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MR, NE, SN, TD, TG).

SEATING SUPPORT SYSTEM

BACKGROUND OF THE INVENTION

Chairs and sofas have been used to provide a comfortable resting environment, and use an underlying support structure to support those sitting in the chairs and sofas. Seating support structures used in the furniture industry are known and varied. These seating arrangements provide support with a seat and a back support, and may include arm rests. The chairs found in many homes today are often provided with cushioning and a spring-type suspension system. This increases the comfort of those using the chairs. Most chairs and sofas, however, do not offer an adjustable support system. The support provided, in whatever form it takes, cannot be changed by the user.

Some seating systems have been developed that utilize a pneumatic bladder to provide support in the lumbar area or seat area. These systems must provide some type of support for the bladder. If the bladder is merely placed in the cushioning material, the bladder will merely expand downwardly away from the support surface, negating the use of the bladder as an additional support. So, these systems have utilized a rigid support surface for the bladder. The disadvantage of these systems is that the user may have a feeling of “bottoming out” against the hard surface.

Therefore, it is an objective of the present invention to provide a seating product offering a practical adjustable support system for use in sofas, chairs and other seating arrangements.

SUMMARY OF THE INVENTION

This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

Embodiments of the present invention relate to a seating product having a frame. The frame defines the seating area and back area of the seating product. A series of flexible straps extend across the seating area and back area. In a similar fashion, a series of spring supports extend over the flexible straps in the seating and back areas. The straps and the spring supports hold an inflatable bladder in the lumbar region of the back area. The straps and the spring supports in the seating area hold another inflatable bladder in the seating area. The bladders are coupled to a pump, controllable to inflate and deflate the bladders. When deflated, the seating product has a suspension and feel like that of traditional seating products. The bladders can be selectively and individually inflated to provide a customized support in the seating product. The flexible straps provide a suspension surface for the air bladders. This allows the air bladders to provide additional support to the seating product, without using a rigid support thereby reducing any feeling of the user "bottoming out" against a hard surface.

These and other aspects of the invention will become apparent to one of ordinary skill in the art upon a reading of the following description, drawings, and the claims.

BRIEF DESCRIPTION OF THE DRAWING

The present invention is described in detail below with reference to the attached drawing figures, wherein:

FIG. 1 is a partial perspective view, partially cut away of a seating product in accordance with an embodiment of the present invention;

FIG. 2 is a side view of a seating product in accordance with an embodiment of the present invention;

FIG. 3 is a sectional view taken along line 3-3 of FIG. 2;

FIG. 4 is a top view with parts broken away to show the orientation of the seat bladder in one embodiment of the invention; and

FIG. 5 is a top plan view of an exemplary control device for use with the invention.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings, and particularly to FIG. 1, there is illustrated a seating product 10, shown in the Figures as a chair. It should be understood that the following description uses a chair to describe the seating product 10, but that the invention
5 could be used with other seating products. The chair 10 has a supporting frame 12, typically made of wood. The frame 12 defines the overall shape of the chair, including a back area 14, seat area 16 and a pair of arms 18. The frame of the back area 14 provides a supporting structure for a series of springs 20. Springs 20 are typically and preferably a sinusoidal shape, as is known to those of skill in the art. The springs 20 are coupled to the frame and
10 bow outwardly toward the back of a user sitting in the chair.

A series of flexible straps 22 are also coupled to the frame in back area 14. As an example, straps 22 are stapled to the frame in back area 14. The straps 22 are located rearward of the springs 20. Preferably, straps 22 are a knit material that is 60% polyester and 40% rubber. In a preferred embodiment, the maximum elongation of straps 22 is 140%.
15 Straps having other elongation properties could also be used, depending on the support desired by the designers of the chair.

An air bladder 24 is held in place between the springs 20 and straps 22. The straps 22 hold the bladder in place in any condition between fully deflated and inflated. The bladder is located in the lumbar region, such that it can provide additional support to the
20 lumbar area of a user sitting in the chair 10. Bladder 24 can be made from any durable material. In the current preferred embodiment, bladder 24 is made from a polyurethane material.

