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(71) Applicant: **Hernandez Maestre, Ana Maria**
03540 Alicante (ES)

(72) Inventor: **Hernandez Maestre, Ana Maria**
03540 Alicante (ES)

(74) Representative: **Urizar Anasagasti, José Antonio**
Victor de la Sema 3-5 (parking)
28016 Madrid (ES)

(54) MATTRESS COMPRISING INDEPENDENT, REMOVABLE PIECES

(57) A Mattress (1) composed of a base (3), and various independent, removable pieces (4) in form of blocks, and various joining means (2) consisting of adhesive fabrics of a Velcro type or similar that join the base (3) together with the independent and removable (4) pieces.

The base can be of any shape and material, flexible or semi-rigid and provided of different dimensions depending on each type of use.

The independent pieces (4) can be cut lengthways and transversely, like a traditional mattress and can have sections with different shapes and dimensions, therefore also having different heights. They are preferably manufactured in latex even though other materials can be used that would favour its adaptability.

The mattress (1) may be covered, in this case it would carry a fastener that would facilitate the insertion, extraction or change of position for the independent pieces, this fastener can consist of a zipper, pressure latch or any other type that would permit an easy access to the cushion.

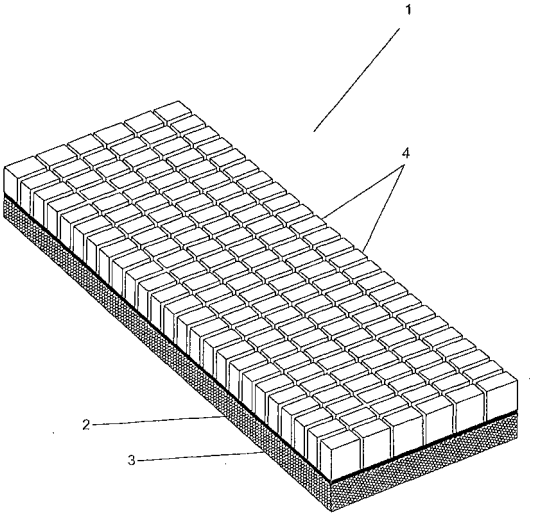

FIGURA 1

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Description

INVENTION PURPOSE

[0001] This invention makes reference to a new type of mattress, which consists of a base, some joining means and a plurality of independent and elastic pieces that are removable and interchangeable to support the body.

INVENTION BACKGROUND

[0002] In today's market, there are numerous types of mattresses that guarantee the human body's enjoyment of a beneficial rest but also need to provide the function of a good support, being neither too soft nor too hard. The main varieties are the following:

- Wool Mattress: nowadays it's rarely produced due to the wool being replaced by new materials. This type of mattress has the disadvantage of the wool becoming matted with use, needing backcombing every two or three years to regain consistency. Furthermore, the professional mattress makers nowadays are very scarce.

- Spring Mattress: consisting of stainless steel springs, which can be bi-conical (the top and bottom hairsprings are larger than the main ones) or cylindrical (the hairsprings are equal in diameter), and are usually isolated to avoid any noises. On each side of the hairsprings the filling cavity carries a layer of horsehair, sisal or felt; followed by a layer of cotton, wool or synthetic fibres, which at the same time carries a sleeve, all closed together by a cover. These mattresses are comfortable and solid.

- Synthetic Latex Mattress: the material is a chemical regeneration of natural latex. These mattresses have one flat surface and another surface full of cells that favour air circulation. They are very hygienic but deteriorate when exposed to daylight without their original cover.

- Polyester Mattress: the density for the production of polyester should not be less than 25 kg/m^3; the softness of the mattresses foam depends entirely of this density. Given that the rules are not always respected, this type of material has acquired an unmerited bad reputation. Before purchasing, the buyer should demand the specification of the density of foam utilized; good quality should also have a minimum of 10 cm.

[0003] All the types of mattresses described before have the inconvenience that the main piece, the resting base is not removable due to it being manufactured as a unique piece; on the other hand, all of these mattresses offer a continuous flat surface on the area where the body is supported, however, no matter how elastic it is, it will never entirely adapt to the body.

DESCRIPTION

[0004] This invention consists of a mattress that is composed of a base and a variety of independent pieces which are removable from the base to support the body. The base is joined to such independent, removable pieces by means of removable joints, specifically adherent fabric of a Velcro type or similar, that allow such independent pieces to be taken out, integrated or exchanged with different or similar ones and consequently substituted by new pieces when these are damaged or in very bad condition.

