

May 10, 1966

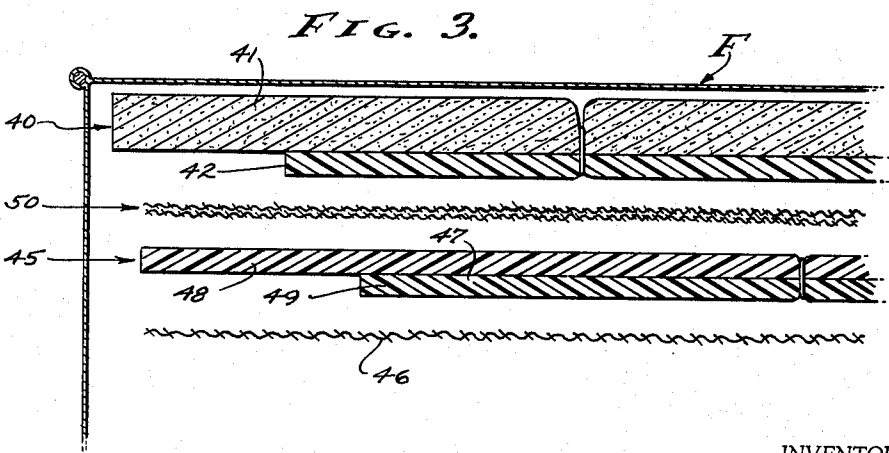
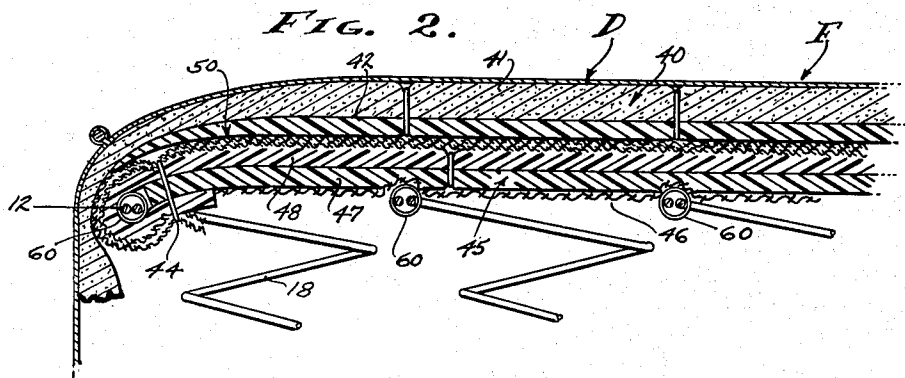
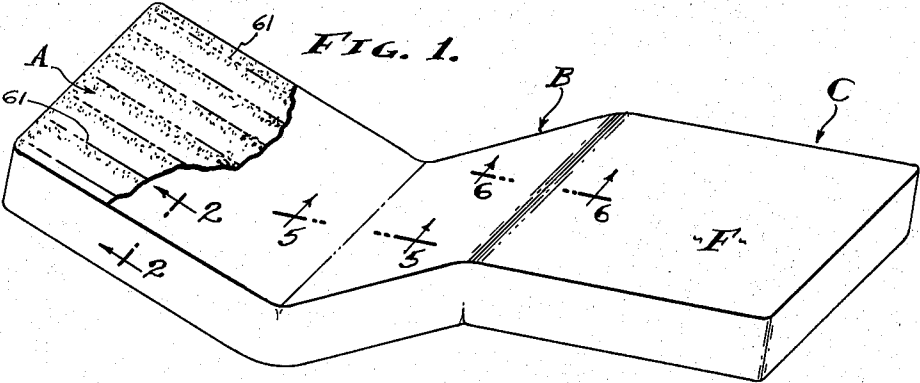
M. N. JANAPOL

