Jan. 14, 1969 M. S. HANSSON 3,421,670

DEVICE FOR CARRYING A CHILD ON THE BACK

Filed Dec. 15, 1966 Sheet 1 of 3

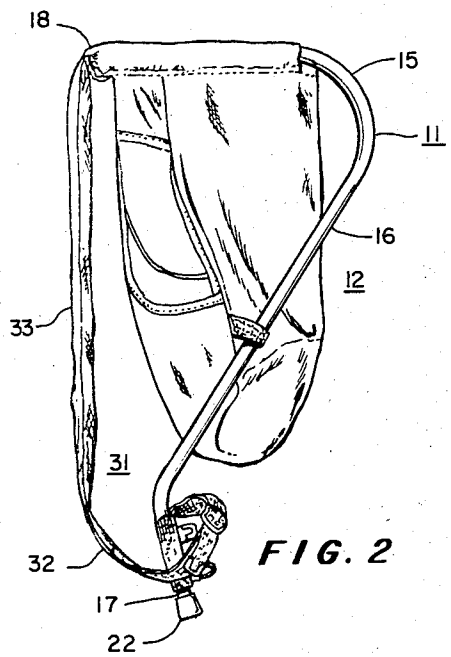


FIG. 2

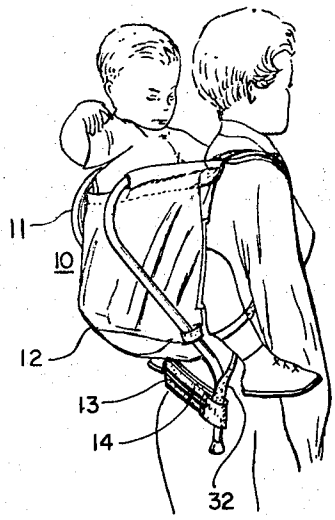


FIG. 1

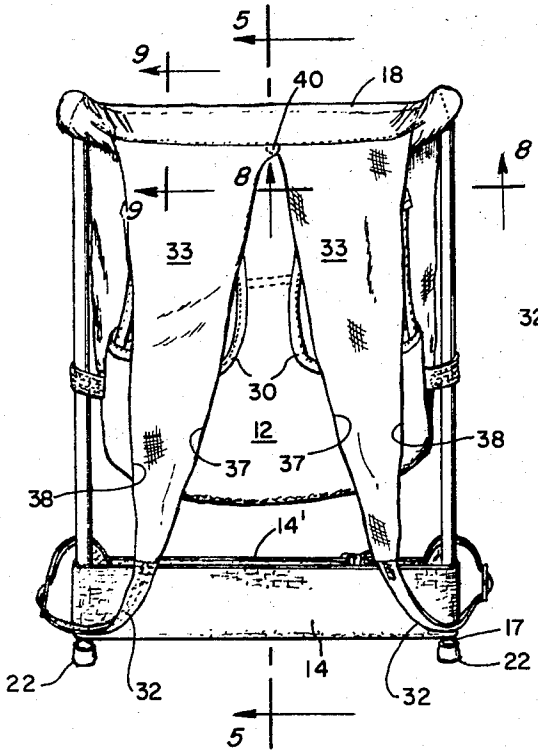


FIG. 3

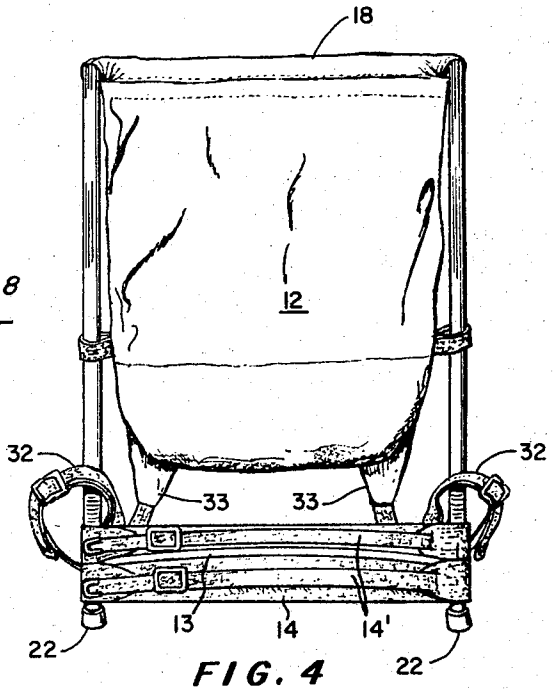


FIG. 4

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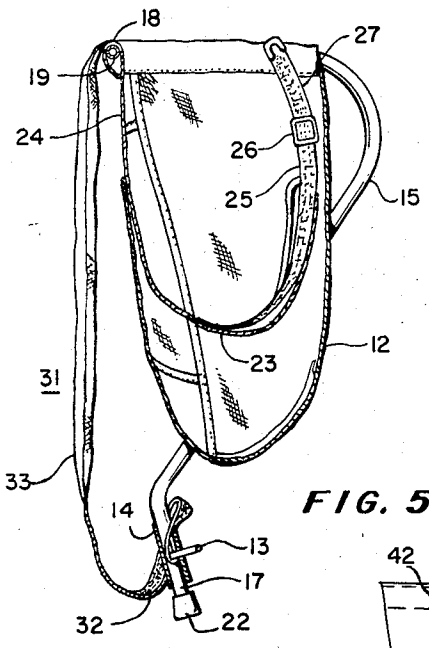


