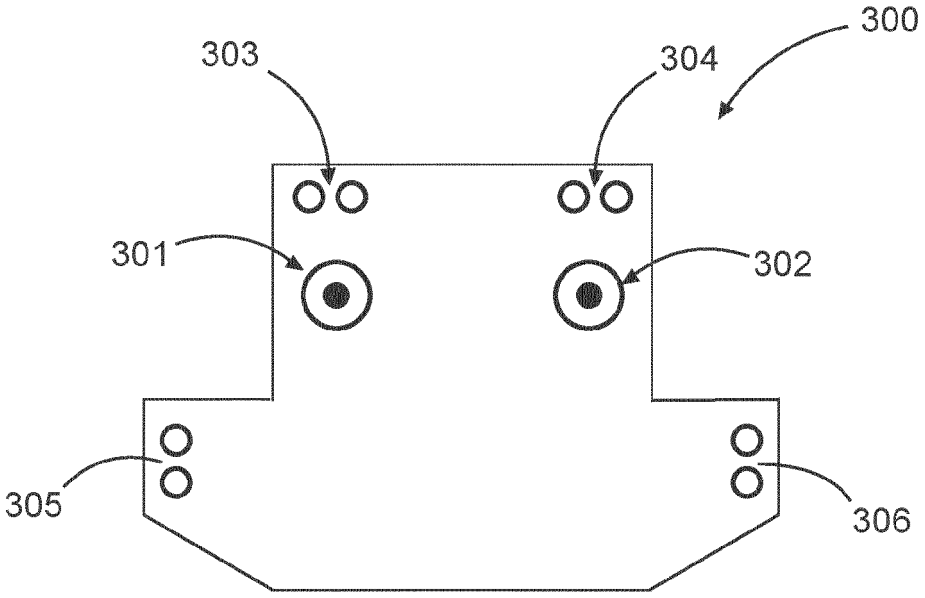

Figure 3

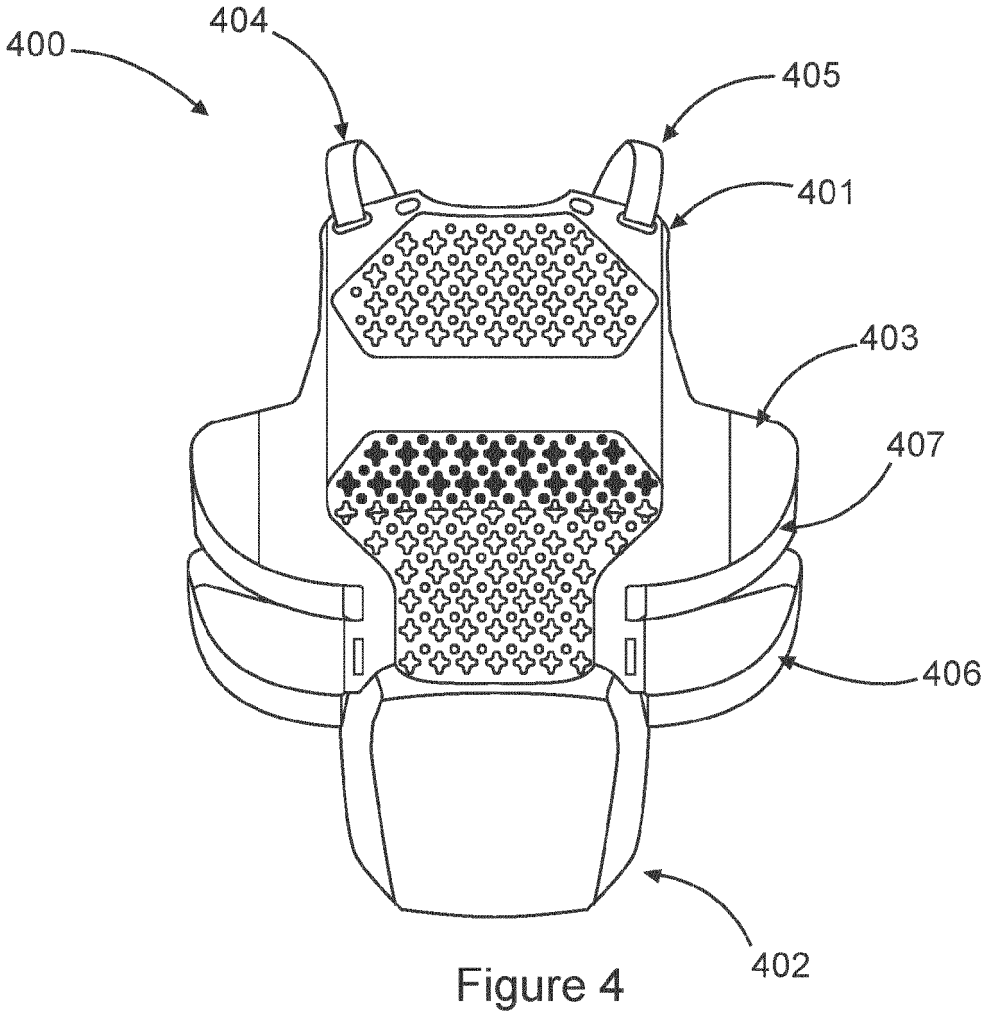

Figure 4

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EUROPEAN SEARCH REPORT

Application Number
EP 23 17 7779

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	EP 1 752 055 A2 (BODO MODEN VERTRIEBS GMBH [DE]) 14 February 2007 (2007-02-14) * paragraphs [0021], [0027], [0028]; figures * -----	1,3-7, 9-14 2,8,15	INV. A45F3/04 A41D13/05
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TECHNICAL FIELDS SEARCHED (IPC)

A45F
A41D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	24 October 2023	Gallego, Adoración

CATEGORY OF CITED DOCUMENTS

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24-10-2023

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