United States Patent [19]

Joseph

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[54] **PACK FRAME AND SACK THEREFOR**

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[73] Assignee: **Samsonite Corporation**, Denver, Colo.

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[52] **U.S. Cl.** ..... **224/8 R**; 224/25 A

[51] **Int. Cl.** **A45f 3/00**

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

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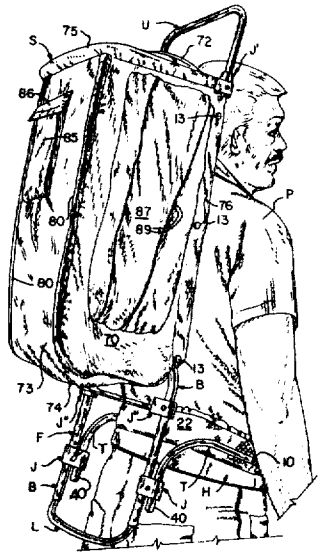
Primary Examiner—Robert J. Spar
Assistant Examiner—Ross Weaver
Attorney, Agent, or Firm—Horace B. Van Valkenburgh; Frank C. Lowe

[57] **ABSTRACT**

A pack frame having a pair of tubular side bars, a straight tubular shoulder strap attachment bar and a rearwardly bowed, tubular waist bar. A rearwardly extending pack spreader bar which is inserted in a surrounding sleeve of a sack attached to the frame is mounted at the upper ends of the side bars, not only maintains the top of the sack in spread position but also provides a support for heavier articles placed on top of the sack. Such articles may be lashed to a removable U-shaped upper extension bar, the sides of which are telescoped into the upper ends of the side bars. An L-shaped hip tube having an upright post and a forwardly extending arm is mounted adjacent the lower end of each side bar and extends forwardly alongside the hip of the user. A joint for connecting each hip tube and the side bar is adjustable upwardly and downwardly along the side bar, while a series of differently angled holes in the post of the hip tube permits the angle of the hip tube to be varied, through a removable pin which also extends through the joint. In addition, the hip tube post may be placed in the joint to extend either upwardly or downwardly, to accommodate a considerable variation in the shoulder to hip dimension of a user. A hip strap, which includes an outer strap and an inner padding, is tightened about the hips of the user, while a pin carried at each side of the hip strap extends through a grommet at the lower end of the corresponding shoulder strap and through the corresponding hip tube, so that the weight of the pack is concentrated at the sides of the hips of the user, rather than on the shoulders. The upper ends of the shoulder straps are also adjustable laterally along the shoulder strap attaching bar. A removable, generally U-shaped lower extension bar, having an outwardly bowed lower cross member, is telescoped into the lower ends of the side bars, so that light but bulky articles may be lashed thereto.

The sack has a forwardly extending flap at each side for attachment to the frame side bars and a sleeve extending around the sides and rear of the top, for encircling the pack spreader bar. A panel in the rear wall of the pack is attached by a pair of laterally spaced zippers which open from the top downwardly, while a pair of pouches inside the sack are attached to the front wall thereof and provided with drawstrings. These pouches will lie flat against the front wall of the sack when empty. A map pocket is mounted on the rear of the panel, while a pair of side pockets are provided with diagonally extending zippers, each having a pair of slides for access to a limited area of a side pocket at any vertical position.