FIG. 5

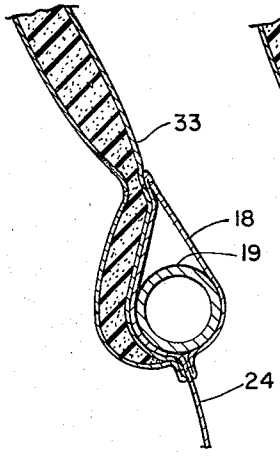


FIG. 10

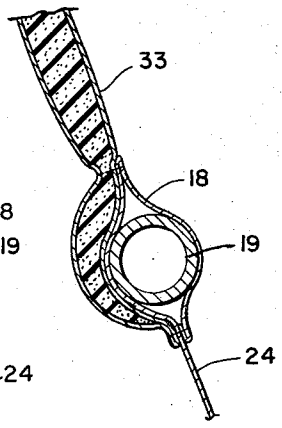


FIG. 9

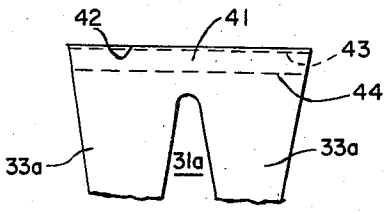


FIG. 11

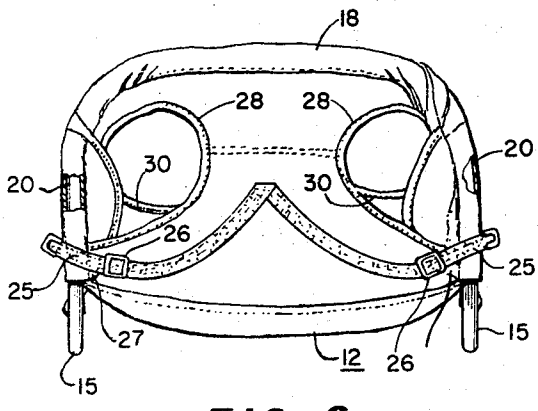


FIG. 6

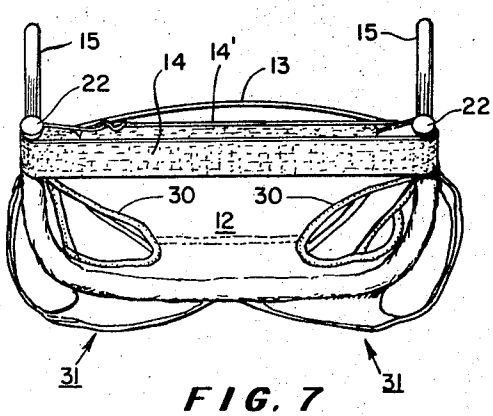


FIG. 7

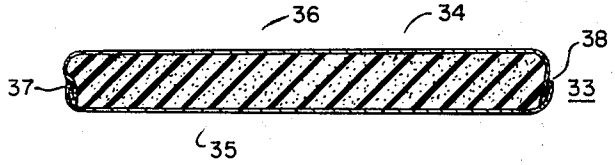


FIG. 8

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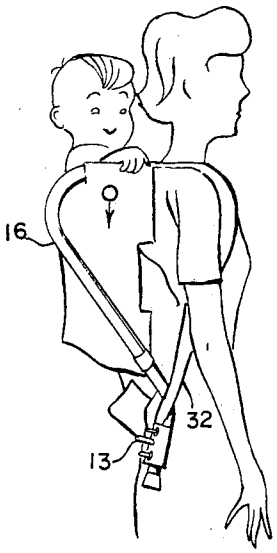


FIG. 12

