Sept. 21, 1965 W. H. BERTRAM 3,206,774

COMPACT COT

Filed June 22, 1964 2 Sheets-Sheet 1

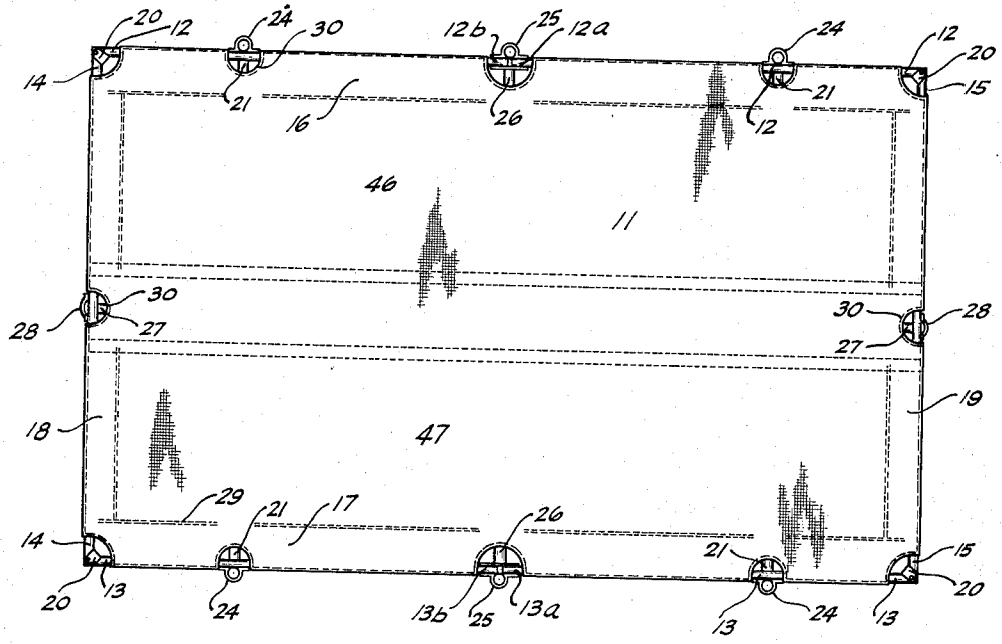


FIG 1

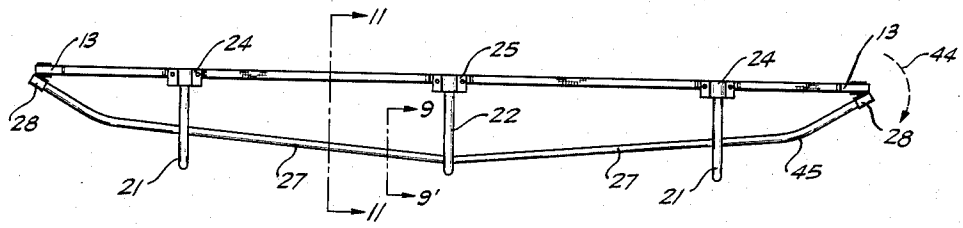


FIG 2

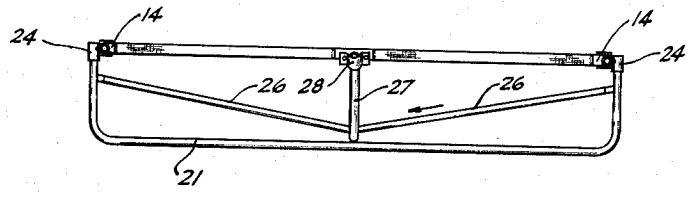


FIG 3

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COMPACT COT

Filed June 22, 1964 2 Sheets-Sheet 2

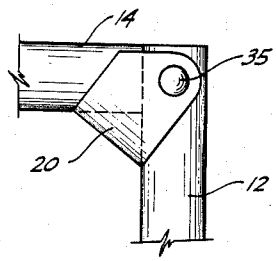


FIG 4

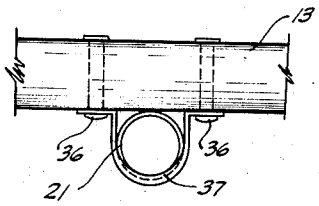


FIG 6

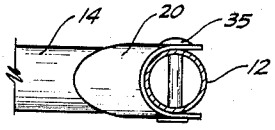


FIG 5

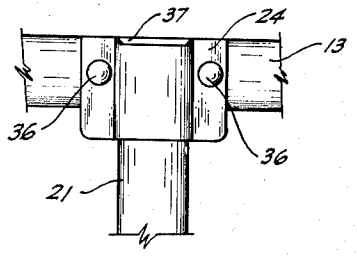


FIG 7

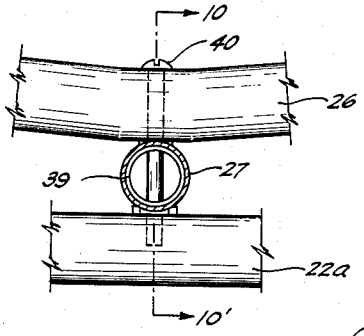


FIG 9

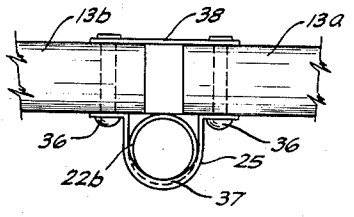


FIG 8

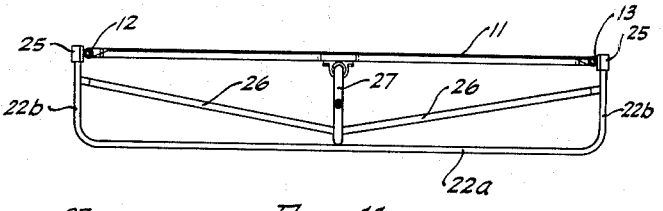


FIG 11

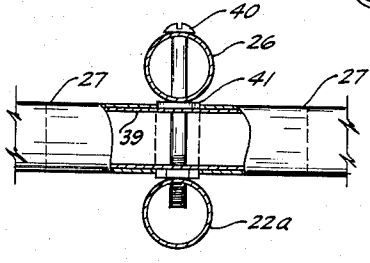


FIG 10

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3,206,774

COMPACT COT

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Filed June 22, 1964, Ser. No. 376,812
8 Claims. (Cl. 5—110)

This invention relates to folding or collapsible cots and, in particular, to a simple, light weight cot which can be fabricated in double bed widths and yet be easily folded or dismantled into a relatively small, compact unit for transportation or storage.

Portable cots have a well established use in outdoor activities such as camping, fishing, boating, trailering, etc. Additionally, there is a need for an inexpensive collapsible cot to be used as an extra bed for home use and for emergencies such as in civil defense bomb shelters. Most cots presently available, however, are bulky, complex and heavy, particularly in the double bed size.

It is accordingly an object of this invention to provide an improved collapsible cot.

It is an additional object of this invention to provide such an improved cot in a double bed size.

It is also an object of this invention to provide a folding cot of sturdy construction that has a minimum of easily assembled parts which can be quickly assembled with little effort to form a neat appearing bed.

It is a further object of this invention to provide a light weight cot that can be folded into a relatively small unit to facilitate its storage and transportation.

It is also a further object of this invention to provide a cot that is sturdy, light weight, foldable, durable, inexpensive, and simple to construct.

It is another object of this invention to provide an improved dismantable connection for furniture members and in particular for furniture member braces.

Other and related objects will be apparent from the detailed description of the invention and various advantages not specifically referred to herein will be apparent to those skilled in the art.

