United States Patent

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[15] **3,648,907**

[45] **Mar. 14, 1972**

[54] BACK PACK CARRIER SYSTEM

[72] Inventor: **Russell H. Romney**, 3259 Bon View Drive, Salt Lake City, Utah 84109

[22] Filed: **Mar. 2, 1970**

[21] Appl. No.: **15,744**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 750,521, Aug. 6, 1968, abandoned.

[52] **U.S. Cl.** ..... **224/25 A**

[51] **Int. Cl.** **A45f 3/08**

[58] **Field of Search** 224/8, 9, 25, 8.1, 25.1, 6, 224/11, 12

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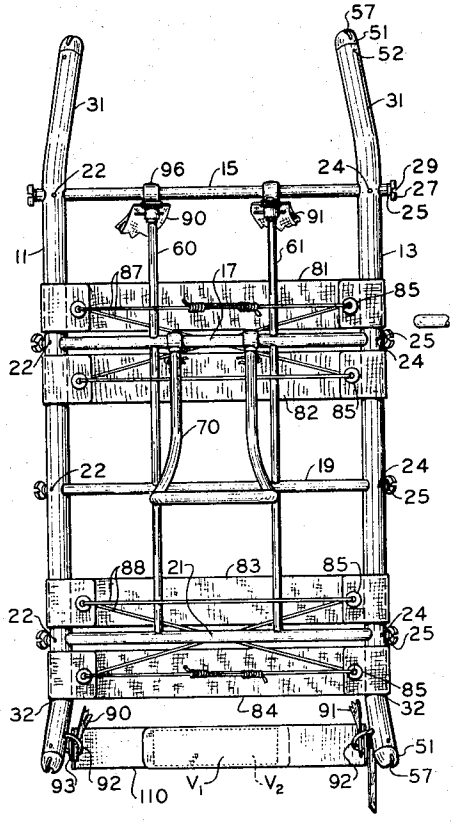
[57] **ABSTRACT**

A back pack carrier system adaptable for various loads is made up of a light tubular frame formed with transverse and upright members connected together with detachable plastic connectors and equipped with multiple self-adjusting back web strips to fit the wearer's back comfortably. A plurality of weatherproof bags equipped with laterally extending grommeted flaps are adapted to be lashed to the frame in various positions. Rearwardly extending shelf elements selectively mountable on different transverse members of the frame are provided to support the bags as needed. Lashing of the bags and other load components to the frame is facilitated by lash retaining elements in the ends of the transverse and vertical frame members.

