BABY AND CHILDREN COT

The present invention relates to a baby and children cot with a sleeping surface created by directed tensile forces.

Previous applications and intellectual property rights describe, amongst other things, a novel baby cot without a mattress or bars, featuring a sleeping surface enclosed by two side walls in a cocoon-like configuration. These enclosing side walls, consisting of an inner membrane and an outer membrane, serve both as the lying surface and as a cushioning chamber, as well as creating soft, comfortable side walls.

Despite the significant improvement resulting from the implementation of these technical approaches, further improvements are necessary to perfect the lying properties of the baby cot.

The invention therefore aims to solve and address the problems described. In particular, it seeks to resolve the problem of the upward curvature in the centre of the lying surface, as described in the prior art.

Furthermore, there is a need, when the lying surface is under load, to prevent a hammock-like alignment across the entire central area resulting from the unequal tensile forces of the side walls and the converging tensile forces at the ends of the created boundary end walls (end walls). This imbalance must be compensated for.

Furthermore, the uneven load should be resolved by the implementation, in accordance with the invention, of a preferred arrangement providing uniform suspension across the entire lying surface. The tension walls (side walls, end walls) surrounding the lying surface are to be designed in such a way that the tension walls on all sides are adapted in their shape, material properties and tensile forces so as to result in uniform suspension across the entire lying surface

Finally, one objective is to prevent shifts in the static properties of the lying surface resulting from the surrounding side walls (in the prior art: inner membrane / outer

membrane), caused by minimal variations in the tolerance of material, properties, elasticity, but in particular also in the workmanship and the seam during stitching.

In one prior art configuration, a lying surface is created within a carrier-bag-like device. In another prior art configuration, a cocoon-like design is presented, in which a self-supporting lying surface is first created and is then supported in its suspension by two enclosing side walls, consisting of an inner and an outer membrane, in the form of a chamber acting as a buffer.

This gives rise to certain problems.

A disadvantage of the prior art is that an independently functioning lying surface is already created and is then supported by two side walls consisting of an inner and an outer membrane. Here, even minor variations in the material of the side walls, the stitching or the perforations of the membranes are sufficient to negatively affect the lying surface, which has already been adjusted in terms of its static properties. Furthermore, the fact that two membranes acting as buffers introduce greater complexity and thus increase the potential for error in the balancing process.

A further disadvantage is that the side walls formed by the two membranes meet at the narrower ends at the front, thereby enclosing the entire lying surface. Furthermore, the horizontal arches slope downwards at the front, thereby reducing the wall area of the side walls that meet at the ends.

Consequently, only these two side walls, designed as membranes, act as a cushioning chamber for the lying surface, that is, they provide the suspension for the entire lying surface. On the one hand, they use the large surface area of the side walls to provide springy support across a large portion of the lying surface; on the other hand, they simultaneously compensate for both a smaller lying surface area and a reduced wall surface area at the ends.

This results in the problems of an upwardly arched lying surface, hammock-like deformation under load, and uneven statics and suspension across the entire lying surface.

According to the invention, these problems are solved by a baby and children cot comprising

- a horizontal frame (101),
- at least one strut element (103) attached to the frame (101),
- at least two support elements (105a, 105b) attached to the frame (101),
- a textile lying surface (107) stretched within the frame (101) by a fastening mechanism,
- two textile side walls (109a, 109b) stretched between the support elements (105a, 105b) and the lying surface (107), and
- two textile end walls (111a, 111b),
  wherein these textile end walls (111a, 111b) consist of at least two interconnected sub-elements (111a1, 111a2, 111b1, 111b2) which are attached to the ends of the textile side walls (109a, 109b) and to the textile lying surface (107) and each form an inclined wall element,
  wherein the first sub-element (111a1, 111b1) points outwards from the textile lying surface (107) at a first angle α and the second sub-element (111a2, 111b2) is arranged inwards at a second angle β in the opposite direction, such that the two sub-elements (111a1, 111a2, 111b1, 111b2) span a spring element.

The horizontal frame (107) may be formed in one piece but is particularly preferably formed from two opposing frame parts which are stably connected at the ends of the frame (107) by means of connecting elements.

At the bottom, at least one strut element (103) is attached, generally referred to as a ‘foot’ or ‘legs’. The designs may vary here; for example, they may take the form of arched legs, as shown in some of the figures.

At the top, the baby and children cot features support elements (105a, 105b) attached to the frame (107), which stretch the fabric side walls (109a, 109b), as will be described below.

