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(54) **Backpack with inflatable bladder**

(57) A backpack for relieving stress, weight and pressure from a user's back comprises: a carrying pack for storing items, with top, forward panel to face the user's back with an upper and lower portion, sides, and, bottom; adjustable shoulder straps connected to the carrying pack, for placement of the straps over a user's shoulders and positioning the backpack behind the user's back; a pleated pouch pocket covering the lower portion of the forward panel and extending beneath the bottom of the carrying pack and having a forward surface facing the user's back; an inflatable bladder enclosed within the pouch pocket having a lower part extending across and beneath the bottom of the pack and an upper part extending part-way upwardly along the forward panel ; a board enclosed and secured within the pouch pocket for preventing, expansion of the bladder into the carrying pack and puncturing of the bladder; valve means for the bladder accessible through the pouch pocket for permitting inflating and deflating the bladder; a cushion composite on the pouch pocket and allowing access to the valve means, the composite comprising an inner layer of expandable material, and outer layer of expandable material and sandwiched therebetween a compressed, apertured foam frame, and an array of cushioning bubbles located within the frame apertures, the frame having cut outs to allow for expansion.

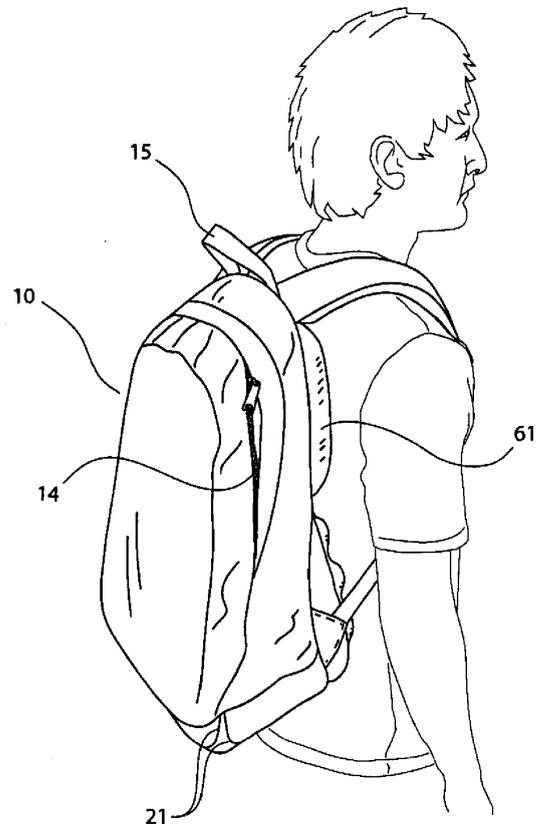


FIG. 1

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Description

Field of the Invention

[0001] This invention relates to backpacks of the type used by, for example, students to carry books, hikers to carry gear and the like. The backpack normally contains a pack and within, one or more pockets for storing items. The backpack is then strapped to the back of a user and carried in that fashion. The backpack described herein is of the type that uses an inflatable bladder and positioned beneath the pack and between the forward panel of the backpack and the user's back and for the purpose of relieving stress, weight and pressure on the back.

Description of the Prior Art

[0002] It is known that the abutting relation of the forward panel of the backpack against the back and spinal column can cause pain, fatigue and perhaps degeneration to affected areas of the back and spine. It is also known that most backpacks in use today place the majority of the weight of the backpack and its contents on the shoulders and on the middle and lower part of the back of the user.

[0003] A backpack for relieving stress, weight and pressure from a user's back is shown and described in my U.S. Patent 7, 631,792, issued December 15, 2009. The present invention represents an improvement over same.

SUMMARY

[0004] An object of the invention is a backpack that when worn minimizes stress, weight and pressure on the back.

[0005] These and other objects, features and advantages are accomplished in accordance with the teachings of the present invention, one illustrative embodiment of which comprises a backpack for relieving stress, weight and pressure from a user's back having: a carrying pack for storing items, with top, forward panel to face the user's back with an upper and lower portion, sides, and, bottom; adjustable shoulder straps connected to the carrying pack, for placement of the straps over a user's shoulders and positioning the backpack behind the user's back; a pleated pouch pocket covering the lower portion of the forward panel and extending beneath the bottom of the carrying pack and having a forward surface facing the user's back; an inflatable bladder enclosed within the pouch pocket having a lower part extending across and beneath the bottom of the pack and an upper part extending part-way upwardly along the forward panel; a board enclosed and secured within the pouch pocket for preventing, expansion of the bladder into the carrying pack and puncturing of the bladder; valve means for the bladder accessible through the pouch pocket for permitting inflating and deflating the bladder; a cushion com-

posite on the pouch pocket and allowing access to the valve means, the composite comprising an inner layer of expandable material, and outer layer of expandable material and sandwiched therebetween a compressed, apertured foam frame, and, an array of cushioning bubbles located within the frame apertures, the frame having cut outs to allow for expansion.

