(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 354 157 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
01.08.2018 Bulletin 2018/31

(21) Application number: **18154278.8**

(22) Date of filing: **10.05.2011**

(51) Int Cl.:
A45F 3/04 *(2006.01)* ***A45F 3/08*** *(2006.01)*
A45F 3/12 *(2006.01)*

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **14.05.2010 GB 201008145**

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:
11165496.8 / 2 386 221

(71) Applicant: **Berghaus Limited**
London
W1U 3PH (GB)

(72) Inventors:
- **McGILL, Christian**
  London, Greater London N3 2QL (GB)
- **BRUCE, Euan**
  London, Greater London N3 2QL (GB)

(74) Representative: **Oxley, Rachel Louise et al**
Mewburn Ellis LLP
City Tower
40 Basinghall Street
London EC2V 5DE (GB)

Remarks:
This application was filed on 30.01.2018 as a divisional application to the application mentioned under INID code 62.

(54) RUCKSACK

(57) The present invention provides a rucksack comprising a back attachment system to be worn by a user and an enclosure mounted on the back attachment system for containing a load to be carried. A frame is attached to a back wall of the enclosure and shaped to hold the back wall of the enclosure away from the user's back to create an air gap. The frame comprises a pre-shaped panel.

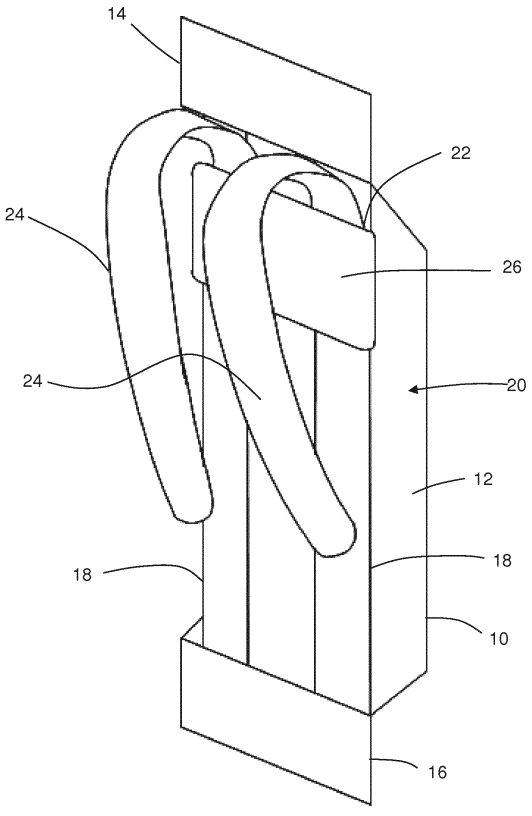


Fig. 1

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Description

[0001] This invention has to do with a rucksack (or backpack) for use e.g. by a hiker to carry a load e.g. when walking. The invention relates more particularly to rucksacks that are configured to provide a ventilation gap between the user's back and the rucksack when worn.

BACKGROUND

[0002] A conventional rucksack comprises a back attachment system to be worn by the user and a, typically flexible, enclosure mounted on the back attachment system for containing a load to be carried by a user. The back attachment system generally includes a pair of shoulder straps and a hip belt. Known rucksacks often have a frame supporting the back wall of the enclosure, to which the back attachment system is mounted. Upper ends of the shoulder straps are attached at or near the top of the frame and the hip belt at or near the bottom. A scapula pad can be provided at the top end, where the straps attach, to improve comfort and, similarly, the hip belt will typically be padded.

[0003] In some known rucksacks the upper ends of the shoulder straps or the scapula pad to which they are attached can be adjusted up or down the frame relative to the hip belt to change the length of the back adjustment system to fit more closely to the length of the user's back.

[0004] It is desirable to keep the centre of gravity of a load carried in the enclosure of the rucksack as close as possible to the user's back. However, where the back wall of the enclosure rests against or very close to the user's back it can result in excessive perspiration on the user's back, causing discomfort.

[0005] A number of systems have been developed to create a ventilation gap between the user's back and the back wall of the enclosure, such as Berghaus' "Freeflow"™ systems. These systems typically include resilient vertical frame members supporting the back wall of the rucksack enclosure, one to either side of the back wall, that are held in tension in an arc shape by an inelastic, air permeable mesh fabric panel connected between the top and bottom ends of the frame members. In such systems, the mesh panel contacts the wearer's back whilst the arc shape of the frame members holds the back wall of the rucksack enclosure away from the user's back to create a ventilation gap through which air can circulate.

[0006] Especially as the mesh panel that contacts the user's back is air permeable, such an arrangement can help keep the user's back cool and significantly reduce perspiration.

[0007] However, the arc shape of the frame means that the enclosure is spaced a significant distance from the user's back. This disadvantageously shifts the centre of gravity of a load in the enclosure further from the user, as well as impinging on the internal space of the enclosure.

