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(54) **BACKPACK HAVING A VERTICAL HOLDING FRAME AND A SUPPORT COVER**

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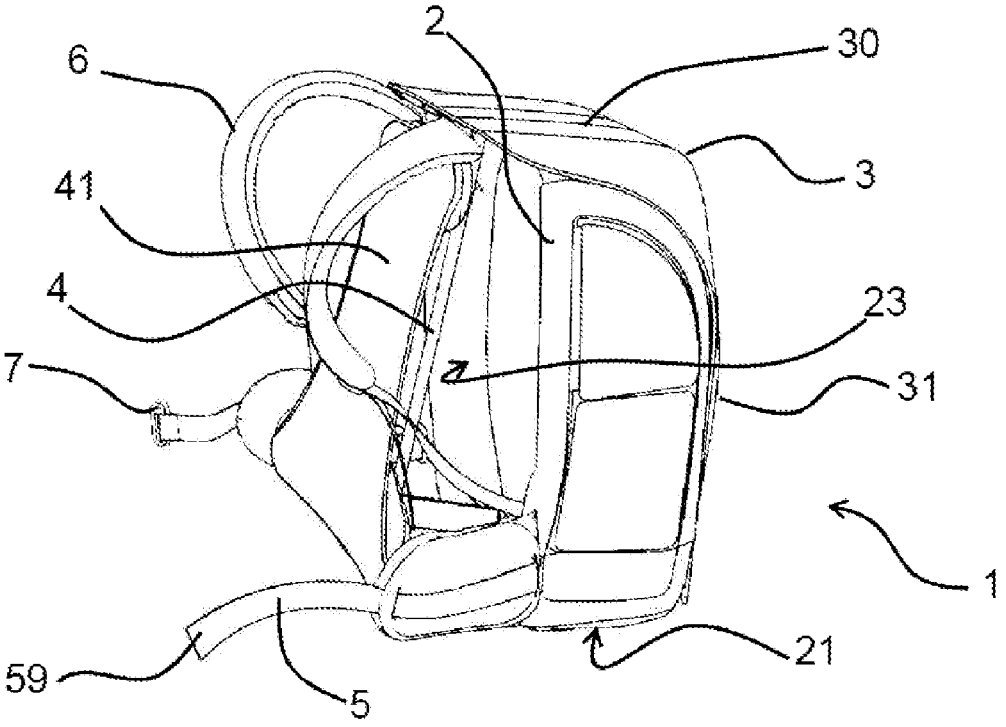
(57) **ABSTRACT**

Some embodiments are directed to a backpack comprising a storage envelope with shoulder straps, a rigid cover covering the top of the envelope, a fixed frame secured to the cover and comprising at least one lower bearing surface, a movable frame that is articulated to the cover or to the fixed frame, with a lower bearing surface and that is able to move between a stowed position and a deployed position, the frames being arranged such that, in the deployed position, the lower bearing surfaces are arranged around the envelope such that the backpack can be placed stably on these lower bearing surfaces, the frames forming the support for the cover.



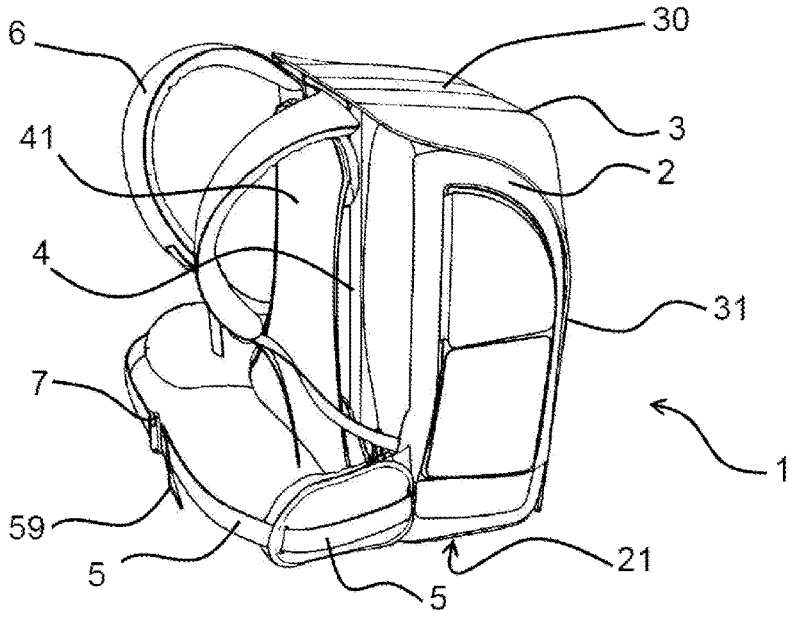


Fig. 1

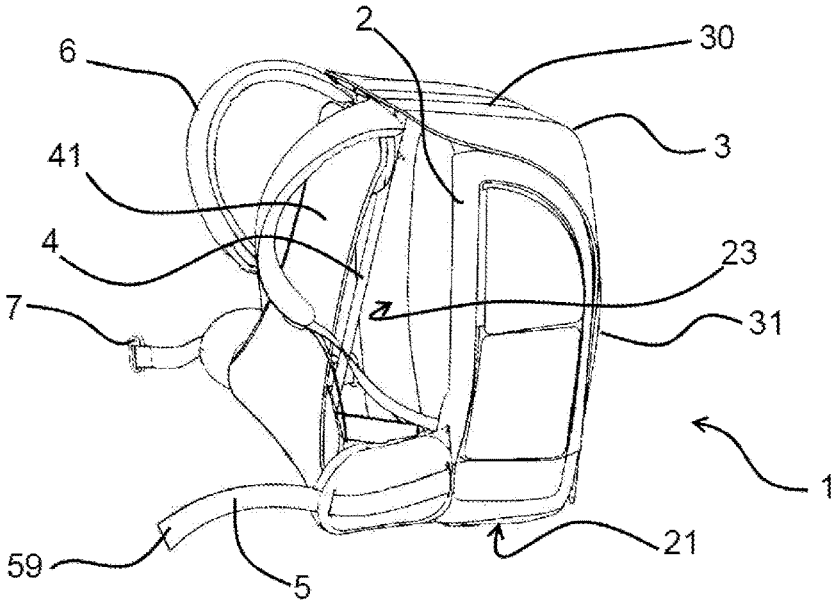


Fig. 2

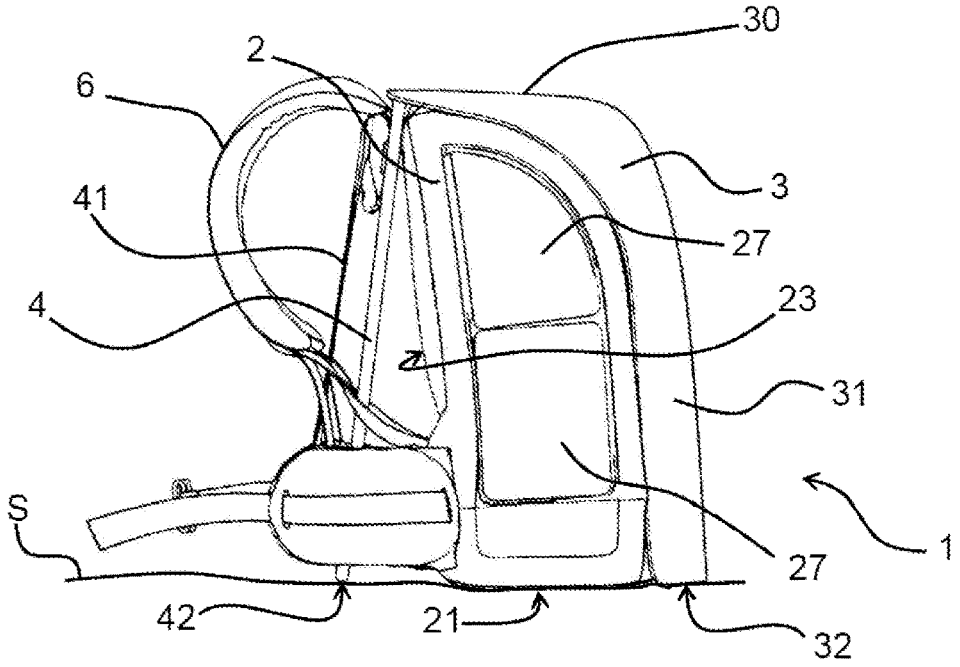
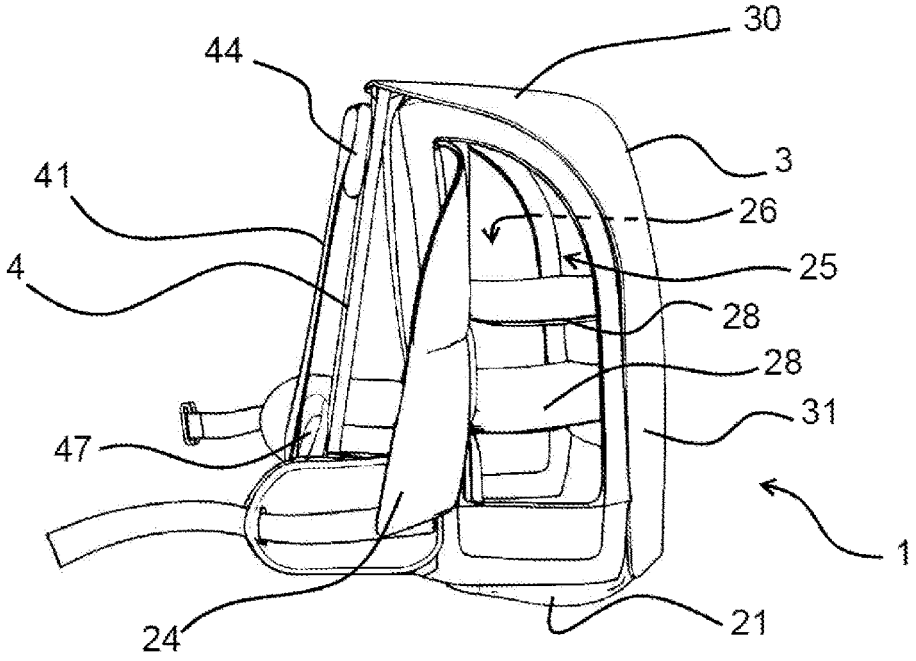


