June 3, 1969 M. P. SPITZ 3,447,170

ARTICULATING PLATFORM STRUCTURE FOR SUPPORTING MATTRESS ON CONTOUR BEDS

Filed Sept. 5, 1967

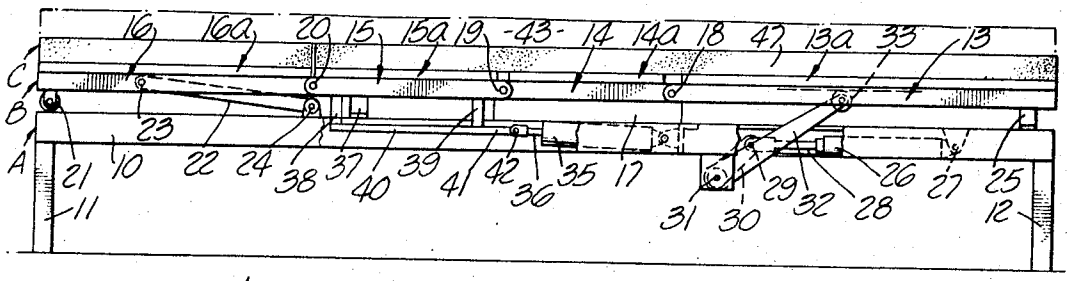

FIG. 1.

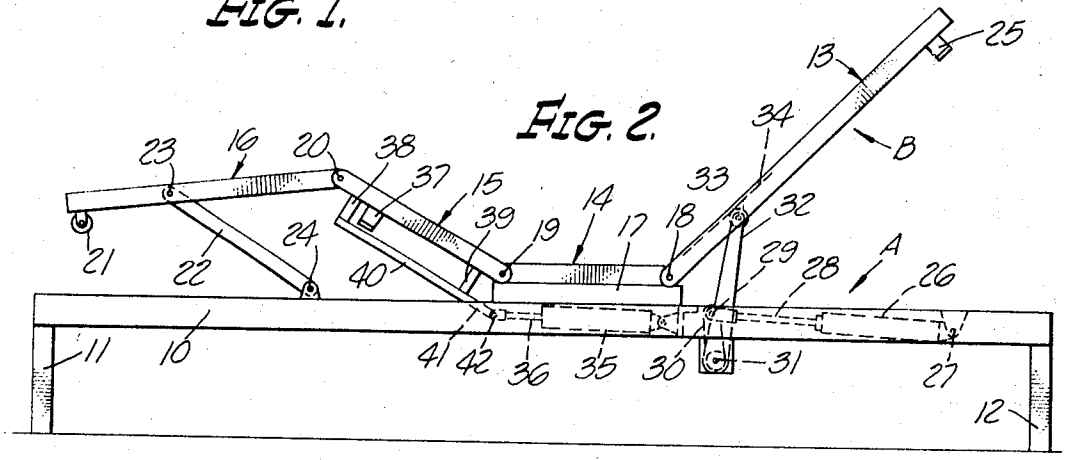

FIG. 2.

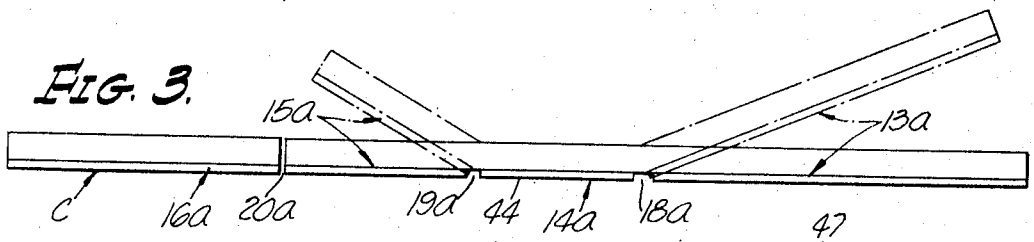

FIG. 3.

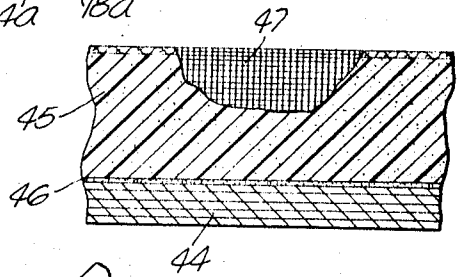

FIG. 5.

