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 [21] Appl. No **811,974**
 [22] Filed **Apr. 1, 1969**
 [45] Patented **June 1, 1971**

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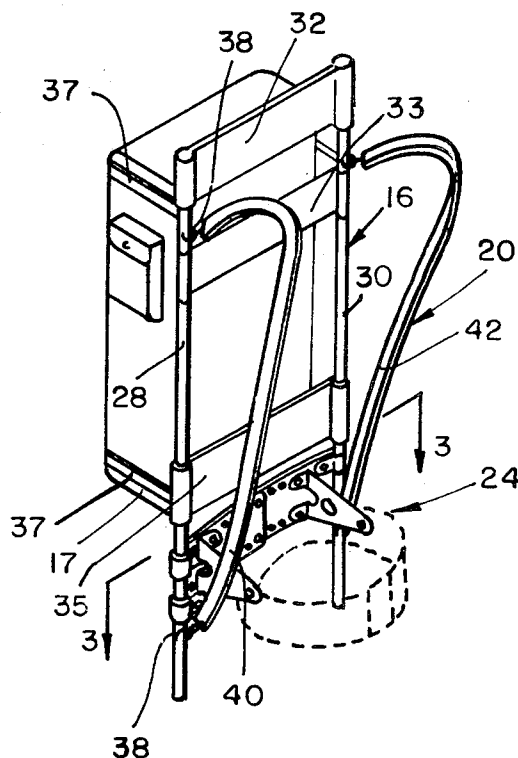