10 Claims, 19 Drawing Figures



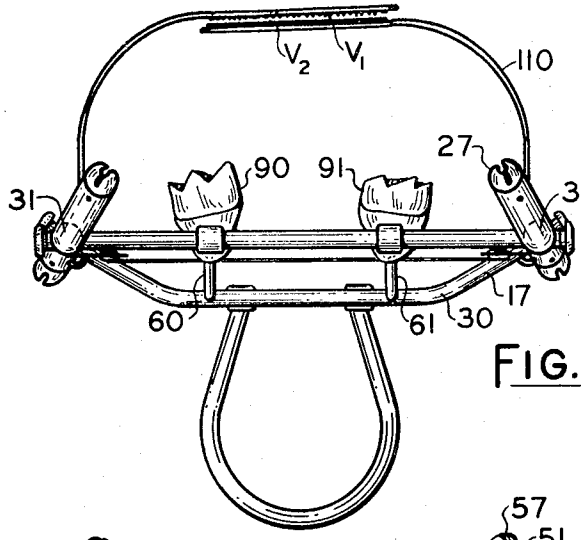


FIG. 3

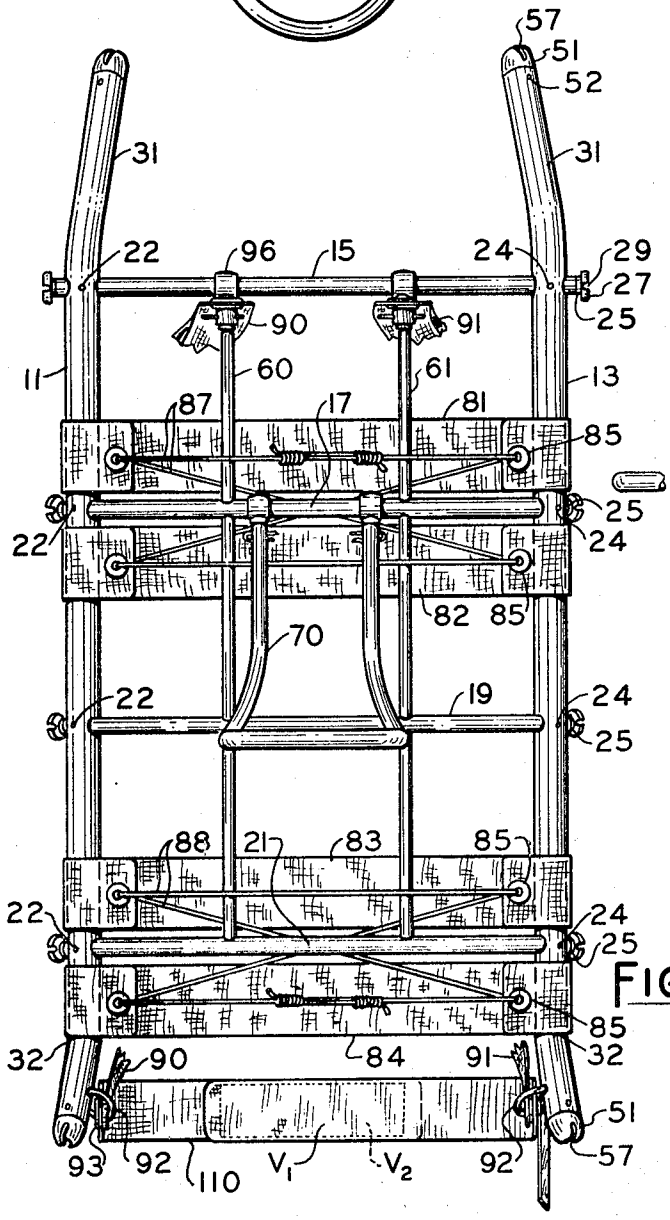


FIG. 1

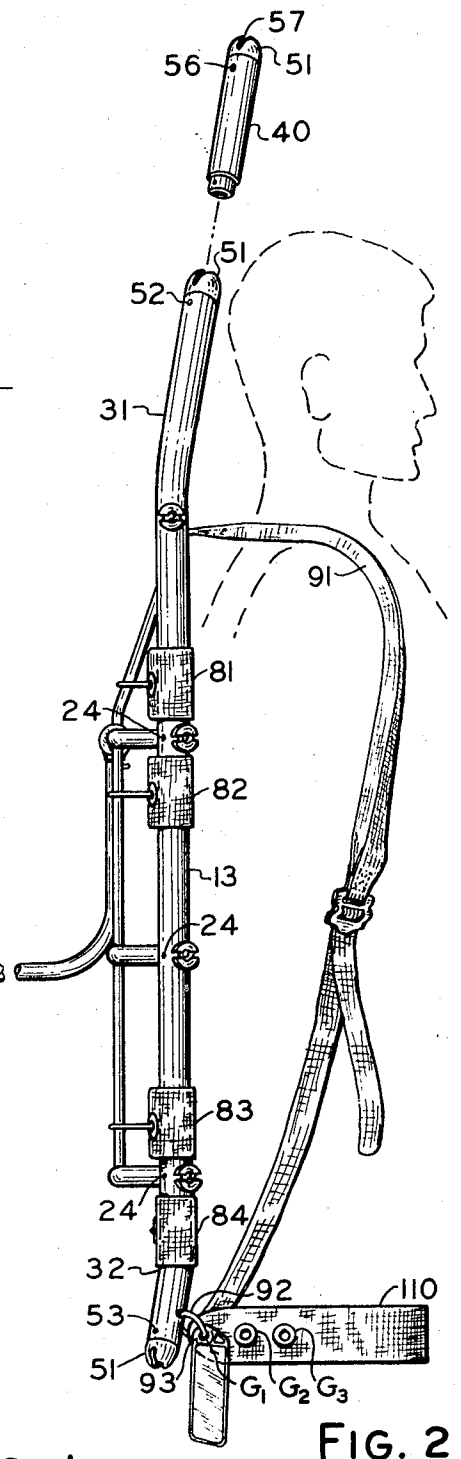


FIG. 2

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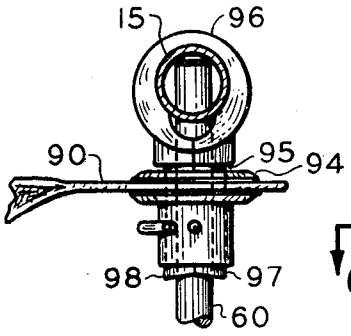

