

[54] **RELEASABLE CONNECTING BAR FOR CHILD CARRIER**

[75] Inventors: Margaret S. Hansson, Boulder;
Gerald A. Cunningham, Ward;
Albert W. Gebhard, Boulder, all of
Colo.

[73] Assignee: Gerico, Inc., Boulder, Colo.

[22] Filed: Dec. 16, 1971

[21] Appl. No.: 208,753

[52] U.S. Cl. 224/6, 224/25 A

[51] Int. Cl. A47d 13/02

[58] Field of Search 224/6, 25 A, 8 R,
224/8 A, 9, 5.1, 5 P, 5 BC, 5 MA, 5 W

[56] **References Cited**

UNITED STATES PATENTS

3,265,260 8/1966 Romney 224/6

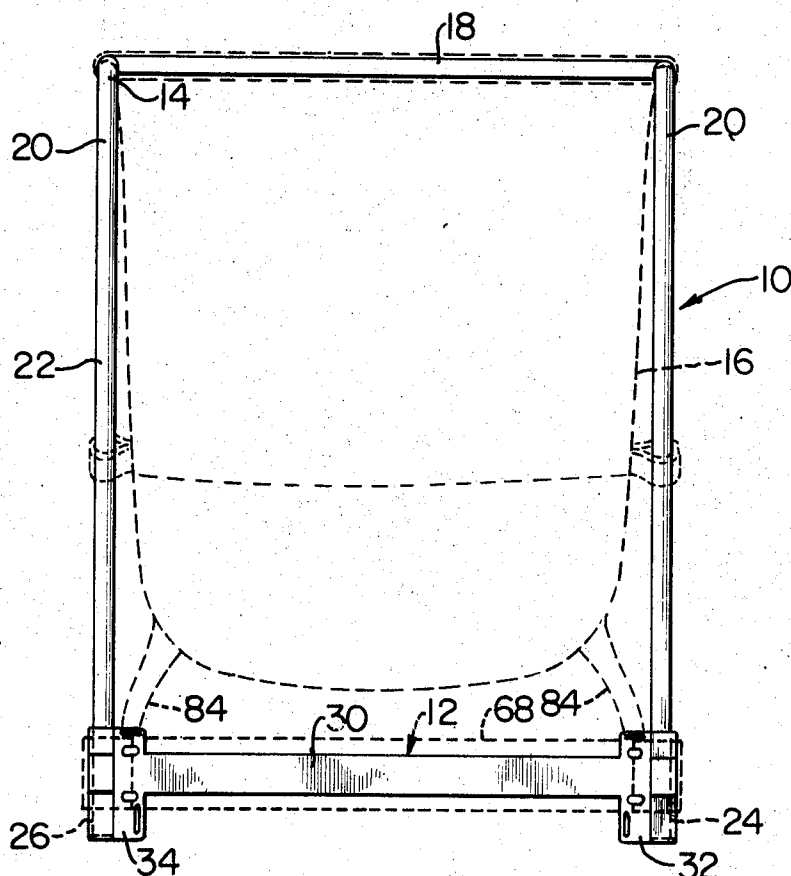
3,260,428 7/1966 Mack 224/25 A X
3,219,243 11/1965 Mack 224/25 A X

