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Gershbein

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[54] **MODULAR REST SURFACE**

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[52] **U.S. Cl.** **5/357;** 5/345

[51] **Int. Cl.** **A47c 27/00**

[58] **Field of Search** 5/91, 345, 352, 357; 297/284

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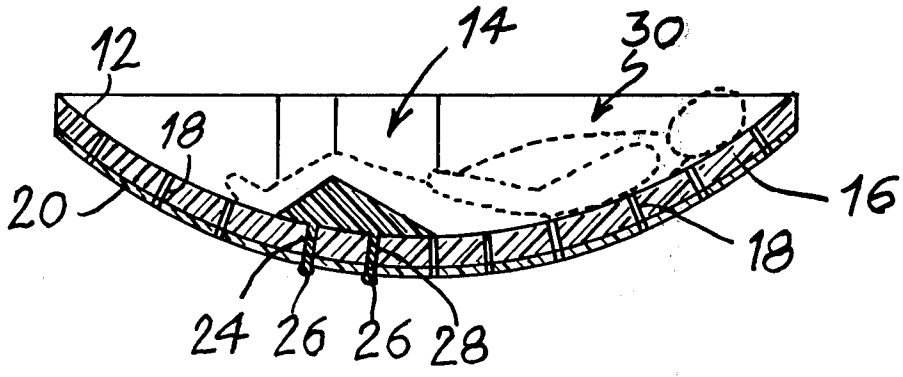
Primary Examiner—Paul R. Gilliam

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[57] **ABSTRACT**

A modular rest surface has a base support member having a predetermined surface contour such as a flat or concave contour. One or more sections of resilient or rigid sections are mountable on the base support member or on top of each other. Each of the sections is provided with a surface contour which modifies the predetermined surface contour when the section or sections are fixed on the base support member. Connecting means, such as mechanical snap fasteners, are used to removably and interchangeably mount the section or sections on the base support member or on each other in a modular fashion. With such an arrangement, rest surfaces which selectively support various portions of a person's body, or relieve pressure therefrom, are possible. The present invention further facilitates the formation of novel rest surfaces which promote body circulation or which enhance and facilitate rest or recreational activities thereon.