FIG. 4

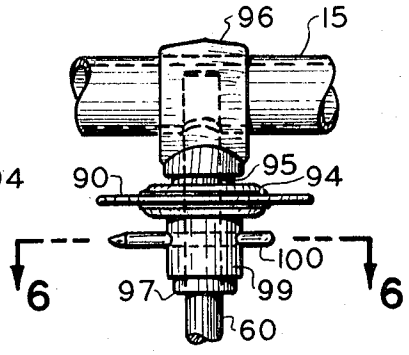

FIG. 5

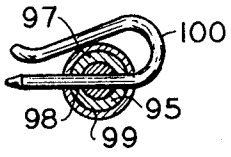

FIG. 6

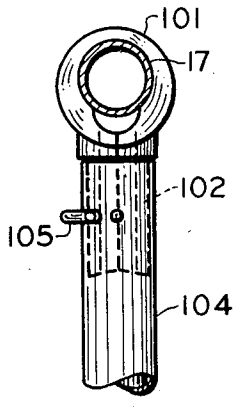

FIG. 7

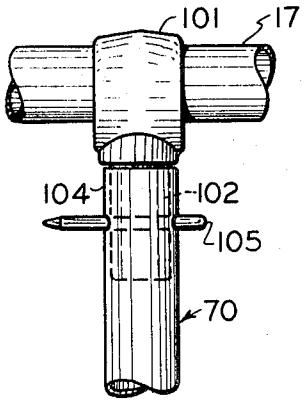

FIG. 8

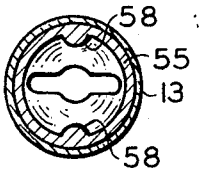

FIG. 13

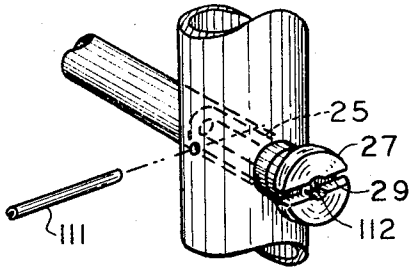

FIG. 9

FIG. 12

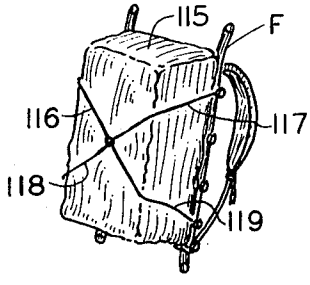

FIG. 10

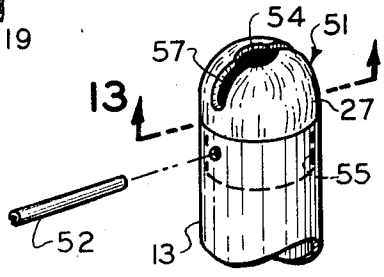

FIG. 11

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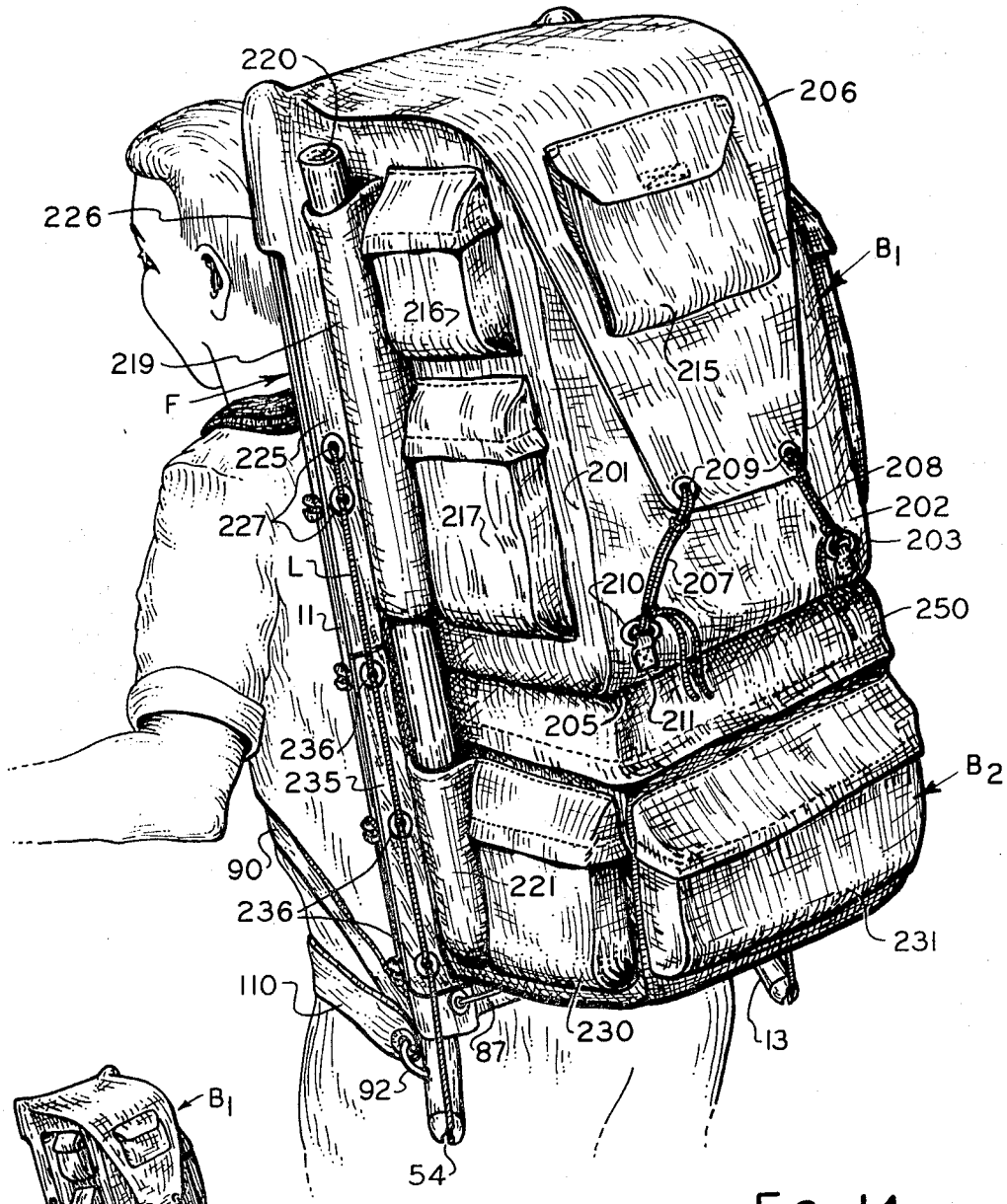

FIG. 14

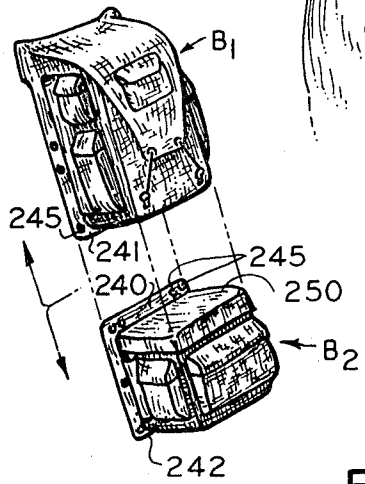

FIG. 15

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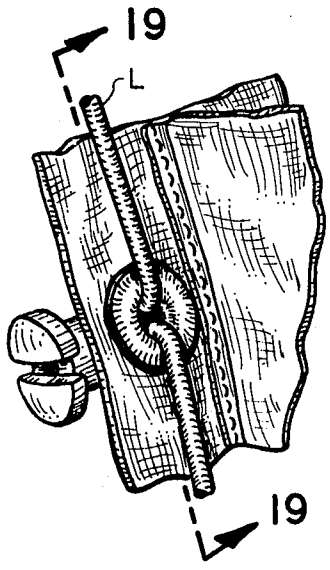