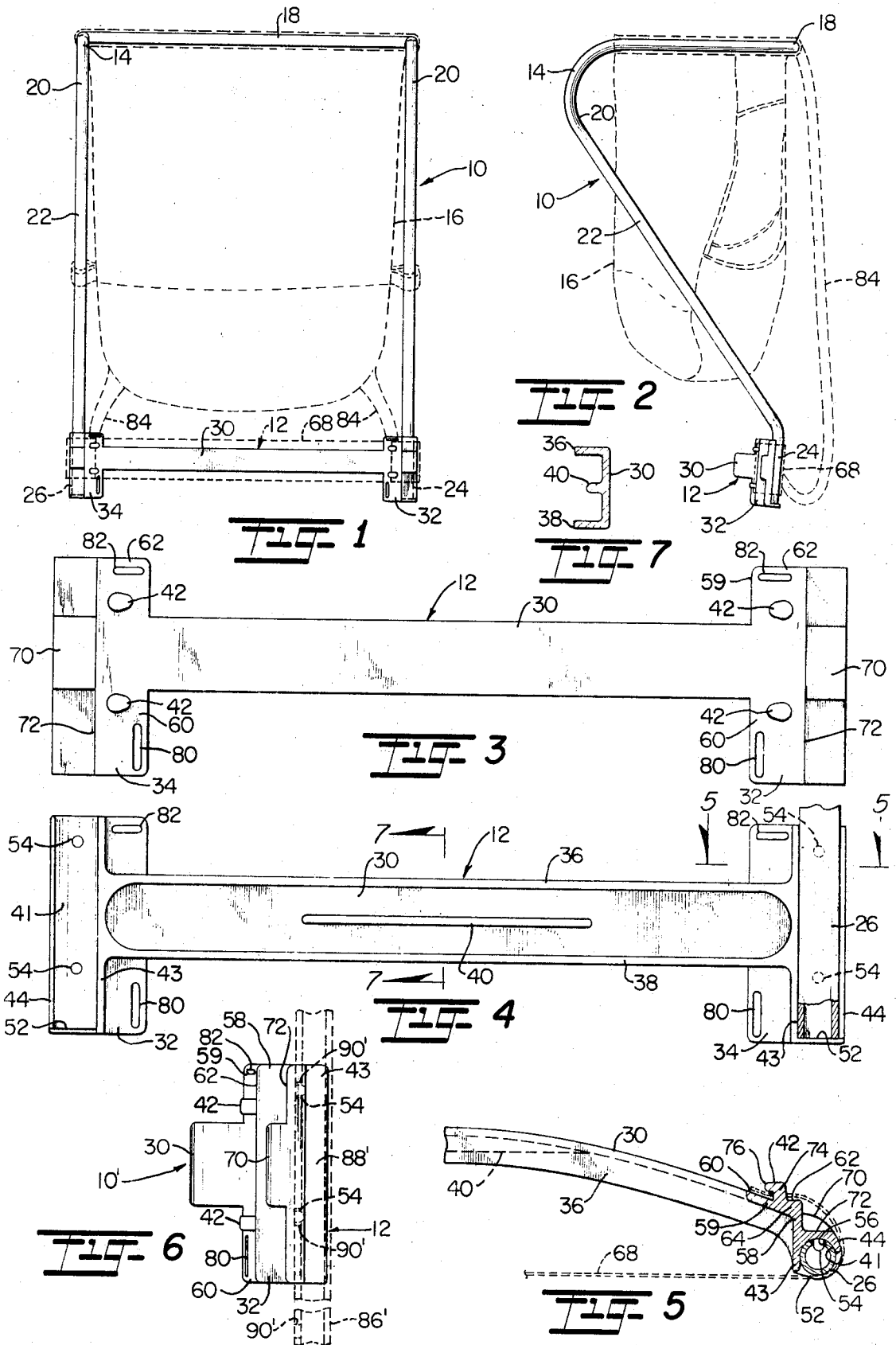
Primary Examiner—Gerald M. Forlenza
Assistant Examiner—Jerold M. Forsberg
Attorney—Reilly and Lewis

[57] ABSTRACT

A resilient connecting bar serves to releasably interconnect the lower vertical frame portions of a back pack type of child carrier in a manner such that the lower ends are covered in one embodiment and a slight spreading force is exerted on the vertical frame portions to rigidly unite the frame portions; and, in cooperation with a flexible strap or belt which contacts the lower back of the user, the connecting bar more effectively transmits the load of the carrier into the lower back or pelvic region.

12 Claims, 7 Drawing Figures





RELEASABLE CONNECTING BAR FOR CHILD CARRIER

The present invention generally relates to back pack frames or carriers and, more particularly, relates to a new and improved cross-piece for interconnecting vertical frame members on a child carrier to establish a strong and integrated frame assembly.

