

[54] **BACKPACK FRAME WITH HANDLES**

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[51] Int. Cl. .... **A45f 3/10**

[58] Field of Search..... **224/25 A, 8 R, 8 A, 9, 224/45 P**

[56] **References Cited**

**UNITED STATES PATENTS**

3,536,237 12/1970 Greenman ..... 224/25 A

**FOREIGN PATENTS OR APPLICATIONS**

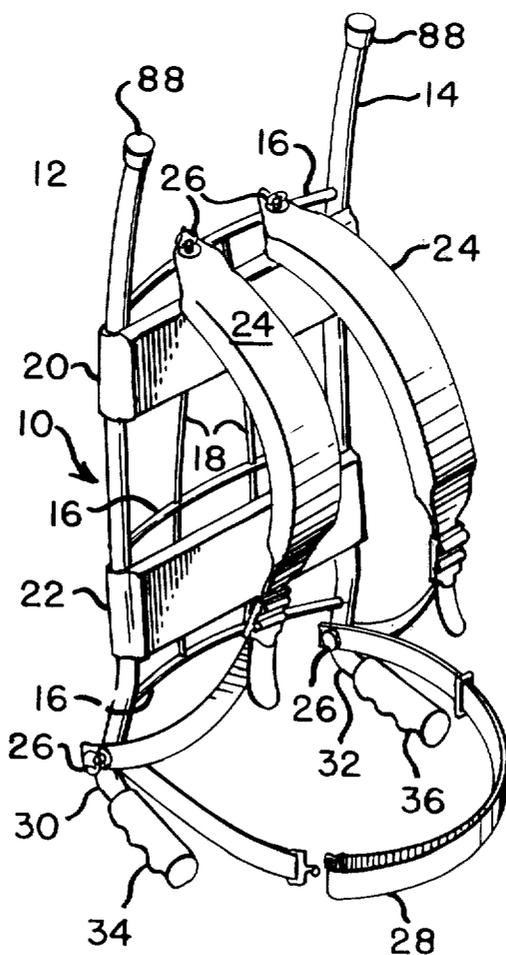
61,404 6/1940 Norway ..... 224/8 R

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Garrison & Havelka

[57] **ABSTRACT**

A backpack frame including handgrip portions mounted near the bottom of the pack frame and extending forwardly therefrom laterally adjacent the hips of the backpack wearer thereby allowing the wearer to easily lift the pack upwardly to relieve the load normally borne continuously by the wearer's shoulders through shoulder straps connected to the pack. Various forms of handgrips and handgrip supports connectable to conventional backpack frames are disclosed including height adjustable handles, rotationally pivotal handles, vertically pivotal handles which may alternately be used to support the pack frame when placed on the ground, handles mountable within the hollow main vertical support rods of a pack frame and handles which may be quickly clamped to or removed from the bottom portion of a pack frame.

18 Claims, 8 Drawing Figures



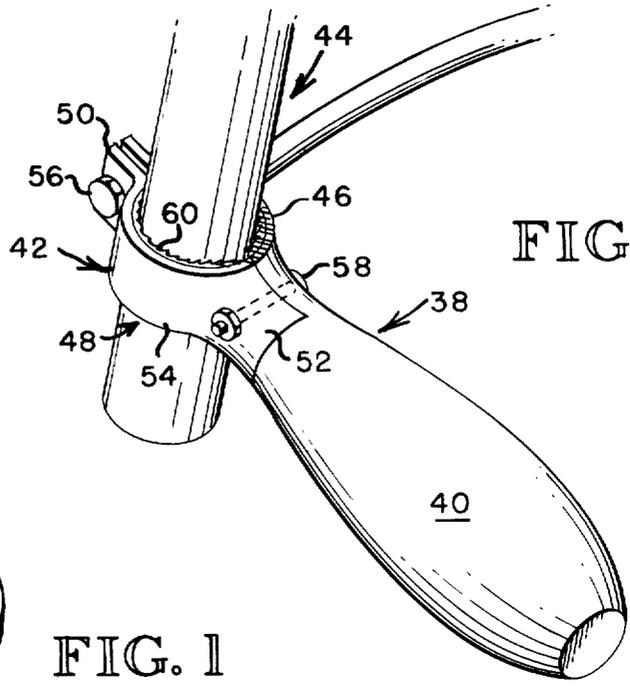
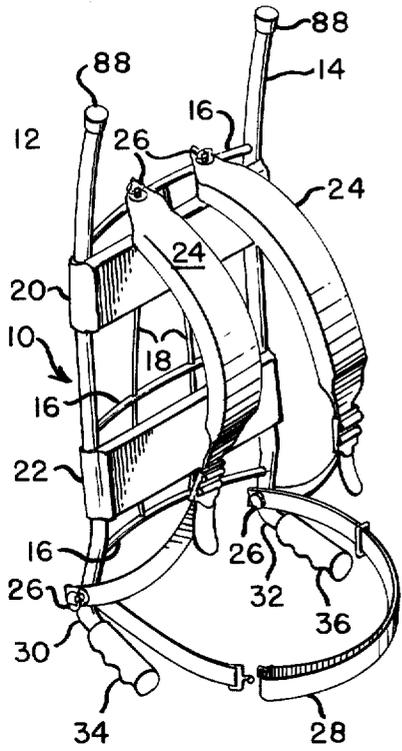