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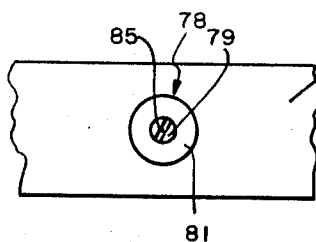
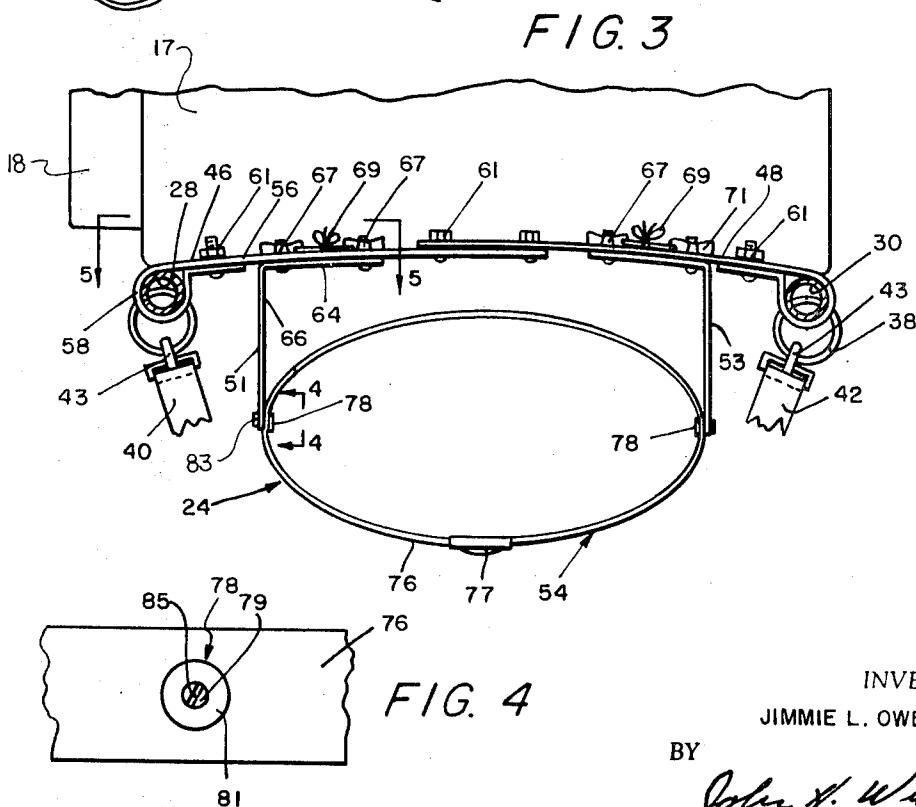
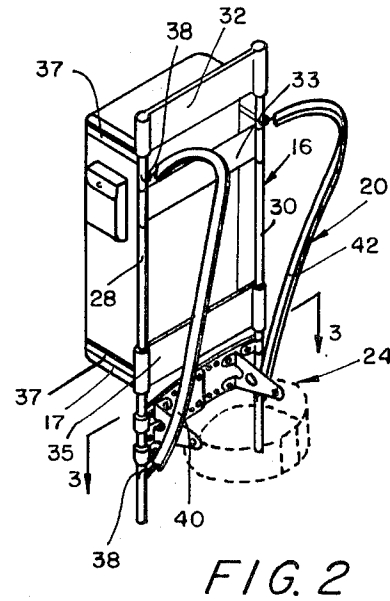
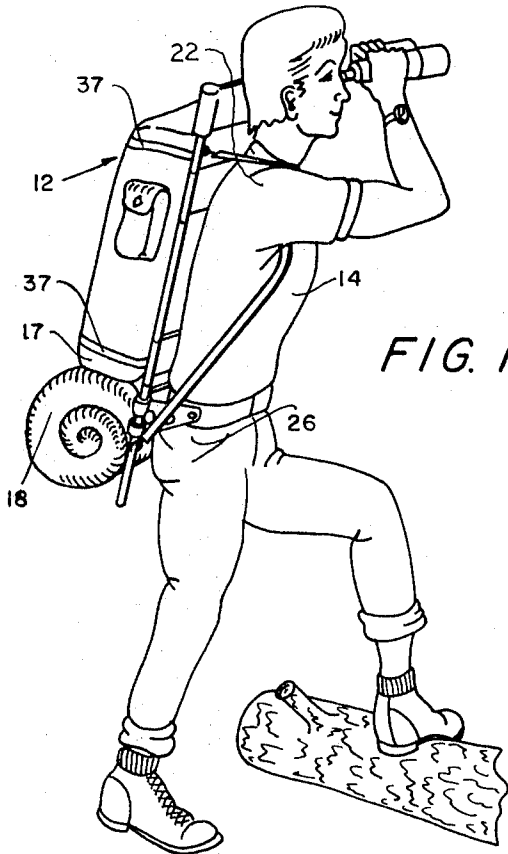
[54] **ADJUSTABLE PACK FRAME ASSEMBLY**
4 Claims, 7 Drawing Figs.