Back pack frames or carriers are now in widespread use for carrying children in piggyback fashion over terrain not adapted for travel by wheeled carts, carriages and the like. Such carriers are often used by men and women in hiking and other extended walking activities and, therefore, it is important that the pack be comfortable and not unduly tiring for the person using it and that it be as stable as possible with optimum weight or load distribution to minimize discomfort or difficulty due to the movement and weight of the child being carried.

The cross-piece or connecting bar of the present invention is best typified by reference to its use in child carriers of the back pack type, such as the type set forth and described in U. S. Pat. to Gerald A. Cunningham No. 3,097,773. By utilizing the connecting bar of the present invention, the main frame portions of the carrier are rigidly interconnected to provide an integrated frame assembly. Also, the connecting bar facilitates attachment of a strap or other cushioning means that may be employed at the lower end of the frame to transmit the load of the frame and carrier into the rear pelvic region of the user.

The connecting bar is composed of a material of limited resiliency and is of a length such that it must be inwardly flexed to reduce its effective length in order to be aligned and releasably connected to the lower ends of the vertical frame members. As such, after it has been connected to the vertical frame members, the connecting bar will be held in compression so as to maintain a predetermined spaced relationship between the lower ends of the frame members and to integrate and rigidify the entire frame assembly.

In the preferred form described in detail hereinafter, the connecting bar is composed of a plastic material with reinforcing means to lend the desired rigidity and strength. At its ends it is provided with brackets adapted to be attached to the lower ends of the vertical frame members, the brackets being dimensioned to extend along a substantial portion of the lower ends of the frame for increased strength and holding power in the integrated frame assembly. In one embodiment, the brackets are designed so that the connecting bar can be selectively moved along the vertical frame members to adjust the height of the connecting bar on the back of the user for optimum comfort.

Accordingly, it is an object of the present invention to provide a resilient connecting bar which serves to maintain a predetermined spaced relationship between the side frame members of a back pack and integrate the entire frame assembly through spreading or tensioning forces applied to the side frame members.

It is another object of the present invention to provide a releasable connecting bar for child carriers and the like which can be easily removed or replaced and is conformable for use with different types of back pack frames and carriers with minimal modification or alteration of the connecting bar or carrier.

It is another object of the present invention to provide a connecting bar which covers the lower extremi-

ties of the metal side frame members of a back pack while establishing a firm support at the lower ends of the frame members and improved distribution of the load carried by the frame into the lower back region.

It is still another object of the present invention to provide a connecting bar which has improved means for conveniently attaching thereto a cushioning member which bears against the lower back of the person in order to cushion the load carried by the pack.

It is still another object of the present invention to provide a connecting bar that is reinforced to give the desired rigidity and strength and which has elongated brackets on the ends adapted to be attached to and extend along a substantial portion of the lower ends of the vertical frame members of a back pack to increase the strength and holding power in the integrated frame assembly.

It is still another object of the present invention to provide a connecting bar for interconnecting spaced vertical frame members of a back pack type carrier such that the connecting bar can be selectively positioned along the length of the frame members for optimum comfort of the user.

Other objects, advantages and features of the present invention will become more readily appreciated and understood from a consideration of the following detailed description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a diagrammatic back elevation of a child carrier employing the connecting bar of the present invention;

FIG. 2 is a diagrammatic side elevation of the child carrier of FIG. 1;

FIG. 3 is a back elevation of the connecting bar of the present invention;

FIG. 4 is a front elevation of the connecting bar of FIG. 3;

FIG. 5 is a horizontal section taken along line 5—5 of FIG. 4;

FIG. 6 is an end elevation of an alternative embodiment of the connecting bar; and

FIG. 7 is a section taken along line 7—7 of FIG. 4.

Referring now to the drawings, FIGS. 1 and 2 show by way of illustrative example a conventional child carrier 10 including one embodiment of the connecting bar 12 of the present invention as part thereof. The child carrier 10, excluding the connecting bar 12, is conventional and is of the type described in detail in the aforementioned patent to Cunningham. The carrier 10 includes a metal frame 14 of tubular lightweight aluminum alloy or other suitable material and a pouch 16 constructed of light canvas or other suitable fabric within which the child may be seated. The frame 14 of the carrier comprises a single length of tubing bent to provide a substantially horizontal, generally rectangular loop 18 at the top connected by curved portions 20 to sloping side members 22 which extend forwardly and downwardly and terminate in straight end pieces constituting lower supporting ends 24 and 26 of the frame which flare rearwardly and downwardly away from the body of the user. It will be appreciated from the design of the frame that a substantial portion of the weight of the pack and its load will be transferred from the shoulders of the users and applied as a substantially horizontal force into the rear pelvic region of the user. In fact, the lower ends 24 and 26 of the frame are flared rearwardly and downwardly so as to lie substantially paral-

lel to the upper portion of the buttocks of the user so that, when the connecting bar 12 is attached to the lower ends with a cushioning member affixed thereto, the pressure exerted upon the buttocks will be minimized. In the drawing the horizontal portion 18 of the frame is substantially covered by the fabric of the carrier pouch 16 which is wrapped loosely around the frame and sewed to provide a tube or envelope in which the frame is loosely held.

Referring now in particular to the connecting bar 12, it can be seen to include a channeled arcuate brace portion 30 and integral connecting bracket portions 32 and 34 at opposite ends thereof. The brace portion 30 is generally U-shaped in transverse cross section defining upper and lower horizontally extending edges 36 and 38, respectively, as viewed in the drawings, along its entire length and includes in a central portion thereof a horizontally extending reinforcing rib 40 to give desired rigidity as will be explained later.

The connecting bracket portions 32 and 34 are identical and each has a socket 41 for releasably seating the lower ends of the frame 14 and also a pair of lugs 42 for facilitating attachment of a flexible strap or other cushioning means, as will be explained in more detail later. The connecting bracket portions 32 and 34 have their length extending vertically so as to extend along a substantial portion of the lower ends 24 and 26 of the frame thereby giving the integrated frame assembly added strength. The socket 41 in each connecting bracket is defined by two vertically elongated sides 43 and 44 which have a common inner circular surface. More particularly, the sides 43 and 44 on the integral connecting bracket portions 32 and 34 of the connecting bar are normal to each other, side 43 extending forwardly and side 44 in an outward lateral direction. As mentioned before, the sides define therebetween a vertical socket 41, the socket having a semi-circular transverse cross section (FIG. 5) for seating the lower ends 24 and 26 of the frame. The vertical sockets 41 extend along a substantial portion of the ends 24 and 26 of the frame (approximately 4 inches) and terminate at their lower ends in a flattened abutment or bottom plate 52 which covers the lower ends of the frame when the lower ends are seated in the sockets thereby providing means for preventing potential damage by the protruding lower ends of the frame. A pair of vertically spaced integral connecting pins 54 protrude inwardly from the curved semi-cylindrical surface of the sockets 41 in a forward direction and are adapted to fit into identically spaced holes 56 in the lower ends 24 and 26 of the frame.

The forwardly extending side 43 on each connecting bracket has a rearward extension 58 that forms an obtuse angle with a back plate 59 which forms a part of each connecting bracket and extends a short distance along the back side of the brace portion 30. The back surface 60 of the back plate 59 has a laterally flared flattened ledge 62 which creates a fattened zone 64, at the juncture of the back plate 59 and the rearward extension 58 of the side 43, to give the connecting brackets 32 and 34 added strength. The flattened ledge 62 supports the two integral rearwardly protruding lugs 42, to be described in more detail later, which as mentioned before define attachment means to which a flexible fabric strap 68, which is conventionally used on child carriers, may be attached.

A fragmented cylindrical reinforcing web 70 interconnects the rear face 72 of the laterally extending side 44 and the rearward extension 58 of the forwardly extending side 43 in a zone which is approximately centered between the upper and lower ends of the semi-cylindrical socket 41. The reinforcing web 70 braces the laterally extending side 44 against the rearward extension 58 to prevent the lateral side from collapsing when the connecting bar is attached to the frame in a manner to be set forth hereinafter.