FIG. 1

FIG. 2

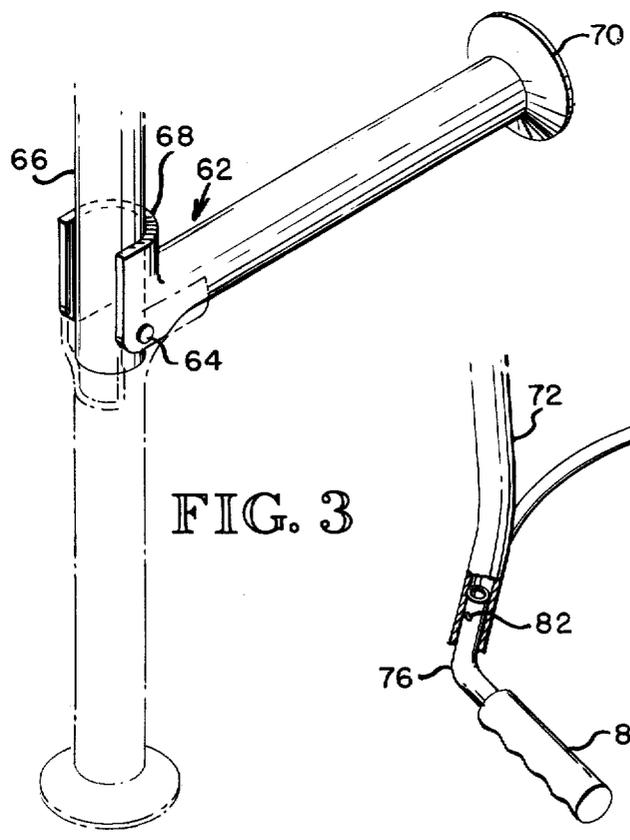


FIG. 3

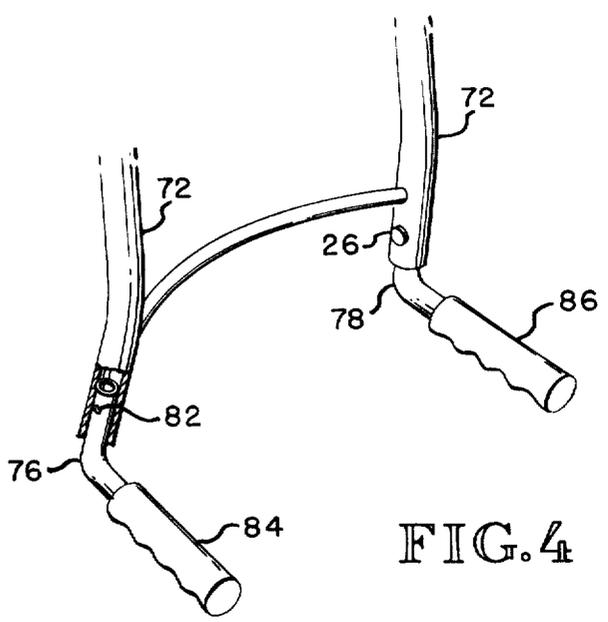


FIG. 4

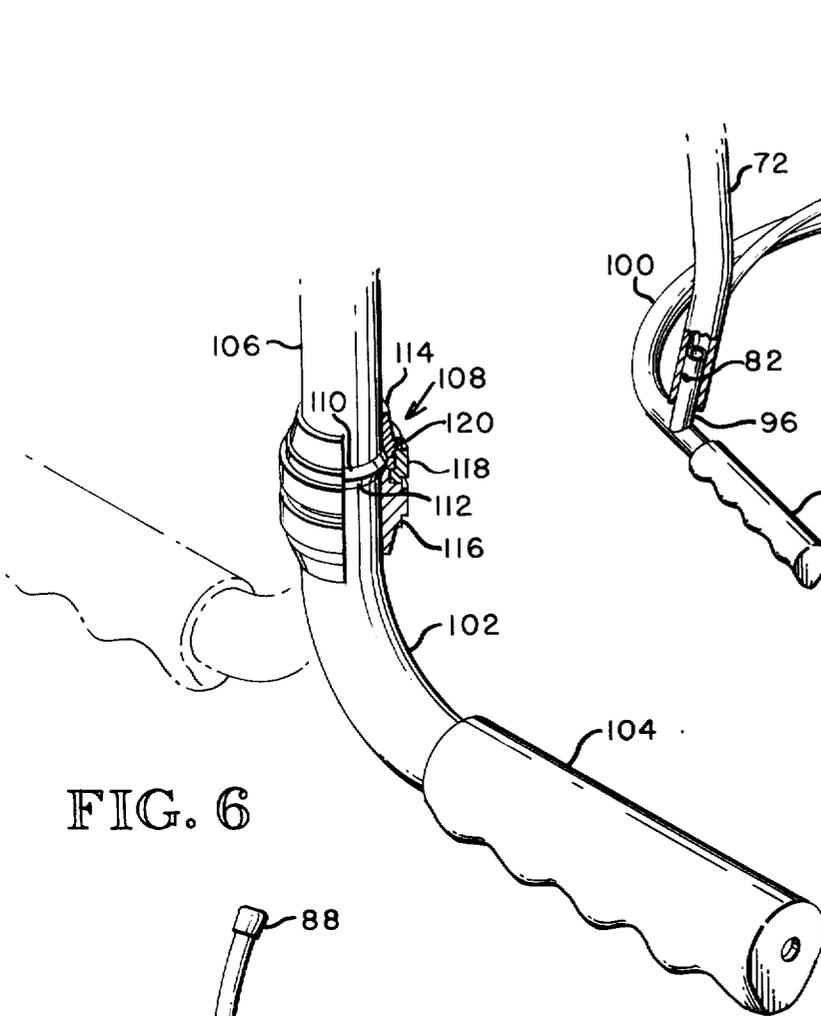


FIG. 5

FIG. 6

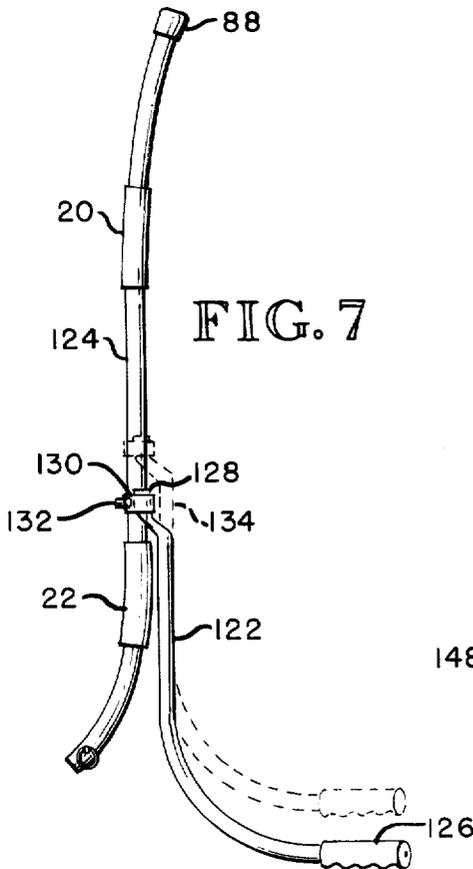


FIG. 7

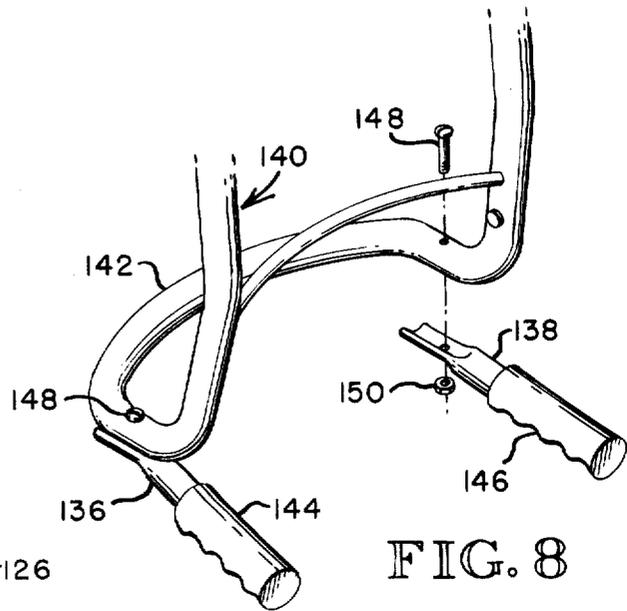


FIG. 8

**BACKPACK FRAME WITH HANDLES****BACKGROUND OF THE INVENTION****1. Field of the Invention**

This invention relates, in general, to pack frames used to support loads on a packer's back by means of shoulder straps mounted thereon, and, in particular, to backpack frames including handgrip portions extending forwardly from near the bottom of the pack frame to allow the pack wearer to lift a portion of the weight of the pack from his shoulders while the pack is being carried.

**2. Description of the Prior Art**

In recent years, great numbers of persons have taken up hiking as a form of outdoor recreation. Many of these hikers travel into wilderness areas and camp for one or more nights thereby necessitating their carrying their food, sleeping bags, shelter and miscellaneous equipment with them, usually in a back pack or knapsack. The term knapsack generally relates to a cloth bag having shoulder straps for supporting the bag on a wearer's back. While knapsacks are suitable for carrying relatively light loads over short distances, it has been found that the carrying of heavy loads, such as those which must be borne on hikes when the packer is to be away from civilization for an extended period, are best borne on a relatively rigid frame known as a pack frame. Normally, a pack bag having one or more internal compartments and a plurality of external pockets is fastened on the pack frame to compactly carry the load, although it is also known to tie heavy or bulky loads directly to a pack frame.