BRIEF DESCRIPTION OF THE DRAWING

[0006] Other objects, features and advantages of the present invention will be apparent from the following detailed description and accompany drawing, wherein:

[0007] Fig. 1 is a perspective view showing the backpack of the present invention mounted against the back of a user;

[0008] Fig. 2 is a perspective view of the backpack of the present invention showing the front of the backpack that is positioned against the back of a user;

[0009] Fig. 3 is a perspective view of the backpack of the present invention showing the rear of the backpack partially cut away to show the inflated air bladder and filler valve arrangement;

[0010] Fig. 4 is an exploded view of the bladder valve design with a bladder inflator needle;

[0011] Fig. 5 is an exploded view of the bladder valve design with the bladder valve positioned in the bladder with a bladder inflator needle;

[0012] Fig. 6 is a perspective view of the front of the backpack with portions cut away to show the foam material used in the upper pads and lower bubbles;

[0013] Fig. 7 is a perspective view of the front of the backpack showing the elastic fabric material covering the upper pads and lower cushion composite;

[0014] Fig. 8 is a perspective view partially cut away of the front of the backpack to show an alternate covering for the upper pads; and,

[0015] Fig. 9 is a perspective view together with a cross sectional view detailing the materials of the cushion composite on the lower portion of the forward panel.

DETAILED DESCRIPTION

[0016] Referring now to Figs. 1-3 of the drawing, a backpack 10 is shown having a forward panel 11 that faces the user's back when worn and an expandable pouch pocket 12. The backpack can be of canvas, polyester, nylon, plastic, fabric, and the like, although certain portions of the backpack are preferably fabric.

[0017] The backpack 10 further includes adjustable straps 13 extending from the top of the backpack to the sides near the bottom of the backpack for placement of the straps 13 over a user's shoulders and positioning the backpack 10 behind the user's back. An adjustable waist belt (not shown) for securement about the user's waist may be provided.

[0018] Normally the backpack will have a zippered carrying pack 14 comprised of a number of pockets so that

articles can be placed within and removed from the carrying pack 14. The backpack may also be provided with a strap 15 at its top for hanging the backpack when not being carried by a user.

[0019] The pouch pocket 12 is provided with a zippered opening along its top at 16 positioned within the pouch pocket 12 are an angled, flexible board 17 as of plastic (P.E. board) or composite and an inflatable bladder 18 that is slid under the board 17 and carrying pack 14. Board 17 is stitched to the forward panel just above zippered opening 16. The bladder 18 is placed in the pouch pocket 12 and slid against and under the board 17. In inflated position, the lower portion 19 of bladder 18 extends across the bottom beneath the pack 14, while an upwardly extending portion 20 becomes positioned across the forward panel 11 corresponding generally to its length and width, so as, when inflated, it generally conforms to the shape of the curvature of the thoracic region of the spine. Due to the board 17, the bladder 18 expands outward and not inward towards the carrying pack 14. The board 17 also prevents the bladder 18 from getting punctured. In the process of inflation, the pouch pocket 12 also expands. The pocket 12 is pleated in the lower corners, as at 21 to allow for expansion.

[0020] The bladder 18 is of flexible material such as rubber, elastomeric or polymeric material. It is provided with an air valve at 31. In military and hiking applications, the backpack's bladder 18 can be pulled out and used as a pillow at night.

[0021] As best seen in Figs. 3-5, air valve 31 is embedded in the bladder 18 surrounded by a molded, thickened ring 32. The bladder 18 is inflated via the air valve 31 using, for example, an ordinary ball inflator needle N. Valve 31 normally prevents air from escaping from bladder 18, but will allow air to enter and escape the bladder 18, as via the needle N. Valve 31 includes: the locking cap 33; pin valve 34 that opens when needle N is inserted and closes upon the needle's removal; female member 35 for receiving the pin valve 34; and, bellows member 36, as of PVC, joined to thickened ring 32 and surrounding female member 35 and which is expandable for easy access and can be pulled up or pushed down. Locking cap 33 holds pin valve 34 within female member 35.

[0022] Referring to Figs. 2, 3, 6, 7 and 9, the forward panel 11, up to the zippered opening 16, forms the front wall of pouch pocket 12.

[0023] Sewn to this front wall is a composite 41 that includes an inner layer 42 of an expandable, durable, mesh fabric (Fig. 9), and an outer, similar fabric layer 43 (Figs. 7 and 9). Layers 42, 43 could be a webbing fabric, nylon, polyester and the like.

[0024] Sandwiched between layers 42 and 43 is a compressed, apertured foam frame 44 (Fig. 9) such as compressed P.E., with cut-outs 45, star-like in shape, and an array of horizontally and vertically aligned, bubbles 46, as of soft, molded, foam-like resilient material such as P.E. (Figs. 6 and 9) positioned and glued within the apertures in frame 44. These cushioning bubbles 46

can be oval-shaped, circular, square and the like. The frame 44 is molded with apertures for the receipt and holding of the foam bubbles 46 and portions cut out at 45 to allow for expansion and then the entire composite 41 heat sealed together.

[0025] The bubbles 46 are held in place by the compressed PE foam frame 44. After heat sealing, the composite 41 is then sewn to the front wall 11.

[0026] The composite 41 expands outwardly when the bladder 18 is filled and does not take room away from the interior of the backpack 10.

[0027] Disposed centrally of the composite 41 is a grommet 51 leading through an opening to the bladder valve 31.