The foregoing objects and their attendant advantages can be achieved in accordance with my invention in a folding cot which comprises a pair of substantially parallel sectional side rails with a strong body-supporting sheet stretched between them, the sections of the side rails being hingedly connected so that they can be folded parallel with each other to reduce the overall cot length to about half or one-third of its extended length. At each end of the cot, extending between the side rails, are end rails which seat into connecting members attached to the ends of the side rails. The end rails pass through folds at each end of the body-supporting sheet and are retained within their connecting members by tension of the sheet. The cot is supported by upright supports comprising transverse, generally U-shaped members whose upright ends engage connecting members on the cot side rails. The cot upright supports are resilient and their upper ends are sprung together to engage the connecting members on the side rails. In this manner, the cot supports impart a transverse bias or tension to the body-supporting sheet and stretch the latter part between the side rails. The central cot support is provided with a transverse brace and a connecting member for the attachment of longitudinal braces that extend to either end rail and that lock into connecting members affixed to each of said end rails, thereby providing a longitudinal brace along the midline of the cot.

The invention will now be described in greater detail in reference to the drawings of which:

FIGURE 1 is a plan view of the cot of this invention in the assembled position;

FIGURE 2 is a side view of the assembled cot;

FIGURE 3 is an end view of the assembled cot;

FIGURES 4 and 5 are enlarged views of the connecting member between the end and side rails;

FIGURES 6 and 7 are enlarged views of the connecting member between the upright ends of the cot supports and the side rails;

FIGURE 8 is an enlarged view of the section joint and connecting member between the central cot support and the sectioned side rails;

FIGURE 9 is an enlarged view taken along line 9–9′ of FIGURE 2 illustrating the transverse and longitudinal brace connections to the central cot support;

FIGURE 10 is a view of the brace support connection taken along line 10–10′ of FIGURE 9; and

FIGURE 11 is a view of the assembled cot taken along line 11–11′ illustrating the central cot support.

Referring now to FIGURES 1, 2, 3, and 11, the cot is illustrated as comprising a body-supporting sheet **11** stretched between a pair of side rails **12** and **13** which comprise sectioned members **12***a* and **12***b* and **13***a* and **13***b*, respectively, hingedly connected at the midportion of the side rail. Although only a single hinged connection between two sections is shown, several such hinge joints could be used to further subdivide the cot length and reduce its folded size without departing from the scope of the invention. A pair of end rails **14** and **15** are employed to stretch body-supporting sheet **11** on a generally rectangularly shaped frame. Side rails **12** and **13** pass through longitudinal folds or hems along the edges of body-supporting sheet **11** shown as **16** and **17**, respectively, and end rails **14** and **15** pass through similar hems **18** and **19** along the ends of body-supporting sheet **11**. End rails **14** and **15** butt against the inside edges of side rails **12** and **13** and seat into connecting members **20** which are attached to each end of side rails **12** and **13**. Connecting members **20** are hereafter described in greater detail in the discussion of FIGURES 4 and 5. Briefly, however, end rails **14** and **15** snap into these connecting members **20** and are held in place by longitudinal tension on sheet **11**.

The body-supporting sheet **11** is preferably reinforced with a second layer of fabric which is stitched along each side of the cot as shown by areas **46** and **47** of FIGURE 1 to thereby provide additional reinforcing to the fabric.

The frame and its taut sheet **11** are supported above the ground by two or more laterally disposed, generally U-shaped, cot supports **21** and a centrally disposed, generally U-shaped central cot support **22**. The upright legs of cot supports **21** fit into connecting members **24** which are affixed to side rails **12** and **13**. A similar connecting member **25** is employed to serve as a hinge between sections **12***a* and **12***b* and **13***a* and **13***b* of side rails **12** and **13** and also serve as a connecting member to the upright legs of centrally disposed, braced central cot support **22** comprising base cot support **22** and upright legs **22***b*.

Central cot support **22** has transverse braces **26** which are attached to base cot support **22***a*, preferably at its midpoint, and extend to upright legs **22***b*. Preferably, transverse braces **26** are rigidly affixed to upright legs **22***b* of central cot support **22** in the position in FIGURE 11. Longitudinal braces **27** are also attached to base **22***a* of central cot support **22** and extend to connecting members **28** which are affixed to each of end rails **14** and **15**, preferably at their midpoints. Preferably, for compactness, braces **27** are detachably affixed to a connecting member on base cot support **22***a* of central cot support **22** in the manner hereinafter described in reference to FIGURES 9 and 10.

