Abstract: A backpack has a front pocket containing a plate and a pair of shoulder straps for holding the plate against the back of a user. A pressurizable, flexible and elastic bladder covers the plate and has inside surfaces with an embossed pattern for preventing sticking together of facing walls of the bladder to facilitating an initial inflation of the bladder. A pair of tubular extensions extends from the bladder and into the shoulder straps, one of the tubular extensions being for inflating and deflating the bladder. A mouth-inflatable check valve connected to expansion location so as to be accessible to the user for inflating the bladder and a valve cover is detachably connected over the entire mouth engageable perimeter of the check valve for keeping it clear. Semi-rigid liners in the shoulder straps near the bladder form channels for facilitating inflating and deflating of the bladder.
Published:

- with international search report (Art. 21(3))
IMPROVED AIR-CUSHION BACKPACK AND LAPTOP SLEEVE

FIELD BACKGROUND OF THE INVENTION

The present invention relates in general to article carriers, and in particular to an new and useful backpack and laptop sleeve having air cushion features for increased comfort and for protection of a laptop computer carried by the backpack or sleeve.

U.S. Patent Application US2007/021 5662, published September 20, 2007, on U.S. Patent Application No. 11/377,008, filed March 16, 2006, that shares at least one inventor with the current application and which is incorporated here by reference, teaches a backpack with a generally rigid plate having a front face, a back face and shoulder straps for holding it against a back of a user. An inflatable, non-elastic and smooth surfaced bladder covers generally all of the front face of the plate and has a closable fill opening so that the bladder can be inflated for added comfort and load distribution.
Although the backpack of the above-identified application has been extremely successful because of its variety of advantages, there are certain areas of improvement which the present application addresses. One of these areas involves the use of vinyl as the material for the bladder which while being flexible was less elastic then was found to be ultimately advantageous and also importantly because it was made to have smooth inner and outer surfaces. After manufacture and in the deflated condition, the inside facing walls tended to stick to each other because of these smooth surfaces. This made it very difficult to inflate the bladder the first time since in addition to over coming the internal pressure to inflate the bladder to a comfortable level, the stuck together walls had to be separated by the blown in air pressure alone. This proved to be very difficult.

Another perceived difficulty with the prior backpack was that since only one tube extended along the shoulder strap for inflation according to the preferred embodiment of the invention, when the backpack and its one tube were inflated it was perceived to be asymmetric because the other strap was not inflated, or even perhaps defective because of this asymmetry. The present invention overcomes this difficulty as well.

Another area of improvement addressed by the present application is the presence of a check valve cover that covers the mouth inflatable check valve of the prior backpack and thus improves sanitation and cleanliness of the mouth inflated check valve and its surrounding areas.

The use of flexible but non-elastic material for the bladder was also found to be less
desirable so that bladder material that is both flexible and elastic is now used in the approved backpack.

Another problem with the prior art is the protection of laptop computers which are small and easily portable but likewise, easily dropped and damaged. Although padded sleeves are known, the need remains for an improved padding arrangement for a laptop sleeve alone, or within a backpack.

**SUMMARY OF THE INVENTION**

It is an object of the present invention to provide backpack having a first front wall, a second front wall spaced forwardly of the first front wall and defining a front pocket with the first front wall, a generally rigid plate having a front face and a back face, the plate being in the front pocket with the back face of the plate being adjacent the first front wall, a pair of shoulder straps operatively connected to at least one of the front walls for holding the plate against a back of a user with the second front wall being between the plate and the back of the user, load bearing means connected to at least one of the front walls for holding an object, and a pressurizable, flexible and elastic bladder covering generally all of the front face of the plate. The bladder is provided in the front pocket between the front face of the plate and the second front wall and at least the entire inside surfaces of the bladder have a non-smooth texture thereon for preventing sticking together of facing walls of the bladder to facilitating an initial inflation of the bladder. A pair of tubular extensions
or tubes extend from the bladder and respectively into each of the shoulder straps, one of the tubular extensions being for inflating and deflating the bladder. A mouth-inflatable, normally closed check valve is connected to the one tubular extension at a location that is spaced from the bladder and positioned so as to be accessible to a user for inflating the bladder by blowing into the check valve while the shoulder strap is on a shoulder of the user, the check valve having a mouth engageable perimeter. A valve cover is detachably connected over the entire mouth engageable perimeter of the check valve for covering the check valve and keeping it clear. A pair of semi-rigid liners are respectively in the shoulder straps near the bladder to form a pair or semi-rigid channels for the tubular extensions near the bladder to facilitate inflating and deflating of the bladder through the one tubular extension.

