Aug. 14, 1934. M. F. HAMZA 1,970,502

MATTRESS

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Fig. 1.

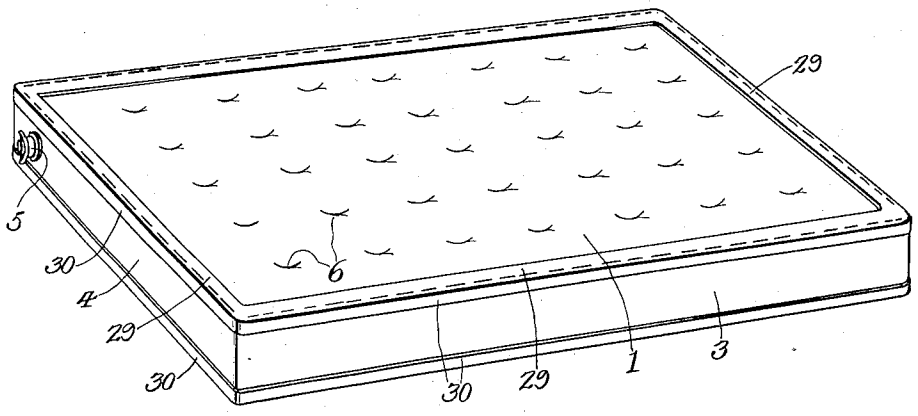


Fig. 2.

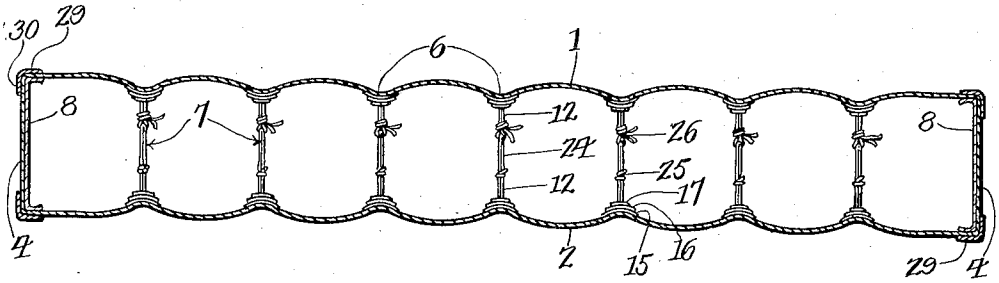
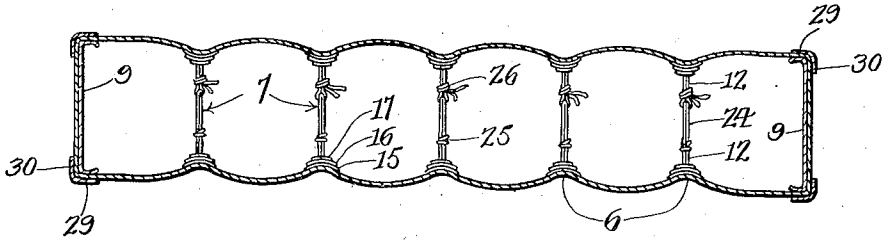


Fig. 3.



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MATTRESS

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Fig. 4.

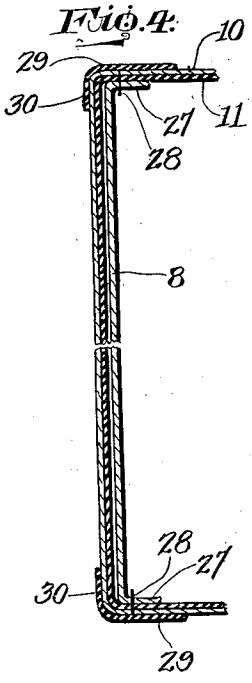


Fig. 5.

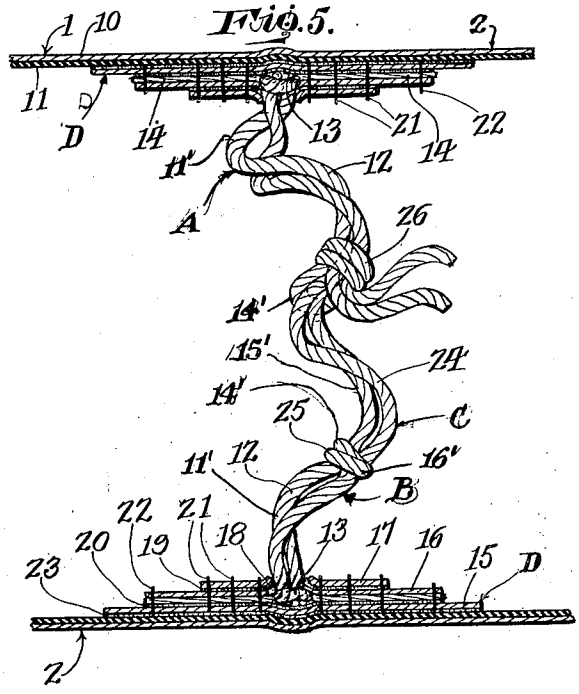


Fig. 6.

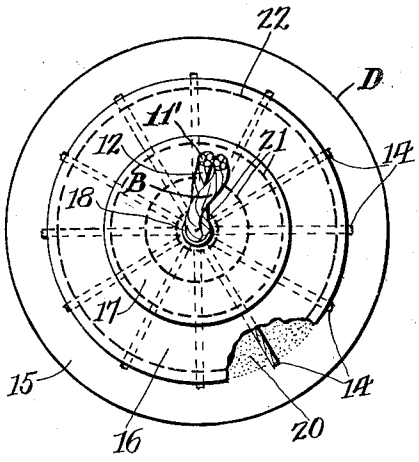
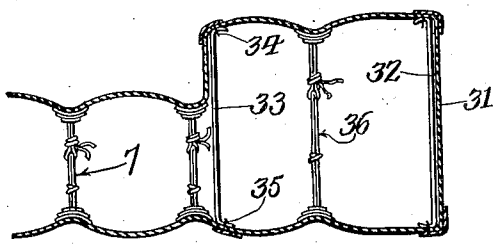


Fig. 7.



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MATTRESS

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4 Claims. (Cl. 5—350)

This invention relates in general to mattresses and the like, and more particularly has reference to the construction and arrangement of stay elements or structures in an inflatable mattress for the purpose of holding it in the proper shape when it is inflated.

Mattresses or the like have previously been constructed in such a manner that they were capable of being inflated and deflated, thus at the same time attaining the advantages of the pneumatic cushioning effect which is present in such a structure, and of the extreme collapsibility of the article by the mere process of deflation. Also, in previous constructions of this type various means have been used as stays or internal braces for the purpose of imparting to the inflated structure the desirable flatness and uniformity of shape. Difficulty has been encountered, however, in making these stays which are usually in the form of flexible cords of exactly the proper length so that the opposite sides of the mattress will be the same distance apart at each stay. Difficulty has also been encountered in anchoring these stay elements or structures to the walls of the mattress in such a manner that they would not pull loose and at the same time so that they would not create a sharp inwardly drawn depression at each point of attachment. The tufted appearance of the mattress is desirable, but it is likewise desirable not to place too much strain on any particular portion of the mattress walls because this will obviously sooner or later result in a rupture at such point. Furthermore, in previous structures of this nature, it has not been possible to make the corners or edges of the mattress square and uniform in shape when inflated. These edges have on the other hand assumed the natural rounded shape ordinarily assumed by a flexible inflated body.

It is, therefore, the principal object of this invention to overcome the difficulties encountered in prior constructions of this type, particularly in the provision of a stay cord structure which may be adjusted to the proper length after it has been secured to the opposite walls of the mattress, and likewise to provide a securing or anchoring means for stay cords of said structures, which means will distribute the pull exerted by the stay cords on the mattress wall over a considerable area surrounding the point of its attachment, and will at the same time furnish a firm anchorage for the cords. It is a further object that this securing means will be of greater strength and stiffness immediately adjacent the cords of the stay structures than in parts more remote from the cords because of the fact that the force exerted by the cords on the mattress wall is much more concentrated close to the cords than at points further away. It is, therefore, the object to provide stiffness and strength where the same is necessary without interfering with the flexibility of the structure as a whole at points any considerable distance from the points of attachment of the cords.

A further object of this invention is to provide a stay means for disposition adjacent the edges of a mattress of this type, which stay means shall be so constructed and disposed as to cause the edges of the mattress to assume a square and regular formation as compared with the rounded and irregular formation assumed in the edges of prior constructions when inflated.

Other objects and advantages of this invention will become apparent from the following description taken in connection with the accompanying drawings in which like numerals indicate corresponding parts throughout. With reference more particularly to the drawings:

Figure 1 is a perspective view illustrating a mattress in accordance with this invention.

Figure 2 is a longitudinal cross section through the structure illustrated in Figure 1.

Figure 3 is a transverse cross section of the same structure.

Figure 4 is an enlarged sectional view illustrating the stay means for controlling the shape of the edges of this mattress.

Figure 5 is an enlarged sectional view illustrating the stay cord structure of this invention and the anchorage therefor.

Figure 6 is a view with parts broken away illustrating the means of anchoring or securing the stay cords of this invention to the walls of the mattress.

Figure 7 is a view similar to a portion of Figure 2 illustrating a slightly modified form.

In accordance with this invention, the mattress consists in general of an inflatable container having top and bottom walls 1 and 2 respectively and side and end edge walls 3 and 4 respectively. A suitable valve construction 5 is located in some convenient position such as along one of the end edges for the purpose of inflating and deflating the mattress. The walls 1 and 2 of the mattress are drawn inwardly toward each other to form slight depressions 6 giving a tufted appearance to the opposite faces of the mattress, by means of lengthwise adjustable, flexible stay cord structures generally indicated at 7 in Figures 2 and 3. Likewise, at the edges of the mat-

tress construction, there are provided stay members for the purpose previously set forth which consist generally speaking of webs extending parallel to and along the end edges as indicated at 8 in Figure 2, and along the side edges as indicated at 9 in Figure 3. These webs 8 and 9 are disposed closely adjacent the end and side edges respectively, and are secured thereto in a manner which will be presently described.

With reference now more particularly to Figures 4 and 5, it will be seen that the inflatable container is formed of a material which itself consists of two layers, the outer layer 10 being of fabric or other material for the purpose of giving strength, stability, and appearance to the structure, and the inner layer 11 being a coating of rubber or the like for the purpose of rendering the fabric container non-porous and enabling it to retain air.

The stay elements or structures are of like construction and the description of one will apply to the others. See Figures 5 and 6. Each element is formed of a pair of oppositely disposed outer sections and an intermediate section. The outer sections are of like form and are adjustably coupled together by the intermediate section. The sections of each stay element are designated generally A, B and C. Each outer section includes an anchoring head D and a stay cord 11' extended from the head D. The cord 11' is bent upon itself to provide a pair of stretches knotted together intermediate their ends to form a loop 12. The knot is indicated at 13. The portions of the stay cord 11' beyond the knot 13 are divided into their component strands 14. The bend in the cord 11 is indicated at 14'. The anchoring head D consists of outer, intermediate and inner laminations 15, 16 and 17 respectively which are preferably formed of circular contour. The lamination 15 is of greater diameter than lamination 16 and the latter is of greater diameter than lamination 17. The laminations 15 and 16 consist of light relatively flexible material. The lamination 17 is formed of relatively heavy stiff material. The laminations 16 and 17 are provided with registering openings 18 of a size for the passage therethrough of the loop 12, but of insufficient size to permit of the passage of the knot 13. The section C consists of a stay cord 15' bent upon itself to form a pair of stretches. The bend in cord 15 is designated 16'.

In assembling a section A or B, the looped portion 12 of cord 11' is passed through the openings 18 of the laminations 16 and 17 which have been previously secured together by a layer of cementitious material 19, until the knot 13 abuts the outer face of lamination 16. The divided strands 14 are then arranged radially against the outer face of lamination 16. The inner face of lamination 15 is then secured against the outer face of lamination 16 by a layer of cementitious material 20. In order to firmly unite the laminations 15, 16, 17 and the strands 14, circular rows of stitching 21 are passed through all of the laminations and the strands and a circular row of stitching 22 is passed through the laminations 15 and 16 and the outer ends of the strands. By this arrangement the laminations are not only firmly anchored to each other, but the strands are also firmly anchored to the head. As the laminations 15, 16 and 17 are of different diameters, the lamination 15 being the largest and the lamination 17 the smallest, the assembling of section A or B in the manner referred to produces a relatively flat flexible anchoring head to which an end of a stay cord 11' is firmly anchored. The anchoring head is relatively stiff and inflexible adjacent the point of anchorage where the greatest stress is placed, and is relatively light and flexible adjacent its outer edges where the stress is not so great. After the looped portions 12 have been provided with anchoring heads or securing members as just described, these anchoring heads are then secured along their entire outer faces to the inner walls of the inflatable container by means of layers of cement 23. Because of the large area of the outer face of the lamination 15, the layer of cement will be enabled to firmly attach the anchoring heads to the wall of the mattress in a manner sufficient to withstand any strain which might be placed upon it.

After the sections A and B of the stay elements have been anchored to the opposite walls 1 and 2 of the mattress in the manner just set forth, the outer sections of each stay element are adjustably connected together by the inner section C of such element, and in this connection the stay cord 15' is passed through the loop 12 and around the bend 14' of an outer section, as indicated at 25, and through the loop 12 and around the bend 14' of the other outer section and knotted, as at 26 whereby the outer sections are adjustably coupled together. The bend 16' and knot 26 provide section C of loop-like form as indicated at 24. It will be readily appreciated that in tying section C to one of the looped portions 12, as at 26 it is a comparatively simple matter to draw the two looped portions 12 together by exactly the amount desired and to there secure or tighten up on the knot 26. Thus, the distance between the opposite side walls of the mattress may be very easily adjusted during the construction of the invention.

With reference to the stays 8 and 9 which are disposed along the side and end edges of the mattress, these stays as indicated in Figure 4 are disposed closely adjacent the edge portions of the inflatable container and have their marginal portions 27 lying flat against the inner surfaces of the opposite walls 1 and 2 of the mattress. Stitching 28 is then passed through these marginal portions 27 and through the walls 1 and 2 of the container so as to secure these stay members 8 and 9 to the walls substantially all along the side and end edges of the mattress. In order to prevent any leakage of air which might occur past the stitching 28 upper and lower sealing means are secured on the outside surface of the container so as to cover the outer portions of the stitching 28. Each sealing means is formed of a thin ply of rubber or other suitable material and consists of a horizontally disposed part 29 and a vertically disposed part 30. The parts 29 of the sealing means cover the outer portions of stitching 28. By virtue of this stay construction, when the mattress is inflated, it will assume a shape somewhat similar to that illustrated in the various figures of the drawings rather than assuming the rounded shape which it would ordinarily take if not provided with these stay members.

Referring now to the modified form illustrated in Figure 7, it will be seen that one of the end walls 31 is made of considerably greater height than the end walls illustrated in the previously described figures. The inflatable container is also shaped in such a manner as to provide an enlarged portion adjacent the end thereof which is adapted to serve as a pillow. A stay member 32 is provided along this end edge which is similar in all respects except as to size to the stay members 8 and 9. A similar stay member 33 is

provided along the inner edge of the pillow section for the purpose of retaining it in its proper position. As illustrated, the stay member 33 is anchored in much the same manner as the stay members 8, 9 and 32, in that it is provided with rows of stitching 34 and 35 passing through the respective walls of the container. Within this enlarged end portion of the mattress, there are likewise provided stay elements 36 which are similar in all respect to the stay elements 7 previously described except for the fact that they are of greater length.

From the above, it will be seen that a means has been provided for carrying out all of the objects and advantages sought to be attained by this invention, and that the same has been set forth in a specific embodiment illustrated in the drawings. It is to be pointed out, however, that the forms illustrated and described herein are by way of illustration and example only and are not to be taken as in any way limiting the spirit or scope of this invention. This invention is to be limited in its scope only by the prior art and by the terms of the appended claims.

What I claim is:—

1. In an inflatable mattress structure, a stay means having divided strands at each end thereof, a flexible flat anchoring head for each end of the stay means consisting of a lamination of larger radius than the length of the divided strands, a lamination of slightly less radius than the length of the divided strands and a third lamination of less radius than the second lamination, the said second and third laminations having registering openings centrally thereof for the passage of the stay means, said divided strands being radially disposed between the first and second laminations of said heads, spaced rows of stitching and layers of adhesive material for securing said laminations together and for securing the divided strands to the first and second laminations, adhesive means for securing the first laminations of said heads to opposed walls of the mattress, and said stay means provided with a pair of spaced knots positioned between the first and second laminations of said heads.

2. In an inflatable mattress structure, a stay means having divided strands at each end thereof, a flexible flat anchoring head for each end of the stay means consisting of a lamination of larger radius than the length of the divided strands, a lamination of slightly less radius than the length of the divided strands and a third lamination of less radius than the second lamination, the said second and third laminations having registering openings centrally thereof for the passage of the stay means, said divided strands being radially disposed between the first and second laminations of said heads, spaced rows of stitching and layers of adhesive material for securing said laminations together and for securing the divided strands to the first and second laminations, adhesive means for securing the first laminations of said heads to opposed walls of the mattress, said stay means provided with a pair of spaced knots positioned between the first and second laminations of said heads, and the third lamination of each of said heads being of heavier construction than the first lamination whereby said knots will be firmly retained without reduction of flexibility of the outer edges of said heads.

3. In an inflatable mattress, spaced pairs of flexible laminated anchoring heads, the central portion of each of said heads being of greater thickness than the remaining portion thereof to provide for greater flexibility of said remaining portion and greater strength for said central portion, each of said heads being formed centrally thereof with a passage of a length less than the thickness of the head at the central portion of the latter, said passage having one end at the inner face of the head and its other end spaced from the outer face of the head, the heads of each pair adapted to have their outer faces secured to the inner faces of opposed walls of said mattress, pairs of flexible stay cords, each stay cord of a pair including an end terminal portion and a knot anchored within a head of a pair of heads intermediate the inner and outer faces of the head, each stay member of a pair including a looped portion extending through a passage in a head and projecting from the inner face of the latter, and flexible stay cords of loop-like form, each passing through and around the looped portion of one stay cord of a pair and adjustably connected to the looped portion of the other stay cord of the pair whereby the stay cords of a pair are coupled together.

4. In an inflatable mattress structure, in combination an inflatable body and spaced stay elements of cord like-form for opposed walls of said body, each of said elements being formed at the ends thereof with divided strands, and spaced pairs of opposed anchoring means for ends of said elements secured to said opposed walls, each of said means being of increasing stiffness and strength from the outer edge toward the central portion thereof whereby the pull exerted by each stay element on said walls will be distributed over the area surrounding the ends of the element and said means will serve to reinforce the zones about the ends of said elements in varying degree, depending upon the distance from the ends of said elements, each of said means consisting of an imperforated lamination of larger radius than the length of the divided strands at an end of an element, a second lamination of slightly less radius than the length of the divided strands at an end of an element and a third lamination of less radius than the second lamination, the second and third lamination having axially aligning openings for the passage of the non-divided portion of a stay element, the divided strands at the end of a stay element being positioned between the first and second laminations of an anchoring means, and means for securing the laminations of an anchoring means together and for securing the divided strands at an end of a stay means to the first and second laminations of an anchoring means.

MORRIS F. HAMZA.