A mattress has a frame, which is formed from an elastic material and laterally delimits an interior. Arranged in the interior are at least two elastic spacer textiles, which are each releasable from the frame and from one another. The mattress has a high degree of reclining comfort and, because of the modular construction, can be cleaned in a conventional washing machine.
MAATTRESS WITH A SPACER TEXTILE
CROSS REFERENCE TO RELATED APPLICATIONS


FIELD OF THE INVENTION

[0002] The invention relates to a mattress with a spacer textile and a frame, which is formed from an elastic material and laterally delimits an interior.

BACKGROUND OF THE INVENTION

[0003] A mattress with a mattress core made of foam and a spacer textile arranged thereon is known from DE 203 09 793 U1. This mattress has a high degree of reclining comfort, the spacer textile, because of its dimensional stability, having a high degree of air permeability, which leads to a pleasant micro-climate on the reclining surface. The drawback with this mattress is that the spacer textile is so voluminous to achieve a high degree of reclining comfort that it has to be cleaned manually or by means of spray disinfection.

[0004] A viscoelastic mattress with a woven spacer fabric is known from DE 10 2008 045 517 A1. The mattress has an upper reclining surface made of viscose foam and a substructure made of cold foam. Inserted between the reclining surface and the substructure is a woven spacer fabric, which is surrounded by a foam frame with air slots. The viscose foam, the substructure, the woven spacer fabric and the foam frame are connected to one another by cold glue adhesion. The drawback is that the mattress is so voluminous that it is difficult to clean it.

[0005] A mattress for aircraft is known from EP 1 700 783 A1, which has a foam core with a recess. A foam web is formed at the edge by the recess. A spacer textile is inserted in the recess as a reclining support. The drawback is that the mattress is so voluminous that it is difficult to clean it.

SUMMARY OF THE INVENTION

[0006] The invention is based on the object of developing a mattress of the generic type in such a way that it has a high degree of reclining comfort and is easy to clean.

[0007] This object is achieved by a mattress comprising at least two elastic spacer textiles arranged in the interior, which are each releasable from the frame and from one another. It was recognized that spacer textiles used in conventional mattresses with an adequately high degree of reclining comfort are too voluminous to be cleaned in conventional washing machines. In contrast to this, the mattress according to the invention is constructed in a modular manner, in that at least two elastic spacer textiles, in particular knitted spacer fabrics, are arranged in an elastic frame. The frame delimits the interior to four sides and forms a through-opening. The at least two elastic spacer textiles can be released from the frame and from one another, so the individual modules, in other words the frame and the at least two spacer textiles, can be cleaned separately from one another in a conventional washing machine, for example in an industrial or domestic washing machine. Owing to the modular type of structure, on the one hand, the desired reclining comfort is achieved and, on the other hand, easy cleaning of the modules with limited volume is ensured in a conventional washing machine. Since the individual modules are limited with respect to their volume and can therefore be washed by means of a conventional industrial or domestic washing machine, easy and economical cleaning is made possible, so the hygiene of the mattress can be increased.

[0008] The at least two elastic spacer textiles may, for example, be arranged vertically above one another, the surface of the spacer textiles extending over the entire interior. Furthermore, the spacer textiles may, for example, be arranged horizontally next to one another, their respective height corresponding at most to the height of the frame. Despite the loose structure, the mattress has adequate stability owing to the elastic frame, without the elastic frame impairing the reclining comfort. The at least two spacer textiles may, for example, be clamped in the frame or releasably fastened to the frame by fastening means, such as, for example, hook and loop fasteners.

[0009] A high degree of reclining comfort is achieved by the at least two spacer textiles, as they ensure good pressure relief because of their good pressure distribution and point elasticity and a correspondingly good microclimate because of their air and vapor permeability. In addition, the at least two spacer textiles have a permanent recovery capacity, so the high degree of reclining comfort is permanently retained. Exclusively spacer textiles and optionally covers, but no foam layers, are preferably arranged in the interior of the frame.