[52] U.S. Cl..... 224/25,
 224/8
 [51] Int. Cl..... A45f 3/10
 [50] Field of Search..... 224/8, 25,
 25.1, 9, 5.24, 11, 12

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ABSTRACT: This invention is a pack frame assembly adapted to be carried upon a person's back through the use of shoulder straps and having hip-engaging means thereon to bear on a portion of the person's hips so as to carry the majority of the load thereagainst. More particularly, this invention is a pack frame assembly adapted to carry packs, sleeping rolls, or the like having hip-engaging means which are readily adjustable so as to be readily carried by anyone while placing the majority of the load upon one's hips through the use of an interconnected belt member.

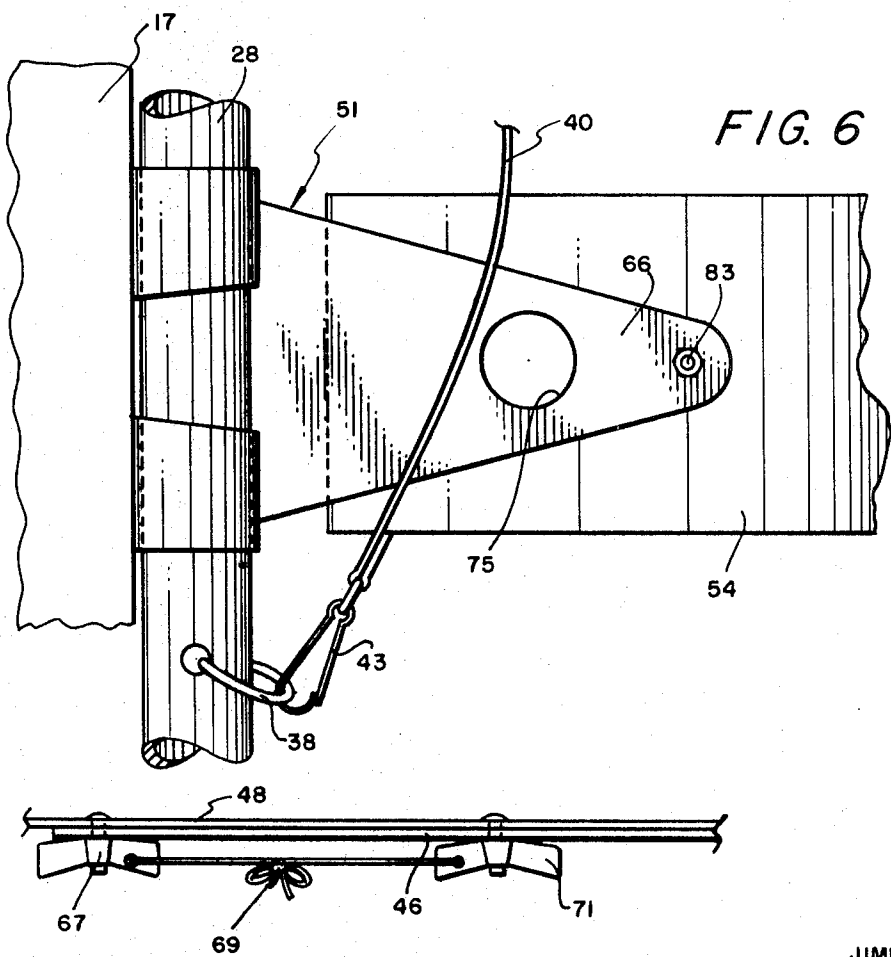
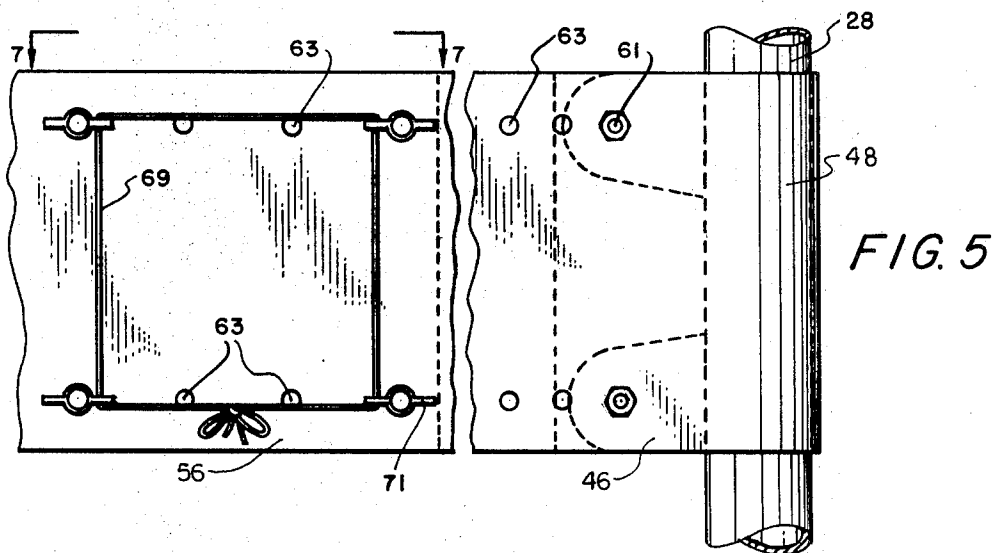




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ADJUSTABLE PACK FRAME ASSEMBLY

It is well known in the prior art that it is advantageous in transporting loads by means of a pack frame to relieve as much strain as possible from the shoulders of the bearer where fatigue is most acute so as to enable the load to be uniformly balanced or equalized between the shoulders and also to prevent chapping of the bearer's shoulders normally caused by taut, uneven shoulder straps. The prior art devices normally provide most of the load-carrying capacity to the one's shoulders which is extremely undesirable. Also, a common fault of the prior art pack frame is that the load is carried away from the human body to dispose the center of gravity of the load outwardly and rearwardly from the body in a cantilever fashion. This creates a substantial force moment as compared to a comparable load carried close to the body and held in place by a substantially rigid pack frame whereupon the center of the gravity is placed near the body.

In one preferred embodiment of this invention, an adjustable pack frame assembly is provided including a main pack frame means adapted to receive carrier packs, sleeping bags, and the like thereon; a shoulder strap assembly connected to the pack frame means operable to stabilize the load and provide a certain portion thereof to be carried by one's shoulders; and a hip-engaging means operably connected to the pack frame means and engageable with one's hip area for carrying a load hereon. The pack frame means includes parallel, elongated support tube members interconnected by spaced, cross strap members and having a plurality of connector straps and connector rings mounted thereon operable to be readily attached to the load such as a sleeping bag, a carrier pack, etc. to be mounted thereon. The shoulder strap assembly includes a pair of adjustable strap members connected to upper and lower ones of the connector rings on the parallel support tube members. The hip-engaging means includes a backplate assembly adjustably connected between the support tube members; hip plate members connected to the backplate assembly having vertical sections to be placed in a proper position adjacent the hips of one carrying the same; and a belt assembly secured to the vertical sections. The pair of hip plate members are adjustably connected and extended forwardly of the backplate assembly with the belt assembly placing the majority of the load upon the hips of the person carrying the same.

One object of this invention is to provide a pack frame assembly overcoming the aforementioned disadvantages of the prior art structures.

One further object of this invention is to provide a pack frame assembly including a pack frame means; a shoulder strap assembly connected to the pack frame means to provide lateral and vertical stability; and hip-engaging means connected to the pack frame means operable to carry the load mainly on the bearer's hip area.

Still, one other object of this invention is to provide a pack frame assembly adapted to receive and carry various types of loads which is economical to manufacture, simple to mount and adjust for proper carrying characteristics, and rigid in construction.

Various other objects, advantages and features of the invention will become apparent to those skilled in the art from the following discussion, taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of the pack frame assembly of this invention illustrated as mounted upon a hiker for the conveyance thereof;

FIG. 2 is a perspective view of the pack frame assembly of this invention;

FIG. 3 is an enlarged fragmentary sectional view taken along lines 3-3 in FIG. 2;

FIG. 4 is a fragmentary sectional view taken along lines 4-4 in FIG. 3;

FIG. 5 is an enlarged fragmentary sectional view taken along lines 5-5 in FIG. 3;

FIG. 6 is a fragmentary elevational view illustrating a vertical side piece structure of the pack frame assembly of this invention; and

FIG. 7 is a fragmentary sectional view taken along lines 7-7 in FIG. 5.

The following is a discussion and description of preferred specific embodiments of the new pack frame assembly of this invention, such being made with reference to the drawings, whereupon the same reference numerals are used to indicate the same or similar parts and/or structure. It is to be understood that such discussion and description is not to unduly limit the scope of the invention.

Referring to the drawings in detail and in particular to FIG. 1, a pack frame assembly of this invention, indicated generally at 12, is shown as attached to the back area of a hiker or camper 14 for the ready conveyance thereof. The pack frame assembly 12 includes a main upright pack frame means 16 to receive a pack structure 17, sleeping roll or bag 18, and the like thereon; shoulder strap assemblies 20 connected to the pack frame means 16 operable to be placed over the shoulders 22 of the hiker 14; and hip-engaging means 24 connected to the pack frame means 16 operable to be placed against a hip area 26 of the hiker 14 as will be further described in detail.

The pack frame means 16 includes a pair of spaced parallel support tube members 28 and 30 interconnected at spaced intervals along its length by cross strap members 32, 33 and 35 and having a plurality of connector straps 37 and connector rings 38 secured to the support tube members 28 and 30. The support tube members 28 and 30 are preferably constructed of a lightweight, noncorrosive material such as aluminum tubing having a sufficient length to carry the load thereon. It is obvious that the support tube members 28 and 30 may be shortened to the desired length depending on the size of the hiker 14. The cross strap members 32, 33 and 35 are preferably constructed of a heavy gauge canvas material operable during usage to contact the back area of the hiker 14. At opposed upper and lower ends of the support tube members 28 and 30 are placed the connector rings 38. The connector straps 37 are provided for readily mounting the various items to be carried by the pack frame assembly 12.