As with other chairs, a cushioning material 26 is disposed on top of the springs 20 and completely covers the back area 14. A cover 28 extends over the cushioning material
25 26 to provide the surface exposed to the user of the chair 10. Any of the materials known to those of skill in the art in the furniture industry are acceptable for use as cushioning material 26 and cover 28.

Like the back area 14, the frame of the seat area 16 provides a supporting structure for a series of springs 30. Springs 30 are typically and preferably the sinusoidal
30 shape of those on the back area 14. The springs 30 are coupled to the frame and bow upwardly toward the user sitting in the chair. As an example, springs 20 and 30 can be coupled to the frame with a series of connecting clips.

A series of flexible straps 32 are also coupled to the frame in seat area 14. As with straps 22, straps 32 are stapled to the frame in seat area 16. The straps 32 are located under the springs 30. Preferably, straps 32 are made from the same material as straps 22. It should be understood that straps 22 and straps 32 could be made from different material, if
5 different elongation characteristics were desired in seat area 16 than back area 14.

An air bladder 34 is held in place between the springs 30 and straps 32. The straps 32 hold the bladder in place in any condition between fully deflated and inflated. The bladder 34 is preferably u-shaped, or half dog bone shape, such as that shown in FIG. 4. The shape as shown provides support for the legs of the person sitting in chair 10, while not
10 providing unneeded support in the area of the tailbone. Bladder 34 is preferably made from the same material as bladder 24. Bladders 24 and 34 have been described as air bladders, but it should be understood that other types of fluid or gas filled bladders could also be used.

As with other chairs, a cushioning material 36 is disposed on top of the springs 30 and completely covers the seat area 16. A cover 38 extends over the cushioning material
15 36 to provide the surface exposed to the user of the chair 10. The cover 38 is, in most cases, the same material as that of cover 28 so that covers 28 and 38 match.

As best seen in FIG. 2, an air tube 40 extends from bladder 24 to a pump 42. Pump 42 is operable to inflate or deflate bladder 24. In a preferred embodiment, pump 42 is an electric pump. Similarly, an air tube 44 extends from bladder 34 to the pump 42. Pump
20 42 is operable to selectively inflate or deflate bladder 24 separate and apart from inflation of bladder 34. It should be understood that a single pump 42 is shown, and is preferred, but that multiple pumps could be used and be within the scope of the present invention. With continued reference to FIG. 2, a hand-wand control 46 is coupled to pump 42 and is used to control the pump.

The hand-wand control 46 is best seen in FIG. 5. As shown, the control 46 preferably has buttons 48 used to activate the pump 42 to increase or decrease the inflation of bladder 34. A level indicator 50 is used to show the user the currently selected level of inflation for bladder 34. Similarly, the control 46 has buttons 52 to activate the pump 42 to increase or decrease the inflation of the bladder 24. A level indicator 54 is used to show the
30 user the currently selected level of inflation for bladder 24 in the seat area. Preferably, the control has preset buttons 56 used to move the bladders 24 and 34 to desired presets for a user.

In use, bladders 24 and 34 can be completely deflated. In this condition, the chair 10 will feel the same to a user as any other chair. If the user desires additional support in the lumbar area, the hand-wand control 46 is used to inflate bladder 24 using buttons 52. As the bladder 24 inflates, the straps 22 will elongate as the bladder inflates. At the same time, the bladder 24 will exert an outward force toward the user and against the springs 20. As the bladder 24 continues to inflate, the straps 22 will eventually reach maximum elongation so that further inflation of bladder 24 operates to increase the support toward the springs 20 and the lumbar region of the user.

The user may also desire additional support in the seating area. To increase support, the hand-wand control 46 is used to inflate bladder 34 using buttons 48. As the bladder 34 inflates, the straps 32 will elongate as the bladder 34 inflates. At the same time, the bladder 34 will exert an upward force toward the user and against the springs 30. As the bladder 34 continues to inflate, the straps 32 will reach maximum elongation so that further inflation of bladder 34 operations to increase the support provided in the seating area of the user.