12 Claims, 10 Drawing Figures



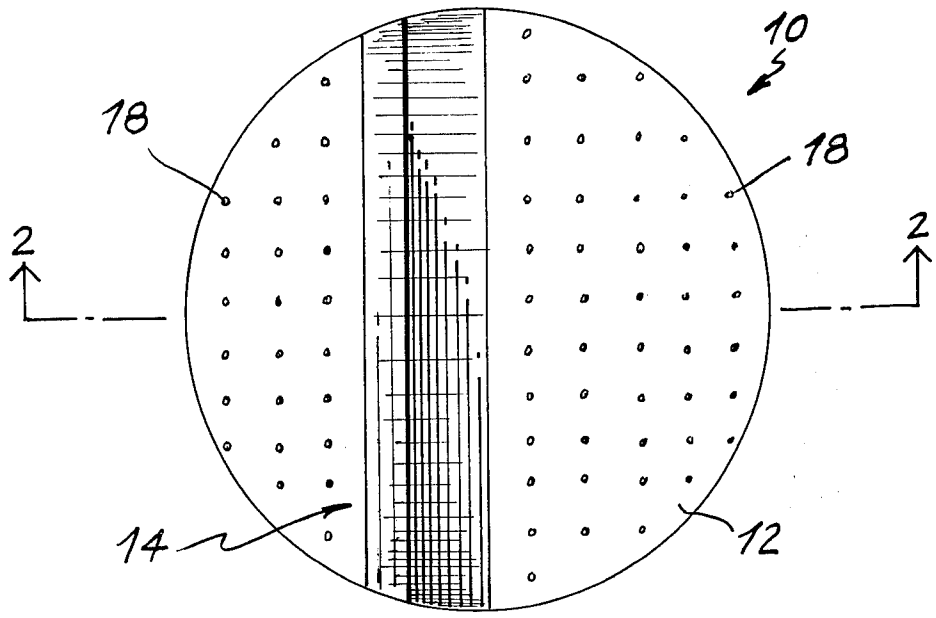


FIG. 1

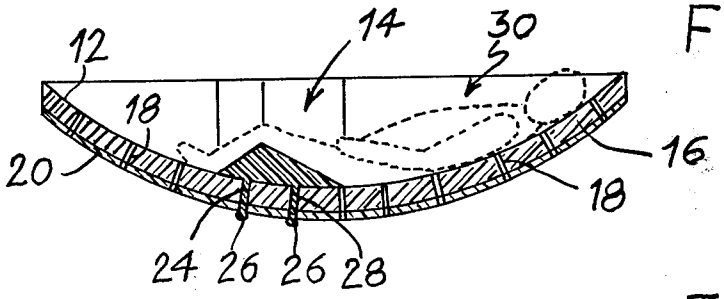


FIG. 2

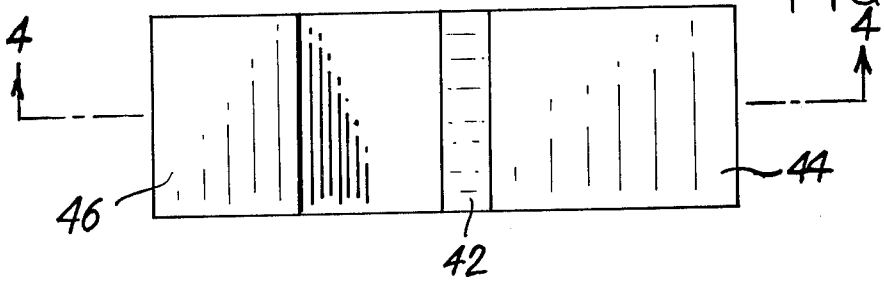


FIG. 3

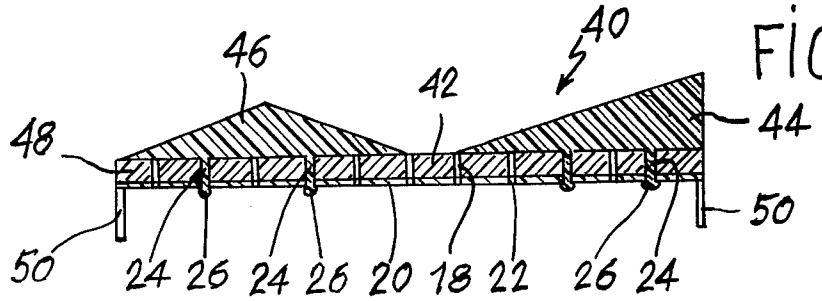


FIG. 4

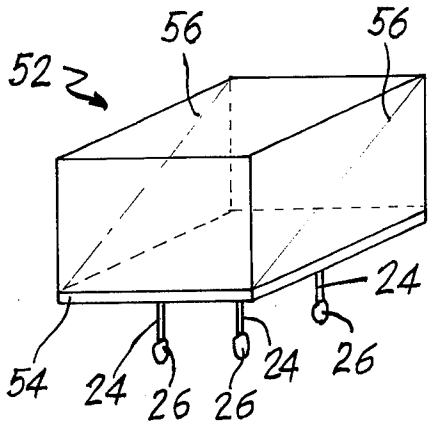


FIG.6

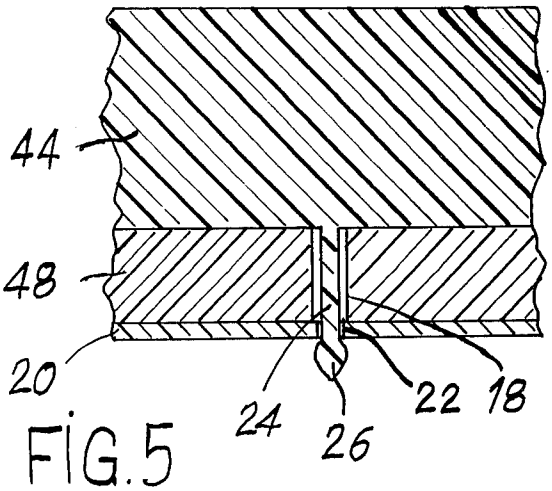


FIG.5

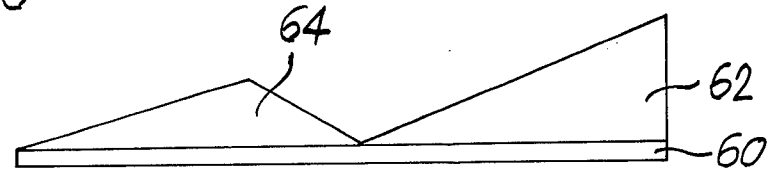


FIG.7

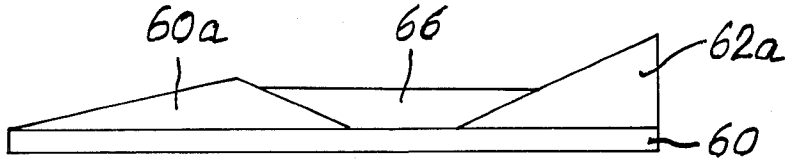


FIG.8

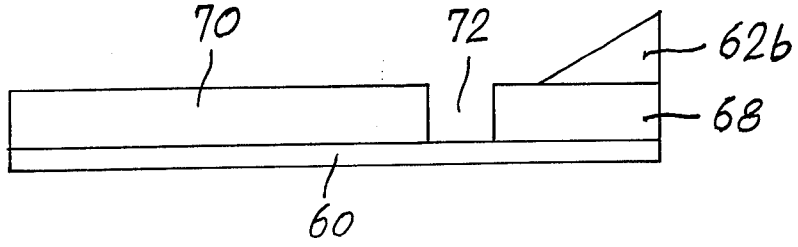


FIG.9

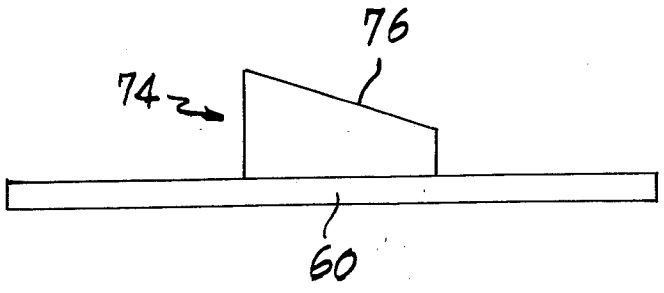


FIG.10

MODULAR REST SURFACE

BACKGROUND OF THE INVENTION

The present invention generally relates to body supporting devices, and more particularly to a modular rest surface which can be modified with facility to provide a desired upper surface contour to support or relieve pressure from selected portions of a person's body.

Various lounge chairs, mattresses and beds and the like are known which exhibit upper surface contours other than conventionally flat surface contours. Mattresses are known, for example, which are specifically designed for invalids or other clinical purposes. Typically, such a mattress is moulded to follow the body contours of the person which it is to support. However, these mattresses have limited utility since once they are formed, they cannot be easily modified to serve other functional uses.

Mattresses are also known which include one or more inserts which together define a contoured upper surface. However, the mattresses of this type are formed by adhesively connecting the inserts to a basic flat surface. Accordingly, once the inserts are cemented, the mattresses assume the permanent surface contour configurations characteristic of the above-mentioned molded body supporting devices.