[0005] The adherent fabric which is integrated to the base as a piece of a joining means like Velcro or similar, can cover the entire upper surface or can partially cover it when used as continuous or broken strips, although it should be noted that, for the purpose of the invention, such strips need to be placed in a quantity enough to be able to place the independent, removable pieces, whatever their shape or dimension, in any piece of said upper surface of such base. The independent, removable pieces are provided with a corresponding and complimentary fabric on the bottom part to complete the joining means of Velcro type or similar.

[0006] Apart from its use as a conventional resting element, this mattress is especially suitable for people during hospital treatment, particularly, for people that have suffered any type of fracture and/or injury that requires the patient to remain in bed or in the same position. Since the pieces mentioned are removable, the surface of the mattress under the fractured zone or injury can be endowed of independent pieces and of any convenient shapes and reduced dimensions than the rest of the independent pieces of the mattress with the sole purpose of not forcing the affected part of the patients body and therefore permitting the pressure of the mattress to be correct and allowing the recovery of the affected part. This includes, of course, the case in which an area of the mattress can have no pieces at all.

[0007] The base of the mattress can have any kind of shape and be fabricated of any kind of material, elastic or semi-rigid and its dimensions can be variable according to its use and finality. An appropriate use of these variables allows to adapt the setting-up of this mattress to fit adult people or even children, and by extension, can be applicable to the manufacturing of cushions, seats and backing including those of vehicles, armrests, footrests, pillows, etc.

[0008] The independent pieces can be obtained by lengthways and transversely cuts of a traditional mattress or by means of an independent manufacture for each type of piece; its form can be prismatic, cylindrical, conical or pyramidal trunk or any other type that can deform elastically when submitted to a perpendicular or slightly in-

clined load regarding the plan of the mattress base; its section can be square, circular, elliptical, polygonal or of any other form; its height can vary according to the needs of the user or patient; the material composition of the pieces will preferably be made out of natural or synthetic latex, even though any other adequate and elastic material can be used for the mattresses. Due to the simplicity of the mattresses design and the features of its independent, removable pieces, these can be assembled over the same base of independent pieces of different shapes, sections, heights and materials. This ultimately means that the disposition of the independent, removable pieces over the base of the mattress does no have to be on reticule files and parallel columns but instead in whichever form, depending on the placement of each piece exclusively of the convenient placement at a given point depending on the needs of the body, particularly of the body of hospitalised patients.

[0009] This type of mattress which is composed of independent pieces favours the ventilation of the patient's body by circulating air, avoiding the multiple inconveniences of the classic mattresses. It also favours the cellular regeneration due to the massaging provided by the plurality of the independent pieces. It also avoids the formation of wounds produced by the friction between the skin and a hard surface.

[0010] The independent pieces are separated by variable separations that can be controlled as desired without any limitation in dimension of such separations. This is due to being the main objective of the invention to provide independent, removable pieces so they can be easily joined or extracted from the base at any given place. Such separations are chosen according to the needs of the user or the injury that would need to be treated; if necessary, some of the independent pieces can be removed, for example, with certain wounds so they won't be in direct contact with the mattress.

[0011] When this mattress is used for children or babies, the independent pieces are of a smaller size; the space of separation between them can avoid the well known suffocation produced by the mattress in contact with the respiratory tract of children due to the mattress being of great help for breathing. Pieces with a greater height than the ones mentioned before can also be provided in the areas of the edge of the mattress so these can act as a type of barrier to avoid children falling off the bed.

[0012] All of the pieces of the mattress (base, independent pieces, all of them with their corresponding elements to form the joining means) are capable, as mentioned before, of being manufactured and commercialised at different times and places; they are all interchangeable and any of them can be substituted or cleaned if they are deteriorated or dirty.