[0008] Some rucksacks have sought to address this problem by replacing the tensioned, arc shaped frame members with pre-shaped, rigid frame members that are shaped to more closely conform the shape of the user's back to maintain a more uniform gap between the enclosure and the user's back. An example is described in GB-A-2413948. This keeps the centre of gravity closer to the user's back. However, the rigid frame members used in such rucksacks tend to be expensive as they must be made from strong but lightweight materials, so are typically reserved for "high end" rucksacks and have not been widely adopted.

[0009] A further disadvantage of known rucksacks with back ventilation systems is that they tend to be of fixed back length, so the fit cannot be optimised for users with different length backs. Mechanisms for enabling adjustment of the back length by attaching a scapula pad to the frame or back wall of the pack in an adjustable manner will tend to compromise the air gap between the back wall of the rucksack enclosure and the user's back.

SUMMARY OF INVENTION

[0010] In general terms the invention aims to provide a back system for a rucksack that provides, in combination, a ventilation gap and an adjustable back length. Preferred embodiments of the rucksack have an air gap with one or more mesh webs spanning the air gap from top to bottom and a scapula pad adjustably mounted on the one or more mesh webs. With this arrangement, because the back adjustment is provided by adjustment of the position of the scapula pad up and down the webs, the air gap is not compromised.

[0011] Some embodiments of the invention use a pre-shaped frame to form a low-profile air gap. In preferred embodiments this frame is a pre-shaped panel that extends across the full width (or nearly the full width) of the back wall of the enclosure. Such a panel can be made relatively inexpensively from a plastics material, e.g. by moulding. This concept can be used independently (i.e. without the adjustable back system) to provide a less expensive pack that nevertheless has the benefits associated with a low-profile air gap, namely less impingement on the internal space of the rucksack enclosure and a centre of gravity close to the user's back.

[0012] In a first aspect, the invention provides a rucksack comprising:

an enclosure for containing a load to be carried;
a frame attached to a back wall of the enclosure and shaped to hold the back wall of the enclosure away from the user's back to create an air gap;
one or more web elements extending from a top portion of the frame to a bottom portion of the frame across the air gap; and
a pair of shoulder straps with their top ends adjustably mounted on the web element(s) to be adjustable along the web element(s) between a first position

nearer the top of the frame and a second position nearer the bottom of the frame.

[0013] The top ends of the shoulder straps are preferably mounted on the web element (s) via a panel that engages with and is able to slide up and down the web element(s). The top ends of the shoulder straps can be attached to this sliding panel or be formed integrally with it. The sliding panel may be or incorporate one or more scapula pads.

[0014] The rucksack will typically also include a hip belt mounted in the region of the bottom end of the frame. The adjustment of the position of the top ends of the shoulder straps relative to the hip belt adjusts the back length of the rucksack.

[0015] By mounting the adjustable shoulder straps on web elements that span the air gap, the top ends of the straps and any e.g. scapula pad they are fixed to need not impinge on the air gap between the web elements and the back wall of the enclosure as they are adjusted. In this way, the back length of the rucksack can be adjusted without seriously compromising the air gap and the ventilation it provides.

[0016] Securing means are preferably provided to secure the shoulder straps in said first position and, alternatively, in said second position. Preferably the shoulder straps can also be secured in one or more positions intermediate the first position and the second position. The securing means may, for example, be a clip or clasp or other selectively releasable fixing element. In some embodiments, the securing means comprises two or more fixtures on the back wall of the enclosure and a complementary fixture joined to the shoulder straps that can selectively be engaged with one of the fixtures on the back wall. To adjust the back length, the complementary fixture on the shoulder straps can be disengaged from one fixture on the back wall of the enclosure, the straps adjusted up or down the web element(s) to a new position corresponding to another of the fixtures on the rear wall and the shoulder strap fixture then engaged in the back wall fixture at the new position. The fixtures on the back wall may be loops with the complementary fixture joined to the shoulder straps being a hook, or vice versa.

[0017] The or each web element is preferably constructed from an air permeable mesh fabric. In preferred embodiments there are two parallel web elements, one towards either side of the rucksack, laterally spaced apart from one another.

[0018] The frame may be formed by resilient frame members that are bent into a curved shape and held in tension by the web elements to maintain the air gap. More preferably, however, the frame is pre-shaped to define the air gap. Preferred embodiments of this aspect of the invention employ a pre-shaped frame in accordance with the second aspect of the invention below.

[0019] In a second aspect the invention provides a rucksack comprising:

a back attachment system to be worn by a user;
an enclosure mounted on the back attachment system for containing a load to be carried; and
a frame attached to a back wall of the enclosure and shaped to hold the back wall of the enclosure away from the user's back to create an air gap;
wherein the frame comprises a pre-shaped panel that preferably extends across substantially the full width of the back wall of the enclosure.

