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Geiben

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[54] **HIKER'S BACK PACK**

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[52] **U.S. Cl.** ..... **224/8 R;** 224/5 W

[51] **Int. Cl.** **A45f 3/04**

[58] **Field of Search** ..... 224/25 A, 8 R, 8 A, 9, 224/10, 11

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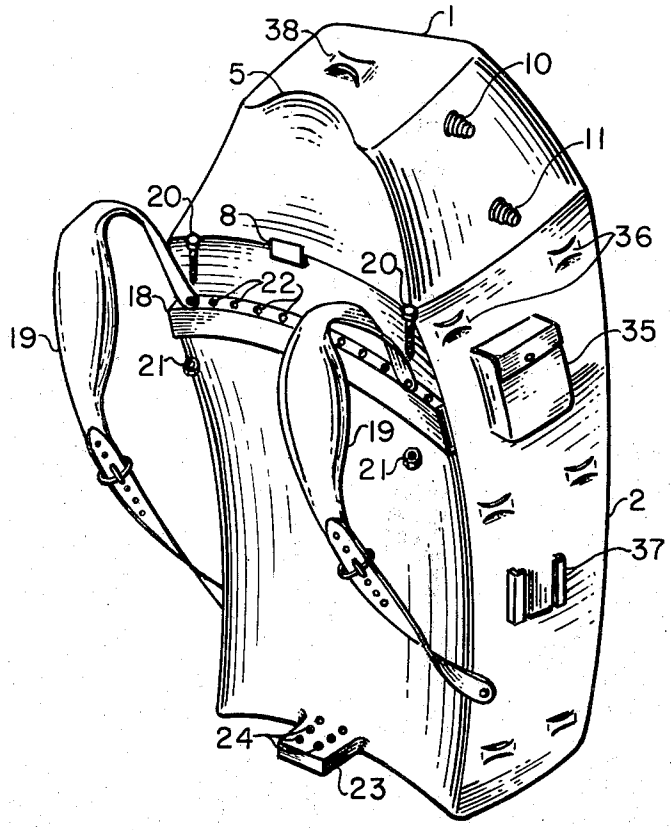
[57] **ABSTRACT**

This invention relates to a two section semi-rigid, hiker's back pack having a lower section comprising a structurally reinforced, molded open basket, to which shoulder and waist straps are adjustably attached, said section being so molded that the side of the lower section which is adjacent to the hiker's back is laterally and vertically contoured to generally conform with the back curvature of a wearer; and an upper section comprising a structurally reinforced, molded, open container, inversely and removably hinged to the lower section, being so molded that the side of the upper section, which is adjacent to the wearers neck and head, has an exaggerated depression therein to allow unrestricted head movement by the wearer. Additional provision is made therein for specific shoulder and waist strap adjusting means together with compartmentalization of the pack and accessory attachment means.