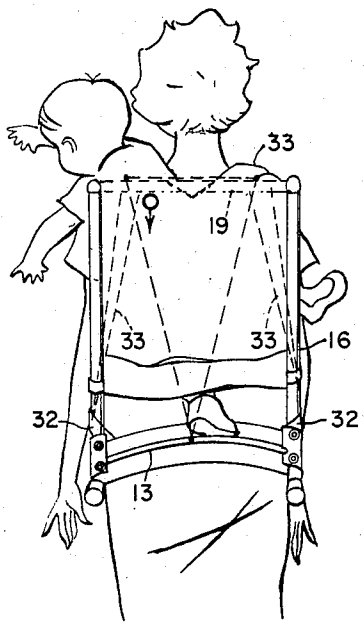


FIG. 14

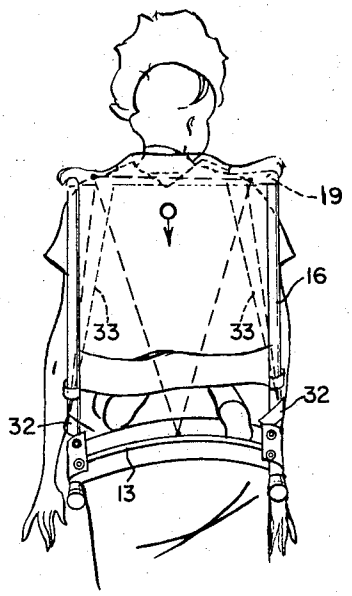


FIG. 13

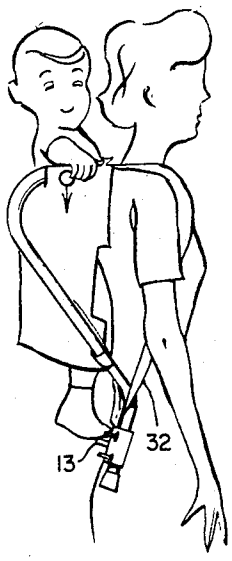


FIG. 15

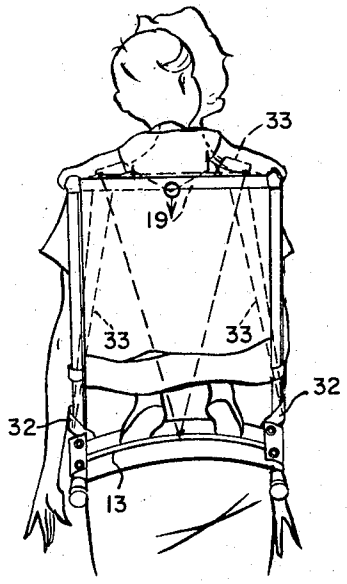


FIG. 16

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Patented Jan. 14, 1969

3,421,670

DEVICE FOR CARRYING A CHILD ON THE BACK

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Filed Dec. 15, 1966, Ser. No. 602,070