The prior art devices of the general type under discussion do not have the versatility of a modular construction contemplated by the present invention. Thus, beds utilized for hospital patients must be tailored for accomodating their particular conditions. By providing a rest surface which permits simple addition, deletion or rearrangement of modular sections, the rest surface assumes a universal nature which can be altered at will to suit a particular patient, condition or use.

The rest surface of the present invention is also suitable for multiple purposes outside of the clinical realm. For example, it is generally accepted that blood circulation is promoted and stresses on the heart are relieved when a person sleeps or rests with his middle body portion disposed below the level of his head and leg portions. This portion is readily achievable with the present invention by, for example, mounting a head and a foot supporting portion on a basic flat supporting member, thereby leaving the middle body portion unsupported. On the other hand, a physically handicapped person who may have difficulty in having marital relations can convert the same last-described bed to instead solely provide a middle body portion supporting section or module which may be of assistance in coping with this problem. The rest surface can then be reverted to its optimum contour for sleeping purposes.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a body supporting device in the form of a rest surface which does not have the above-described disadvantages associated with prior art body supporting devices.

It is another object of the present invention to provide a versatile rest surface which is simple in construction and economical to manufacture.

It is still another object of the present invention to provide a rest surface which has a modular construction and which can be easily modified to provide a desired upper surface contour.

It is yet another object to provide a rest surface of the type above described which includes a basic support member and one or more modular sections which can be stacked or mounted on the basic support member or on top of each other to selectively modify the contour of an upper rest surface.