[0010] The mattress according to the invention may, for example, be used as an overlay for a conventional mattress or as a complete mattress. The at least two spacer textiles are preferably configured as knitted spacer fabrics, which are produced by the XI1 knitting method, in other words, their spacer threads form thread groups with an XI1 form. The frame may be one-piece or multi-piece. The horizontal width of the longitudinal and/or transverse parts of the frame is 5 to 15 cm and, in particular, 5 to 10 cm.

[0011] The spacer textiles may have different compression hardnesses to increase the reclining comfort and/or be configured in such a way that at least one spacer textile has a plurality of zones with different compression hardnesses. As a result, the mattress according to the invention may be used, in particular, for preventing or treating bed sores.

[0012] A mattress, in which the frame consists of a foam material, in particular of polyurethane foam, cold foam or reticulated foam, ensures a high degree of stability and a high degree of reclining comfort. The elastic foam has a weight per unit volume of 20 to 70 kg/m³, in particular 25 to 55 kg/m³ and, in particular 30 to 60 kg/m³.

[0013] A mattress, in which a compression hardness of the frame is greater than a compression hardness of the at least two spacer textiles, because of its higher compression hardness or strength of the frame, forms an edge for sitting and standing up, so the comfort of the mattress is improved. The compression hardness of the frame is preferably 5 to 50%, in particular 10 to 40%, and in particular, 10 to 50% higher than the compression hardness of the at least two spacer textiles.

[0014] A mattress, in which the frame is configured in one piece, ensures a high degree of stability and therefore a high degree of reclining comfort.

[0015] A mattress, in which the frame has separate frame parts, which are releasably connected to one another, allows easier cleaning of the frame, as the individual frame parts
have a small volume. The frame parts can be connected to one another sufficiently firmly, so the mattress has adequate stability. The frame parts may, for example, be connected by means of hook and loop fasteners.

[0016] A mattress, in which at least two spacer textiles are arranged next to one another, in particular in a horizontal longitudinal direction and/or a horizontal transverse direction, ensures an adequately small volume of the at least two spacer textiles, the volume being able to be flexibly adapted to the volume of the washing machine by means of the number of spacer textiles. In a domestic washing machine, a division into comparatively more spacer textiles with a smaller volume is necessary than in an industrial washing machine. The at least two spacer textiles are, in particular, divided in accordance with the reclining requirements of the human body. For example, two to five, and in particular three or four, spacer textiles are arranged next to one another in a longitudinal direction. The length and/or the width of the spacer textiles may be identical. For example, three or four spacer textiles having an identical length and width are arranged next to one another in the longitudinal direction. The assembly of the mattress after the washing process is simplified by the identical length and width of the individual spacer textiles. Accordingly, two to four, in particular three, spacer textiles may be arranged next to one another in a transverse direction. The two lateral spacer textiles may have an identical width, but a smaller width than the central spacer textile. In particular, a large number of spacer textiles may also be arranged next to one another in the described manner in the longitudinal and transverse direction, the spacer textiles at least partially having identical lengths and/or widths.

[0017] A mattress, in which at least two spacer textiles are arranged next to one another, ensures a high degree of reclining comfort, the volume of the at least two spacer textiles being able to be flexibly adapted to the volume of a conventional washing machine. Since a plurality of spacer textiles are arranged one above the other, the height of the mattress can be flexibly adapted to the desired reclining comfort, without the individual spacer textiles being too voluminous for cleaning in a conventional washing machine. In particular, at least three spacer textiles may also be arranged horizontally next to one another and vertically one above the other.