A further object of the present invention is to provide, either as part of the backpack, or as a stand-alone item, a laptop sleeve including a pair of cushion panels connected in a rear pocket of the backpack or as a stand-alone sleeve, each cushion panel comprising a plurality of spaced apart, parallel, permanently sealed and partially filled air tubes made of flexible elastic material with webs between the air tubes in each cushion panel, the air tubes of one cushion panel each facing the webs of the other cushion panel for minimizing a volume occupied by the cushion panels when there is nothing in a space between the cushion panels, and for cushioning a laptop computer placed between the cushion panels.

Another object of the invention includes providing the check valve to have a flapper that is normally closed to prevent air from escaping from the bladder and including a push
button on the flapper that is manually depressed to move the flapper and allow air to escape from the bladder to adjust the amount of air in the bladder for improved comfort.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and specific objects attained by its uses, reference is made to the accompanying drawings and descriptive matter in which preferred embodiments of the invention are illustrated.

**BRIEF DESCRIPTION OF THE DRAWINGS**

In the drawings:

Fig. 1 is a side view of a backpack according to the invention with an inside bladder cushion deflated;

Fig. 2 is a horizontal section taken along line 2-2 of Fig. 1 with a cushioned sleeve or pocket for a laptop computer;

Fig. 2A is a view like Fig. 2 but of another embodiment of the invention with an empty laptop sleeve;
Fig. 2B is a view like Fig. 2 of the other embodiment of the invention with a laptop in the sleeve;

Fig. 3 is a view like Fig. 1 of the backpack with the cushion inflated and the backpack partly cut away to show the laptop sleeve embodiment of Fig. 2;

Fig. 4 is a front view of the backpack of Fig. 3;

Fig. 5 is a partial front view illustrating the pack of Fig. 1 on a person;

Fig. 6 is a view like Fig. 5 illustrating use of the backpack;

Fig. 7 is a front view of another bladder according to the invention;

Figs. 8 and 9 are front views of a pack employing the bladder of Fig. 7 in two different positions;

Fig. 10 is a rear view of the bladder of the pack of Figs. 1 to 6;

Figs. 11 and 12 are sections taken along respective lines 11-11 and 12-12 of Fig. 10;

Figs. 13 and 14 are side sectional views of the bladder of Fig. 10, in respective
deflated and inflated conditions;

Fig. 15 is a large-scale view of the fitting used at the location indicated at 15 in Fig. 10;

Fig. 16 is a front view of another bladder according to the invention;

Figs. 17 and 18 are sections taken along respective lines 17-17 and 18-18 of Fig. 16;

Fig. 19 is a side sectional view of the bladder of Fig. 16;

Fig. 20 is an exploded perspective view of a stand-alone cushioned laptop computer sleeve of the present invention;

Fig. 21 is a plan view of a pre-assembled sleeve of Fig. 20;

Fig. 22 is a perceptive view of another embodiment of a laptop sleeve of the invention; and

Fig. 23 is an exploded perspective view of the assembly steps of another embodiment of the laptop sleeve.
DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, in which like reference numerals are used to refer to the same or functionally similar elements, Fig. 1 shows an improved backpack 10 of the present invention which overcomes some of the shortcomings of the prior backpack of the above-identified published patent application by, among other things, providing a texture or embossed pattern on at least the inner surfaces of the bladder to avoid sticking, the use of inflatable shoulder strap tubes in both shoulder straps 30, along with a mechanism to permit free air flow in those tubes so that the backpack is perceived as being symmetrical and in no way defective, the inclusion of permanently inflated, elastic material tubes shown at 40, 42 and 44 in Fig. 2, in a main pocket or chamber in the backpack that may be closed by a zipper 18, or as a stand alone laptop sleeve of Figs. 20 to 23 to protect a laptop computer, the inclusion of a cover 35 in Figs. 5 and 6, over the air inflated check valve 34, and other advantageous improvements which distinguishes the improved backpack over the prior art in general, and over the above-identified published patent application specifically.