3 Claims, 20 Drawing Figures



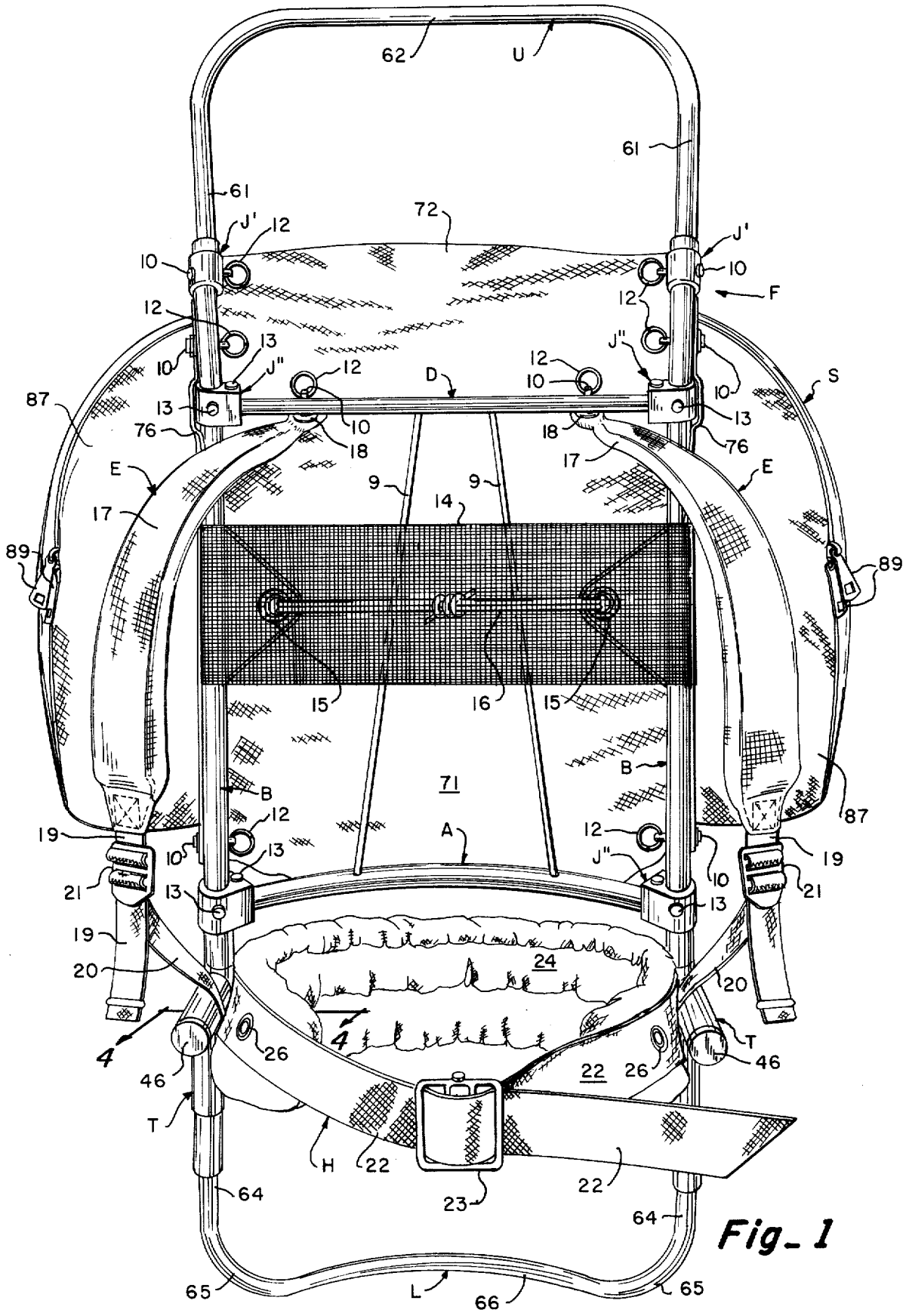

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Fig_1

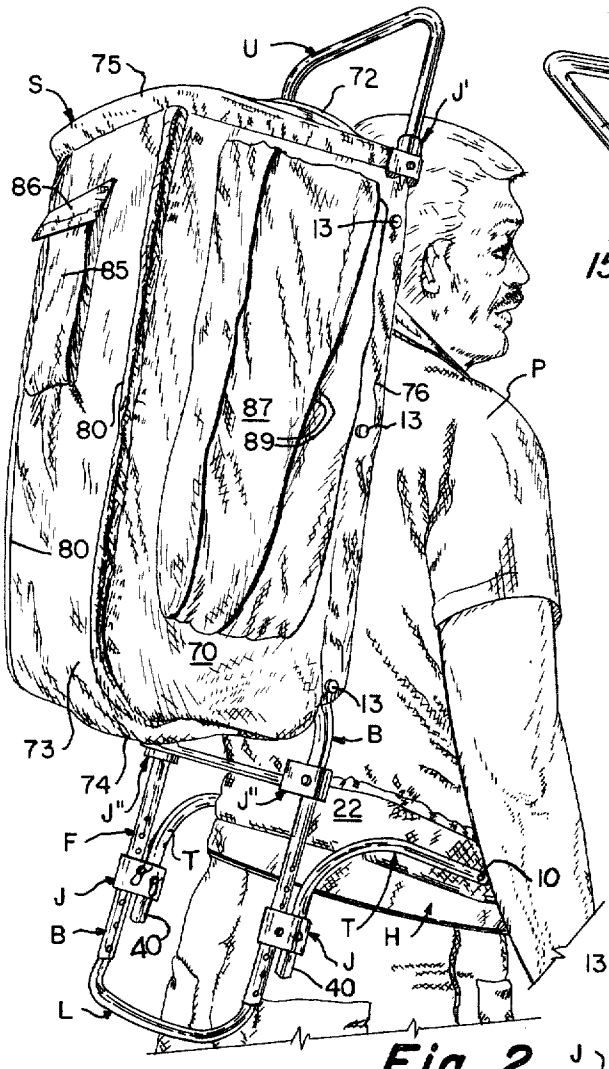
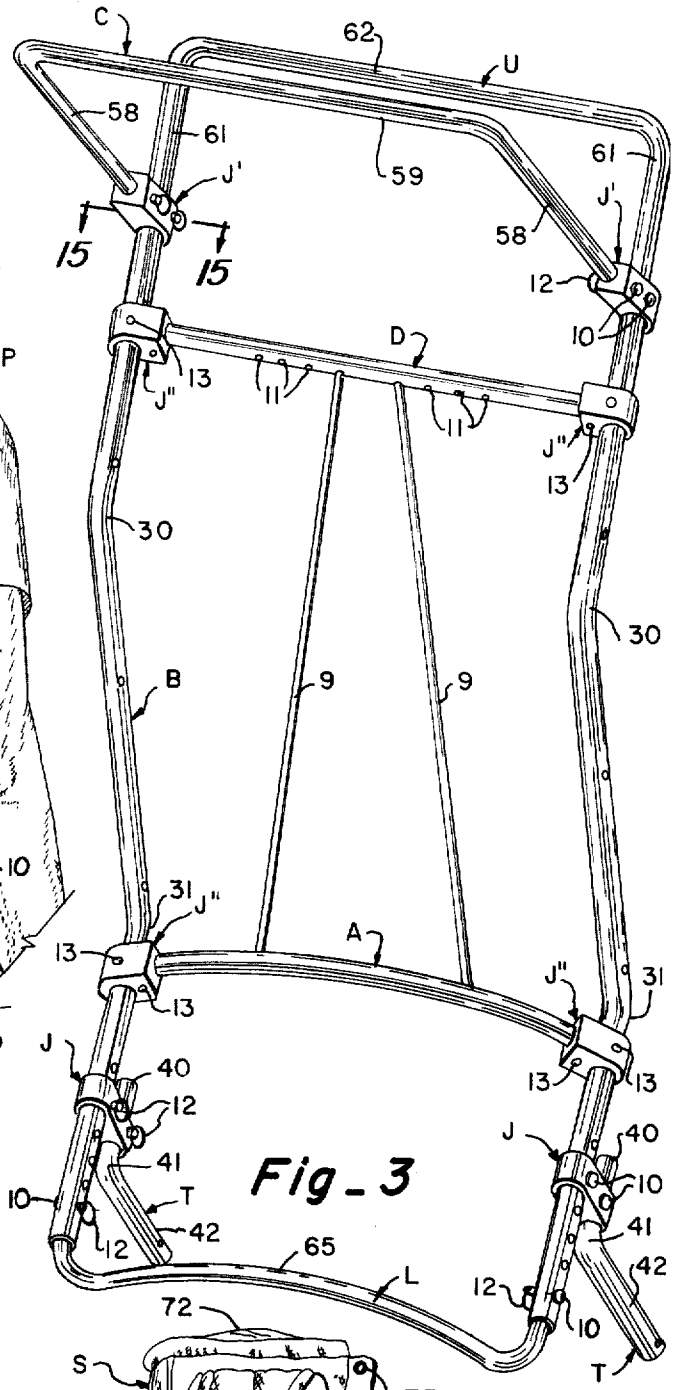


Fig_2



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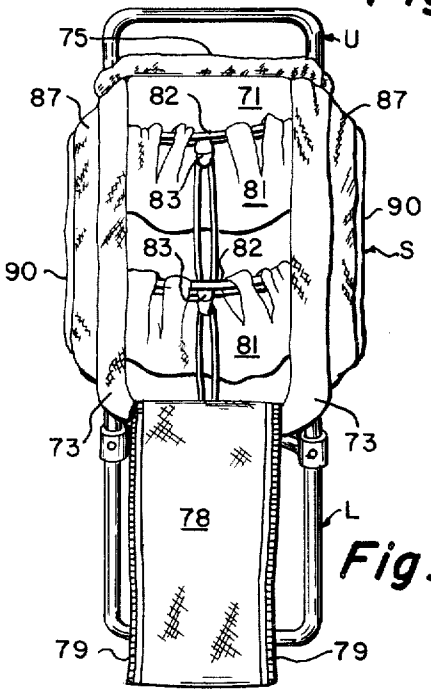