[0018] A mattress, in which at least two spacer textiles arranged next to one another and/or above one another are releasably connected to one another, increases the stability and therefore the reclining comfort. The adjacent spacer textiles may, for example, be releasably connected to one another by means of at least one hook and loop fastener and/or at least one zip fastener. The hook and loop fastener parts may be fastened at the end face to two adjacent spacer textiles. The fastening may, for example, take place in such a way that the protruding cover layers of the spacer textile overlap the region of the spacer threads at the end face and are therefore used as a fastening base for the respective hook and loop fastener part. Furthermore, adjacent spacer textiles may be releasably connected to one another by one or two zip fasteners. In a zip fastener connection, the latter is sewn on both sides to the two protruding cover layers of the adjacent spacer textiles. When using two zip fasteners, each of the zip fasteners is sewn on both sides to one respective one of the protruding cover layers of the adjacent spacer textiles, so they are releasable, connected to one another by an upper and lower zip fastener.

[0019] A mattress, in which a spacer textile configured in one piece has at least one joint, which, in particular, runs in a horizontal longitudinal direction and/or a horizontal transverse direction, allows easy bending or rolling up of the respective spacer textile configured in one piece. As a result, the latter can be arranged more easily in a conventional washing machine. The at least one joint may, for example, be formed by a spacer thread-free region or a releasable connection, such as, for example, a zip fastener, a hook and loop band or another anti-slip fixing. The joints may, in particular, be arranged next to one another and/or one behind the other.

[0020] A mattress, in which the at least one joint is formed by a spacer thread-free region of the spacer textile, ensures a high degree of reclining comfort in connection with easy cleaning. Joints, which facilitate the bending or rolling up of the spacer textiles, may easily be formed by spacer thread-free regions. Moreover, the spacer thread-free regions, when arranged in the interior, in other words within the frame, can be eliminated, in that the cover layers are pushed together in this region and the associated joint or the spacer thread-free region disappears. In this manner, the reclining comfort is not impaired for a user.

[0021] A mattress, in which a reclining surface is formed by a one-piece spacer textile, which has a height of at most 15 mm, in particular of at most 10 mm, and in particular of at most 5 mm, the spacer textile in particular being joint-free, ensures a high degree of reclining comfort as the reclining surface facing the user is formed by a one-piece spacer textile. As no fastening means or gaps or joints are arranged on the reclining surface, these cannot impair the reclining comfort either. The comparatively thin configuration of the spacer textile avoids the latter being too voluminous for cleaning in a conventional washing machine.

[0022] A mattress, in which the spacer textiles each have two cover layers connected to one another by spacer threads and the spacer threads form thread groups running in one plane with an IXI form, the spacer textiles in particular being configured as knitted spacer fabrics, because of the IXI form of the large number of spacer thread groups, has a high elasticity of compression and dimensional stability, so the reclining comfort is permanently retained. Pressure loads can be elastically absorbed by the spacer threads, these returning to the original form once the pressure load ceases. In particular, the good pressure distribution and point elasticity lead to a high pressure relief.

[0023] A mattress, in which the frame and the at least two spacer textiles are completely covered by a common and removable outer cover, ensures a high degree of stability and a high degree of reclining comfort. The removable outer cover may be cleaned separately from the other modules. The outer cover may, for example, be liquid-permeable on the upper side, in other words on the reclining surface, whereas the lower side is liquid-impermeable. In addition, the side walls may be liquid-impermeable, so the outer cover forms a liquid-impermeable trough. As a result, liquid can be discharged from the reclining surface with it not being able to escape again at the lower side and the side walls. The reclining comfort is improved by this.