22 Claims, 5 Drawing Figures



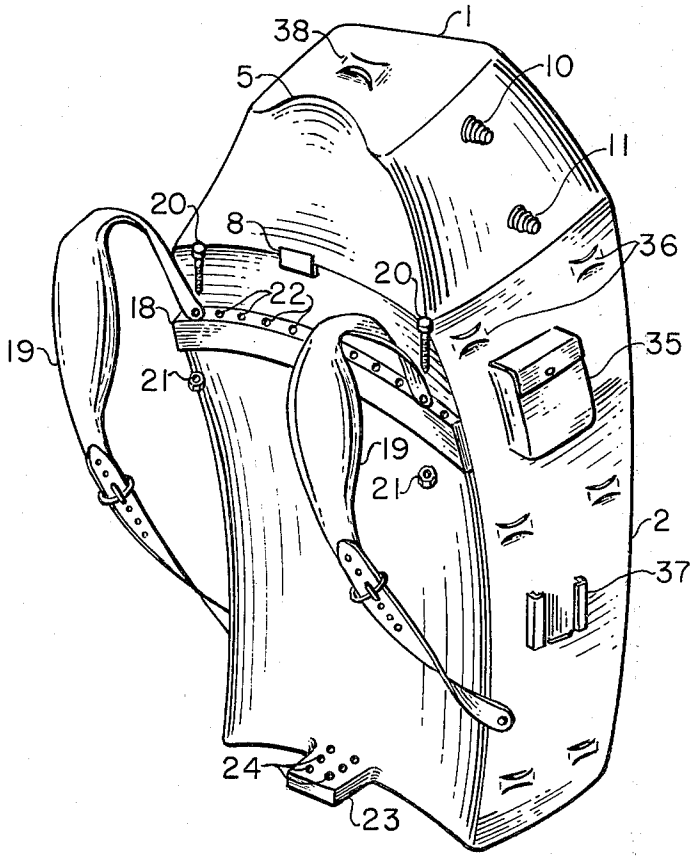


FIG. 1

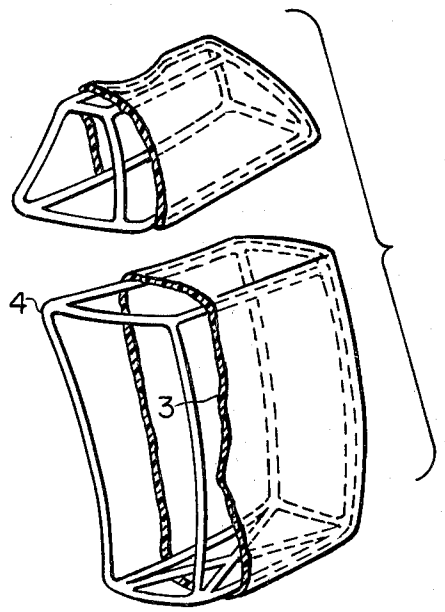


FIG. 2

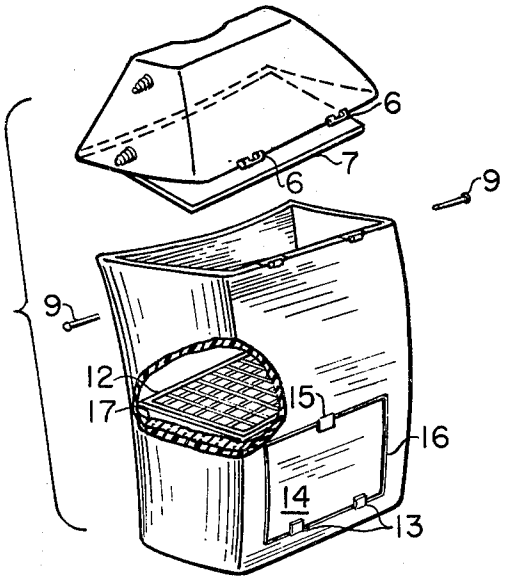


FIG. 3

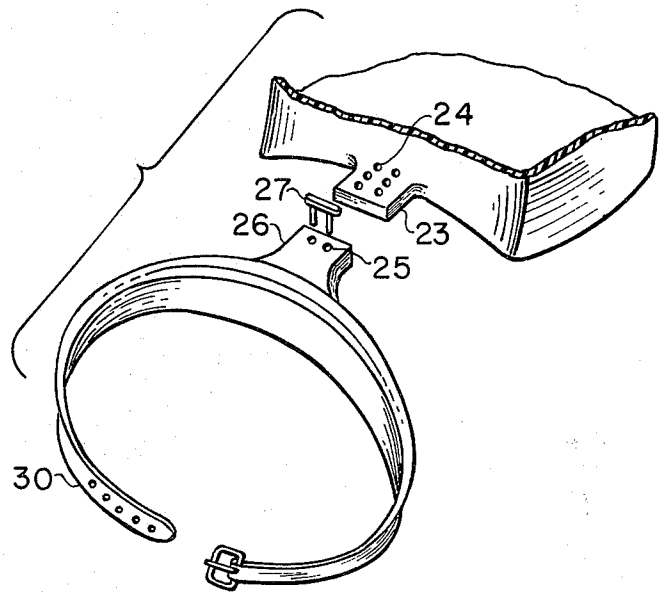


FIG. 4

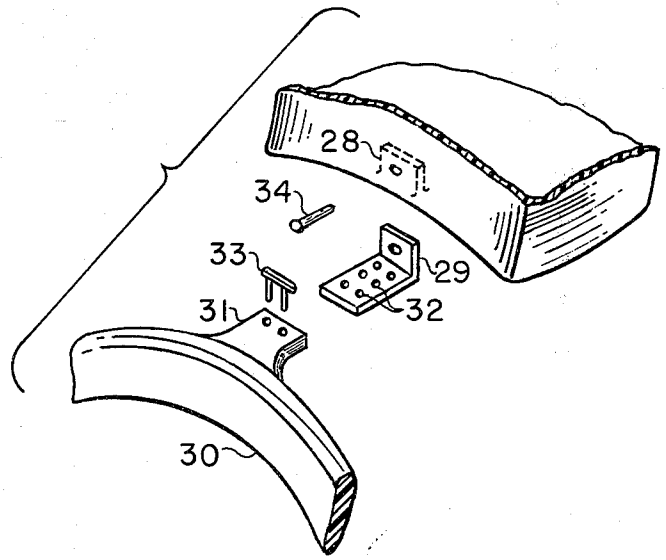


FIG. 5

HIKER'S BACK PACK

BACKGROUND OF THE INVENTION

This invention relates to a hiker's back pack apparatus for transporting loads on the wearers back. Specifically, the present invention relates to an improved hiker's back pack which effects optimum distribution of a load on the wearers back, while providing compartmentalized load distribution in a waterproof, multi-use carrying pack having a simplified yet versatile structure.

A common problem associated with back packing is that of enduring the load placed on the hiker's body and the inability to easily vary stable positions of comfort of both the pack and the load forces. With most hikers, it is desirable to shift the load frequently while carrying, so that the direct weight thereof is alternately assessed against varying muscles of the shoulders, back and waist. One desirable placement of the load is to direct the weight from the shoulders and torso to the hips enabling the strongest body muscles to bear the major weight of the load. Prior art back packs seeking to effect this load placement employed various complicated frame structures and elaborate shoulder harnesses which have proved difficult, if not impossible, for the hiker to quickly and properly adjust to a different stable position without removal of the pack. A further problem associated with prior art back packs is their failure to be adequately weatherproof. As packs are traditionally made of a fabric like material with a high degree of flexibility having non weatherproof zippers and flaps, truly water tight and weatherproof packs have not been available to the hiker. Further, the nature of these fabric type packs severely limits their utility other than as a back packing device. It is desirable that hikers carry items having multiple utility and the prior art back pack has little utility other than as a carrying device.