Supports **21** and **22** can be reinforced at the point where they are bent by inserting a piece of smaller diameter tubing into the section to be shaped, the outside

diameter of thus tubing conforming to the inside diameter of the support tubing. The length of the reinforcing tubing should be such as to include substantially the entire curved portion of the support. Typically, the support and side rail tubing is 0.750 inch outside diameter and has a wall thickness of 0.035 inch. The ninety degree bends typically should have a radius of about two inches. Therefore, for reinforcing, about three inches of tubing having an 0.035 inch wall and an outside diameter of 0.715 inch, is inserted into the bend area prior to bending. As a result of this reinforcement, the circular cross-section of the support tubing does not change substantially, resulting in a stronger support with little added weight or cost.

From the preceding, it is apparent that flexible body-supporting sheet **11** provides the resting or reclining surface of the cot. Sheet **11** can be formed from any suitable material such as cloth, web, or fabric of canvas, sailcloth or synthetic materials such as nylon cloth, plastic sheeting, woven plastic fibers, etc. Sheet **11** is stretched taut in the frame formed by side rails **12** and **13** and end rails **14** and **15** and transverse tension is imparted to sheet **11** by the resiliency of the upright arms of U-shaped cot supports **21** and **22** which are sprung together slightly to engage connecting members **24** and **25**. As previously mentioned, rails **12**, **13**, **14**, and **15**, which form the generally rectangularly shaped frame for body-supporting sheet **11**, extend through a continuous fold or hem formed about the periphery of sheet **11** by folding the peripheral margin inwardly and hemming the edges of sheet **11** with stitching as shown as **29**. To avoid undue fabric wear at connecting members **24**, **25**, and **28**, sheet **11** is notched about these connecting members as shown at **30** and the edge of the fabric is reinforced about this notch by hemming to prevent fraying.

From the preceding discussion, it is apparent that the longitudinal tension on sheet **11**, created by locking end rails **14** and **15** into connecting members **20**, will tend to buckle sheet **11** along the joint between the sections of side rails **12** and **13**. To provide means to counter this force and maintain sheet **11** in a generally continuous plane, longitudinal braces **27** are provided. These braces, together with their connecting member hereafter described at the midpoint of base cot support **22***a* of central cot support **22**, form a continuous and rigid longitudinal brace beneath sheet **11** which extends along the midline of the cot. These braces **27**, together with transverse braces **26** also provide load distribution to central cot support **22** and thereby prevent collapse of the cot when uneven loading is applied to the surface of sheet **11**.

Referring now to FIGURES 4 and 5, the connections provided between end rails **14** and **15** and side rails **12** and **13** will be described. As illustrated, the connection between end rail **14** and side rail **12** comprises a connecting member **20**. Connecting member **20** generally comprises a U-shaped bracket having a radius of curvature corresponding to the diameter of tubing **12** and **14** and having extending sides. The bracket **20** is attached to the end of side rail **12** by a suitable connector such as rivet **35** or other equivalent screw or bolt fasteners. The edge of the bight of member **20** rests against the inside edge of tubing **12** to provide an extended saddle in which the end of tubing **14** seats. The hole for rivet **35** can be offset slightly as shown to extend the point of seating inwardly from the end of rail **14**, thereby insuring against accidental discharge of rail **14** from the saddle formed by connecting member **20**. As previously mentioned, the longitudinal tension on body sheet **11** retains end rails **14** and **15** seated in the saddle formed by brackets **20**. The ends of end rails **14** and **15** butt against the inside surfaces of side rails **12** and **13**. If desired, it is of course apparent that the engaging surfaces on the ends of rails **14** and **15** can be hollowed to match the curvature or radius of the surfaces of side rails **12** and **13** to reduce the wear from that experienced with a point contact.

Referring now to FIGURES 6 and 7, connecting members **24** will be described. As illustrated, these members **24** comprise a U-shaped plate **24** which is permanently affixed to the side rails such as **13** by rivets or other suitable connectors shown as **36**. The radius of curvature of U-shaped bracket **24** corresponds to the radius of the generally tubular upright ends of cot supports **21**. The upped edge of U-shaped bracket **24** is preferably lipped inwardly to form a generally horizontal lip **37** which engages against the upper end of upright support **21** and prevents support **21** from passing through bracket **24**. In this maner, cot supports **21** are removably locked into connecting members **24** and retained against vertical movement.

