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[54] **METHOD FOR ASSEMBLING MATTRESS SUPPORT**

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[52] **U.S. Cl.** ..... **29/448,** 5/187, 5/200 C

[51] **Int. Cl.** **B23p 11/02**

[58] **Field of Search** ..... 29/448, 446; 108/49; 5/187, 110, 111, 200 R, 200 C

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[57] **ABSTRACT**

The mattress support disclosed utilizes a supporting sheet of fabric, preferably of non-woven, heat-bonded, polypropylene fibers that provide a tough, strong support. This sheet is generally rectangular with straight tubular edges along the major portion of the periphery of the sheet and interrupted by non-tubular corners at which the tubular edges open. Four elongated frame members, preferably of angled metal stock, are disposed within the tubular edges and extend therefrom at the non-tubular corners. These frame members are secured together at the corners by nuts and bolts and are rigidified by short corner struts which extend between and are secured, as by nuts and bolts, to the adjacent frame members outward of the non-tubular corners of the supporting sheet. The mattress support can be assembled by inserting the frame members into the tubular edges, securing adjacent ends of the frame members together except at one of the corners, tensioning the supporting sheet by pulling the unsecured frame members outwardly and then securing them together, and securing the short corner struts to adjacent frame members.

3 Claims, 5 Drawing Figures

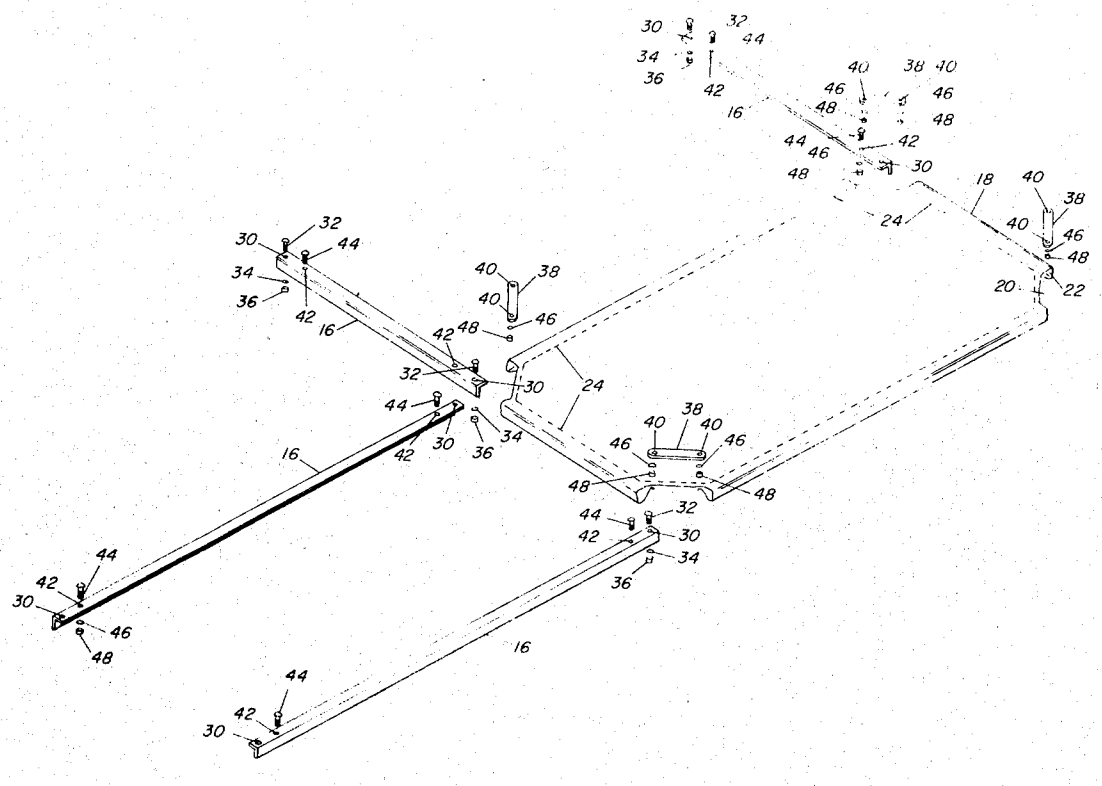


Fig. 1

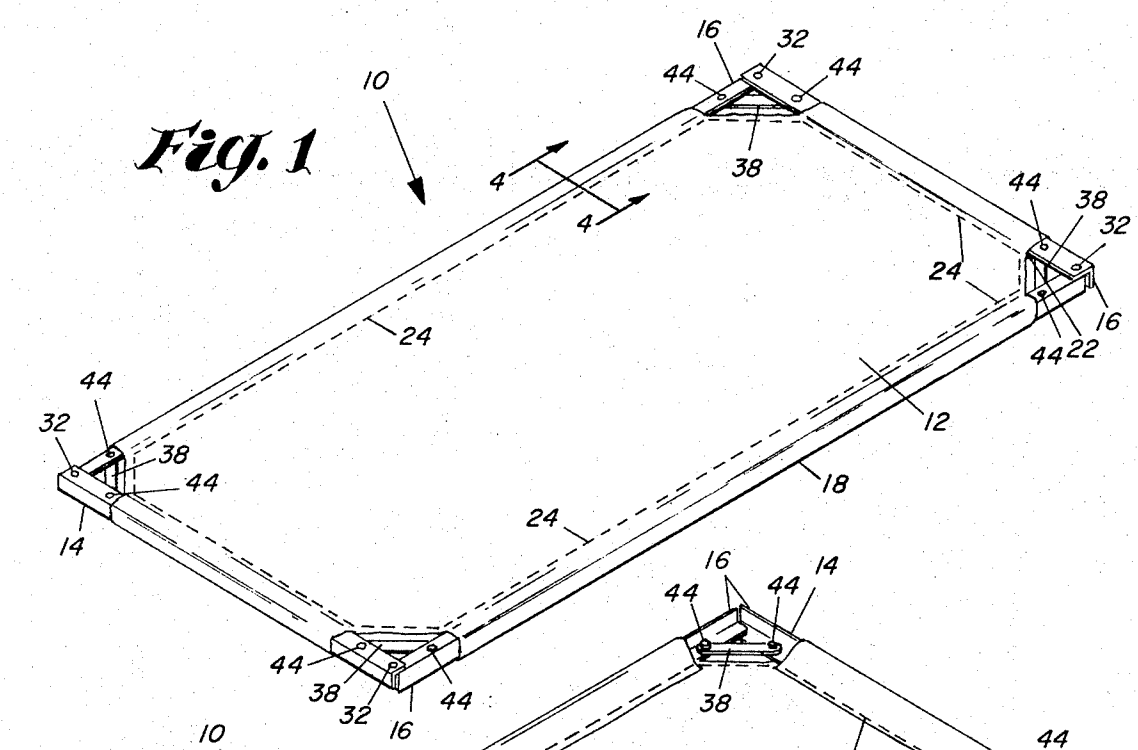


Fig. 2

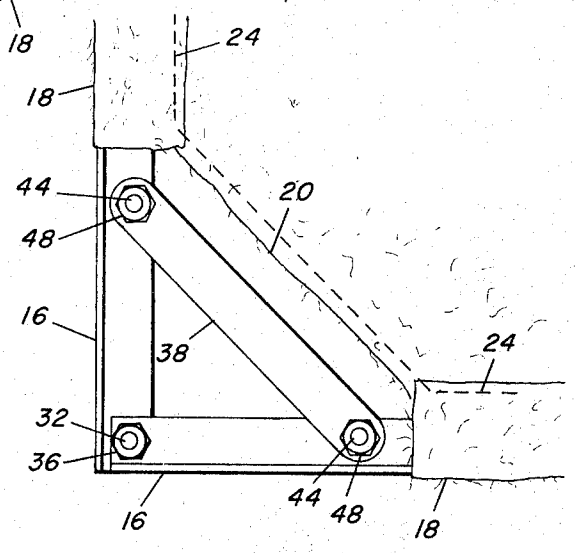


Fig. 3

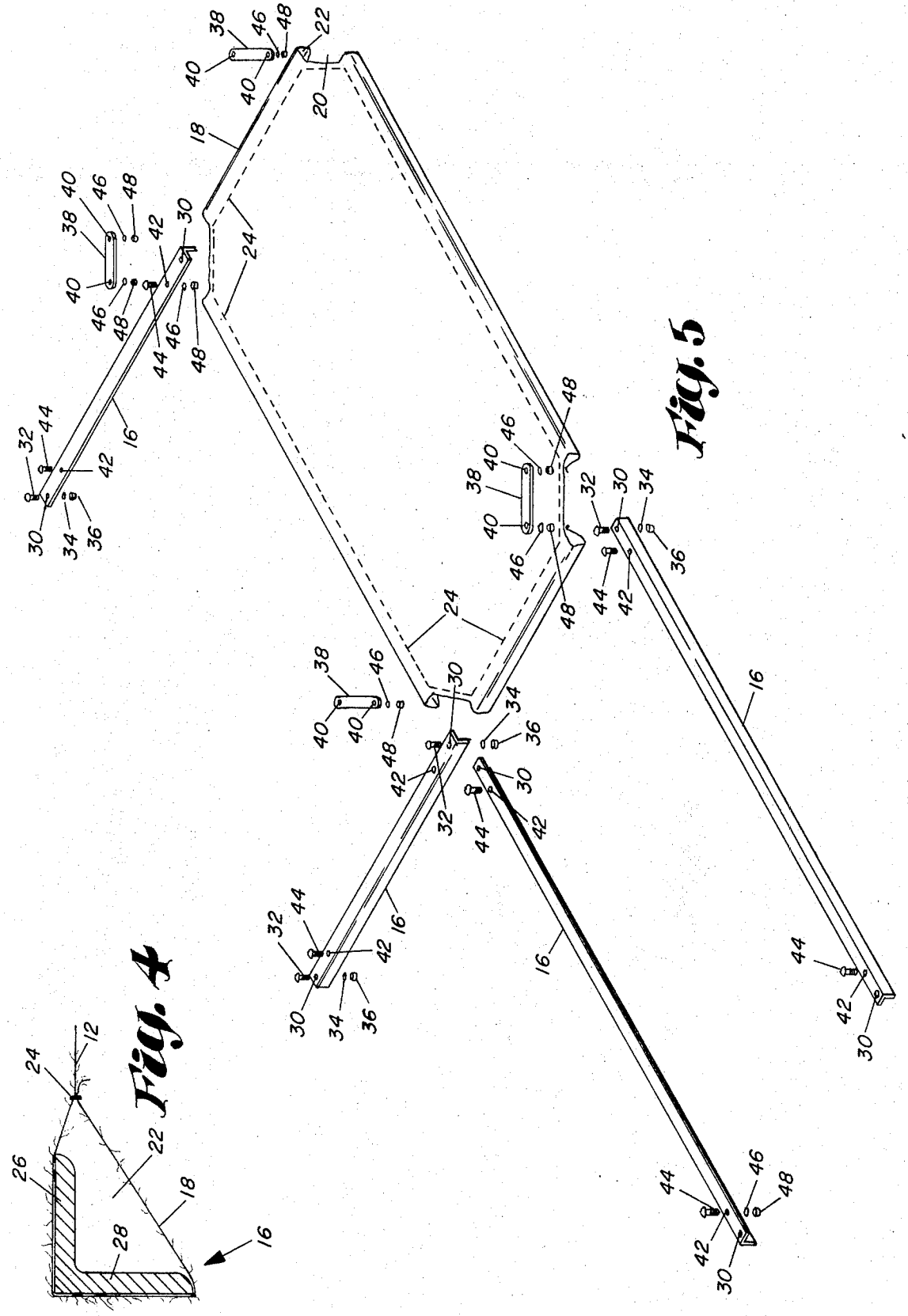

38
46
48
22
40
40
20
18
24
30
42
44
46
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16
32
34
36

Fig. 5

12
24
22
26
18
28
16

Fig. 4

METHOD FOR ASSEMBLING MATTRESS SUPPORT

BACKGROUND OF THE INVENTION

The field of this invention is that of mattress supporting devices and particularly of a mattress support that can be used as a substitute for metal link fabric bed springs, such as are used in baby cribs as well as in various other types of beds.