It is a further object to provide a rest surface of the type under discussion which includes a basic support member, one or more modular sections, and connecting means which permits addition, deletion or rearrangement of the modular sections with great facility.

It is still a further object to provide a rest surface whose contour can be easily and quickly modified to support selected portions of a human body or relieve pressure therefrom to make the same suitable, for example, for hospital or other clinical uses.

It is yet a further object to provide a rest surface of the type above suggested which can be readily converted from a generally concave sleeping surface which promotes circulation and relieves pressure on the heart to a surface having a middle body portion supporting section which may be of assistance to a physically handicapped person in having marital relations.

In order to achieve the above objects, as well as other objects which will become apparent hereafter, the present invention for a rest surface comprises a base support member having a predetermined surface area contour. At least one modular section is provided which is adapted to be mounted on said base support member. The modular section has a surface contour which modifies said predetermined surface contour when the section is mounted on said base support member. Connecting means is provided for removably and interchangeably connecting the section to said base support member for fixing the former to the latter. In this manner, a rest surface is provided which has a desired upper surface contour. Such a surface contour can be formed and modified by selectively positioning the section on said base support member and fixing the position thereof on the latter.

According to one presently preferred embodiment, said predetermined surface contour is circular and concave or dish-shaped. In another embodiment the surface is flat. Said connecting means is advantageously in the form of mechanical fastener means. The mechanical fastener means may, for example, comprise snap fastener means acting between said base support member and the section.

In many instances a plurality of sections are advantageously provided each mounted on said base support member. The facility with which sections are added, deleted and rearranged permits selective support of body portions or relief of pressure therefrom.

BRIEF DESCRIPTION OF THE DRAWINGS

With the above and additional objects and advantages in view, as will hereinafter appear, this invention comprises the devices, combinations and arrangements of parts hereinafter described and illustrated in the accompanying drawings of several preferred embodiments in which:

FIG. 1 is a top plan view of a circular and concave rest surface in accordance with the present invention, showing a modular leg support section mounted on the rest surface and showing an array of holes forming part

of connector means for releasably and interchangeably securing the modular section to the rest surface;

FIG. 2 is a cross sectional view of the rest surface and modular section shown in FIG. 1, taken along line 2 2

FIG. 3 is a top plan view of a flat rest surface in accordance with another embodiment of the present invention, showing head and leg modular supporting sections mounted on the rest surface;

FIG. 4 is a cross sectional view of the rest surface and modular sections shown in FIG. 3, taken along line 4—4;

FIG. 5 is an enlarged fragmented view of a portion of the rest surface shown in FIG. 4, showing the details of the mechanical snap fastener means utilized to releasably and interchangeably fix the modular support sections to the rest surface;

FIG. 6 is a perspective view of a universal module including an upper portion which can be cut to provide a desired upper surface contour and a lower support and connecting portion forming part of the snap fastener means shown in FIG. 5;

FIG. 7 is a schematic representation of a rest surface, shown in a side elevational view, provided with head and leg supporting modular sections similar to those shown in FIGS. 3 and 4, the resulting surface contour being especially suitable for lowering the middle portion of a person's body relative to his head and leg portions to relieve pressure on the heart and promote blood circulation;

FIG. 8 is similar to FIG. 7, further showing an arm support modular section extending between and to one side of the head and leg supporting modular sections;

FIG. 9 is a similar to FIGS. 7 and 8, but showing modular support sections spaced from one another to selectively provide a gap therebetween to relieve pressure from an intermediate body portion; and

FIG. 10 is similar to FIGS. 7–9, but showing an intermediate body support modular section projecting from the rest surface and suitable for exercise and recreation purposes.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, in which identical or similar parts are designated by the same reference numerals throughout, and first referring to FIGS. 1 and 2, a first embodiment of a presently preferred rest surface is generally designated by the reference numeral 10. The rest surface 10 is defined by a basic upper surface 12, which is shown to be circular and concave. Mounted on the upper surface 12 is an elongate foot supporting section 14 which has a triangular cross section as shown in FIG. 2. An important feature of the present invention is the modular versatility with which body supporting sections may be added, deleted and rearranged, as will be further described in connection with FIGS. 7–10.