[0028] Referring to Figs. 6 - 8, the upper part of the forward panel 11 includes a pair of pads 61, as of foam material 62 of the same type as bubbles 46, and covered with mesh fabric material 63, similar to mesh material 42 and 43, except more durable and rigid. Pads 61 push the backpack 10 at an angle and keep the user from compressing the top of the backpack 10 against the user's back. They force the weight of what's inside the pack 14 to be transferred to the bottom of the air system so as to sit on the top of the user's buttocks.

[0029] In the alternate embodiment of Fig. 8, the pads 62 are a mixture of common foam with soft covering molded foam.

[0030] In use, the bladder 18 is inflated through the grommet 51 to the bladder valve 31, using a ball inflator needle N. With inflation, the thickened ring 32 fits right against and under the grommet 51. The ring 32 helps to hold the position of valve 31 in the center of grommet 51, and, due to its thickness, eases the placement and withdrawal of the needle N in valve 31. The valve 31 can be pulled up and the needle N inserted and then the valve 31 pushed down so that it doesn't hit the user in the back.

[0031] The user straps the backpack 10 on, fitting it to its desired position using the straps 13.

[0032] In inflated condition, the lower portion 19 of the pocketed bladder 18 will rest upon the user's buttocks. The upper portion 20 of the bladder 18 conforms generally to the curvature of the thoracic region of the user's body and rests comfortably against the back.

[0033] The bladder 18, when placed in the pouch pocket 12 is so positioned to a generally L-shaped configuration, with the lower portion 19 for resting upon and generally conforming to the buttocks area of the user, and the bladder upper portion 20 continuing from the bladder lower portion, extending at an angle part-way up, so as to rest upon the user's back and generally conforms to the curvature of the thoracic region of the user's body.

[0034] The combined effect of the upper pads 61 and the bubbled composite 41 is to create air channels between the user's back and the backpack 10 and thereby reduce the accumulation of moisture on the user's back and shirt.

[0035] Also, known prior art backpacks do not have large thick padding at the top such as the pads 61. What

this does is when the user adjusts the straps 13, thereby pulling the backpack towards his back, these pads 61 help to keep the major portion of backpack 10 off the user's shoulders and back. It shifts the weight off the upper back and puts the weight lower towards the pocket pouch 12 and resting against the user's buttocks.

[0036] The feeling to the user is that a significant portion of the weight of the backpack and contents is removed.

[0037] The back is relieved from stress, weight and pressure. The inflation of the air bladder moves the backpack away from the back, shifting some of the weight to now be borne by the shoulders and with part of the weight now being supported by the buttocks area.

[0038] The backpack can be made in different styles and sizes, for example, a student backpack, one for hiking, one for military use and can be made to carry a computer.

[0039] The pouch 12 is zippered at 16 to allow for removal and replacement of bladder 18.

[0040] It should be obvious that changes, additions and omissions may be made in the details and arrangement of parts without departing from the spirit and scope of the invention as hereinafter claimed.

Claims

1. A backpack for relieving stress, weight and pressure from a user's back, comprising:
 - a carrying pack for storing items, having top forward panel to face the user's back with an upper and lower portion, sides, and, bottom;
 - adjustable shoulder straps connected to the carrying pack, for placement of the straps over a user's shoulders and positioning the backpack behind the user's back;
 - a pouch pocket covering the lower portion of the forward panel and extending beneath the bottom of the carrying pack and having a forward surface facing the user's back;
 - an inflatable bladder enclosed within the pouch pocket having a lower part extending across and beneath the bottom of the pack and an upper part extending part-way upwardly along the forward panel ; and,
 - valve means for the bladder accessible through the pouch pocket for permitting inflating and deflating the bladder.
 2. The backpack of claim 1 including a board enclosed and secured within the pouch pocket for preventing, expansion of the bladder into the carrying pack and puncturing of the bladder.
 3. The backpack according to at least one of the pre-
- ceding claims, wherein the pouch pocket is pleated to allow for expansion.
 4. The backpack according to at least one of the preceding claims including a cushion composite on the pouch pocket and allowing access to the valve means.
 5. The backpack of claim 4 wherein the cushion composite includes an array of cushioning bubbles.
 6. The backpack of claim 4 wherein the cushioning composite comprises an inner layer of expandable material, and outer layer of expandable material.
 7. The backpack of claim 6, wherein the cushioning composite comprises sandwiched between the inner layer of expandable material and the outer layer of expandable material a compressed, apertured foam frame.
 8. The backpack of claim 7, wherein an array of cushioning bubbles is located within the frame apertures.
 9. The backpack of claim 8 wherein the frame has cut outs to allow for expansion.
 10. The backpack according to at least one of the preceding claims including cushioning pads on the upper portion of the forward panel.
 11. The backpack according to claim 1, comprising: a pleated pouch pocket; a board enclosed and secured within the pouch pocket for preventing expansion of the bladder into the carrying pack and puncturing of the bladder; a cushion composite on the pouch pocket and allowing access to the valve means, the composite comprising an inner layer of expandable material, and outer layer of expandable material and sandwiched therebetween a compressed, apertured foam frame, and an array of cushioning bubbles located within the frame apertures, the frame having cut outs to allow for expansion.