Typical metal link fabric bed springs have a rectangular frame to which is secured a sheet of metal link fabric by small helical springs connecting the fabric to the frame at numerous locations. This construction is characterized by openings in the fabric and between the springs, which openings are dangerous, especially in baby beds and cribs. Further, the helical springs are capable of pinching occupants and bed clothes and are easily overstretched individually. Moreover, there is a capability of rusting with a resulting staining of mattresses and bed clothes, and the many individual parts are inherent dust and dirt collectors.

In contrast, the present invention provides a mattress support that has an almost completely uninterrupted supporting surface that does not use springs and that has a supporting area of non-metallic material. Thus, it is much safer, more reliable, relatively rust free, and notably cleaner than the metal link fabric bed spring. Further, the present invention is considerably less expensive and easier to make than the metal link fabric bed spring.

An important feature of the mattress support of the present invention is its capability of being easily assembled from its individual parts, which is not easily done with a metal link fabric bed spring. Thus, with the present invention a mattress support can be shipped to the ultimate user in knocked-down condition at a significant saving in labor and shipping cost, and the ultimate user can easily assemble the frame members in the tubular edges of the supporting sheet, secure the frame members together, and secure the rigidifying corner struts to the frame members. On the other hand, a metal link fabric bed spring is normally made with a completed frame that is not disassemblable and uses a number of spring connections that require considerable time and are difficult to connect.

As a matter of fact, the mattress support of the present invention superficially resembles a folding camp cot more than a metal link fabric mattress support, but this resemblance is in respect only to the use of a fabric sheet instead of metal link fabric and helical springs. There is a clear difference between the present invention that has a rigidly secured frame of straight frame members with reinforcing struts and extension of tubular edges of the fabric close to the corners of the support and a folding cot that to be foldable is necessarily less rigid, that normally includes legs, and that is not used as a mattress support. The differences between the mattress support of the present invention and a camp cot is further demonstrated by the fact that the present mattress support is intended for use in a bed or crib and when so used would be sufficiently rigid to allow a child to jump on it in safety, whereas a camp cot is intended for independent use and would be likely to collapse or at least be dangerous if jumped on by a child.

Therefore, the present invention provides a relatively inexpensive, easy to assemble, safe, and sturdy mattress support, and a method of assembling a mattress support which can be easily and inexpensively assembled from a knocked-down, i.e., unassembled, condition.

SUMMARY OF THE INVENTION

The present invention provides a mattress support having a supporting sheet of fabric, elongated straight angled frame members assembled into a rigid frame, and short corner struts extending between adjacent frame members to rigidify the mattress support. The supporting sheet has generally straight tubular edges extending along a major portion of the periphery of the sheet and interrupted by non-tubular corners at which the tubular edges open in relatively close proximity to one another. The elongated straight angled frame members are disposed within the tubular edges of the supporting sheet and extend therefrom at the non-tubular corners. Adjacent frame members are secured together to form a frame which is rigidified by securing short corner struts between adjacent frame members outward of the non-tubular corners.

In the preferred embodiment of this invention the frame members of the mattress support may be dimensioned in length in relation to the supporting sheet so that the sheet may be tensioned. For example, the mattress support may have four frame members arranged in the form of a rectangular frame with opposed frame members which are spaced sufficiently far apart to tension the supporting sheet. The preferred means for securing adjacent frame members and for securing the short corner struts to the frame members is a nut and bolt connection. The supporting sheet of fabric is preferably made of heat-bonded, non-woven, polypropylene fibers.

