

[54] **BACK PACK AND FRAME**
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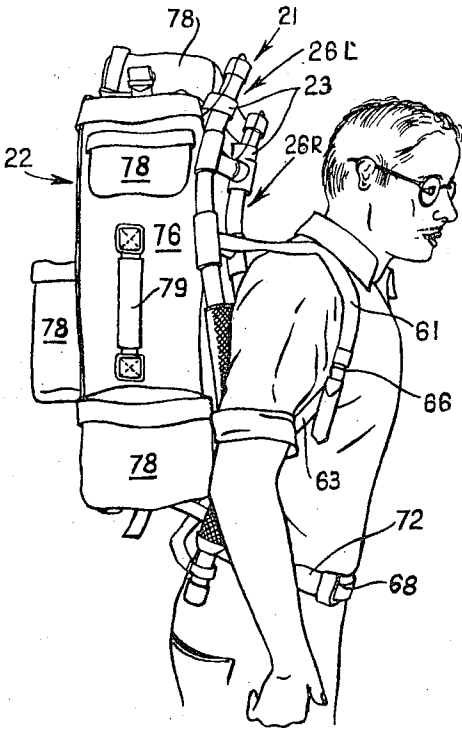
[52] **U.S. Cl.** **224/8 R, 224/25 A**
[51] **Int. Cl.** **A45f 3/08**
[58] **Field of Search** **224/25 A, 8 R, 8 A;**
24/129 R, 129 B, 129 D, 123 D, 128

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[57] **ABSTRACT**

Back pack frame is made of sections of tubing and tees to form sides and transverse connectors of a light-weight frame to which a pack is attached and which may be strapped to the back. At least some of the joints of the tubing sections and tees are detachable so that the frame may be disassembled. The pack has a pocket which may be opened for storage of the frame parts. The pack may be used for attachment to the frame, or may be lifted by a permanent handle on one side like a suitcase, or may be slung over the shoulder using as a sling the hip surrounding belt of the frame.