[0024] A mattress, in which the frame is completely covered by a frame cover, the frame cover, in particular, being removable, ensures a high degree of stability and a high degree of reclining comfort. The frame cover may be cleaned with the frame or removed for cleaning and cleaned separately. The frame cover may be liquid-permeable and/or liquid-impermeable. The frame may be completely welded in in foil, so the foil forms the frame cover. To clean the frame, the
foil has to be able to be disinfected. Accordingly, the frame parts of a multi-piece frame may be welded in as a whole and/or individually in foil. The frame can additionally be covered by a washable and disinfectable material, so the material forms a further frame cover. The fastening of a plurality of mattress modules made of spacer textile may, for example, be carried out in that the inside of the frame cover is provided at central contact height with respect to the inserted mattress modules with a hook and loop fastener band on all sides. Accordingly, the mattress modules arranged at the edge, or a spacer textile cover, which covers the mattress modules, is provided with a hook and loop fastener band. This achieves good fixing of the spacer textiles or mattress modules arranged at the edge. Spacer textiles, which do not contact the edge, can be fastened accordingly by a hook and loop fastener band or a zip fastener to the adjacent spacer textiles.

A mattress, in which at least one spacer textile is completely covered by a spacer textile cover, the spacer textile cover, in particular, being removable, ensures a high degree of reclining comfort, as the stability and the reclining properties can be flexibly adapted by means of spacer textile covers. Individual spacer textiles may be covered by their own spacer textile covers, which may be liquid-permeable and/or liquid-impermeable. For example, a spacer textile cover may be liquid-permeable on the reclining surface or upper side and liquid-impermeable on the lower side. In addition, the side walls of the spacer textile cover may be liquid-impermeable, so a liquid-impermeable trough is formed. Alternatively, the spacer textile cover may be completely liquid-permeable or liquid-impermeable. Furthermore, a plurality of spacer textiles arranged one above the other and/or next to one another may be covered with a common spacer textile cover, the configuration of which may, as described above, be liquid-permeable and/or liquid-impermeable. Since the spacer textile cover is removable, it can be cleaned separately. To orient the spacer textiles or to produce a flat mattress surface, the spacer textiles may be covered individually and/or in groups by anti-slip and air-permeable nets and thus be fixed with respect to one another. The nets thus, in each case, form a spacer textile cover. For multiple use, the nets are preferably produced from a washable material.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and specific objects attained by its uses, reference is made to the accompanying drawings and descriptive matter in which preferred embodiments of the invention are illustrated.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a partly sectional view of a mattress according to a first embodiment;

FIG. 2 is a sectional view through the mattress in FIG. 1 along the section line II-II;

FIG. 3 is an enlarged view of FIG. 2 in the region between two adjacent spacer textiles;

FIG. 4 is a cutout-wise sectional view through the mattress in FIG. 1 along the section line IV-IV in the region between two adjacent spacer textiles;

FIG. 5 is a partly sectional view of a mattress according to a second embodiment;

FIG. 6 is a sectional view through the mattress in FIG. 5 along the section line VI-VI;

FIG. 7 is an enlarged view of the mattress in FIG. 6 in the region of two adjacent spacer textiles;

FIG. 8 is a partly sectional view of a mattress according to a third embodiment; and

FIG. 9 is a sectional view through the mattress in FIG. 8 along the section line IX-IX.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

A first embodiment of the invention will be described below with reference to FIGS. 1 to 4. A mattress has a frame 2 formed from an elastic foam material, which laterally delimits an interior 3. The frame 2 is configured in one piece and consists, for example, of polyurethane foam, cell foam, or reticulated foam.

Arranged next to one another in the interior 3 are a total of twelve separate spacer textiles 4 to 15 in three longitudinal rows 16 to 18 and four transverse rows 19 to 22. The longitudinal rows 16 to 18 extend in a horizontal longitudinal direction, which is designated the x-direction, whereas the transverse rows 19 to 22 extend in a horizontal transverse direction, which is designated the y-direction. Adjacent spacer textiles 4 to 15 are releasably connected to one another by fastening means. The spacer textiles 4 to 15 connected to one another are clamped in the frame 2 and releasable therefrom.