The basic upper surface 12 is shown in FIG. 2 to be formed of a layer or sheet of material 16 which is provided with an array of transverse holes 18. The layer 16 may be made of a foam material or other soft material. However, the layer 16 may also be made from a rigid or hard material in which case a soft cushioning material may be used to cover the same (not shown) to increase the comfort to a person reposing thereon.

When the layer 16 is made of a non-rigid material, a rigid sheet 20 is advantageously provided which maintains the desired contour of the basic upper surface 12. The rigid sheet 20 is, according to a presently preferred embodiment, provided with an array of holes 22 which are coextensive or aligned with the array of holes 18. The holes 18 and 22 form part of a mechanical snap fastener means to be more fully described in connection with FIG. 5.

In FIGS. 3 and 4 a rest surface 40 is shown which includes a flat basic surface 42. The flat surface is modified by the addition of a modular head supporting section 44 and a modular foot supporting section 46. The section 44 has a single inclined surface while the section 46 has two inclined surfaces. A central portion of the basic flat surface is left exposed. Clearly, the effective contour of the rest surface 40 is not unlike that of the rest surface 10. In each case a person 30, shown in dashed outline in FIG. 2, can rest or sleep with his midportion disposed at a level generally below that of the rest of his body. Such a position is frequently desirable and is believed to promote blood circulation and relieve pressure on heart. This is achieved by promoting the flow of body fluids away from the region of the heart and towards the central body portion. It has also been established that the position shown in FIG. 2 is a comfortable one for the average individual. The rest surface upper contours also encourage a person to repose on his back since both rest surfaces 10 and 40 exhibit generally concave characteristics. Thus, both rest surfaces 10 and 40 are helpful when a person must sleep on his back for medical reasons.

Still refering to FIGS. 1–4, it will be noted that very similar upper contours can be obtained by selectively choosing first a basic upper surface and second choosing the upper surface contours of one or more appropriately positioned modular sections. Thus, the head is supported directly by the arcuate surface 12 of the rest surface 10 while the section 44 supports the head in the rest surface 40.

The basic flat surface 42 is formed by a flat perforated layer or sheet of material 48 provided with an array of holes 18 as suggested above. When the layer 48 is made of soft, resilient material and as foamed elastomeric plastic, a rigid supporting sheet 20 is provided as described above. When snap fastener means is used, as to be described, an array of holes 22 is formed in the rigid sheet to align with the array of holes in the flat layer or cushion 48. While the rest surfaces can be placed directly on a floor, they can be disposed above the floor by suitable legs such as 50 shown in FIG. 4 or in an other conventional manner.

In one presently preferred embodiment the layers 16, 48 and the modular sections are soft to enhance the comfort of the person resting thereon. In this case, the rigid sheets 20 maintain the contours of the basic surfaces. However, the layers 16, 48 and sections 14, 44 and 46 can also be made of wood, metal or plastic. In the latter instance, the rigid sheets 20 may be optional and a soft covering (not shown) may be provided to make the resulting rest surfaces more comfortable.

As suggested above, an important feature of the present invention is the modular approach of mounting one or more sections on a basic rest surface. Unlike the prior art comparable devices, the contoured sections of the present invention are intended to be mounted on, removed from and interchanged or rearranged on a basic rest surface with great facility. To this end, a wide variety of connecting means may be utilized at the in-

terfaces between the basic surfaces and the modular sections.

One possible type of connecting means is shown in FIGS. 2 and 4, with the details thereof being shown in FIG. 5. The type of connecting means to be described is in the general form of a mechanical snap fastener. However, this type of connecting means is by way of illustration only and any other conventional and suitable connecting means may be used for this purpose.

Referring to the FIGS., the modular sections are provided with bottom surfaces which are complementary to the basic surfaces so that the sections can be matingly mounted on the latter. Extending from the bottom surfaces of the sections are one or, preferably, more rods or extensions 24 which are each provided with enlarged or bulbous ends 26. As best depicted in FIG. 5, the extensions 24 are dimensioned to pass through the holes 18. The enlarged ends 26 are also intended to pass through the holes 18 without undue interference. This is readily achieved when the perforated layers 16 or 48 are made from a resilient and expandable material such as foam plastic. However, in this instance, the enlarged ends 26 are dimensioned to include a transverse cross sectional diameter greater than the diameters of the holes 22. When either or both the enlarged ends and the rigid sheet 20 are somewhat flexible or yielding, the enlarged ends can be forced through the holes 22 with attendant temporary deformation of the former or the latter. To facilitate entry, the enlarged ends can be provided with leading tapers at the free ends thereof, as shown in FIG. 5. Once the enlarged ends are forced or snapped through the holes 22, the sections become fixed in position on the basic support layers.