4 Claims, 13 Drawing Figures



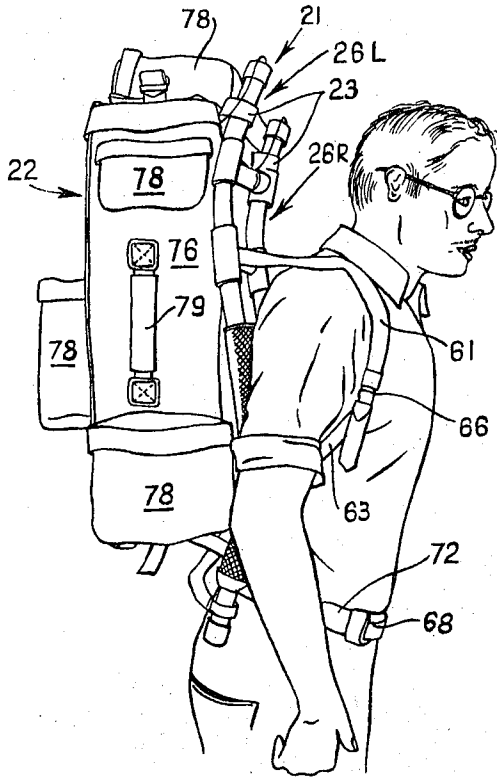


FIG. 1

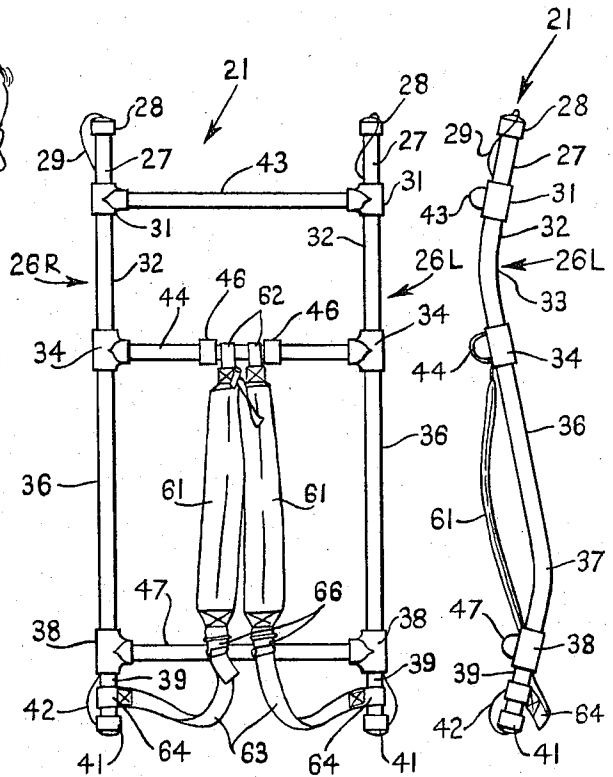


FIG. 2

FIG. 2A

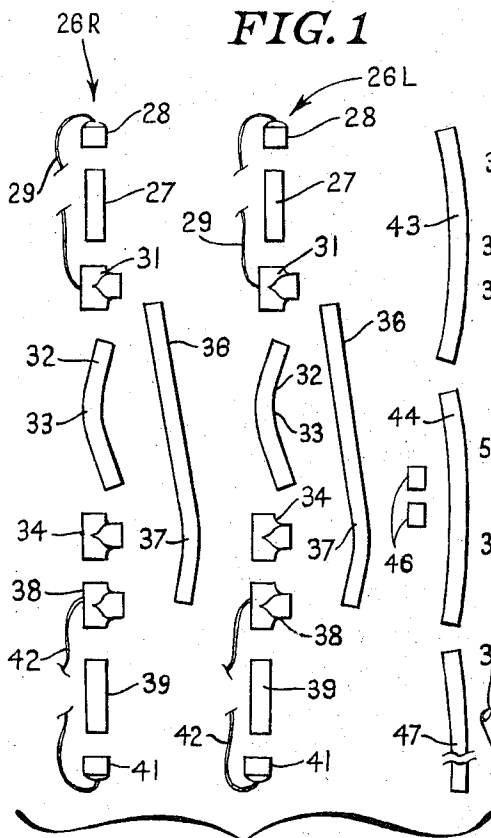


FIG. 3

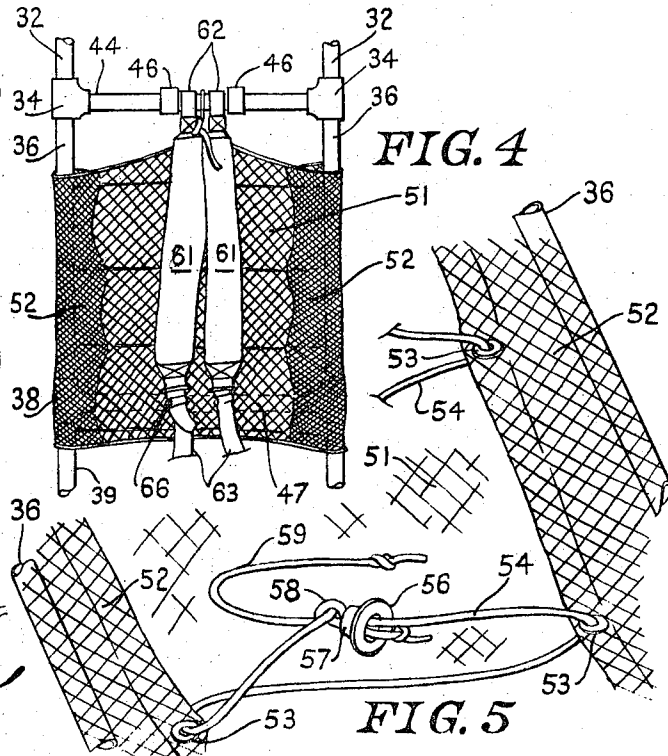


FIG. 4

FIG. 5

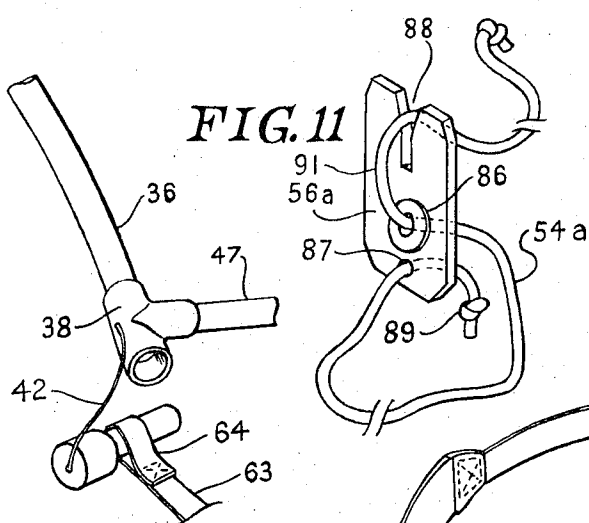


FIG. 11

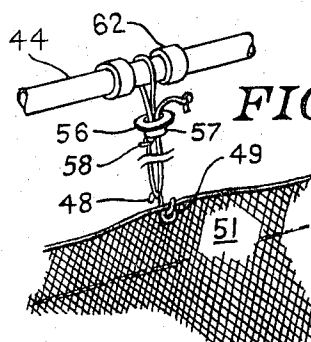


FIG. 12

FIG. 6

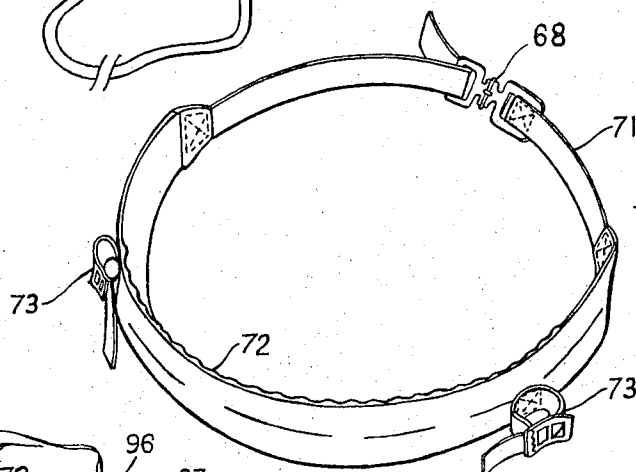


FIG. 7

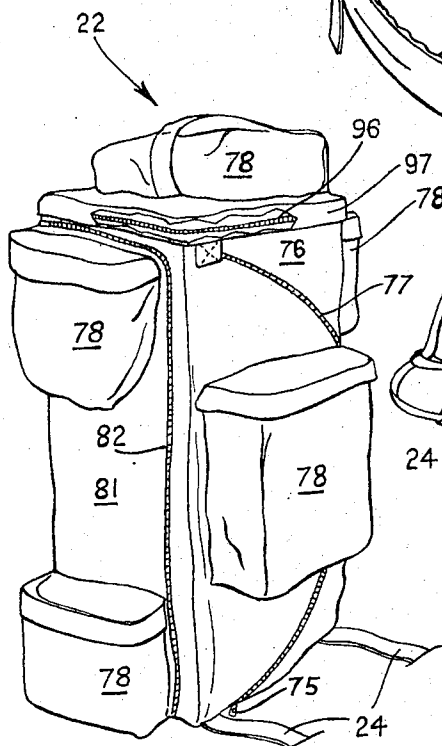


FIG. 8

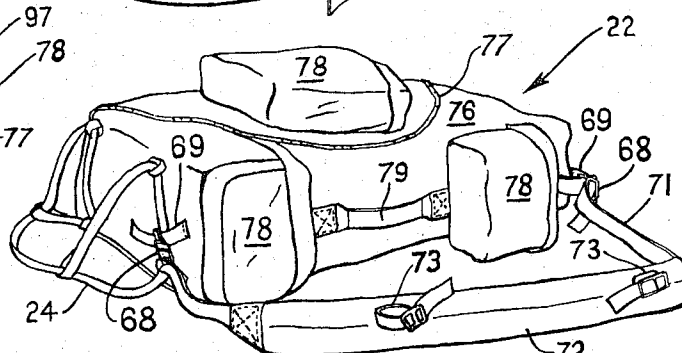


FIG. 9

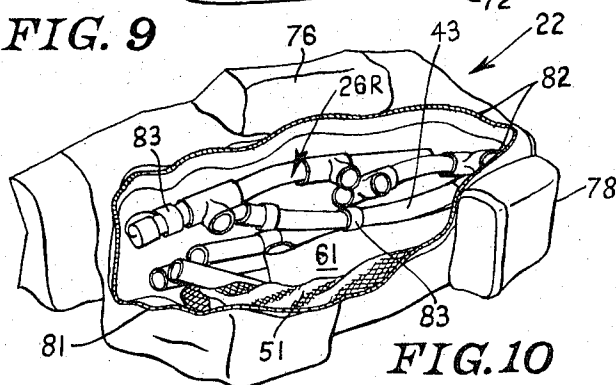


FIG. 10

BACK PACK AND FRAME

This invention relates to a new and improved back pack and frame therefor. A principal feature and advantage of the invention is the fact that the frame is formed of lightweight materials particularly sections of tubing and tees which can be taken apart when the frame for the pack is not being used. The pack itself is preferably formed with a compartment in which the parts of the frame may be stored. Hence the pack may be used as a suitcase when shipped by common carrier or when carried on the streets or in hotels.

Another principal feature of the invention is the fact that the pack may be carried in several ways. Among these ways are the primary method where the pack is supported by the frame which is carried on the back of the user, but the pack may also be carried like a suitcase from a handle provided on the side of the pack. Alternatively, a sling may be constructed of the padded belt which is used with the pack frame, the belt being unbuckled and attached to opposite ends of the pack for sling support.

