

BACKPACK WITH ADJUSTABLE SHOULDER STRAPS

FIELD OF THE INVENTION

[0001] This invention relates to backpacks, and more particularly to backpacks with adjustable shoulder straps.

BACKGROUND OF THE INVENTION

[0002] Backpacks typically comprise one or more bags attached to a frame, a shoulder strap assembly, comprising at least a pair of shoulder straps, and often a belt and/or other lumbar support which can be attached to a person's waist and may be connectable to the shoulder strap assembly. Many available backpacks have shoulder straps with length which can be changed in an effort to partially accommodate users of different sizes. However, with most known backpacks the shoulder straps are fixedly attached to the rest of the backpack, so there are limits in the amount of accommodation available.

[0003] There are a few known designs where the shoulder strap is adjustably mounted to the rest of the backpack. One is the Vari-Quick™ System for backpacks from DeuterUSA. Those backpacks have a harness strap connected to a shoulder strap and also looped through openings in a ladder fixed along a frame of the backpack. The harness strap is threaded through a different opening to adjust the position of the shoulder strap with respect to the frame. Hook and loop fasteners connects the harness strap to itself. Disconnection of the hook and loop fastener

1 allows for adjustment of the harness strap with respect to the ladder. Such an
2 assembly is relatively difficult to adjust, since it requires unfastening the harness
3 strap, unlooping the harness strap out of the ladder, re-looping the harness strap into
4 the ladder, and then refastening the harness strap. It would therefore be desirable to
5 provide a backpack with an adjustable shoulder strap which is easy to adjust, is of
6 low cost design and which is relatively easy to manufacture.

7 8 SUMMARY OF THE INVENTION

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10 [0004] In accordance with a first aspect, a backpack comprises a back and a frame
11 attached to the back, a shoulder strap assembly adjustably attached to the frame
12 comprising left and right shoulder straps connected to a shoulder strap support plate
13 assembly, wherein the support plate assembly has a front face and a back face, and
14 left and right lateral supports connected to the back and releasably connectable to
15 the shoulder strap assembly. Each lateral support has a back side, the back side of
16 each lateral support is releasably fastened to the front face of the support plate
17 assembly, and the back face of the support plate assembly cooperates with the back
18 to form a hook and loop fastener, releasably securing the support plate assembly to
19 the back.

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21 [0005] From the foregoing disclosure and the following more detailed description of
22 various embodiments it will be apparent to those skilled in the art that the present
23 invention provides a significant advance in the technology of backpacks. Particularly
24 significant in this regard is the potential the invention affords for providing a high
25 quality, aesthetically attractive backpack with easy to operate shoulder strap

adjustment. Additional features and advantages of various embodiments will be better understood in view of the detailed description provided below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Fig. 1 is a back side view of a backpack in accordance with one embodiment.

[0007] Fig. 2 is a side view of the backpack of Fig. 1

[0008] Fig. 3 is a front side view of the backpack of Fig. 1.

[0009] Figs. 4 and 5 show a shoulder strap assembly at a full up and a full down position, respectively.

[0010] Figs. 6 and 7 show adjustment of the shoulder strap assembly.

[0011] Fig. 8 shows an isolated view of a back of the backpack showing locations for hook and loop fasteners.

[0012] Fig. 9 is a cross section view taken along line 9-9 in Fig. 4.

[0013] Fig. 10 is a cross section view taken along line 10-10 in Fig. 4 showing a hook and loop connection between the back of the backpack and the shoulder strap assembly, and also showing a hook and loop connection between one of the lateral supports and the shoulder strap assembly.

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2 [0014] It should be understood that the appended drawings are not necessarily to
3 scale, presenting a somewhat simplified representation of various features illustrative
4 of the basic principles of the invention. The specific design features of the backpack
5 as disclosed here, including, for example, the specific dimensions of the shoulder
6 straps will be determined in part by the particular intended application and use
7 environment. Certain features of the illustrated embodiments have been enlarged or
8 distorted relative to others to help provide clear understanding. In particular, thin
9 features may be thickened, for example, for clarity of illustration. All references to
10 direction and position, unless otherwise indicated, refer to the orientation illustrated
11 in the drawings.