Fig. 3



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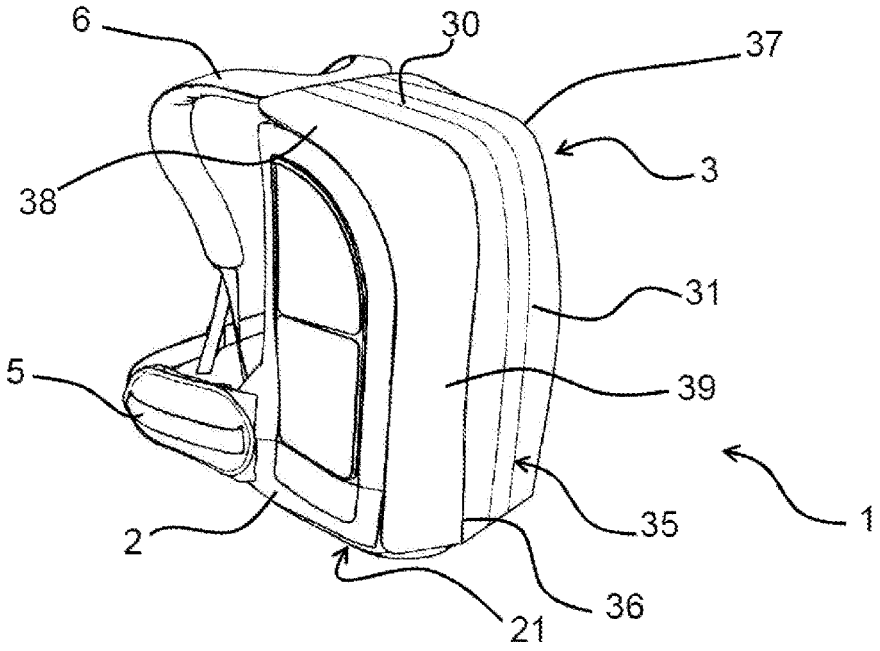
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Fig. 5

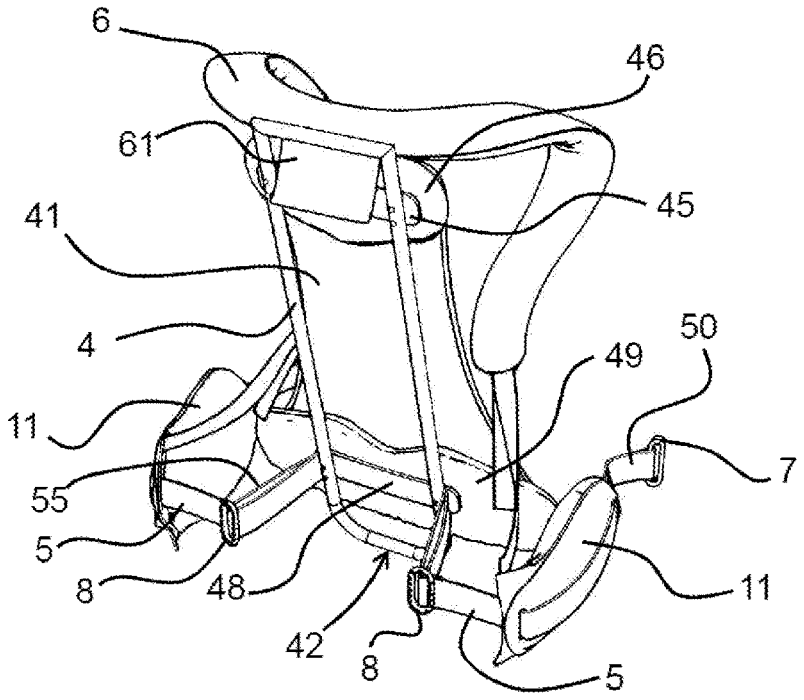
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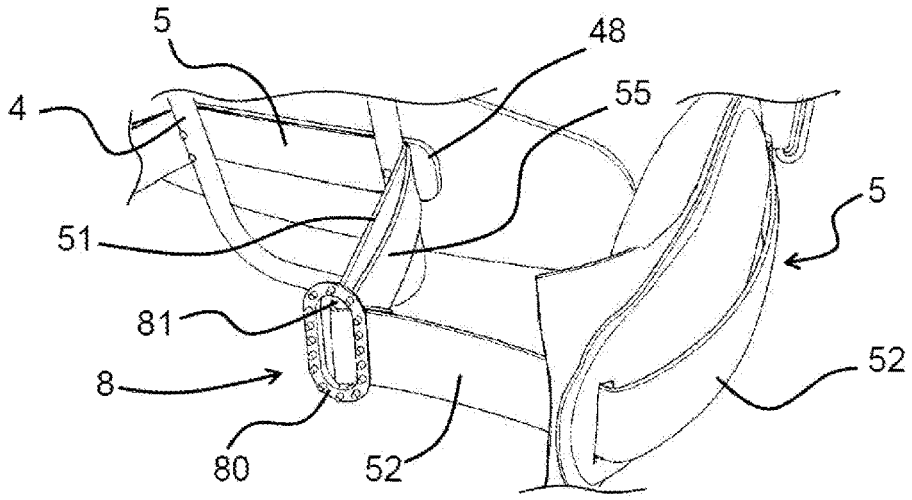
Fig. 6



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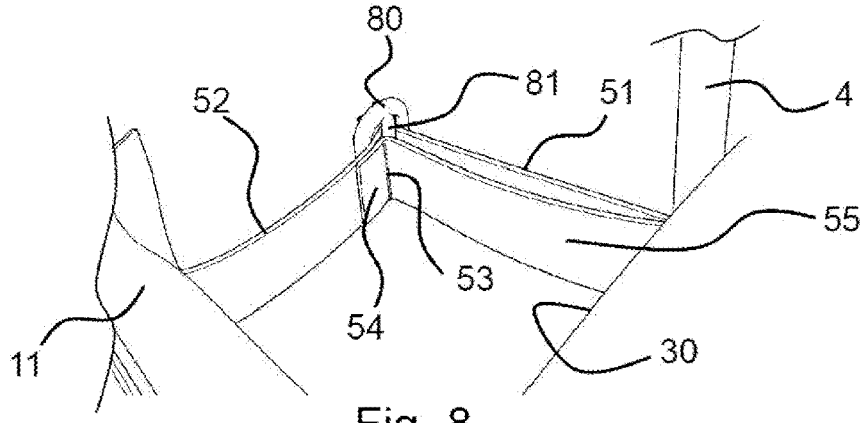
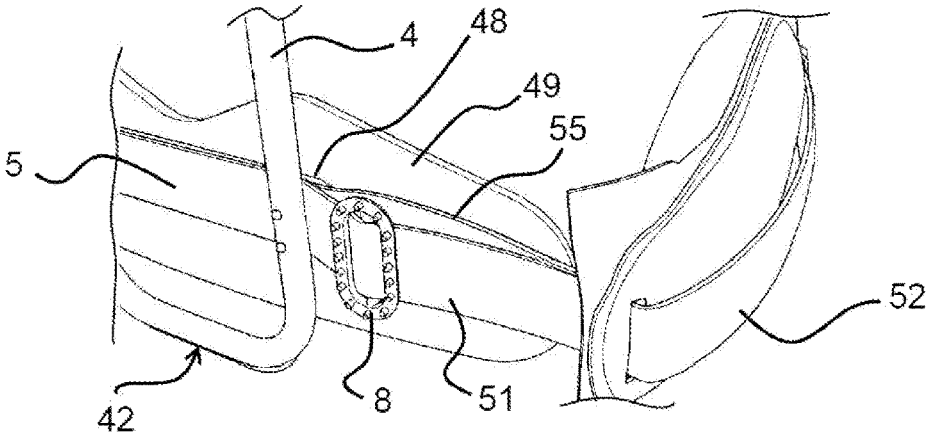


Fig. 8



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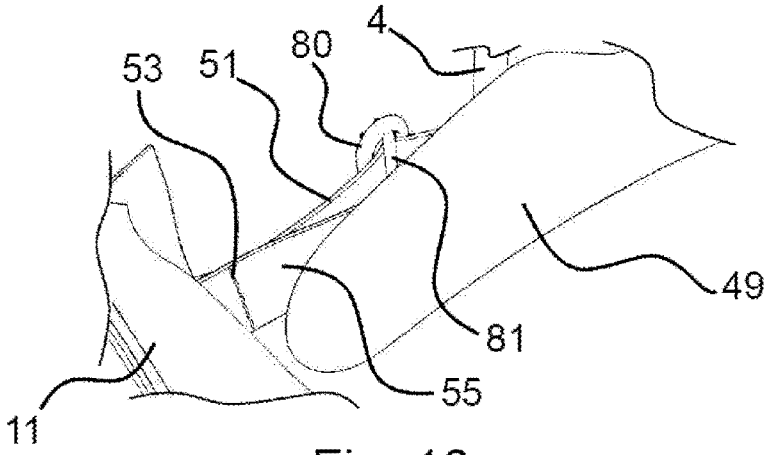