Other features of the pack are that it is multi-pocketed so that a number of different items may be stored in selected location where they are readily located when required without the necessity of rummaging through an entire single compartment pack. The various pouches on the sides and back of the pack are readily accessible.

Another feature of the pack is the use of a semi-circular zipper which closes the front and provides easy and convenient access to the interior. For this purpose, the zipper opens from the bottom to top, giving access to the bottom and there is a separate opening for access to the top. The arcuate shape of the closure makes it easier to operate since there are no corners which are difficult for a slide out fastener to traverse.

Among the features of the pack frame are its extreme light weight and its comfortable conformation. Since the frame sections are formed of tubing which fit into the ends of the tees, they may be shortened to adjust the frame to the dimensions of the back of the user merely by cutting sections of tubing. Further, if the frame is of a material such as a thermoplastic, when the tubing is heated, it can be bent which further conforms the shape of the frame to the wearer.

Another feature of the pack is the use of netting such as nylon seines (primarily used for fishing nets) which is tightened around the sides of the frame in the region which engages the back so that the netting is next to the back of the wearer and the weight of the pack is distributed up and down the back more comfortably than in other pack frames. The netting is comfortable since it permits air circulation to the wearer's back. Further, the netting has an additional function of applying tension to the sides of the frame so that they are not unintentionally disassembled.

Another feature of the invention is the fact that the netting is held on the frame by ties which are adjustable in length and, therefore, adjust the tension of the netting which is a further comfort feature.

Another feature of the invention is the use of a specially constructed tension device for the tension tie which enables each tie to be adjusted in length very rapidly and further permits intentional loosening of the ties but does not permit unintentional loosening.

Another advantage of the invention is the use of a padded hip engaging belt which may be rapidly attached to the back frame but which may be detached, unbuckled and used as a sling as heretofore explained. The padding which is useful when the belt is around the hips is further useful when the belt is slung over the shoulders.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawings:

FIG. 1 is a side elevational view showing the pack mounted on the pack frame and the pack frame on the shoulder of the user.

FIG. 2 is a front elevational view of the frame with the pack removed.

FIG. 2A is a side elevational view of the structure of FIG. 2.

FIG. 3 is an exploded view showing the various portions of the frame disassembled.

FIG. 4 is a fragmentary elevational view of a portion of FIG. 2 showing netting applied to the frame.

FIG. 5 is a fragmentary perspective view in enlarged scale showing a portion of the netting and the tie for tightening the same.