When the modular sections are made of a relatively rigid material, the rods or extensions 24 may be integrally formed therewith and directly depend therefrom. However, when the modular sections are made from a soft, yielding material, it may be necessary to provide a rigid layer or sheet connected by conventional means to the bottom surfaces of the modular sections. The extensions 24 may then depend from this rigid layer or sheet. The arrangement above described for the connecting means is particularly useful when the basic surface layers are made of a soft, yielding material. The advantage of the connecting means of the type under discussion is that the portions of the basic surfaces which remain exposed continue to exhibit the soft characteristics while being adapted to cooperate with a modular section to fix the latter in position. Clearly, if a soft upper basic surface is not deemed necessary, the the perforated layers 16 and 48 can be deleted and shorter pins or extensions 24 can be directly urged through the holes 22 in the rigid sheets 20.

A modular section made of a soft material provided with a rigid under layer or sheet is shown in FIG. 6. Here, a basic modular foam section is generally designated by the reference numeral 52. A rigid base or under layer or sheet 54 is provided from which the pins or extensions 24 depend. Any suitable number of pins 24 with enlarged ends 26 may be provided. The section 52 is provided with four pins 24 arranged in a square array and spaced to be receivable in holes 18 and 22.

As suggested above, and as will become apparent from the description that follows, the modular sections contemplated by the present invention can have any lengths, widths or upper contour surfases desired. Such modular sections may be made in standard and assorted sizes to accomodate different requirements or uses. These sections may also be made from soft and hard or rigid materials. However, the present invention also contemplates the use of basic modular sections which can have their upper surface contours altered prior to or subsequent to being mounted on a basic surface layer. For example, the section 52 can be made from a soft foam plastic material and is shown in the general shape of a cube. Since modular sections may be required to exhibit, for example, inclined or arcuate upper surfaces, the section 52 can be easily cut, such as along cutting lines 56, to provide an inclined upper surface. The cutting may be accomplished by an conventional means, such as by use of a hot wire or cutting blade. The provision of such basic modular sections alleviates the need to preform an excessive number of different modules, permits the formation of intricate upper surface contours and permits modules to be custom made for particularly critical applications. However, it is pointed out that the use of basic module sections does not detract from the versatility that the basic system or principle of the present invention offers. Whether preformed or custom made, the modules can be easily mounted on, removed from and rearranged on the basic surface layers.

In this connection, it is pointed out that the present invention can be carried out when the above-described snap fastener arrangement is replaced by any other suitable connecting means. For example, any other mechanical fastener means which permits the sections to be easily connected to and disconnected from a basic surface layer can also be used. The use of magnetic materials or the surface adhesion properties of some materials is also possible.

FIGS. 7–10 are illustrative of the type of upper surface contours which are readily achievable with the rest surfaces of the present invention. The rest surfaces are shown in schematic and, in each view, the referance numeral 60 represents the basic support member or surface which is flat and corresponds to the layer 48. In FIG. 7, an inclined head supporting section 62 and a doubly inclined foot supporting section are provided. This results in an arcuate type rest surface similar to those described in connection with FIGS. 1–4. As mentioned at that point, this contour lowers the mid-section of a person's body relative to the rest of his body. This is a confortable position which is believed to promote blood circulation and relieve pressure on the heart.

The rest surface shown in FIG. 8 is similar to that in FIG. 7 with the exception that the head supporting section 62*a* is spaced from the foot supporting section 64*a*. Additionally, an arm supporting section 66 is provided extending between and to one side of the sections 62*a* and 64*a*. The arm supporting section 66 projects above the basic support member 60 to maintain an arm of a reclining person at a desired elevation.

In FIG. 9, a head supporting section 68 is shown which is provided with a horizontal upper surface. A foot supporting section 70 is provided which is spaced from the section 68 and is likewise provided with a horizontal upper surface. The sections 68 and 70 are spaced to result in a gap or space 72 which can be selectively positioned to relieve pressure from any desired portion of a human body. In this respect, the rest surface shown in FIG. 9 differs from those shown in FIGS. 7 and 8 wherein the modular sections are ar-

ranged to primarily support portions of a human body. The embodiment shown in FIG. 9 is particularly suitable for relieving pressure from sensitive body portions which, for example, may be healing wounds. While the gap 72 is formed in a substantially horizontal surface formed by the sections 68 and 70, it should be clear that such gaps may be formed in any desired upper contour or surface, such as those shown in FIGS. 1–4, 7 and 8.