Fig. 10

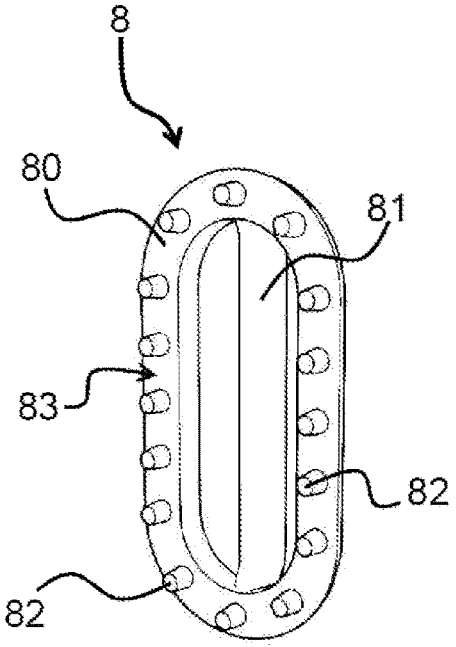
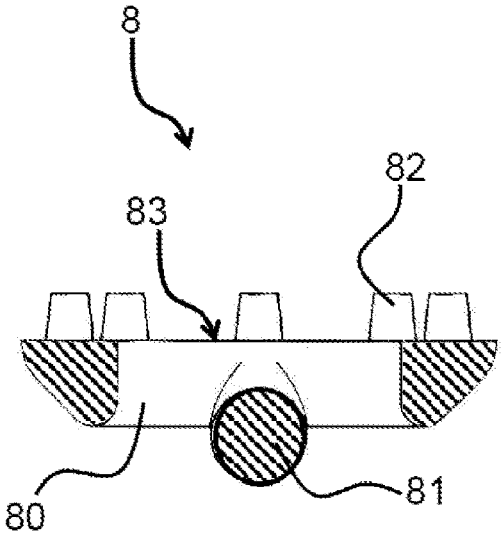


Fig. 11



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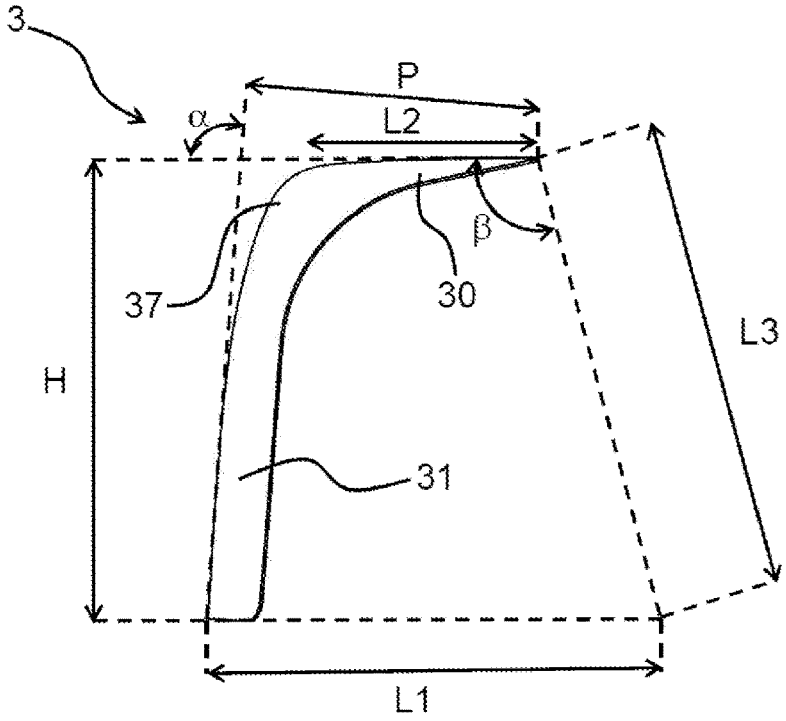

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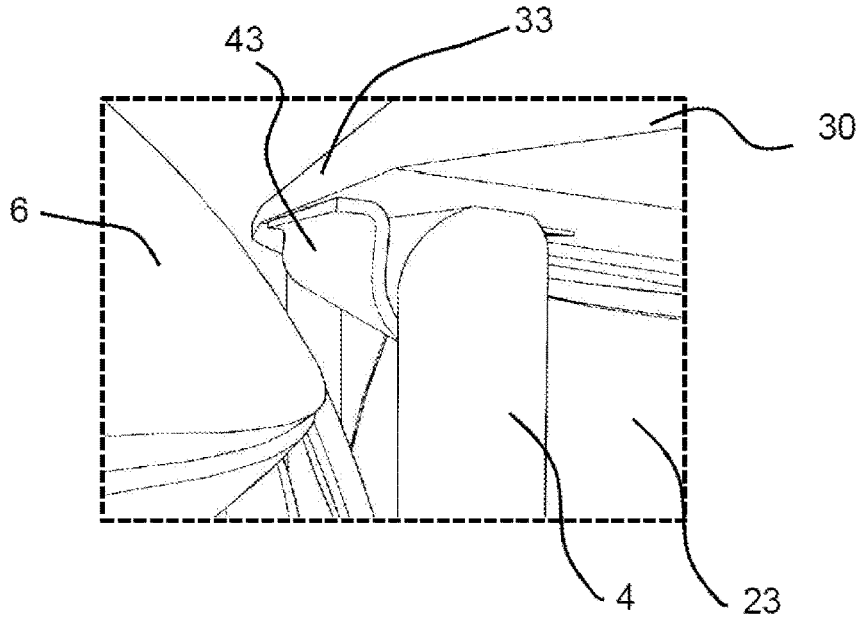


Fig. 14

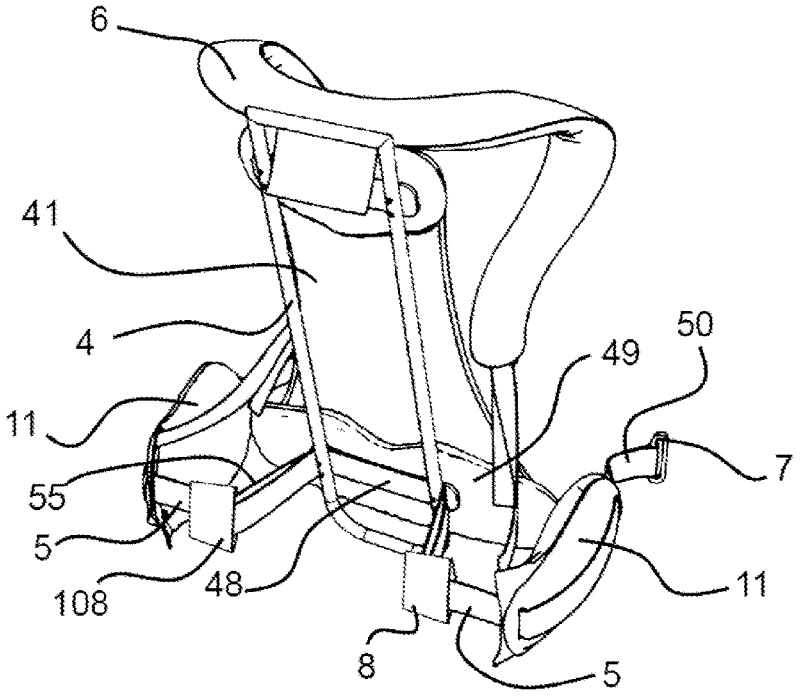


Fig. 15

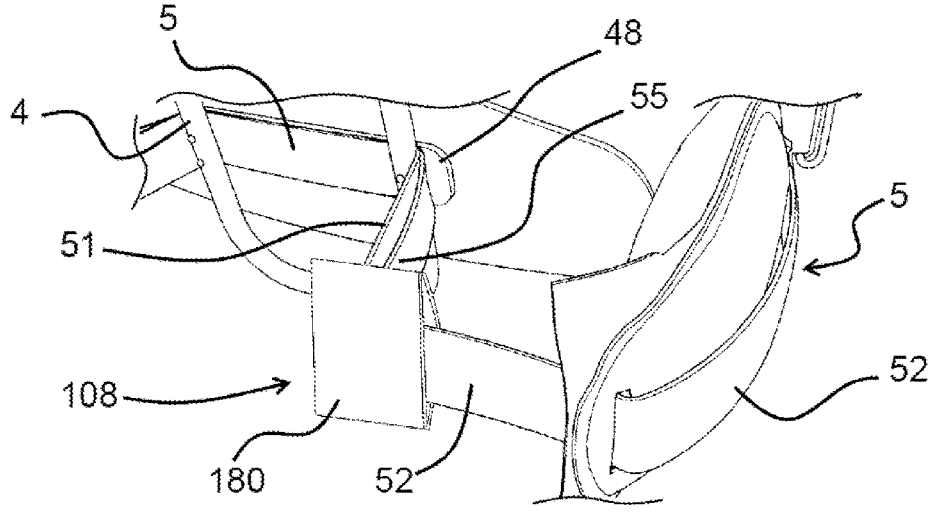
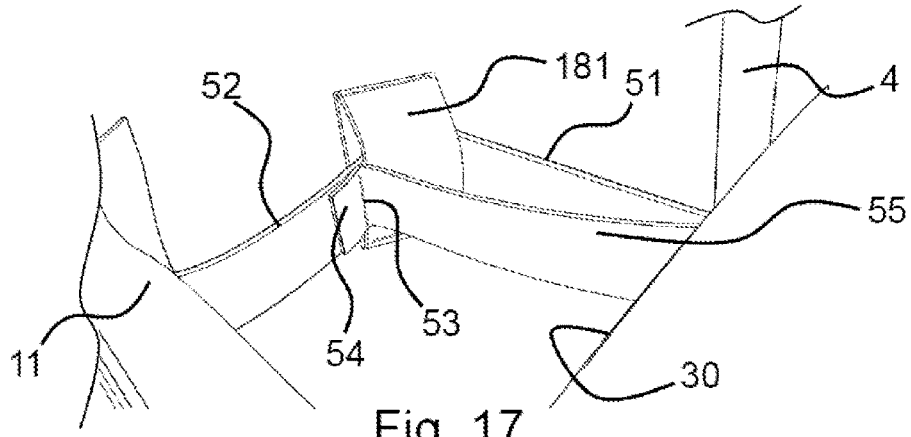