Presently, backpack frames are constructed in a wide variety of designs from a great number of different materials. Early pack frames were usually fashioned of wood in a simple, generally rectangular shape, often having a plurality of cloth or rope straps stretched thereover to hold the load carried on the pack frame away from the wearer's back.

The presently most popular packs are usually constructed of hollow tubular aluminum, and include vertical main support bars usually contoured to generally conform to the curve of a wearer's back. The vertical main support bars are usually interconnected by smaller diameter aluminum rods some of which may be bowed outwardly to hold a pack bag mounted thereon away from the wearer's back to both allow air to circulate between the pack bag and the wearer and to prevent objects within the pack bag from digging into the wearer's back. Cushioning pads are often mounted transversely between the main vertical support bars for additional comfort, while cushioned shoulder straps and secured between the top and bottom of the pack frame and extend forwardly therefrom.

A common problem encountered by novice hikers and experts alike is the physical discomfort, felt particularly in the packer's shoulders on which the pack straps bear, caused by carrying heavy loads in substantially the same position for long distances. Waist belts are sometimes mounted near the bottom of the pack frame in an attempt to relieve the load on a pack wearer's shoulders, the waist belt being tightened to ride on the wearer's hips such that the pack load is distributed between the hips and shoulders. Waist belts, however, are uncomfortable in their restriction of freedom of movement and tendency to chafe, and further may be dangerous in that they tie the heavy pack to the wearer