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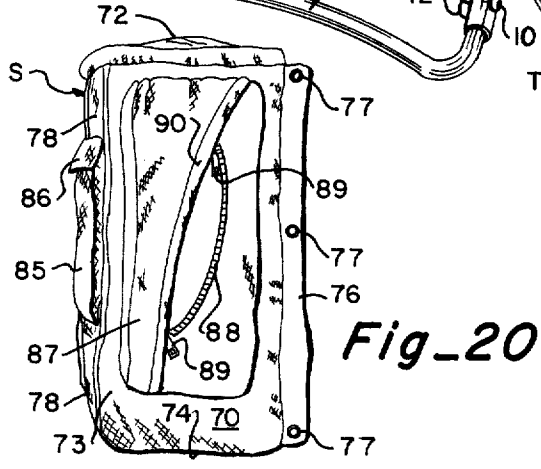

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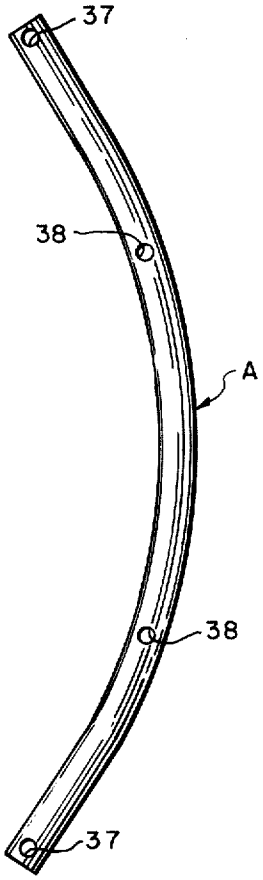

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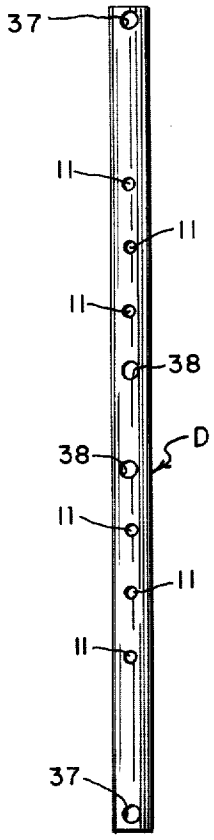

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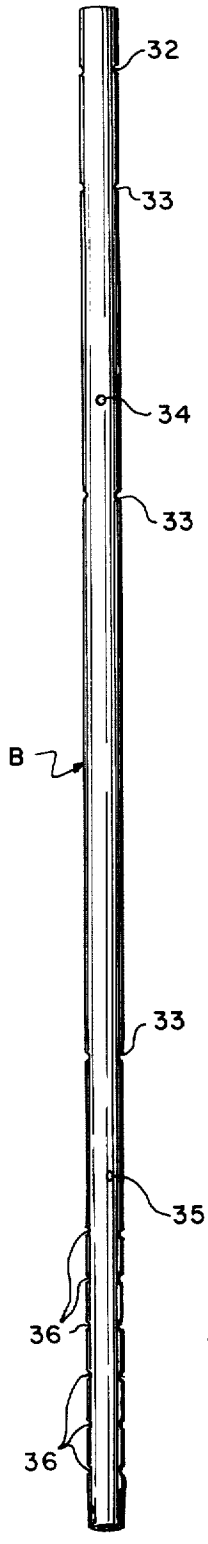

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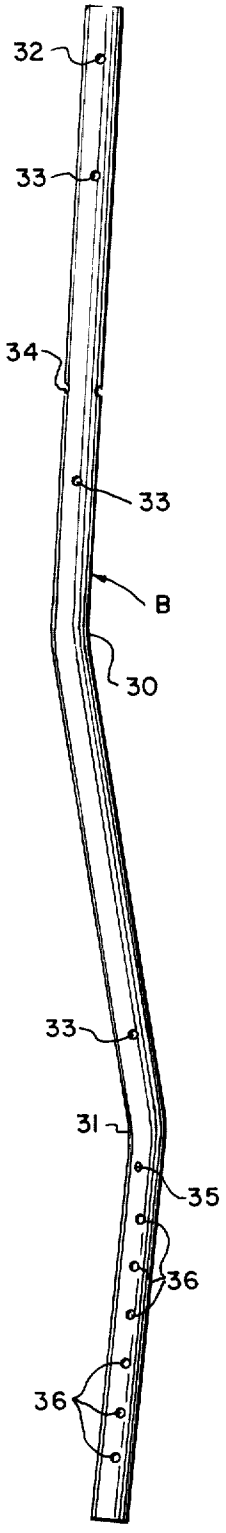

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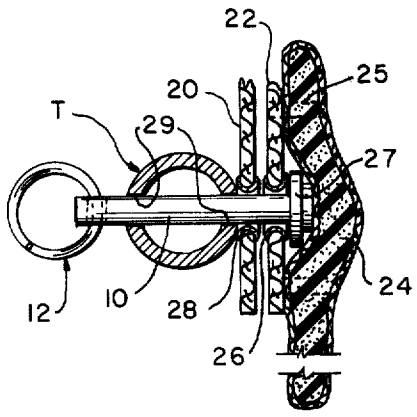

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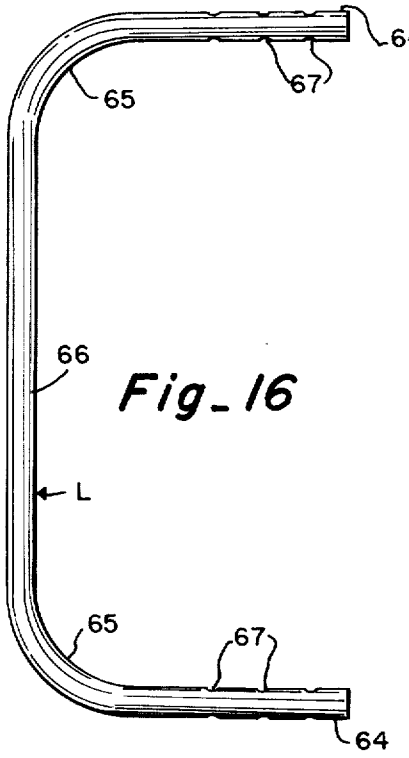

