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(54) Air bed system

(57) An air bed system including three separate air-tight segments (28,30,32) secured together in a linear fashion to form an air mattress sized to fit a standard bed size. Each segment of the air mattress is independently inflatable, allowing a sleeper to adjust the level of support provided for his or her head, lumbar, and foot region by altering the air pressure within each segment. By placing two air mattresses side by side, a larger size air bed may be constructed suitable for use by two separate sleepers, with each air mattress having individually adjustable support and comfort levels.

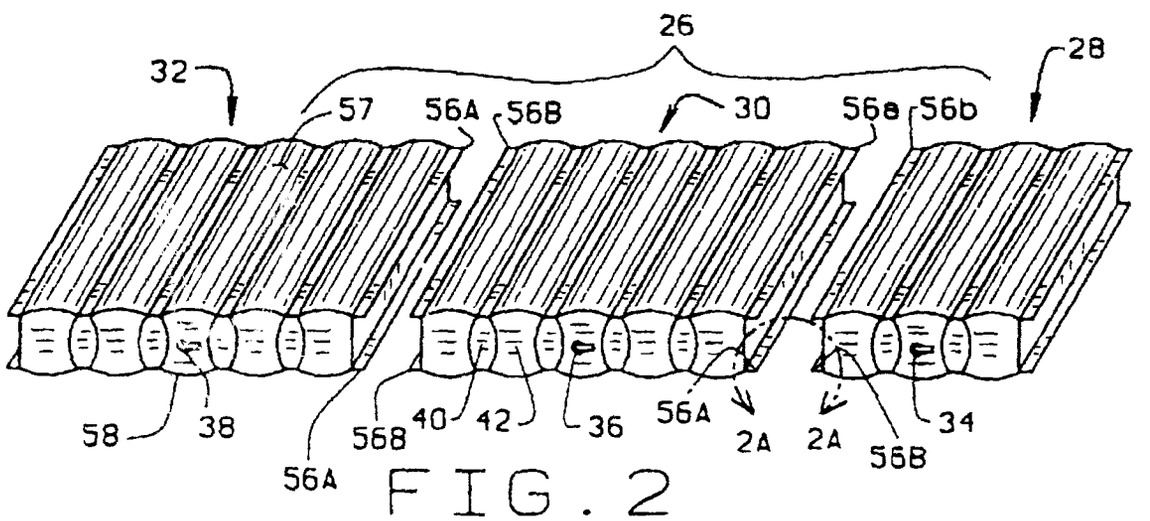

FIG. 2

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] None.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not Applicable.

BACKGROUND OF THE INVENTION

[0003] The present invention relates to air beds generally, and more particularly, to an improved air bed system with independently inflatable sections for providing varying degrees of support over a sleeper's body.

[0004] Air beds having independently inflatable mattresses for separate sleepers are known, but they could be improved. For example, currently available air mattresses may "bottom out" when the weight thereon is too high, resulting in an uncomfortable mattress. Single mattresses or pairs of independently inflatable mattresses connected together for separate steepers may also create a rolling effect when one person lays down on the bed, resulting in the other person being jostled. Moreover, the support for the sleeper's body in many conventional air mattresses is not always satisfactory. Often, due to the sleeper's weight distribution, additional support is needed in the lumbar region. With conventional air mattresses, increasing the inflation pressure to provide the needed lumbar support results in a mattress which is then uncomfortable for the sleepers head and leg positions. Failure to provide adequate lumbar support may result in the sleeper sinking into a "valley" as the mattress compress in the lumbar region and expand under the sleeper's head and feet due to the reduced weight distribution in those areas.

SUMMARY OF THE INVENTION

[0005] Among the several objects and advantages of the present invention are:

The provision of an air bed system with improved comfort and adjustability;

The provision of such an air bed system which provides a separate mattress for each user;

The provision of such an air bed system in which each separate mattress comprises three or more individual airtight compartments; and

[0006] The provision of such an air bed system which allows the user to separately control the air pressure in each individual compartment comprising the mattress, providing individual support, comfort, and adjustability.