The user may also set the buttons 56 to desired preset levels. Thereafter, the user may select one of the buttons 56 to inflate the bladders 24 and 34 to the levels corresponding to the desired pre-selected levels. This allows the user to customize the chair 10 to achieve the support most comfortable.

While not shown, it should be understood that the principles of the present invention can be used with motion furniture as well. In other words, the furniture may be equipped with recliner and footrest mechanisms. The support system of the straps, bladders and springs is low-profile, and so does not interfere with these motion mechanisms. This allows the support system to be used on a wide variety of furniture.

The present invention has been described in relation to particular embodiments, which are intended in all respects to be illustrative rather than restrictive. Alternative embodiments will become apparent to those of ordinary skill in the art to which the present invention pertains without departing from its scope.

From the foregoing, it will be seen that this invention is one well adapted to attain all the ends and objects set forth above, together with other advantages which are obvious and inherent to the system and method. It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

CLAIMS

What is claimed is:

1. A seating product comprising: a frame defining at least a seating area and a back area; at least one spring extending across the back area, at least one flexible strap
5 extending across the back area in the same area as the at least one spring and behind the at least one spring; a first inflatable bladder disposed and held between the at least one spring and the at least one flexible strap; a cushioning material disposed over the at least one spring, and a covering disposed over said cushioning to provide a user support surface.

10 2. The seating product of claim 1, further comprising a pump coupled to the first inflatable bladder and operable to inflate or deflate the bladder.

3. The seating product of claim 2, further comprising a hand-wand control operable to control the pump.

15 4. The seating product of claim 1, further comprising a first plurality of flexible straps adjacent the at least one flexible strap.

20 5. The seating product of claim 4, further comprising; a plurality of springs extending across the seat area a second plurality of flexible straps extending across the seat area in the same area as at least one of the springs in extending across the seat area; and a second inflatable bladder disposed and held between the at least one the plurality of springs in the seat area and the second plurality of flexible straps.

25 6. The seating product of claim 5, wherein the second inflatable bladder is coupled to the pump such that the pump is operable to selectively inflate or deflate the first and second bladders.

7. The seating product of claim 6, wherein the bladders are filled using air and the pump is a pneumatic pump.

8. The seating product of claim 5, wherein the second inflatable bladder is generally u-shaped, with the base of the u extending along the back of the seat.

9. A seating support system, comprising: a frame defining a seating area, a plurality of elastic knitted straps extending across the seating area defined by the frame; a first inflatable bladder disposed on top of said elastic straps; and a plurality of wire springs extending across said frame and over said bladder.

10. The seating support system of claim 9, wherein the first inflatable bladder has a u-shape with the arms of the u extending along the sides of the seating area and the base of the u extends along the rear of the seating area.

11. The seating support system of claim 10, wherein the elastic straps are made from polyester and rubber with a maximum elongation of 140%.

12. The seating support system of claim 11, further comprising a pneumatic pump coupled to the first inflatable bladder and operable to inflate and deflate the first inflatable bladder.

13. The seating support system of claim 11, further comprising a hand-wand pump control having a plurality of preset buttons used to inflate the first inflatable bladder to desired predetermined settings.

14. The seating support system of claim 9, wherein the frame further defines a back area, the seating support system further comprising: a plurality of elastic knitted straps extending across the back area defined by the frame; a second inflatable bladder disposed on top of said elastic straps; and a plurality of wire springs extending across
5 said frame and over said second bladder.

15. A chair having an adjustable support system, comprising: a frame defining a back area and a seat area; a plurality of spaced spring wires extending across the back area and the seat area; a plurality of flexible straps extending across the back area and
10 the seat area below the spring wires in the seat area and behind the spring wires in the back area; a first inflatable bladder disposed between the spring wires and the flexible straps in the back area; and a second inflatable bladder disposed between the spring wires and the flexible straps in the seat area.

15 16. The chair of claim 15, wherein the spring wires are sinusoidal springs.

17. The chair of claim 16, further comprising a pump coupled to the first and second inflatable bladders and operable to selectively inflate and deflate the first and second bladders.

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18. The chair of claim 16, wherein the second inflatable bladder is generally u-shaped and is oriented with the base of the u along the rear of the seat area.

