United States Patent [19]

Propst

[11] **3,855,655**

[45] **Dec. 24, 1974**

[54] **SELF-MAKING BED**

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[73] Assignee: **Herman Miller Inc.,** Zeeland, Mich.

[22] Filed: **July 12, 1973**

[21] Appl. No.: **378,649**

[52] **U.S. Cl.** ..... **5/317 R,** 5/321

[51] **Int. Cl.** **A47c 21/00**

[58] **Field of Search** ..... 5/334 C, 317 R, 321, 319, 5/320, 344; 297/DIG. 6

[56] **References Cited**

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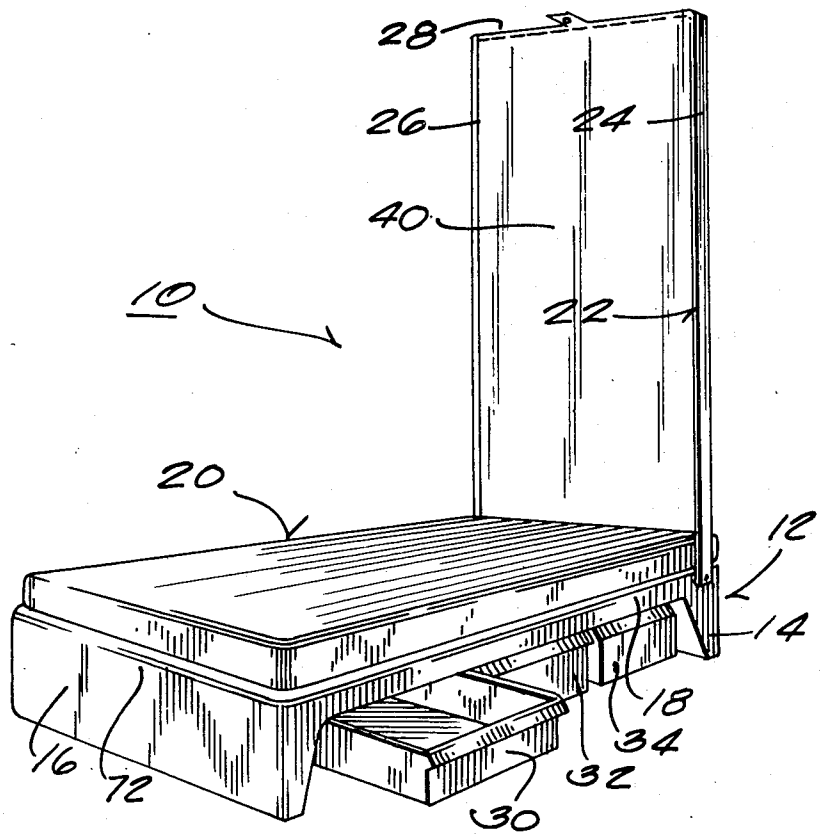
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Attorney, Agent, or Firm—Price, Heneveld, Huizenga, & Cooper

[57] **ABSTRACT**

A U-shaped cover frame is pivotal about one end of a day-bed and includes one or more covers attached at one end to the cross member of the frame. The frame pivots between an upright position wherein the covers are hung loosely above one end of the bed and a lowered position wherein the covers lie over the bed in self-making fashion. The covers are removably attached to each other and to the cross member by a plurality of paired overlapping strips of material, one strip having a looped pile fabric and the other a plurality of resiliently deformable hooked-shaped elements which when pressed against the pile fabric becomes securely but removably entangled therewith.

11 Claims, 5 Drawing Figures



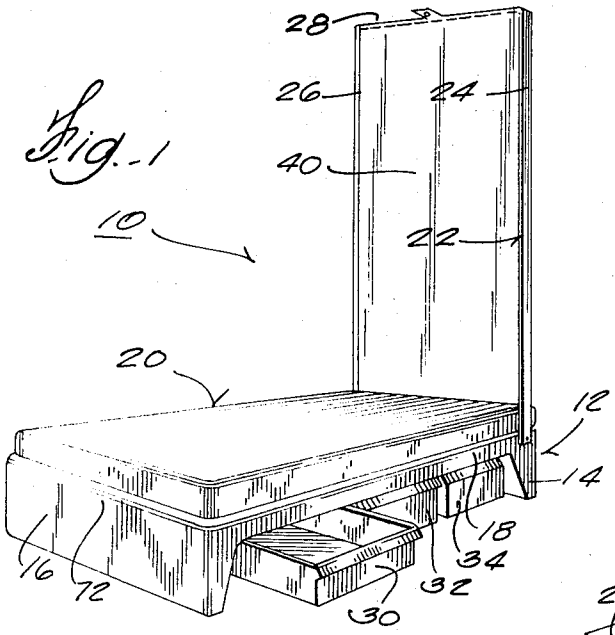


Fig. 1

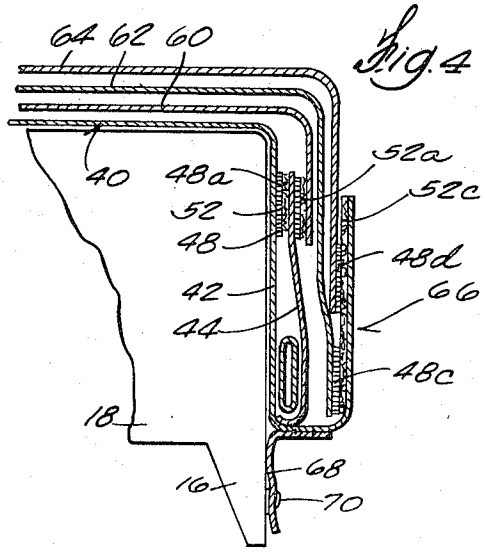


Fig. 4

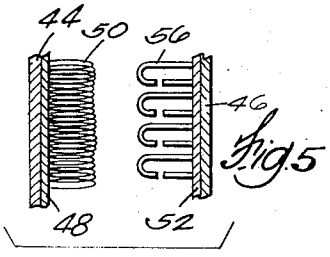


Fig. 5

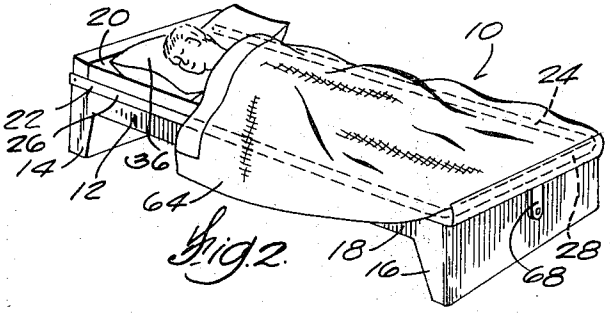


Fig. 2

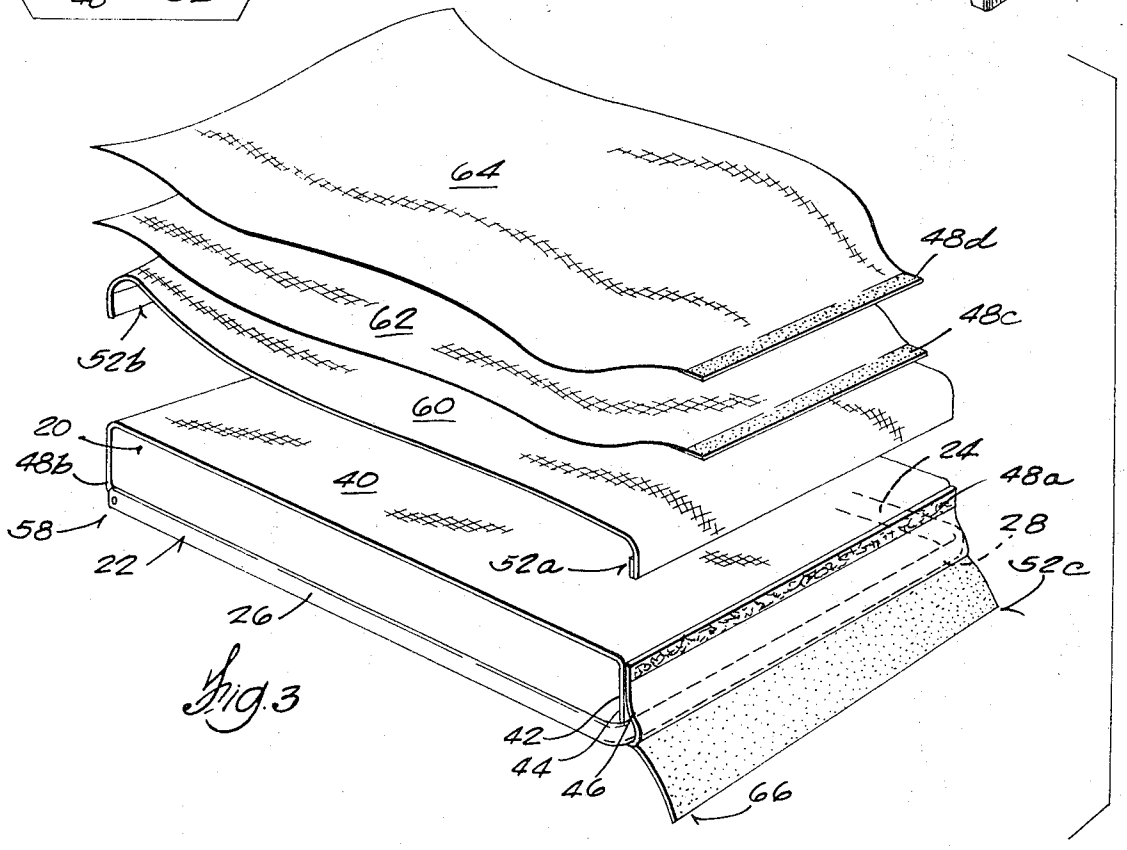


Fig. 3

SELF-MAKING BED

BACKGROUND OF THE INVENTION

This invention is particularly related to a day-bed utilized selectively as a couch or a bed.

The upturn in population of the last decade along with steady inflationary trends in building costs and the price of land has put an ever increasing burden on institutions such as colleges and universities to provide adequate living space for its students and the like at a reasonable cost. This premium on land and building has been felt in the home building industry as well. In order to reduce the amount of individual living space required, it is well known to combine the traditional bedroom with the living room producing what is known as an efficiency or studio apartment. Either a single piece of furniture is utilized for the bed and couch or a retractable bed is used and stored in an upright position during the day with a separate piece of furniture being used for a couch.

There are several disadvantages to the retractable bed concept since it is an investment in addition to a couch and is generally permanently anchored to or into the wall. This prevents flexibility and location within the room or in the alternative added costs in labor and repair if it is relocated. The combination day-bed of the prior art also has its drawbacks since in accordance with the teaching of the prior art, it requires daily changing and storage of the sheets and blankets utilized during the nights for sleeping purposes and putting a fitted day-bed cover on it for use as a couch or the like during the day. The tendency among many students or the like is to forego the effort in so outfitting the combination day-bed and hence the room tends to be in a state of disarray which is nonconductive to student morale and learning habits. These same concepts and drawbacks are similarly present whether the day-bed is used in other environments such as hospitals or residencies. There is thus a need in this art for an improved combination day-bed which is in effect self-making.

SUMMARY OF THE INVENTION

In accordance with the invention, a free-standing couch includes a cover frame having a pair of arms interconnected by a cross member. The arms extend essentially the length of the bed and are pivotally anchored at one end to the head of the bed for movement between an upright position wherein the frame is vertically upright and a lowered position wherein the frame is essentially horizontal overlapping the couch with the cross member positioned at the foot of the bed. One or more sheets and covers are removably anchored to the cross member of the frame by an attachment means such that they are loosely suspended for airing out and storage in the upright position and in proper overlapping self-made position for sleeping when in the lowered position.

In a narrower aspect of the invention, the sheets and covers are removably anchored to the web of the frame by a plurality of strips secured to the foot end of each of the sheets and covers which strips overlap. Certain of these strips have a pile fabric of looped elements and the others include a plurality of resiliently deformable hooked shaped elements which, when pressed against the pile fabric, become securely but removably entangled therewith.

The free standing combination day-bed permits easy movement into any desired location within the room of its intended use. By simply pivoting the frame upward into the upright position when the day-bed is to be used as a couch, the sheets and covers are suspended freely for ventilation, the bottom sheet preferably being aesthetic in appearance so that the upright frame and enclosed sheets and covers are pleasant to the eye within the motif of the room. For use as a bed, the frame is simply lowered with the sheets and covers overlying the body support portion of the day-bed in proper order such that the bed is completely self-making. For periodic washing and cleaning, the sheets and covers are quickly and simply removed by pulling the deformable hook strip portions away from the pile fabric portions to separate the sheets and covers from the frame.

DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of the self-making bed of the invention illustrating the frame and associated covers in the upright position;

FIG. **2** is a perspective view of the self-making bed of the invention illustrating the frame and associated covers in the lowered position for sleeping;

FIG. **3** is an exploded view of the mattress and frame illustrating the overlap of the covers and sheets;

FIG. **4** is a fragmentary cross-sectional view enlarged to illustrate the removable attachment of the sheets and covers to the frame; and

FIG. **5** is an enlarged side elevation view with parts in cross section, illustrating one of the fastening means positioned in oppositely disposed relation.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in detail, FIG. **1** illustrates a day-bed **10** which is free standing on its own support frame **12** having front and rear leg portions **14** and **16** interconnected by a support platform **18.** The front and rear leg portions also define the head and foot of the bed respectively. A body support in the form of a mattress **20** rests on platform **18** and is preferably covered by an aesthetic fabric so that when the day-bed is used as a couch for sitting, the exposed mattress has an aesthetic appearance.

Referring yet to FIG. **1,** a generally U-shaped frame **22** includes a pair of arms **24** and **26** interconnected at one end by a cross member or web portion **28.** The opposite ends of each arm are pivotally anchored to the head end of frame **12** for movement between an upright position illustrated in FIG. **1** wherein the frame is in a vertical position relative the bed over the head end and a lowered position as illustrated in FIGS. **2–4** wherein the frame **22** is lowered into a generally horizontal position overlapping mattress **20** with web **28** of the frame lying generally in the plane of mattress **20** at the foot end of bed **10.** As will be described in more detail hereinafter, a plurality of sheets and covers are anchored to web **28** so that when the frame is in the lowered position, the bed is self-making with the sheets and covers overlying the mattress for sleeping and when in the upright position, the sheets and covers are suspended vertically for ventilation while the day-bed is usable as a couch. For extra utility, a plurality of slidable drawers **30, 32, 34** (FIG. **1**) may be slidably suspended from the support platform **18** for storing pillow **36** (FIG. **2**) or any other desired effects of the user.

Referring now to FIGS. 3 and 4, the preferred embodiment includes a mattress cover or graphic sheet 40 which in the lowered position illustrated in FIG. 3 covers the mattress surface. In the upright position as illustrated in FIG. 1, graphic sheet 40 is the outer exposed sheet shielding the remaining sheet and covers. Preferably, sheet 40 is a fabric material which has an aesthetic appearance which compliments the sourrounding motif of the room so that during the day, the upright positioning of the frame and associated sheets and covers is not distracting or unsightly.

Graphic sheet 40 is preferably anchored at the head end of the bed to the mattress or frame so that when tension is applied to sheet 40, it is securely anchored at the head end. The graphic sheet is more or less permanent in the sense that it is generally not removed from the frame or bed although it may be removably secured to the front head of the bed. The length of the graphic sheet is such that when frame 12 is in the lowered position, the sheet extends entirely over the upper surface of mattress 20 and covers the endwall 42 at the foot of the bed thus having an endwall portion 44. The sheet then loops around web 28 and includes a terminal end portion 46 which at least partially overlaps in flush engagement with wall portion 44.

Referring to FIG. 5, a strip of pile fabric 48 containing a large plurality of loop elements 50 is secured to endwall portion 44 of graphic sheet 40 with a plurality of closely positioned loop elements facing outwardly. The loop elements are preferably comprised of a material which is both rigid and resilient so that it retains its desired shape. The strip preferably extends the entire width of mattress 20 although it will be appreciated that this is not necessary. A corresponding strip of material 52 comprising a plurality of hook elements 54 is affixed to the inner surface of end portions 46. The loops 50 and hook elements 56 are resilient and deformable and when the hook shaped elements are positioned in juxtaposition and pressed against pile fabric 48, they become removably entangled with loop elements 50 pivotally securing strip 52 to strip 48. They can however be released from entangled engagement by positively pulling the hook elements away from the loop elements or vice versa. The looped and hooked fabric elements 48 and 52 are available under the tradename "Velcro" more specific details of which may be had from U.S. Pat. Nos. 2,717,437 and 3,114,951. The material is hereinafter referred to as "Velcro" looped material and "Velcro" hooked material.

The front or head margin 58 of graphic sheet 40 (FIG. 3) may also be attached to mattress 20 or base 12 by utilizing a strip of Velcro loop material on the mattress or support and a corresponding strip of Velcro hook material along the margin 58 of sheet 40 (not shown).

Continuing now in detailed reference to FIGS. 3 and 4, the preferred embodiment illustrated shows in addition to graphic sheet 40, a bottom sheet 60; a top sheet 62 and a blanket 64. It will be appreciated that depending on the individual needs or desires of the user, additional or less sheets and/or covers may be provided. The embodiment illustrated however is what would be considered the basic arrangement for most typical users.

Graphic sheet 40 includes an additional strip of Velcro loop material 48*a* affixed to the outer or exposed marginal surface of end portion 46. This facilitates releasable engagement with a strip of corresponding Velcro hook material 52*a* affixed to the inner surface of the foot end of bottom sheet 60. Since bottom sheet 60 is the lower sheet upon which the user reclines, the head end is preferably also positively secured to the head end of the bed. Thus bottom sheet 60 may also include a corresponding Velcro hook strip 52*b* which releasably engages a corresponding Velcro loop strip 48*b* at the head end of graphic sheet 40 so that the sheet 60 is positively held in position. With regards to both graphic sheet 40 and bottom sheet 60, the length of the sheet is selected such that when the sheets are anchored in place and frame 12 is pivoted into the lowered position, the weight of frame 12 exerted through web portion 28 applies a slight tensioning to graphic sheet 40 and bottom sheet 60 so that it is in effect self-making on mattress 20.

Graphic sheet 40 further includes a flap 66 extending therefrom at approximately the transition between end portion 46 and endwall portion 44. Flap 66 hangs by its own weight in a generally vertical direction and the entire inner facing thereof is preferably encompassed by Velcro hook material 52*c*. Correspondingly, the outer surface along each marginal foot end of top sheet 62 and blanket 64 includes a strip of Velcro loop material 48*c* and 48*d* respectively such that when the top sheet 62 and blanket 64 are positioned over mattress 20 with their marginal ends slightly offset, flap 66 is pivotal up into engagement between the Velcro loop and Velcro hook material as illustrated in FIG. 4. In this fashion, the entire foot ends of graphic sheet 40, bottom sheet 60, top sheet 62 and blankets 64 are releasably engaged with web 28 of frame 22 so that they can be jointly rotated between the upright (storage) position illustrated in FIG. 1 and the lowered bed position illustrated in FIG. 4. Once joined together, the sheets and covers hang loosely from web 28 in the storage position. This permits use of the bed as a couch and also airs out the sheets and covers. Alternatively, when cover frame 22 is lowered, the bed is self-making and immediately available for its intended use.

Referring to FIGS. 1 and 2, a tab 68 extends downwardly from flap 66 at the midsection and includes a snap 70 which is engageable with a corresponding mating snap 72 mounted to the foot end of bed 10 to anchor cover frame 22, sheet and covers 40, 60, 62 and 64 in the lowered position to prevent unintentional accidental raising of the frame. Although not shown nor described in detail, a bias means such as a spring may be utilized in connection with the pivot mechanism of the cover frame (not shown) to bias the frame and covers into an upright position once positioned upright. This would require a positive force application on frame 22 to bring it into the lowered position and prevent accidental lowering of the frame and associated covers and blankets.

Although but one embodiment has been shown and described in detail, it will be obvious to those having ordinary skill in this art that the details of construction of this particular embodiment may be modified in a great many ways without departing from the unique concepts presented. It is therefore intended that the invention is limited only by the scope of the appended claims rather than by particular details of construction shown, except as specifically stated in the claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A combination bed and couch comprising, in combination: a support frame; a body support mounted on said support frame; a cover frame pivotally fixed to said support frame; cover means removably anchored to said cover frame, said cover frame being pivotal relative said body support and support frame between a first position wherein said cover frame extends above said support frame and body support generally perpendicular thereto such that said cover means hangs generally vertically from said cover frame and a second position wherein said cover frame lies generally within or parallel to the plane of said body support and said cover means covers said body support, said cover means including a first cover having an end looped around a portion of said cover frame, part of said end having a plurality of resiliently deformable hook-shaped elements and another part having a plurality of loop elements said hook elements being releasably engageable with said loop elements when said end is looped around said portion of said cover frame to releasably anchor said first cover to said cover frame.

2. The combination bed and couch according to claim **1** wherein said support frame and body support includes a head end and foot end, said cover frame is pivotally connected to said support frame at said head end, said frame having a generally U-shape comprising a pair of arms connected at one end to said head end of said support frame and interconnected at the other end by a web, said web extending along the foot end of said frame adjacent the foot end of said body support when said cover frame is in said second position, said cover means being connected to said cover frame at said web.

3. The combination bed and couch according to claim **2** wherein said first cover is a fabric cover which covers said body support when said body frame is in said second position and shields the remainder of said cover means when said cover means is in said first position.

4. The combination bed and couch according to claim **3** wherein said fabric cover includes a foot portion which covers the foot end of said body support when said cover frame is in said second position and an adjacent end portion wrapped around said web into juxtaposition with said foot portion of said fabric cover, one of said foot and end portions including at least a strip of pile fabric material having loop elements, the other of said foot and end portion including a strip of material having a plurality of resiliently deformable hook shaped elements incorporated therewith, whereby said end portion of said fabric cover can be removably affixed to the foot portion of said fabric cover interconnecting said fabric cover to said web by pressing said hooked shaped elements into removable entanglement with said loop elements.

5. The combination bed and couch according to claim **4** wherein said cover means further includes a first sheet having a foot end which covers said fabric cover when said cover frame is in said second position, one of the end portions of said fabric cover and foot end of said first sheet including a strip of pile fabric having looped elements, the other of said end portion and foot end including a strip of material having a plurality of resiliently deformable hook shaped elements incorporated therewith, whereby said end portion of said fabric cover and foot end of said first sheet can be removably affixed to each other by pressing said hook shaped elements into removable entanglement with said loop elements.

6. The combination bed and couch according to claim **5** wherein the end portion of said fabric cover includes a strip of one of said pile fabric and hook material on each side of said end portion, one releasably engaging said strip of material on the foot end portion of said fabric cover, the other releasably engaging the foot portion of said first sheet.

7. The combination bed and couch according to claim **4** wherein said fabric cover includes a flap extending from the transition of said foot and end portions, said flap being movable into position toward engagement with the foot end of said bed, the inner surface in said position being covered with a plurality of loop elements, said cover means further including one or more sheets and covers which fit respectively over said body support including at least a portion of the foot end thereof when said cover frame is in said second position, the marginal foot portion of each of said sheets and covers including one or more strips of fabric material having a plurality of resiliently deformable hook shaped elements incorporated therewith, said sheets and covers being positioned over said body support and slightly offset at the foot ends thereof whereby said sheets and covers are removably affixed to said flap by pressing the loop portions of said flap into removable entanglement with the hook shaped elements of said sheets and covers.

8. A self-making bed and couch comprising, in combination: a support frame; a body support on said support frame; a cover frame pivotally anchored to the head end of said support frame, said cover frame including a pair of arms pivotally anchored at one end to said head end of said support frame and pivotal jointly between a raised generally vertical position to a lowered generally horizontal position wherein said arms extend alongside said body support, said arms extending the length of said body support in said lowered position and being interconnected at said other end by a cross member; and cover means removably attached to said cross member, said cover means overlying said body support when said frame is in said lowered position and being loosely suspended vertically from said cross member when said cover frame is in said raised position, said cover means having a fabric cover which overlies said body support when said cover frame is in said lowered position, the foot end of said fabric cover being wrapped around said cross member and removably joined to itself by a first fabric pile material having loop elements on one portion of the foot end, and a second material having a plurality of resiliently deformable hook shaped elements incorporated therewith on a second portion of said fabric cover, said first and second material portions being pressed into removable entanglement with each other.

9. The self-making bed according to claim **8** wherein said cover means includes additional sheets and covers overlying said fabric cover when said cover frame is in said lowered position, each of said sheets and covers including additional and complementary portions of said first and second materials to permit complete removable interconnection of said sheets and covers to the cross member of said frame.

10. The self-making bed according to claim 9 wherein said fabric cover shields the remaining sheets and covers when said cover frame is in said raised position.

11. The self-making bed according to claim 10 wherein said fabric cover is covered by a first sheet when said cover frame is in said lower position, said first sheet being positioned beneath the body of the user reclining on said body support, said cover fabric and said first sheet being additionally removably anchored with respect to the head end of said support frame and body support.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 3,855,655

DATED : December 24, 1974

INVENTOR(S) : Robert L. Propst

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 36;
"nonconductive" should be --- noncondusive ---;

Column 7, line 5;
"Claim 10" should be --- Claim 9 ---.

Signed and sealed this 29th day of April 1975.

(SEAL)
Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents
and Trademarks