Fig. 16



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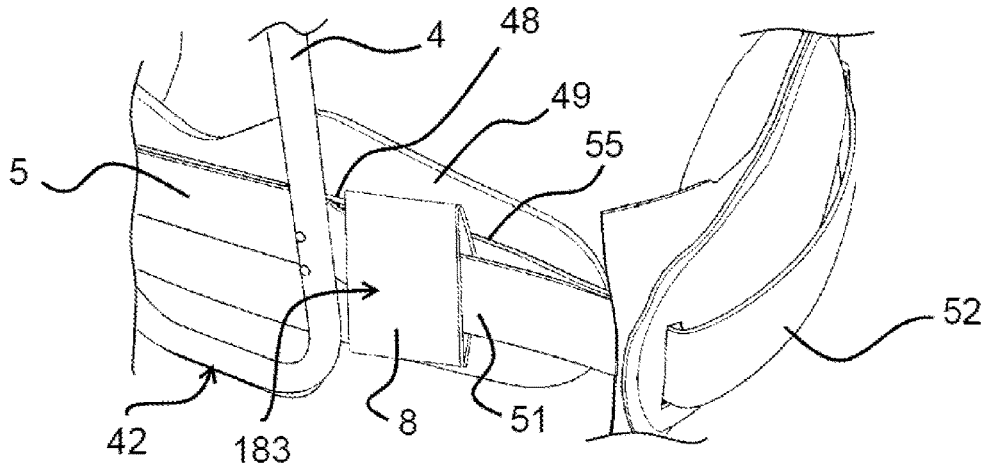

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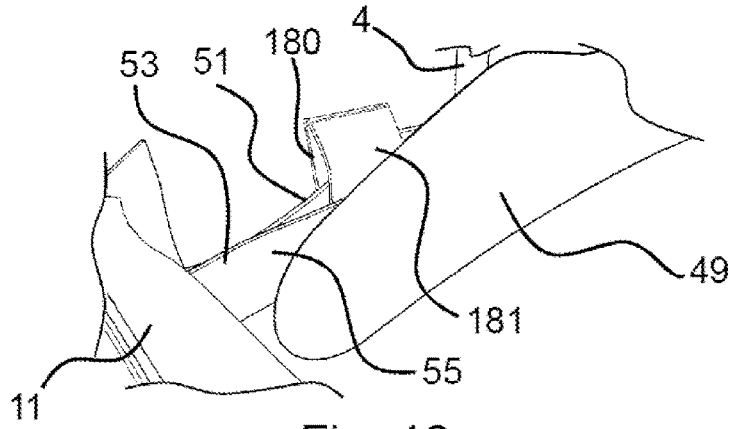

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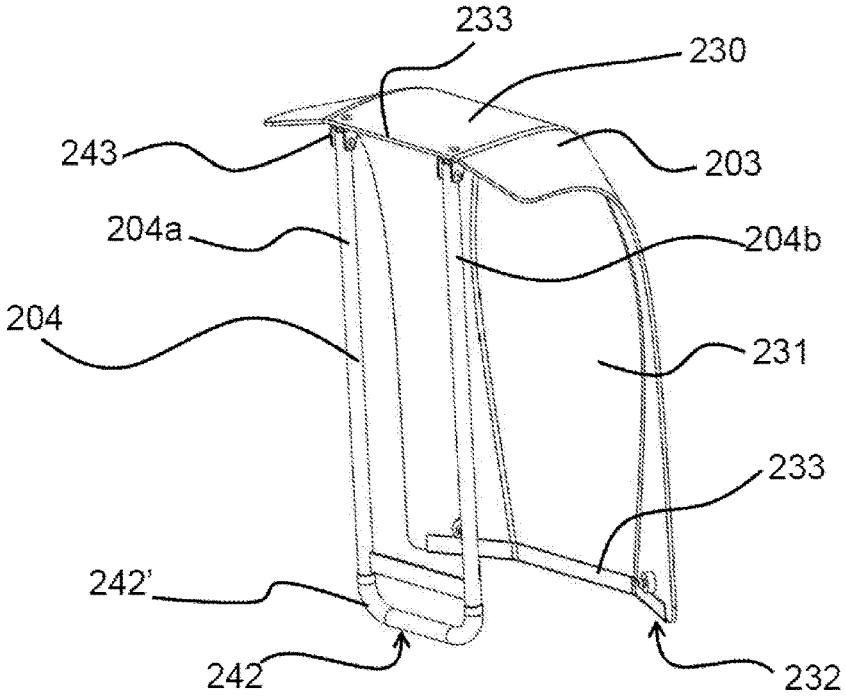
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Fig. 20

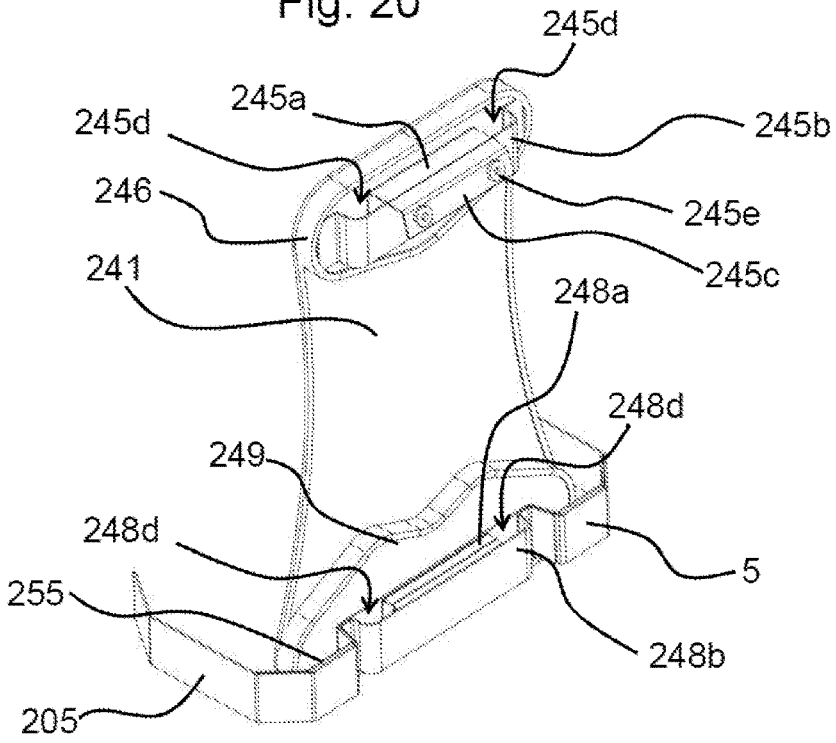
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Fig. 21

BACKPACK HAVING A VERTICAL HOLDING FRAME AND A SUPPORT COVER

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is a national phase filing under 35 C.F.R. § 371 of and claims priority to International Patent Application No. PCT/FR2017/052125, filed on Jul. 21, 2017, which claims the priority benefit under 35 U.S.C. § 119 of French Application No. 1657525, filed on Aug. 3, 2016, the contents of which are hereby incorporated in their entireties by reference.

BACKGROUND

[0002] Some embodiments relate to the field of backpacks. More particularly, some embodiments relate to a backpack having a frame that allows it, once placed on the ground, to remain vertical and form a support.

[0003] The document US2014/0076942A1 describes a backpack including a frame that is fixed with respect to a storage envelope. This frame includes a base at the bottom and a panel at the top, the rear side of the base and the rear side of the panel being connected by two struts. The backpack can thus rest vertically on its base, the panel forming a seat. However, the significant overhang between the panel and the struts, the structure of the base, and the surface delimited between the bars of the base, result in low stability of the assembly and require relatively flat ground.

SUMMARY

[0004] The technical problem to be solved by some embodiments are therefore that of improving or enhancing a backpack that makes it possible to realize a support while giving it greater stability, especially in the case of uneven ground.

[0005] To this end, some embodiments are directed to a backpack including:

- [0006] a storage envelope having a bottom and a top,
- [0007] shoulder straps at the front of the storage envelope,
- [0008] a rigid cover covering the top of the envelope,
- [0009] a fixed frame that is fastened to the cover and includes at least one lower bearing surface, known as the fixed lower bearing surface,
- [0010] a movable frame hinged to the cover or to the fixed frame, including a lower bearing surface, known as the movable lower bearing surface, the movable frame being movable between
  - [0011] a stowed position against the assembly formed by the storage envelope, the cover and the fixed frame, and
  - [0012] a deployed position in which the movable lower bearing surface is at a distance from the envelope,

the frames being arranged such that, in the deployed position, the lower bearing surfaces are arranged around the storage envelope such that the backpack can be placed in a balanced manner on these lower bearing surfaces, the frames forming the support for the cover.

[0013] Thus, when the backpack is placed on the ground with the movable frame in the deployed position and on the lower bearing surfaces, the area delimited between the lower bearing surfaces is wider than the bottom of the storage envelope, since the movable lower bearing surface is at a distance from this envelope. The backpack is thus more stable and maintained vertically.

[0014] Moreover, by having an area delimited between the wider lower bearing surfaces, any unevenness of the ground has less impact on the balanced state of the backpack.

[0015] Furthermore, the cover forms a support, for example for setting down objects, or for sitting down.

[0016] Note that the fixed frame is the to be fixed because it is not movable with respect to the storage envelope.