With reference to Figs. 1 to 10, the improved backpack 10 of the invention comprises a first front wall 20 of heavy duty fabric such a heavy nylon fabric, a second front wall 22 of the same or heavier fabric spaced forwardly of the first front wall 20 and defining a front pocket 24 with the first front wall 20, and a generally rigid, preferably plastic plate 26 having a front face and a back face, the plate being in the front pocket 24 with the back face of the plate being adjacent the first front wall 20. A pair of the shoulder straps 30 are
operatively connected to the body of the backpack, namely to at least one of the front walls 20 and/or 22 as shown in Figs. 4 to 6, for holding the plate against a back of a user with the second front wall 22 being between the plate 26 and the back of the user.

Load bearing means, such as a main and additional backpack pockets formed by a rear wall 12 and an interior partition wall 14 also of the same fabric as one or the other front walls, and connected to at least one of the front walls, are provided for holding an object or load. A rear pocket between walls 12 and 14 is closed by a further zipper 16. As shown in Fig. 3, the plate pocket 24 formed of walls 20 and 22 also has a top zipper 19 for access to the plate pocket. This allows access to the plate pocket for airport security measures that do not permit closed storage volumes that may contain contraband.

As best shown in Figs. 2, 2A, 2B and 10 to 14, a pressurizable, flexible and elastic bladder 28 covers generally all of the front face of the plate 26, the bladder being in the front pocket 24 between the front face of the plate and the second front wall 22. At least the entire inside surface 27 of the bladder has a non-smooth texture or embossed pattern 29 thereon for preventing sticking together of facing walls of the bladder 28 to facilitating an initial inflation of the bladder. The outside surfaces of the bladder 28 may have the same or a different pattern or not pattern and all patterns are made by providing the surfaces of the mold for forming the bladder with a negative image of the pattern. For example, as shown in Fig. 10 the pattern may be an embossed pattern of concentric circles or any other pattern that has the effect of keeping broad smooth surfaces of the flexible plastic material from contacting each other and therefore unavoidably sticking together.
For both flexible and elastic properties, it has been found advantageous to form the bladder of plastic like PU (polyurethane) or PVC (polyvinyl chloride) that stretch when impacted thus absorbing energy and not transferring the energy. Flexible but non-elastic vinyl may also be used, however. As will be explained later, cushion panels forming a laptop sleeve that are each made of a plurality of spaced apart, parallel, permanently sealed and partially filled air tubes, are also made of flexible elastic material such as PU or PVC so that they too can stretch when impacted and absorb and transfer energy to protect the laptop computer in the sleeve.

To make sure that backpack appears perfectly symmetrical, a pair of tubular extensions or tubes 32, 33 shown in Fig. 10, extend from the bladder 28 and respectively extend into each of the shoulder straps 30. One of the tubular extensions 32 is for inflating and deflating the bladder as will be explained later, although if desired both can be used for this purpose if both are provided with an inflation valve. In any case, a mouth-inflatable, normally closed check valve 34 is connected at least to the one tubular extension 32 at a location that is spaced from the bladder 28 and positioned so as to be accessible, as shown in Fig. 6, to a user for inflating the bladder 28 by blowing into the check valve 34 while the shoulder strap 30 is on a shoulder of the user, the check valve having a mouth engageable perimeter.

A valve cover 35 having a rim around its perimeter is detachably connected over the entire mouth engageable perimeter of the check valve 34 for covering the check valve 34 and keeping it clear. To keep the cover from being lost it is permanently held to the valve.
perimeter by a tab 35a. The check valve 34 has an inwardly pushable flapper that is
normally closed around and against the inner surface of the valve perimeter and held in
place by internal air pressure in the bladder 28 and tube 32 to prevent air from escaping
from the bladder. The flapper includes a central raised push button 39 on the flapper that
can be manually depressed by the user to move the flapper inwardly away from the valve
perimeter and allow some or all of the air to escape from the bladder to adjust the firmness
and comfort of the bladder against the user's back.