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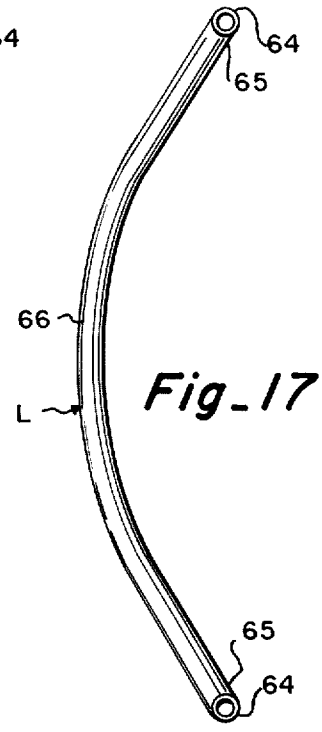

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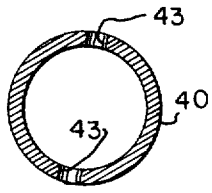

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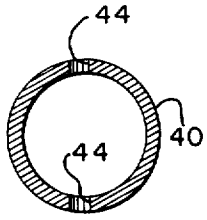

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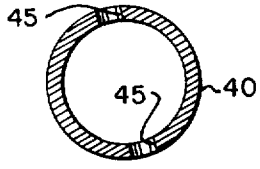

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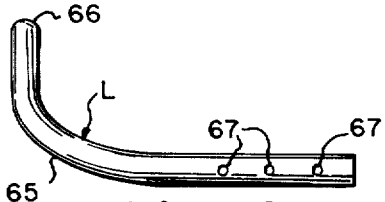

Fig_18

Fig_9

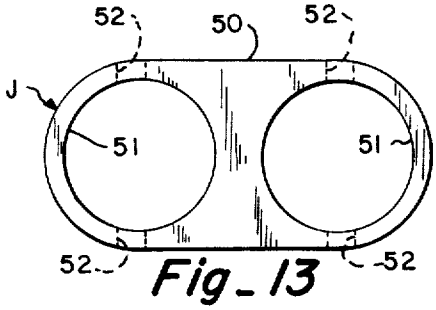

Fig_13

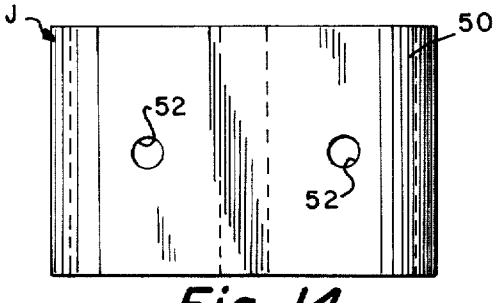

Fig_14

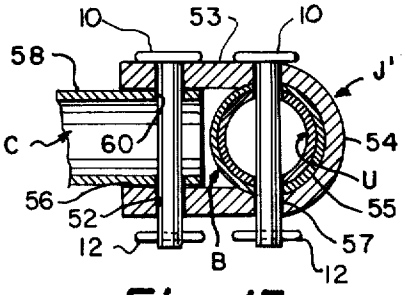

Fig_15

PACK FRAME AND SACK THEREFOR

This invention relates to pack frames and sacks therefor. More particularly, this invention relates to a pack frame and sack which is particularly adapted to be utilized by campers, hunters, fishermen, mountain climbers and the like.

An object of this invention is to provide a pack frame which is adjustable with respect to the body of the user. For this purpose, the upper ends of the shoulder straps of the pack frame of this invention are adjustable in accordance with the width of the shoulders of the user, and more particularly, a hip strap is adjustable not only upwardly and downwardly so as to vary the longitudinal distance of the hip strap from the shoulders, but also to accommodate variations in the girth of the hips of the user. Such adjustability accommodates numerous variations in both the height and the body dimensions of various users.

Another object of this invention is to provide a pack frame by which a major portion of the load thereof is carried by the hips of the user. For this purpose, the hip strap is padded and is tightened about the hips of the user, in a position engaging the hip bones, with the hip strap being positioned accurately by the above mentioned adjustability. In addition, the load is transferred to the hip strap at each side, rather than primarily to the back or shoulders of the user, thereby, in effect, causing the load to tip rearwardly from the body of the user and the shoulder straps merely maintaining the balance of the load, i.e., primarily resisting a rearward force, rather than a downward force.

A further object of this invention is to distribute the load on the shoulder straps in such a manner that the area below the shoulders, and particularly under the arms, is neither pinched nor squeezed during use. For this purpose, the lower ends of the shoulder straps are carried at a point forwardly of the main portion of the pack frame.

A further object of this invention is to provide a sack which is especially adapted to fit the pack frame; which provides additional accessibility to articles carried in the sack; which permits a concentration of weight at a reasonably high position on the pack frame; and which permits variation in both the location and extent of the load or articles to be carried.

A further object of this invention is to provide a pack frame which, in cooperation with the sack of this invention, provides a fixed support for articles mounted above the sack, as well as an adjustable extension of the lower end of the pack frame, so as to accommodate articles of considerable bulk, but relatively light in weight, such as sleeping bags, foam pads and the like.

A still further object of this invention is to provide a pack frame and sack therefor which is rugged in construction but light in weight and will withstand the rigors of hard usage, but is readily adjustable for use by different users.

Additional objects and the novel features of this invention will become apparent from the following description and the accompanying drawings, in which:

FIG. **1** is a front perspective view of a pack constructed in accordance with this invention, which includes a frame and a sack.

FIG. **2** is a side perspective view of the pack on a user.

FIG. **3** is a rear perspective view of the frame for the pack.

FIG. **4** is a vertical section, on an enlarged scale and taken along line **4—4** of FIG. **1**, at the location of a pin which attaches a shoulder strap and a waist strap to a hip tube.

FIG. **5** is a front elevation of a side bar of the frame.

FIG. **6** is a side elevation of the side bar.

FIG. **7** is a top plan view of a waist bar of the frame.

FIG. **8** is a bottom plan view of a shoulder strap bar.

FIG. **9** is a side elevation of the right hand adjustable hip tube showing also, in exploded arrangement, resilient plugs for the ends of the hip tube, with one plug in section.

FIGS. **10, 11** and **12** are transverse sections, on an enlarged scale, taken respectively along lines **10—10, 11—11** and **12—12** of FIG. **9.**

FIG. **13** is a top plan view, on an enlarged scale, of a joint for connecting the hip tube to the lower portion of a side bar of the frame.