[0020] The back attachment system will typically comprise a pair of shoulder straps. It preferably also comprises a hip belt.

[0021] The panel can be pre-formed, during manufacture, to have the shape desired to create the air gap, so that in the assembled rucksack it does not need to be further bent and placed under tension to create the desired gap. By using a pre-shaped panel in this way, the air gap can be reliably maintained across the full width of the rucksack. The air gap can have a low-profile, preferably of substantially the same depth across a majority of the height and width of the back wall of the rucksack. This can keep a centre of gravity of a load in the enclosure close to the user's back and minimises the impingement of the frame on the internal space of the enclosure.

[0022] The pre-shaped panel may be formed of any suitable material but is preferably formed from a plastics material. This can provide a lightweight yet inexpensive alternative to the pre-bent metal rods that have previously been used.

[0023] The pre-shaped panel preferably has a generally flat central section and a bottom section that is bent to protrude forwardly (toward the user's back) of the central section. The panel may also have a top section that is bent to protrude forwardly of the panel. The lower forwardly protruding section is intended to be adjacent the user's lower lumbar region. Where the rucksack comprises a hip belt, it may be mounted on this lower protruding section of the frame. Top ends of the shoulder straps may be mounted in a fixed position adjacent the top protruding section of the frame, preferably at a lower edge of that protruding section, although in preferred embodiments the shoulder straps are adjustable, as discussed below.

[0024] The flat, central section of the pre-shaped panel is preferably at least 30% of the vertical extent of the panel and may be 40% or 50% or more of the vertical height of the panel. The top and bottom sections of the panel preferably protrude forwardly of the central section by at least 2cm (this being the approximate depth of the resultant air gap) and more preferably by about 3cm.

[0025] In other embodiments, the pre-shaped panel may have a continuously concave curved shape or other appropriate shape to create the desired air gap. Generally, the air gap will be at least 2cm deep and more preferably at least 3cm deep, although it is desirable that the air gap is not made too deep (e.g. no more than 10cm and more preferably no more that 5cm)

[0026] One or more air permeable mesh elements may extend generally vertically across the air gap. Such elements are intended to rest against the user's back to help maintain the spacing between the user's back and the back wall of the enclosure that is created by the shape of the frame.

[0027] The shoulder straps are preferably adjustable relative to the frame to adjust the back length of the rucksack. Top ends of the shoulder straps may, for example, be mounted on the pre-shaped panel (e.g. to edges of the panel) and adjustable thereon. In preferred embodiments of this aspect, the shoulder straps are adjustable in accordance with the first aspect above.

[0028] In a third aspect, the invention provides a rucksack comprising:

a back attachment system to be worn by a user;
an enclosure mounted on the back attachment system for containing a load to be carried; and
a frame attached to a back wall of the enclosure and pre-shaped to hold the back wall of the enclosure away from the user's back to create an air gap therebetween;
wherein the back attachment system comprises a pair of shoulder straps with their top ends adjustably mounted on the rucksack to be adjustable between a first position nearer the top of the frame and a second position nearer the bottom of the frame.

BRIEF DESCRIPTION OF FIGURES

[0029] An example is now described with reference to the accompanying drawings, in which:

Fig. 1 schematically illustrates the main concepts included in the back system of a rucksack in accordance with an embodiment of the invention;
Fig. 2 is a front view of the back (i.e. the side facing the user when worn) of a rucksack in accordance with an embodiment of the invention;
Fig. 3 is a front view of the shoulder harness part of the rucksack of fig. 2;
Fig. 4 is a rear view of the shoulder harness part of the rucksack of fig. 2;
Fig. 5 is a partial front view of the back of the rucksack of fig. 2 with the shoulder harness part removed; and
Fig. 6 is a side profile (along line A-A in fig. 2) of a moulded plastic, pre-shaped panel that forms the frame of the rucksack of fig. 2 ("S/S end" is the top or shoulder strap end and "H/B end" is the bottom or hip belt end of the frame).

DETAILED DESCRIPTION

[0030] Fig. 1 illustrates schematically the main concepts and constructional components embodied in the exemplary rucksack illustrated in the other figures and discussed below. The rucksack incorporates a pre-shaped frame 10, which in this example is a moulded plastic panel. This frame 10 supports the back wall of the load carrying enclosure of the rucksack and may be retained within a pocket in the back wall. It extends to substantially the full width of the rucksack back wall. The frame has a flat central section 12 and top and bottom sections 14, 16 that protrude forwardly (i.e. towards the user's back) of the central section.