[0017] Some embodiments may optionally have one or more of the following features:

- [0018] the fixed lower bearing surface is situated at the bottom and the rear of the backpack, and, in the deployed position, the movable lower bearing surface is situated at the bottom and the front of the backpack; thus, the movable frame is less bulky when against the user's back;
- [0019] the frames and the cover are arranged such that the cover forms a seat when the backpack is placed in a balanced manner on the lower bearing surfaces; this allows the user to rest by placing his backpack on the ground and sitting on the cover, without needing to carry an additional chair;
- [0020] the movable frame is hinged to a front edge of the cover; this makes it easier to produce the backpack;
- [0021] the fixed frame and the cover form a single one-piece part; this makes it easier to produce the cover and its support and improves its strength;
- [0022] the one-piece part may be formed by a shell, this shell having an upper portion forming the cover and a lower portion forming the fixed frame, the lower portion covering the rear of the storage envelope; the shell thus also forms protection for the rear of the backpack, especially with respect to impacts;
- [0023] the outer surface of the upper portion and the outer surface of the lower portion are smooth; this allows the user to walk bent over under branches, allowing the latter to slide over the shell;
- [0024] the lower portion and/or the upper portion include lateral returns at least partially covering the sides of the storage envelope; these returns make it possible to reinforce the upper portion and/or the lower portion; moreover, this also makes it possible to spread the branches better to the side when walking bent over;
- [0025] the cover is arranged so as to be inclined with respect to the bottom of the storage envelope, the cover approaching the bottom of the storage envelope in a direction from the front to the rear of this storage envelope; this makes it possible to have a less inclined cover when the backpack is placed on the ground in the deployed position; for example, the frames and the cover can be arranged such that, when the movable frame is in the deployed position and when the backpack is placed in a balanced state on the lower bearing surfaces, the cover has a horizontal flat receiving part, thereby making it easier to sit down or to set down a measuring instrument or a camera; the receiving part can represent the greater part of the surface of the cover;
- [0026] the storage envelope includes one or more access openings for accessing the inside of the storage envelope that are arranged on at least one of the sides of the storage envelope; this makes it possible to access the

inside of the storage envelope without separating it from the cover; the cover can be thus be fastened inseparably to the backpack; this is particularly useful in the abovementioned case, in which a shell forms the cover and the fixed frame;

[0027] the storage envelope has several of the access openings:

[0028] at least one first access opening being arranged on the left-hand side of the storage envelope, and

[0029] at least one second access opening being arranged on the right-hand side of the storage envelope and opposite the first access opening;

this makes it possible to access the inside of the storage envelope across its entire width, simply from one side or the other;

[0030] the movable frame is formed by a framework; this is a simple and robust embodiment;

[0031] the movable frame is formed by a U-shaped bar with a transverse portion including the movable lower bearing surface and lateral ends hinged to the cover or to the fixed frame; this is a simple embodiment;

[0032] according to one or the other of the two preceding points, the backpack can include:

[0033] catches mounted at the top and bottom of the movable frame,

[0034] a textile arranged in front of the movable frame and stretched between these catches, the catches being arranged between the textile and the movable frame so as to stretch the textile away from the movable frame;

the catches and the textile allow the user to keep his back away from the movable frame, thereby improving comfort;

[0035] the catches mounted at the bottom of the movable frame can be arranged above and at a distance from the movable lower bearing surface; this allows the textile not to touch the ground when the backpack is put down on its lower bearing surfaces;

[0036] the backpack includes a strap fastened to the front of the storage envelope at one end and to the movable frame at the other end, so as to limit the spacing apart of the movable frame from the storage envelope in the deployed position;

[0037] the strap is an abdominal strap of the backpack; this limits the number of straps;

[0038] a slide is arranged on the storage envelope, the strap passing through the slide such that, as a result of the strap being pulled, the latter causes the movable frame to move toward and/or be clamped against the storage envelope; this makes it easy to pass from one position to another;

[0039] according to the preceding point and when the strap is the abdominal strap, the latter is also connected to at least one closing fastener of the abdominal strap, the abdominal strap also being designed to slide with respect to this or these fasteners, such that by pulling on the abdominal strap, the latter is tightened around the abdomen at the same time as the movable frame is clamped against the storage envelope; this simplifies the hand movements that may be necessary to move the movable frame from one position to another;

[0040] the slide is a ring including an annular element and a central strut connected to this annular element; this is a simple and strong embodiment of a slide;

[0041] the strap includes:

[0042] a first end connected in a sliding manner to a fastener of the abdominal strap, then

[0043] a first strap portion passing in one direction through the ring and between the central strut and the annular element, then between the central strut and the front of the storage envelope, and then passing in the other direction through the ring and between the central strut and the annular element, then being fastened to the movable frame;

this constitutes one way of producing a mover for moving the movable frame into the stowed position;

[0044] according to the preceding point, the first strap portion can also be doubled by an additional strap portion fastened to the movable frame on one side and to the strap between the central strut and the first end on the other side, such that the first strap portion and the additional strap portion can slide on either side of the central strut, the fastening of the additional strap portion to the strap forming a stop; this limits the amplitude of the spacing apart of the movable frame from the storage envelope;

[0045] the annular element is pressed securely against the storage envelope and the central strut is offset forward with respect to the annular element; this improves the robustness of the fastening of the strap, the pressing of the movable frame and the sliding of the strap;

[0046] alternatively, the slide is a loop, in particular stitched onto the storage envelope; this is a very simple embodiment.

[0047] In some embodiments, the front of the backpack is the side placed against the user's back when wearing the backpack and the rear is the opposite side. The right and the left of the backpack are defined with respect to this orientation. This orientation is also the vertical orientation of the backpack.

BRIEF DESCRIPTION OF THE FIGURES

[0048] Further features and advantages of some embodiments will become apparent upon reading the detailed description of the following nonlimiting examples, for an understanding of which reference will be made to the appended drawings, in which:

[0049] FIG. **1** shows a perspective view from the side and front of a backpack according to an exemplary embodiment of the presently disclosed subject matter, the pack being shown in a vertical position, the movable frame being in the stowed position;

[0050] FIG. **2** shows the backpack according to FIG. **1** but with the movable frame in the deployed position;

[0051] FIG. **3** shows FIG. **2** but in a side view and with the backpack placed vertically on the ground, in a balanced state;

[0052] FIG. **4** shows the backpack from FIG. **3** in a similar view but with access to the inside of the storage envelope open, the shoulder straps of the backpack not being shown;

[0053] FIG. **5** shows the backpack from FIG. **1** in a perspective view from the side and rear;

[0054] FIG. **6** shows the backpack from FIG. **1** but without the shell or the storage envelope, and in a perspective view slightly from the side and the rear;

[0055] FIGS. **7** and **8** show the position of the strap in the deployed position of the movable frame, in a perspective view from the rear and a perspective view from the front, respectively;

[0056] FIGS. **9** and **10** show the position of the strap in the stowed position of the movable frame, in a perspective view from the rear and a perspective view from the front, respectively;

[0057] FIG. **11** shows an example of a slide of the backpack from FIG. **1**;

[0058] FIG. **12** shows a cross-sectional view of the slide from FIG. **11**;

[0059] FIG. **13** shows a side view of the shell of the backpack from FIG. **1**;

[0060] FIG. **14** shows the hinging of the movable frame to the shell of the backpack from FIG. **1**;

[0061] FIGS. **15** to **19** correspond to FIGS. **6** to **10** but according to a variant embodiment;

[0062] FIG. **20** shows a backpack according to another exemplary embodiment but without the storage envelope or the shoulder straps, and in a perspective view slightly from the side and the front, the movable frame being stowed;

[0063] FIG. **21** shows the backpack from FIG. **20** but without the shell or the storage envelope or the shoulder straps, and in a perspective view slightly from the side and the rear.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0064] FIG. **1** shows an exemplary embodiment of a backpack **1** according to the presently disclosed subject matter.

[0065] The backpack includes a storage envelope **2**, which forms the envelope that separates the outside of the backpack **1** from its inside, thereby defining a storage volume inside which various objects can be stored.

[0066] The backpack **1** includes shoulder straps **6** attached at one end to the top of the backpack and at the other end to the bottom of the latter, so as to allow a user to carry the backpack on his back, the shoulder straps **6** passing over his shoulders.

[0067] The backpack **1** may also include, as illustrated here, an abdominal belt that is designed to be closed around the user's waist and includes at least one closing strap **5**.

[0068] The backpack **1** illustrated includes a shell **3**. This shell **3** includes an upper portion forming a rigid cover **30**, which forms protection for the top of the storage envelope **2**.

[0069] In the example illustrated, the cover **30** covers the entire top of the storage envelope **2** and includes a generally flat surface.

[0070] This shell **3** also includes a lower portion, which forms protection for the rear of the storage envelope **2**.

[0071] The shell **3** is fastened immovably to the storage envelope **2**. The lower portion **31** is thus fixed with respect to the assembly of the storage envelope **2** and the cover **30**. This lower portion thus also forms a fixed frame **31**.

[0072] According to some embodiments, the shell **3** can be fastened to the envelope **2** so as not to be removable, for example by bonding, riveting, thermowelding or further techniques. Alternatively, the shell **3** can be fastened to the envelope **2** so as to be removable, for example by touch-and-close tapes, press studs, or clip-fasteners.

[0073] The backpack **1** also includes a movable frame **4** hinged to the cover **30**, in this example to the front edge **33** of the cover **30**, as can be seen in FIG. **13**.

[0074] This movable frame **4** is formed, in this example, by a framework situated on the front of the storage envelope **2**. Therefore, when the user carries the backpack **1** on his back, this framework **4** is situated between his back and the storage envelope **2**.

[0075] To improve the comfort of wearing the backpack **1**, the framework **4** can include a stretched textile **41**, also referred to as a stretched back **41**, that is intended to come into contact with the user's back. This stretched back can be formed for example by netting.

[0076] The storage envelope **2** includes a bottom **21**. When the backpack **1** is placed vertically on the ground S, as illustrated in FIG. **3**, this bottom **21** is in contact with the ground S.

[0077] As illustrated in FIG. **2**, the movable frame **4** opens to a certain angle.

[0078] According to some embodiments, the movable frame **4** is able to move from a stowed position, particularly against the storage envelope **2**, as illustrated in FIG. **1**, to a deployed position, illustrated in FIG. **2**.

[0079] In particular, in the example illustrated, by virtue of its hinging, the movable frame passes from its stowed position against the front wall **23** of the storage envelope **2** to the deployed position, by being spaced apart from this front wall **23**, for example by being rotated about an axis situated at the top of the storage envelope **2**.

[0080] The deployed position allows better stability of the backpack **1** when placed in a vertical position on the ground S, as for example in FIG. **3**.

[0081] The movable frame **4** has a lower bearing surface **42**, known as the movable lower bearing surface **42**, intended to come into contact with the ground S when the backpack is placed vertically on the ground S. Similarly, the shell **3**, and thus the fixed frame **31** formed by the lower portion of this shell **3**, includes a lower bearing surface **32**, known as the fixed lower bearing surface **32**, which is intended to be in contact with the ground S when the backpack is placed vertically.