FIG. 18

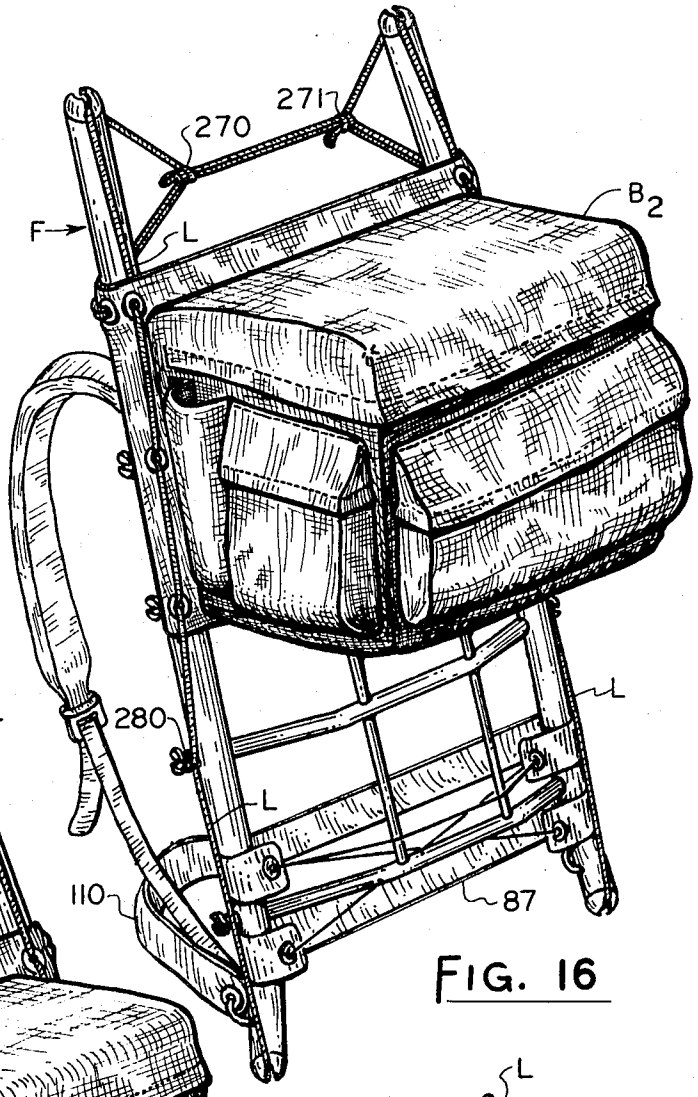

FIG. 16

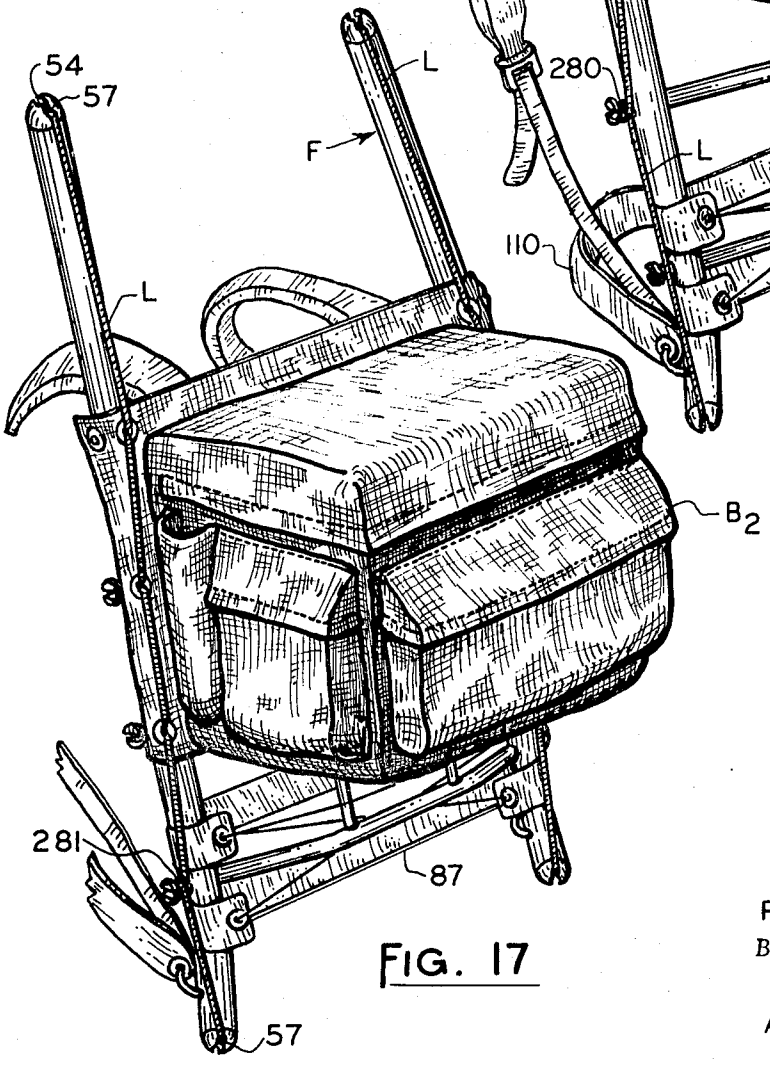

FIG. 17

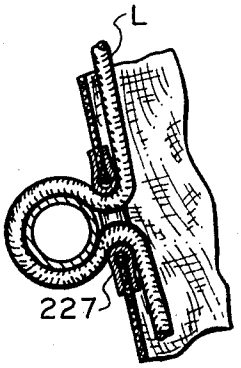

FIG. 19

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BACK PACK CARRIER SYSTEM

The present application is a continuation-in-part of my application Ser. No. 750,521, filed Aug. 6, 1968, now abandoned.