[0013] The mattress may or may not be covered. In the latter case, the cover can be provided of a lateral latch in all or in a few of the edges, such as a zipper, a pressure latch or similar, that would allow the easy access to its interior in order to extract, insert, interchange or alter the disposition of one or various of the independent and interchangeable pieces.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] For a better comprehension of the invention, as an example, it is included a description of a practical execution of such invention by means of the following drawings:

- Fig. 1 is a perspective view of a mattress in which all of the areas of the independent pieces are identical and prismatic.
- Fig. 2A is a partial side elevational view of a mattress where the invention is provided with identical pyramidal trunk pieces that show the separation between one another.
- Figures. 2B y 2C are elevational views of two subsets of independent pieces that are different in shape and dimension, suitable for placement on the edge of the mattress of a baby's crib that would avoid, with the baby's movement, injury by placing it's head between the bars of the crib.
- Fig. 2D is a side elevational view of the mattress for a baby's crib, where it shows the disposition of the independent pieces and some subsets which have been showed in Figs. 2B y 2C.
- Fig. 3A is a side elevational view of a mattress, a cushion, a seat a backrest, etc., in form of an arch, allowing the formed hollowness to adapt to any part of the body.
- Fig. 3B is an enlarged detail of Fig. 3A that allows us to observe the adaptability of the independent pieces (4) due to the separation and shape of such pieces.
- Fig. 4A is a side elevational view of a mattress, a cushion, a seat a backrest, etc., in form of an arch, allowing the formed convexity to easily adapt to any surrounding area.
- Fig. 4B is an enlarged detail of Fig. 4A that allows us to observe the adaptability of the independent pieces (4) with different surrounding areas.
- Fig. 5 is an elevational view of a mattress of the invention where we can observe the different distortion of the independent pieces (4) that are in contact with the body of the person lying down.

PREFERRED EMBODIMENT OF THE INVENTION

[0015] As a non limiting example, a description of a preferred embodiment of the mattress of the invention is hereinafter disclosed, out of the many possible embodiments pursuant to the contents of the previous description, that also include not only mattresses but cushions, seats, and backrests including those of vehicles, armrests, footrests, pillows and other elements for the everyday rest of adult and children's bodies.

[0016] In the preferred embodiment shown in Fig. 1, the mattress (1) of the invention shows a base (3) of a parallelepiped shape, the flat upper side of which adheres by conventional known in the art, methods, to a continuous sheet or separate strips of auto adherent fabric of a Velcro type or similar, which will completely cover the top surface of the base (3).

[0017] The complimentary sheet of the Velcro type or similar joining measure will adhere a plurality of independent pieces (4), previously cut according to the size of each independent piece (4). In this preferred embodiment, the independent pieces (4) are equal in dimension and prismatic shape.

[0018] The independent pieces (4), each provided with said complimentary sheet of Velcro type or similar joining means, are arranged over the base (3) provided with a continuous sheet or separate strips of auto adherent fabric (2) of a Velcro type or similar in a uniformed distribution according to a reticule set of perpendicular columns and rows leaving a small and constant separation between the adjacent independent pieces (4).

[0019] The mattress may or may not be covered (1). In the latter case, the cover will be provided of lateral latches in all or some of the sides, such as zippers, pressure latches or other types.

[0020] This will allow that such independent pieces (4) can be individually extracted, inserted or changed by different or similar ones and consequently substituted by new ones when these are damaged or deteriorated.

[0021] It is clear that the invention described and accompanied of a preferred embodiment can be object of obvious variations for people who are experts in the matter as far as shapes, dimensions and materials used, these do not have to be viewed as modifications of the invention or of the following claims.

Claims

1. A mattress (1) of independent, removable pieces, comprising:

- a base (3);
- a plurality of independent, removable pieces (4) which are placed upon said base (3);
- auto adherent joining means of Velcro type or similar to join in a removable way said base (3) with said plurality of independent, removable pieces (4).

2. A mattress (1) of independent, removable pieces according to claim 1, **characterized in that** said base (3) can have any shape and dimension according to its use and finality and can be manufactured in any elastic or semi-rigid material.

3. A mattress (1) of independent, removable pieces according to claim 1, **characterized in that** said independent, removable pieces (4) are of a shape selected of prismatic, cylindrical, conical or pyramidal trunk or any other type suitable to deform elastically when submitted to a load perpendicular or slightly inclined with respect to the upper surface of the base (3) of the mattress (1); and said independent, removable pieces (4) have a section that can be selected of square, circular, elliptical, polygonal or of any other form, being the height of said independent, removable pieces (4) variable according to the needs of the user or patient, the material of said independent, removable pieces (4) being of any type of elastic material adequate for mattresses, preferably latex, the plurality of said independent, removable pieces (4) placed upon such base (3) can be composed simultaneously by independent pieces (4) of different shapes, different sections, different heights and different materials, the arrangement of said independent, removable pieces (4) upon said base (3) of said mattress (1) being of any desired shape, the placement of each independent and removable piece (4) exclusively depending upon the convenience of placing said piece (4) at a certain place according to the needs of the user's body, particularly of the body of the patient confined to bed or hospitalised and being each and every independent and removable piece (4) separated by a small distance of any adjacent independent, removable pieces (4).

4. A mattress (1) of independent, removable pieces according to claim 1, **characterized in that** said auto adherent joining means of Velcro type or similar that join in a removable way said base (3) with said plurality of independent, removable pieces (4) comprise :

a) either a continuous fabric sheet (2) of auto adherent Velcro type or similar of the same dimensions as the ones of the upper surface of said base (3) and joined to said upper surface of said base (3),
or
a plurality of continuous or separated fabric auto adherent removable strips of Velcro type or similar joined to the upper surface of said base (3) and placed in a sufficient quantity to allow for placing said independent, removable pieces (4), no matter what their dimensions, sections and

shapes are, in whatever position of said upper surface of said base (3); and
b) some auto adherent complementary fabric sheets to complete, once joined to said auto adherent fabric (2), said joining means of Velcro type or similar, each of said complementary auto adherent fabric sheets being joined to the lower surface of the corresponding independent, removable pieces (4) and each of the said sheets of auto adherent complementary fabric being the same in dimensions as said lower surface of the independent and removable piece (4) to which they are joined to.

whereby, through the joining of said sheets of complementary and auto adherent fabric with said continuous sheet of auto adherent fabric (2) or with said continuous or separate strips of auto adherent fabric, a removable joining is established between said base (3) and said plurality of independent, removable pieces (4) which are placed over such a base (3).

5. A mattress (1) of independent, removable pieces according to claim 1, **characterized in that** it can be provided with an outer cover provided with a side fastener in all or some of the sides, such as zippers, pressure latches or other types, to allow said independent pieces (4) to be individually extracted, inserted or changed by others which would be similar or even different and consequently substituted by new ones when these are damaged or deteriorated.

6. A mattress (1) of independent, removable pieces according to claim 1, **characterized in that** it can be used by means of an adequate choice of the shapes and dimensions of its components, as a cushion, a seat and a headrest including those of vehicles, an armrest, a footrest, a pillow, and other elements for the daily rest of adult and children's bodies.

Amended claims under Art. 19.1 PCT

1. A mattress (1) of independent, removable pieces, comprising:

- a base (3) which can have any kind of shape and dimension according to the mattress' use and finality that can be fabricated of any material, elastic or semi-rigid;
- a plurality of independent, removable pieces (4) that are placed on said base (3), said plurality of independent, removable pieces (4) placed on said base (3) being composed simultaneously by independent pieces (4) of different shapes, different sections, different heights and of different materials and each of these independent, removable pieces (4) being separated by a distance from the removable and independent piece (4) adjacent to it;
- auto adherent joining means of a Velcro type or similar to join in a removable way said base (3) with said plurality of independent, removable pieces (4).

wherein
the placement of said independent, removable pieces over the base (3) is free, the placement of each independent and removable piece (4) depending exclusively on the convenience of locating it in any given place according to the needs of the user's body, particularly hospitalised patients' bodies, and without any further restriction except that the portion of the base (3) over which each removable piece is placed (4) must be covered with said joining means (2).

2. A mattress (1) of independent, removable pieces according to claim 1, **characterized in that** said independent, removable pieces (4) are of a shape selected from prismatic, cylindrical, conical or pyramidal trunk of any other type that can deform elastically when submitted to a load perpendicular or slightly inclined with respect to the upper surface of the base (3) of the mattress (1); the height of said independent, removable pieces (4) being variable according to the needs of the user or patient, being the material of said pieces an elastic material adequate for mattresses, preferably latex.