A textile lying surface (107) is stretched across the frame (101) by means of a fastening mechanism, for example a zip, a piping rail or the like. This essentially serves to support the baby or toddler in a lying position. The textile lying surface (107) according to the invention does not require a conventional slatted base or similar.

Textile side walls (109a, 109b) are stretched between the textile lying surface (107) and the support elements (105a, 105b), whereby attachment to the support elements (105a, 105b) can be effected using the same or a different fastening mechanism.

The baby and children cot is enclosed by two textile end walls (111a, 111b).

The baby and children cot according to the invention is characterised in that, in a basic embodiment, these textile end walls (111a, 111b) consist of at least two interconnected sub-elements (111a1, 111a2, 111b1, 111b2) which are attached to the ends of the textile side walls (109a, 109b) and to the textile lying surface (107) and each form an inclined wall element.

Specifically, the first sub-element (111a1, 111b1) is connected at the bottom to the textile lying surface (107) and at the sides to the ends of the textile side walls (109a, 109b), in particular by stitching. The second sub-element (111a2, 111b2) adjoins the first sub-element (111a1, 111b1) at the top and is likewise connected laterally to the ends of the textile side walls (109a, 109b).

According to the invention, the first sub-element (111a1, 111b1) extends outwards at a first angle α from the textile lying surface (107), i.e. away from the centre towards the end of the baby and children cot. This first angle α lies between 30° and 179°. Preferably, the first angle α is an obtuse angle between 91° and 179°, in particular between 100° and 179°.

The second sub-element (111a2, 111b2), on the other hand, is arranged at a second angle β in the opposite direction to the first sub-element (111a1, 111b1), i.e. towards the centre of the baby and children cot. The second angle β is 30° to 179°, preferably 45° to 179°, more preferably between 91° and 179°, and in particular between 100° and 179°. Through this arrangement according to the invention, the two sub-elements (111a1, 111a2, 111b1, 111b2) tension a resilient element. This has, in particular, an accordion-shaped configuration (Z).

If a baby or toddler is placed in a state-of-the-art baby and children cot, a conventional lying surface would either remain very stiff and therefore uncomfortable, or would quickly sag downwards. However, the at least two-part textile end walls (111a, 111b) according to the present invention span a spring element which is deflected to a greater or lesser

extent depending on the weight of the baby or toddler. This allows the tension of the lying surface (107) to regulate itself at least partially.

For this self-regulation, the spring forces of the textile side walls (109a, 109b) and the textile end walls (111a, 111b), and optionally also of the textile lying surface (107), are coordinated with one another. This can be achieved, for example, by using textiles with specific elasticities, which may also differ from one another.

In a preferred embodiment of the baby and children cot, the seams between the textile side walls (109a, 109b) and the textile lying surface (107) are arranged at a predetermined distance from the point of attachment to the frame (101).

This arrangement, as per the invention, allows the textile side walls (109a, 109b) to be incorporated into the suspension of the lying surface (107), as they are not attached to a rigid bed frame as is conventionally the case. This advantageous development also contributes to self-regulation; when the textile lying surface (107) is subjected to greater load, a higher tensile force arises in the textile side walls (109a, 109b).

Furthermore, the arrangement according to the invention can compensate for manufacturing tolerances; that is, if seams are not executed precisely, this is compensated for by the invention.

In a preferred embodiment of the baby and children cot, the cot further comprises two crossbars (113a, 113b) secured between the support elements (105a. 105b), wherein the at least two textile end walls (111a, 111b) consist of at least three sub-elements (111a1, 111a2, 111a3, 111b1, 111b2, 111b3). In this arrangement, the third sub-element (111a3, 111b3) is positioned at a third angle γ pointing outwards and upwards in the opposite direction to the second sub-element (111a2, 111b2) and is secured to the crossbars (113a, 113b), such that the three sub-elements (111a1, 111a2, 111a3, 111b1, 111b2, 111b3) span an expanding spring element. The third angle γ is 30° to 179°, preferably 45° to 179°, more preferably between 91° and 179°, and in particular between 100° and 179°. This also has, in particular, an accordion-shaped configuration (Z).

This embodiment improves, on the one hand, the structural stability through the crossbars (113a, 113b) and, on the other hand, the distribution of tensile forces and the spring action through the textile end walls (111a, 111b) consisting of three sub-elements

(111a1, 111a2, 111a3, 111b1, 111b2, 111b3) on the other. As the textile end walls (111a, 111b) are designed in a quasi-accordion-shaped manner, they are able to provide even better springiness when the lying surface (107) is loaded.

The basic shape of the baby and children cot according to the invention is not fixed. However, it is preferable for the frame to have a more or less oval basic shape, as can be seen from the figures illustrating preferred embodiments.