As shown in Figs. 10 and 15, a pair of semi-rigid liners 36 and 37, of semirigid
plastic for example, and respectively in the shoulder straps 30, 30, each near the bladder,
form a pair of semi-rigid channels for the tubular extensions 32, 33 near the bladder to
facilitate inflating and deflating of the bladder through the one tubular extension 32. Two
liners are provide again for symmetry, or in case both tubes 32 and 33 are to be provided
with a mouth-inflatable valve 34. The liner of both inflation tube 32 and extra tube 33, keep
the tubes from collapsing under the load on the shoulder straps, that would otherwise
make it impossible to use the tube 32 for inflating or deflating the bladder 28. The other
tube 33 is also automatically inflated by air from the bladder 28 that is allowed to move
through the open channel made by at liner 37 so both tubes and both shoulder straps are
inflated to the same extent and are therefore symmetrical.

As noted above, the material of the bladder can be of flexible but non-elastic vinyl
or other plastic, but is preferably an elastic plastic like PU (polyurethane) or PVC (polyvinyl
chloride) that stretch when impacted thus absorbing energy and not transferring the
As shown in Figs. 1, 3, 4, 8 and 9, at least one front wall, but preferable the second front wall 22 against the user's back is made of mesh of better ventilation. The second front wall 22 can also or alternatively be of a stretchable textile forming the front pocket for holding the bladder 28.

As shown in Figs. 10 to 14 the bladder can be subdivided into a plurality of interconnected compartments, including a relatively large lower lumbar support compartment 28a, and a plurality of relatively small upper compartments 28b, 28c and 28d. The backpack bladder can be formed with a forwardly open central recess as is evident in Figs. 2, 2A and 2B for avoiding direct pressure against the user's spine.

The front pocket 24 can alternatively be downwardly open and the backpack further can comprise a releasable fastener like a hook and loop tape at a lower edge of the front panel as shown in Fig. 8 for access to the plate.

As shown in Figs. 2, 2A, 2B and 3, the backpack may include a laptop computer sleeve in the rear pocket against wall 20, or a stand-alone laptop sleeve that will be disclosed later in connection with Figs. 20 to 23. In Figs. 2, 2A, 2B and 3, the sleeve comprises a pair of cushion panels connected in the rear pocket and behind the first front wall 20, each cushion panel comprising a plurality of spaced apart, parallel, permanently sealed and partially filled air tubes 40 made of flexible elastic material with webs 48.
between the air tubes 40 in each cushion panel. The air tubes 40 of one cushion panel each face the webs 48 of the other cushion panel for minimizing a volume occupied by the cushion panels when there is nothing in a space between the cushion panels as shown in Fig. 2A, and for cushioning a laptop computer 50 placed between the cushion panels as shown in Fig. 2B.

As noted above, the cushion panels are made of an elastic plastic like PU or PVC that stretch when impacted thus absorbing energy and not transferring the energy to the laptop.

As shown in Fig. 3, the sleeve may also have a top permanently sealed and partially filled air tube 46 made of flexible elastic material, with top web 48 connected between one of the cushion panels, in this case the top of the front panel, and the top air tube 46 for covering and cushioning the space between the cushion panels, and a pair of side 42 and a bottom 44 permanently sealed and partially filled air tubes made of the same flexible elastic material connected respectively at the sides and the bottom of the space between the cushion panels for further cushioning the space as shown in Figs. 2 and 3.

Referring now to Figs. 20 to 23, a stand-alone laptop computer sleeve of the invention comprises a fabric outer covering 52 with a front panel with top zippered pocket 54 and a rear panel with top zippered pocket 56. The front and rear cover panels are connected to each other by a gusset 60 extending across the bottom and sides of the pocket panels. A top gusset 62 with a longitudinal main zipper 58 closes the perimeter of
the cover and provides an access opening for inserting and removing a laptop computer.

Here too a pair of cushion panels each comprise a plurality of spaced apart, parallel, permanently sealed and partially filled air tubes 40 made of flexible elastic material with webs 48 between the air tubes 40 in each cushion panel. The front and rear cushion panels are inserted through the top zippers into the respective front and rear cover panels 54 and 55 in the direction of the arrows in Fig. 20. The air tubes 40 of one cushion panel each face the webs 48 of the other cushion panel for minimizing a volume occupied by the cushion panels when there is nothing in a space between the cushion panels. With a laptop in the space, cushioning of the laptop computer occurs between the cushion panels.

Fig. 21 shows the cover in a disassemble state before zippered cover panels 54 and 56 have been sewn or otherwise connected at the perimeter to the gussets 60 and 62.