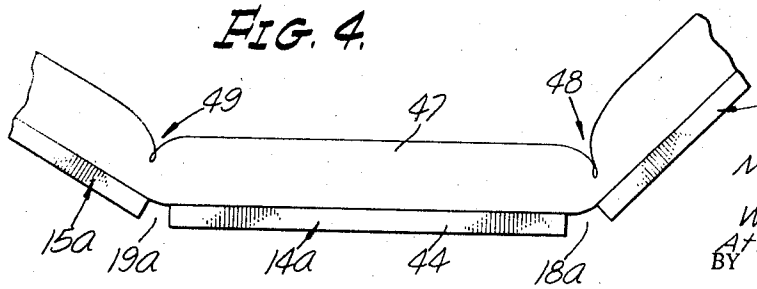

FIG. 4.

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ARTICULATING PLATFORM STRUCTURE FOR SUPPORTING MATTRESS ON CONTOUR BEDS

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U.S. Cl. 5—91 2 Claims

ABSTRACT OF THE DISCLOSURE

An articulate mattress supporting platform structure for an adjustable contour bed in which one or more rigid panels of plywood are secured to bed frame sections, each panel having a pad of cushioning material such as foam rubber bonded to its upper surface, and in the case of multiple panels, the panels being positioned end-to-end with adjacent edges spaced apart and bridged by the cushioning material so that when the panels are moved to a relatively angular position from a coplanar position, the bridging cushioning material will be compressed and creased. An enevlope encloses the cushioning material and is marginally secured to the associated panel or panels.

Background of the invention

The present invention relates generally to a mattress supporting structure.

The present invention is especially useful for embodiment as a component part of adjustable bed units such as have heretofore been primarily utilized in hospitals and similar institutions where it is desirable to position different portions of a patient's body in a variety of positions during a course of treatment or otherwise. Such beds were provided with pivotally connected sections in end-to-end relation, these sections in the usual construction being provided with mattress supports of link fabric which was peripherally attached along its sides and ends by means of coiled tension springs to the section frames.

Currently, there is an increasing demand to utilize adjustable beds of the above described character in homes and other domestic uses, such beds being provided with appropriate power means and selective control which will permit the user to selectively adjust the bed sections as desired for comfortable television viewing, reading, and the like.

Link fabric and other means of mattress support which have been utilized to particularly adapt these beds for hospital use are relatively crude and not designed for permanent use such as that in the home. According to the present invention, it is proposed to provide a higher quality and more attractive mattress supporting articulating platform, which will not be excessively thick (to maintain a relatively low bed height) and which will be more economical to produce than an articulating innerspring support structure.

Summary of the invention

The present invention relates generally to a mattress supporting structure, and is more particularly concerned with an articulate platform structure for use in connection with adjustable contour beds and the like.

It is one object of the invention to provide a mattress supporting structure for use in combination with an adjustable bed frame, such structure embodying a unique supporting platform in which a rigid panel is secured to the frame section, this panel having bonded to its upper surface a pad of flexible resilient-like material.

Another object is to provide an articulate mattress supporting platform structure which embodies a plurality of

panels of rigid material in end-to-end relation which are respectively securable to adjacent pivoted sections of the bed frame, these panels having a single continuous pad of flexible resilient material bonded to their upper surfaces and bridging the space between the adjacent edges of the panels.

Further objects and advantages of the invention will be brought out in the following part of the specification, wherein detailed description is for the purpose of fully disclosing several embodiments of the invention without placing limitations thereon.

Brief description of the drawings

Referring to the accompanying drawings, which are for illustrative purposes only:

FIG. 1 is a side elevational vew of an adjustable bed structure embodying a mattress supporting structure according to the present invention, the bed sections being positoned in coplanar relationship;

FIG. 2 is a similar view to that of FIG. 1 with the mattress supporting structure removed, and showing the bed sections in relatively adjusted positions;

FIG. 3 is a side elevational view of the mattress supporting platform structure of the present invention illustrating the coplanar position of sections thereof, and relative positions in phantom lines when adjusted to an acute angle above the coplanar position;

FIG. 4 is an enlarged fragmentary side elevational view of the same showing adjacent sections in relatively adjusted positions; and

FIG. 5 is an enlarged fragmentary section through the support to show further details of construction.