12 13 DETAILED DESCRIPTION OF CERTAIN EMBODIMENTS

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15 [0015] It will be apparent to those skilled in the art, that is, to those who have
16 knowledge or experience in this area of technology, that many uses and design
17 variations are possible for the backpack disclosed here. The following detailed
18 discussion of various alternate features and embodiments will illustrate the general
19 principles of the invention with reference to a backpack suitable for use carrying
20 outdoor gear, books, school supplies, etc. Other embodiments suitable for other
21 applications will be apparent to those skilled in the art given the benefit of this
22 disclosure.

23
24 [0016] Turning now to the drawings, Figs. 1-3 show a back side view, a side view
25 and a front side view, respectively, of one embodiment of a backpack 10. The

backpack has a front side 14 and a back side 12. A back 80 can have a series of pouches and pockets on either side, or both. A structural frame member 70 is provided, which can comprise a lightweight metal or an at least semi-rigid engineering plastic. Other elements of the backpack are anchored on the structural frame 70, including the back 80.

[0017] A shoulder strap assembly 20 comprises a pair of shoulder straps 30 and a support plate assembly 40. As shown in Fig. 1, the shoulder straps or belts 30 can have adjustable length and can comprise a robust cloth or fabric, optionally with foam components positioned along some or all of the cloth. Further, the shoulder straps have first ends 32, 33, respectively, which are operatively connected to the back at a lower end 25. The shoulder straps have a second end 31 where they meet at and are affixed to the support plate assembly 40. In the embodiment shown in the drawings, the ends 32, 33 are connected to the back near a lower back area, near the lower end of the backpack. Left and right lateral supports 50, 60, are provided connected to the back. In the embodiment shown in the Figs., the lateral supports 50, 60 are padded members and able to pivot with respect to the back away from the central frame 70. Advantageously, the lateral supports are releasably connectable with respect to the back.

[0018] In accordance with a highly advantageous feature the support plate assembly 40 is releasably adjustable with respect to the frame 70. Figs. 4 and 5 show a full up position and a full down position, respectively. In Fig. 5, the full down position is limited by expansion of the width of the frame 70 closer to the lower end of the backpack. The wide part of the frame closer to the lower end of the backpack also

1 acts as a stabilizer and helps to balance load on the bag horizontally. This
2 construction advantageously allows for easy comfort adjustment to suit a wide range
3 of users.

4
5 [0019] Fig. 6 shows the lateral supports 50, 60 pulled away and the support plate
6 assembly partially compressed, exposing back sides 54, 56, respectively, of the
7 lateral supports. As noted above, the lateral supports are releasably connectable
8 with respect to the back. Fig. 6 shows surfaces 81 and 52 on the right, and 83 and
9 62 on the left which cooperate to form a hook and loop fastener, often referred to as
10 a Velcro™ fastener. Such hook and loop fasteners releasably secure the lateral
11 supports to the back. In the embodiment of Fig. 6, hook and loop fasteners 52, 62
12 extend along most of the back sides 54, 56 of the lateral supports 50, 60. Similarly,
13 complimentary hook and loop fasteners 81, 83 are positioned on a front surface 82
14 of the back 80. Optionally, part of the support plate assembly 40 may extend across
15 hook and loop fasteners 81, 83. During a normal use position (such as shown in
16 Figs. 4 or 5) the support plate assembly is at least partially sandwiched or positioned
17 between the support pads 50, 60 and the back 80. Therefore during normal use, on
18 the front face 64 of the support plate assembly hook and loop fasteners 42, 44 are
19 provided which releasably connect to corresponding hook and loop fasteners 52, 62,
20 respectively.

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22 [0020] Fig. 7 partially shows additional hook and loop fasteners releasably
23 connecting the support plate assembly 40 (and therefore the shoulder strap
24 assembly 20) to the back 80. One set of hook and loop fasteners 81 is positioned on
25 the front surface of the back, and the other, corresponding hook and loop fastener 45

1 is positioned on a back face 65 of the support plate assembly. Similar hook and loop
2 fasteners are positioned on the other side of the frame. When a user wants to adjust
3 the position of the shoulder belts 30 with respect to the back, first the lateral supports
4 are pulled away from the back so that the hook and loop fasteners disengage. Next,
5 he squeezes the support plate assembly 40 to disengage the support plate assembly
6 fasteners from the fasteners on the back. At this point, the support plate assembly
7 may be slid up or down with respect to the frame 70, as desired.