FIG. **14** is a side elevation of the joint shown in FIG. **13.**

FIG. **15** is a transverse, fragmentary section, on an enlarged scale and taken along line **15—15** of FIG. **3** through a joint for attaching a pack spreader bar and a top U-bar to a side bar of the frame.

FIG. **16** is a rear view of a bottom U-bar of the frame.

FIG. **17** is a top plan view of the bottom U-bar.

FIG. **18** is a side elevation of the bottom U-bar.

FIG. **19** is a rear view of the sack with a center compartment of the sack open to show parts inside such compartment.

FIG. **20** is a side view of the sack per se, showing the manner of access to a side pocket and one of the strips by which the sack is attached to the frame.

As illustrated in FIGS. **1–3,** a pack frame F, to which a sack S is attached, may be carried by a user or person P, with smaller articles in the various pockets provided on sack S, as will be described later, which may be articles to which relatively ready access is desired, such as a compass, matches, dark glasses when not in use, maps and the like. Other articles, such as food, clothing and the like, knives, hatchets and the like are carried inside the sack. Bulky but relatively heavy articles, such as a folded tent, an air mattress (if carried) and the like may be placed on top of the sack S and attached, as by cords or other type of lashing, to an upper extension bar U, which is also removable, if not desired for use, as explained later. Other bulky but lighter articles, such as down or other lighter types of sleeping bags, foam pads and the like may be rolled or folded and attached to the frame, under the sack S, as by lashing by cords or the like to frame side bars B and/or a lower extension bar L, which is also adjustable upwardly and downwardly, in a manner described later.

As in FIGS. **1** and **3,** the pack frame F of this invention includes a pair of side bars B, of a special configuration described later and between which extends, at an appropriate position, a shoulder strap bar D, to which the upper ends of shoulder straps E are attached. A rearwardly bowed waist bar A extends between the side bars, at a lower position. The generally U-shaped but rearwardly bowed lower extension bar L is adjustable upwardly and downwardly in the lower ends of the side bars, while the upper U-shaped bar U is releasably secured in the upper ends of the side bars B. Also, a pair

of rods **9** may extend between the shoulder strap bar D and the waist bar A, to rigidify the frame structure.

In accordance with this invention, a pair of angular hip tubes T, one on each side of the lower end of the pack frame, are removably and adjustably attached to the lower ends of the side bars B by a special joint J, which is adjustable upwardly and downwardly along the corresponding side bar. In addition, the angular hip tubes T may be reversed in position with respect to the joints J, as between the position of FIG. **2** and that of FIG. **3,** to accommodate a shorter or longer torso of the user. Furthermore, the lateral inclination of the hip tubes T may be adjusted to increase or decrease the width between the ends of the hip tubes, to accommodate narrower or wider hips of a user. Thus, the hip tubes T, to the ends of which are not only secured the lower ends of the shoulder straps E, but also the opposite sides of a hip strap H, accommodate, by adjustment of the hip tubes only, variations not only in the length of the torso, but also the girth at the hips of the user. In addition, the attachment of the hip strap H at each side to the end of the corresponding hip tube T, causes the weight of the pack to be transferred to the hip strap at each side and thus the pack to tend to tip rearwardly with the consequence that the shoulder straps primarily resist a rearward rather than a downward force.

The upper ends of the shoulder straps E are secured to the shoulder strap bar D, as by a pin **10** inserted through a selected hole **11** in the shoulder strap bar, shown in FIG. **3,** and secured by a suitable fastening device, such as a device similar to a cutter pin or the spiral rings **12** shown, of a conventional nature. It will be noted that similar pins **10** and rings **12** are utilized to attach the joint J to the lower portion of a side bar B, as well as a hip tube T to the joint J. Similar pins **10** and rings **12,** or other suitable fastening devices, are utilized to attach a joint J′ to the upper end of the side bar B for optional attachment of the upper extension bar U and attachment of the pack spreader bar C, which, in accordance with this invention, maintains the top of the pack in a spread position and serves the additional function of supporting articles which may be placed on top of the pack and lashed to the upper extension bar U.

Similar pins **10** and rings **12** or the like are utilized in attaching the lower extension bar L to the lower end of the side bars B. However, the joints J″, by which the ends of the shoulder strap bar D and the waist bar A are attached to the side bars B, are preferably secured by rivets **13,** since due to the adjustability provided by the hip tubes T, it is unnecessary to adjust either the shoulder strap bar D or the waist bar A. The use of rivets **13** also tends to impart additional rigidity to the frame structure.

As in FIG. **1,** an apertured webbing **14** may be stretched around the side bars at a position below the shoulder bar D, with each end of the webbing being provided with a grommet **15** for tightening the webbing, as by a cord **16** which is preferably extended several times between the grommets and then tied together, as at the center. The purpose of the webbing is to provide an air space between the back of the user and the sack S, and also to provide a smoother surface for contacting the back of the user, as to prevent articles within the sack S, which might become canted or twisted to present a sharp edge, from causing discomfort to the back of the user. It will be noted that the knot in the cord **16** is approximately at the center of the back of the user, in which there is a depression or indentation running longitudinally.

Each shoulder strap E, as in FIG. **1,** may include an upper strap **17,** preferably formed of a sleeve of tightly woven webbing, such as nylon, enclosing a pad, as of synthetic rubber or plastic foam of the type known as "Ensilite," or other resilient material, to provide comfort for the shoulders of the user. At its upper end, each strap **17** is provided with a grommet **18** through which the pin **10** for attaching the shoulder strap to the shoulder strap bar D extends. At its front lower end, the sleeve of upper strap **17** is attached, as by stitching, to an extension strap **19,** such as formed of webbing, which is adjustably secured to a lower strap **20** by a buckle **21.**

The hip strap H may include a webbing strap **22,** the length of which is adjustable by a buckle **23,** to which one end of the waist strap is attached and through which the other end extends. To the inside of strap **22** is attached padding **24** which may consist of a fabric covering enclosing a foam rubber or similar pad, to provide comfortable engagement of the hip strap with the body of the user, with strap **22** being attached to padding **24** by stitching **25** of FIG. **4,** adjacent both the upper and lower edges, except below the position of one or two pair of grommets **26** at each side, to permit insertion of a pin **10** for attachment to the hip tube T and shoulder strap E. Pin **10,** with a washer **27** beneath its head to engage the grommet and a similar washer preferably being placed below each grommet **18** at the upper end of the shoulder strap, extends through the grommet **26,** then through a similar grommet **28** at the lower end of the lower shoulder strap **20,** and then through a selected one of a pair of spaced holes **29** at the outer end of hip tube T, shown also in FIG. **9.** As will be evident, the girth which the waist strap will encompass is adjusted by buckle **24,** as well as the lateral position of the hip tubes T, which may be moved closer together or further apart, in a manner described later, and the selection of alternate grommets **26.** As will be evident from FIG. **1,** the weight of the pack is essentially concentrated over the extended ends of ths hip tubes T which bears downwardly through the hip strap H on the hips of the user and therefore permits the hips to support primarily the weight of the pack and its contents, rather than concentrating the load on the shoulders.