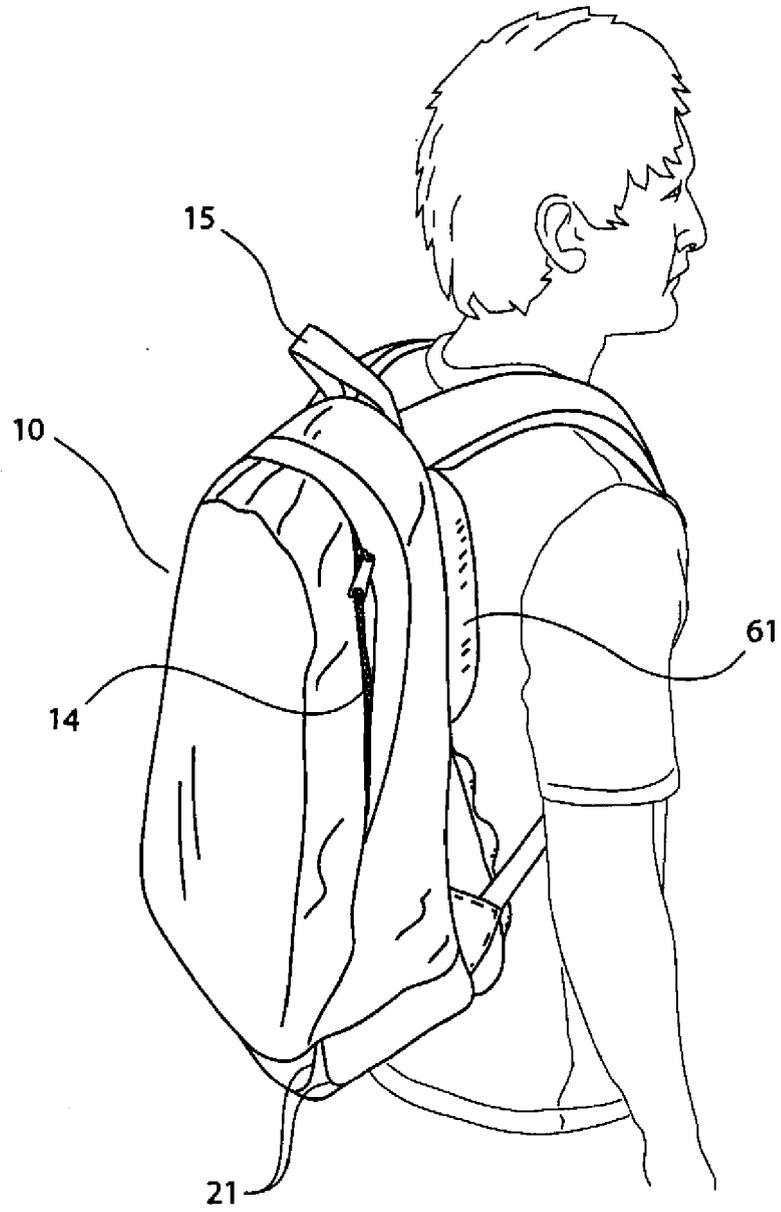


FIG. 1

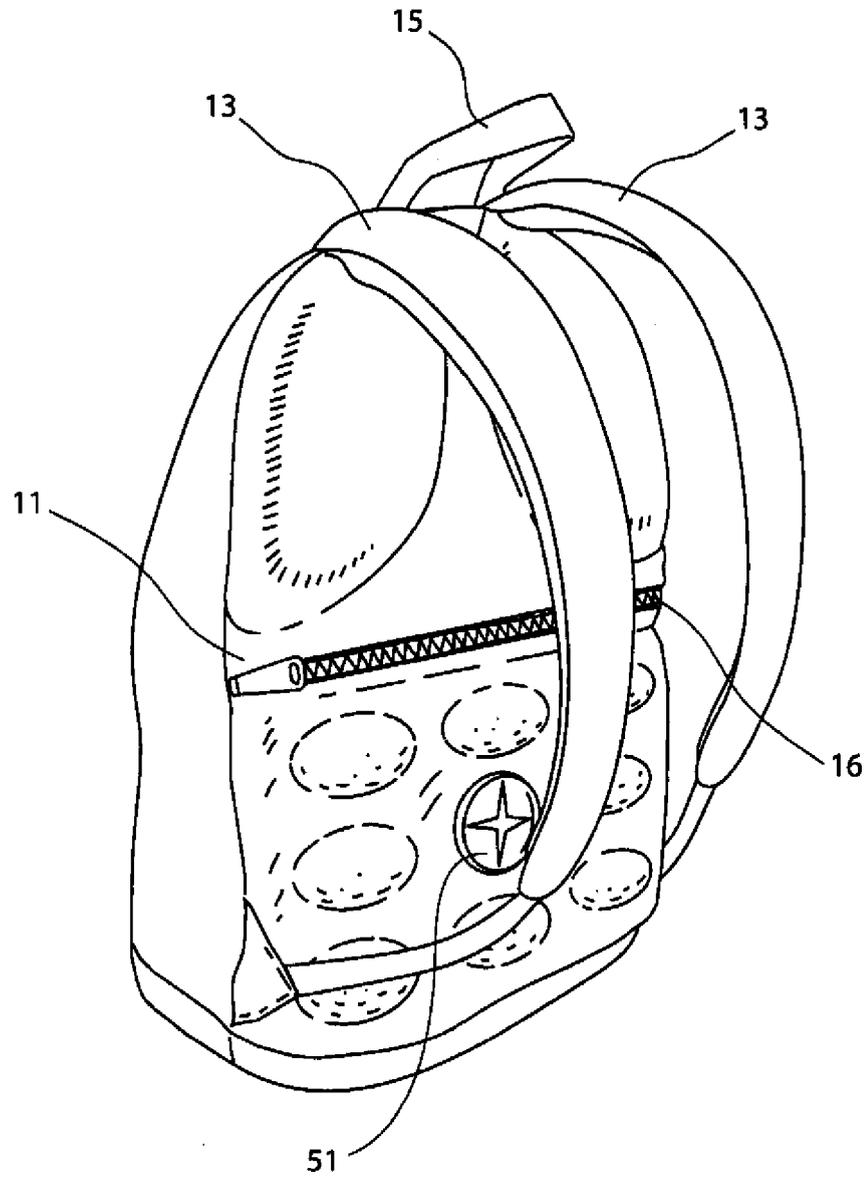


FIG. 2