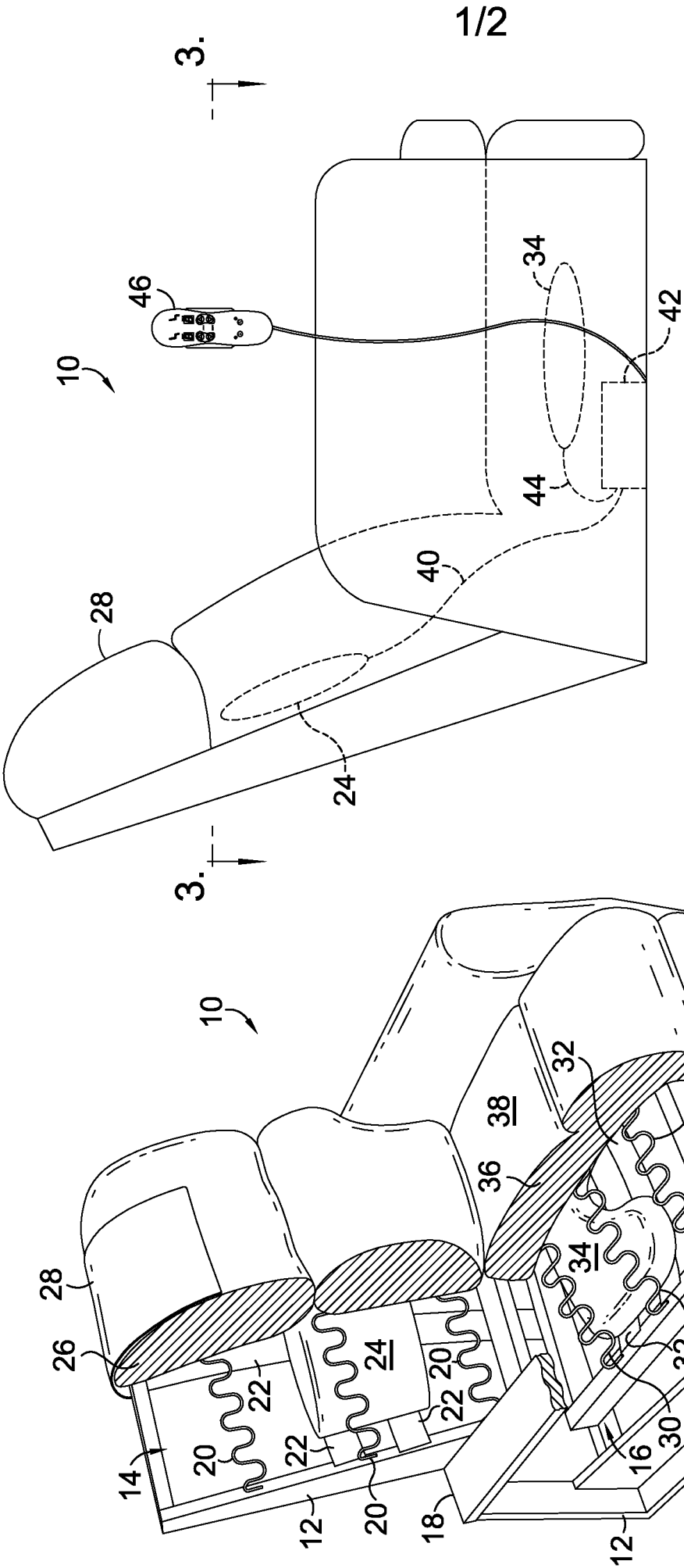


FIG. 2.

FIG. 1.

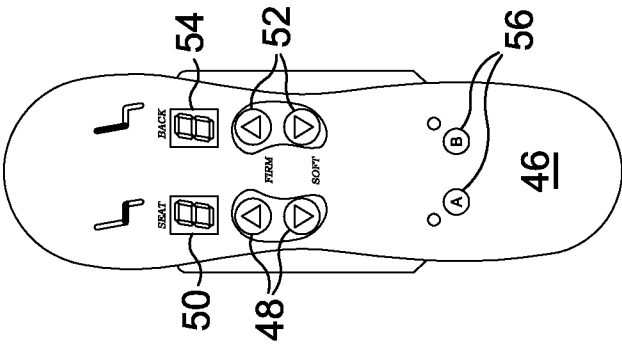


FIG. 5.