3. A mattress (1) of independent, removable pieces according to claim 1, **characterized in that** said auto adherent joining means of Velcro type or similar used to detachably join said base (3) with said plurality of independent, removable pieces (4) comprise :

a) either a continuous sheet made of an auto adherent fabric (2) of a Velcro type or similar of the same dimensions as the ones of the upper surface of said base (3) and joined to said upper surface of said base (3),
or
a plurality of continuous or separated fabric auto adherent and detachable strips of Velcro type or similar joined to the upper surface of said base (3) and placed in a sufficient quantity to allow for placing said independent, removable pieces (4), no matter what their dimensions, sections and shapes are in whatever position of said upper surface of said base (3); and
b) some auto adherent complementary fabric sheets to complete, once joined to said auto adherent fabric (2), said joining means of Velcro type or similar, each of said complementary auto adherent fabric sheets being joined to the lower surface of the corresponding independent, re-

movable pieces (4) and each of the said sheets of auto adherent complementary fabric being the same in dimension as said lower surface of the independent and removable piece (4) to which they are joined to.

whereby, through the joining of said sheets of complementary and auto adherent fabric with said continuous sheet of auto adherent fabric (2) or with said continuous or separate strips of auto adherent fabric, a detachable joining is established between said base (3) and said plurality of independent, removable pieces (4) which are placed over said base(3).

4. A mattress (1) of independent, removable pieces according to claim 1, **characterized in that** it can be provided with an outer cover that features side fasteners in all or some of the sides, such as zippers, pressure latches or other types, to allow said independent pieces (4) to be individually extracted, inserted, changed by others which would be similar or different and consequently substituted by new ones when these are damaged.

5. A mattress (1) of independent, removable pieces according to claim 1, **characterized in that** it can be used by means of an adequate choice of shapes and dimensions of its components, as a cushion, a seat and a headrest including those of vehicles, an armrest, a footrest, a pillow and other elements for the daily rest of an adult or child's body.

6. A mattress (1) of independent, removable pieces according to claim 1, **characterized in that** by placing independent, removable pieces (4) of greater height than the others in the areas of the edge of the mattress (1) a mattress that avoids children falling off the bed is formed.