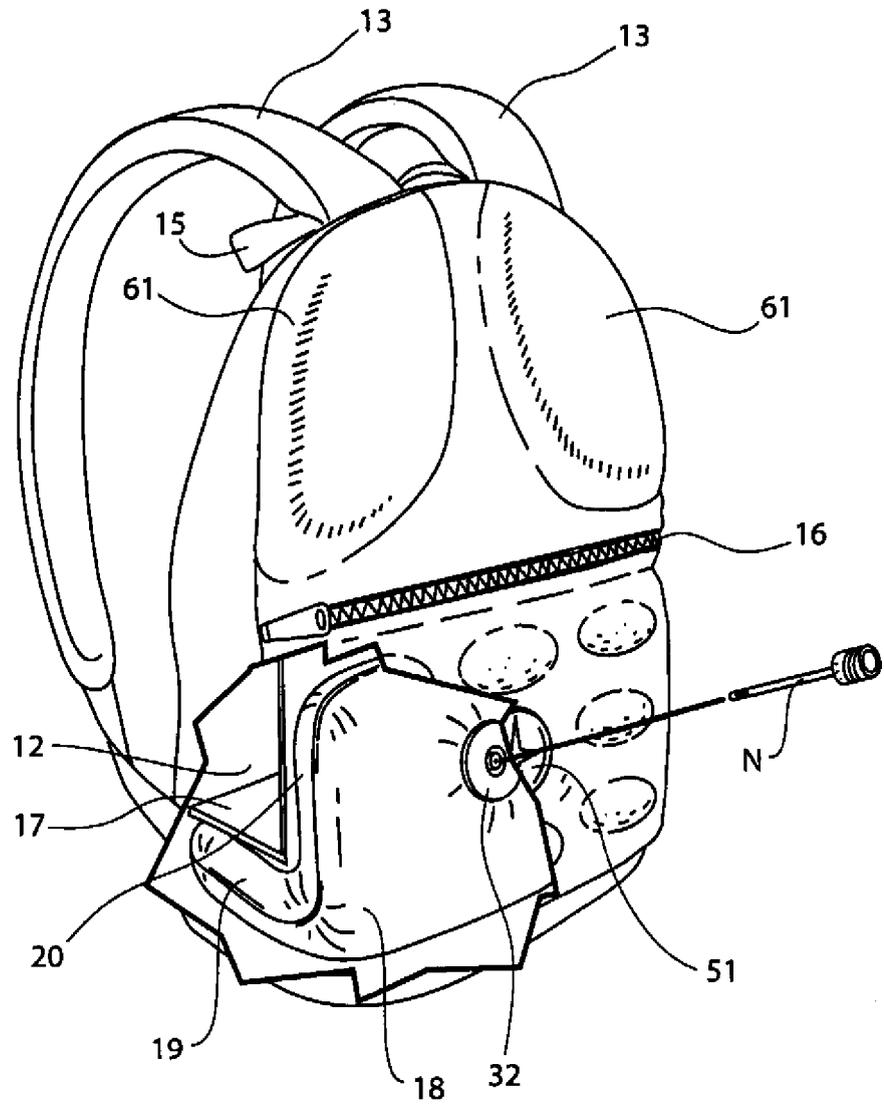
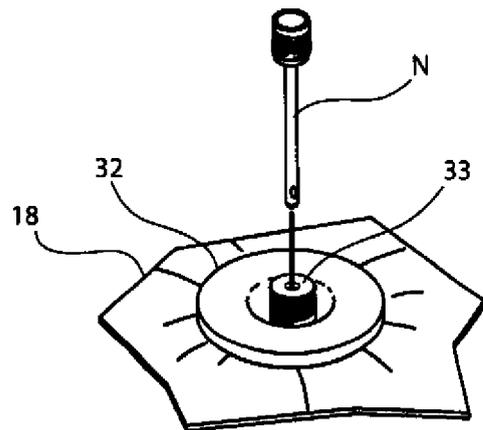
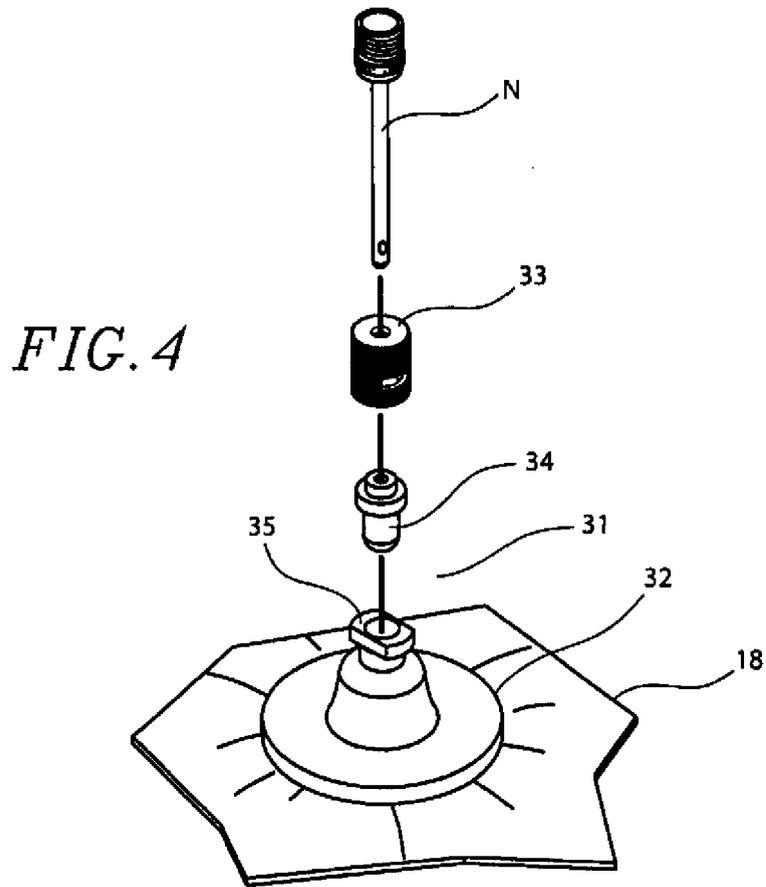