3,249,952

ARTICULATED HOSPITAL BEDDING

Filed Jan. 24, 1964

3 Sheets-Sheet 1



INVENTOR.
MELVIN N. JANAPOL
BY
W. H. Yarnall
AGENT

May 10, 1966

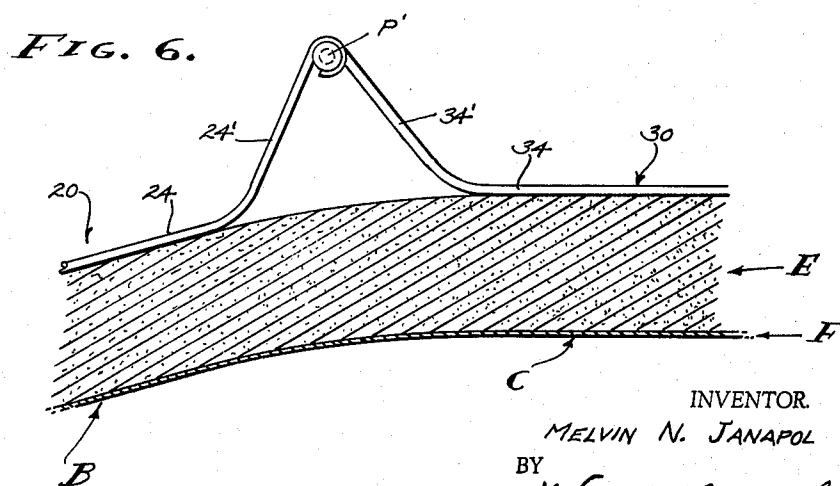
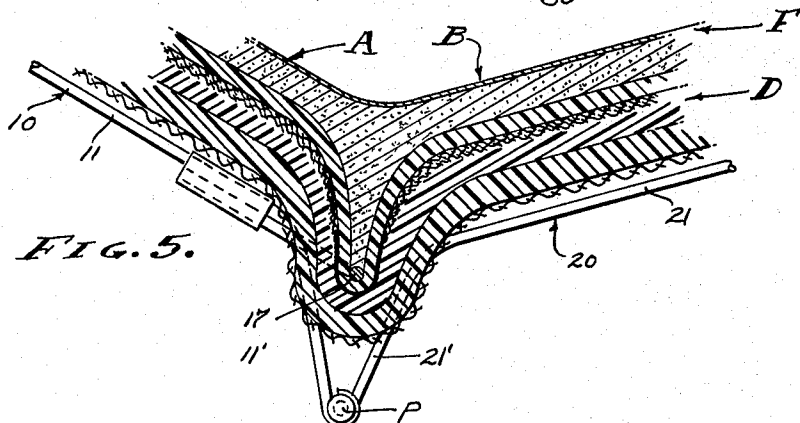
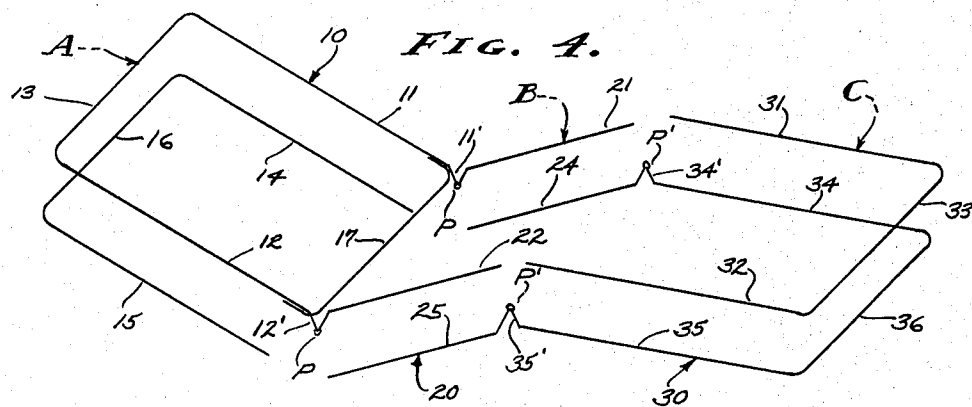
M. N. JANAPOL