BACKGROUND AND PRIOR ART

In U.S. Pat. Nos. 3,225,985, 3,265,260 and 3,490,063, the present inventor has described pack carriers suitable for use by hikers, hunters and other outdoors men, scouts, soldiers, etc. for carrying various goods and loads on their backs. The carrier frames therein described are made up mainly of tubular upright and transverse elements, suitably secured together by pins and other fastenings. They have desirable features of light weight and adequate strength, but they have certain deficiencies, particularly in comfort to the wearer and adaptability to various loads and uses, which the present invention is designed to overcome.

U.S. Pat No. 3,265,260 describes a load supporting bracket or shelf in connection with a pack frame, which is a useful component in the present invention. There is a need, however, for various features of versatility in pack carrying equipment which have not hitherto been available and which the present invention is designed to provide.

With increased leisure time available to many people, and with improved access to woods, mountains and other resorts of nature, there has been in recent years a large increase in camping, fishing, hunting, mountain climbing, skiing and other outdoor activities. These have led in turn to increased demands for better camping and hiking equipment, particularly for load carrying equipment adapted to be used where self powered vehicles cannot go. Along with improved pack frames have come light weight sleeping bags, tentage and other camping gear, and many other items that are desirable for use in areas where all equipment must be man carried. Many of these items can be simply strapped onto a frame, in which case, the design of the frame and its comfortable carriage by the wearer is a most important consideration. Many other items, however, must be carried in such a way as to protect them from the weather and from other sources of damage. While numerous types of bags and the like are available for the latter purpose, they often are not particularly suitable or adaptable for carriage on a back pack carrier frame. They can, of course, be strapped onto almost any frame by using a sufficient quantity of lashing, but this may be very inconvenient.

Aside from the above, the hiker or camper may have several and diverse objects on his trip. He may want to hike to a camp or operating base from which he may want to take side trips while more lightly loaded. He needs carrying equipment that can permit him to deposit part of the load at the base and to proceed elsewhere with preselected items, without having to unpack and reload before he can go For for this purpose the present invention provides multiple bags or containers of weatherproof character, which can be loaded and unloaded independently, and which can be carried with safety and convenience at various positions on the carrier frame.

The prior art is familiar with numerous types of pack outfits which include multiple bags and other containers. Most of these, however, are not conveniently attachable to pack frames and, particularly, are not designed for attachment at various heights or positions on a given pack frame. While it is possible to attach in some way almost any item to almost any kind of pack frame, it is obviously desirable to be able to do so with convenience and efficiency. For the comfort of the wearer, pack carrying equipment must be placed as nearly as practicable to his center of gravity or in a vertical line above it. For this reason, the present invention is designed to permit placement of the load substantially on or above the shoulders of the wearer or as near thereto as possible to insure his comfort and avoid unnecessary fatigue.

The equipment of the present system is designed for maximum versatility in packing, comfort in carrying, and convenience in loading and unloading. The use of simple but effective lashing to hold all parts of the load in place is facilitated, since the pack frame itself, and the carrier bag units, are equipped with effective lash retaining or receiving elements of the utmost simplicity. The equipment of this invention includes special loops or pockets for carrying long items, such as tent poles, fishing rods, etc., with a minimum of interference with the wearer or with other articles that normally must be carried. The bags, two or more in number, as desired, which can be referred to collectively as a "Stackpac" can be placed above or below each other, and can be secured independently to the frame in a minimum of time and with good security.

BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is a rear elevational view and

FIG. **2** is a side view of a preferred form of pack frame of the present invention.

FIG. **3** is a top view of the frame of FIGS. **1** and **2**.

FIGS. **4** and **5** are respectively side and rear views of a means for holding straps and FIG. **6** is a sectional view of the same parts, taken substantially along the line **6—6** of FIG. **5**.

FIGS. **7** and **8** are side and rear views, respectively, of other connections such as those for holding a supporting shelf.

FIG. **9** is a detail perspective view of an end connection for a transverse frame element.

FIG. **10** is a perspective view on a small scale of a lashing connection for a bag or package.

FIG. **11** is a detail view of an end element on a main side frame element.

FIG. **12** is a detail view of a manner of interconnecting lashing elements to form a quad-lashing arrangement.

FIG. **13** is a detail sectional view taken substantially along the line **13—13** of FIG. **11**.

FIG. **14** is a perspective view showing multiple bag carrying means attached to a pack frame of the type shown in FIGS. **1** to **3**.

FIG. **15** is a diagrammatic view of the separation of bag elements as may be practiced in connection with the invention.

FIG. **16** is a perspective view showing a single bag or carrier attached to the pack frame.

FIG. **17** shown another arrangement for carrying a bag on an intermediate part of the frame.

FIG. **18** shows on enlarged scale the manner of fastening a bag to the frame through grommet and lashing and FIG. **19** is a sectional view of the parts of FIG. **18**, taken substantially along the line **19—19** of FIG. **18**.