As shown in Fig. 22, the sleeve also preferably includes a top permanently sealed and partially filled air tube 46 made of flexible elastic material with a top web 48 connected between one of the cushion panels or the cover panel on that side, and the top air tube 46, for covering and cushioning the space between the cushion panels and any laptop therein. As shown in Fig. 23, a pair of side 42 and a bottom 44 permanently sealed and partially filled air tubes made of flexible elastic material are connected respectively at the sides and the bottom of the space between the cushion panels for further cushioning the space. This is done by providing the gusset 60 with fabric side tubes 60a and 60c and a fabric bottom tube 60b, which each have an access opening for receiving a respective tube 42 or 44 in
the direction of arrows in Fig. 23. After the tubes 42, 44 and 42 are inserted sequentially as is diagrammatical illustrated in Fig. 23, the gusset is sewn to the front and rear cover panels to complete the sleeve. The tubes 42 and 44 can alternatively but inserted into the gusset tubes 60a, 60b and 60c, after the fabric cover is assembled.

It has been found that even with no way to refill the tubes 40, 42, 44 and 46, the plastic material is sufficiently impervious so that the tubes will retain their cushioning effect for a period of years. The partial filling is also essential, e.g. each tube is only filled to about 60 to 90 percent of its full volume with air. This provides sufficient cushioning as the air moves around in each cushion to absorb an impact, but without excessive bouncing or rebound of the sleeve after a first impact, which violent bouncing would be counterproductive to protecting the laptop.

The backpack 10 according to the invention could be used to carry any load in, on or around the bag, such as a musical instrument, pieces of equipment, or virtually anything typically carried on the back.

The bladder 28 has the lower region 28a that is substantially thicker than its upper region 28b when fully inflated as shown in Fig. 14 to provide a good cushion at the kidney or lumbar level of a wearer of the pack 10. In addition the bladder 28 has the somewhat recessed central area 28c and raised, vertically elongated side regions 28d.

As noted above, to prevent the flexible tubular extensions or tubes 32 and 33 from
being pinched closed where they pass over the user's shoulder, the straps 30 are provided internally with U-section semi-rigid liners 36 and 37 having foam edges 38 and stitched in place so that in these regions where the strap 30 is normally compressed by the weight of the pack 10 the tubes 32, 33 are held open at semi-rigid channels formed under liners 36, 37.

With this system it is therefore possible to inflate the bladder 28 from the relatively flat and flaccid condition shown in Fig. 13 to the relatively full and even moderately hard condition shown in Fig. 14. This can be done before the pack is put on, or afterward. Once the backpack 10 is put on by passing the user's arms through the straps 30 so that the front mesh panel 22 overlying the bladder 28 rests against the user's back, the valve 34 is actuated, for instance by pressing down in its center button 39, to relieve some of the pressure. This causes the backpack 10 to settle against the user's back and assume a position in effected molded to the user. In this position the weight of the pack and its contents is applied uniformly to the entire back of the user, eliminating any concentrated load that could be injurious or, at the very least, uncomfortable.

Figs. 7 to 9 show another arrangement where a bladder 28' is provided in a lower corner with the valve 34' and does not have the tubular over-the-shoulder extension 32. Here a pocket 24' is formed by a front panel 22' that is open downward and that can be closed over the embossed bladder 28' by securing it via a velcro fastener 23 to the bottom of the pack 10. Such an arrangement also has an unillustrated rigid plate 26.
Figs. 16 through 19 show yet another embossed bladder 28" with a lateral short extension 32" provided with a valve 34". With this arrangement the unillustrated front panel 22 is formed with an aperture through which the extension 32" can extend for operation of the valve 34".

Use of the backpacks with the embossed bladders 28' and 28" is the same as that with the bladder 28, that is the bladder is blown up hard to start with and then deflated partially for comfortable use.