[0082] Thus, when the backpack is placed vertically on the ground, with the movable frame **4** in the deployed position, the backpack **1** is maintained vertically and in a balanced state by its movable frame **4** and the fixed frame **31**. This balanced state is stabilized by the supports on the lower bearing surfaces **42** and **32**. When the movable frame **4** is in the deployed position, the movable lower bearing surface **42** is situated away from the storage envelope **2**, thereby increasing the stability of the backpack **1**.

[0083] The lower bearing surfaces **32**, **42** are distributed around the bottom **21** of the storage envelope and, between one another, define an area greater than that of the bottom **21** of the storage envelope **2**, thereby improving stability.

[0084] Moreover, in some embodiments of the presently disclosed subject matter in which the fixed frame **31** is formed by a shell **3**, for example as illustrated, this shell can be in the form of a plate, in particular a nonflat plate, the edge face of this plate forming the fixed lower bearing surface **32**.

[0085] Similarly, when the movable frame is realized as a framework **4**, it is the lower strut of the framework **4** which can directly form the movable lower bearing surface **42**.

[0086] By being formed by an edge face and a strut of the framework, the lower bearing surfaces **42**, **32** can adapt more easily to various irregularities of the ground that may be situated between these lower bearing surfaces.

[0087] The bottom **21** adapts to the ground S.

[0088] Once the backpack **1** has been placed vertically on the ground S, the panel formed by the outer surface **35** of the cover **30** can serve as a support for various objects and also serve as a seat for the user of the backpack. In such a case, the weight is transferred directly to the frames **4**, **31**, then is transferred to the ground S by the lower bearing surfaces **42**, **32**.

[0089] The backpack according to some embodiments, and in particular according to the example illustrated, is thus particularly suitable for hikes, particularly in hilly areas. In particular, it is suitable for professionals who work outdoors, such as paleontologists, entomologists, primatologists, geologists, etc. These professionals have to travel under the best or better conditions to research sites that are particularly difficult to access, while also transporting fragile equipment.

[0090] Generally, in cases in which the fixed frame **31** and the cover **30** are formed by a rigid shell **3**, the latter makes it possible to protect the sensitive material stored inside the storage envelope **2**, and if desired in this embodiment to move around in dense vegetation, limiting the risk of the backpack getting caught on plants. This shell **3** is also able to form a seat for the researcher, this shell **3** and the movable frame forming a seat, in particular once at the work site. This shell **3** can also serve as support for various devices, such as a camera, a laptop computer, a GPS antenna.

[0091] In particular in the example illustrated, the shell **3** and the movable frame are arranged in such a way that, in the deployed position, the cover **30** is horizontal when the backpack **1** is positioned on approximately horizontal ground.

[0092] The stretched back **41** improves walking comfort.

[0093] Moreover, the outer surface **35** of the shell **3** can be smooth in order to reduce the risk of catching on plants.

[0094] In order to make this sliding easier, the backpack **1** can include, as illustrated in FIG. **5**, a curve **37** connecting the cover **30** and the fixed frame **31**. This curve **37** forms a transition between the cover **30** and the fixed frame **31**. In particular, the curve **37** allows sliding when the user moves along bent over, the branches first of all sliding over the cover **30** and then along the fixed frame **31**.

[0095] The shell **3** may also include lateral returns **38**, **39**. These lateral returns **38**, **39** are in this example portions of the cover **30** and of the fixed frame **31** and are inclined slightly downward for the cover **30** and inclined slightly forward for the fixed frame **31**. These lateral returns improve the sliding of branches over the shell, without catching on the sides of the storage envelope **2**.

[0096] The lateral returns **39** of the lower portion **31** also confer on the fixed lower bearing surface **32** the shape of an edge face that is curved or has segments forming an angle between one another. These lateral returns **39** thus generally surround the rear of the storage envelope **2**, thereby further improving the stability of the support on the fixed lower bearing surface **32**.

[0097] According to some embodiments, and as illustrated in FIG. **5**, the transition between the lateral returns **39** of the lower portion **31** and the rest of the shell **3** can form a rib **36**, making it possible to further reinforce the shell **3**, and thus also to reinforce the support of the cover **30** when the backpack **1** is in a vertical position on the ground S.

[0098] In FIG. **5**, given the orientation of the backpack **1**, only the lateral returns **38** and **39** of the cover and of the lower portion **31** that are situated on the left are visible. However, the same type of lateral returns may be present on the right-hand side of the storage envelope **2**.

[0099] The shell **3** can have, as in this example, a vertical plane of symmetry that is oriented from front to rear.

[0100] The shell **3** forms a single one-piece part, which is easier to produce but also makes it possible to protect the entire top and rear of the backpack. To this end, it can also have a shape allowing it to match the volume that the storage envelope **2** can have once full. The back and/or the top of the storage envelope **2** can also be pressed against the shell **3**, in particular by bonding.

[0101] However, according to further embodiments that are not shown, the cover and the fixed frame can be produced in separate parts.

[0102] According to further embodiments that are not shown, it is possible for the fixed frame not to form a plate entirely covering the back of the storage envelope. The fixed frame can include two rear legs, leaving an opening at the rear between these two legs, in order to provide access to the rear of the storage envelope.

[0103] According to some embodiments, and as illustrated in FIGS. **3** and **4**, the storage envelope **2** can include flaps **24** for closing the sides of the storage envelope **2**. These 24 flaps open, as illustrated in FIG. **4** in order to provide access to two access openings **25**, **26** for accessing the inside of the storage envelope.

[0104] In this example, the openings are a left-hand access opening **25** and a right-hand access opening **26** arranged opposite one another, such that when the flaps **24** are open on both sides, the backpack **1** is open all the way through from the left-hand access opening **25** to the right-hand access opening **26**. This makes it possible to access all of the inside of the storage envelope **2** through the sides.

[0105] This makes it possible to rapidly access the contents of the backpack **1** while walking, but also when it is placed on the ground.

[0106] This is all the more advantageous in the case of the example illustrated, in which the shell **3** completely covers the top and rear of the storage envelope **2**.

[0107] The backpack **1** may also include partitions, which are fixed or removable, in particular by way of touch-and-close tapes, so as to divide the inside of the storage envelope **2** into compartments.

[0108] Thus, in the example illustrated in FIG. **4**, horizontal partitions **28** are arranged so as to form three compartments inside the storage envelope **2**, each of these compartments being accessible from both sides of the backpack.

[0109] The flap(s) **24** can allow access to all of the compartments, as illustrated in FIG. **4**.

[0110] The number of partitions is not limiting.

[0111] Division into compartments by way of horizontal partitions **28**, regardless of the number thereof, allows the backpack to form a rack once placed on the ground. It makes it easier to access the contents and to store them, in particular during professional expeditions. In order to improve this function, the horizontal partitions **28** can be rigid. For example, they may include a rigid core surrounded by a

flexible material, such as a foam glued to this core, in order to protect the fragile materials.

[0112] The lowest horizontal partition **28** can be arranged at a distance from the bottom **21**, the access opening(s) **25**, **26** being level with or above this horizontal partition. Thus, the storage envelope **2** does not have an access point between this partition and the bottom **21**. This makes it possible to protect objects from impacts, especially when the backpack is set down.

[0113] The flaps **24** may include flaplets **27** that open through one of these flaps **24** in order to access individual compartments.

[0114] In an embodiment that is not shown, the storage envelope may include a flap only on one side of the storage envelope.

[0115] The storage envelope **2** may also include a vertical partition, not shown, that extends from right to left behind the front wall **23** of the storage envelope **2**, for example in order to form a storage compartment for a laptop computer.

[0116] In general, the inside of the storage envelope **2** can be covered with a padded lining made in particular of foam.

[0117] According to embodiments that are not shown, instead of a flap, there are simply flaplets that open into each of the individual compartments.

[0118] The flaplets **27** and/or the flaps **24** can be opened using a zip fastener.

[0119] According to some embodiments, and as illustrated in FIG. **4**, in order to improve the user's comfort, the backpack **1** includes an upper catch **44** and a lower catch **47**, which are situated at the top and the bottom of the framework **4**, respectively. The textile of the stretched back **41** is fastened between the upper catch **44** and the lower catch **47** so as to be stretched away from the framework **4**.

[0120] As can be seen in FIG. **6**, the upper catch **44** and/or the lower catch can each be formed by a plate **45**, **48** that is directly fixed to the framework **4** by screwing or riveting. Fastened to each plate **45**, **48** is a pad **46**, **49**. The catches **44**, **47** protrude laterally beyond each side of the framework **4** with their plates **45**, **48** and their pads **46**, **49**. This gives the stretched back **41** a certain width. As here, the lower catch **47** can be wider than the upper catch **44**, giving the stretched back **41** a flared shape that widens toward the bottom.

[0121] For example, and as here, the stretched back can cover the pads **46**, **49** in front of the latter, in order to stretch the textile away from the framework **4**.

[0122] According to some embodiments, and as illustrated, the shoulder straps **6** can be formed by a single part, which may have in its center an attachment **61**, in this case a textile tongue **61**, intended to be fastened to the rear of the stretched back **41** in order to improve comfort. In particular, it can be stitched to the stretched back **41** and/or to the pad **46** of the upper catch **44**. These shoulder straps can also be attached at the bottom to the storage envelope **2**.

[0123] The arrangement of the abdominal belt and the hinge of the movable frame **4** will now be described in detail.

[0124] According to some embodiments, and in particular in the example illustrated, this belt makes it possible not only to keep the backpack on the user at their abdomen but also to limit the opening angle of the movable frame **4** with respect to the front wall **23** of the storage envelope **2**.