The compression hardness of the frame 2 is greater than or equal to the compression hardness of the spacer textiles 4 to 15. The compression hardness of the frame 2 is preferably greater than the compression hardness of the spacer textiles 4 to 7 and 12 to 15 of the lateral longitudinal rows 16 and 18. The spacer textiles 4 to 15 may have the same and/or different compression hardnesses. To prevent or treat bed sores, individual spacer textiles 4 to 15 may have different compression hardnesses and accordingly be softer. For example, individual ones of the spacer textiles 4, 8, 12 or 7, 11, 15 may have a smaller compression hardness in the foot support region, in other words be softer.

The frame 2 and the spacer textiles 4 to 15 are completely covered by a common outer cover 23. The outer cover 23 is removable and, for this purpose, has an upper part 24 and an associated lower part 25, which are connected to one another by a zip fastener 26 and can be at least partially separated from one another. The trough-shaped lower part 25 is liquid-impermeable but air-permeable. In contrast, the upper part 24 is air-permeable and liquid-impermeable.

The spacer textiles 4 to 15 are, for example, configured as knitted spacer fabrics and/or interlaced spacer fabrics. The spacer textiles 4 to 15 each have two cover layers 27, 28 which run substantially parallel to one another and are connected to one another by spacer threads 29. The spacer threads 29 form spacer thread groups 30, which run in one plane and have an XIIX form. This is shown in FIG. 2. The XIIX form is formed by two spacer threads 29 running perpendicular to the cover layers 27, 28 and two crossing spacer threads 29 running obliquely, for example at an angle of 45°. The threads of the cover layer 27, 28 and/or the spacer threads 29 may be configured as monofilaments and/or multifilaments and, for example, consist of polyester. Reference is made to DE 100 26 405 B4 with respect to the structure and material of the spacer textiles 4 to 15.

The longitudinal rows 16 and 17 and 17 and 18 are releasably connected to one another by zip fasteners 31, 32. For this purpose, the protruding cover layers 27 of adjacent spacer textiles 4 to 15 are sewn to the upper zip fastener 31,
whereas the protruding cover layers 28 of adjacent spacer textiles 4 to 15 are sewn to the lower zip fastener 32. The zip fasteners 31, 32 are accordingly arranged one above the other in a vertical z-direction. The transverse rows 19 and 20, 20 and 21 and 21 and 22 are releasably connected to one another by hook and loop fasteners 33 to 35. For this purpose, the protruding cover layers 27, 28 are sewn to one another and to an associated hook and loop fastener part 36 or 37.

The height Hx of the frame 2 in the z-direction corresponds to the height Hx of the spacer textiles 4 to 15. The spacer textiles 4 to 15, for example, have a height Hx in the region of 20 to 100 mm. The spacer textiles 4 to 15 have a uniform length L in the x-direction. Furthermore, the spacer textiles 4 to 7 and 12 to 15 of the lateral longitudinal rows 16, 18 have a uniform width Bx in the y-direction. Accordingly, the spacer textiles 8 to 11 of the central longitudinal row 17 have a uniform width Bx in the y-direction, which is, however, greater than the width Bx.

To clean the mattress 1, the outer cover 23 is removed and the spacer textiles 4 to 15 are separated from one another and from the frame 2. The individual spacer textiles 4 to 15 and the frame 2 and the outer cover 23 are limited with respect to their volume, so they can be cleaned individually or in small groups in a conventional domestic washing machine or industrial washing machine. The ability of the frame 2 to be washed or cleaned assumes that the corresponding foam material can be treated. Reticulated foam can be used, for example, as the treatable foam material. After cleaning, the individual modules are jointed together again to form the mattress 1.