FIG. 6 is an exploded perspective view of a portion of the lower left corner of the frame.

FIG. 7 is a perspective view showing the hip pad off the frame.

FIG. 8 is a perspective view showing the back, top and one side of the pack.

FIG. 9 is a perspective view showing the back, one side and bottom of the pack and also showing the hip pad attached thereto as a sling.

FIG. 10 is an enlarged fragmentary perspective view showing a side pocket of the pack opened and showing the parts of the frame disassembled and stored in the pocket.

FIG. 11 is a perspective view of a modified cord tightener and associated structure.

FIG. 12 is a perspective view of a portion of the structure of FIG. 4.

The present invention provides a pack frame 21 which is carried on the back of the user as is shown in FIG. 1 to which is attached a pack 22 of canvas or other construction by means of top loops 23. The pack 22 may be rapidly and conveniently installed and removed from the frame 21, and the frame 21 may be rapidly and conveniently strapped to the back of the user and is extremely comfortable when thus strapped. As shown in FIG. 1, the pack frame 21 is high on the shoulders and supports the pack 22 almost vertical with the weight of the pack distributed to the legs by means of hip belt 71, an extremely comfortable means of supporting the weight of the contents of the pack. As further explained in detail, the frame 21 may be disassembled and its parts stored inside the pack 22. When thus used, the pack 22 may be carried as a suitcase or it may be slung over the shoulders.

Preferably, the frame of the pack 21 is made up of sections of tubing and fittings such as tees. A preferred material is the polyvinyl chloride high impact tubing used for underground garden sprinkler systems. Such tubing is inexpensive, is easily cut in length and may be bent into various shapes by heating and forming the

tubing. One of the features of the invention is the fact that the frame 21 may be adjusted to fit the user. Such adjustment may be performed by shortening the various sections of tubing or by bending or unbending some of the sections.

The frame has two substantially vertical sides 26R, 26L, each of which is substantially identical. On each side there is a top extension 27 of tubing, the upper end of which is closed by a top cap 28 which fits over the end thereof and is secured against loss by a retainer loop 29 which is permanently connected to one of the other portions of the side. The cap 28 is removed when the strap 23 is slipped over the end of extension 27. When the cap 28 is replaced, the strap 23 cannot be unintentionally removed from the frame 21. Below extension 27 is upper tee 31 which receives the lower end of extension 27 and which is connected to the second side member 32 which preferably is formed with a bend 33 (see FIG. 2A) which causes the upper end of the frame 21 to slant upwardly-forwardly for better weight distribution. The lower end of member 32 is received in the second tee 34 which is located at about the level of the shoulders of the wearer. Below tee 34 is a long member 36 which is preferably formed with a bend 37 near its lower end which curves in a direction opposite bend 33. The bend 37 is about at the small of the back of the wearer. Its lower end is about at hip level. Third, or bottom tee 38, is attached to the lower end of member 36 and there is a bottom extension 39 extending from tee 38 which has a bottom cap 41 held against unintentional loss by retainer 42 which is permanently fastened to the tee 38.

There are three transverse members which interconnect the sides 26L, 26R, all of approximately equal length and all curved forwardly concave to accommodate the back of the wearer. The uppermost member 43 interconnects the tees 31. The intermediate transverse member 44 interconnects the tees 34 and preferably has near its middle two spaced sleeves 46 which are cemented thereto and provide a gap between them for attachment of straps 61 as hereinafter appears. The lowermost transverse member 47 interconnects the tees 38.

Each of the transverse members 43, 44, 47 is detachable from both of the tees into which its ends fit. Furthermore, the long members 36 are preferably detachable from the tees 34. However, all of the members may be made detachable. Where no detachment is required, the ends of the tubing may be cemented into the openings in the tees in the same manner that sections of sprinkler pipe are cemented to pipe fittings.

The demounting arrangement described and illustrated in FIG. 10 makes the frame into detachable segments which are conveniently handled and stored.

To hold the sides 26R, 26L in engagement with the transverse members 44, 47 netting 51 which is preferably a nylon seine may be used. The side edges of the netting 51 pass around the outsides of the tubing sections 36 and are formed with overlaps 52. The inner edges of the overlaps 52 are provided at vertically spaced intervals with grommets 53. Cords 54 are used to pull opposed grommets 53 toward each other with the desired degree of tension and preferably there is a cord 54 for each pair of grommets 53 so that tension may be adjusted differently at different portions of the netting 51. As best shown in FIG. 5, to adjust the tension on cord 54 a special fitting is used consisting of a

ring 56 and an integral nipple 57. One end of cord 54 is formed in a loop 58 which fits through the ring 56 and nipple 57 and out the end thereof. The opposite end 59 of cord 54 passes through the loop 58. By pulling the end 59 so that the cord 54 is tight between the grommets 53, and because of the tension of the netting 51, the cord 54 tends to draw itself tight and tends to pull loop 58 inwardly of the nipple 57 thereby tightly crimping the end 59. The loosening of the cord 54 is accomplished by reversal of the operation. The tension on the netting 51 draws the members 36 toward each other and thus prevents the transverse members 44, 47 from slipping out of the ends of the tees 34, 38. Also, the netting 51 engages the back of the wearer as is partially shown in FIG. 1, and distributes the load all over the portion of the back of the wearer which it engages. This is a very comfortable means of suspending the frame 21 from the back.

An alternate tension device is illustrated in FIG. 11. A flat, thin member 56a of metal or plastic, preferably rectangular, has a central hole provided in the grommet 86. Near one end is a hole 87 and the opposite end has a slot 88. One end of cord 54a is formed with knot 89 which prevents the cord from being pulled through hole 87. The cord 54a is threaded through grommets 53 in netting 51 as in FIG. 5. To draw the cord 54a tight, a loop 91 therein passes through grommet 86 and the free end of the cord passes through loop 91 and is secured in slot 88. Rapid and easy adjustment of the effective cord length is thus possible.

FIG. 12 shows one means for holding the top edge of netting 51 in proximity to intermediate transverse member 44. A piece of cord 45 passes around member 44 and its length is adjustable by tightener 56 or other means. Utility hook 48 on cord 45 hooks into grommet 49 on the top edge of netting 51.

There are two shoulder pads 61 each having an upper loop 62 which passes around transverse members 44 between the sleeves 46. The sleeves 46 prevent the loop 62 from spreading outwardly and it is found that this method of holding the pads 61 relative to the frame 21 is particularly comfortable. Pads 61 are attached to webs 63 formed at their lower ends with lower loops 64 which pass around lower extensions 39. There are buckles 66 connecting the pads 61 to the web 63 in an adjustable manner, said buckles 66 being normally located at about the arm pits of the wearer as best shown in FIG. 1. The shoulder pads 61 hold the pack frame 21 upright but are not intended to support a major portion of the weight of the pack. The major portion of the weight is applied by netting 51 to the back and to the hips by the hip belt 71. The web 63 passing around the extensions 39 required when the netting 51 be in firm contact with the back of the wearer.

A hip-belt 71 which is provided with a pad 72 fits around the waist of the wearer. Belt 71 holds the bottom of the frame 21 in vertical position and also distributes most of the weight on and around the hips and legs and relieves most of the weight from the shoulders. The belt 71 is formed with a pair of loops 73 which fit around the bottom extensions 39, these loops being provided with buckles for adjustment. There is also a buckle 68 at the front of belt 71 for adjustment to the size of the waist of the user. As best shown in FIG. 9, the buckle 68 may be opened and its parts used to buckle the ends of belt 71 to the tabs 69 sewn to pack 22. The pads 72 then can be fitted over the shoulder of

the wearer and the pack 22 suspended from a sling provided by the belt 71. This is a second means of wearing the pack 22.

Turning now to the details of the pack 22, this pack is, of course, subject to wide variation. There is, preferably, a main compartment 76 which is rectangular. In a preferred form of the invention, access to the main compartment 76 is obtained through a slide fastener 77 on the back of the pack which is preferably curved. This shape prevents the slide fastener from jamming and also prevents all of the contents of the main compartment 76 from falling out as soon as the fastener is opened. The slide 75 for fastener 77 preferably opens from the bottom, giving access to the bottom without fully opening the zipper and disturbing the other contents of the pack. As an auxiliary means for access to the top of the pack, a horizontal zipper 96 closing three sides of the top edge may be used. A flap 97 covers the zipper 96. A plurality of individually accessible pouches 78 is distributed at various locations on the top, back and sides of the main compartment to hold various cooking utensils and items of clothing and toilet. As a third means of carrying the pack, there is preferably a suitcase style handle 79 on one side which may be gripped in the hand.

As has heretofore been explained, one of the features of the frame 21 is its demountability. Preferably, there is a pocket 81 on one of the sides or other position of the pack to which access is obtained by slide fastener 82. Within side pocket 81 are straps 83 through which the ends of the various sections of the demounted frame 21 may be slipped for storage. The side pocket 81 is preferably large enough to accommodate the netting 51 and the hip-belt 71 when not used as a sling.

Pack frame 21 is readily assembled and disassembled. The various elements which fasten the frame 21 to the wearer are conveniently attached and detached and adjusted. Thus the netting 51 may be slipped over the assembled frame 21 by first loosening the various cords 54 by pulling the rings 56 away from the loops 58 and slipping the end 59 relative to the loop 58. The overlapped ends 52 may be slipped over the sides of the assembled frame 21. When the ends 59 are drawn tight, the netting 51 is tensed, which biases the sides 26 toward each other and prevents the transverse members 43, 44, 47 from slipping out of their respective places. After the frame 21 is assembled, the caps 28 and 41 are removed permitting the loops 23, 64 and 73 to be attached. Thereupon, the caps 28, 41 are replaced holding the pack on the frame 21. With the buckle 68 opened, the shoulder pads 61 are slipped over the shoulder and thereupon the ends of the belt 71 are drawn around the waist of the wearer and the buckle 68 fastened. Thereby, the frame 21 and pack 22 are comfortably supported on the back of the wearer. Adjustment can routinely be made by the buckles 66, 68 and attachment of the portion of the cord 54. However,

if major adjustment is required, the various sections of tubing may be formed or may be bent after heating to fit the frame to the back of the wearer.

Detachment of the netting 51 permits disassembly of the tubing section; and if desired, they may be stored in the side pocket 81. Thereupon, the pack 22 functions as a suitcase which may be carried by the handle 79 or by the sling formed by the hip-belt 71.

Whether the pack 22 is assembled on the frame 21, or whether it is carried separately, access to its various pouches 78 is convenient and the slide fasteners 77 and 82 provides convenient access to the main compartment 76 or the side pocket 81.

What is claimed is:

1. A back pack frame comprising a first side and a second side each formed of a plurality of polyvinyl chloride tubular members and a plurality of polyvinyl chloride tee fittings receiving opposite ends of said tubular members, each said side having an upward and a downward extension fitting into the uppermost and lowermost of said tee fittings respectively, said extensions adapted to receive loops on the top and bottom of a pack supported by said frame to hold said pack and frame assembled, at least two transverse tubular members, each said transverse member having one of its ends received in an opening of a tee fitting of said first side and its opposite end received in an opening of a tee fitting of said second side, stretchable netting extending across said transverse members around said sides and cord through holes in margins of said netting drawing edges of said netting inward to draw said sides toward each other, said netting and friction of the ends of said transverse members in said tees being the sole means of holding said transverse members and said sides assembled, said tubular members being bent to fit the back of the wearer of said frame and being bendable when heated to adjust the fit of said members to the wearer's back.

2. A frame according to claim 1 which further comprises fittings for said cords each having a nipple and an enlarged ring, a loop of said cord extending through said fitting and an end of said cord passing through said loop for convenient adjustment of the effective length of said cord.

3. A frame according to claim 1 which farther comprises fittings for said cords each having a thin body formed with three openings, one end of said cord fixed to one said opening, a loop of said cord adjacent the opposite end thereof passing through the second said opening, said opposite end passing through said loop and being detachably secured in the third said opening.

4. The frame of claim 1 in combination with a pack having a pocket wherein all the elements of said frame may be disassembled and fitted within said pocket and a closure for said pocket.

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