[0031] Two air permeable mesh web elements 18 extend from the top section 14 of the frame to the bottom section 16 of the frame. By virtue of the pre-formed shape of the frame 10, the mesh elements 18 are spaced forwardly of the central section 12 of the frame 10. When the rucksack is on a user's back, the mesh elements 18 rest against the user's back and the central section 12 of the frame 10 holds the back wall of the rucksack enclosure away from their back. An air gap 20 between the mesh elements 18 and the central section 12 of the frame (corresponding to the back wall of the rucksack), allows air to circulate between the user's back and the rucksack enclosure.

[0032] The upper ends 22 of two shoulder straps 24 are fixed to a scapula pad 26. The scapula pad 26 is mounted on the two mesh elements 18 and can slide up and down these elements to adjust the position of the top ends 22 of the straps 24 to be more or less spaced from the bottom section 16 of the frame 10 to adjust the effective length of the back of the rucksack.

[0033] Figs. 2 to 5 show views of a rucksack incorporating the conceptual and constructional features schematically shown in fig. 1. Thus, looking at fig. 2, the rucksack has a frame (not shown) that is a pre-shaped moulded plastic panel, retained within a pocket in the back wall 30 of the rucksack.

[0034] Two generally parallel air permeable mesh fabric strips 18 (seen best in fig. 5) extend from a top end of the back wall 30 to a bottom end, spanning a ventilation air gap that is formed by the shape that the frame gives to the back wall 30.

[0035] The rucksack includes a hip belt 32 at the lower end of the back wall 30 and a shoulder harness arrangement 34 towards the top end of the back wall 30. The shoulder harness arrangement 34 includes a scapula pad 26 and two shoulder straps 24. The scapula pad 26 is slidably mounted on the mesh strips 18 to allow the position of the scapula pad 26, and hence the top ends of the shoulder straps 24, to be adjusted relative to the hip belt 32, thus altering the back length of the rucksack.

[0036] In more detail, with reference in particular to figs 3 to 5, a rear side of the scapula pad 26 (see fig. 4) has two fabric patches 40 affixed thereto, one to either side of the pad 26. These patches are joined to the rear side of the scapula pads at their side edges only, so that they form tunnels on the rear side of the scapula pad 26 through which respective ones of the mesh strips 18 can pass top to bottom. The scapula pad is thereby retained on the mesh strips 18 but is free to slide up and down them.

[0037] The scapula pad 26 can be secured in any of a number of positions along the mesh strips 18 by a hook or buckle 50 on the scapula pad 26 that can be selectively engaged with a selected one of a series of loops 52 formed on the rear wall 30 of the rucksack enclosure. In this example, the hook 50 is attached to, and hangs down from, the rear face of the scapula pad 26 by a webbing loop 56.

[0038] In this example, as best seen in fig. 5, there are five loops, corresponding to five possible positions for the scapula pad 26, providing a corresponding five possible back lengths for the rucksack. The loops 52 are formed by a strip of fabric 54 that is secured at vertically spaced apart horizontal regions to the back wall 30 so that the fabric between the secured regions stands out from the back wall 30 to form the loops 52.

[0039] To adjust the position of the scapula pad 26, the hook 50 is disengaged from the loop 52 it is currently engaged in, the scapula pad is slid up (or down) the mesh strips 18 to the desired new position, in which the hook 50 can be engaged with another of the loops 52.

[0040] To aid the support of the shoulder straps in the desired position, length adjustable top tension straps 58 may connect a mid portion of each shoulder strap 24 to the back wall of the rucksack above the highest position possible for the scapula pad 26. These straps 58 can be lengthened when the scapula pad 26 is moved down (to shorten the back length) and shortened when the scapula pad 26 is moved up the back of the rucksack (to increase the back length).

[0041] In the illustrated example, the length of the shoulder straps is also itself adjustable using adjusters 60 at the lower end of each strap and a chest strap 62 is provided to help keep the shoulder straps sitting correctly on the shoulders in use.

[0042] Fig. 6 shows a side profile of the moulded plastic board or panel used as the frame of the rucksack. The panel has a flat central section 12 and top and bottom sections 14, 16 that protrude forwardly (towards the user's back) of the central section 10 by about 3cm to form the air gap 20. At the transition between the central section 12 and the top section 14, the panel is bent along a first fold line 70, there is then a further straight section 72 followed by a second bend at a second fold line 74, which defines the forward-most extent of the panel. The bottom section 16 is shaped in a similar fashion. The panel has this same section across its complete width, which corresponds generally to the width of the back wall of the rucksack.

[0043] The skilled person will appreciate that various modifications to the specifically described embodiment are possible without departing from the invention.

[0044] The following numbered paragraphs (paras.) contain statements of broad combinations of the inventive technical features herein disclosed:-

1. A rucksack comprising:

an enclosure for containing a load to be carried;
a frame attached to a back wall of the enclosure and shaped to hold the back wall of the enclosure away from the user's back to create an air gap;
one or more web elements extending from a top portion of the frame to a bottom portion of the frame across the air gap; and
a pair of shoulder straps with their top ends adjustably mounted on the web element(s) to be adjustable along the web element(s) between a first position nearer the top of the frame and a second position nearer the bottom of the frame.