DESCRIPTION OF PREFERRED EMBODIMENT

Referring first to FIGS. **1**, **2** and **3**, the basic pack carrier frame will be described. It consists of side frame members **11** and **13**, usually more or less vertically oriented, and transverse members **15**, **17**, **19** and **21**. These members are all made of light tubular metal, such as aluminum or magnesium, or of alloys of similar lightness and strength. The transverse members are smaller in diameter than the vertical side members and are passed through them in openings provided for the purpose. Pins **22** and **24** are provided to hold the parts together. Each of the tubular transverse members **15**, **17**, etc. terminates at each end in a plug element **25** preferably made of hard and durable plastic material, such as nylon, Delrin or the like. In some cases, wood or other material may be used. Plug **25** is provided with a slot **29** across the head **27** to receive and hold in place a lashing as will be described further below. The usual lashing is of a well known type, preferably a braided rope of nylon, polypropylene or other strong fibrous material. The ends of the cross members **15**, **17**, etc. project far enough outside the vertical members **11**, **13** that they can be used to retain one or more turns of lashing between the side frame members and the heads **27**. See, for example, FIG. **19**. The top transverse or cross member **15** is preferably straight; the others are offset rearwardly in the middle, as shown in connection with member **17**, FIG. **3**, at **30**, in order to conform fairly closely to the body of the wearer. This facilitates carrying the

load as near the center of gravity of the wearer or as closely to his body as possible.

Side frame members **11** and **13** are bent forwardly and inwardly toward each other at the top as at **31** and are bent rearwardly and outwardly away from each other at the bottom as at **32** to better conform to the body of the average wearer. Also, for still greater versatility, extension elements **40** may be added at the top to lengthen the side frame members. See FIG. **2**. These can be added, for example, to lengthen the frame for an unusually tall person, or for any other purpose. The normal end cap or plug **51**, which is normally inserted in the upper end of each of the side frame members is retained there by a spring pin **52**, which remains in place by friction. Plug **51** can be taken out by removing this pin and the extension part **40** can be inserted in its place. The plug or cap member **51** can then be placed in the end of the extension **40** and secured then by a pin **52**. Each cap or plug member **51** has a cross slot **57** to receive and retain a lashing. Also, a cup or cavity inside each plug **25** is large enough to receive a lashing knot. Similar plug or cap members **51** are inserted in the bottom ends of the side frame members **11**, **13** and retained there by pins **53**, similar to pins **52**. These have similar lash holding notches or slots **57** as shown also in FIGS. **14**, **16** and **17**. They also may contain a cavity large enough to receive and hold a knot in a lashing.

Intermediate vertical bars or rods **60**, **61** are mounted in openings in cross members **17** and **19** and their upper ends are inserted in openings in the lower side of the top transverse member **15**. Likewise, their lower ends are inserted into openings in the top side of the bottom member **21**. A pivoted shelf member **70**, described in greater detail in U.S. Pat. No. 3,265,260, is attached to one of the cross members, such as member **17** in FIGS. **1** and **2**. More than one such shelf may be used, as pointed out below. The manner in which the vertical rods or bars are attached to the top cross member **15** will be described in detail in connection with FIGS. **4**, **5** and **6**, below.

Body contacting webs or broad straps are provided in pairs as shown at **81**, **82** towards the top of FIG. **1** and **83**, **84** near the bottom of said figure. These are provided with grommets **85** through which a single lashing **87** for the upper pair and another single lashing **88** for the lower pair are provided. By trying these lashings **87** and **88** with proper tension, the weight of the pack and its load bring the pack and particularly the webs **81**, **82**, etc. into smooth but firm contact with the body of the person carrying the pack. Since the single lashing **87** is shared by each of the body webs or straps **81**, **82**, etc., these straps are self-adjusting to the body of the wearer. At the same time, by straddling the ends of a transverse member such as **15** or **17**, etc., or **21**, the pair of webs, as a unit, cannot shift or migrate up or down the side members **11**, **13**. This has been a deficiency in prior art webbing arrangements. Also, in the past where such webs have been used, they have usually been wider and fewer in number; the webs of the present invention are relatively narrow. Consequently, they allow freer evaporation of perspiration than wider belts when carried in hot weather. Because of their greater total number, they distribute the load or pressure against the wearer's back much better than most of the prior art arrangements.

Shoulder straps **90** and **91** are attached by means of key ring type fasteners (multiple turn spiral rings of spring metal) **92** which pass through the lower ends of the straps, preferably through grommets **93**, and through openings in the side frame members near their bottom ends. The upper ends of these straps are secured in the manner shown in FIGS. **4**, **5** and **6** by grommets **94** in the straps through which are passed plastic (nylon, Delrin or other strong elastic plastic material) connectors **95** having an upper loop element **96** which surrounds the top cross member **15** and bifurcate legs **97**, **98** which pass through the grommets **94** and are held against spreading apart by a retaining ring or ferrule **99**. A suitable pin, such as a cowl pin **100** of well known type, is passed through the ferrule **99**, through notches between the legs **97** and **98**, and through an opening in the vertical rod **60** or **61**. This fastening thus holds the vertical rods **60**, **61** in connection with the transverse member **15** but also holds the shoulder straps at their upper ends. The connectors **95** are flexible enough that their legs or bifurcations **97**, **98** can be spread apart far enough that the connector can be placed astride and over the member **15**, or any of the transverse members **17**, **19**, or **21**. When the legs are forced tightly together and retained in such a position by the ferrule or ring **99**, the pin **100** cannot be pulled downwardly between them by any reasonable force. The connecting means **95** per se form no part of the present invention, being claimed in a separate application filed herewith, Ser. No. 15,785.