Description of the preferred embodiment

Referring more specifically to the drawings, for illustrative purposes, the present invention will be described in connection with a bed of the adjustable type, although it will be appreciated that the bed sections might comprise an adjustable chair or chaise lounge, and the present invention is not to be limited specifically to bed structures per se.

More specifically, the illustrated bed structure comprises a unitary assembly composed of a lower horizontal supporting frame A and an upper frame B.

The frame A may embody a variety of constructional arrangements but is disclosed in this application as comprising a frame structure which is of rigid substantially rectangular configuration with a side rail **10** at each side supported by end leg members **11** and **12** so that the side rail will occupy a substantially horizontal position. The side rails may be connected by the usual end rails and intermediate bracing members in conventional manner.

The upper frame B is of articulate construction, and is composed of a number of sections as shown in FIG. 2, and it will be understood that while only one side of the sections have been shown, the sections are of conventional construction and include an opposite side similar to that shown. For purposes of illustration, it is believed that it will only be necessary to disclose one side of the connected frame sections in order to clearly understand the invention.

More specifically, the upper frame B is composed of a plurality of sections which are connected in pivoted or hinged end-to-end relation so as to form a conventional head section **13**, seat or hip section **14**, thigh section **15**, and foot section **16**. These sections are identified by the numerals applied to their side rails, and since the side rails are the same and duplicated on opposite sides of the bed frame structure, reference will be made to one side only in the following description.

The seat section **14** is supported at each side on a spacer plate **17** carried by the supporting frame A. The seat section is thus fixed and is not adjustable. The head section **13** has a pivotal connection **18** with the seat section, and the thigh section **15** has a pivotal connection **19** with the seat section. The thigh and foot sections are hingedly connected by a pivot connection **20**. The free end of the foot section is provided on each side with roller means **21** which is adapted to engage the side rail **10** and form a support for this end of the foot section, when the foot section is in lowered position, as shown in FIG. 1. Movement of the foot section during adjustment is guided by means of an elongate link **22**, this link having one end pivoted at **23** to the foot section and its opposite end pivoted at **24** to frame A. The head section **13** carries a bracket **25** at its free end for engagement with the frame A, when the head section is in lowered position.

Conventional power means with manually selectable control (not shown) are provided whereby the occupant of the bed may selectively adjust the position of the head section **13**, or the position of the thigh section **15** and connected foot section **16**. As exemplary of the power means for actuating the head section, this is shown as comprising a fluid actuator with a cylinder **26** which is pivotally connected at one end of the lower frame A as indicated at **27** for vertical swinging movement. The cylinder is operatively associated with a reciprocable power delivery member **28** having its outermost end pivotally connected at **29** to the outermost end of a crank lever **30** carried by a shaft member **31** which extends transversely of the lower frame and is rotatably supported thereon in conventional manner. Also carried by the shaft member **31** is a longer actuating arm **32** which carries a roller **33** at its outermost end, this roller being adapted to bear against a suitable surface on the head section **13**. This surface may comprise one of the leg portions of the section side rail, for example, where the side rail is constructed of an angle member. Such a leg portion is indicated in dotted lines by the numeral **34**. With this arrangement, it will be apparent that when the actuating arm **32** is swung in a counter-clockwise direction by the power means, the head section will be moved to a raised position as shown in FIG. 2, while movement of the arm **32** in a clockwise direction will permit the head section to swing to a horizontal position as shown in FIG. 1.

Similar power means are utilized for adjusting the thigh section **15**. In this case there is provided a fluid cylinder **35** having a power delivery element **36**. The thigh section **15**, as in the case of the head section, carries a bracket **37**, which is positioned to engage the lower frame A when the thigh section is swung to its horizontal position, as shown in FIG. 1. This section is transversely strengthened by means of a pair of tubular bracing members **38** and **39** which extend between the side rails **15** and have their ends secured thereto. The bracing members **38** and **39** extend below the thigh section, however, and form a support for an innerconnecting member **40** which extends therebetween and has a projecting end **41** pivotally connected at **42** to the power deliver element **36**. It will be observed that the connection **42** is offset below the pivotal connection **19** of the thigh section. This offset in effect provides a lever arm so that when the power delivery element is moved to an extended position, the thigh section will be swung about its pivot **19** in a clockwise direction. Upon retraction of the power delivery element, the thigh section will be swung in the opposite direction.