The lugs 42, which are best seen in FIG. 5, are all identical and include a substantially cylindrical body 74 which, as mentioned before, protrudes rearwardly from the flattened ledge 62, and a laterally inwardly extending lip 76 on the rear end of the lug body. The curved surface of the lug body 72 which faces laterally outwardly and is on the opposite side of the lug from the lip 76 is tapered approximately 10° so that the forward or base end of the lug body has a greater diameter than the rearward end of the lug body thereby giving the lug a self-bracing design so that the lug has added strength against an outward lateral force which will be placed on the lug by the fabric strap 68 as will be explained later.

The connecting bar 12 is made of a substantially rigid material having limited resiliency such as polyethylene so that it can be slightly flexed in a horizontal plane, as viewed in the drawings, but will have a tendency to resume its original configuration. The connecting bar is slightly greater in length than the lateral spacing of the lower ends 24 and 26 of the frame 14. Therefore, in order for the connecting bar to be attached to the frame, the connecting bar must be flexed inwardly a slight amount so that the vertical sockets 41, adapted for seating the ends 24 and 26 of the frame, will be moved closer together and will be properly spaced and aligned with the lower ends of the frame. The lower ends of the frame abut against the bottom plates 52 and are urged outwardly by the connecting bar which, as stated before, is resilient and has a tendency to resume its original configuration and, therefore exerts a spreading force on the lower ends of the frame when connected thereto. The connecting pins 54 protruding inwardly from the inner surface of the elongated socket 41 fit into the holes 56 in the tubular lower ends of the frame when the lower ends of the frame are abutted against the bottom plates to better anchor the frame to the connecting bar. It will be appreciated that, when the connecting bar is so connected and anchored to the frame and exerts a spreading force thereon, the lower ends 24 and 26 of the frame, which also resist being moved out of their natural position, will hold the connecting bar in compression. With the connecting bar held under compression and exerting a spreading force on the lower ends of the tubular frame to place them in tension, a rigid integrated framework is established. The reinforcing rib 40 has been carefully designed and dimensioned to give the connecting bar the desired degree of rigidity and resiliency. It will be appreciated that the horizontally extending reinforcing rib as well as the horizontally extending upper and lower edges 36 and 38, respectively, on the brace portion 30 tend to strengthen the brace portion to prevent excessive longitudinal bending in a horizontal plane and give the bar the rigidity and resiliency desired.

As stated hereinbefore, the lugs 42 on the flattened ledge 62 of the connecting bar are adapted to receive the ends of the flexible fabric strap 68. The fabric strap

68 is conventionally used on child carriers of the type described herein to cushion the load exerted through the frame against the rear pelvic region of the user. It should be pointed out here that, as mentioned before, the connecting bar is arcuate in that it is curved about its longitudinal axis and, when bent for attachment to the frame, is curved even more. Thus when the fabric strap is fastened to the connecting bar it resembles a bowstring whereby the cushioning fabric strap engages the back of the user but the hard connecting bar is curved away from the user's back so as not to engage and thereby discomfort the user.

A strap adapted for use with the present connecting bar is simple, convenient and easy to attach and has a pair of vertically spaced openings in each end having reinforcing metal eyelets adapted to fit over the holding lugs 42 and be retained thereon by the protruding lip 76 of the lug. The length of the strap is such that it needs to be stretched a slight amount in order to be attached to the lugs on either end of the connecting bar and when so attached it can be seen that the fabric strap will place an outward pull on the lugs 42 thereby placing the connecting bar under even more compressive force because the strap is wrapped around the forward portion of the sockets 41 before passing over to the opposite end of the bar. The manner in which the flexible strap is attached to the connecting bar therefore not only provides a secure means for attaching the strap, but serves the additional purpose of further rigidifying the framework by placing the connecting bar under greater compressive force. It can also be seen that by using lugs for securing the ends of the fabric strap, the inconvenience of buckles or laces, as have formerly been used in securing the strap to the frame of the carrier, is avoided. As an added feature of the connecting bar, an elongated slot 80 is formed in each of the brackets 32 and 34 to provide means whereby a waist strap can be attached to the connecting bar. A waist strap is conventionally used to anchor the lower end of a child carrier to the user by connecting the carrier to the waist of the user. Also, a slot 82 is formed in each bracket to provide means for the shoulder strap 84 of the carrier to be attached to the connecting bar.