A similar bracket **25**, shown in FIGURE 8, is employed to removably engage upright legs **22***b* of central cot support **22**. This bracket **25** is also permanently affixed to cot side rails by rivets or other fasteners such as **36**. As previously mentioned, however, this connector also serves as a hinge between the separate sections of the side rails such as **13***a* and **13***b*. To complete the hinge, a second bracket **38** is attached to the opposite or inside surface of rails **13***a* and **13***b* and fasteners **36** extend therethrough to provide a pair of generally parallel brackets affixed to the ends of the side rails to provide a hinged connection about fasteners **36**. The upper edge of U-shaped bracket **25** is also lipped at **37** to restrain vertical movement of the upright leg **22***b* of cot support **22** therethrough.

Referring now to FIGURES 9 and 10, the connections for the brace supports of central cot support **22** will be described. As shown, FIGURE 9 is a sectional view along lines **9–9′** of FIGURE 2, and FIGURE 10 is a sectional view taken along **10–10′** of FIGURE 9. As shown in FIGURE 9, the base cot support **22***a* supports transverse braces **26** affixed thereto and longitudinal braces **27** removably attached thereto. Transverse braces **26** are affixed to upright legs **22***b* of central cot support **22** and these transverse braces **26** thereby form a generally V-shaped continous member as illustrated in FIGURE 3. At the base of this V, a fastener such as machine screw **40** extends through transverse brace **26**, through a sleeve **41** (see FIGURE 10) and into a bore in the upper surface of base cot support **22***a*. Fastener **40** is extended a sufficient distance into base cot support **22***a* to prevent its accidental discharge. If desired, it is of course apparent that **40** could be threaded into base cot support **22***a* to insure against its discharge. Machine screw **40** engages a threaded tab in the base of sleeve **41**. Permanently affixed to the inside preiphery of sleeve **41** is connecting member **39** which comprises a generally tubular member having an outside diameter corresponding to the inside diameter of longitudinal braces **27**. This connecting member **39** extends a suitable distance, e.g., eight to about twelve inches on each side of sleeve **41**, to provide a support over which the ends of longitudinal braces **27** can be slipped. Connecting member **39** is bent slightly at its midpoint to provide a V member having an inclination of its wings corresponding to the desired inclination of longitudinal braces **27** from the horizontal, see FIGURE 2.

The outboard ends of longitudinal braces **27** slip into connecting members **28** which are carried on the end rails **14** and **15** at their midpoints. These brackets **28** are genrally U-shaped brackets similar to brackets **24** and **25** previously described in regard to FIGURES 6, 7, and 8. Braces **27** are affixed to the cot at the last stages of the cot assembly by slipping their inboard ends over the wings connecting member **39** and then are forced into brackets **28** of end rails **14** and **15**. As apparent from the discussion in regard to FIGURES 4 and 5, end rails **14** and **15** can rotated about their respective

axis. To engage the outboard ends of braces **27** in brackets **28**, the end rails are rotated until the edge of bracket **28** is aligned to the end of brace **27**. Then, a downward and inward rotation of this rail is applied as shown by the broken arrowhead line **44** of FIGURE 2 to force the bracket **28** to slip over the end of brace **27** and thereby lock brace **27** in place. To provide a steep angle of engagement of brace **27** with bracket **28**, brace **27** is preferably bent as shown at **45**, thereby rendering it more readily engagable by bracket **28**.

The supports, braces and rails of this invention can be fabricated from any suitable solid or hollow material having sufficient strength and can be circular, rectangular, or elliptical in cross-section. Preferably, the supports and side rail sections are constructed of tubing made from a light weight material, e.g., aluminum or its alloys such as used in aircraft manufacture, or magnesium alloys. Thin wall steel tubing can also be used in order to provide a cot which is strong, yet light in weight. The typical weight of a cot of this invention for supporting body loads up to at least six hundred pounds is about fourteen pounds. A typical cot of this invention suitable for double bed use opens to about six feet six inches in length and forty-eight inches in width and can be supported about nine to twelve inches or more above the ground by upright supports **21** and **22**. Despite this extended area, the cot can still be stored in a carton approximately 3 inches by 9 inches by 48 inches in length.