Instead of utilizing conventional link fabric for the bed sections, an articulated mattress supporting unit C is provided for securement to the sections of the upper frame B to form a support for a mattress **43** as shown in dotted lines in FIG. 1.

More specifically with reference to FIG. 3, it will be noted that the articulated unit C is provided with sections which correspond to the sections of the upper frame

B, namely, a head section **13***a*, seat or hip section **14***a*, thigh section **15***a*, and foot section **16***a*, respectively.

The mattress support in each section will in general comprise a substantially rectangular panel member **44** of a sufficiently rigid material, such as plywood, as shown in FIG. 5. The panel is arranged to be secured to the frame section of the bed structure by any suitable conventional means such as anchor bolts or otherwise (not shown) so that the panel will assume the same position as its associated section. Each panel **44** is secured to the material of a pad member **45** of suitable resilient flexible material such as sponge rubber or the like. The confronting surfaces of the pad and panel are bonded together by a suitable bonding agent **46**. Further, the pad material will be encased within a suitable envelope **47** of a suitable fabric **47** of cloth, plastic or other material. If desired, this envelope may have its edge margins secured to the underlying panel by any appropriate means. Preferably, the pad will be of greater thickness than the thickness of the underlying panel.

A feature of the mattress supporting unit of the present invention resides in the use of a construction wherein for example, a number of the panel sections of the mattress supporting unit have their panels in spaced relation to provide separations or spaces between the panels as indicated at **18***a*, **19***a* and **20***a*, which will be positioned directly above the pivot points **18**, **19** and **20** of the upper frame B. The width of these spaces will be determined by the manner in which the adjacent sections are to be relatively pivoted. For example, where the adjusted panels in raised position are at an angle in which they diverge downwardly from their pivot, as in the case of sections **15** and **16** in FIG. 2, the spacing **20***a* may be made a minimum at the time the sections are in coplanar relation. On the other hand, if adjacent sections are to diverge upwardly in their adjusted position as in the case of sections **14** and **15**, FIG. 2, then it is desirable to have a wider space **19***a* at the time the panels are coplanar, since this space will decrease as the panels move into an adjusted position. For this reason, the spaces **18***a* and **19***a* are normally of greater width than the space **20***a*.

It will also be observed that in the case of the sections **13***a*, **14***a* and **15***a* of the mattress supporting unit, the pad material is constructed from a single piece so that at the panel spaces **18***a* and **19***a*, the pad material will form a bridge. This will best be seen in FIG. 4.

With this arrangement, and due to the fact that the pivot points **18** and **19** are respectively disposed below these spaces **18***a* and **19***a*, these spaces in the adjusted position of the sections will become narrowed, and as a consequence the pad material in the upper surface margins of the pad above these spaces will be put into compression and inwardly creased along crease lines **48** and **49** and thus avoid producing raised bulges in these areas which would be undesirable.

From the foregoing description, it is believed that it will be appreciated that the heretofore outlined objects as to the invention will be attained, and that bed structures incorporating the features of the articulated mattress support will provide inherent advantages which are not available in presently known and conventional structures.

I claim:

1. As an article of manufacture, a mattress supporting platform structure for a contour bed frame, comprising:

(a) a plurality of rigid platform panels positioned in end-to-end relation with their adjacently disposed edges in spaced apart relation; and

(b) a pad of relatively thick flexible material extending over the upper surfaces of said panels, said pad bridging the spaces between the adjacent edges of the panels, the engaged surfaces of said pad and panels being bonded together, when the panels are in a coplanar position.

2. An article of manufacture according to claim **1**, including an enclosing envelope around the outer surfaces

of the pad having edge margins extending over and secured to said panel.

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U.S. Cl. X.R.

5—68; 297—457

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,447,170 June 3, 1969

Melvin P. Spitz

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

Column 3, line 26, "of" should read -- to --.

Signed and sealed this 9th day of December 1969.

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents