

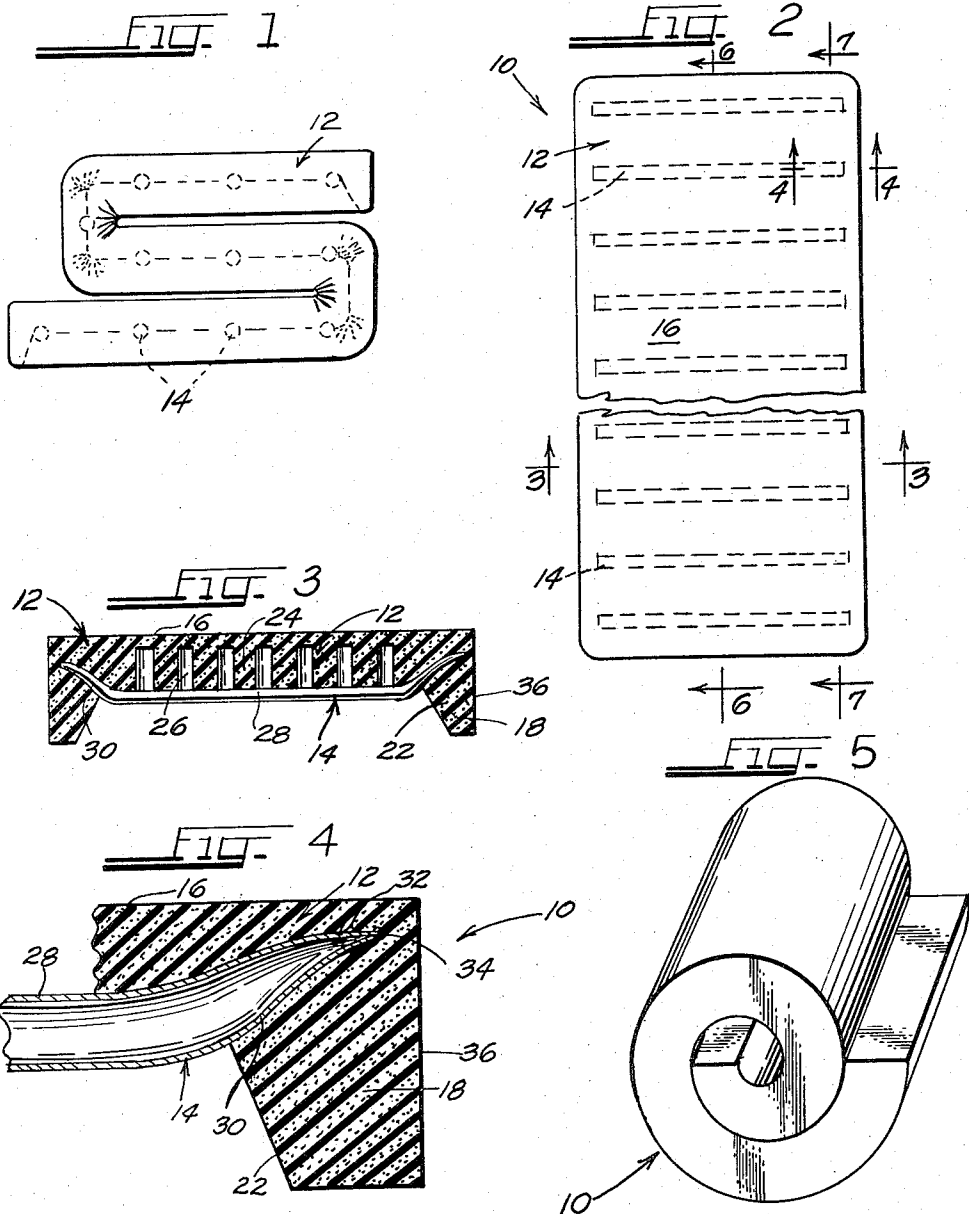
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E. F. HEALY
FOAM RUBBER MATTRESS

2,878,494

Filed Aug. 12, 1957

2 Sheets-Sheet 1



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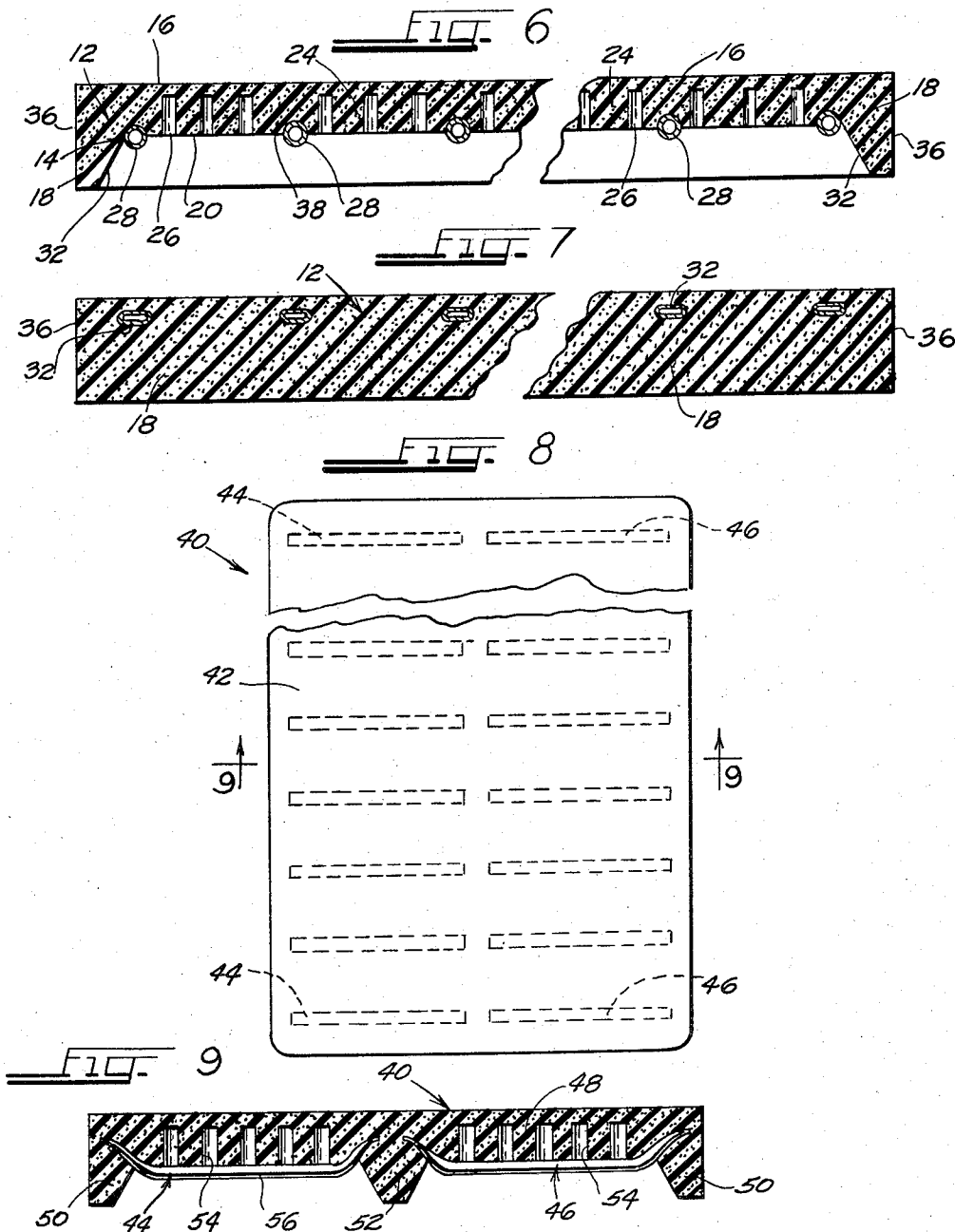
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FOAM RUBBER MATTRESS

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The present invention relates to mattress constructions and particularly to flexible mattresses which can be rolled and folded.

In many uses, it is desirable to be able to roll or fold a mattress about an axis extending transversely to the length thereof. Examples of such uses are in convertible beds, couches and the like. Also when mattresses must be stored or handled frequently, it is more convenient to handle stored mattresses in a more compact rolled or folded form. Mattresses which could be rolled and folded have been provided heretofore. In general, however, the prior mattresses have been foldable and rollable only by sacrificing other desirable features thereof. More specifically, certain of the body support features desirable in a mattress often must be sacrificed to provide a structure which could be folded and/or rolled.

Accordingly, it is an important object of the present invention to provide an improved mattress structure which can be readily rolled and folded.

Another object of the invention is to provide a mattress structure of the type set forth which is comfortable in use.

In conjunction with the foregoing object, it is still another object of the invention to provide a mattress which can be rolled and folded and which in use can still provide good transverse and longitudinal support for the body of a user and which more specifically can give varying degrees of support to different parts of the user's body.

Yet another object of the invention is to provide a mattress structure of the type set forth which is more simple in construction and yet more rugged than mattresses provided heretofore.

A further object of the invention is to provide a mattress of the type set forth which is more economical and easier to manufacture.

These and other objects and advantages of the invention will be better understood from the following description when taken in conjunction with the accompanying drawings. In the drawings wherein like reference numerals have been utilized to designate like parts throughout:

Figure 1 is a perspective view of a mattress made in accordance with and embodying the principles of the present invention, the mattress being shown folded in three superimposed layers;

Figure 2 is a plan view with certain portions broken away of the mattress of Figure 1 in the extended operative position;

Figure 3 is an enlarged view in vertical section substantially as seen in the direction of the arrows along the line 3—3 of Figure 2;

Figure 4 is a further enlarged fragmentary view showing the connection between the mattress body and one of the transverse support tubes substantially as seen in the direction of the arrows along the line 4—4 of Figure 2;

Figure 5 is a perspective view of the mattress of Figures 1 through 4 shown rolled into a compact form;

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Figure 6 is an enlarged fragmentary view in vertical section through the mattress of Figure 2 substantially as seen in the direction of the arrows along the line 6—6 thereof;

Figure 7 is an enlarged fragmentary view in vertical section through the mattress of Figure 2 substantially as seen in the direction of the arrows along the lines 7—7 thereof;

Figure 8 is a plan view of a double bed mattress made in accordance with and embodying the principles of the present invention; and

Figure 9 is an enlarged view in vertical section through the mattress of Figure 8 substantially as seen in the direction of the arrows along the line 9—9 thereof.

Referring to Figures 1 through 7 of the drawings, there is shown a mattress of the so called "twin bed" size made in accordance with and embodying the principles of the present invention. The mattress is generally designated by the numeral 10 and includes a body 12 and a plurality of transversely disposed support members or tubes generally designated by the numeral 14. Body 12 may be of the usual size for a twin bed mattress and for example may be thirty-six inches wide and seventy-two inches long, the corners being rounded. The top surface 16 of mattress 10 is preferably flat and extending downwardly from the bottom of mattress 10 and around the entire periphery thereof is a depending and integral support flange 18. The vertical extent of body 12 around the periphery thereof may be for example eight inches with the thickness of the central portion of mattress 10 being substantially four inches and the vertical extent of flange 18 below the bottom surface 20 (see Fig. 6) being substantially four inches. The inner side of flange 18 preferably slopes upwardly and inwardly as at 22 to provide increased support therefor.

Improved sleeping qualities are imparted to the mattress by providing within central portion 24 thereof a plurality of vertically extending recesses 26. Recesses 26 may extend three inches upwardly from the bottom surface 20 and terminate approximately one inch from upper surface 16. A plurality of the recesses 26 is provided with the recesses being distributed in a definite regular pattern throughout the under surface of body 12 as may be best seen in Figures 3 and 6 of the drawings.

Any suitable self supporting resilient material may be used to form body 12. A preferred material of construction is so called "foam rubber" which more particularly may be a synthetic organic plastic elastomer. It is preferred that the structure be of the closed cell type. Bodies made of such material and having the relative dimensions outlined above are readily foldable to the position illustrated in Figure 1 and can be easily rolled into the position illustrated in Figure 5 of the drawings.

Additional transverse support is preferably given to the body 12 in the form of the support tubes 14. Tubes 14 include a substantially hollow cylindrical center portion 28. The outer ends of portion 28 are turned upwardly to provide upturned portions 30 on each end thereof. The outer ends of portions 30 are flattened as at 32 with the ends 34 being closed. Also preferably ends 34 are bent at an angle with respect to the upturned portions 30 to a position such that they extend in a direction substantially parallel to the longitudinal axis of the central portion 28. The ends 34 and the upturned portions 30 are inserted into body 12 at the junction of the longitudinal flanges 18 and the main body portion 24. More specifically, as is illustrated in Figure 3 of the drawings the ends 34 extend upwardly and outwardly toward the outer vertical walls 36 of mattress body 12. The central portion 28 of tubes 14 are disposed in semi-cylindrical recesses 38 provided in surface 20 as may be best seen in Figure 6 of the drawings. It has been found

that good support is given by tubes 14 if the longitudinal axes thereof are disposed six inches apart. It is to be understood, however, that a greater or lesser distance between tubes may be necessary or desirable depending upon the particular end use of the mattress 10 and the material of construction of mattress body 12.

A preferred material of construction for tubes 14 is aluminum. Aluminum tubes 14 provide good strength yet are light in weight and are resistant to corrosion and the like. A preferred size of tube is a tube having a one inch outer diameter at the central portion 28.

One preferred method of manufacturing the mattress 10 contemplates the molding of body 12 with suitable recesses therein to receive tubes 14. After body 12 has been molded, tubes 14 are then inserted in position. Some suitable adhesive can be utilized to insure that tubes 14 remain in proper operative position. In another preferred method of manufacturing mattress 10, the tubes 14 are molded in place and are therefore adhered to mattress body 12.

Because of the transverse arrangement of tubes 14 and the substantial longitudinal spacing therebetween, mattress 10 can be readily folded to the position illustrated in Figure 1 of the drawings or can be readily rolled to the form shown in Figure 5 of the drawings. The mattress body 12 between tubes 14 is substantially flexible whereby to permit deformation thereof into the shapes illustrated. This characteristic of the mattress 10 ideally suits it for use with convertible beds, sofas, couches and the like. Mattress 10 is also useful in those installations in which it must be frequently moved or stored, the moving and storing being more readily accomplished in a folded or rolled condition as illustrated in Figures 1 and 5, respectively, of the drawings.

The above described ready foldability of the mattress is achieved without sacrificing the durable and comfortable characteristics thereof in use. The tubes 14 provide substantial lateral support for the body of a user. Each tube, however, is supported independently of the others so that various longitudinal sections of mattress 10 can be deformed to conform to different sizes and weights of body parts disposed thereon.

There is shown in Figures 8 and 9 of the drawings a double bed size mattress generally designated by the numeral 40 made in accordance with and embodying the principles of the present invention. Mattress 40 includes a body 42 having a first row of transverse support bars 44 and a second parallel row of support bars 46. Body 42 is of the same general construction as body 12 but preferably has external dimensions in the order of fifty-four inches wide and seventy-two inches long. The overall thickness of body 42 may also be eight inches with the central body portion 48 being four inches thick and an annularly extending depending support flange 50 being also four inches thick.

In addition, a longitudinal downwardly extending support flange 52 is provided between the longitudinally extending portions of flange 50. Flange 52 extends the entire length of mattress 40 and divides the mattress into substantially two sleeping sections. Recess 54 similar to recesses 26 described above are also provided on the under side of mattress body 42.

The transverse support tubes 44 are in general constructed like tubes 14 described above but the central cylindrical portions 56 thereof are substantially shorter so that tubes 44 can be supported between and by a longitudinally extending portion of flange 50 and the central flange 52. The support tubes 46 are identical with tubes 44 and are supported in the same manner, corresponding tubes 44 and 46 being in general transverse alignment.

The materials of construction and methods of construction of mattress 40 are the same as those of mattress 10 described above. Mattress 40 also possesses the same

important structural and functional advantages set forth above with respect to mattress 10.

It will be seen that there has been provided a mattress construction which fulfills all of the objects and advantages set forth above. Although two preferred forms of the invention have been illustrated in the drawings and described for purposes of illustration, it is to be understood that various changes and modifications can be made therein without departing from the spirit and scope of the invention. Accordingly, the invention is to be limited only as set forth in the following claims.

I claim:

1. A flexible mattress comprising a mattress body formed of flexible material and shaped to provide a substantially flat support surface, and a plurality of substantially rigid support members mounted on and carried by said mattress body on the side thereof opposite said support surface, said support members being spaced apart and extending transversely of said mattress body to give transverse support therefor while permitting folding and rolling thereof.

2. A flexible mattress comprising a substantially rectangular mattress body formed of flexible material and shaped to provide a substantially flat support surface, and a plurality of substantially rigid support tubes mounted on and carried by said mattress body on the side thereof opposite said support surface, said support tubes being spaced apart and extending transverse to the longitudinal axis of said mattress body to give transverse support therefor while permitting folding and rolling thereof.

3. A flexible mattress comprising a substantially rectangular mattress body formed of flexible material and shaped to provide a substantially flat support surface, a support flange extending around the periphery of said mattress body on the surface thereof opposite said support surface and extending in a direction away from said support surface, and a plurality of substantially rigid support tubes mounted on said mattress body on the side thereof opposite said support surface, said support tubes being spaced apart and extending transverse to the longitudinal axis of said mattress body to give transverse support therefor while permitting folding and rolling thereof.

4. A flexible mattress comprising a substantially rectangular mattress body formed of flexible material and shaped to provide a substantially flat support surface, a support flange extending around the periphery of said mattress body on the surface thereof opposite said support surface and extending in a direction away from said support surface, a plurality of recesses formed in the surface of said mattress body opposite said support surface and extending in a direction substantially perpendicular thereto, and a plurality of substantially rigid support tubes mounted on said mattress body on the side thereof opposite said support surface, said support tubes being spaced apart and extending transverse to the longitudinal axis of said mattress body to give transverse support therefor while permitting folding and rolling thereof.

5. A flexible mattress comprising a substantially rectangular mattress body formed of flexible material and shaped to provide a substantially flat support surface, a support flange extending around the periphery of said mattress body on the surface thereof opposite said support surface, and a plurality of substantially rigid support tubes mounted on said mattress body on the side thereof opposite said support surface, said support tubes being spaced apart and extending transverse to the longitudinal axis of said mattress body to give transverse support therefor while permitting folding and rolling thereof, said tubes extending into said mattress body at the junction of said support flange and said mattress body.

6. A flexible mattress comprising a substantially rectangular mattress body formed of foam rubber and shaped to provide a substantially flat support surface, a support flange extending around the periphery of said mattress body on the surface thereof opposite said support sur-

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face, and a plurality of substantially rigid support tubes formed of aluminum mounted on said mattress body on the side thereof opposite said support surface, said support tubes being spaced apart and extending transverse to the longitudinal axis of said mattress body to give transverse support therefor while permitting folding and rolling thereof, said tubes extending into said mattress body at the junction of said support flange and said mattress body.

7. A flexible mattress comprising a substantially rectangular mattress body formed of flexible material and shaped to provide a support surface, and a plurality of substantially rigid support tubes mounted on said mattress body on the side thereof opposite said support surface, said support tubes being spaced apart and extending transverse to the longitudinal axis of said mattress body to give transverse support therefor while permitting folding and rolling thereof, the ends of said tubes being upturned toward said support surface and extending into said mattress body to be engaged thereby.

8. A flexible mattress comprising a substantially rectangular mattress body formed of flexible material and shaped to provide a support surface, a depending support flange formed on said mattress body around the periphery thereof on the side opposite said support surface, and a plurality of substantially rigid cylindrical tubes mounted on said mattress body on the side thereof opposite said support surface, the ends of said tubes being upturned toward said support surface and flattened at the ends of said upturned ends to provide outer portions disposed substantially parallel to the central portions thereof, the outer portions of said tubes extending into said mattress body at the junction thereof with said support flange, said support tubes being spaced apart and extending transversely with respect to the longitudinal axis of said mattress body to give transverse support therefor while permitting folding and rolling thereof.

9. A flexible mattress comprising a substantially rectangular mattress body formed of flexible material and shaped to provide a support surface, a depending support flange formed on said mattress body around the periphery thereof on the side opposite said support surface, and a plurality of substantially rigid cylindrical tubes mounted on said mattress body on the side thereof opposite said support surface, the ends of said tubes being upturned toward said support surfaces and flattened at the ends of said upturned ends to provide outer portions disposed substantially parallel to the central portions thereof, the outer flattened portions being embedded in said body at the junction of said support flange and said body, the central portions of said tubes being received in part-cylindrical grooves formed on the surface of said body opposite said support surface, said support tubes being spaced apart and extending transversely with respect to the longitudinal axis of said mattress body to give transverse support therefor while permitting folding and rolling thereof.

10. A mattress body as set forth in claim 9, wherein said tubes are cemented to said mattress body.

11. A flexible mattress as set forth in claim 9, wherein said tubes are molded in position on the mattress body.

12. A flexible mattress comprising a substantially rectangular mattress body formed of flexible material and shaped to provide a substantially flat support surface, and a plurality of substantially rigid support tubes mounted on said mattress body on the side thereof opposite said sup-

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port surface, said tubes being arranged in two rows extending longitudinally of the mattress body with said tubes being spaced apart and extending transversely to the longitudinal axis of said mattress body, corresponding tubes in said rows being in substantial transverse alignment to give transverse support to said mattress body while permitting folding and rolling thereof.

13. A flexible mattress comprising a substantially rectangular mattress body formed of flexible material and shaped to provide a substantially flat support surface, an annular support flange formed on said body on the side thereof opposite said support surface and extending therearound, an intermediate support flange formed on said mattress body on the side thereof opposite said support surface and extending longitudinally thereof and substantially centrally thereof, and a plurality of substantially rigid support tubes mounted on said mattress body on the side thereof opposite said support surface, said tubes being arranged in two rows extending longitudinally of the mattress body with said tubes being spaced apart and extending transversely to the longitudinal axis of said mattress body, the ends of said tubes extending into said mattress body at the junction thereof with said support flange and said intermediate flange, corresponding tubes in said rows being in substantial transverse alignment to give transverse support to said mattress body while permitting folding and rolling thereof.

14. A flexible mattress comprising a substantially rectangular mattress body formed of foam rubber and shaped to provide a substantially flat support surface, and a plurality of substantially rigid support tubes formed of aluminum mounted on said mattress body on the side thereof opposite said support surface, said tubes being arranged in two rows extending longitudinally of the mattress body with said tubes being spaced apart and extending transversely to the longitudinal axis of said mattress body, corresponding tubes in said rows being in substantial transverse alignment to give transverse support to said mattress body while permitting folding and rolling thereof.

15. A flexible mattress comprising a substantially rectangular mattress body formed of flexible material and shaped to provide a support surface, and a plurality of substantially rigid support tubes mounted on said mattress body on the side thereof opposite said support surface, said tubes being arranged in two rows extending longitudinally of the mattress body with said tubes being spaced apart and extending transversely to the longitudinal axis of said mattress body, corresponding tubes in said rows being in substantial transverse alignment to give transverse support to said mattress body while permitting folding and rolling thereof, the ends of said tubes being upturned toward said support surface and extending into said mattress body to be engaged thereby.

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