[0125] According to some embodiments, in particular as illustrated in FIG. **14**, this hinge can be formed by a sheet-metal plate **43** shaped into a trough shape. The tops of this trough include curved edges that are fastened to the front edge **33** of the cover **30** and under the latter, in particular by screwing, riveting or bonding, preferably by riveting. A horizontal upper strut of the framework **4** is accommodated in the trough between the bottom of this trough and the cover **30**. This horizontal upper strut is cylindrical, with an approximately circular cross section, and thus pivots about an axis parallel to its length inside the trough. In this way, a simple hinge of this framework **4** with respect to the cover **30** is formed. The framework **4** can, as here, be formed entirely of tubular parts.

[0126] Here, the belt includes an abdominal strap **5** that forms the right-hand side of the abdominal belt at one of its ends and the left-hand side at the other end.

[0127] In another embodiment of the presently disclosed subject matter that is not shown, the abdominal belt could include a right-hand abdominal strap and a left-hand abdominal strap.

[0128] Thus, as can be seen in FIG. **6**, the abdominal strap **5** includes a first end **50** connected to a first closing fastener, in this case a fastening buckle **7**. The abdominal strap **5** then passes into an abdominal pad **11** such that, when the abdominal strap **5** is fastened, the latter comes into contact with the user's stomach, then passes through a slide **8** fastened to the front wall **23** of the storage envelope **2**, then passes around the framework **4**, passes again through a slide **8**, which is also fastened to the front wall **23** of the storage envelope **2**, then passes again through an abdominal pad **11** and ends at a second end **59**, which is not visible in FIG. **6** but is visible in FIG. **1**. This second end directly forms a closing fastener that is fastened and clamped by sliding in the fastening buckle **7**.

[0129] According to embodiments that are not shown, each end of the abdominal strap can be connected to a fastening buckle, the buckles being fastened to one another, at least one of the ends being able to slide with respect to the buckle that it carries in order to tighten the abdominal belt.

[0130] As illustrated in FIGS. **11** and **12**, the slide **8** is a ring including an annular element **80** and a central strut **81**, extending parallel to the straight parts of the annular element and situated roughly midway between each of the straight parts of this annular element **80**. However, as can be seen in FIG. **12**, which corresponds to a cross section of this slide **8** in a plane perpendicular to the central strut **81**, the central strut **81** is offset forward or downward in FIG. **12**.

[0131] In some embodiments the annular element **80** may include a flat rear face **83** which is pressed against the front wall **23** of the storage envelope **2**. This rear face **83** is in contact with the storage envelope **2**, the offset of the central strut **81** allowing the strap to slide more easily between the storage envelope **2** and this central strut **81**, as can be seen in FIGS. **6** to **10**.

[0132] The annular element **80** can be fastened to the storage envelope **2** by studs **82** extending from this rear face **83**. These studs **82** can be pressed into the front wall **23** of the storage envelope by thermowelding and/or hot riveting. In particular, the ring **8** and the front wall **23** of the storage envelope **2** can be made of thermoplastic polymer(s).

[0133] For example, this front wall **23** can be formed of one or more polymer fabrics or a textile formed by a fabric, such as polyethylene (PE) coated and/or impregnated with polyvinyl chloride (PVC).

[0134] The slide **8** can be formed from polypropylene (PP), acrylonitrile butadiene styrene (ABS), or a mixture of both.

[0135] On each side of the framework **4**, the abdominal strap **5** includes a first portion **51** that is defined between the fastening of the abdominal strap **5** to the framework **4** and a stop **53**. The abdominal strap **5** includes a second portion **52** that extends from this stop **53** and the corresponding end **50**, **59** of the abdominal strap **5**, and which therefore passes through openings in the corresponding stomach pad **11**.

[0136] As shown in FIGS. **7** to **10**, the first portion **51** of the abdominal strap **5** passes in front of a first lateral straight part of the annular element **80**, then passes in one direction through the ring between the central strut **81** and the annular element **80**, then between the central strut **81** and the front wall **23** of the storage envelope **2**, then passes in the other direction through the ring and between the central strut **81** and the annular element **80**, then reaches the framework **4** to which it is fastened, in this example by being clamped between the plate **48** of the lower catch **47** and the framework **4**.

[0137] According to some embodiments, and as illustrated, the backpack **1** may include an additional portion of strap **55**, which is separate from the abdominal strap **5** and arranged between the abdominal strap **5** and plate **48** of the lower catch **47**. For example, rivets can pass through the plate **48**, the additional portion of strap **55**, the abdominal strap **5** at the framework **4**, and the lateral struts of the framework **4** itself.

[0138] The ends of this additional portion of strap **55** can be stitched to the strap **5** on either side of the framework **4**. FIG. **8** shows one of the ends **54** of the additional portion of strap **55** pressed against the abdominal strap **5** and stitched thereto. In this example, the stitching thus forms the stop **53**.

[0139] This end **54** of the additional portion of strap **55** is stitched in such a way that the central strut **81** is accommodated between the first portion **51** of the abdominal strap **5** and this additional portion of strap **55**.

[0140] As can be seen in FIGS. **9** and **10**, when the movable frame **4** is in the stowed position, the first portion **51** of the abdominal strap **5** is distributed on either side of the central strut **81** of the ring **8**, the abdominal strap **5** being tight. When the user undoes the closing fasteners **7**, **59**, he can loosen this strap **5** by spacing apart the framework **4** from the front wall **23** of the storage envelope **2**, the first portion **51** of abdominal strap **5** slides between the annular element **80** and the central strut **81** until the stitching **53** reaches the central strut **81**, as illustrated in FIGS. **7** and **8**. At that time, the stitching **53** forms a stop, which limits the angular opening of the movable frame **4**.

[0141] Conversely, tightening the abdominal strap **5** makes it possible to stow the movable frame **4** against the storage envelope **2** again. When the abdominal strap **5** slides in the opposite direction between the central strut **81** and the annular element **80**, the stitching **53** moves away from the central strut **81**, as illustrated in FIGS. **9** and **10**.

[0142] As a result, the abdominal strap **5** has a double function: tightening the storage envelope **2** around the user's waist and stowing the movable frame **4**. There is therefore a need for a single hand movement for these two functions. This is particularly useful in dirty, in particular muddy environments. Specifically, limiting the number of hand movements reduces the soiling of the backpack.

[0143] In another embodiment that is not shown, the hinge of the movable frame can include an elastic element designed such that the passage from the deployed position to the stowed position increases the stress thereon. As a result, it exerts a restoring force to the deployed position on the movable frame. Thus, all that is desired in this embodiment is to loosen the abdominal strap in order for the movable frame to move into the deployed position. Therefore, there is one fewer hand movement. This elastic element may be for example a torsion spring, notably with the coils wrapped around the upper strut of the framework, one of the ends of the spring being fastened to the framework and the other to the shell.

[0144] According to some embodiments, in order to reduce the risk of soiling of the stretched back **41**, the lower catch **47** can be arranged above and at a distance from the movable lower bearing surface **42**, as can be seen in FIGS. **3** and **6**. For example, this distance may be between 20 and 50 millimeters (mm), in particular 40 millimeters.

[0145] Likewise, the stomach pads **11** can be stitched at a distance from the bottom **21**, in order to avoid touching the ground S.

[0146] Moreover, the framework **4**, the shell **3**, the stretched back **41** and the front wall **23** of the storage envelope **2** can be arranged such that, in the stowed position, the bottom **21** and the bottom of the framework **4** are at a distance from the stretched back **41**. This allows areas that are in contact with the ground when the backpack **1** is set down to come in contact with the walker's back when he carries the backpack **1** again.

[0147] According to some embodiments, and as illustrated, in order to avoid soiling, the flap **24** can be arranged, as here, at a distance from the bottom **21**. It can be designed to open around its entire perimeter, except for an upper portion which forms a hinge. For example, in FIG. **4**, the zip fastener starts at the very top of the flap **24** and at the front, descends toward the rear, goes around the access opening **25**, **26**, and then goes up to the top again, ending at a distance from its starting point, for example about halfway up the edge of the corresponding access opening **25**, **26**.

[0148] The backpack **1** may include a removable accessory (not shown), formed by a plate including on one side clip-fasteners, such as studs, designed to be clip-fastened around the lower strut of the framework **4**. In this case, it is possible to clip-fasten this accessory in order to increase the area of contact of the movable frame **4** with the ground, this possibly being useful on soft, notably muddy terrain.

[0149] In addition, the bottom **21** can be reinforced, in particular lined with a waterproof layer, for example a textile coated with at least one polymer. This makes it possible to easily clean this bottom **21**.

[0150] In general, the entire storage envelope, or even the backpack as a whole, can be made of materials that are able to be wetted, or even washed with a water jet.

[0151] Of course, the embodiment illustrated is not limiting in terms of its dimensions.

[0152] However, by way of example, a few dimensions that are applicable, in particular to the exemplary embodiment illustrated, as shown in FIG. **13**, may be mentioned.

[0153] For example, in order to form a good seat for the user of the backpack **1**, the length L**1** between the lower bearing surfaces **32** and **42** may be 357 mm for a flat surface level with the cover **30** having a length of 200 mm. This

makes it possible to improve the stability on the ground by virtue of the difference between these two lengths L1 and L2.

[0154] The movable frame **4** may have a length L3, from its hinge to the movable lower bearing surface **42**, of 405 mm. The opening angle β of the movable frame **4** in the deployed position may be 100°.

[0155] The height of the shell **3**, measured from the outer surface **35** of its cover **30** to the fixed lower bearing surface **32**, may be 400 mm. This allows a comfortable seat.

[0156] The curve **37** of the shell **3** can be designed such that a curve angle α is defined between a plane that includes the flat surface of the cover **30** and a plane passing through the part of the outer surface of the lower portion **31** of the shell **3**, this part being situated between the left-hand and right-hand lateral returns. The shape of the curve **37** from one of the planes to the other is continuous and regular. The curve angle may be 95°.

[0157] According to some embodiments, the cover **30** and/or the fixed frame **31**, or the shell **3**, can be made of a material selected from: aluminum, a polycarbonate (PC), a polypropylene filled with glass fibers or polymer material, ABS or PP.

[0158] For example, in the case of PC and filled PP, the shell **3** can be obtained by thermoforming. In the case of ABS and PP, it can be obtained by injection-molding.

[0159] More particularly, according to some embodiments, the shell **3** can be made of PC and/or have a thickness of between 3 and 8 millimeters (mm), in particular 4 mm.

[0160] The abdominal strap can be made for example of nylon or textile fiber.

[0161] FIGS. **15** to **19** illustrate a variant embodiment that differs from the backpack in FIGS. **1** to **14** by way of its slide **108**. Since the other elements are unchanged, their references are retained and only the differences are described below.

[0162] According to this variant, the slide **108** is formed by a simple fabric loop. The loop includes a rear side **180** and a front side **181**.

[0163] The rear face **183** of the rear side **180** is flat and pressed against the front wall **23** of the storage envelope **2**. In particular, the rear side **180** can be stitched to the storage envelope **2**.

[0164] The slide **8** can be formed from the same material as that of the strap.

[0165] As in the preceding variant, the first portion **51** of the abdominal strap **5** is defined between the fastening of the abdominal strap **5** to the framework **4** and the stop **53**. However, in this case, this first portion **51** passes between the front face of the rear side **180** and the front side **181**.

[0166] The second portion **52** of the abdominal strap **5** extends, here too, from the stop **53** to the corresponding end of the abdominal strap **5**.

[0167] In this variant, too, the backpack can include an additional portion of strap **55**. FIG. **17** shows one of the ends **54** of the additional portion of strap **55** pressed against the abdominal strap **5** and stitched thereto. In this example, the stitching thus forms the stop **53**.

[0168] Here, this end **54** of the additional portion of strap **55** is stitched in such a way that the front side **181** is accommodated between the first portion **51** of the abdominal strap **5** and this additional portion of strap **55**.

[0169] Thus, when the user loosens this strap **5** by spacing apart the framework **4** from the front wall **23** of the storage envelope **2**, the first portion **51** of abdominal strap **5** slides in the slide **8**, between the rear side **180** and the front side **181**, until the stitching **53** reaches the front side **181**, as illustrated in FIGS. **16** and **17**.

[0170] Conversely, tightening the abdominal strap **5** makes it possible to stow the movable frame **4** against the storage envelope **2** again. The abdominal strap **5** then slides in the opposite direction, between the front side **181** and the rear side **180**, the stitching **53** moving away from the front side **181**, as illustrated in FIGS. **18** and **19**.

[0171] FIGS. **20** and **21** illustrate another exemplary embodiment of a backpack according to the presently disclosed subject matter, this example having several additional variants. However, these variants can be applied independently of one another to the backpack according to some embodiments. The storage envelope **2** is not shown since it can be identical to that of the previous example.

[0172] The differences of these variants mainly relate to the movable frame **204**, in particular its fastening to the shell **203** and to the stretched back **241**.

[0173] Thus, FIG. **20** illustrates second, third and fourth variants.

[0174] According to the second variant, the movable frame is formed by a U-shaped bar **204**. Thus, it includes a transverse part connecting the bottom ends of two lateral portions **204***a* and **204***b* of this U-shaped bar.

[0175] The top ends of these lateral portions **204***a* and **204***b* are hinged to the front edge **233** of the shell **203**. For example, two forked brackets **243** can be fastened to this front edge **233**, on each side of the cover **230**, in particular by screwing or riveting. The fork of each of these brackets **243** carries a pivot pin passing through the top end of the corresponding lateral portion **204***a*, **204***b* of the U-shaped bar from one side to the other.

[0176] According to the third variant, the bearing surface **242** can be covered with a layer **242'** of PVC, in order to protect the bottom of the movable frame from moisture, in particular mud. This layer **242'** can extend over part of the height of the movable frame **204**.

[0177] Similarly, according to the fourth variant, the bottom of the lower portion of the shell **203** may be fitted and/or bonded in a stiffener **233**. This stiffener **233** may, as illustrated, be formed by a bar with a U-shaped cross section and have a shape complementary to the lower edge of the shell **203**. The lower face of this stiffener **233** thus forms the fixed lower bearing surface **232** of the fixed frame **231**. This bar may be formed from a metal sheet. For example, it can have a length of about 330 mm.

[0178] FIG. **21** illustrates fifth and sixth variants.

[0179] According to the fifth variant, the upper and/or lower catch of the stretched back **241** at the top and/or bottom of the movable frame **204**, respectively, can include an upper catch strap **245***b* and/or a lower catch strap **248***b*, respectively. Each catch strap **245***b*, **248***b* is fastened to the rear of a corresponding pad, namely a top pad **246** or a bottom pad **249**, so as to clamp the top of the movable frame **204** between the corresponding pad **246**, **249** and the corresponding catch strap **245***b*, **248***b*.

[0180] The upper and/or lower catch may also include a spacer **245***a*, **248***a*. This spacer **245***a*, **248***a* has a width and a length allowing it to create housings **245***d*, **248***d* for the lateral portions **204***a*, **204***b* of the movable frame **204** on each side of the corresponding spacer **245***a*, **248***a*. This type

of housing **245***d*, **248***d* can also be used for the lateral bars of the framework **4** of the example illustrated in FIG. **6** or **15**.

[0181] The spacer **245***a*, **248***a* can be formed by a pouch, the sides of which are stitched to form a spacer between the pad **246**, **249** and the catch strap **245***b*, **248***b*.

[0182] The upper catch strap **245***b* can be stitched directly to the top pad **246**. The spacer **245***a* may include a tab **245***c* protruding beyond the rear of the catch strap **245***b*. The shoulder straps may be fastened to this tab **245***c*. For example, the shoulder straps can include a textile tongue such as the one **61** in FIG. **6**, this tongue being fastened directly to the tab **245***c*, for example by press studs **245***e*.

[0183] The lower catch strap **248***b* can be stitched to an abdominal strap **205**, itself stitched to an additional portion of strap **255**, itself stitched to the bottom pad **249**. These straps **248***b*, **205**, this portion of strap **255** and this bottom pad **249** can be stitched together by one and the same seam.

[0184] The additional portion of strap **255** is arranged with the abdominal strap **205** in the same way as described with reference to FIGS. **1** to **19**, and may engage with a slide, such as the slides **8** or **108** in FIGS. **11** and **12** or **16** to **19**.

[0185] According to some embodiments, in order to be more resistant, the straps and/or the spacers can be made of textile covered, coated or impregnated with polymer, for example a PE textile coated with PVC.

[0186] The shoulder straps can also include an outer layer made of these materials.

[0187] The pads may include casings formed of the same materials and containing a foam. They may include a reinforcement plate bearing against the movable frame.

[0188] The bottom of the storage envelope can also be reinforced by straps stitched on the inside or outside.

[0189] Generally, the movable frame can be made of steel.

1. A backpack, comprising:
- a storage envelope having a bottom and a top,
- shoulder straps at the front of the storage envelope,
- a rigid cover covering the top of the storage envelope,
- a fixed frame that is fastened to the cover and comprises at least one lower bearing surface, known as the fixed lower bearing surface,
- a movable frame hinged to the cover or to the fixed frame, comprising a lower bearing surface, known as the movable lower bearing surface, the movable frame being movable between
  - a stowed position against the assembly formed by the storage envelope, the cover and the fixed frame, and
  - a deployed position in which the movable lower bearing surface is at a distance from the envelope,
- wherein the frames being arranged such that, in the deployed position, the lower bearing surfaces are arranged around the storage envelope such that the backpack can be placed in a balanced manner on these lower bearing surfaces, the frames forming the support for the cover.

2. The backpack according to claim **1**, wherein the fixed lower bearing surface is situated at the bottom and the rear of the backpack, and wherein, in the deployed position, the movable lower bearing surface is situated at the bottom and the front of the backpack.

3. The backpack according to claim **1**, wherein the frames and the cover are arranged such that the cover forms a seat when the backpack is placed in a balanced manner on the lower bearing surfaces.

4. The backpack according to claim **1**, wherein the movable frame is hinged to a front edge of the cover.

5. The backpack according to claim **1**, wherein the fixed frame and the cover form a single one-piece part forming a shell, this shell having an upper portion forming the cover and a lower portion forming the fixed frame, the lower portion covering the rear of the storage envelope.

6. The backpack according to claim **5**, wherein the outer surface of the upper portion and the outer surface of the lower portion are smooth.

7. The backpack according to claim **1**, wherein the cover is arranged so as to be inclined with respect to the bottom of the storage envelope, the cover approaching the bottom of the storage envelope in a direction from the front to the rear of this storage envelope.

8. The backpack according to claim **1**, wherein the storage envelope further includes one or more access openings for accessing the inside of the storage envelope that are arranged on at least one of the sides of the storage envelope.

9. The backpack according to claim **8**, wherein the storage envelope has several of the access openings:
- at least one first access opening being arranged on the left-hand side of the storage envelope, and
- at least one second access opening being arranged on the right-hand side of the storage envelope and opposite the first access opening.

10. The backpack according to claim **1**, wherein the movable frame is formed by a framework or a U-shaped bar with a transverse portion comprising the movable lower bearing surface and lateral ends hinged to the cover or to the fixed frame, the backpack comprising:
- catches mounted at the top and bottom of the movable frame,
- a textile arranged in front of the movable frame and stretched between these catches, the catches being arranged between the textile and the movable frame so as to stretch the textile away from the movable frame.

11. The backpack according to claim **1**, further including a strap fastened to the front of the storage envelope at one end and to the movable frame at the other end, so as to limit the spacing apart of the movable frame from the storage envelope in the deployed position.

12. The backpack according to claim **11**, wherein the strap is an abdominal strap of the backpack.

13. The backpack according to claim **11**, wherein a slide is arranged on the storage envelope, the strap passing through the slide such that, as a result of the strap being pulled, the latter causes the movable frame to move toward and/or be clamped against the storage envelope.

14. The backpack according to claim **13**, wherein the abdominal strap is also connected to closing fasteners of the abdominal strap, the abdominal strap also being designed to slide with respect to these fasteners, such that by pulling on the abdominal strap, the latter is tightened around the abdomen at the same time as the movable frame is clamped against the storage envelope.

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