A further feature of the present invention is shown in FIG. 9, wherein a head supporting section 62b is fixed on the section 68. Accordingly, it is contemplated that an overall upper surface contour of a rest surface can be formed not only by stacking or mounting modular sections on a basic surface layer but stacking such modular sections on top of each other. This substantially enhances the versatility of the present invention and the ability to quickly and easily form simple or complex rest surface contours. In this connection, the same or different connecting means can be utilized to connect modular sections to each other as the connecting means utilized to connect the modular sections to the basic surface layers, as suggested above.

A further embodiment of a rest surface in accordance to the present invention is shown in FIG. 10, wherein an intermediate body supporting or elevating modular section 74 is provided, the section exhibiting an inclined surface 76. In addition to being suitable for resting and sleeping, the subject rest surfaces can also be used for exercise and recreation.

As should be evident from the FIGS. and the above description, the combination of a basic rest surface, one or more modular sections and suitable connecting means for connecting the latter to the former in a manner which permits easy separation and rearrangement of the sections is an improvement over presently known contoured mattresses and the like. With the present combination, it should be clear that any of the rest surfaces shown in FIGS. 7–10, for example, can be easily and quickly converted to any of the other rest surfaces by replacing and rearranging one or more of the modular sections.

The specific shapes or dimensions of the basic surfaces or of the modular sections are not critical and any shapes or dimensions suitable for a particular application may be used for either one.

Numerous alterations of the structure herein disclosed will suggest themselves to those skilled in the art. However, it is to be understood that the present disclosure relates to preferred embodiments of the invention which are for illustration only and are not to be construed as limitations of the invention.

What is claimed is:

1. A rest surface comprising a base support member having a predetermined surface contour; at least one three-dimensional section having a base surface which conforms to said predetermined surface contour and which projects above said base surface an amount comparable to the linear dimensions of the latter, said at least one section being mountable on any portion of said predetermined surface contour on said base support member and having an upper surface contour which modifies said predetermined surface contour when said at least one section is mounted on said base support member; and connecting means for removably and interchangably connecting said at least one section to any portion of said predetermined surface contour of said base support member for fixing the former to the latter, whereby a rest surface having a desired upper surface contour can be formed and modified at will by selectively positioning said at least one section on any portion of said predetermined surface contour of said base support member and fixing the position thereof on the latter.

2. A rest surface as defined in claim 1, wherein said predetermined surface contour is arcuate.

3. A rest surface as defined in claim 2, wherein said surface contour is concave.

4. A rest surface as defined in claim 1, wherein said connecting means comprises mechanical fastener means.

5. A rest surface as defined in claim 4, wherein said mechanical fastener means comprises a plurality of apertures in said base support member, and extensions having enlarged ends configured to releasably snap into said apertures when extended through the latter.

6. A rest surface as defined in claim 1, wherein a plurality of sections are provided each mounted on said base support member.

7. A rest surface as defined in claim 6, wherein a first section is provided for supporting a user's head, and a second section is provided for supporting the user's feet, whereby the central portion of the user's body is maintained at a level lower than that of the head and feet.

8. A rest surface as defined in claim 6, wherein a first section is provided for supporting a portion of a user's body, and a second section is provided for supporting another portion of the user's body proximate to the first mentioned body portion, said sections being spaced to provide a gap therebetween to relieve pressure from a portion of the user's body intermediate the two supported portions.

9. A rest surface as defined in claim 1, wherein said at least one section is mounted centrally of said base support member to support the mid-section of a user's body.

10. A rest surface as defined in claim 1, wherein a plurality of sections are provided, and further comprising additional connecting means for releasably and interchangeably connecting one section to another section, whereby variously contoured sections may be stacked one on top of another to form a desired overall upper rest surface.

11. A rest surface as defined in claim 1, wherein said at least one section is made of a material which can be cut, whereby said at least one section can be cut to provide a desired contour prior or subsequent to being mounted on said base support member.

12. A rest surface as defined in claim 11, wherein said material is a foamed elastomeric material.

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