The mattress support of the present invention may be easily assembled from a knocked-down condition. To do this the frame members are inserted into the tubular edges of the supporting sheet so that the ends of the frame members extend out of the tubular edges at the non-tubular corners of the sheet. Then the adjacent frame members are secured together except at one of the corners. In the next step, the sheet is tensioned by pulling the unsecured frame members outwardly and then securing the frame members together. The final step involves securing the short corner struts to adjacent frame members outward of the non-tubular corners.

The preferred method for tensioning the supporting sheet is to assemble four frame members into a rectangular frame with opposed frame members which are spaced sufficiently far apart to tension the supporting sheet. The preferred method for securing the adjacent frame members and the short corner struts to the frame members is to connect them with nut and bolt connections.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective plan view of the mattress support of the preferred embodiment of the present invention;

FIG. 2 is a perspective bottom view of the mattress support of FIG. 1;

FIG. 3 is an enlarged bottom view of one corner of the mattress support of FIGS. 1 and 2;

FIG. 4 is a vertical sectional view taken along line 4—4 of FIG. 1; and

FIG. 5 is an exploded perspective view of the mattress support of the preceding figures.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The mattress support **10** of the preferred embodiment of the present invention in assembled condition as illustrated in FIGS. **1 – 4** includes a supporting sheet of fabric **12** that is disposed in flat tensioned condition across a rectangular frame **14** formed of four straight elongated angled frame members **16** that are dimensioned for seating of the mattress support in a bed structure.

The supporting sheet **12** is rectangular in shape and has four straight tubular edges **18** extending along a major portion of the periphery of the sheet **12** and interrupted by four non-tubular corners **20** at which the tubular edges **18** open, as at **22,** in relatively close proximity to one another. The tubular edges **18** are formed by folding over the edges of a flat sheet of fabric and then sewing the edges along the inturned ends thereof, as at **24,** to the sheet to form tubular edges **18** which are large enough to receive the aforesaid frame members **16.** For convenience, the sewing can be extended around unturned corners **20.** The non-tubular corners **20** and open tubular ends **22** result from cutting of the sheet inwardly to provide the open ends **22** and cutting diagonally between the inward cuts. Limiting the inward cuts to only that necessary to form the open tubular ends **22** and connecting these by a diagonal cut minimizes the size of the corners **20** for maximum strength and minimum hazardous corner opening. For the same purpose, the tubular edges **18** extend uninterrupted between the corners **20.**

The use of a supporting sheet of fabric eliminates the danger of an occupant or bed clothes becoming entangled in openings, eliminates the need and expense of springs, and eliminates the rust, dust, and dirt problems occurring with metal link fabric spring units.

Preferably, the supporting sheet **12** is a non-woven fabric made of heat-bonded polypropylene fibers such as that presently marketed under the tradename TYPAR by E. I. duPont de Nemours & Company of Wilmington Del. TYPAR exhibits good strength, durability, and toughness, and importantly withstands sagging in use, as well as punctures without tearing either when punctured or later when subjected to further stress.

The straight elongated angled frame members **16** are disposed within the aforementioned straight tubular edges **18** of the supporting sheet **12,** as illustrated by FIG. **4,** and extend from the tubular edges **18** out of the openings **22** at the non-tubular corners **20,** as illustrated in FIGS. **1 – 3.** The four frame members **16** are formed into a frame **14** with two side frame members and two end frame members. Each frame member **16** has a horizontal flange **26** and a vertical flange **28** which impart strength and rigidity to the assembled frame **14** and mattress support **10.** The vertical flanges **28** are located outwardly on the frame **14** to form the periphery thereof and the horizontal flanges **26** are located on the upper surface of the frame **14.** Each frame member **16** has a hole **30** in its horizontal flange **26** closely adjacent each end thereof, with the holes in adjacent frame members **16** aligned for receiving bolts **32** such that the frame members **16** can be secured together by the bolts **32** and by washers **34** and nuts **36** fastened thereto. Thus, adjacent frame members **16** are secured together by nut and bolt connections. Alternatively, the securing means may be rivets, if it is preferred that the frame be permanently assembled rather than being easily assembled or disassembled.

The assembled frame is rigidified by four short corner struts **38** that extend between adjacent frame members **16** outward of the non-tubular corners **20** of the supporting sheet **12.** These struts **38** are flat metal strips and have holes **40** closely adjacent the ends thereof for alignment over holes **42** in the horizontal flanges **26** of the frame members **14** inwardly of the ends thereof adjacent the open ends **22** of the tubular edges **18** of the sheet **12.** The struts **38** are secured to the frame members **16** by bolts **44** extending through the aforementioned frame member and strut holes **42, 40,** respectively, and to which are secured washers **46** and nuts **48.** The means for securing the struts **38** may alternatively be rivets if it is not necessary that the mattress support be easily assembled or disassembled.

Despite its advantages of rigidity and safety, the mattress support **10** of the present invention may be easily assembled from and is adaptable to marketing in a knocked-down, i.e., unassembled, condition. The parts can be produced, packed in an easy-to-transport package, and sold to the ultimate user as a do-it-yourself mattress support at a substantial labor and shipping cost saving to the manufacturer and dealer. The ultimate user will unpack the parts and assemble them according to the following method, which can be more easily understood by referring to FIG. **5.**

First, four frame members **16** are inserted into the tubular edges **18** of the rectangular supporting sheet **12** so that the frame members **16** extend outwardly from the openings **22** in the tubular edges **18** at the non-tubular corners **20** of the supporting sheet **12,** with the vertical flanges **28** of the frame members **16** extending downwardly and the horizontal flanges **26** extending inwardly. Next, adjacent frame members **16** are secured together by the nut and bolt connections at all but one of the non-tubular corners **20.** The nut and bolt connections are comprised of bolts **32** which extend downwardly through the above-described holes **30** in the horizontal flanges **26** of the adjacent frame members **16** which are to be secured together, washers **34** through which the bolts **32** also extend, and nuts **36** through which the bolts **32** extend and which tightly fasten the nut and bolt connections, thereby securing the adjacent frame members **16** at three corners of the frame **14.**

The supporting sheet **12** is then tensioned by pulling the unsecured frame members **16** at the fourth corner outwardly until their holes **30** are aligned and then securing together these frame members **16** with a nut and bolt connection to form the rectangular frame **14** with opposed frame members **16** spaced sufficiently far apart to tension the supporting sheet **12** therebetween. The final step of the method comprises securing the short corner struts **38** to adjacent frame members **16** outward of the non-tubular corners **20** by aligning the holes **40** in the struts **38** over the corresponding holes **42** in the frame members **16** and securing these parts with nut and bolt connections that include bolts **44** extending downward through the holes **40, 42** and washers **46** and nuts **48** secured on the bolts **44.**

The present invention has been described in detail above for purposes of illustration only and is not in-

tended to be limited by this description or otherwise to exclude any variation or equivalent arrangement that would be apparent from, or reasonably suggested by, the foregoing disclosure to the skill of the art.

I claim:

1. A method of assembling a mattress support having a supporting sheet of fabric with generally straight tubular edges extending along a major portion of the periphery of the sheet and interrupted by non-tubular corners at which the tubular edges open in relatively close proximity to one another, elongated straight angled frame members, and short corner struts, said method comprising the steps of:

a. inserting the frame members into the tubular edges of the supporting sheet such that the frame members extend outwardly from the tubular edges at said corners;

b. securing together adjacent frame members except at one of said corners;

c. tensioning said supporting sheet by pulling the unsecured frame members outwardly and then securing together the frame members; and

d. securing said short corner struts to adjacent frame members outward of said corners.

2. A method as defined in claim **1** and further characterized in that said tensioning of said supporting sheet comprises assembling four frame members to form a rectangular frame with opposed frame members spaced sufficiently to tension the supporting sheet.

3. A method as defined in claim **1** and further characterized in that said securing of adjacent frame members and the corner struts and frame members comprises connecting said frame members together and said struts to said frame members with nut and bolt connections.

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