From the foregoing description, it is apparent that a cot has been provided in a double bed size which is simple, strong, light in weight, compact when folded, and which is constructed and arranged so that it is convenient to assemble and dismantle. Furthermore, the cot of this invention provides a comfortable and durable piece of camp furniture which can be readily transported, set up and knocked down, yet suiting the comfort of the most discriminating users.

Various other changes and modifications are apparent from the description of this invention and further modifications will be obvious to those skilled in the art. To illustrate, connectors **24** could comprise hinge joints such as **25** between hinged end sections with a rigid middle section having a connector such as **24** to engage central cot support **22**. Such modifications and changes are intended to be included within the scope of this invention as defined by the following claims.

I claim:

1. A folding cot comprising:

a pair of side rails, each of said side rails comprising at least two side rail sections hingedly connected together by a hinge connecting member;

each of said side rail sections having affixed thereto a cot support connecting member intermediate the ends of said side rail section;

a central cot support connecting member positioned substantially at the midpoint of each of said side rails, and attached to an end of each of said side rail sections;

the ends of each of said side rails having affixed thereto an end rail connecting member;

a flexible body-supporting sheet extending between said side rails and attached along its longitudinal edges to said side rails;

a pair of end rails attached to the transverse edges of said body-supporting sheet, said end rails extending between said side rails and being resiliently engaged into said end rail connecting members by the longitudinal tension of said body-supporting sheet;

a brace connecting member attached to an intermediate point along the length of each of said end rails;

at least one cot suport beneath each of said side rail sections, said cot support comprising a generally U-shaped member having a substantially flat base with generally vertical upright legs that engage said cot support connecting members of said side rails;

a central cot support comprising a generally U-shaped member having a substantially flat base with generally vertical upright legs that engage said central cot support connecting members;

a generally V-shaped brace attached to and extending from one of said generally vertical upright legs to an attachment at an intermediate point on said substantially flat base of said central cot support and extending to and attached to the other of said generally vertical upright legs;

a central brace connecting member having ends disposed at right angles to said generally V-shaped brace and also attached intermediate said ends to said substantially flat base at said intermediate point; and

a pair of longitudinal braces, each of which attach to an end of said central brace connecting member, said longitudinal braces extending to said brace connecting members attached to said intermediate point on each of said end rails and removably engaged with said brace connecting members.

2. The cot of claim **1** wherein the distance between the generally vertical upright legs of said cot supports in an unrestrained position is slightly greater than the width of said body-supporting sheet so that when the upper ends of said legs of said supports are inserted in said cot support connecting members said cot support members impart a transverse tension to said body-supporting sheet.

3. The cot of claim **1** wherein said longitudinal braces are bent upwardly at a point near their outboard ends to facilitate engagement with said brace connecting member affixed to said end rails.

4. The cot of claim **1** wherein said side rails comprise two side rail sections that are hingedly connected at their inner ends by a hinge connector comprising an inner bracket and an outer generally U-shaped bracket, said U-shaped bracket also defining said central cot support connecting member for said central cot support.

5. The cot of claim **1** wherein said end rail connecting member comprise a generally U-shaped saddle that is affixed to the ends of said side rails and forms a seat for said end rail.

6. The cot of claim **1** wherein said body-supporting sheet is hemmed along its periphery to thereby define marginal folds through which said side rails and end rails extend.

7. The cot of claim **1** wherein said cot support connecting members attached to said side rails comprise U-shaped brackets having an inwardly lipped upper edge to thereby provide a stop for the upper ends of said legs of said cot supports.

8. The cot of claim **1** wherein said brace connecting members attached to said end rails comprise U-shaped brackets having an inwardly lipped upper edge to thereby provide a stop for the upper end of said longitudinal braces.

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