[0007] Briefly stated, an air bed system of the present invention comprises three separate airtight segments secured together in a linear fashion to form an air mattress sized to fit a standard twin-sized bed. Each segment of the air mattress is independently inflatable, allowing sleeper to adjust the level of support provided by altenng the air pressure within each segment. A full, queen, or king sized bed may be formed for two separate sleepers by placing two air mattresses of the present invention side by side, allowing each sleeper to retaining individual support level and comfort adjustments.

[0008] The foregoing and other objects, features, and advantages of the invention as well as presently preferred embodiments thereof will become more apparent from the reading of the following description in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] In the accompanying drawings which form part of the specification:

Figure 1 is a perspective view of a prior art contiguous air mattress;

Figure 1A is an enlargement of the valve portion of Fig. 1;

Figure 2 is a perspective view of the separate segments comprising an air mattress of the present invention;

Figure 2A is an enlarged view of the hook and loop fasteners shown in Fig 2;

Figure 3 is a perspective view of a partition used in the segments of Fig. 2;

Figure 4 is a perspective view of an air mattress of the present invention with the individual segments secured together, suitable for a single sleeper;

Figure 5 is a perspective view of the foundation system employed in conjunction with an air mattress of the present invention shown in Fig. 4; and

Figure 6 is a perspective view of an air bed system of the present invention suitable for two sleepers.

[0010] Corresponding reference numerals indicate corresponding parts throughout the several figures of the drawings.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0011] The following detailed description illustrates the invention by way of example and not by way of limitation. The description will clearly enable one skilled in the art to make and use the invention, describes several embodiments, adaptations, variations, alternatives, and uses of the invention, including what we presently believe is the best mode of carrying out the invention.

[0012] Referring to Figure 1, a standard air mattress 10 is shown formed from a single air-tight bladder 12. Support is provided by air introduced into the air-tight bladder 12 through a suitable valve 14, preferably a dou-

ble valve with a reverse flow inhibitor. It is well known in the art that these valves (sometimes known as Boston valves) simplify the inflation of air mattresses and avoid undesired releases of air from the air-tight bladder 12. The air mattress 10 additionally has a plurality of internal partitions 16 extending across its width. The partitions 16 are internally secured to both the top 18 and bottom 20 surfaces of the bladder 12 by means of continuous seams 22. The partitions 16 define a plurality of interconnected chambers 24 therebetween and their structure substantially strengthens the air mattress 10, increasing support after inflation. The air-tight bladder 12 shown in Fig. 1 is dimensioned to fit a standard twin sized bed, and suitable for use by a single sleeper. Typically, to provide for a second sleeper and fit larger standard bed sizes such as full, queen, and king-size beds, a second air-mattress substantially identical in size (length, height, and width is positioned adjacent the first mattress 10.

[0013] Referring now to Figure 2, the segments comprising an air mattress 26 of the present invention are shown disassembled in a linear arrangement. A head segment 28 is positioned adjacent one end of a lumbar segment 30. A foot segment 32 is positioned on the opposite side of the lumbar segment 30 from the head segment 28. Preferably composed of a high plasticizer content PVC vinyl with a laminated coating of canvas-like rayon material, each segment forms an individual air-tight compartment. A suitable valve 34, 36, and 38 of the type describe above for adjusting the internal air-pressure is incorporated within each segment. An additional layer of a quilting material may be provided to cover the upper surface of the lumber segment 30.

[0014] Each segment contains several double-walled internal partitions 40 (Fig. 3) which extend across the segment width, creating interconnected chambers 42 and providing additional support upon inflation. As can be seen in Fig. 3, each partition 40 is hollow, with openings 44 at the ends and openings 46 in the middle which allow air to flow from chamber to chamber as weight is applied to the segment. Each partition 40 is preferably welded at its top 48 and its bottom 50 to the corresponding top and bottom surfaces of the segment (28, 30, or 32 as applicable). This welded seam runs horizontally and is preferably about ½" in width for each partition 40. This partition design provides greater seam surface area and two partition walls (52 and 54) for added air containment and strength. The number of partitions 40 per segment varies depending upon the desired size and strength of the air mattress 26.

[0015] Shown in Fig. 4, an assembled air mattress 26 is formed by securing the head segment 28 to the adjacent side of the lumbar segment 30, and the foot segment 32 to the adjacent side of the lumbar segment 30, opposite the head segment 28. The preferred method for securing the individual segments together is by means of matching hook and loop fastener strips 56a, 56b, such as those sold under the trade name Velcro, arrayed along the adjacent upper edges 57 and lower edges 58 of each of the segments as seen in Figs. 2 and 2a.