Connecting means for holding the shelf member **70** to the cross member **17**, to which it is shown pivotally attached in FIG. **1**, are of the same type as just described. FIGS. **7** and **8** show the loop part **101** of such a connecting member **102** surrounding the cross member **17** with its legs inserted in the tubular element **104** which supports and forms a part of shelf member **70**. Here again the weight of the dependent shelf **70** is supported by a pin, shown of the cowl type at **105**, which passes through the member **104** and in notches between the legs of member **102**. One reason for inserting the pin in this manner is that this places the pin parallel with the back of the pack wearer and has no points projecting towards him or into the load. Another reason is that the assembly and disassembly of the parts, or removal of the shelf to another cross member, or from the pack frame completely, is thus facilitated.

FIG. **9** shows in larger scale the manner of fastening the transverse bars to the main uprights **11** or **13**. The plastic plug members **25** having an enlarged head **27** and formed of tough strong material such as plastic nylon or Delrin, or the like, all fit neatly in the hollow cross members **15**, etc., and are pinned in each case to both the cross member and upright by a pin **111**. Head **27** is slotted at **29** to receive a lashing L and is set out far enough from the side of the main upright **11** that such a lashing may be looped around it a time or two to make a secure fastening. The knot-receiving opening mentioned above is shown at **112**.

FIG. **10** shows a "quadline" arrangement for securing a bag or package **115** to the pack frame F. As shown in FIG. **12**, two lash lines or small ropes of the type mentioned above are fastened together, in a square knot, for example, so that four lines **116**, **117**, **118**, and **119** can be led off in four different directions. The ends of these lines are each secured to fastenings such as shown in FIG. **9**. In some cases they may be secured to the end plugs or caps **51** in the manner already described. Such a cap is shown in FIG. **11** as secured by a pin **52** to upright member **13** and the knot-receiving opening or cavity **54** is plainly visible. FIG. **13** shows a cross section Each plug **51** has a shank **55** reduced in diameter enough to fit neatly inside the tubular member **11** or **13** as shown in FIG. **13**. Each plug has also reinforcing internal rib elements **58** at the sides of the cavity **54** to strengthen the side walls so as to give them sufficient strength to support the load while resting on the ground or while resting against lateral supports and also to sustain the pull of tight lashings which may be secured to them.

Turning now to FIGS. **14** to **19**, inclusive, these show in various modifications the "Stackpac" or bag pack arrangement which constitutes an important feature of the whole system. The pack frame F is of the construction described above; one of its side members **11** is plainly visible in FIG. **14**; the lower end of the other member **13**, is visible also. The assembly shown in FIG. **14** comprises an upper bag $^{B}1$ and a lower bag $^{B}2$. Bag $^{B}1$ is made of weatherproof textile material, formed with side walls **201**, **202**, **203**, etc., a bottom wall **205** and a cover flap **206**. The latter has fastening strings **207** and **208** secured in grommets **209** and these are adapted to be tied into D-rings **210** in loops **211** sewed to the rear wall **202**. A pocket **215** is sewed onto the cover flap to carry small articles; side pockets **216** and **217** are sewed on side wall **201** in similar fashion and additional pockets not shown may be provided on the opposite wall. In addition, a wide loop or tunnel element **219** is provided along the front edge of side wall **201** to receive

a long slender article such as a tent pole, fishing rod or the like indicated at **220**. A cooperating slender pocket with a bottom is shown at **221** on the lower bag *B*2. Together these loop and pocket elements **219**, **221** give full support to article **220**. By these aligned and cooperating loop and pocket means, a longer slender article can be more stably carried than would be possible with a single loop on a single bag.

The upper bag *B*1 is provided with side flaps on the front edge of each side wall as shown at **225**. The side flaps terminate at the top in an inverted pocket **226**, which is adapted to receive the upper end of a main side frame member **11** or **13**. Each flap **225** is provided with a plurality of grommets **227** through which lashings L may be passed to secure the flaps **225** to pack frame. These grommets are preferably positioned so that the lashings L may be secured to and around the ends of the transverse members **15**, **17**, or **19**, etc., or around and to the projecting plug members **25**, **27**. See FIG. **9**. Since the transverse members **15**, **17**, **19** and **21** on the pack frame proper are preferably spaced at equal intervals, or substantially so, the bag *B*1 can be secured at different levels if desired, except that the inverted pockets **226** might not then fit over the upper ends of the side frame members. It is not always essential, of course, that pocket **226** be engaged with these.

The lower bag *B*2 is of generally similar construction to bag *B*1, being provided with a side pocket **230**, a rear pocket **231** and other pockets not shown, as desired. The pocket **221** for the long slender article **220** has been mentioned above; similar pocket and loop means for another long article such as **220** may be provided on the opposite side **203** of the bags *B*1 and *B*2 if desired. Bag *B*2 also has frame-engaging side flaps **235** equipped with grommets **236** through which the lashings L may be passed to secure the bag to the pack frame. Preferably, the lashing is merely doubled, inserted through a grommet and looped over one of the end members **25**, **27** of a transverse bar **15**, **17**, **19**, or **21**. Then by merely taking up the slack, e.g., by first tying a knot and inserting the knot in an opening **54** in an upper or lower end cap on the side frame member **11** or **13**, or into a similar opening **112** in one of the plugs **25**, the whole load is quickly secured in place and can be unfastened almost instantly.