FIG. 3



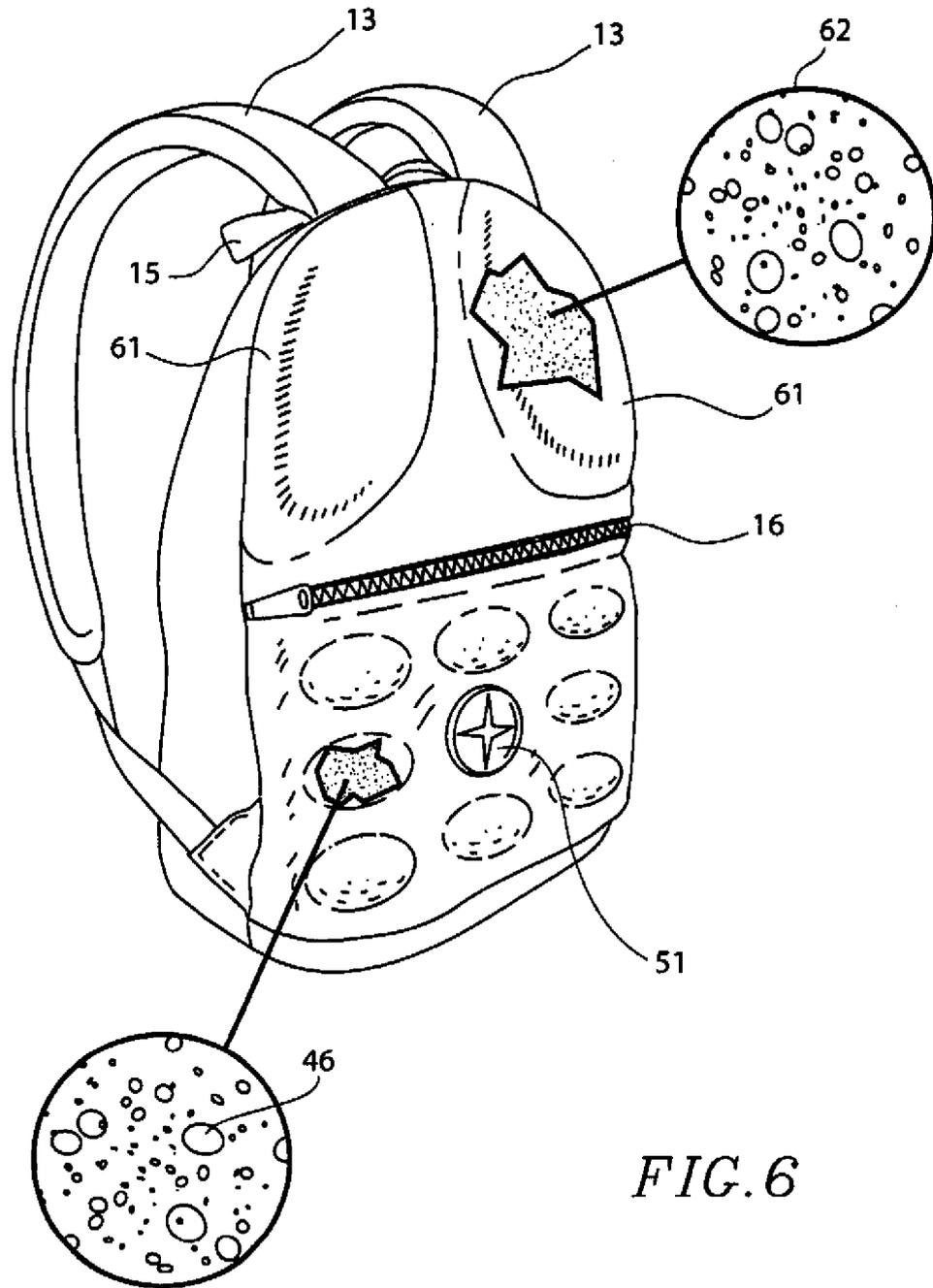


FIG. 6

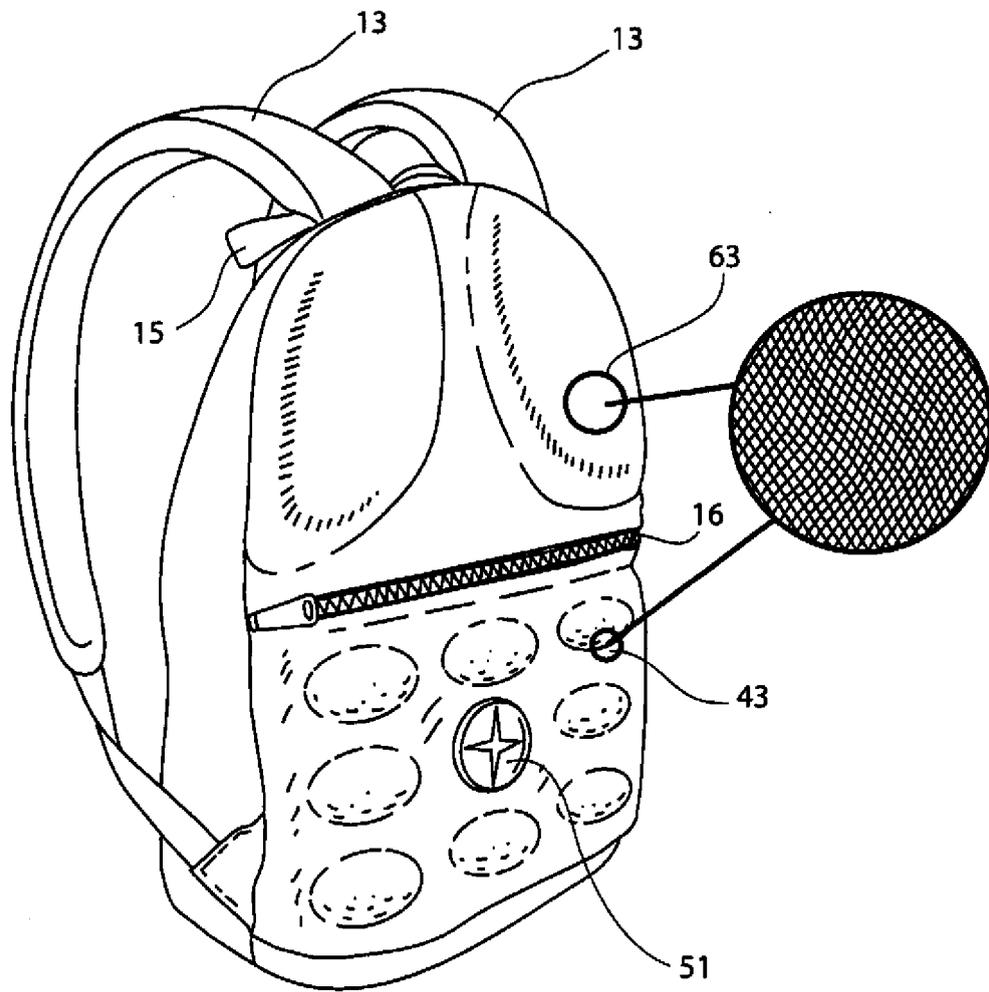


FIG. 7

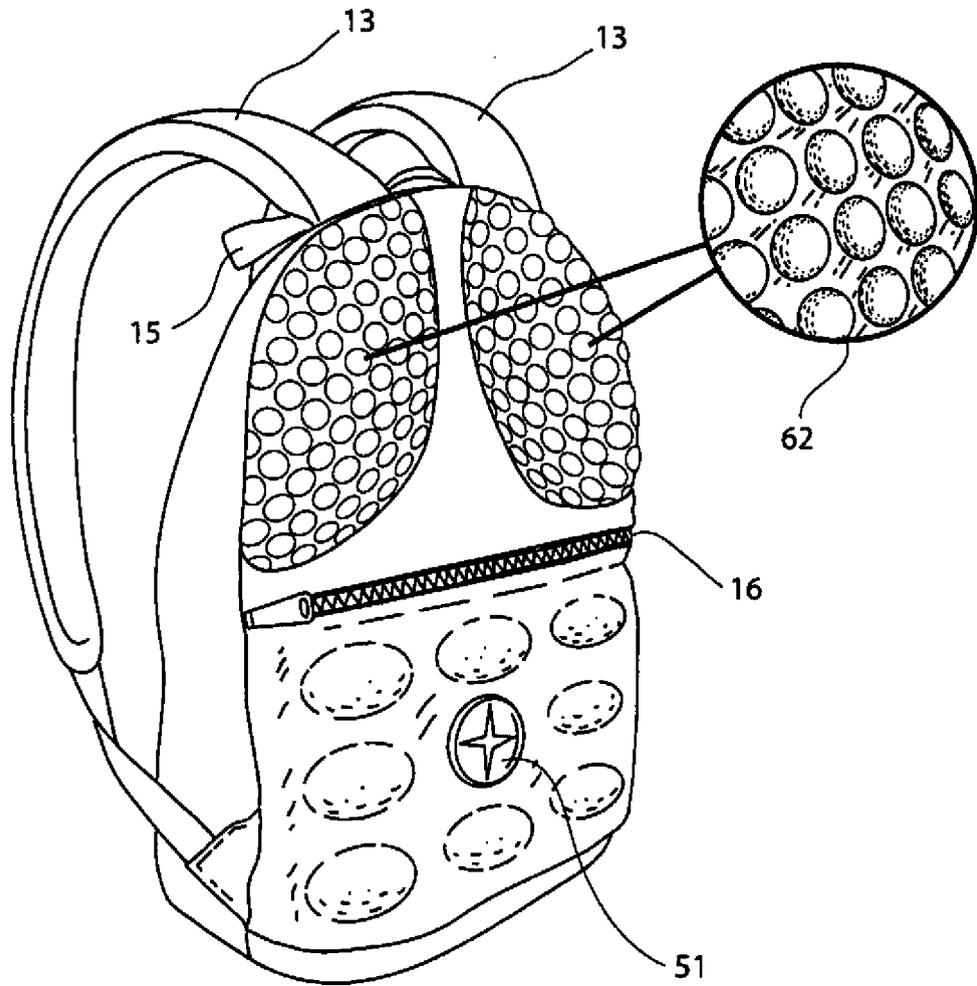


FIG. 8