The shoulder strap assembly 20 includes a pair of elongated adjustable strap members 40 and 42, each having snap members 43 connected to opposite ends thereof. It is obvious that the strap members 40 and 42 may be provided with buckle members (not shown) so that the same may be adjustable in length. The snap members 43 are easily connectable to the connector rings 38 on the parallel support tube members 28 and 30, respectively, to provide the desired length and supporting means thereto as will become obvious.

The hip-engaging means 24 includes a backplate assembly having a pair of anchor plates 46 and 48 connected to respective ones of the support tube members 28 and 30 and to each other; a pair of vertical side or hip pieces 51 and 53 adjustably connected to the anchor plates 46 and 48, respectively; and a belt assembly 54 connected to laterally extended portions of the vertical hip pieces 51, 53. Each of the anchor plates 46 and 48 is provided with a flat main body 56 having a loop section 58 at one end. More particularly, the loop sections 58 are adapted to fit about respective ones of the support tube members 28 and 30 which are clamped therebetween as through nut and bolt assemblies 61. It is obvious that the anchor plates 46 and 48 can be adjusted as desired vertically upon the respective support tube members 28 and 30. The adjacent portions of the main bodies 56 of the anchor plates 46 and 48 are interconnected through the use of nut and bolt assemblies 61 in an overlapped relationship. Additionally, it is seen that there is a plurality of spaced rows of holes 63 in the main bodies 56 of the anchor plates 46 and 48 so that the spacing of the parallel support tube members 28 and 30 can be readily adjusted for use on various sizes of persons.

As each of the vertical side or hip pieces 51 and 53 are substantially identical, only one need be described in detail. The vertical side piece 51 is of a substantially L-shape in transverse cross section having an anchor body portion 64 and an integral outwardly projected leg portion 66. The body portion 64 is connected to respective ones of the anchor plates 46 and

48 through the use of a plurality of bolt and wingnut assemblies 67. It is obvious that the bolt and wingnut assemblies 67 can be attached through selected ones of the holes 63 within the main bodies 56 of the anchor plates 46 and 48 so as to be in a proper laterally adjusted position for the desired spacing between the leg portions 66. It is also seen that safety laces 69 are readily placable through holes in wingnut members 71 and secured thereto so as to prevent the same from rotating and resultant loosening.

It is noted that the vertical side pieces 51 and 53 have the leg portions 66 tapered outwardly to be of substantially V-shape with holes 75 therein to provide for weight-reducing features.

The belt assembly 54 includes a wide belt member 76 having adjacent ends releasably connected through the use of a conventional buckle member 77 as desired. Opposite sides of the belt member 76 are attached to the outermost respective ends of the vertical side pieces 51 and 53 through the use of connector assemblies 78. More particularly, each connector assembly 78 includes a bolt member 79 through a washer 81 which, in turn, clamps the belt member 76 between the washer 81 and the respective vertical side pieces 51 and 53 with a securing nut member 83 on the other end. It is seen that the bolt member 79 is of a flat-headed type provided with a slot 85 therein for ease of tightening. Also, it is seen that the use of a washer 81 and the flat-headed bolt member 79 operates to provide a substantially continuous surface with the inner surface of the belt member 76 so that the same does not provide discomfort to one wearing the same.

In the use and operation of the adjustable pack frame assembly 12 of this invention, it is noted that any type of load may be placed on the back surface of the pack frame means 16 and interconnected thereto through the use of the connector straps 37 or any other securing means. Next, it is obvious that the shoulder strap assembly 20 through the adjustable strap members 40 and 42 can be regulated so as to position the load carried upon the pack frame assembly 12 in the proper vertical position depending upon the size of the camper or hiker. The hip-engaging means 24 may thereupon be adjusted so as to properly fit the person wearing the same.

In order to achieve the proper adjustment, it is seen that the anchor plates 46 and 48 can be moved vertically on the respective parallel support tube members 28 and 30 on loosening of the nut and bolt assemblies 61. The proper location found is to place the side pieces 51 and 53 adjacent to and directly over the hips of the camper or hiker. Also, to control the lateral movement of the entire pack frame assembly 12, the vertical side pieces 51 and 53 can be readily adjustable laterally of each other through the use of the bolt and wingnut assemblies 67 so that the same fits in a snug relationship on opposite sides of the hips. Thereupon, the belt assembly 54 may be adjusted through the buckle member 77 to provide the desired fit about the person's waist wearing the same. It is seen that through the proper adjustment features of the pack frame assembly 12 of this invention, substantial vertical and lateral stability can be achieved and operable through the theory of this invention to place the weight of the load directly over the hips of the bearer since this is the carriage center and the strongest part of the human body. By suspending and stabilizing the load from the hip areas, the shoulders carry only a small percentage of the load thus leaving the neck, shoulders, and back more freedom allowing the bearer to walk much farther with less fatigue.

It is seen that the pack frame assembly of this invention provides a structure which is readily adjustable in all directions so as to custom fit the camper or hiker bearing the same and any type of load may be readily attached for the conveyance thereof. Also, it is obvious that the pack frame assembly may be constructed of numerous types of material, as for example, the support tube members may be of magnesium, stainless steel, plastic, etc. and the connector straps and cross straps

could be constructed of material such as plastic, fiberglass, nylon, etc. wherein the main characteristics of these elements are the provisions of sufficient strength, lightweight, and being noncorrosive.

It is obvious that the pack frame assembly of this invention can be readily sold as an adapter kit so that the same can be readily attached to existing pack frame structures. This operates to alter the prior art structures so as to transfer the load from the shoulders and shoulder strap members to an area over and above the hip area so the bearer carrying the same achieves the results of the new and novel operation of this invention.

It is seen that the pack frame assembly of this invention provides a compact completed structure or a kit assembly which is economical to manufacture; simple to install and adjust as required; durable in construction; and placing the load on the hip area which allows the bearer to carry the same with less fatigue.

While the invention has been described in conjunction with preferred specific embodiments thereof, it will be understood that this description is intended to illustrate the invention, which is described by the following claims.

I claim:

1. A pack frame assembly adapted for mounting on the back of a human body for carrying a load thereon, comprising:
 - a. a pack frame means to receive a load thereon through the use of connecting means and having elongated spaced upright parallel support members interconnected as by cross members, and having strap connector members connected to the upper and lower end portions, respectively, of said support members;
 - b. a shoulder strap assembly operably connectable to said support members adapted to be placed over the shoulders of the person carrying the same for vertical and lateral stability, said strap assembly including a pair of strap members having adjustable means thereon and provided with connector members at opposite end portions readily connectable to respective ones of said strap connector members on said support members;
 - c. a hip-engaging means operably connected to the pack frame means including a backplate assembly to adjustably interconnect said support member; vertical side members; and a belt assembly connected to said vertical side members adapted to be placed about the person wearing the same adjacent to and immediately above the hip portion for carrying a substantial portion of the load on said pack frame means thereupon; and
 - d. nut assemblies adjustably interconnecting said vertical side members to said backplate assembly whereupon the lateral spacing therebetween can be readily adjusted so as to position the same adjacent the hip area of a person carrying the same for lateral stability.
2. A pack frame assembly as described in claim 1, wherein:
 - a. said belt assembly having opposed sides connected to said vertical side members, said connection to said vertical side member such as to maintain said pack frame means out of engagement with said belt assembly so that the majority of the load is carried vertically upon said belt assembly.
3. A pack frame assembly as described in claim 2, wherein:
 - a. said vertical side piece members of a generally L-shape in transverse cross section having a main body portion adjustably connected to said backplate assembly, and a forwardly projected V-shape attachment portion having an outer end thereof connected through a flat-headed bolt member to said belt assembly.
4. A pack frame assembly as described in claim 1, wherein:
 - a. said nut assemblies having a wingnut member, each interconnected to adjacent ones thereof by a safety lace member.