which may be disastrous in the event of an inadvertent slip into a river or stream.

Often, packers relieve and distribute the load on their shoulders by placing their thumbs beneath the shoulder straps at chest level and lifting the pack so that a portion of the load is borne by their arms. This movement provides some temporary relief for the packer's shoulders, but if the load being carried is of substantial weight, the packer's thumbs soon tire. Temporarily shifting the pack load while hiking gives significant physical relief to the pack wearer, and can enable a hiker to cover substantially greater distances before his shoulders "give out."

**BRIEF SUMMARY OF THE INVENTION**

This invention provides a pack frame having a novel means for shifting a portion of the pack load from the wearer's shoulders to his arms comprising handles extending forwardly from the bottom of the pack frame laterally adjacent the wearer's hips. The handles are thus positioned to be easily gripped by the pack wearer to allow a portion of the weight of the pack to be lifted from the wearer's shoulders. A pack frame wherein the forwardly extending handles are molded integrally with the pack frame is disclosed, as are a plurality of handles and handle support arms mountable in a variety of ways on packs of varying configurations. A laterally rotatably mounted handle is disclosed to allow the handle to be pointed rearwardly to prevent underbrush from snagging thereon when hiking through extremely rough country. Further a vertically pivotal handle is disclosed having an outwardly flanged platform on its end which may act as a ground support for the pack when the handle is pivoted out of its lifting position.

It is an object of the present invention, therefore, to provide an improved backpack frame having handles which are easily grippable by the pack wearer to lift the pack to shift weight from the wearer's shoulders while hiking.

Another object of the instant invention is to provide a pack frame having removable handles mounted on its lower portion.

One more object of the instant invention is to provide a pack frame having handles which are horizontally rotatable with respect thereto.

Another object of the present invention is to provide a pack frame having forwardly extending pack frame lifting arms which are relatively movable with respect to the pack frame.

Still another object is to provide a pack frame having a pivotally mounted handle including an end mounted flange useful to support the backpack on the ground when it is not being worn.

One more object is to provide handles for a conventional backpack frame mountable thereon by insertion within the hollow main vertical support bars of the pack frame.

An additional object is to provide a handle which may be quickly and easily fastened to the bottom portions of a wide variety of pack frame designs.

Other and additional objects will be apparent from the following description taken in conjunction with the accompanying drawings.

**BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is a perspective view of a typical pack frame made according to the instant invention including inte-

gral handles extending forwardly from the lower portion of the pack frame, the pack frame also including a belt and a pair of shoulder straps.

FIG. 2 is a perspective view of a typical handle made according to the teachings of the instant invention mounted on the bottom portion of one form of conventional pack frame.

FIG. 3 is a perspective view of another typical backpack handle made according to the instant invention, the handle being shown in dashed line pivoted vertically to act as a support for the pack when placed on the ground.

FIG. 4 is a partial perspective view of another typical form of packback handles made according to the instant invention including a section view showing an L-shaped handle arm inserted within a hollow pack frame structural member.

FIG. 5 is another typical backpack handle unit made according to the instant invention, said unit being similar to the handles of FIG. 4 but including a rearwardly extending curved bar suitable for mounting a bedroll or the like.

FIG. 6 is a partial perspective view of a backpack frame including a typical rotatable handle made according to the instant invention mounted on the bottom portion thereof, the handle being shown in its rotated position in dashed line.

FIG. 7 is a side elevation view of still another typical embodiment of the instant invention including a pack frame support arm and handle which is adjustably mounted for vertical movement on the lower portion of a pack frame.

FIG. 8 is a perspective view of another typical embodiment of the instant invention wherein a pair of handles are removably mounted on the bottom portion of a pack frame having an integral rearwardly extending bedroll support.

#### DETAILED DESCRIPTION OF THE INVENTION

Referring initially to FIG. 1, a backpack frame 10 is disclosed comprising a pair of vertical main support bars 12 and 14 interconnected by transverse support rods 16 which are in turn interconnected between the support bars 12 and 14 by means of bowed vertical support rods 18. Resilient cushions 20 and 22 are mounted laterally between support bars 12 and 14 while shoulder straps 24 are connected by conventional lock pins 26 or the like between the uppermost transverse support rod 16 and the bottom portions of vertical support bars 12 and 14.

As shown, shoulder straps 24 are padded and are length adjustable to allow the pack to be worn comfortably by persons of different size. It will be understood that pads 20 and 22 are also adjustable up or down on the main vertical support bars 20 and 22 so that the wearer of the pack may select the points on his back which the pack will contact, however, the majority of the weight of the pack is borne on the shoulders of the wearer through pack straps 24.

Also illustrated in FIG. 1 is a waist belt 28 mounted on the lower set of lock pins 26. The handles of the instant invention function somewhat similarly to a waist belt, in that both distribute the weight of the pack between the wearer's shoulders and another portion of the wearer's body, the hips in the case of a waist belt and the hands and arms in the case of the instant invention. Thus it will be understood that a pack frame em-

bodying the instant invention may be used with or without a waist belt as desired by the user.

Referring again to main vertical support bars 12 and 14, it will be seen that the lower portions of these bars are curved forwardly to define support arms 30 and 32 on which handgrips 34 and 36 are mounted. As shown, support arms 30 and 32 are flaired outwardly from each other to provide lateral clearance for the support arms with respect to the hips of the backpack wearer. Support arms 30 and 32 are formed of a length to allow the pack wearer to comfortably grip the handles adjacent to or slightly forward of his hips so that the handles may be easily lifted to raise the entire pack frame and its load off of the wearer's shoulders.