While specific embodiments of the invention have been shown and described in detail to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.
WHAT I CLAIMED IS:

1. A backpack comprising:
   a first front wall (20);
   a second front wall (22) spaced forwardly of the first front wall and defining a front pocket (24) with the first front wall;
   a generally rigid plate (26) having a front face and a back face, the plate being in the front pocket (24) with the back face of the plate being adjacent the first front wall (20);
   a pair of shoulder straps (30) operatively connected to at least one of the front walls for holding the plate against a back of a user with the second front wall (22) being between the plate and the back of the user;
   load bearing means connected to at least one of the front walls for holding an object;
   a pressurizable, flexible and elastic bladder (28) covering generally all of the front face of the plate, the bladder being in the front pocket between the front face of the plate and the second front wall, at least the entire inside surfaces of the bladder having a non-smooth texture (29) thereon for preventing sticking together of facing walls of the bladder to facilitating an initial inflation of the bladder;
   a pair of tubular extensions (32, 33) extending from the bladder (28) and respectively into each of the shoulder straps (30), one of the tubular extensions being for inflating and deflating the bladder;
   a mouth-inflatable, normally closed check valve (34) connected to the one tubular extension at a location that is spaced from the bladder and positioned so as to be accessible to a user for inflating the bladder by blowing into the check valve while the
shoulder strap is on a shoulder of the user, the check valve having a mouth engageable perimeter;

a valve cover (35) detachably connected over the entire mouth engageable perimeter of the check valve for covering the check valve (34) and keeping it clear; and

a pair of semi-rigid liners (36, 37) respectively in the shoulder straps (30) near the bladder to form a pair or semi-rigid channels for the tubular extensions (32, 33) near the bladder to facilitate inflating and deflating of the bladder through the one tubular extension (32).

2. The backpack defined in claim 1 wherein the non-smooth texture (29) is an embossed pattern (29) on at least the entire inside surfaces of the bladder.

3. The backpack defined in claim 1 wherein the non-smooth texture (29) is an embossed pattern (29) of concentric circles at least the entire inside surfaces of the bladder.

4. The backpack defined in claim 1 wherein the load bearing means is a bag fixed to at least one of the first and second front walls behind the back face and having an openable closure.

5. The backpack defined in claim 1 wherein the plate is an imperforate semirigid plastic plate.
6. The backpack defined in claim 1 wherein at least one front wall of the front pocket is made of mesh.

7. The backpack defined in claim 1 wherein the check valve (34) has a flapper that is normally closed to prevent air from escaping from the bladder and includes a push button (39) on the flapper that is manually depressed to move the flapper and allow air to escape from the bladder.

8. The backpack defined in claim 1 wherein the second front wall (22) is a stretchable textile front panel forming the front pocket holding the bladder.

9. The backpack defined in claim 8 wherein the load bearing means includes a textile rear panel forming a rear pocket with the first front panel.

10. The backpack defined in claim 9, further comprising a first slide fastener closing an end of the rear pocket and a second slide fastener closing an end of the front pocket.

11. The backpack defined in claim 10 wherein the second front panel is a mesh.

12. The backpack defined in claim 11 herein the bladder is subdivided into a plurality of interconnected compartments.

13. The backpack defined in claim 1 wherein the bladder is subdivided into a
plurality of interconnected compartments and the compartments include a relatively large lower compartment and a plurality of relatively small upper compartments.

14. The backpack defined in claim 8 wherein the front pocket is downwardly open and the backpack further comprises a releasable fastener at a lower edge of the front panel.

15. The backpack defined in claim 1 wherein the bladder is formed with a forwardly open central recess for avoiding pressure on the spine of a user.

16. The backpack defined in claim 1 wherein the load bearing means includes a textile rear panel forming a rear pocket with the first front panel, and including a pair of cushion panels connect in the rear pocket and behind the first front wall (20), each cushion panel comprising a plurality of spaced apart, parallel, permanently sealed and partially filled air tubes made of flexible elastic material with webs between the air tubes in each cushion panel, the air tubes of one cushion panel each facing the webs of the other cushion panel for minimizing a volume occupied by the cushion panels when there is nothing in a space between the cushion panels, and for cushioning a laptop computer placed between the cushion panels.

17. The backpack defined in claim 15 including a top permanently sealed and partially filled air tube made of flexible elastic material with top web connected between one of the cushion panels and the top air tube for covering and cushioning the space between
the cushion panels, and a pair of side and a bottom permanently sealed and partially filled air tubes made of flexible elastic material connected respectively at the sides and the bottom of the space between the cushion panels for further cushioning the space.