A second embodiment of the invention will be described below with reference to FIGS. 5 to 7. Structurally identical parts receive the same reference numerals as in the first embodiment, to the description of which reference is hereby made. Structurally different, but functionally similar parts receive the same reference numerals with a b placed thereafter. The frame 2a of the mattress 1a has four frame parts 38 to 41, which can be distinguished as longitudinal parts 38, 39 running in the x-direction and transverse parts 40, 41 running in the y-direction. The frame parts 38 to 41 are firmly but releasably connected to one another, for example by means of hook and loop fasteners, not shown in more detail. The frame 2a is completely covered by a frame cover 42, which has an associated lower cover 44, which are connected by a zip fastener 45. The frame cover 42 is accordingly removable from the frame 2a. The lower part 44 is trough-shaped and liquid-impermeable and air-permeable. The upper part 43 is air-permeable and liquid-impermeable or liquid-permeable.

A total of six separate spacer textiles 4a to 9a are arranged in three longitudinal rows 16a, 17a, 18a and two transverse rows 19a, 20a in the interior 3. The spacer textiles 4a to 9a are completely covered by a common spacer textile cover 46. The spacer textile cover 46 has an upper part 47 and a lower part 48, which are connected to one another by a zip fastener 49. The spacer textile cover 46 is removable by opening the zip fastener 49. The lower part 48 is trough-shaped and liquid-impermeable and air-permeable. The upper part 47 is liquid-permeable and air-permeable.

The spacer textiles 4a to 9a each have a transverse joint 50, which runs in the y-direction and is arranged centrally with respect to the spacer textiles 4a to 9a in the x-direction. In addition, the spacer textiles 6a and 7a have a longitudinal joint 51, which runs in the x-direction and is arranged centrally with respect to the spacer textiles 6a and 7a in the y-direction. The joints 50, 51 are each formed by a spacer thread-free region 52. The joints 50, 51 facilitate the bending or rolling up of the spacer textiles 4a to 9a for the washing process.
1. A mattress with a spacer textile and a frame, which is formed from an elastic material and laterally delimits an interior, the mattress comprising:
   at least two elastic spacer textiles arranged in the interior,
   which are each releasable from the frame and from one another.
2. A mattress according to claim 1, wherein the frame consists of a foam material.
3. A mattress according to claim 1, wherein a compression hardness of the frame is greater than a compression hardness of the at least two spacer textiles.
4. A mattress according to claim 1, wherein the frame is configured in one piece.
5. A mattress according to claim 1, wherein the frame has separate frame parts, which are releasably connected to one another.
6. A mattress according to claim 1, wherein said at least two elastic spacer textiles are arranged next to one another.
7. A mattress according to claim 1, wherein said at least two elastic spacer textiles are arranged one above the other.
8. A mattress according to claim 6, wherein said at least two elastic spacer textiles arranged at least one of next to one another and above one another are releasably connected to one another.
9. A mattress according to claim 1, wherein a spacer textile configured in one piece has at least one joint.
10. A mattress according to claim 9, wherein the at least one joint is formed by a spacer thread-free region of the spacer textile.

11. A mattress according to claim 1, wherein a reclining surface is formed by a one-piece spacer textile, which has a height of at most 15 mm.
12. A mattress according to claim 1, wherein each of the at least two elastic spacer textiles has two cover layers connected to one another by spacer threads and the spacer threads form thread groups extending in one plane with an IXI form.
13. A mattress according to claim 1, wherein the frame and the at least two spacer textiles are completely covered by a common and removable outer cover.
14. A mattress according to claim 1, wherein the frame is completely covered by a frame cover.
15. A mattress according to claim 1, wherein at least one spacer textile is completely covered by a spacer textile cover.
16. A mattress according to claim 2, wherein the frame is one of a polyurethane foam, cold foam and a reticulated foam.
17. A mattress according to claim 6, wherein said at least two spacer textiles are arranged next to one another in at least one of a horizontal longitudinal direction and a horizontal transverse direction.
18. A mattress according to claim 9, wherein said at least one joint extends in at least one of a horizontal longitudinal direction and a horizontal transverse direction.
19. A mattress according to claim 11, wherein said spacer textile is joint-free.
20. A mattress according to claim 12, wherein said at least two elastic spacer textiles are configured as knitted spacer fabrics.

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