

United States Patent

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[54] PACK FRAME ASSEMBLY

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224/11, 12

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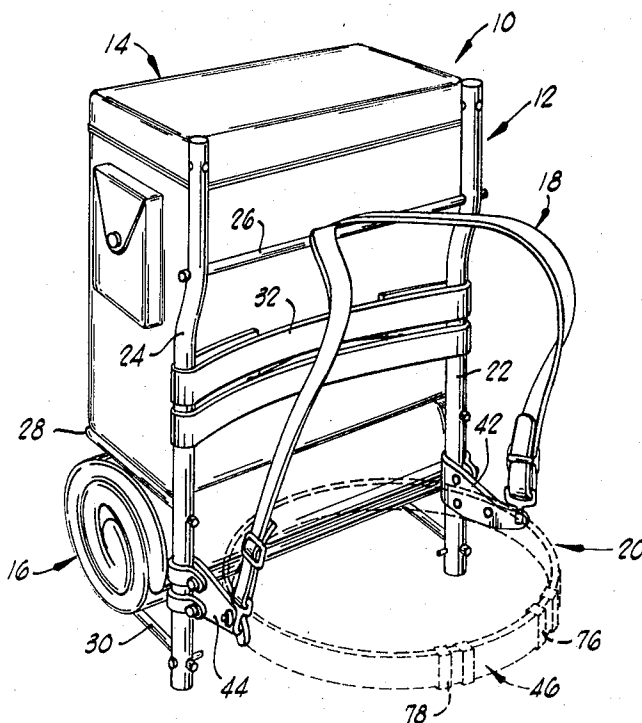
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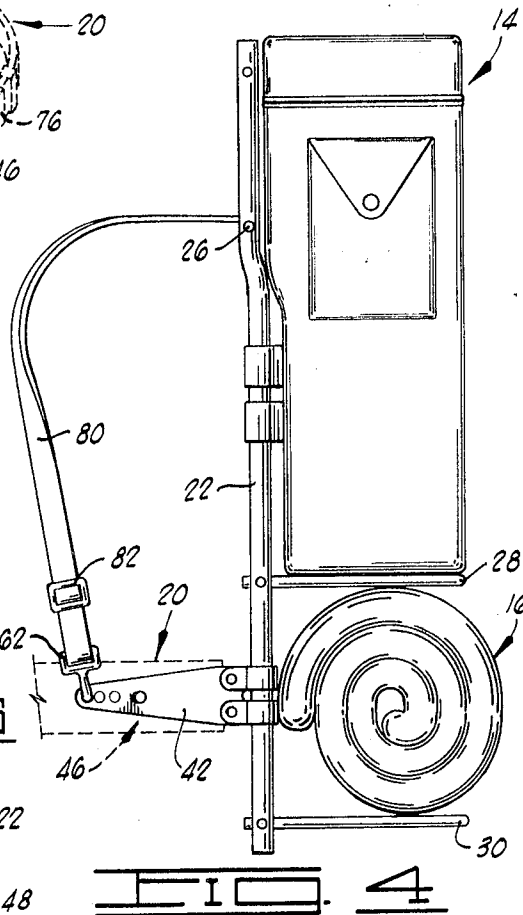
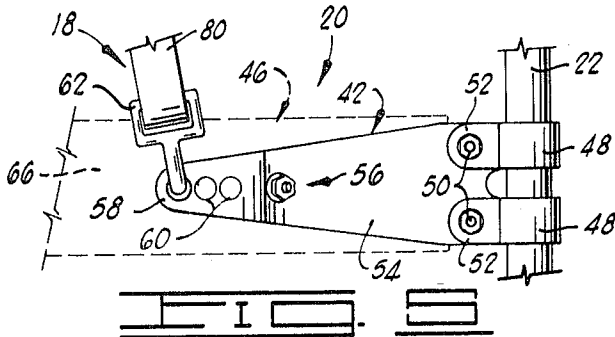
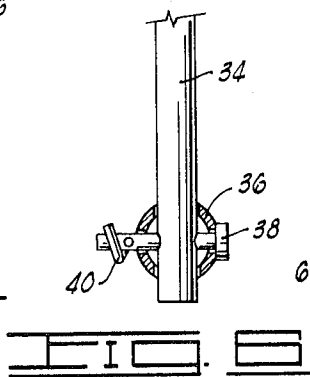
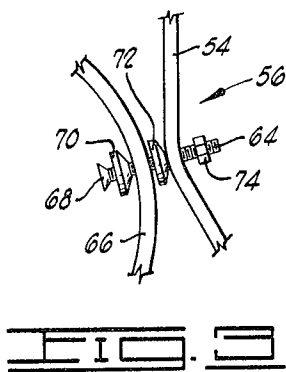
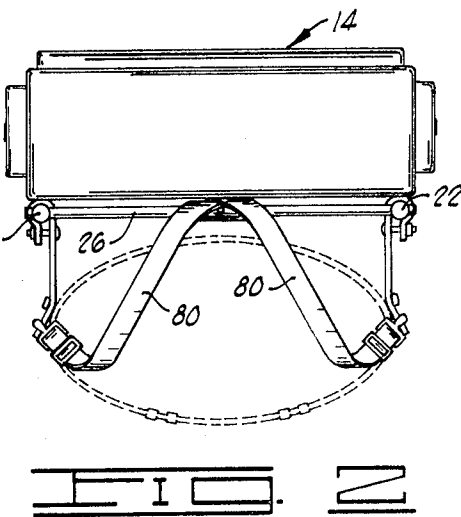
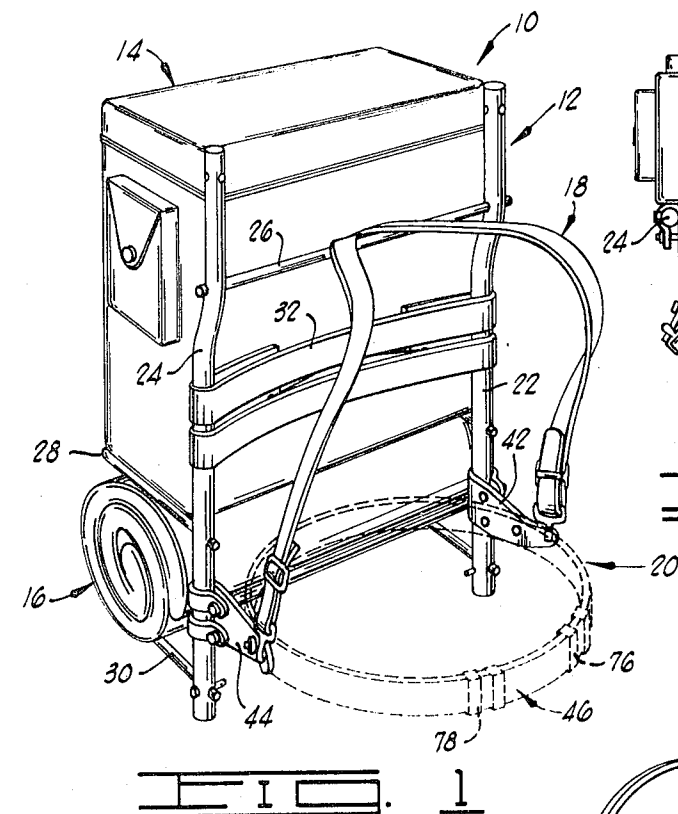
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[57] ABSTRACT