2. A rucksack according to paragraph 1, wherein the top ends of the shoulder straps are mounted on the web element(s) via a panel that engages with and is able to slide up and down the web element(s).

3. A rucksack according to any one of the preceding paragraphs, including a hip belt mounted in the region of the bottom end of the frame, wherein adjustment of the position of the top ends of the shoulder straps relative to the hip belt adjusts the back length of the rucksack.

4. A rucksack according to any one of the preceding paragraphs, wherein the shoulder straps can be secured in one or more positions intermediate the first position and the second position.

5. A rucksack according to any one of the preceding paragraphs, wherein the or each web element is constructed from an air permeable mesh fabric.

6. A rucksack according to any one of the preceding paragraphs, comprising two parallel web elements, one towards either side of the rucksack, laterally spaced apart from one another.

7. A rucksack according to any one of the preceding paragraphs, wherein the frame is pre-shaped to define the air gap.

8. A rucksack according to any one of the preceding paragraphs, wherein the frame comprises a pre-shaped panel.

9. A rucksack according to paragraph 8, wherein the pre-shaped panel extends across substantially the full width of the back wall of the enclosure.

10. A rucksack according to paragraph 8 or paragraph 9, wherein the panel is pre-formed, during manufacture, to have the shape desired to create the air gap.

11. A rucksack according to any one of paragraphs

8 to 10, wherein the pre-shaped panel is formed from a plastics material.

12. A rucksack according to any one of paragraphs 8 to 11, wherein the pre-shaped panel has a generally flat central section and a bottom section that is bent to protrude forwardly of the central section.

13. A rucksack according to paragraph 12, wherein the panel also has a top section that is bent to protrude forwardly of the panel.

14. A rucksack according to paragraph 12 or paragraph 13, wherein the flat, central section of the pre-shaped panel is at least 30% of the vertical extent of the panel.

15. A rucksack according to any one of paragraphs 12 to 14, wherein the top section of the panel protrudes forwardly of the central section by at least 2cm.

Claims

1. A rucksack comprising:

a back attachment system to be worn by a user;
an enclosure mounted on the back attachment system for containing a load to be carried; and
a frame attached to a back wall of the enclosure and shaped to hold the back wall of the enclosure away from the user's back to create an air gap;
wherein the frame comprises a pre-shaped panel.

2. A rucksack according to claim 1 wherein the pre-shaped panel extends across substantially the full width of the back wall of the enclosure.

3. A rucksack according to claim 1 or 2 wherein the pre-shaped panel comprises a generally flat central section and a bottom section that is bent to protrude forwardly of the central section.

4. A rucksack according to claim 3 wherein the central section is at least 30% of the vertical extent of the panel.

5. A rucksack according to claim 3 or 4 wherein the bottom section of the panel protrudes forwardly of the central section by at least 3cm.

6. A rucksack according to any one of claims 3 to 5 further comprising a hip belt mounted on the bottom section of the frame.

7. A rucksack according to any one of claims 3 to 6 wherein the panel further comprises a top section that is bent to protrude forwardly of the panel.

8. A rucksack according to claim 7 wherein the top section of the panel protrudes forwardly of the central section by at least 3cm.

9. A rucksack according to claim 7 or 8 wherein the back attachment system comprises a pair of shoulder straps with their top ends mounted in a fixed position adjacent the top section of the panel.

10. A rucksack according to any one of claims 1 to 8 wherein the back attachment system comprises a pair of shoulder straps with their top ends adjustably mounted on the rucksack to be adjustable between a first position nearer the top of the frame and a second position nearer the bottom of the frame.

11. A rucksack according to claim 1 or 2 wherein the pre-shaped panel has a continuously concave curved shape.

12. A rucksack according to any one of the preceding claim further comprising one or more air permeable mesh elements extending generally vertically across the air gap.

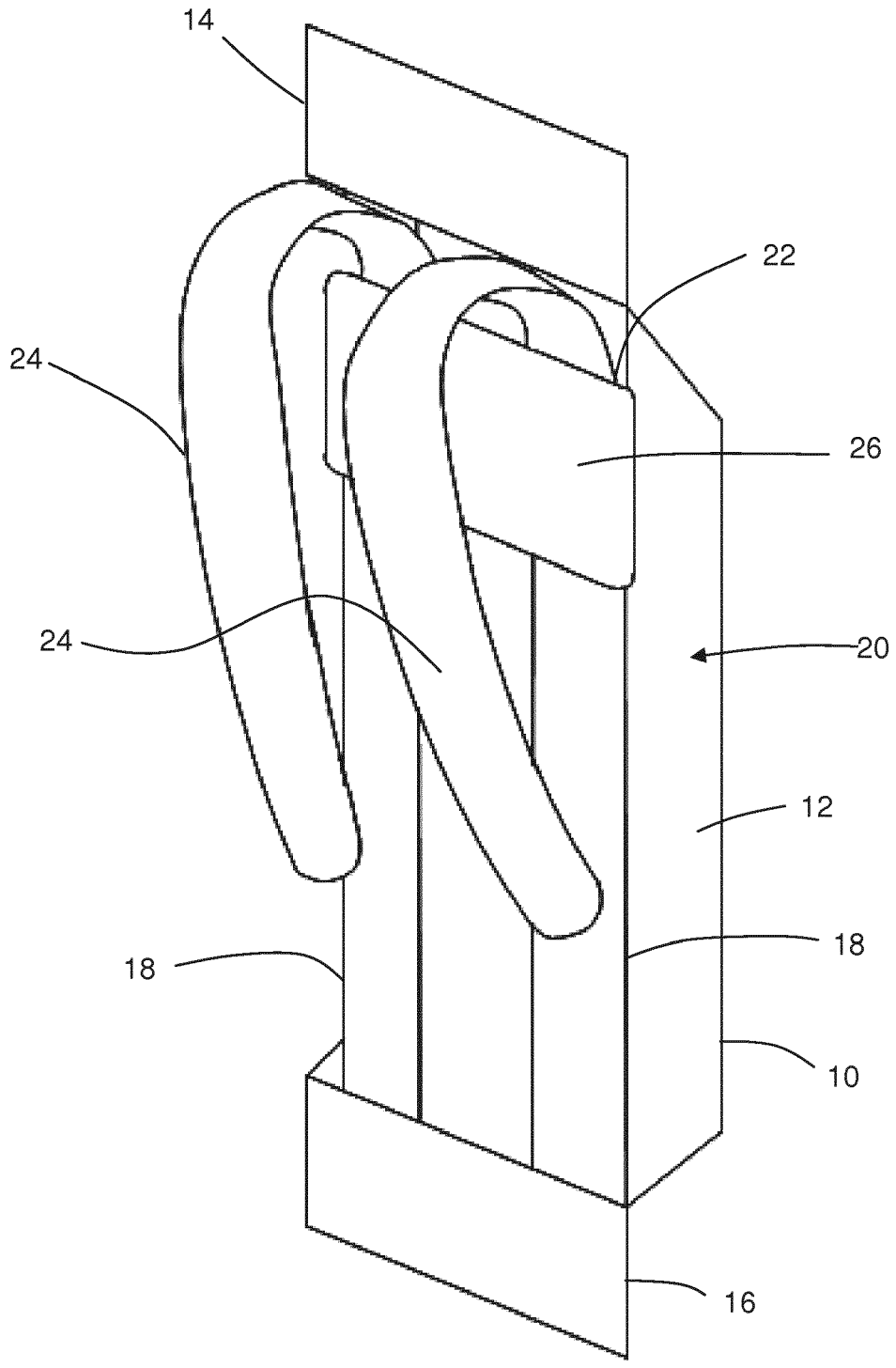


Fig. 1

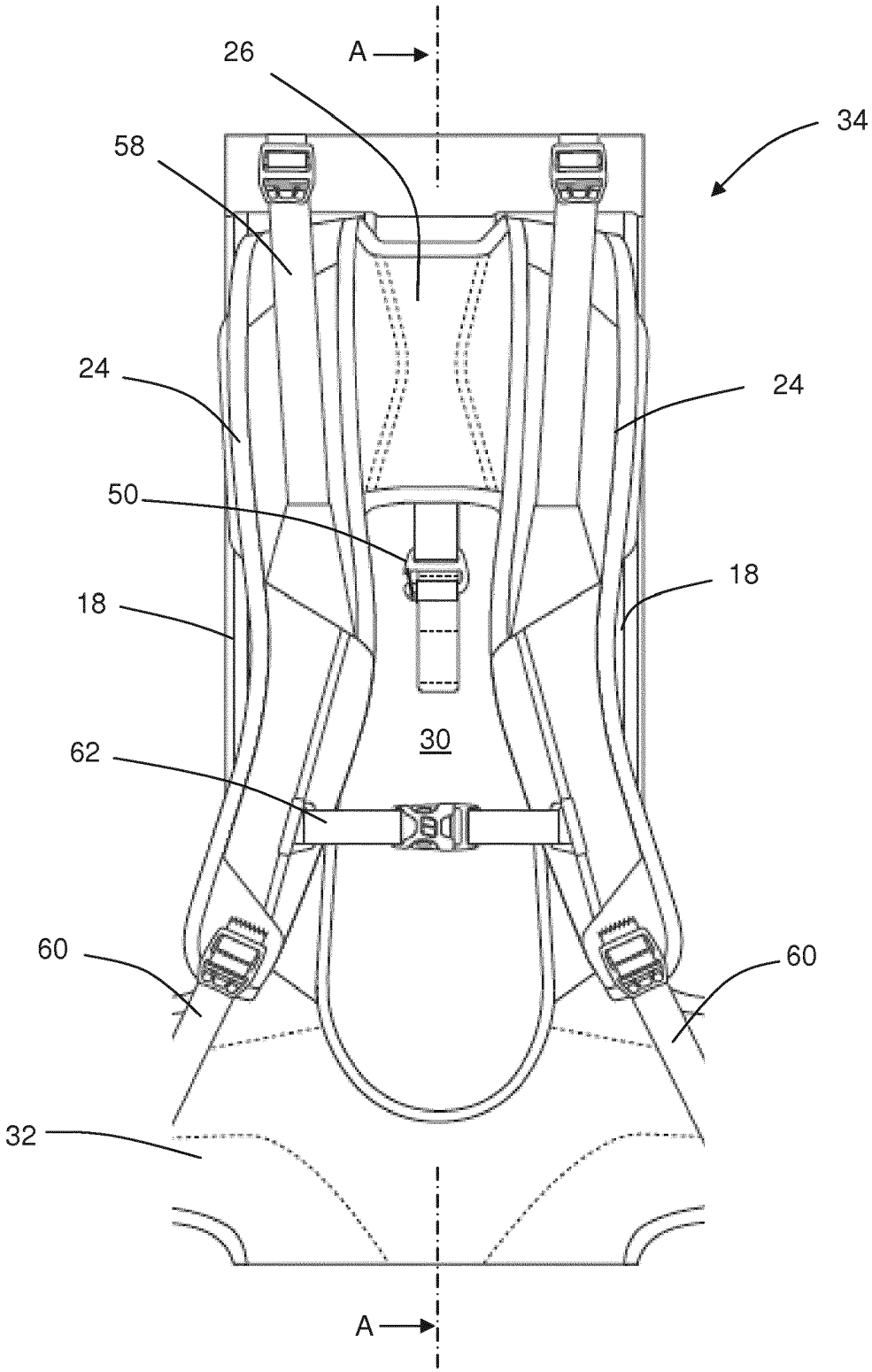


Fig. 2

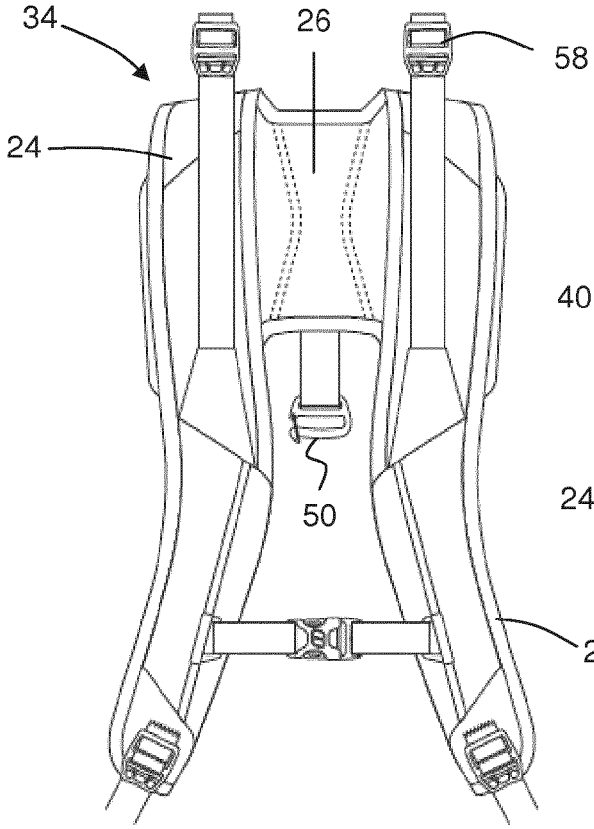


Fig. 3

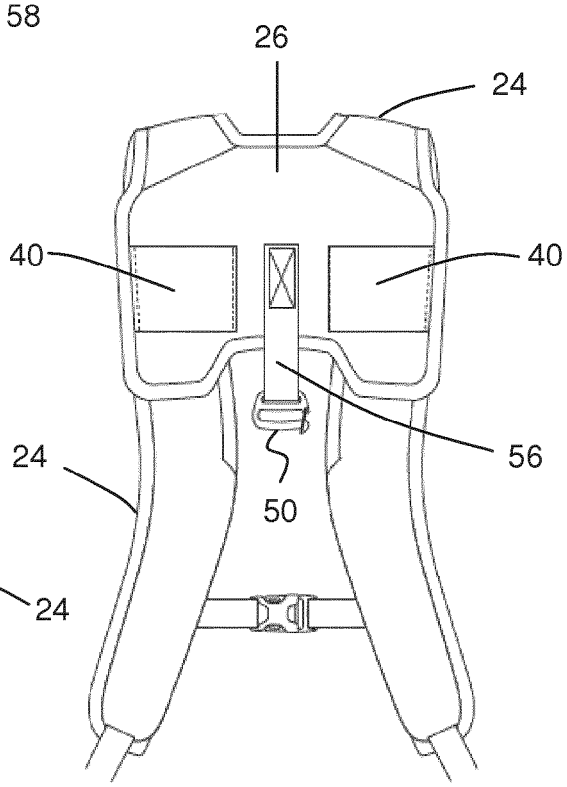


Fig. 4

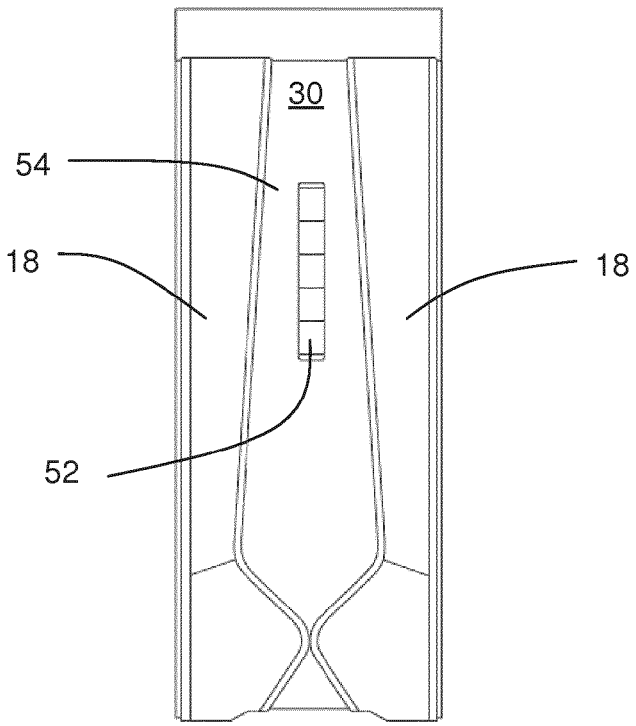


Fig. 5

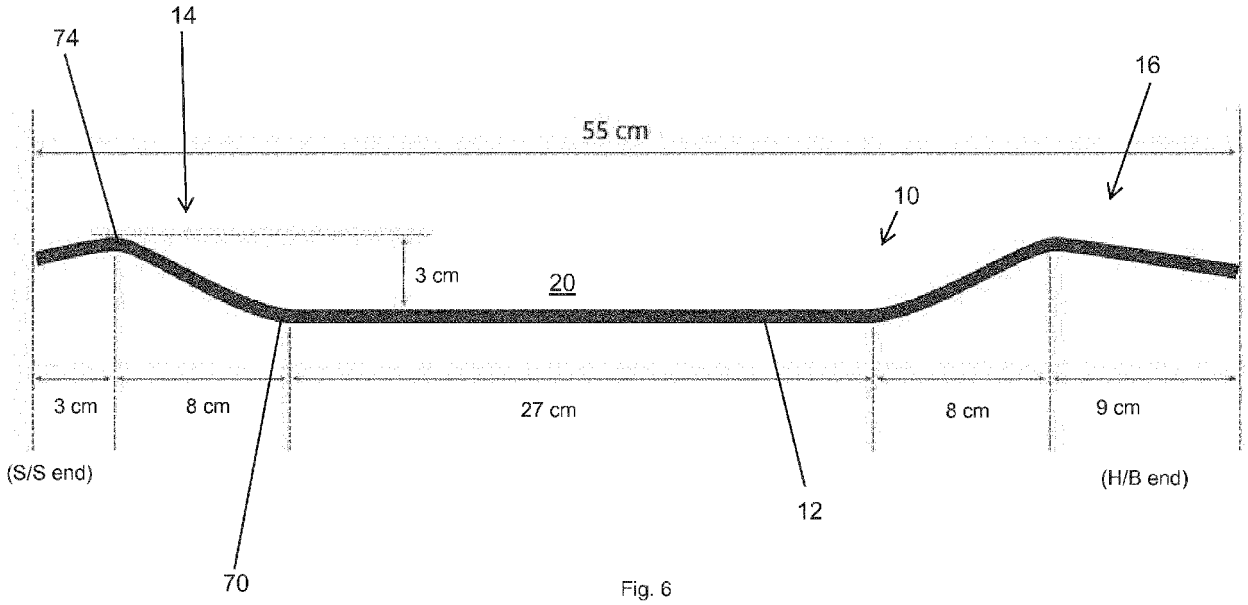


Fig. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 18 15 4278

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC) A45F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	11 June 2018	Ionescu, C

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 18 15 4278

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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