8
9 [0021] Fig. 8 shows the back 80 with the lateral supports 50, 60, and shoulder strap
10 assembly removed for clarity of illustration. During normal use of the backpack,
11 hook and loop fasteners 81 and 83 releasably connect to corresponding hook and
12 loop fasteners on the lateral supports and on the support plate assembly. Fig. 9 is a
13 cross section view taken through line 9-9 in Fig. 4, where the second ends 31 of the
14 shoulder belts 30 meet. The shoulder belts are connected to support plate assembly
15 40 on its front face 64. For example, the belts 30 and fabric 41 of the support plate
16 assembly 43 may be stitched together so movement of the support plate assembly
17 results in movement of the shoulder straps. Advantageously, the frame 70 extends
18 through an opening in the fabric 41, adjustably captivating the support plate
19 assembly to the frame. The support plate 43 is positioned between the frame 70 and
20 the back 80 and can comprise a resiliently deformable, semi-rigid plastic.

21
22 [0022] Fig. 10 is a cross section view taken through line 10-10 in Fig. 4. There, the
23 lateral support 60 is visible, and hook and loop fasteners 62 releasably connect to
24 corresponding hook and loop fasteners 44 on the front face of the support plate
25 assembly 40. Similarly, hook and loop fasteners 47 on the back face of the support

1 plate assembly releasably connect to corresponding hook and loop fasteners 83 on
2 the front surface of the back 80. Use of such hook and loop fasteners positioned
3 between the back the support plate assembly, and also between support plate
4 assembly and each lateral support advantageously allows for easy adjustment and
5 reset of the shoulder strap with respect to the back.

6
7 [0023] From the foregoing disclosure and detailed description of certain
8 embodiments, it will be apparent that various modifications, additions and other
9 alternative embodiments are possible without departing from the true scope and
10 spirit of the invention. The embodiments discussed were chosen and described to
11 provide the best illustration of the principles of the invention and its practical
12 application to thereby enable one of ordinary skill in the art to use the invention in
13 various embodiments and with various modifications as are suited to the particular
14 use contemplated. All such modifications and variations are within the scope of the
15 invention as determined by the appended claims when interpreted in accordance
16 with the breadth to which they are fairly, legally, and equitably entitled.

CLAIMS

What is claimed is:

1. A backpack comprising, in combination:
 - a back and a frame attached to the back;
 - a shoulder strap assembly adjustably attached to the frame comprising left and right shoulder straps connected to a shoulder strap support plate assembly, wherein the support plate assembly has a front face and a back face; and
 - left and right lateral supports connected to the back and releasably connectable to the shoulder strap assembly, wherein each lateral support has a back side;
 - wherein the back side of each lateral support is releasably fastened to the front face of the support plate assembly, and the back face of the support plate assembly and the back have form hook and loop fasteners which engage one another, releasably securing the support plate assembly to the back.
2. The backpack of claim 1 wherein the back side of each lateral support cooperates with the front face of the support plate assembly have hook and loop fasteners which engage one another, releasably securing each lateral support to the support plate assembly.
3. The backpack of claim 1 wherein the frame extends along the middle of the back and the support plate assembly is releasably slidable along the frame from a full up position to a full down position.

1 4. The backpack of claim 1 wherein each shoulder strap has a first end that is
2 fixedly attached to the back and a second end opposite the first end attached to the
3 shoulder support plate assembly.

4
5 5. The backpack of claim 1 wherein each lateral support is attached to the back
6 and movable with respect to the back.

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8 6. The backpack of claim 1 wherein the support plate assembly defines an
9 opening, and the frame is received in the opening.

10
11 7. The backpack of claim 6 wherein the support plate assembly comprises a
12 support plate and fabric surrounding at least a portion of the support plate, and the
13 support plate is positioned between the frame and the back.

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15 8. The backpack of claim 1 wherein during a normal use position the support
16 plate assembly is positioned between the lateral supports and the back.