Referring now to FIG. 2, an elongate handle 38 including a handgrip portion 40 disposed on one end and a clamp portion 42 disposed on its opposite end is disclosed mounted on the bottom portion of a conventional pack frame 44. It will be understood that in actual use a pair of like handles are mounted on the laterally spaced main vertical support bars of the pack frame 44 or on some other convenient portion of the pack frame. Handle 38 may be formed in the shape of two mating pieces, the first including handgrip portion 40 and a semicircular portion 46 of the clamp end 42 and the second comprising clamp plate 48 and including a pair of flanged end portions 50 and 52 and a central semicircular portion 54 cooperating with the semicircular portion 46 to form a circular opening adapted to receive one of the main vertical support bars of the backpack frame 44. Conventional fasteners such as nuts and bolts 56 and 58 are mounted in aligned holes in clamp portion 46 and in flanges 50 and 52 to allow the clamp to be tightened onto the pack frame. In one embodiment, a circular gripping pad 60 fabricated of plastic, hard rubber or the like and having a roughened inner surface may be mounted within the jaws of clamp end 42 to provide a non-slip connection for the handle with the backpack frame.

Pairs of handles such as that disclosed in FIG. 2 may be rapidly and easily mounted on either vertical or horizontal structural parts of a pack frame. Circular gripping pads of differing thickness and internal diameter may be employed to mount the handles 38 on different diameter pack frame structural members, although normally the larger diameter pack frame members are better able to withstand the lifting forces transmitted thereto by the handles during use. Additionally, mounting the handles on a vertical rather than horizontal member prevents the handles from rotating on its support during lifting.

Referring now to FIG. 3, an elongate support arm 62 is shown pivotally mounted on pin 64 to the lower end of a main vertical support bar 66 of a conventional backpack frame. Elongate support member 62 includes a semicircular shoulder portion 68 mounted adjacent pivot pin 64 to limit to horizontal the vertically upward pivoting of the elongate support rod with respect to the pack frame such that the horizontal elongate support arm acts as a lifting handle for the pack frame. Again it will be understood that for normal use, pivotal elongate support arms are mounted on the bottom portion of each of the main vertical support bars. Flange 70 is mounted on arm 62 opposite shoulder 68 to provide a platform on which the pack frame may be rested on the ground when the pack has been removed and elongate arm 62 pivoted to the vertical position as shown in

dashed line. The widened flange prevents arm 62 from sinking into the ground when the pack is rested thereon, and further serves as a portion of the handgrip on the arm when pivoted to the horizontal position. In one embodiment of the invention, elongate support arm 62 may be limited to pivot 90° between the horizontal lifting position and the dashed line vertical support position, while in other embodiments, the elongate support arm may be pivoted approximately 180° to allow it to be moved to a position extending rearwardly with respect to the pack frame to reduce the possibility of its becoming entangled with brush or the like during hiking.

FIGS. 4 and 5 disclose two related embodiments of the instant invention mounted within the bottom portions of hollow main vertical support bars 72 and 74 of a conventional backpack frame. In FIG. 4, a pair of separate support arms 76 and 78 curved at right angles along their length are shown disposed within the hollow main vertical support bars and held therein by means of lock pins 26 disposed in aligned holes 82 in the pack frame and in one end of the support arms 76 and 78. Handgrip portions 84 and 86 are mounted on the opposite ends of support arms 76 and 78. It will be understood that holes 82 are often provided in conventional pack frames to serve as mounting points for the bottom ends of the shoulder straps or for pinning the pack bag to the pack frame and thus the support arms 76 and 78 may be rapidly mounted on the pack frame by merely removing the end plugs, such as caps 88 shown in FIG. 1, from the bottom ends of the main vertical support bars, sliding the support arms therein and removing and reinserting lock pins 26 through the holes provided in the elongate support arms. Although not illustrated, it will be understood that differently sized holes may be vertically spaced on the upwardly extending portion of the curved support arms both to allow the vertical position of the handgrip portions 84 and 86 to be varied, as well as to allow the support handles to be mounted on pack frames using varying sized strap fasteners.

Referring now to FIG. 5, a substantially U-shaped handle 90 having handgrip portions 92 and 94 mounted on its opposite ends and including a pair of upstanding fingers 96 and 98 insertable within the hollow end portions of main vertical support bars 72 and 74 and pinned therein by means of conventional fasteners 26 extending through aligned holes 82 is disclosed. The central portion 100 of U-shaped handle 90 extends rearwardly with respect to the pack frame to provide an additional mounting platform for a bedroll or the like below the pack bag mounted on the pack frame as well as adding structural rigidity to the handle structure such that a lifting force on one of the handgrips is transmitted through handle portion 100 to the laterally spaced main vertical support bar of the pack frame.

Referring now to FIG. 6, a handle including support arm 102 curved at a right angle along its length and having a handgrip portion 104 mounted on one end is shown mounted on the bottom of one of the main vertical support bars 106 of a conventional pack frame by means of chuck 108. Again it will be understood that pairs of the illustrated handle units are mounted on a pack frame for actual use. As illustrated, main vertical support bar 106 includes a bottom flange 110 adapted to mate with a similarly sized flange 112 mounted on the end of curved support arm 102. Chuck 108 includes a fixed collar 114 mounted above flange 110

and a fixed collar 116 mounted below flange 112. Collar 116 further includes a slidably rotatable ring 118 mounted thereon. Rotatable ring 118 includes a threaded portion 120 adapted to mate with cooperating threads on collar 114 to allow flanges 110 and 112 to be clamped together to prevent undesired rotation of the curved support arm 102 with respect to the pack frame. Thus, while the handgrip 104 would normally be oriented to extend forwardly with respect to the pack frame as shown in full line, the unthreading of ring 118 from collar 114 loosens the chuck 108 and allows the support arm 102 to be rotated, such as to the dashed line position shown, to move the support arm from adjacent the hips of the wearer. Further, it will be seen that completely unthreading ring 118 from collar 114 allows the support arm 102 to be completely removed from the pack frame.

FIG. 7 discloses a curved pack frame support arm 122 mounted for vertical movement on an S-curved main vertical support bar 124 of one form of conventional pack frame. Curved support arm 122 includes handgrip portion 126 mounted on one end, while its distal end 128 is contoured to the curved surface of the main vertical support bar 124 and is held thereagainst by means of releasable ring clamp 130. Clamp 130 includes a split ring the ends of which are tied together by means of a conventional nut and bolt fastener 132, such that tightening the fasteners against each other draws the ring clamp tight. It will be understood that loosening the clamp 130 allows the curved support arm 122 to be moved vertically on the main vertical support bar 124, such as to dotted line position 134, for example, to allow the handgrips 126 to be positioned for comfortable use by packers of varying size and arm length. Support arm 122 includes a relatively long vertical portion which allows the arm to be clamped to the relatively straight central portion of the pack bar 124 rather than to the curved bottom of the bar. Thus vertical movement of the curved support arm 122 on the pack bar does not alter the generally horizontal orientation of the handgrips 126.

Finally, referring to FIG. 8, another embodiment of the instant invention is disclosed wherein support arms 136 and 138 are suitably formed for mounting on a known form of pack frame 140 having an integral bedroll support bar 142 extending rearwardly therefrom. In this embodiment, support arms 136 and 138 include handgrip portions 140 and 142 mounted on one end while the opposite end of each support arm is contoured to partially surround the outside diameter of a portion of the pack frame such that it may be firmly connected thereto by means of conventional nut and bolt fasteners 148 and 150 inserted through aligned holes in the pack frame and the support arms 136 and 138. Clamps such as ring clamp 130 illustrated in FIG. 7 might also be used satisfactorily to mount the support arms 136 and 138.

From all of the above, it will be understood that the instant invention may be embodied in a variety of structures to accomplish the principal purpose of providing handle means on the lower portion of a pack frame to allow a packer to lift the pack frame from his shoulders while hiking to temporarily redistribute the weight of the pack between his shoulders and his arms.

The invention may be embodied in other specific forms without departing from the spirit or central characteristics thereof. The present embodiments are there-

fore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore to be embraced therein.

What is claimed is:

1. In a backpack frame of the type having a pair of generally vertical main support bars each having upper and lower ends and being interconnected by transverse rods, said frame having an upper mounting means for fastening one end of a pair of shoulder straps, said straps extending forwardly from said frame to mount the frame on the back of a wearer and a mounting means secured to said lower ends of said main support bars, for mounting a lower, body engaging flexible support means, the improvement comprising a pair of handles extending forwardly and outwardly from said lower ends of said vertical main support bars adjacent the hips of the wearer, said handles extending forwardly of the point of connection of said lower body engaging support means to said lower end portions of each of said main support bars and being rigidly connected to said main support bars, said handles functioning structurally only as handles, whereby said handles are accessible to and may be gripped by the wearer and raised to lift the pack upwardly off the wearer's shoulders to temporarily redistribute the pack load.

2. The backpack frame of claim 1 wherein each of said handles include a generally L-shaped arm including releasable clamp means mounted on one end thereof to clamp one of said vertical main support bars, and a handgrip portion mounted on the end of said arm distal from said clamp means.

3. The backpack frame of claim 2 wherein said releasable clamp means is vertically adjustable on said vertical main support bar to allow said hand grip portions to be raised or lowered to be comfortably gripped by wearers of varying size.

4. A backpack frame comprising a pair of laterally spaced generally vertical, main support bars interconnected transversely by support rods; a pair of shoulder straps mounted between the top and bottom portions of said frame and extending forwardly from said frame to hold said frame on the back of a wearer; a body engaging support means on said main support bars; and elongate rigid handle means mounted on said vertical main support bars near the bottom portions thereof and extending forwardly therefrom laterally adjacent the hips of the wearer, at least a portion of said elongate handle means extending forwardly beyond said body engaging support means, said main vertical support bars include threaded collar means mounted externally on the lower portions thereof, and wherein said handle means comprise generally L-shaped arms having handgrip portions on one end and chuck portions on their opposite ends, said chuck portions including collars fixedly mounted on said handle means and ring portions rotatably mounted thereon, said ring portions including threaded portions mateable with said threaded collar means to adjustably mount said L-shaped arms on said main vertical support bars.

5. The backpack of claim 1 wherein said handles each comprise an elongate rod having a handgrip portion on one end and a clamp portion on its opposite end, said clamp portion including a circular collar adapted to surround and grip one of said vertical main

support bars, said collar including a first semicircular portion integral with said elongate rod and partially surrounding one of said vertical main support bars and a second separate semicircular portion adapted to mate with and be releasably connected to said first semicircular portion to surround and grip said vertical main support bar.

6. The backpack frame of claim 5 including a gripping pad mounted on said vertical main support bar beneath said clamp portion, said gripping pad including a roughened inner surface providing a non-slip connection between said clamp portion and said vertical main support bar.

7. The backpack frame of claim 4 wherein said L-shaped arms are rotatable on said threaded chuck connections to move between a forwardly extending lifting position laterally adjacent the wearer's hips and a rearwardly extending storage position.

8. The apparatus of claim 1 wherein said vertical main support bars are hollow and said handles further comprise a pair of curved arms having one end sized to slide within the bottom portions of said vertical main support bars and be held therein, the opposite end of said curved arms including handgrip portions, said handgrip ends of said curved arms extending forwardly from said pack frame to a position where they may be conveniently gripped and lifted by the wearer of the pack.

9. The backpack frame of claim 8 including a pair of aligned holes in the lower portions of said main vertical support bars and a pair of holes adjacent the ends of said curved arms insertable in said main vertical support bars and alignable with the pair of holes therein, and pin means insertable through said aligned holes to hold said L-shaped arms therein.

10. The backpack frame of claim 8 wherein said pair of curved arms include a rearwardly curved transverse bar extending therebetween providing a mount for a bedroll or the like on said backpack frame.

11. In a backpack frame comprising a pair of upright main frame elements interconnected by transverse members, a plurality of body engaging support means, each of said support means connected to said frame at mounting locations on said frame, said plurality of body engaging support means including a pair of shoulder straps each secured between mounting locations at the top and bottom portions of the frame and extending forwardly therefrom to hold the frame on the back of a wearer, the improvement comprising: a pair of handles mounted rigidly upon said frame near its bottom portion and extending forwardly therefrom beyond the forwardmost of said mounting locations laterally adjacent but spaced outwardly from the hips of the wearer, whereby those portions of said handles extending forwardly of said forwardmost mounting locations are readily accessible to be grasped and lifted by the wearer to temporarily redistribute the pack load.

12. The backpack frame of claim 11 wherein said handle means comprise an elongate arm having a handgrip portion on one end and a connection means on its opposite end, said connection means including a contoured portion on said elongate arm partially surrounding a portion of said U-shaped main support bar and fastener means clamping said contoured portion of said arm against said U-shaped main support bar.

13. The apparatus of claim 1 wherein said body engaging support means comprises a resilient cushion mounted laterally between said support bars.

14. The apparatus of claim 1 wherein said body engaging support means comprises a waist encircling belt mounting means adapted to receive a waist encircling belt.

15. The apparatus of claim 4 wherein said body engaging support means comprises a resilient cushion mounted laterally between said support bars.

16. The apparatus of claim 4 wherein said body en-

gaging support means comprises a waist encircling belt mounting means adapted to receive a waist encircling belt.

17. The apparatus of claim 11 wherein said body engaging support means comprises a resilient cushion mounted laterally between said support bars.

18. The apparatus of claim 11 wherein said body engaging support means comprises a waist encircling belt mounting means adapted to receive a waist encircling belt.

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