FIG. 4.

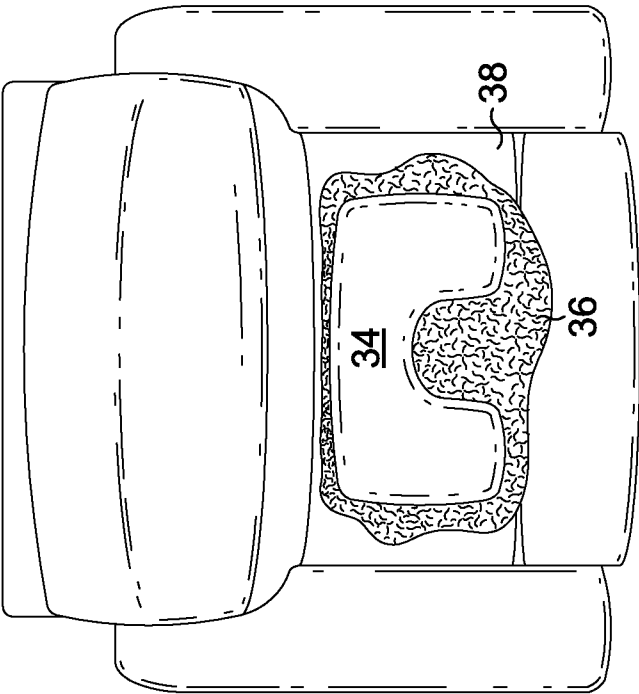
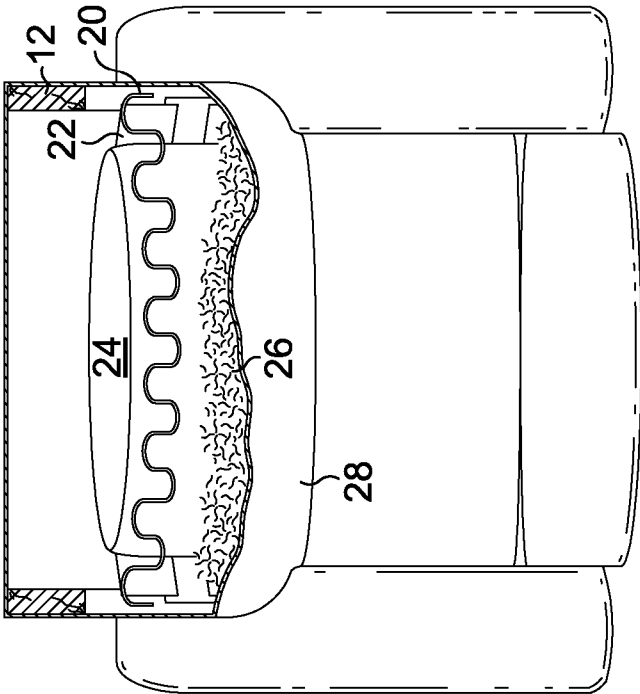


FIG. 3.



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2009/039428

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A47C 4/54 (2009.01)

USPC - 297/284.3

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC(8) - A47C 4/54, 27/00, 27/10 (2009.01)

USPC - 5/710, 713; 267/82, 131; 297/284.1, 284.3, 284.4, 284.6, 452.41, Dig.3

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PatBase

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4,437,702 A (AGOSTA) 20 March 1984 (20.03.1984) entire document	1-8, 15-18
Y	US 2006/0085919 A1 (KRAMER et al) 27 April 2006 (27.04.2006) entire document	1-18
Y	US 5,967,608 A (VAN SICKLE) 19 October 1999 (19.10.1999) entire document	9-14
A	US 5,711,575 A (HAND et al) 27 January 1998 (27.01.1998) entire document	1-18

☐ Further documents are listed in the continuation of Box C.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

20 May 2009

Date of mailing of the international search report

29 MAY 2009

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