U.S. Cl. 224—6 6 Claims

Int. Cl. A47d 13/02

ABSTRACT OF THE DISCLOSURE

An equipment for carrying a child on a person's back comprising a metal frame having two portions connected by crosspieces and arranged to extend rearwardly from the shoulders of the person and then downwardly and forwardly for engagement with the hips. A fabric seat is slung from the frame. The shoulder supports are of elongated triangular configuration and each has the base of the triangle connected to the fabric seat and to the upper crosspiece. The bases of the triangular supports are wide and each extends about one-half the width of the front upper crosspiece; the shoulder supports are attached to the fabric seat and are attached to the frame by a loose tubular fabric envelope which facilitates the distribution of weight, and the assembly provides greater stability and safety for the child being carried.

The present invention is an improvement on the invention disclosed in Patent No. 3,097,773, issued to Gerald A. Cunningham on July 16, 1963.

Back packs for carrying small children have come into substantial use especially for carrying a child over a terrain not adapted for travel by wheeled carts, carriages and the like. The device of the above identified patent has proved effective for this purpose and is used extensively by men and by women for carrying children during hikes and other walking activities. It is especially desirable when the pack is used by women that it be comfortable for the person using it and that it be as stable as possible to minimize discomfort or difficulty due to the movements of the child being carried. Accordingly it is an object of this invention to provide a child carrying equipment including an improved arrangement for providing greater comfort of the user of the equipment.

It is another object of this invention to provide a child carrying equipment including an improved arrangement for assuring greater stability during the usual movements of the child.

Briefly, in carrying out the objects of this invention in one embodiment thereof, a child carrying equipment generally similar to that of the above identified patent is provided with two relatively wide shoulder supports each having a wide base attached to an upper portion of the carrier frame, and preferably being of elongated triangular configuration; these supports are positioned to lie closely over the shoulders of the user. The shoulder supports are made of light canvas or similar fabric and are connected by a loose tubular envelope of fabric to an upper crossbar on the frame of the carrier. The bases of the triangular supports are connected to the envelope and the adjacent edges of the triangles diverge to provide space for the user's neck. The bases of the triangular supports are wide and carry the load of the carrier uniformly over their length. Greater comfort and safety are provided by this arrangement and these advantages are further increased by employing a flat padding within the shoulder supports which performs the normal function of padding and further facilities the even distribution of weight over the shoulders of the user.

The features of novelty which characterize this invention are pointed out with particularity in the claims annexed to and forming a part of this specification. The invention itself, however, both as to its organization and its characteristics during use, together with further objects and advantages thereof, will be better understood upon reference to the following description taken in connection with the accompanying drawings in which:

FIG. 1 is a perspective view of the carrier of this invention in use;

FIG. 2 is a side elevation view of the carrier in an upright position when not in use;

FIG. 3 is a front view of the carrier of FIG. 2;

FIG. 4 is a rear view of the carrier of FIG. 2;

FIG. 5 is a sectional view taken along the line 5—5 of FIG. 3;

FIG. 6 is a top view of the carrier;

FIG. 7 is a bottom view of the carrier;

FIG. 8 is an enlarged sectional view of the shoulder support of the carrier taken along the line 8—8 of FIG. 3;

FIG. 9 is an enlarged sectional view of the upper portion of the carrier frame taken along the line 5—5 of FIG. 3 illustrating one load carrying position of the carrier;

FIG. 10 is an enlarged view similar to FIG. 9 illustrating another load carrying position of the carrier;

FIG. 11 is a plan view, partly broken away, of a modified form of shoulder support;

FIG. 12 is a somewhat diagrammatic side elevation view of the carrier in use with a child in a seated position;

FIG. 13 is a rear view of the carrier and child of FIG. 12;

FIG. 14 is a rear view similar to FIG. 13 with the child leaning to one side;

FIG. 15 is a side elevation view of the carrier similar to FIG. 13 but with the child in a standing position; and

FIG. 16 is a rear view of the child and carrier shown in FIG. 15.

Referring now to the drawings, FIG. 1 illustrates a woman carrying a child in a carrier **10** embodying the invention. The carrier includes a metal frame **11** of lightweight aluminum alloy or other suitable material and a cover or outer shell **12** constructed of light canvas or other suitable fabric and within which the child is seated in a fabric sling (not visible in this figure). The lower ends of the frame **11** rest against the rear of the hip or pelvic region and a crossbar **13** connects the two ends of the main frame and is covered by a strap **14** of fabric or other material which is stretched between the two ends by straps **14'** and acts as a cushion.

The construction of the carrier is shown in FIGS. 2 to 7, inclusive. The frame **11** of the carrier comprises a single length of tubing bent to provide a substantially horizontal generally rectangular loop at the top connected by curved portions **15** to sloping side members **16** which extend forwardly and downwardly and terminate in straight endpieces **17** constituting the lower supporting ends of the frame. In the drawing the horizontal portion of the frame is substantially covered by the fabric of the carrier which is wrapped loosely about the frame and sewed to provide a tube or envelope **18** in which the frame is loosely held.

As shown in FIG. 6 the horizontal portion of the frame comprises a transverse member **19** positioned to extend across the back of the person using the carrier and connected by bent portions or corners to straight side members **20** which terminate in the loops **15**. As shown in FIG. 7 the crosspiece **13** connecting the lower ends of the carrier frame is bowed outwardly so that the fabric strap or crosspiece **14** extends somewhat like a bowstring

between the two endpieces. The tips of the endpieces **17** are covered by rubber feet **22** which act as bumpers when the frame is resting on the ground or other support. Within the outer shell **12** there is suspended the above mentioned seat or sling indicated at **23** and comprising a piece of fabric which forms the upper front wall portion of the shell **12**, as indicated at **24**, and is provided with two straps **25** comprising the ends of a continuous strap sewed to the fabric of the seat as a reinforcement and extending upwardly across the rear corners of the seat and attached by buckles **26** to loops **27** extending around and in contact with the frame and which are covered by and sewed to the tubular portion **18** of the fabric of the shell; the buckles **26** are attached to the loops **27** and frictionally engage the straps **25**.

The seat or sling **23** is thus suspended at the front from the transverse bar portion **19** of the frame and at the rear from the rearwardly extending arms **20** adjacent their ends near the curved portions **15**. As shown in FIGS. 6 and 7 the sling is shaped to provide openings **28** for the legs of the child in the carrier in a position so that the child faces forward in the manner described in the aforesaid patent. The outer shell or casing **12** is also provided with leg openings which are indicated at **30** and afford free passage of the child's legs. The space below the sling **23** and within the shell **12** is a convenient place for the storage of various items to be carried such as clothes or diapers.

In order to support the carrier from the shoulders of the user, two shoulder supports **31** are provided each comprising a strap **32** which is secured by a loop formed around the crossbar **13** and has its other end sewed or otherwise securely attached to a shoulder support **33** which, as shown in FIG. 3, is flat and of elongated triangular configuration and has its base secured to the transverse portion of the tube formed by the material of the shell and its remote end secured to the strap **32**. Each of the bases is relatively long and extends for a distance along the tubing or frame of about one-half that of the straight portion of the transverse frame member. The wide portions of the members **33** conforms to the shoulders of the user and the load is transferred to the broad base portions of the members uniformly throughout their line of attachment to the carrier; this facilitates the even distribution and application of the load to the shoulders. The triangular configuration of the shoulder supports is particularly well suited for face engagement with the surfaces of the shoulders and further facilitates the even distribution of the load. The flat elongated triangular members **33** comprise envelopes of fabric which may be the same fabric as that of which the shell **12** is made and are filled by a piece of flat packing or padding material, such as foam rubber, as indicated at **34** in FIG. 8. In this figure, the fabric walls of the triangular shoulder supports **33** are indicated at **35** and **36**, these two complementary pieces being sewed together along both sides as indicated at **37** and **38** on the inner and outer sides of the shoulder support appearing on the right-hand side of FIG. 3.

The edges of the bases of the triangular supports **33** adjacent the cross member **19** are formed to provide overlapping tongues indicated at **40** in FIG. 3, these tongues being sewed together as well as to the fabric of the tubular portion **18**. For some applications it is desirable to form the supports **33** in a single integral assembly and this arrangement is indicated in FIG. 11 where corresponding parts have been designated by the same numerals with the suffix letter "*a*." The assembly illustrated in FIG. 11 is formed by cutting two opposing forms from fabric and sewing them together around their edges in a manner similar to each of the supports **33**, the two forms being joined by a cross portion **41** along their bases and providing a long base edge **42**. The portion **41** is arranged to be sewed to the tubular portion **18** along lines indicated by dotted lines **43** and **44**. This unitary construction provides the same advantages as the separate support structures illustrated in the first embodiment and in addition has the advantage of the integral or one-piece construction providing an integrally combined base for the shoulder supports.

The diverging inner sides **37** of the two shoulder supports provide space for the neck of the person using the carrier and further the two shoulder supports are located so that they extend over the shoulders in good and uniform face engagement therewith throughout the contacting area and then downwardly and outwardly along the diverging lines **37**, and it will be noted that the strap portions **32** of the shoulder support assemblies extend from the ends of the padded portions **33** downwardly and outwardly over the lower ends of the portions **16** of the frame and thence inwardly and downwardly to the cross-piece **13** adjacent the end portions **17** of the frame. The lower ends of the shoulder supports are thus maintained spaced apart a distance determined by the width of the frame.

For many persons using the carrier the bar **19** will rest across the shoulders substantially below the line of the neck and the ends of the shoulder pieces **33** will thus extend upwardly from the frame and over the shoulders. FIGS. 9 and 10 have been drawn to represent this upwardly extending position of the shoulder pieces **33** under two conditions during the use of the carrier, the position of FIG. 9 being that when the child is supported entirely on the sling or seat and FIG. 10 representing the condition when the child is standing up, his weight then being supported by the lower ends of the frame. In this latter connection it has been observed that children frequently change position and will place their feet at the outer ends of the bar **13** or between the ends **17** of the frame and the strap portions **32** and will then stand up so that a major portion of their weight is carried directly through the frame to the shoulder support pieces **33** as indicated in FIG. 10.

On the other hand, as shown in FIG. 9, when the child is supported by the sling a substantial weight is transmitted directly through the sling to the fabric, and the tube does not serve to transfer weight to the shoulder pieces. Under this condition of operation substantial weight is transmtited to the frame through the straps **25** which engage the rear end portions of the rearwardly extending arms of the upper horizontal loop of the frame. This weight transmitted to the frame is carried downwardly and is transmitted by the lower end portions **17** to the rear pelvic region of the user. A portion of this weight is, of course, transmitted to the shoulder pieces through the straps **32** but this does not affect the positioning of the frame member **19** within the tubular portion **18** of the fabric.

As shown in FIGS. 9 and 10 the padded portion **33** extends not only to the tubular portion but around this portion to the bottom thereof so that the padding is available between the transverse tube portion **19** and the user. This provides padding for the transverse portion of the frame and further increases the comfort of the user. This construction provides a reinforced fabric member extending transversely of the carrier which is further reinforced and kept from distortion by the pressure of the crossbar **19**.

It will be understood that FIGS. 9 and 10 represent only two positions in a wide range of angular positions of the shoulder supports with respect to the carrier. Thus, in FIG. 1, for example the shoulder supports slope very slightly upwardly toward the shoulders and the supports **33** and the wall portion **24** are not in alinement but lie at an angle of, say, eighty degrees. This is a position when a smaller person is using the carrier. The angle between the wall **24** and supports **33** will vary depending upon the size of the user and upon the height at which he adjusts the carrier on his back. In all the positions the weight will be transmitted primarily through the fabric in the sitting position of the child and from the frame to the fabric in the standing position.

The attaching of the elongated triangular pieces **33** over substantial portions of the width of the transverse member **19** assures even distribution of the load over the cross section of the pieces **33** and facilitates the even distribution of the weight over the shoulders of the user and thereby increases the comfort of the person using the carrier. The distribution of weight over the wide bases of the shoulder supports, whether padded or not, not only provides uniform distribution of the forces over the shoulders of the user but also eliminates any tendency of concentrating forces along the edges and the possibility of a cutting effect which may be experienced with simple straps. This arrangement of the shoulder supports in combination with the characteristics of the frame and seat of the carrier not only provides a comfortable carrier for the user but in addition provides increased stability of the carrier together with increased safety for the child. The person carrying a child in this equipment may stand erect with comfort and ease.

FIGS. 12 through 16 illustrate various positions of the child in the carrier and the manner in which the center of gravity of the child is maintained within a stable area over a wide range of changed positions of the child. In FIG. 12 the child is shown in a sitting position with its center of gravity, indicated by a downward arrow depending from a small circle, located down about one-third of the distance between the top transverse frame and the lower supporting portions **17** of the frame. In this position, as indicated by the arrows about the shoulder pieces, the forces on the shoulder pieces are evenly distributed.

FIG. 13 is a rear view of the child when in the position shown in FIG. 14 and indicates the forces applied to the user through the shoulder straps and through the lower ends of the frame and the belt **14**. A triangle indicated by dotted lines is formed by the end portions of the transverse portion **18** of the frame and the midportion of the crosspiece **13** and represents the area within which the center of gravity of the child may be moved with minimum change in the forces and with substantially uniform stability throughout this area. The relatively constant stability factor makes it easier for the user to carry the child regardless of the movements of th child.

FIG. 14 illustrates a shift of the center of gravity of the child due to its movement to the left, and it will be noted that this shifted position is such that the center of gravity remains within the triangular area defined by the dotted lines.

FIGS. 15 and 16 illustrate a child in a standing position, the center of gravity rising to about the level of the horizontal portion of the frame where it is about level with the upper side of the stability triangle as indicated in FIG. 16. Since this a stable position the child may move between this position and the seated positions with safety and without substantial annoyance to the person using the carrier.

It has been found that the carrier constructed as described above makes it possible to carry a child comfortably for extended periods and over rough terrain with minimum discomfort to the user of the carrier and with increased safety for the child.

While the invention has been described in connection with a specific form of carrier and framework, various other applications and modifications will occur to those skilled in the art. Therefore, it is not desired that the invention be limited to the details of construction illustrated and described and it is intended by the appended claims to cover all modifications which fall within the spirit and scope of the invention.

I claim:

1. A device for supporting a load on a person's back comprising

a carrier for holding the load to be supported,

a reinforcing member on said carrier extending transversely thereof for positioning across and adjacent the person's back near his shoulders, said member having its dimension transversely of the person's back of the order of the width of the person's back,

said carrier including a frame having a rigid transverse member for positioning adjacent the back of the person and extending between the person's shoulders and constituting a portion of said reinforcing member and said frame having two lower end portions secured to said transverse member for positioning below said member in engagement with the person adjacent the rear pelvic region on respective sides thereof,

a pair of wide elongated flexible members attached to said reinforcing member for engagement with the shoulders of the person,

the combined bases of said flexible members being secured to said reinforcing member along said transverse dimension and having a combined length of the order of said transverse dimension,

means for connecting the remote ends of said flexible members to said carrier at points substantially below the line of attachment of said bases to said reinforcing member to form said flexible members into shoulder engaging load carrying loops,

means adjacent the lower portion of said frame for affording direct support for the load,

and a tubular envelope of flexible material providing a lost motion connection between said shoulder pieces and said transverse member of said frame.

2. A carrier for carrying a child on a person's back comprising

a frame having a transverse shoulder engaging portion and two arms extending outwardly and rearwardly from the ends of the shoulder portion, and means spaced from and below said arms and including two lower portions of the frame one on each side thereof for engaging the back pelvic region of the person,

an envelope of flexible material loosely surrounding said shoulder portion,

a sling engaging the rearward portions of said arms and the lower side of said envelope for supporting a child from said frame,

two elongated generally triangular flexible shoulder engaging supports having their bases secured to said tubular portion and each base extending over a respective length of substantially one-half that of said envelope,

means for supporting a child in a rising or standing position on said lower portions, means for securing the remote ends of said flexible shoulder supports to said lower frame portions to provide loops for retaining said shoulder portions in engagement with the shoulders of the person, a substantial part of the weight of the child being applied to the upper portion of said frame when the child is supported in said sling and being applied to said lower portions of said frame when the child is standing, said shoulder portion of said frame being free to float in said envelope when the child is supported in the sling and the weight of the child being transferred from the frame to the lower side of said envelope when the child is in a standing position.

3. A carrier for carrying a child on a person's back as set forth in claim **2** wherein said elongated generally triangular flexible shoulder engaging supports are secured with their inner edges diverging from one another to provide a space for the person's neck therebetween.

4. A carrier for carrying a child on a person's back as set forth in claim **3** wherein said flexible shoulder supports comprise envelopes of flexible material having main body portions parallel to one another and a flat body of compressible filling material extending between the flat portions of said flexible material and substantially coextensive with the shoulder engaging portions thereof.

5. A carrier for carrying a child on a person's back as set forth in claim 2 wherein said frame comprises a single bent member including said shoulder engaging portion and said arms and said two lower portions and wherein the portions of said frame connecting said arms and said lower portions extend downwardly and forwardly from the outer ends of said arms whereby weight applied to said arms tends to rotate said frame rearwardly about said lower portions thereby increasing the portion of the weight carried by said lower portions, and utilizing the lost motion characteristic of said loosely surrounding envelope for decreasing the portion of the weight transferred to said shoulder supports.

6. A carrier for carrying a child on a person's back comprising a frame having a transverse shoulder engaging portion and two arms extending outwardly and rearwardly from the ends of the shoulder portion and two lower portions one on each side engaging the pelvic region below said arms,

a supporting sling of flexible material suspended from said shoulder portion at the front and from the rear end portions of said arms on each side,

a tubular portion of said flexible material loosely surrounding said shoulder portion of said frame,

flexible shoulder engaging supports secured to said tubular portion each extending over a length of substantially one-half that of said shoulder portion,

each of said supports being of elongated generally triangular configuration having their bases extending along said tubular portion,

means securing the outer ends of said support to said lower frame portions and affording engagement of said supports with the shoulders of the wearer,

each of said triangular support members comprising a shell of flexible material and a uniform filling of padding material whereby the load of a body supported in said sling is supported directly from said supports and is distributed evenly over the shoulders and the effect of lateral forces due to shifting of the body laterally of said sling is minimized,

and means whereby said body may be supported from said lower portions and a portion of the weight thereof transferred through said frame to said shoulder supports.

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R. J. SPAR, *Assistant Examiner.*