18. The laptop computer sleeve comprising:
   a pair of cushion panels comprising a plurality of spaced apart, parallel permanently sealed and partially filled air tubes made of flexible elastic material with webs between the air tubes in each cushion panel, the air tubes of one cushion panel each facing the webs of the other cushion panel for minimizing a volume occupied by the cushion panels when there is nothing in a space between the cushion panels, and for cushioning a laptop computer placed between the cushion panels.

19. The laptop sleeve defined in claim 18 including a top permanently sealed and partially filled air tube made of flexible elastic material with top web connected between one of the cushion panels and the top air tube for covering and cushioning the space between the cushion panels, and a pair of side and a bottom permanently sealed and partially filled air tubes made of flexible elastic material connected respectively at the sides and the bottom of the space between the cushion panels for further cushioning the space.

20. A backpack comprising:
   a first front wall;
   a second front wall spaced forwardly of the first front wall and defining a front pocket with the first front wall;
a generally rigid plate having a front face and a back face, the plate being in the front pocket with the back face of the plate being adjacent the first front wall, the plate being an imperforate semirigid plastic plate;

a pair of shoulder straps operatively connected to at least one of the front walls for holding the plate against a back of a user with the second front wall being between the plate and the back of the user;

load bearing means connected to at least one of the front walls for holding an object;

a pressurizable, flexible and elastic bladder covering generally all of the front face of the plate, the bladder being in the front pocket between the front face of the plate and the second front wall, at least the entire inside surfaces of the bladder having a non-smooth texture thereon for preventing sticking together of facing walls of the bladder to facilitating an initial inflation of the bladder, the non-smooth texture being created by an embossed pattern on at least the entire inside surfaces of the bladder;

a pair of tubular extensions extending from the bladder and respectively into each of the shoulder straps, one of the tubular extensions being for inflating and deflating the bladder;

a mouth-inflatable, normally closed check valve connected to the one tubular extension at a location that is spaced from the bladder and positioned so as to be accessible to a user for inflating the bladder by blowing into the check valve while the shoulder strap is on a shoulder of the user, the check valve having a mouth engageable perimeter;

a valve cover detachably connected over the entire mouth engageable perimeter
of the check valve for covering the check valve and keeping it clear; and

   a pair of semi-rigid liners respectively in the shoulder straps near the bladder to form

a pair or semi-rigid channels for the tubular extensions near the bladder to facilitate

inflating and deflating of the bladder through the one tubular extension;

5

the load bearing means being a bag fixed to at least one of the first and second front

walls behind the back face and having an openable closure;

   the check valve having a flapper that is normally closed to prevent air from escaping

from the bladder and includes a push button on the flapper that is manually depressed to

move the flapper and allow air to escape from the bladder;

10

   the bladder being subdivided into a plurality of interconnected compartments and

the compartments include a relatively large lower compartment and a plurality of relatively

small upper compartments;

   the load bearing means including a textile rear panel forming a rear pocket with the

first front panel; and

15

   a pair of cushion panels connect in the rear pocket and behind the first front wall

(20), each cushion panel comprising a plurality of spaced apart, parallel, permanently

sealed and partially filled air tubes made of flexible elastic material with webs between the

air tubes in each cushion panel, the air tubes of one cushion panel each facing the webs

of the other cushion panel for minimizing a volume occupied by the cushion panels when

there is nothing in a space between the cushion panels, and for cushioning a laptop

computer placed between the cushion panels.


21. The backpack defined in claim 20 including a top permanently sealed and
partially filled air tube made of flexible elastic material with top web connected between one of the cushion panels and the top air tube for covering and cushioning the space between the cushion panels, and a pair of side and a bottom permanently sealed and partially filled air tubes made of flexible elastic material connected respectively at the sides and the bottom of the space between the cushion panels for further cushioning the space.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A45F 3/04 (2010.01)
USPC - 224/627

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC(8) - A45F 3/04; B63C 1/02 (2010.01)
USPC - 224/627, 642, 644; 405/196; 441/106

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>US 4,137,585 A (WRIGHT III) 06 February 1979 (06.02.1979) entire document</td>
</tr>
</tbody>
</table>

Relevant to claim No. 18-19

Further documents are listed in the continuation of Box C.

Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

Later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

Document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

Document member of the same patent family

Date of the actual completion of the international search: 29 April 2010

Date of mailing of the international search report: 17 MAY 2010

Authorized officer: Blaine R. Copenheaver

PCT Helpdesk: 571-272-4300
PCT DSp: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)