[0016] Once assembled, the air mattress 26 is preferably placed on a foundation 60 (Fig. 5) consisting of form perimeter rails 62 covered in a textured vinyl material. The valves 34, 36, and 38 are then connected to two or more pneumatic pumps 64, 66, housed within the foundation 60 to keep operational noise levels to a minimum. Separate controls 68 operate the pneumatic pumps 64, 66, permitting an individual using the air mattress 26 to separately inflate or deflate the head segment 28, the lumbar segment 30, and/or the foot segment 32, or to simultaneously adjust both the head and foot segments separate from the lumbar segment.

[0017] Application of the above-described air bed system to larger sized beds such as full, queen or king beds, a second air mattress is employed (Fig. 6). The second mattress is a mirror image of the first, having a second set of identical pneumatic pumps and separate controls placed within the foundation 60. By providing a second set of pneumatic pumps and controls, an individual sleeper may adjust the second portion of the air bed system to his or her individual comfort levels without affecting the comfort of a first sleeper on the first air mattress.

[0018] In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results are obtained. As various changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Claims

1. An air bed comprising:

   a first air mattress, the air mattress including a plurality of independently inflatable air-tight segments disposed in a plane, at least a first air-tight segment having a substantially different cross-sectional area in said plane from the cross-sectional area in the plane of at least a second air-tight segment, the dimensions of each segment being in proportion to the dimensions of said air mattress;
   a foundation disposed around and below the segments, said foundation supporting and retaining said segments; and
   means for securing linearly adjacent segments together in said plane.

2. The air bed as set forth in claim 1 further comprising a second air mattress adjacent said first air mattress, said second air mattress being substantially a mirror image of said first air mattress.

3. The air bed as set forth in claim 2 wherein said first and second air mattresses are independently inflatable.

4. The air bed as set forth in claim 1 wherein said first air mattress includes a head segment, a lumbar segment, and a foot segment, the head segment and the foot segment being linearly disposed on opposite sides of the lumbar segment within said plane.

5. The air bed as set forth in claim 4 wherein said head segment and said foot segment being sealed with respect to said lumbar segment, so that said head and foot segments inflate independently from said lumbar segment.

6. The air bed as set forth in claim 5 wherein said head segment is sealed with respect to the foot segment so that said head segment inflates independently from said foot segment.

7. The air bed as set forth in claim 5 including means to inflate said head segment simultaneously with said foot segment.

8. The air bed as set forth in claim 4 wherein each segment has its own filling valve, said filling valves having means to inhibit reverse air flow out of the segments during inflation.

9. The air bed as set forth in claim 4 further including a plurality of pneumatic pumps contained inside said foundation. said pneumatic pumps being operatively connected to said air-tight segments, and means for controlling said pneumatic pumps, said control means being contained inside said foundation.

10. The air bed as set forth in claim 9 wherein a first pneumatic pump is operatively connected to both said head segment and said foot segment, and a second pneumatic pump is operatively connected to said lumbar segment.

11. The air bed as set forth in claim 9 wherein a first pneumatic pump is operatively connected to the head segment, a second pneumatic pump is operatively connected to the lumbar segment, and a third pneumatic pump is operatively connected to the foot segment.

12. The air bed as set forth in claim 4 wherein said lumbar segment includes an upper surface, said upper surface being covered in quilting.

13. The air bed as set forth in claim 1 wherein each segment has therein a plurality of partitions extending across its width, said partitions being secured to both a top and a bottom of the respective segment and defining a plurality of compartments therebetween.

14. The air bed as set forth in claim 13 wherein the partitions are in the shape of loops extending across the width of their respective segments.

15. The air bed as set forth in claim 14 wherein the loops have openings therein to allow the controlled passage of air from compartment to compartment.

16. The air bed as set forth in claim 1 wherein the securing means includes matching hook and loop fasteners arrayed on adjacent edges of said segments.

17. The air bed as set forth in claim 1 wherein said segments are composed of a PVC vinyl of high plasticizer content.

18. The air bed as set forth in claim 17 wherein said segments are laminated with a rayon material.

19. The air bed as set forth in claim 1 wherein said foundation is composed of a foam material.

20. The air bed as set forth in claim 19 wherein said foundation is covered in a textured vinyl material.

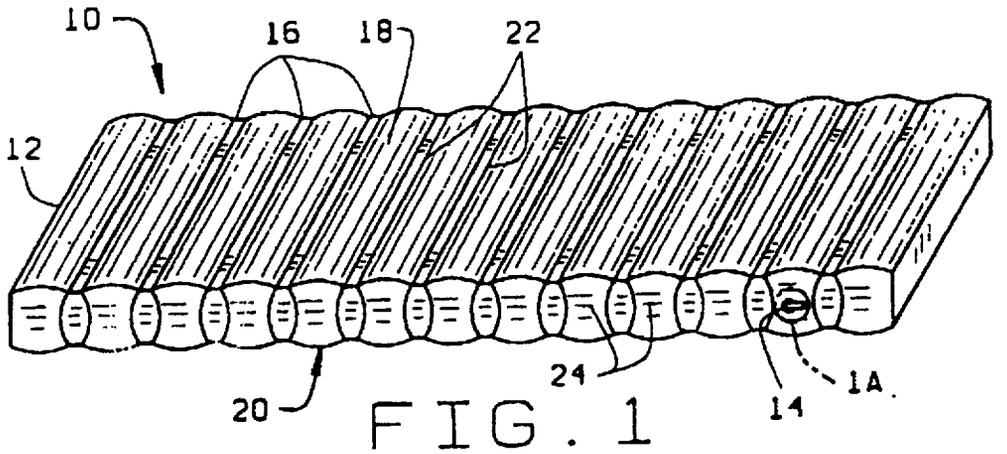

FIG. 1
PRIOR ART

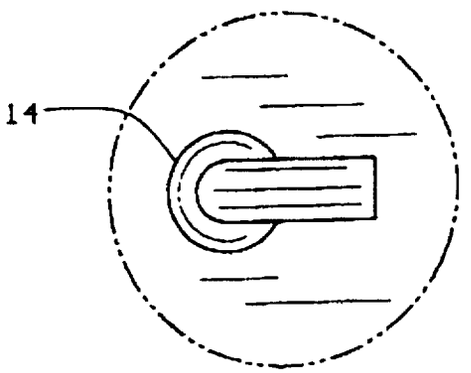

FIG. 1A