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ARTICULATED HOSPITAL BEDDING

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3 Sheets-Sheet 2



INVENTOR
MELVIN N. JANAPOL
BY *H. H. Maxwell*
AGENT

May 10, 1966

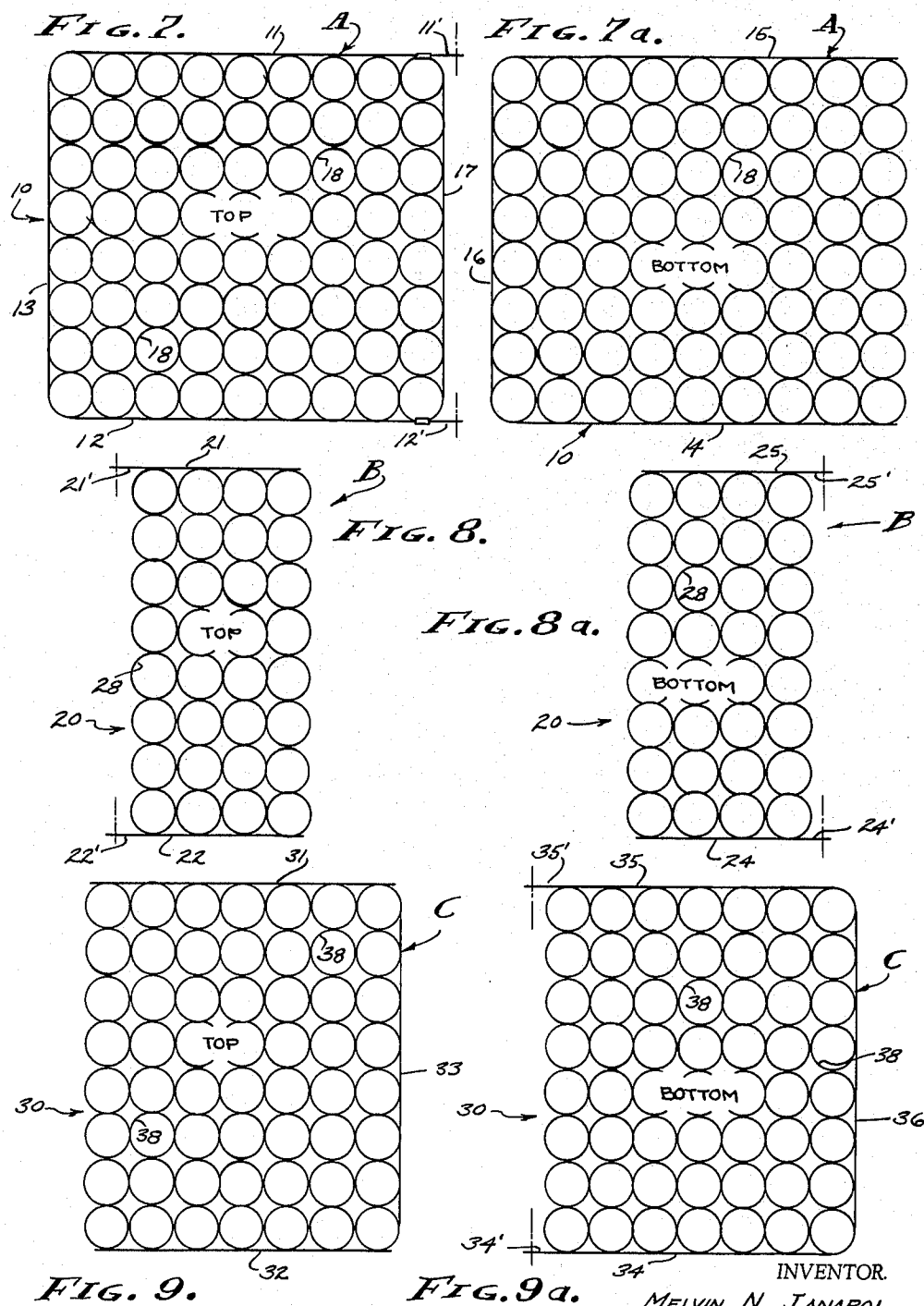
M. N. JANAPOL

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ARTICULATED HOSPITAL BEDDING