The side bars B, shoulder strap bar D, waist bar A and hip tubes T are preferably formed of lightweight tubing, such as aluminum of a greater diameter than other parts, also made of tubing, such as pack spreader bar C, upper extension bar U and lower extension bar L, formed of lightweight tubing having an outside diameter corresponding to the inside diameter of side bars B, so that bars U and L will fit into the side bars. Rods **9** may be solid but considerably smaller in diameter. Joints J, J′ and J″ may also be formed of lightweight metal, such as aluminum, which is cast or molded and then polished on the outside and holes therethrough machined or reamed to size.

Each side bar B, as in FIGS. **5** and **6,** includes a slight forward curve **30,** which is positioned below the shoulder strap bar D, as in FIG. **3,** and a slight rearward curve **31,** which is positioned just above the waist bar A, as in FIG. **3,** with the webbing **13** of FIG. **1** being positioned immediately below the curve **30.** The curve **31**

positions the lower end of the pack frame away from the buttocks of the user, while the curve **30** permits the upper portion of the frame to tip slightly toward the head of the user, to position the heavier weight carried by the upper portion of the frame closer to the body of the user and the center of gravity of the pack and its load closer to the ends of hip tubes T. At its upper end, each side bar B is provided with a hole **32**, for attachment of the joints J' of FIG. **3**, by which the pack spreader bar C is attached, and in conjunction with which the upper bar U may be attached. Disposed at spaced positions along each bar are a series of holes **33** for receiving a pin or rivet, for attachment of the sack S, in manner described later, while a rivet hole **34** in each bar accommodates a rivet **13**, for attachment of the joints J'' for the shoulder strap bar D. Just below the curve **31** is an oblique hole **35** which accommodates a rivet **13**, for attachment of joints J' for the waist bar A, while a series of spaced holes **36** continue downwardly toward the lower end of each side bar, for upward and downward adjustment of the joint J carrying the corresponding hip tube T, with the lowermost hole **36** normally being used for attachment of the lower bar L.

The waist bar A, as in FIG. **7**, is provided with a hole **37** adjacent each end for a rivet **13** for attachment to joint J'', as in FIG. **3**, and spaced, intermediate holes **38** which extend only through the upper surface of the bar to receive the lower ends of reinforcing rods **9**.

The shoulder strap bar D, as in FIG. **8**, is provided, at each end, with a rivet hole **37** for attachment to joint J'', and a pair of spaced, centrally located holes **38** which extend through the lower surface only of the bar and receive the upper ends of the reinforcing rods **9**. The holes **11**, by which the shoulder straps E may be attached and adjusted to different lateral postions, are spaced outwardly from each side of the holes **38**, as shown. Any desired number of holes **11** may be utilized, although the three holes shown are normally satisfactory.

Each hip tube T, as in FIGS. **9–12**, is provided with an upper post **40**, a curved section **41** and an extending arm **42** which extends slightly upwardly when the post **40** extends upwardly through joint J, as in FIG. **3**, but tips slightly downwardly when the post **40** extends downwardly through joint J, as in FIG. **2**. The holes **29** are positioned along the outer end of arm **42**. A series of holes **43**, **44** and **45** in post **40**, with the holes **44** being transversely centered and the holes **43** and **45** above and below hole **44**, but angled, in an inward direction, slightly forwardly and rearwardly, respectively, as in FIGS. **10–12**, permit the hip tube T, when the post **40** extends upwardly through joing J, to be tipped inwardly through pin **10** in hole **43**, but to be tipped outwardly through pin **10** in hole **45**, in order to accommodate different widths of the hips of a user. Conversely, when post **40** extends downwardly through joint J, pin **10** in hole **43** causes the hip tube to be tipped outwardly and pin **10** in hole **45** causes the hip tube to be tipped inwardly. A thin plastic sleeve may be shrunk over post **40** to minimize marking or scratching of the surface due to frequent insertion of pin **10** into different holes **43**, **44** or **45**. Each end of the hip tube T is closed by a resilient plug **46**, so as to avoid contact by the user or an article with the end of the tube. Plug **46** is provided with a stepped shoulder **47**, convex on the outside, for clamping engagement with the inside of the tube T, as well as an inwardly extending, central projection **48** of reduced diameter to facilitate handling the plug during molding thereof, as of a resilient plastic, such as polyethylene.

Each hip tube joint J, as in FIGS. **13** and **14**, comprises a generally rectangular block having rounded ends, each corresponding in shape to half the diameter of one of a pair of circular, longitudinal holes **51** therethrough, one of which engages a side bar B and the other engages post **40** of the corresponding hip tube T. Transverse holes **52** centrally intersect the longitudinal holes **51**, for receiving a pin **10** for attachment to side bar B and post **40**, respectively.

Joint J', as in FIG. **15**, is formed from a generally rectangular block **53**, one end **54** of which is semicircular to correspond in shape to a longitudinal hole **55** into which the upper end of a side bar B extends, from below. The lower ends of the upper bar U extend into the joint, from above, each fitting inside the corresponding side bar B. The opposite end of the joint J' is proved with a transverse hole **56** which extends into the joint in a direction to intersect perpendicularly the longitudinal hole **55** and receives the inner ends of the pack spreader bar C. A pair of holes **52** extend completely through the block and centrally intersect each of holes **55** and **56**, respectively, for attaching the joint to the side bar B and upper bar U, and the pack spreader bar C, respectively. Thus, a pin **10** is placed in each of the holes **52**, being retained in position by a ring **12** or other suitable device for preventing the pin from coming out. As will be evident, upper bar C may be removed by first removing the attaching pins **10**, lifting bar U out and then replacing the pins **10**. The joints J'' of FIGS. **1** and **3**, by which shoulder strap bar D and waist bar A are attached between the side bars B, are essentially the same in construction as the joint J, except that the holes for rivets **13** which attach the bars D and A to the joint, may extend upwardly through the joint, rather than laterally.

The pack spreader bar C, as in FIG. **3**, comprises a pair of posts **58**, the ends of which fit into the respective joints J', as in FIG. **15**, and a cross bar **59**, with a round corner, as shown, between the posts and the cross bar. A transverse hole **60**, as in FIG. **15**, is provided adjacent each end of a post **58**, corresponding in size to the holes **52** in the joint J' and the holes **32** at the upper ends of the side bar B, since each is adapted to receive a pin **10**, as in FIG. **3**.

The upper extension bar U is similar in construction to the pack spreader bar C, having a pair of posts **61** and a cross bar **62**, with rounded corners, as shown, connecting each post with the cross bar. The lower end of each post **61** extends into the upper end of a corresponding side bar B, as in FIG. **15**, while a hole through which a pin **10** extends is provided adjacent the lower end of each post **61**, similar to hole **60** in each post **58** of pack spreader bar C.

The lower U-shaped bar L, which is removable but normally fits within the lower end of each side bar B to provide an extension for the frame of the pack for attachment of relatively light but bulky articles, as described previously, is offset rearwardly, as in FIGS. **1–3** and **16–18**. Thus, the lower bar L may comprise a pair of upright posts **64**, each connected by a compound curved section **65** with a rearwardly bowed, lower cross bar **66**. As will be evident, articles attached to the lower end of the pack frame will be at least partially sup-

ported by the bowed cross bar **66**. Each post **64** is provided with a series of transverse holes **67**, by which the lower bar L may be attached to the lower end of each side bar B through a pin **10** which is inserted through one of the holes **36** of FIGS. **5** and **6** of the side bar B, most conveniently the lowermost hole, with the vertical position of the lower bar L adjusted by a selection of one of the holes **67** of FIGS. **16** and **18**. In FIG. **3**, the lower bar L is shown as extending upwardly within the lower ends of the side bars B to the maximum extent, while in FIG. **2**, the lower bar L is shown as adjusted further downwardly. As will be evident, the lower bar L may be adjusted, both in accordance with the size of the article or articles which are lashed to the frame below the sack S, as well as to correspond generally to the length of the torso of the user.

Although any suitable sack may be attached to the frame F, or the frame utilized without a sack and equipment only lashed to the frame, it is preferable to utilize a sack with the frame, the sack S being particularly adapted for this purpose. As in FIGS. **1, 2, 19** and **20**, the sack S may be formed of a suitable material, such as a sufficiently heavy nylon cloth to withstand the rigors of wear and hard usage, from pieces cut to a suitable size and shape and sewed together in any suitable manner, to provide side walls **70**, a front wall **71**, a top wall **72**, a rear wall **73** and a bottom wall **74**. The side and rear walls are joined to the top wall in a manner which provides a sleeve **75** which extends around the sides and rear of the top wall and is open at the front, for insertion of the pack spreader bar C of FIG. **3**, prior to its attachment to the frame at the joints J'. Of course, the pack spreader bar C is preferably inserted in the sleeve **75** while the sack S is empty. The front edge of each side wall **70** is also provided with an upright strip **76**, conveniently double walled, in view of the load imposed therein, and desirably integral with the side walls and front wall. Each strip **76** is provided with a series of grommets **77**, spaced apart in the same relation as the holes **33** of FIGS. **5** and **6** in the side bars B, so that a pin **10** may be inserted through the corresponding grommet **77** in each strip **76**, preferably from the inside to the outside, so that the sack S will be securely attached to the frame. When the pins **10** are utilized, a restraining device, such as a ring **12**, is utilized with each to prevent the pin from coming out. Alternatively, each strip **76** may be attached to the corresponding side bar B by a series of rivets **13**, as in FIG. **2**, also extending through the holes **33** in the corresponding side bar and a grommet **77**.

For more convenient access to the interior of the sack, the rear wall **73** may be provided with a panel **78** which, as in FIG. **19**, may be dropped downwardly by unfastening a zipper **79** at each edge of the panel. Although the panel **78** is shown in fully open position in FIG. **19**, it will be understood that the panel may be opened partially from the top, until access to a desired article has been obtained. In order to protect the zippers **79** from the exigencies of weather conditions, a longitudinal flap **80**, as in FIG. **2** and such as a sleeve of the same fabric as the pocket but stuffed with a suitable material, is adapted normally to cover each zipper, but is merely moved aside as the zippers are opened or closed. The interior of the sack may be provided with a series of pouches **81**, each attached at its front sides and bottom to the front wall **71** and closeable at the top by a drawstring **82**, provided with a conventional drawstring locking device **83**. As will be evident, when larger articles are to be placed inside the sack S, either one or both of the pouches **81** may be unfilled, and thus merely pressed against the front wall of the sack by such articles. Thus, the pouches **81**, while being adapted to be utilized in securely containing a series of smaller articles, do not interfere with the placement of an article, even as large as the inside of the sack S, within the sack.

For convenience, a map pocket **85** may be attached to the rear side of panel **78**, as in FIG. **2**, with a top cover **86** for the map pocket being adapted to be attached to the rear upper edge thereof in a quickly releasable manner, as by strips of "Velcro."

For additional convenience in access to smaller articles stored in the pack, a side pocket **87** is attached to each side wall of the sack. For readier access to the articles stored in the side pocket **87**, a zipper **88** extends diagonally downwardly across the outside of the pocket, each zipper **88** being provided with a pair of zipper slides **89**, so that the opening provided by the zipper **88** into the side pocket **87** may be restricted to a small area which is movable to different vertical positions, as well as the entire area of the inside pocket. This combination of a diagonal zipper and the two slides for the zipper permits not only articles to be inserted in the pocket with facility, but articles other than the articles being removed or inserted in the pocket to be retained in the pocket with a reduced possibility of falling out. One difficulty with side pockets which are accessible only from the top is that many times a large proportion of the contents of the pocket must be removed before a desired article is found. Also, a normally vertical zipper in a side pocket, which opens only from the top to bottom, often permits a number of articles to spill out of the pocket when an article to be removed is found to be at or near the bottom of the pocket. Thus, the diagonal zipper with two slides overcomes each of the above difficulties in previous types of side pockets.

Again, to protect the zipper **88** from the exigencies of adverse weather, a flap **90**, similar in construction to flaps **80**, is adapted to overlie the zipper **88**, but is merely pushed aside when either or both of the zipper slides are moved. The flap **90** additionally protects the zipper, as from rain or snow, because of its diagonal position.

From the foregoint, it will be evident that the pack frame and sack therefor of this invention fulfills to a marked degree the requirements and objects hereinbefore set forth. As described previously, the upper ends of the shoulder straps of the pack frame are adjustable laterally through the holes **11** in the shoulder strap bar D, while each hip tube T is adjustable vertically through adjustment of the corresponding joint J along the corresponding side bar B, through holes **36** at the lower end of each side bar. In addition, the angularity of the arm **42** of each hip tube T may be adjusted inwardly and outwardly, to accommodate the measurement around the hips of an individual using the pack, through the obliquely staggered holes **43, 44** and **45** in the hip tubes. Furthermore, the hip tubes T may be placed with the arms **42** below the joints J, i.e., with a post **40** of each hip tube extending upwardly to accommodate a longer torso of a user, as well as with the arms **42** above the joints J, i.e., the posts **40** extending downwardly into the joint, to accommodate a shorter torso

of a user. Of course, the user may find that either position of the hip tubes T is more comfortable and thus may utilize the considerable adjustment of the vertical position of the hip tubes, irrespective of the position of the hip tubes relative to the joints J. Since the hip strap H may be adjusted to comfortably encircle the hips of the user and the load of the pack is concentrated on the hip strap, but at a position at each side of the hip strap rather than at the rear, the weight of the pack and the load carried thereby is imposed primarily upon the legs of the user — which must carry this weight in any event — rather than on the shoulders of the user, as in the usual prior type of pack frame. While the hip strap H is preferably tightened so as to be quite snug around the hips of the user, such position is low on the torso, producing little or no pressure on the stomach area and further does not tend to produce pressure which restricts the breathing of the user.

Since the weight carried by the shoulder straps is reduced to what may be considered a minimum, there is little opportunity for the shoulder straps to constrict breathing or to bind the area near the shoulders, particularly at the position of the pectoral muscles. In addition, since the lower ends of the shoulder straps are attached at the sides of the user, rather than behind him, there is again less tendency for the shoulder straps to bind the area just below the shoulders.

The sack S, as described and shown, is particularly adapted for use with the pack frame of this invention and has many features of convenience, including the pack spreader bar C which maintains the sack in a spread condition at the top and thus holds the sack in an open condition, when articles are being placed inside. The pack spreader bar C, of course, has a dual function, the additional function being that of providing a fixed support for articles placed on top of the sack and lashed to the upper bar U. The rigid support provided by the pack spreader bar C thus permits articles of considerable weight to be placed at the top of the pack without tending to slide down or to compress articles placed inside the sack S. The upper bar U and lower bar L are, of course, removable when desired, but add relatively little weight to the pack frame, when retained thereon. Also, the lower bar L may be adjusted to the upper position of FIG. 3 and adds a minimum of additional weight. The rearwardly bowed cross bar of the lower bar L further prevents the lower end of the pack frame from banging the buttocks of the user each time a step is taken.

It will be understood that, although a preferred embodiment of both the pack frame and the sack of this invention have been illustrated and described, other embodiments may exist and various changes made therein, without departing from the spirit and scope of this invention.

What is claimed is:

1. A pack frame comprising:

a pair of side bars and transverse bars connecting said side bars, including an upper transverse bar adapted for the attachment of the upper ends of a pair of shoulder strap means;

a forwardly extending hip member attached to each side bar at a lower position and adapted to extend forwardly to a position alongside a hip of a user, each hip member being provided with a rear post and a forwardly extending arm;

means for attaching said hip member to the corresponding side bar with said post extending either upwardly or downwardly;

a pair of shoulder strap means attached at the upper ends thereof to said upper transverse bar;

a hip strap means constructed and arranged to encircle the hips of said user;

means for connecting the lower end of a shoulder strap means and one side of said hip strap means to the corresponding hip member alongside each said hip of said user;

joints for attaching each hip member to the corresponding side bar, each joint having spaced upright apertures for engaging said side bar and said post, respectively, said post having a series of vertically spaced holes at different angles to the direction of said arm and said side bar having a series of vertically spaced holes;

removable pin means for extending alternatively through said holes of said post for attaching said post to said joint at different angular positions; and

removable pin means for extending alternatively through said holes in said side bar for attaching said joint to said side bar at different vertical positions.

2. A pack frame as defined in claim **1**, wherein:

said hip member is tubular with open ends; and

a plug closes each end of said hip member, said plug being resilient to engage the inside of each end of said hip member and having a flange abutting the end of the tubular wall of said hip member.

3. A pack frame as defined in claim **1**, wherein:

said side bars are tubular and provided with an angular forward offset spaced below said upper transverse bar and a rearward angular offset spaced above said hip member, each said side bar having a transverse hole adjacent the upper end for attachment by pin means of a joint for connecting a pack spreader bar to said side bars, a series of vertically spaced, transverse holes for attachment by pin means of a sack to said side bars, said upper transverse bar being tubular and having a spaced series of vertical holes at each side thereof for pin means for attaching the upper ends of said shoulder strap means, and a pair of centrally located, spaced holes in the underside only for reception of reinforcing rods;

a tubular waist bar is attached to said side bars immediately below said rearward angular offset, said waist bar being bowed rearwardly and having a pair of laterally spaced holes in the upper side only, for reception of the lower ends of said reinforcing rods;

a rearwardly extending tubular pack spreader bar of generally rectangular configuration with rounded corners and forwardly extending posts attached to the upper ends of said side bars;

a tubular upper extension bar having an outer diameter corresponding to the inner diameter of said side bars and insertable within the upper ends of said side bars, said upper extension bar having a pair of spaced, depending posts and an upper cross member connected to said posts by rounded corners;

a tubular lower extension bar having an outer diameter corresponding to the inner diameter of said side bars and having a pair of upwardly extending posts insertable within the lower ends of said side bars,

said posts being connected by rounded corners with a rearwardly bowed lower cross member;

second joints having a vertical aperture therethrough for engaging said side bar and a horizontal aperture extending into said joint from the inside for engaging the ends of the respective upper transverse bar and waist bar, said second joints being attached by rivet means to said side bars and to the respective ends of said upper transverse bar and waist bar;

third joints attachable to the upper end of each side bar, having a vertical aperture for receiving said side bar and a horizontal aperture extending from the rear into said joint for receiving the ends of the posts of said pack spreader bar;

removable pin means for attaching the ends of said posts to said third joints and for attaching said third joints to the upper ends of said side bars and concurrently attaching the lower ends of the posts of said upper extension bar to said side bars; and

removable pin means for attaching said posts of said lower extension bar inside the lower ends of said side bars.

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