It will thus be appreciated that the hereinbefore described embodiment of the connecting bar of the present invention serves several useful purposes. It first places an outward force on the frame members which in turn create a compressive force within the connecting bar so that the framework will be more rigidly integrated; secondly, the connecting bar covers the lower protruding ends of the frame to prevent potential damage or harm; thirdly, the connecting bar provides convenient lug means for attaching the fabric cushioning strap which heretofore was fastened to a child carrier frame by inconvenient buckles or straps; fourthly, the fabric strap is attached directly to the connecting bar in such a manner that greater compressive force is established in the connecting bar thereby more firmly rigidifying the carrier frame; and fifthly, the connecting bar is attached to the frame in such a manner that it can be easily removed when damaged and a new identical connecting bar easily attached to replace the damaged bar.

A second embodiment of the connecting bar of the present invention designated 10' is shown in FIG. 6 with like parts given the same reference numerals and additional parts given reference numerals with a prime

suffix. This embodiment is adapted for use with a frame having lengthened lower end portions 86' and is characterized by having open ended continuous sockets 88' extending from top to bottom of the brackets 32 and 34. More than two appropriately spaced holes 90', corresponding to holes 56 of the first described embodiment, are provided in the lower end portions 86' of the frame so that the connecting pins 54 protruding into the sockets 88' can be inserted into selected pairs of holes 90' to positively position the connecting bar at any one of a number of selected positions along the length of the lower end portions 86'. The prime advantage in this type of arrangement is that the position of the connecting bar relative to the back of the user can be regulated to provide optimum comfort so that any height individual can comfortably use a carrier incorporating the connecting bar 10'. It will be appreciated that the connecting bar 10' maintains all of the advantages of the connecting bar 10 except that the lower end portions of the frame will not always be covered.

Although the present invention has been described with a certain degree of particularity, it is understood that the present disclosure has been made by way of example and that changes in details of structure may be made without departing from the spirit thereof.

What is claimed is:

1. In a child carrier for supporting a child on a person's back wherein the child carrier includes a pouch in which the child can sit and a frame for supporting the pouch, said frame having an upper horizontal portion to which the pouch is affixed, sloping side portions which extend forwardly and downwardly, and spaced lower supporting ends which flare rearwardly and downwardly from the side portions, the improvement comprising a connecting bar for rigidly interconnecting the lower supporting ends of the frame, said bar comprising an elongated substantially rigid brace portion of a plastic material possessing limited resiliency, and connecting bracket portions on the ends of the brace portion, said bracket portions being spaced a greater distance than the spacing between said lower supporting ends of the frame, the brace portion being curved along its length and having a generally U-shaped cross section, said connecting bracket portions each including a substantially semi-cylindrical socket for seating one of said lower supporting ends of the frame member when said brace portion has been inwardly flexed to align said socket with the lower supporting ends, said lower supporting ends holding said bar in compression when seated in the sockets, said sockets having abutment plates at the bottoms thereof against which the lower supporting ends of the frame abut to thereby cover the ends of the frame, connecting pins on the bracket portions protruding inwardly into the sockets and being adapted to fit into openings in the lower supporting ends of the frame member to thereby connect the respective brackets to an associated one of the lower supporting ends, a flexible strap having eyelet means for attachment to the bracket portions whereby the strap places the connecting bar under further compression, said bracket portions also including a pair of lugs protruding outwardly from a surface thereof, said lugs having a retaining lip whereby the eyelet means on the ends of the flexible strap when placed over the lugs will be retained on the lugs by the retaining lips to hold the connecting bar in compression.

2. In a child carrier for supporting a child on a person's back wherein the child carrier includes a pouch in which the child can sit and a frame for supporting the pouch, said frame having spaced vertical frame members terminating in lower end portions, the improvement comprising in combination a rigid bar having limited resiliency for interconnecting said end portions, said bar including an elongated brace portion and connecting brackets on the ends of the brace portion for releasably receiving the lower end portions of the frame, the bracket portions being spaced a slight distance more than the lower end portions of the frame so that the bar must be inwardly flexed to align the brackets with the end portions whereby the end portions when connected to the brackets will place a compressive force on the bar, and a cushioning member interconnecting the brackets so as to place a further compressive force on the bar, said cushioning member being disposed to engage the rear pelvic region of the user to soften the pressure exerted against the user in this region.

3. In the child carrier of claim 2, said cushioning member comprising an elongated flexible strap having means adjacent its ends for attachment to the connecting brackets.

4. In the child carrier of claim 3, said bracket portions including lugs protruding outwardly from a surface thereof and said flexible strap having eyelets near its ends adapted to be retained by said lugs whereby the ends of the flexible strap will be securely anchored to the connecting brackets.

5. In the child carrier of claim 4, said lugs including lip portions for overlying eyelets received on the lugs to prevent an eyelet from slipping off the lug.

6. In a carrier for supporting a load on a person's back wherein the load to be supported is suspended by a frame member which is secured to the back to provide an upper load-supporting frame portion extending across the shoulder region of the wearer and spaced frame portions extending downwardly along opposite sides of the back toward the waist of the wearer, the improvement comprising a connecting bar including an arcuate resilient brace portion and end portions including attachment means for attaching the connecting bar to lower ends of the spaced frame portions adjacent to the waist, the length of the connecting bar being greater than the spacing between the lower ends of the frame portions such that said connecting bar must be flexed to reduce its effective length in order to position said end portions for attachment to the frame portions, said connecting bar upon attachment to said frame portions exerting a spreading force on the frame portion which is resisted by the frame portion whereby to hold

the connecting bar in compression and rigidify the entire frame member.

7. In a carrier for supporting a load on a person's back wherein the load to be supported is suspended by a frame member which is secured to the back to provide an upper load supporting frame portion extending across the shoulder region of the wearer and spaced frame portions extending downwardly along opposite sides of the back toward the waist of the wearer, the improvement comprising a connecting bar including an arcuate resilient brace portion and end portions including socket means for reception of the lower terminal ends of the spaced frame portions adjacent to the waist, said socket means each having an abutment plate at one end against which the lower end of the associated spaced frame portion can abut, the length of the connecting bar being greater than the spacing between the lower ends of the frame portions such that said connecting bar must be flexed to reduce its effective length in order to position said end portions for attachment to the frame portions, said connecting bar upon attachment to said frame portions exerting a spreading force on the frame portions which is resisted by the frame portions whereby to hold the connecting bar in compression and rigidify the entire frame member.

8. In the carrier of claim 7, said socket means being adapted to be attached to the lower ends of the spaced frame portions at different positions along the lower ends of the frame portions.

9. In the child carrier of claim 8, said connecting bar being bowed outwardly with respect to the back, and further including an elongated cushioning member extending between the spaced frame portions inwardly of said connecting bar so as to bear against the waist region of the wearer.

10. In the child carrier of claim 9, said cushioning member comprising a flexible strap attached at opposite ends to said socket means.

11. In the carrier of claim 10, said flexible strap having lug receiving eyelets adjacent to opposite ends thereof and lug members on said socket means each having a lip portion for releasably retaining an eyelet on the flexible strap.

12. In the carrier of claim 7, the lower terminal ends of the spaced frame portions each having at least one opening therein, and the socket means at the ends of the connecting bar having at least one connecting pin as a part thereof protruding into said opening, said connecting pin being adapted to fit into said opening in the lower terminal end of the associated spaced frame portion when the lower terminal ends are disposed in said socket means.

* * * * *