Filed Jan. 24, 1964

3 Sheets-Sheet 3



INVENTOR.
MELVIN N. JANAPOL
BY
H. H. Maxwell
AGENT

1

3,249,952

ARTICULATED HOSPITAL BEDDING

Melvin N. Janapol, Los Angeles, Calif., assignor to Wortso Corporation, Los Angeles, Calif., a corporation of California

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8 Claims. (Cl. 5—91)

This invention relates to bedding and is particularly concerned with beds or the like which must be articulate in order to comfortably position a person lying thereon, it being a general object of this invention to provide bedding of this character which articulates freely while maintaining uniform cushioning effect.

Articulated mattresses are commonly employed in hospitals and like establishments, being supported on adjustable beds that comprise selectively movable frame sections. The adjustable bed is not part of the present invention, but is the underlying support upon which the bedding of the present invention must freely articulate. In practice, adjustable beds have two or more relatively movable sections; and most often have three sections, a head section, a center section and a foot section. Ordinarily, these sections are simply pivotally joined one to the other (in relation as indicated in FIG. 1) and the pivotal points of joinder are independently elevated by suitable means (not shown).

Bedding heretofore provided for use on adjustable beds of the type hereinabove referred to has been a subject of concern in institutions such as hospitals where patients are bedridden for long periods of time. In addition to the comfort of the patient hygiene must be considered and ordinary bedding is not altogether conducive to either, since no provision is made therein to properly control articulation and simultaneously maintain uniform cushioning effect. More particularly, ordinary bedding or mattresses of this type are merely sectional, with sufficient space between the springs or sections to permit the cover or padding to bend. It is true that padding is ordinarily provided to span between the sections, but continued and uncontrolled bends soon result in deterioration of the bedding at the points of joinder. As a result, such bedding does not provide a neat and predetermined bend line, but on the contrary is redundant with random folds and undesirable creases accompanied by rapid breaking up of the padding structure.

An object of this invention is to provide articulated bedding, or a mattress, wherein sections thereof which are movable relative to each other are hinged on axes in such a manner that the cushioning and/or padding remains uniformly effective throughout the length of the bedding.

Another object of this invention is to provide articulated bedding, or a mattress, wherein each section comprises a framework integrated with springs and adapted to be hingedly joined together by pivots without adverse effect on the cushioning and/or padding.

It is still another object of this invention to provide a cushioning or padding that is particularly adapted to use in articulated bedding and wherein articulation is not unduly restrained and which readily permits bending without breaking down or deterioration thereof.

The various objects and features of my invention will be fully understood from the following detailed description of the typical preferred form and application of my invention, throughout which description reference is made to the accompanying drawings, in which:

FIG. 1 is a perspective view of a unit of bedding shown in a typical disposition.

FIGS. 2 and 3 are sectional views, being of the cross-section of materials involved in the bedding, FIG. 2 be-

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ing a section taken as indicated by line 2—2 in FIG. 1, and FIG. 3 being an exploded sectional view of the structure shown in FIG. 2.

FIG. 4 is a perspective view of the frame sections involved, the multiplicity of spring coils being removed.

FIGS. 5 and 6 are detailed sectional views taken as indicated by lines 5—5 and 6—6 on FIG. 1.

FIGS. 7 through 9a are top and bottom views of the three frame sections involved in the preferred form of the invention as indicated at each figure of the drawings.

The bedding herein disclosed is a self-contained unit having characteristics of an inner-spring mattress. However, special provision is made for articulation at one or more transverse points, and since the invention is primarily concerned with hospital beds and the like, it is the standardized bed of this type to which I will hereinafter describe by bedding as being applied. The hospital bed which is most often employed involves a plurality of three supporting sections, the head section, the center section and the foot section. Therefore, I will now describe the preferred form of my invention as it is applicable to such a hospital bed and wherein my bedding also has corresponding sections, there being a head section A, a center section B, and a foot section C. In addition to the three general sections A, B and C, there is a top padding D, a bottom padding E, and a cover F. As is clearly shown in FIG. 1 of the drawings, a characteristic positioning of the sections A, B and C places each of said sections on a substantial incline, there being sharp angular joinder at the top padding D between sections A and B while there is a gentle rounding at the opposite padding E, and there being sharp angular joinder at the bottom padding E between sections B and C while there is a gentle rounding at the opposite padding D.

While the joinder of the plurality of sections A, B and C is sharp and gentle as above described in bedding constructed as hereinafter described, such is not the case with ordinary bedding. The difference in ordinary bedding occurs mainly at the said sharp angular joinder where no special provision is made to control bending. Furthermore, the said deficiency is aggravated by the lack of provision in the padding to prevent sloughing thereof when inclined and to permit sliding of the various layers of padding elements when bending occurs, as will become apparent.

Referring now to FIGS. 4, 5, 7 and 7a and to the head section A, a spring frame 10 is provided and which is adapted to function as a semi-rigid element giving permanent form to the section, as a resilient element giving depressible support for the section, and as a coupler element providing means of joinder to the next adjacent section. In order to perform the function of providing rigidity, the spring frame 10 involves upper and lower marginal rails, there being upper side rails 11 and 12 integrally joined by a transverse upper end rail 13, and there being lower side rails 14 and 15 integrally joined by a transverse lower end rail 16. In accordance with the invention the otherwise free ends of the upper rails 11 and 12 remote from the end rail 13 are rigidly joined by a transverse support or spreader 17 preferably made as a separate part and provided with right angle bends at its opposite ends which are clipped to the side rails as shown. It is significant that the corresponding remote ends of the bottom side rails 14 and 15 remain free.

In order to perform the depressible support function, the spring frame 10 involves a set of coil springs 18, each of which is helically wound in the usual manner and of hour glass shape. In practice, for example, a bedding unit of the type under construction will be eighty inches in length, thirty-seven inches in breadth, and six and one-half inches in thickness. In this instance the head section

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A will be about thirty-six inches in length, in which case coil springs 18 having an end diameter of four inches are employed in tangential relation to each other, there being eight coil springs across the frame section and nine coils lengthwise of the frame section. The said frame section rails and said spring coils are suitably joined together as a unit, preferably by means of small diameter helical coils known in the art as "pig-tails" 60 and which are applied in the usual manner as best illustrated in FIG. 2.

In order to perform the function as a coupler element, the spring frame 10 involves extensions 11' and 12' of the upper side rails 11 and 12 and which extend beyond the spreader 17. In accordance with the invention the extensions 11' and 12' establish pivots with an axis of rotation displaced inwardly of the plane of the rectangle as formed by rails 11, 12, 13 and 17, said axis extending transversely intermediate the top and bottom of the spring frame 10. In practice, the frame elements are made of rod-like members that possess substantial resilience. The extensions 11' and 12' being inwardly or downwardly bent ends of the rails 11 and 12 are capable of being deflected from the normal positions shown in order to permit some displacement of the pivot axis. As shown, the terminal end of each extension is turned or bent into an eye for the reception of a pin P, or the like.

Referring now to FIGS. 4, 5, 6, 8 and 8a and to the center section B, the spring frame 20 is provided and which is adapted to function as a semi-rigid element giving permanent form to the section, as a resilient element giving depressible support for the section, and as a coupler element providing means of joinder to the next adjacent sections. In order to perform the function of providing rigidity, the spring frame 20 involves upper and lower marginal rails, there being upper side rails 21 and 22 and lower side rails 24 and 25. It is significant that both or opposite ends of each of the rails 21, 22, 24 and 25 are or remain free, except for the coupling function to be described. As is clearly illustrated, the said rails 21, 22, 24 and 25 are continuations of said respective rails 11, 12, 14 and 15.

In order to perform the depressible support function, the spring frame 20 involves a set of coil springs 28 each of which is helically wound the same as springs 18. In this instance the center section B will be about seventeen inches in length, in which case there are eight coils across the frame section and four coils lengthwise thereof. The said frame section rails and said spring coils are suitably joined together as a unit, preferably by means of small diameter helical coils or "pig-tails" 60 and which are applied in the usual manner as best illustrated in FIG. 2.

In order to perform the function as a coupler element, the spring frame 20 involves extensions 21' and 22' of the side rails 21 and 22, and also involves extensions 24' and 25' of the side rails 24 and 25. In accordance with the invention the extensions establish pivots with axes of rotation displaced inwardly of the top and bottom planes of the rectangles as formed by the upper and lower rails respectively, said axes extending transversely intermediate the top and bottom of the spring frame 20. In practice, the rod-like frame elements are resilient and the inwardly bent ends of the rails at 21', 22', 24' and 25' are capable of being deflected from the normal positions shown in order to permit displacement of the pivot axes. As shown, the terminal ends of each extension are turned or bent into eyes for the reception of pins P' or the like.

Referring now to FIGS. 4, 6, 9 and 9a and to the foot section C, a spring frame 30 is provided and which is adapted to function as a semi-rigid element giving permanent form to the section, as a resilient element giving depressible support for the section, and as a coupler element providing means of joinder to the next adjacent section. In order to perform the function of providing rigidity, the spring frame 30 involves upper and lower marginal rails, there being upper side rails 31 and 32 integrally joined by transverse upper end rail 33, and there being lower side rails 34 and 35 integrally joined by a transverse

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lower end rail 36. In accordance with the invention, the ends of each of these rails, remote from the rails 33 and 36, are free except for the coupling function to be described. As is clearly illustrated the rails 31, 32, 34 and 35 are continuations of said respective rails 21, 23, 24 and 25.

In order to perform the depressible support function, the spring frame 30 involves a set of coil springs 38, each of which is helically wound the same as springs 18 and 28. In this instance the foot section C will be about twenty-seven inches in length, in which case there are eight coils across the frame section and seven coils lengthwise thereof. The said frame section rails and said spring coils are suitably joined together as a unit, preferably by means of small diameter helical coils or "pig-tails" 60 which are applied in the usual manner as best illustrated in FIG. 2.

In order to perform the function as a coupler element, the spring frame 30 involves extensions 34' and 35' of the lower side rails 34 and 35 and which extend inwardly and upwardly to establish pivots with an axis of rotation displaced inwardly from the bottom plane of the rectangle as formed by the lower rails respectively, said axis extending transversely intermediate the top and bottom of the spring frame 30. In practice, the rod-like frame elements are resilient and the inwardly bent ends of the rails 34 and 35 are capable of being deflected from the normal positions shown in order to permit displacement of the pivot axis. As shown, the terminal ends of each extension are turned or bent into eyes for the reception of pins P or the like.

With the depressible and semi-rigid frame sections that have coupling means incorporated therein, as hereinabove described, an assembly thereof is made as shown in FIG. 4 (springs 18, 28 and 38 being omitted for clarity). The extensions 11' and 12' are mated with extensions 21' and 22', while the extensions 24' and 25' are mated with extensions 34' and 35'. Pins P and P' are fastened in the eyes of the mated extensions to the end that the three otherwise independent sections are hingedly coupled to articulate on the two transverse axes as indicated.

Referring now to FIGS. 2 and 3 and to the padding D (and E) and also the cover F, I have provided a lamination of materials which does not slough when inclined and which permits sliding between certain laminations, and all to the end that uniform cushioning is maintained throughout the bedding unit. Generally, ordinary materials such as cotton batting, burlap, muslin and foam plastic are used in constructing the paddings D and E, and the cover F can be any high grade cotton ticking or the like. The said batting materials are specially grouped and secured together in separate laminations that are adapted to slide relative to each other, the muslin or like material effecting the sliding function.

The padding D is provided to overlies the frame sections A, B and C and comprises a cushion lamina 40 separated from a foundation lamina 45 by an anti-friction lamina 50. It is to be understood that said anti-friction lamina 50 has utility particularly where there is to be bending between the sections. As is common practice, a heavy burlap layer 46 is interposed between the frame sections A, B and C and the foundation lamina 45 and the cover F is the usual envelope that encloses the bedding or mattress. It is preferred that the cover F be without buttons or ties as is clearly illustrated.

The cushion lamina 40 comprises a top layer of cotton batting 41 of about 3/4 inch thickness and an underlying layer of foamed plastic cushioning material 42 of about 3/8 inch thickness. The spreader rod 17 passes between these two layers as clearly shown in FIG. 5. From FIG. 3 it will be seen that the marginal portion of the batting 41 projects beyond the edge of the material 42 and that the two layers are fastened together at intervals. In practice, the layers 41 and 42 are sewed on about four inch centers by parallel lines of stitching 61 that extend logi-

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tudinally of the bedding or mattress. From FIG. 2 it will be seen that the layer 41 extends to and overlies the rails of the frame sections, while the extended edge of the batting layer 41 is feathered as it extends around the corner.

The foundation lamina 45 comprises bottom and top layers 47 and 48 of foamed plastic cushioning material or the like, each of about $\frac{3}{8}$ inch thickness and fastened together as by staples placed at random. The coefficient of friction between two such layers is so great as to make it unnecessary to use excessive fastening means. From FIG. 3 it will be seen that the marginal portion of the top layer 48 projects beyond the edge of the layer 47 and that the two layers 47 and 48 thereby present a step with a shoulder 49. From FIG. 2 it will be seen that the layer 47 extends up to and short of the rails of the frame sections, while the extended edge of layer 48 and step formed thereby is wrapped around the rod-like rail member, and any spring coil that may be attached thereto. Thus, a proper and adequate pocket is formed at the shoulder 49 to accommodate the rails that extend continuously around the bedding or mattress.

In accordance with the invention, the two laminated structures 40 and 45 are placed, as above described, with the anti-friction lamina 50 therebetween. From FIG. 3 it will be seen that the lamina 50 is coextensive with the top layer 48 of the underlying foundation lamina 45, so as to wrap around the rod-like rail members and so as to overlap the bottom layer 47. Thus, before applying the cushion lamina 40 the said wrapped-around structure is fastened onto the frame sections by stitching 44, preferably suitably spaced staples that form said stitching.

In carrying out the invention at least two layers of muslin or the like are employed in the lamina 50, said muslin layers being of loosely woven hard cotton, which layers inherently tend to slide relative to each other. The anti-friction lamina 50 being interposed between the foundation and cushion lamina, provides for relative movement of the laminae to occur at the hinge points between sections A, B and C. Since the combined layers comprise a relatively thick padding D (also E) it becomes apparent that independent movement of the cushion and foundation lamina prevents undue strain from being imposed upon them. That is, bending and tearing is virtually eliminated, and the thickness is affected to a minimum degree.

In accordance with the invention, the paddings D and E can be alike, or the padding E can be minimized since the bedding or mattress as it is shown is not to be reversed. Therefore, a description of the padding D is sufficient, the padding E being provided as illustrated. Furthermore, and in order to advantageously utilize the frame sections A, B and C to control the sharp angular bend, the transverse spreader 17 is projected to the padding D intermediate the batting 41 and cushioning material 42 of said padding. As is best shown in FIG. 5, the foundation lamina 45 underlies the cushioning material 42 which is held depressed by the rod 17. It is significant that the spreader rod 17 is disposed at or below the plane of the rails 11 and 12, thereby depressing the cushioning material 42 at the pivot P so as to establish a void into which the batting 41 is filled, as shown. Thus, when bending occurs and the planes of the two adjacent sections A and B are displaced, the spreader 17 pulls or retracts the entire padding D along a straight transverse line overlying the pivot axis. A controlled fold is started and thereby eliminates any possibility of random folds and/or undesirable creases. Further, this tucking in of the padding D thereby foreshortens the said top cushion D without bunching and so that the underside padding E need not be overly stretched.

Having described only a typical preferred form and application of my invention, I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any modifications or variations

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that may appear to those skilled in the art and fall within the scope of the following claims.

Having described my invention, I claim:

1. A mattress comprising a plurality of relatively movable sections and each with its own independent spring frame, said spring frame having opposite side rails with rows of inwardly extending spring coils therebetween, there being padding overlying the rails and intermediate spring coils, and said adjacent spring frames being pivotally coupled by means of inwardly offset extensions of the opposite side rails of said adjacent spring frames, the said extensions being joined by pivot pins on a common axis displaced inwardly from the rails.

2. A mattress comprising a plurality of relatively movable sections and each with its own independent spring frame, said spring frame having opposite upper and lower side rails with rows of spring coils extending therebetween, there being padding overlying the rails and rows of spring coils, and said adjacent spring frames being coupled by means of inwardly offset extensions of the opposite upper side rails of said adjacent spring frames, the said extensions being joined by pivot pins on a common axis displaced inwardly from the rails.

3. A mattress comprising a plurality of relatively movable sections and each with its own independent spring frame, said spring frame having opposite upper and lower side rails with rows of spring coils extending therebetween, there being padding overlying the upper rails and rows of spring coils, the lower rails of each adjacent spring frame terminating short of the plane of adjacency, and said adjacent spring frames being coupled by means of inwardly offset extensions of the opposite upper side rails of said adjacent spring frames, the said extensions being joined by pivot pins on a common axis displaced inwardly from the rails.

4. A mattress comprising relatively movable sections, there being a head section, a center section and a foot section, each with its own independent spring frame, said spring frames having opposite upper and lower side rails with rows of spring coils extending therebetween, there being a common padding overlying the sections, and said adjacent spring frames being pivotally coupled only by means of pivot pins joining the upper rails of the head sections and center section and joining the lower rails of the center section and foot section.

5. A mattress comprising relatively movable and independently sprung sections, means pivotally joining the sections on a transverse axis, and padding overlying the sections and including a foundation lamina engaged on said sections and extending therebetween over said axis, a cushion lamina overlying the first mentioned lamina, and there being an anti-friction lamina intermediate the other laminae to permit relative movement of said laminae.

6. A mattress comprising relatively movable and independently sprung sections, means pivotally joining the sections on a transverse axis, and padding overlying the sections and including a foundation lamina engaged on said sections and extending therebetween over said axis, a cushion lamina overlying the first mentioned lamina, and there being an anti-friction lamina comprising at least several layers of material slidable relative to each other and placed intermediate the other laminae to permit relative movement of said laminae.

7. A mattress comprising relatively movable and independently sprung sections, means pivotally joining the sections on a transverse axis, and padding overlying the sections and including a foundation lamina engaged on said sections and extending therebetween over said axis, a cushion lamina overlying the first mentioned lamina and comprising batting and an underlying foamed plastic cushioning, and there being an anti-friction lamina intermediate the other laminae to permit relative movement of said laminae.

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8. A mattress comprising relatively movable and independently sprung sections, means pivotally joining the sections on a transverse axis, and padding overlying the sections and including a foundation lamina engaged on said sections and extending therebetween over said axis, a cushion lamina overlying the first mentioned lamina and comprising batting stitched to an underlying foamed plastic cushioning, and there being an anti-friction lamina intermediate the other laminae to permit relative movement of said laminae.

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FRANK B. SHERRY, *Primary Examiner.*C. A. NUNBERG, *Assistant Examiner.*