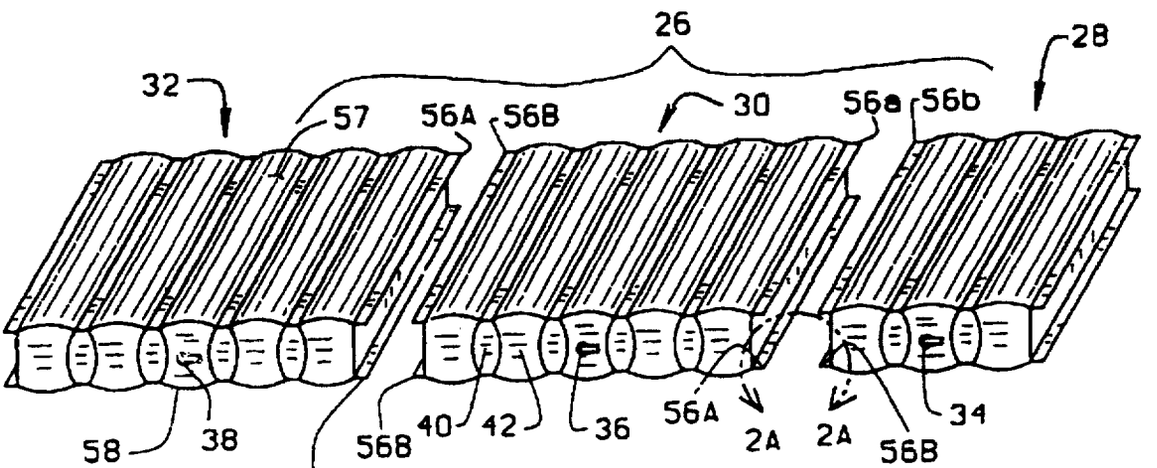

FIG. 2

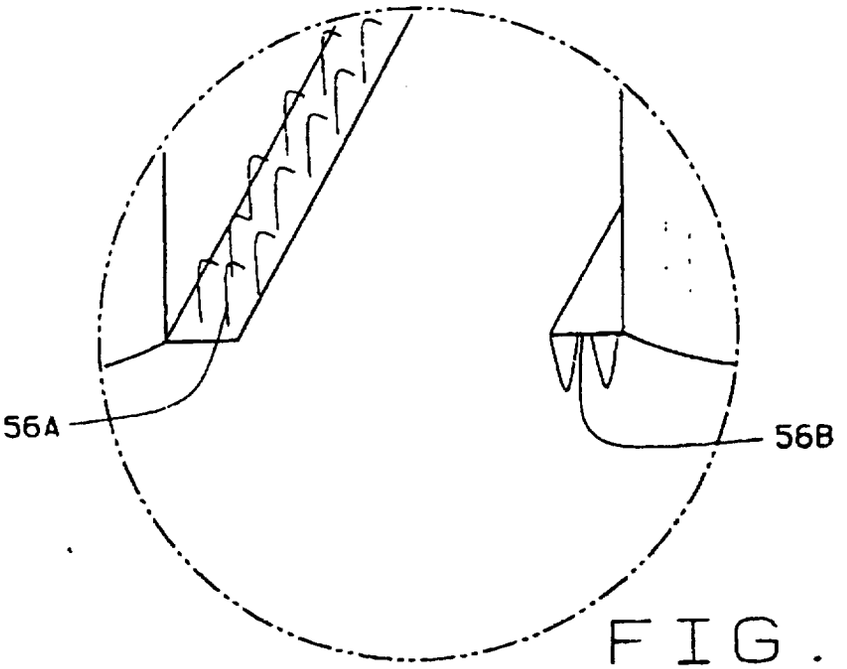

FIG. 2A

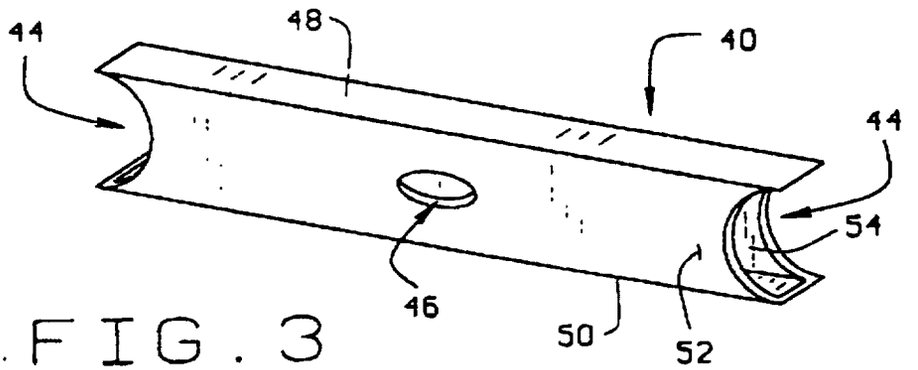

FIG. 3

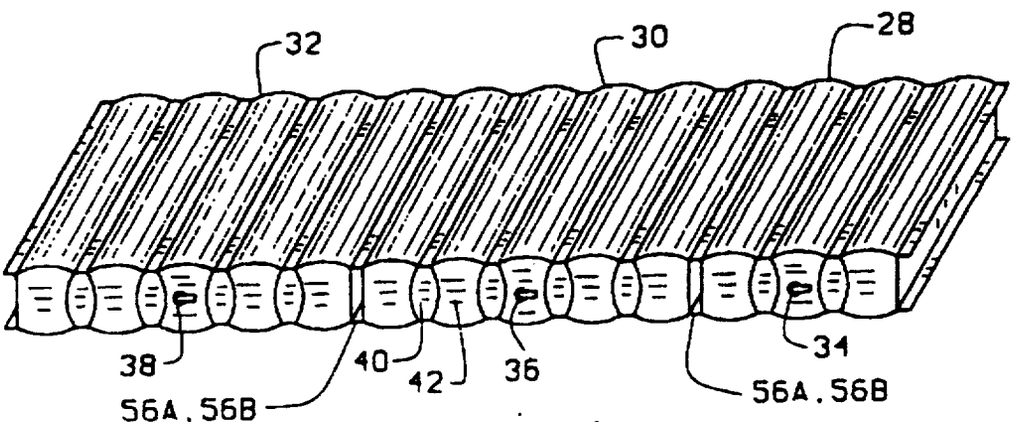

FIG. 4

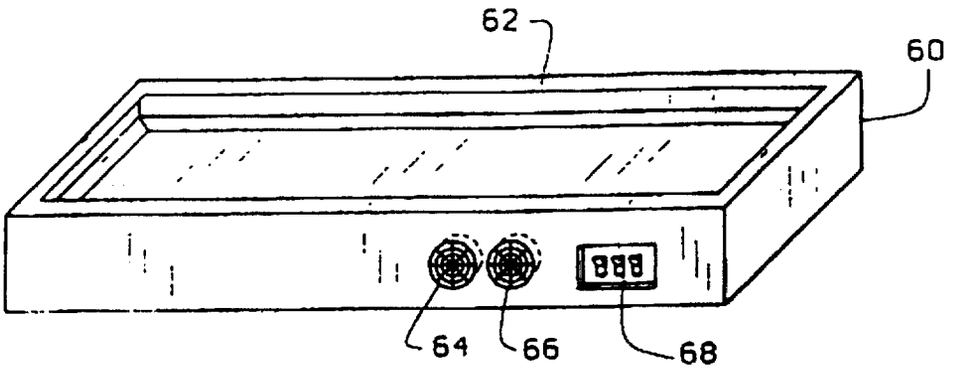

FIG. 5

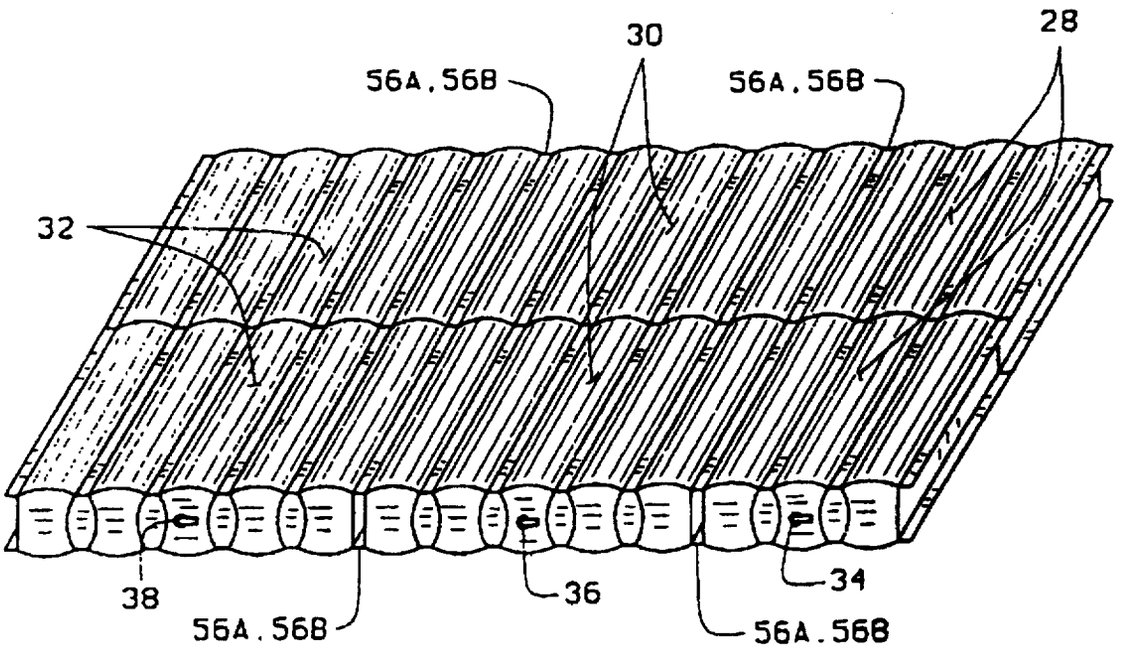

FIG. 6