This invention is an improved pack frame assembly adapted for mounting on a person's body to carry objects thereon. More particularly, this invention has an adjustable hip engaging means mounted with the normally upright support members of the pack frame and operable to transfer a substantial portion of the load to the wearer's hips, and a shoulder strap means connected with the pack frame and adjustably connectable with the hip engaging means.

2 Claims, 6 Drawing Figures





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PACK FRAME ASSEMBLY

This is a continuation-in-part of my application, Ser. No. 811,974, filed Apr. 1, 1969, now U.S. Pat. No. 3,581,961, issued June 1, 1971 entitled Adjustable Pack Frame Assembly.

Numerous devices are known in the prior art to carry objects on one's back and to support a load on one's body, a common fault of these prior art devices is to place the majority of the load on the person's back or shoulders, causing undue physical fatigue. The force a person realizes from these devices is the force of the load plus a force due to the load being carried at a distance from one's center of gravity.

In a preferred specific embodiment of this invention, an improved pack frame assembly is provided, including a pack frame adapted to receive sleeping bags, carrier bags, and the like thereon; a hip engaging means on the lower portion of the pack frame; and a shoulder strap attached with the pack frame and attachable with the hip engaging means. The pack frame necessarily includes elongated upright parallel tubular support members held in the spaced relation by cross members forming transverse supports and load attaching devices. The hip engaging means includes a belt to be worn in a proper position adjacent to a person's hips; side plate members are attached to opposed sides of the belt and to the lower portion of each of the upright tubular support members. The shoulder strap includes a strap attached with a cross member on the upper portion of the pack frame with length adjustment members and snaps on the ends thereof operable to attach the side plate members. The side plate members, the shoulder strap members, and the belt are adjustable to position the pack frame assembly properly adjacent the hips of a person carrying same in order to place the majority of the load upon the hips of the person.

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

One further object of this invention is to provide a pack frame, including a pack frame, shoulder support and hip engaging means which will transmit the majority of the load carried to the hip area of the person using same.

Still, one further object of this invention is to provide a hip engaging means which can be used on many types of tubular pack frames, thereby achieving the same load distribution as with the specific pack frame shown.