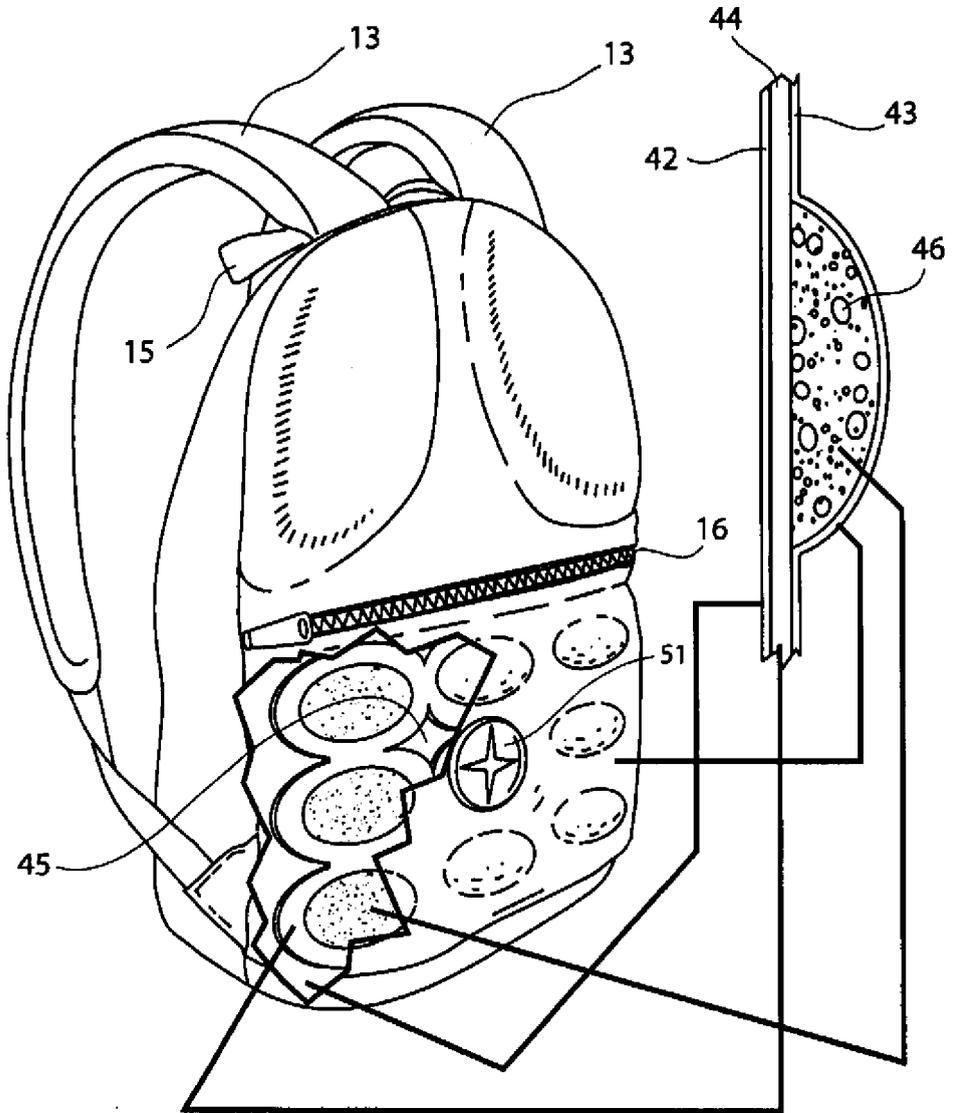


FIG. 9



EUROPEAN SEARCH REPORT

Application Number
EP 11 16 6826

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The Hague		20 December 2011	Nicolás, Carlos
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X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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