It is an object of the present invention to provide a hiker's back pack of simple and economic structure. Another object is to provide a back pack having a means for quickly and easily shifting the center of gravity of the load and accordingly, its effect upon the shoulders, upper torso and hips of the hiker's body. Another object of the present invention is to provide a water and weatherproof back pack. Another object of this invention is to provide a back pack having utility other than for transporting loads on a man's back. Still another object is to provide a back pack which will accord optimum comfort to the hiker transporting loads therein. A further object of the invention is to provide a hiker's back pack which is water tight. Another further object is to provide a hiker's back pack which is thermally insulated in whole or in part. Still another further object of this invention is to provide a back pack which is highly resistant to pests and insects and is highly durable to accidental abrasions and rough handling. A still further object is to provide a back pack having compartmentalized storing and/or easy accessability to stored loads.

The aforesaid and other objects of the invention will become apparent from the following detailed description of the back pack, forming specific embodiments thereof, when read in conjunction with the appended drawings.

FIG. 1 is a front perspective view of a back pack forming one embodiment of the invention.

FIG. 2 is a back perspective view showing one embodiment of the inner structural reinforcing of the back pack in FIG. 1.

FIG. 3 is a back perspective view of a further embodiment of the back pack of FIG. 1.

FIG. 4 is an enlarged perspective view of the waist strap and center of gravity adjustment means embodied in FIG. 1.

FIG. 5 is an enlarged perspective view of a further embodiment of the center of gravity adjustment means.

Referring now in detail to the drawings, in which like reference numerals refer to like parts in the several views and with particular reference to FIG. 1, there is shown therein, a back pack having an upper section designated as 1, and a lower section designated as 2. The structural reinforcement of each of these sections is shown in FIG. 2, wherein a semi-rigid material 3 is used to form the body of the back pack and is integrally molded to a rigid structural reinforcement 4 formed from a low weight high strength material, preferably a box or tubular manufacture. Although any suitable material may be used to form this reinforcement a light weight metal such as aluminum or magnesium or a rigid plastic is preferred. In some instances, a semi-rigid material may be desirable so that under the stress of load, the reinforcing structure would generally bend and conform to the wearer's back. In some instance, the same material used in the body of the pack can be incorporated or integrally molded into a supporting structure.

The upper section is molded so that the side thereof adjacent to the wearer's neck and head has an exaggerated depression 5 therein to allow unrestricted head movement by the wearer. In order to provide greater utility for the upper section, such as a camp stool, water carrier, or cooking device, it is generally perferred that the supporting structure therein be rigid and capable of accepting loads without collapsing. A metal upper section, capable of withstanding direct contact cooking-fire temperatures may be used together with a semi-rigid lower section. It is preferable that the lower edge of the upper section be fitted with a removable lid, so that the upper section may be completely compartmentalized from the lower section. FIG. 3 shows an embodiment where the upper section is removably hinged 6 to the lower section and contains a lid 7 which is removably attached thereto. This embodiment is of multi-purpose in that it provides a cooking lid when used as a cooking utensil and compartmentalizes the back pack so that it may be used for storing foods, etc., when back packing. FIG. 1 shows a molded clasp mechanism 8 which locks the upper section to the lower section. Removable hinges are located on both the upper and lower section so that the upper section can be opened by hinge attachment. When utilizing the upper section for purposes other than back packing, i.e., such as a stool, water carrier or cooking implement, the attachment pins 9 of the hinges may be removed and the upper section completely removed from the lower section. A water tight seal may be used in conjunction with the locking mechanism on the upper/lower section. Proper placement of the watertight seal in combination with a locking mechanism will provide a water tight back pack.

In those instances wherein the upper section is produced from a material incapable of withstanding direct contact cooking-fire temperatures, the upper section

can be used as a container to warm liquids by providing an inlet and outlet means in the wall of the section capable of transporting liquids therethrough and suitably connecting these inlet and outlet means to a hollow remote heating means so that when the upper section is filled with liquid, said liquid will flow through the outlet means to the remote heating device, where it will be heated by the campfire, then flow through the inlet means and back to the upper section. It is preferred that the remote heating means be a loop or coil of hollow metal tubing with the ends thereof being connected by flexible tubing to the inlet and outlet means respectively. FIG. **1** embodies provision for the above type device inlet means and outlet means being **10** and **11.**

The back pack may additionally contain one or more removable or fixed shelf separators as shown in FIG. **3.** Such separators may be either laterally or vertically deposed. When laterally fixed, provision should be made for entrance to the lower area of the lower section. FIG. **3** embodies a laterally deposed shelf **12** wherein entrance to the lower area is by a hinged **13** door **14** having a molded clasp locking mechanism **15** thereon. In addition the door is fitted with a waterproof seal **16** to render the back pack water and weather tight. The door may be of any size or shape hinged or otherwise attached. The shelf can be fixed or removable and may be made of any suitable material. It is preferred however, that such be removable and made of a heat resistant material, grated or perforated, so that it can be used as a camp fire cooking utensil. A further provision of one embodiment of this invention is that the back pack may be thermally insulated in whole or in part. The method and material used for thermal insulation is not critical providing it is suitable for the use. A double walled structure or use of thermal insulation material is preferred. FIG. **3** shows an embodiment wherein the lower area of the lower section is thermally insulated **17.**

The lower section has attached thereto shoulder and waist strap means for attachment to the wearer's back. The upper point of attachment of the shoulder strap to the lower section is by means of a shoulder strap adjusting bar.

The shoulder strap adjusting bar should be of a rigid material, preferably a light weight metal such as aluminum, magnesium or a rigid plastic molded or otherwise attached to the lower section. The bar is horizontally deposed and contains multiple adjustment holes throughout its length for shoulder strap attachment. The shoulder straps are attached by an easily removable attachment means to the adjusting bar and can be of any convenient size or design. It should be noted that the shoulder strap adjusting bar may connect to the structural reinforcement or to both it and the semi-rigid material of the lower section for better support thereof. FIG. **1** illustrates the attachment of the shoulder strap adjustment bar **18** to the lower section **2** of the pack and the relationship of the shoulder straps **19** thereto. Attachment of the shoulder straps to the adjusting bar is by pin **20** and pinlock **21** through the multiple adjustment holes **22.** When the shoulder strap adjustment bar is connected to the structural reinforcement alone, the pin attachment means may attach and lock outside the lower section. When the lower section is molded into the semi-rigid material of the lower section, the pin attachment means may attach and lock inside the lower section.

The lower section is also provided with a center of gravity adjusting means which may be molded into the back pack as an integral and continuous portion thereof. FIGS. **1** and **4** present a preferred embodiment wherein the lower section contains an outward projection **23** thereon, with holes **24** therethrough, matching the holes **25** in the waist belt center of gravity adjusting means **26.** The number of adjusting holes therein may be varied to the suitability of the back packer. It is pointed out that this section may protrude as much as desired to vary the center of gravity of the back pack and is limited in length only by the minimum comfortable closeness to the wearer's back. The waist belt center of gravity adjustment means is attached to the waist belt and may be an integral and continuous portion thereof operating as an acceptor of the lower section center of gravity adjusting means. The waist belt center of gravity adjusting means may be hollow and sufficiently deep so as to accept each of the adjusting points from the lower center of gravity adjusting means or alternately, may be solid, containing multiple adjusting holes, with the lower section being hollow so that the former means is accepted by the latter. In the latter instance a close adjustment may cause the waist belt center of gravity adjusting means to protrude into the inner carrying area of the lower section. Pin attachment **27** may be provided for positive locking of the center of gravity adjusting means.

FIG. **5** presents a further embodiment of the center of gravity adjustment means. Therein, the lower surface of the lower section contains a horizontal slot **28** and the center of gravity adjusting means comprises an upward angled insert **29** for said slot which is adjustably attached to the waist belt by means similar to the adjusting means of FIG. **4.** The waist belt **30** contains a hollow center of gravity adjusting means **31** which accepts the angled insert. The angled insert contains multiple adjustment holes **32** which may be adjustably pin attached **33** to the waist belt center of gravity adjusting means. The mechanism can be provided with a locking means **34** to prevent detachment of the lower section from the angled insert, however, the downward force of the back pack will normally be sufficient to hold the insert in the slot.

A vertical and horizontal curvature of the back pack, assures a comfortable carrying device for the wearer. Curvatures should be manufactured to generally conform with the average wearer's back and if a semi-rigid structural frame is used, tha back pack will tend to conform more readily thereto.

Accessory pockets **35,** tie rings **36,** and slide accessory attachment means **37,** can be molded at convenient spots anywhere on the pack. It is preferable that these items be located on the sides however, so that maximum utility can be obtained therefrom. For example, tie rings should be located at the top side and bottom side so as to allow the securing of a sleeping bag in either of these positions. Tie rings may also be located on the upper section or the upper portion of the lower section to provide a tie on means for use of a tump strap or breast strap means by which a portion of the weight of the load may be transmitted to the head or the chest of the user. Handles may be molded in any convenient position in the upper or lower section. It is preferable to have a molded handle **38** in the top of the upper section as embodied in FIG. **1.**

The materials from which the aforedescribed back pack may be manufactured are many and varied. The shoulder straps and waist belt may be made of any suitable fabric, leather, plastic or combination thereof. The supporting structure can be made of metal, wood, plastic or a suitable rigidized fabric and should be designed for maximizing strength. A tubular, box or I type design are preferred. The body of the back pack can be made of any suitable metal, plastic or a rigidized fabric. The structure of the back pack allows a maximum of flexibility in choice of materials for custom assembly of the pack to use of the wearer. The pack can be molded from one material or be comprised of various materials so as to gain conflicting utilities.

It will be observed that the load may be carried by the bearer in an upright position or it may easily be shifted by the center of gravity adjusting means to a slight forward or backward position. Thus, when endurance of a hiker begins to wan because of the position of a load, simple adjustment of the center of gravity may be accomplished by the wearer with the pack on his back to provide a variance of force pressure upon other muscles of the body.

I claim:

1. A back pack comprising:

an upright, molded, open container having substantially semi-rigid structural integrity, lower section laterally and vertically contoured on the front side to generally conform to a wearer's back;

a horizontally extending adjusting bar attached to the upper portion of the front side of said lower section, said bar having a plurality of adjusting holes spaced throughout its length;

a pair of adjustable length shoulder straps having upper and lower ends, the upper ends thereof each including connectors adapted to be secured, selectively, to an adjusting hole of the adjusting bar and the lower ends are connected to a lower area of the lower section;

a lower section center of gravity adjusting means attached to the lower area of the lower section;

a waist encircling belt, having a center of gravity adjustment means attached thereto, means for securing said center of gravity adjustment means of said belt to the lower section center of gravity adjusting means, for positioning said lower section relative to the wearer;

means for adjustably attaching said lower section center of gravity adjusting means to said center of gravity adjustment means; and

a molded, open container having substantially semi-rigid structural integrity, upper section having an exaggerated depression in the front side thereof conforming to and positioned proximate to the wearers head, means for removably and inversely attaching the upper section to the opening of the lower section, wherein said upper and lower molded sections form a weather resistant back pack compartment for the transportation of articles contained therein.

2. The back pack of claim **1** wherein said lower section, center of gravity adjusting means is an outward projection from the lower area of the lower section containing a plurality of outward arrayed holes and the waist belt center of gravity adjustment means is a hollow outward projection with holes therein so adapted that it accepts the outward projection of the lower section and the holes therein match at varying positions of insertion with the holes of the lower section outward projection.

3. The center of gravity adjusting means of claim **2** wherein the lower section center of gravity adjusting means is hollow and the waist belt center of gravity adjusting means inserts therein.

4. The back pack of claim **1** wherein the waist belt center of gravity adjusting means and the lower section center of gravity adjustment means are secured by pin attachment.

5. The back pack of claim **1** wherein the lower section center of gravity adjustment means comprises a slot on the bottom surface of the lower section and the waist belt center of gravity adjustment means comprises an outward hollow projection with holes therein, and an upward angled insert with a plurality of holes in the horizontal portion thereof, so adapted that the upward angled portion of the insert fits the slot in the lower section and the horizontal portion inserts into the outward hollow projection of the waist belt hollow projection and the holes of the insert and hollow projection match at varying positions.

6. The back pack of claim **5** wherein the waist belt hollow projection and the insert are secured by pin attachment through the matching holes.

7. The back pack of claim **5** where the lower section slot and upward angled portion of the insert have matching holes therein and are secured by pin attachment therethrough.

8. The back pack of claim **1** wherein the upper portion of the shoulder straps are secured by pin attachment through the adjusting bar holes.

9. The back pack of claim **1** wherein the adjusting bar is integrally molded to the lower section.

10. The back pack of claim **1** wherein at least one of the lower and upper sections are structurally reinforced.

11. The back pack of claim **1** wherein at least one of the lower and upper sections is at least partially thermally insulated.

12. The back pack of claim **1** wherein the open end of the upper section has a lid removably attached thereto.

13. The back pack of claim **1** wherein the upper section is removably hinged to the lower section.

14. The back pack of claim **1** wherein said lower section is rigid.

15. The back pack of claim **1** wherein said upper section is rigid.

16. The back pack of claim **10** wherein at least one of the upper and lower section structural reinforcements is rigid.

17. The back pack of claim **10** wherein at least one of the upper and lower section structural reinforcements is semi-rigid.

18. The back pack of claim **1** wherein there is a water tight seal between the upper and lower section containers.

19. The back pack of claim **1** wherein the upper section is comprised of a heat resistant material.

20. The back pack of claim **1** wherein the lower section contains at least one removable shelf separator.

21. The back pack of claim **1** wherein the lower section contains at least one fixed shelf separator.

22. The back pack of claim **1** wherein the lower area of the lower section contains a door in the wall thereof.

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