Yet another object of this invention is to provide a pack frame and hip engaging means which can be easily disassembled and fitted in a small space for transport or storage and easily reassembled for use.

Still, one further object of this invention is to provide a pack frame, hip engaging means and shoulder strap which is economical to manufacture, simple to construct, and easily mountable with popular tubular type pack frames, and is easily adjustable for proper load distribution.

Various other objects, advantages, and features of this 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 with a carrier pack and sleeping bag thereon and having the belt shown dotted for clarity;

FIG. 2 is a top plan view of the pack frame assembly shown in FIG. 1;

FIG. 3 is a segmental top plan view of the belt and side plate member at their attachment point;

FIG. 4 is a side elevational view of the pack frame assembly, as shown in FIG. 1;

FIG. 5 is an enlarged segmental side elevation view of the side plate member, as attached to pack frame assembly; and

FIG. 6 is a partial cross-sectional view of a typical pack frame and support member coupling taken through the pack frame member.

The following is a discussion and description of preferred specific embodiments of the improved 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 preferred specific embodiment of the pack frame assembly of this invention is generally indicated at 10. The pack frame assembly 10 includes a pack frame 12 to receive a pack 14, sleeping bag 16, and various other objects thereon; shoulder strap assembly 18; and hip engaging assembly 20, connectable to the pack frame 12 and operable to be worn in the hip area of a human body.

This pack frame 12 includes two (2) tubular upright support members 22 and 24; supported in a spaced relation by cross support members 26, 28, and 30; and a back support member 32. The preferred pack frame 12 has means to position the cross support members easily at varying positions along the upright support members 22 and 24. It is to be understood the support members can be either straight members, as member 26, or shelf shaped members, as 28 and 30, depending upon the configuration most convenient relative to the objects to be carried. The cross support members attach the upright support members, as shown in detail in FIG. 6, with the cross members, indicated here at 34, passing through oppositely oriented apertures in the upright support members, indicated here at 36. A clevis pin 38 secures the members by passing through apertures in the upright support members 36 and the cross support member 34, perpendicular to the cross support member 34. The clevis pin 38 is secured by a wire retainer 40. The back support member 32 is preferably an adjustable web member looped around the upright support members 22 and 24, secured by a lace type adjustment (not shown) to provide a comfortable and proper fit to the wearer. The upper cross support member 26 provides an upper mount for the shoulder strap assembly 18.

The hip engaging assembly 20 includes side plate members 42 and 44, respectively, connectable with the upright support members 22 and 24; belt assembly 46 connected on opposite sides with the side plate members 42 and 44 and shoulder strap assembly 18 also attachable with the side plate members 42 and 44. The side plate members 42 and 44 are substantially identical. Thus only one need be described in detail. Side plate member 42 is shown in FIG. 8, mounted with the pack frame assembly 10. The side plate member 42 has a forward projecting V-shape, seen laterally and a somewhat J-shape seen transversely with the larger end portion having loop portions 48 encircling the upright support member 22, secured with some by bolts 50, extending through the end portions 52 of the loops 48 and the body portion 54 of the side plate member 42. It is obvious the side plate member 42 can be easily rotated to various angular positions about the upright support member 22 by means of loosening the bolts 50, thus providing lateral and vertical adjustment to the particular hip area of the individual using the pack frame assembly 10. The body portion 54 pivotally attaches with the belt assembly 20 by means of the connector assembly 56. The forward end portion 58 of the side plate member 42 has a plurality of holes therethrough, indicated by 60. The shoulder strap assembly 18 attaches the forward end portion 58 with a snap member 62 clipping through the holes 60. It is noted the forward end portion 58 of the side plate member 42 is the apex end of the V-shape, thereby providing weight reduction and facilitating easy attachment of the snap 62, with the holes 60; additionally the forward end portion 58 is bent transversely outward relative to the belt assembly. The connector assembly 56 includes an anchor bolt 64 passing through the wide belt 66 of the belt assembly 46 and the body portion 54 of the side plate member 42. On the interior of the belt assembly 46 the bolt 64 has a flat head portion 68 contacting a tapered washer 70 which, in combination with another tapered washer 72 on the opposite side of the belt 66 when tightened with the body portion by the nut 74, provides the pivotal attachment of the belt assembly 46 and the side plate member 42. The connector assembly 56 when properly adjusted transmits load from the pack frame 12

to the belt assembly 20 without causing the belt 66 to twist or buckle causing the wearer discomfort.

The belt assembly 20 includes a wide belt 66, preferably constructed of web material with a conventional buckle 76 and conventional length adjusting member 78 to provide a comfortable and proper fit with the hip area of the wearer. The connector assembly 56 attaches transversely opposite sides of the belt 66 in position to allow sufficient clearance between the lower portion of the pack frame 12 and whatever object is carried thereon and the back area of the wearer.

The shoulder strap assembly 18 includes a strap member 80, preferably constructed of web material attached with the cross support members 26 in the center thereof and having snap members 62 on the end portions thereof. The length of the shoulder strap assembly 18 is adjustable by means of the strap member 80 looping through the snap members 62 and secured with itself by an adjusting member 82. This shoulder strap adjustment provides for adjustment of the pack frame assembly 10 to the proper loading condition that retains a portion of the load on the shoulders of the wearer and providing a substantially constant load thereon due to the spaced relation of the upper attachment of the shoulder strap assembly 18 with the cross member 26 relative the lower attachment with the side plate members 42 and 44, and relative the trunk of the body of the wearer. This spaced relation prevents the shoulder strap 80 from cutting into or slipping on the trunk of the wearer's body when in standing erect, stooping, or sitting positions.

In use and operation of the improved pack frame assembly 10, it is to be understood the pack frame assembly 12, described herein, is not peculiar in limiting this invention and that numerous other specific designs of similar pack frames can be easily used. Also, it is obvious the objects to be carried on the improved pack frame assembly 10 depend upon the specific design of the pack frame and likewise the means which various objects can be attached to same.

In order to adjust the improved pack frame assembly 10 of this invention properly to provide a comfortable fit for the greatest variety of sizes and shapes of wearers, it is seen the side plate members 42 and 44 can be easily moved vertically on and angularly about the upright support members 22 and 24 in combination with length adjustment of the belt assembly 46, shoulder strap assembly 18, and back support member 32. To position the improved pack frame assembly properly, the side plate members 42 and 44 are placed over the hips of the wearer by lateral movement. Then, the belt 66 is fitted about the person's waist by means of the buckle 76 and length adjustment 78. The pack frame 12 is moved vertically through the loops 48 of the side plate members 42 and 44 to bring the upper end of the shoulder strap assembly 18 generally in line with the wearer's neck. Then the strap 80 is attached to the side plate members 42 and 44 and then adjusted to provide a comfortable fit, with the wearer's back resting against the back support member 32. When properly adjusted, the improved pack frame assembly 10 of this invention should place the majority of the load on the hip area of the wearer and retain a small portion on the shoulders, thus providing for carrying the majority of the load on the stronger part of the human body and giving stability to the pack frame by supporting a portion of it from the shoulders of the wearer. It is obvious that by supporting the load in the above-described manner, the wearer of the pack frame assembly 10 of this invention, will be subjected to lower loads on the upper portions

of his body and given greater freedom in the neck, shoulder, and back area and thus will be able to bear the load for a longer time with less fatigue.

In construction of the improved pack frame of this invention, it is obvious the pack frame assembly can be constructed of numerous types of materials. Specifically, the pack frame and side plate members can be constructed of sufficiently rigid materials commonly used for same, such as aluminum, magnesium, steel, plastic, etc. The belt and shoulder straps can be constructed of nylon, fiberglass, plastic, etc., where the materials have characteristics of light weight, sufficient strength and flexibility.

It is seen the pack frame assembly of this invention provides a structure which is economical to manufacture, simple to adjust as required, durable in construction, and functions to allow one using the pack frame assembly to carry same with reduced fatigue. Also, it is seen the pack frame assembly of this invention provides a means of supporting numerous styles of pack frames. Additionally, it is seen with the specific pack frame shown that same is easily disassemblable, storable in a small area and easily reassemblable for use.

While the invention has been described in conjunction with preferred specific embodiments thereof, it will be understood this description is intended to illustrate and not limit the scope of the invention which is defined by the following claims.

I claim:

1. An improved pack frame assembly adapted for mounting on the back of a human body for carrying objects thereon, comprising:

a. a pack frame means to receive and hold said objects thereon which has upright parallel and spaced supporting members with connectable cross members therebetween in a plurality of positions, and a back support means between said upright support members,

b. a hip engaging means operably connectable with said pack frame means including forward projecting generally V-shaped side plate members having a base portion thereof adjustably connected with said upright support members; and a belt means having opposed sides of same connected with a center portion of said side plate members by a bolt member and positioned and adapted to be placed about said body immediately above the hips and operable so that substantially the majority of the load is carried vertically, said side plate members independently connected with said upright support members, and

c. a shoulder strap member connected with said cross members and said side plate members operably providing for stability of said pack frame means, said strap member having adjustable means on the end portions thereof and provided with snap members on the ends thereof, readily connectable to said side plate members through apertures in the apex end portions thereof, said back support means in combination with said shoulder strap means providing when mounted lateral support of said pack frame assembly, and said side plate members positionable adjacent the hip area for lateral stability.

2. An improved pack frame assembly as described in claim 1, wherein said side plate members individually are formed therearound said upright support members to exert sufficient pressure on same to hold said side plate members in a fixed position relative said upright members when clamped by means of bolts.

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