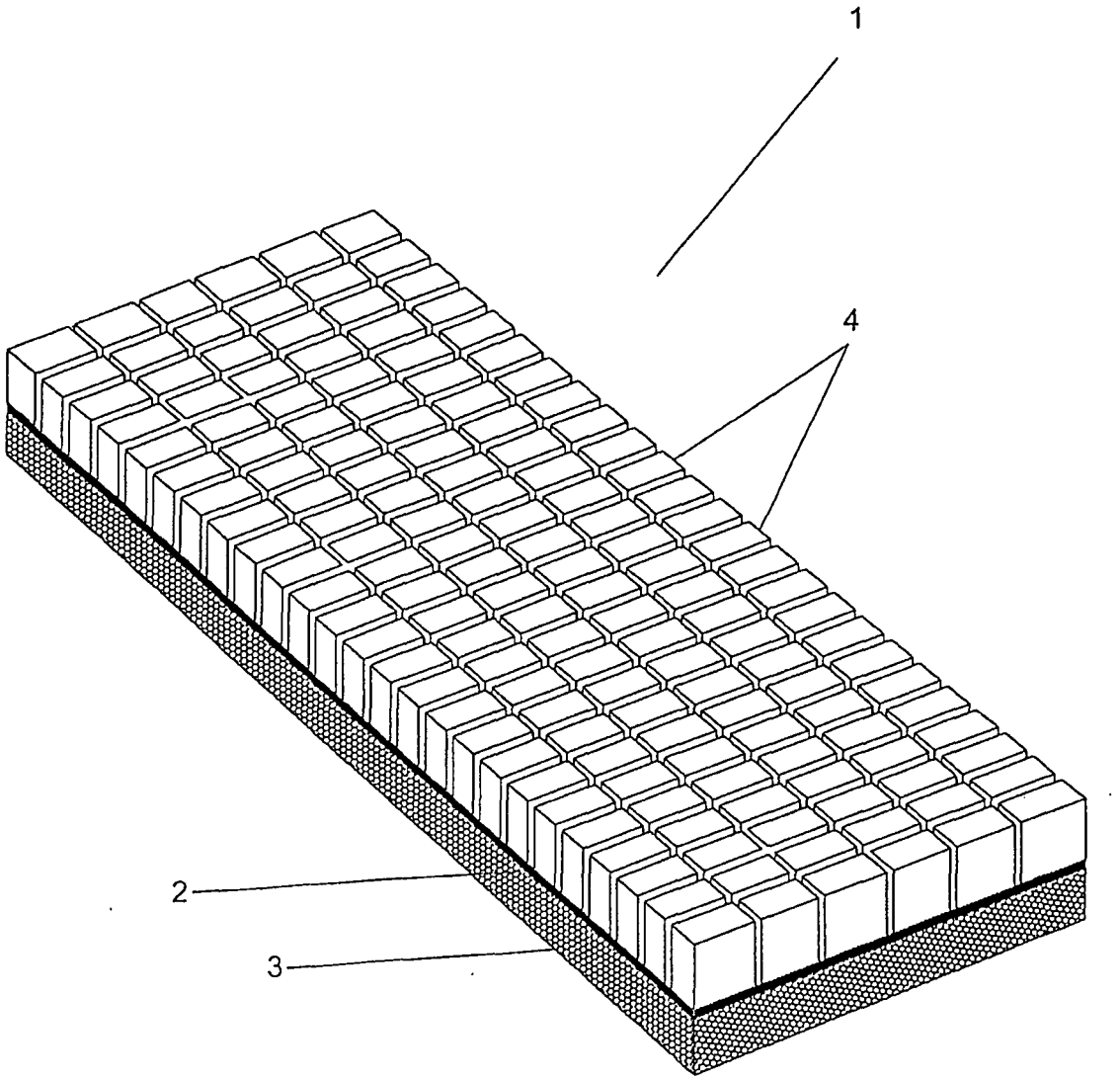

FIGURA 1

FIGURA 2B

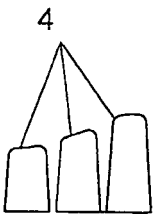

FIGURA 2C

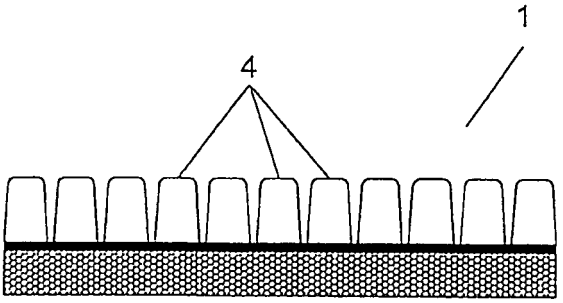

FIGURA 2A

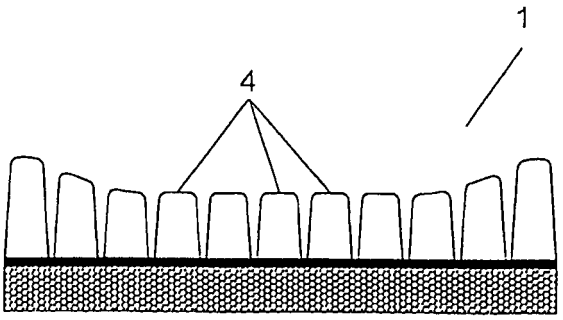

FIGURA 2D

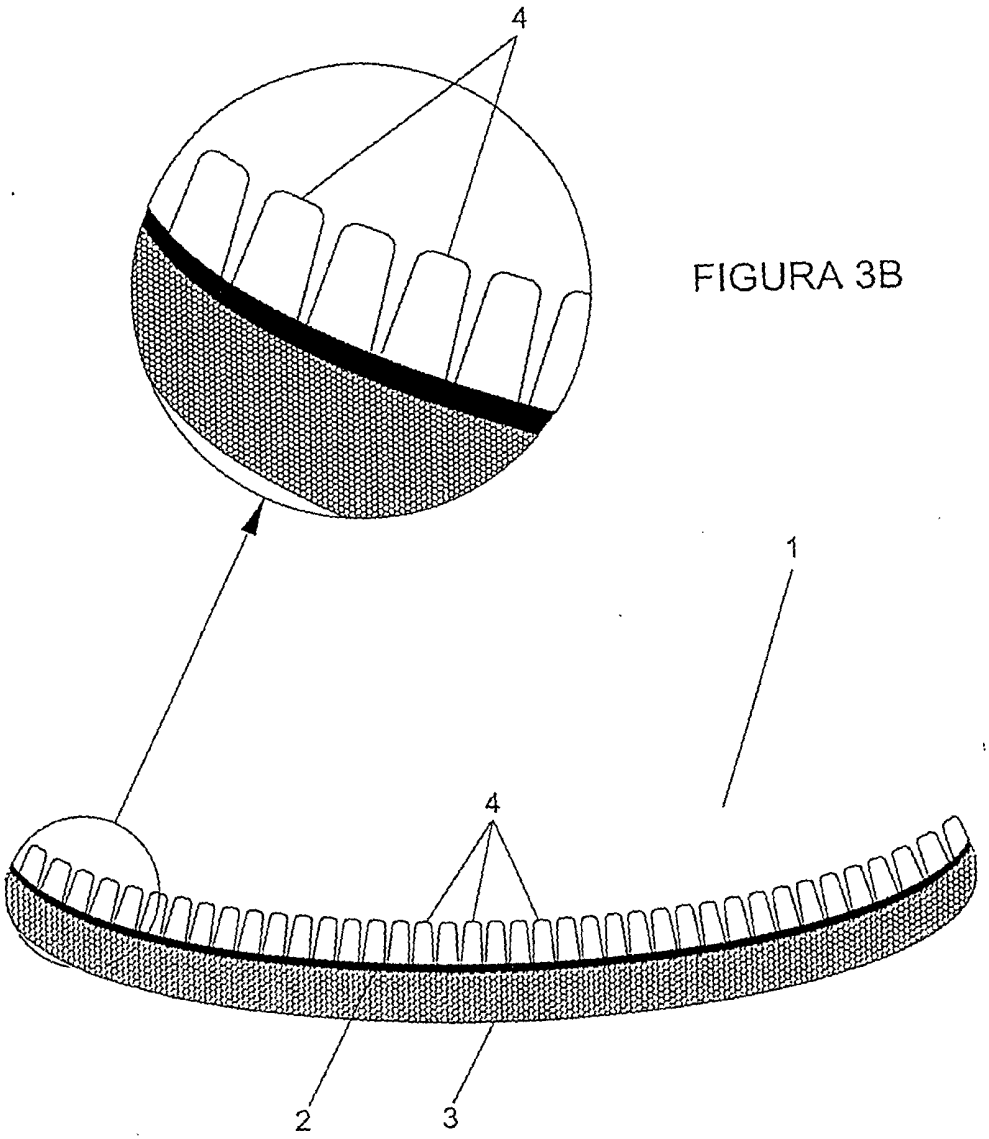

FIGURA 3B

FIGURA 3A

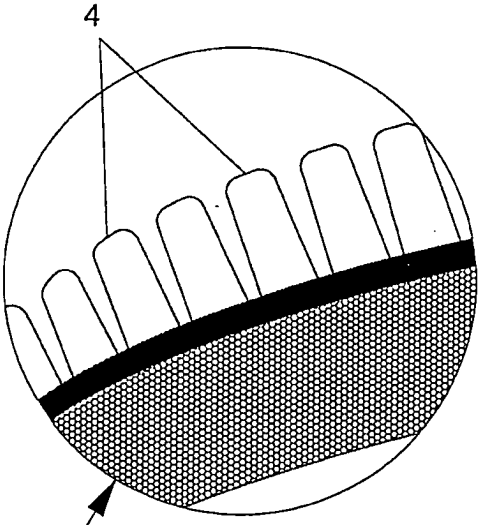

FIGURA 4B

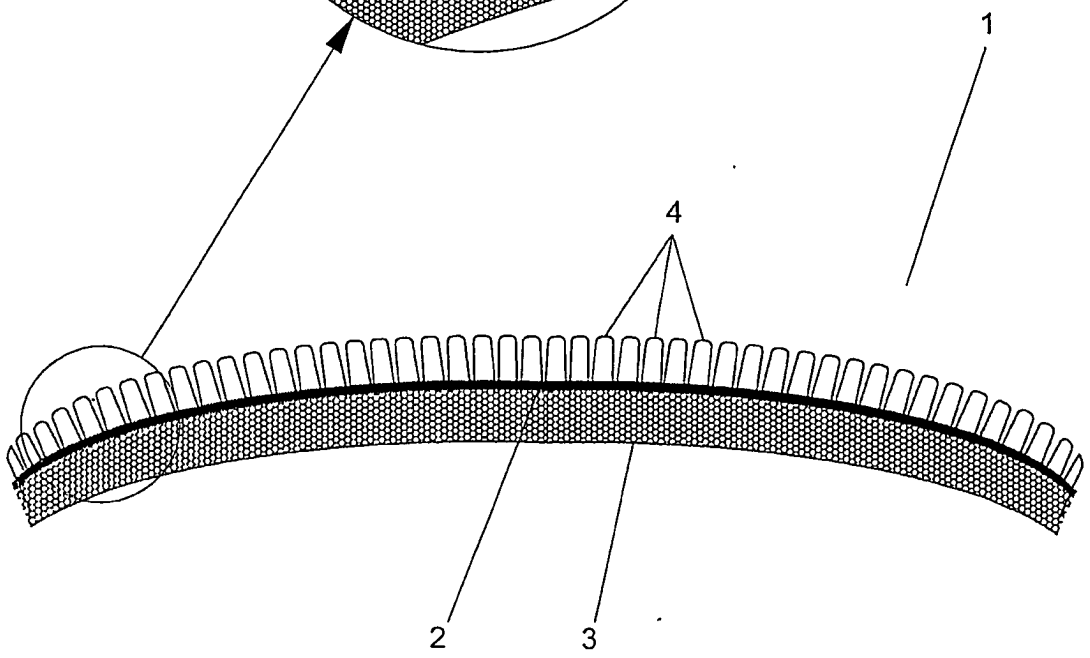

FIGURA 4A

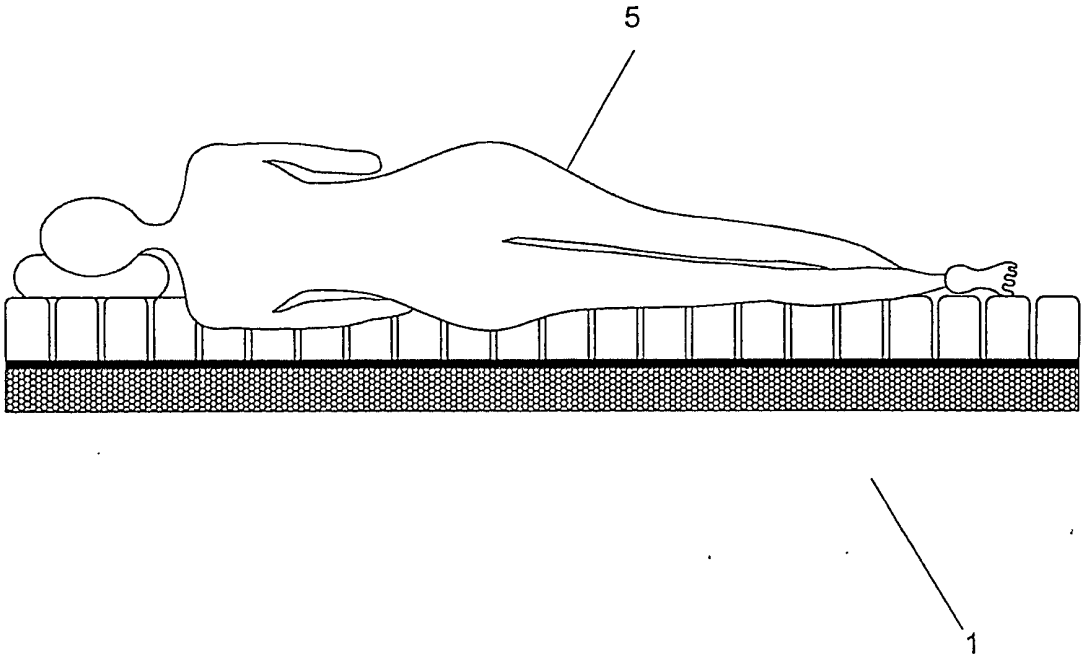

FIGURA 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ ES 2005/000153

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 A47C 31/12, A47C 27/00, A47C 27/14, A61G 7/057

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)

IPC7 A47C 31/12, A47C 27/+, A61G 7/057

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)

CIBEPAT,EPODOC,WPI,PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	WO 03084368 Al (KANG, S.G. Y KANG, T.G.) 16.10.2003, page 13, line 4- page 16, line 32, figures 7,9.	1-6
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A	WO 8102384 Al (KENNAWAY, A. Y FOUNTAIN, M.) 03.09.1981, the whole document.	

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents:

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

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10th June 2005 (10.06.05)	17th June 2005 (17.06.05)
Name and mailing address of the ISA/ S.P.T.O. Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No.
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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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A	ES 2019644 B3 (SAVIEZ, J.) 01.07.1991, the whole document.	
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Form PCT/ISA/210 (continuation of second sheet) (April 2005)

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Information on patent family members

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