FIG. **15** shows an arrangement wherein an upper bag *B*1 and a lower bag *B*2 are spatially separated. The bags are here seen as having a top flange, as at **240** on bag *B*2 and bottom flanges **241** on bag *B*1 and **242** on bag *B*2. These are equipped with grommets **245** as needed to supplement those in the side flaps. With the arrangement of FIG. **15**, an additional bag, not shown, or some other package or article, may be loaded onto the pack frame between the two bags. It will be noted here that the lower bag has a weatherproof integral or hinged cover **250**. Part of this is visible in FIG. **14**.

FIG. **16**, the larger or upper bag *B*1 of FIG. **14** has been removed and the lower bag *B*2 has been moved nearer the top of the pack frame F in its place. In FIG. **17**, the bag *B*2 is lashed to the frame F in an intermediate position.

FIGS. **14**, **16**, and **17** also show a body belt **110** which is secured through a ring **92** to the side members **11** and **13** of the pack frame F. The ends of such belt are shown secured to side frame members **11** and **13**, in FIG. **1** and the belt **110** is shown with multiple grommets g_1, g_2 and g_3 in FIG. **2**. This belt is found by experience to be extremely useful. It makes it possible to switch the burden of the load from the shoulders or partially from the shoulders to the hips and abdomen of the wearer. On a long hike, it is very helpful to make such changes from time to time. The belt **110** is secured by the same key ring element **92** already mentioned, which also holds the lower ends of the shoulder straps **90**, **91**. For a thin person, the excess length of belt **110** can be cut off if desired at the second or third grommet to fit him better. The belt preferably is fitted at its front ends with a self-securing or self-locking material such as "Velcro", a looped nylon material having interlocking elements by means of which the belt ends can be instantly secured together in any desired adjusted position. The "Velcro" fastening elements are indicated at V1 and V2 in FIGS. **1** and **3**.

Various ways for securing the lashings L are shown in FIGS. **14**, **16**, **17**, **18**, and **19**. In FIGS. **14**, **16** and **17**, the lashing is secured at the bottom by a knot (not visible) inserted into the openings **54** of bottom cap (or foot) member **51**. In FIGS. **16** and **17**, the upper ends of the lashings are passed through the notches in upper cap members **51**. In FIG. **17**, the lashings terminate in knots inserted in the opening **54**, as they do at the bottom. In FIG. **16**, they are tied together across the frame as shown at **270**, **271**. FIGS. **18** and **19** show the looping of the lashing L through a grommet **227** and around the projecting end of a cross member **15** (or **17**, etc.) Single or multiple turns may be used as shown at **280** in FIG. **16** and at **281** in FIG. **17**.

It will be understood that numerous other arrangements are feasible and will suggest themselves to those who are skilled in the art. The versatility of this pack equipment in itself will suggest many variations in form and arrangement of the various components and their manner of assembly and use. A particular variation that deserves emphasis is the possibility of manufacturing the components and selling them as a kit for assembly by the buyer. The whole frame assembly may thus be produced. Also, the user may buy separate components at different times, such as a single bag, or extension side members **40**, even supplemental cross members, supplemental body webbings, etc., if desired. By cutting and furnishing the lashing elements L in standard appropriate lengths, these may be used singly to tie on single bags such as *B*1 or *B*2, for example, or looped or knotted together, may be used in pairs as quadlines, as in FIG. **10**, etc., or as tension members **87** for the body web pairs.

It is intended by the claims which follow to cover the above and other obvious arrangements and modifications, such as would suggest themselves to those skilled in the art, as broadly as the state of the prior art properly permits.

What is claimed is:

1. A pack frame assembly comprising, in combination, a pair of main side members arranged normally in more or less vertical position, plural transverse frame members secured to and between said side members, plural pairs of body web elements secured between said side members with an individual web element above and one below a transverse member, a single lashing connecting the ends of each individual web element and also to the other individual web element of a pair to hold said elements in said positions above and below and also to permit self-adjustment in tension of the individual webs with respect to each other thereby to equalize pressure of said web elements on the body of a person carrying the assembly, and notched lash-retaining elements in the ends of vertical and transverse frame elements.

2. Combination according to claim **1** wherein the transverse members extend through and beyond the side members and comprise lash retaining elements.

3. Combination according to claim **1** which includes a body belt and a shoulder strap secured to the lower part of said side members.

4. Combination according to claim **3**, wherein the said belt and shoulder straps are secured through a common fastener.

5. Combination according to claim **5** in which said shoulder straps and said body belts are each independently arranged to carry the whole load and each includes means for independent adjustment and quick release of the load.

6. Combination according to claim **1**, which comprises a container bag secured to said side members and adapted to protect articles contained therein from weather.

7. Combination according to claim **6** wherein said container bag comprises side flaps, grommets in said flaps through which lashings may be passed, and lashing means through said grommets and secured to at least some of the members of said frame to hold said bag secured to the frame.

8. Combination according to claim **1** which comprises a plurality of container bags secured one above another to said frame.

9. Combination according to claim 1 which comprises a plurality of containers each having pockets for small articles secured to said frame and wherein each of said containers has side flaps and grommets in said side flaps, and a common lashing element securing said plural containers to said frame.

10. Combination according to claim 1 which comprises a plurality of cooperating containers attached one above another on said frame, and pocket and loop means in each of said containers aligned and adapted to cooperate in holding a long slender article in upright position more stably and securely than it could be held by either container alone.

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