This oval shape, as well as a round shape, has the advantage that air cannot accumulate in the corners, ensuring that the climate remains largely uniform across the entire textile lying surface.

In a further development, it has proved advantageous for the specific design of the textile side walls (109a, 109b) for the two support elements (105a, 105b) to extend in an arched manner between the two end faces of the frame (101). In this case, the two support elements (105a, 105b) are secured using the same or similar fasteners as those used to secure the opposing frame parts to one another.

In this way, starting from an arched seam (115a, 115b) between the textile lying surface (107) and the textile side wall (109a, 109b), this textile side wall (109a, 109b) is concavely tensioned by an upwardly arched support element (105a, 105b) and the two textile end walls (111a, 111b).

In addition to further optimising the tensile forces under load, these concavely tensioned textile side walls (109a, 109b) have a soothing effect on the baby, as the shape formed in accordance with the invention is modelled on the womb, thereby creating a sense of security. Due to the tensile forces distributed in accordance with the invention, the textile side walls (109a, 109b) remain just as flexible as the environment of the unborn child in the womb.

To better achieve the advantages of the present invention, the fabric of the textile lying surface (107) and/or the textile side walls (109a, 109b) and/or the textile end walls (111a, 111b) is an at least partially elastic fabric that is at least partially breathable.

Depending on the size of the baby or toddler and thus their increasing weight, different textiles with varying degrees of elasticity can be used. This is made possible, among

other things, by the ease with which the textile parts of the baby and children cot can be replaced using the fastening mechanism described above.

The at least partially breathable nature is also important in order to provide the baby or toddler with sufficient fresh air.

In a further embodiment, it has proved advantageous for the fabric of the textile lying surface (107) and/or the textile side walls (109a, 109b) and/or the textile end walls (111a, 111b) to incorporate functional fibres and/or functional particles.

In particular, the functional fibres and/or functional particles may have electromagnetic shielding properties. Analogous to a Faraday cage, the baby or toddler can be protected from, for example, 5G radiation and electromagnetic pollution in general. Examples include fibres or particles made of silver or containing silver ions.

However, care must be taken to ensure that these functional fibres and/or functional particles are arranged in such a way that they do not come into direct contact with the baby or toddler.

In one embodiment, the baby and children cot further comprises a surrounding textile wall (117), which is arranged at the edge of the textile lying surface (107) or on the frame (101) and extends at least outside the textile side walls (109a, 109b), whereby a interstice (119) is created between the surrounding textile wall (117) and the textile side walls (109a, 109b).

The surrounding fabric wall (117) has no structural influence on the baby and children cot of the invention or on the specific distribution of tensile forces. Rather, it serves as a protective covering and, from a non-technical perspective, enhances the appearance.

The fabric of the surrounding textile wall (117) may also contain functional fibres and/or functional particles, whereby these functional fibres and/or functional particles possess electromagnetic shielding properties. In the case of the surrounding textile wall (117), it is ensured in all cases that the baby or toddler has no contact with the functional fibres and/or functional particles.

The textile lying surface (107) as such, in combination with the textile side walls (109a, 109b) and the textile end walls (111a, 111b), is in principle sufficient to offer the baby or toddler very good lying comfort. However, this can be further enhanced if the baby and children cot according to the invention also comprises a mattress (121) arranged on the textile lying surface (107), the outer shape of which is adapted to the shape of the textile lying surface (107). In order to achieve the advantages described above, the mattress (121) is designed to be at least partially breathable.

Where the term ‘mattress’ is used here, this includes any form of mattress, pillow or pad, provided that the features of the invention are present and the corresponding effects are achieved.

The textile side walls (109a, 109b) fit particularly snugly against the mattress (121), so that no gap remains between them. In this way, the mattress (121) forms a breathable unit with the surrounding textile side walls (109a, 109b) and textile end walls (111a, 111b).

As the mattress is easily replaceable, this enhances user comfort, for example when cleaning if urine or faeces come into contact with it. Instead of having to dismantle the textile parts, which are designed as a kind of cocoon, the mattress can simply be removed and cleaned.

In particular, the mattress (121) is designed to be semi-permeable, so that moisture does not reach the textile lying surface (107) through the mattress (121), whilst air can flow through the mattress (121) from below.

The mattress (121) may also contain functional fibres and/or functional particles, wherein these functional fibres and/or functional particles have electromagnetic shielding properties. To ensure that the baby or toddler does not come into contact with the functional fibres and/or functional particles, these are preferably arranged on the underside of the mattress (121).

As described above, the textile parts of the baby and children cot are at least partially breathable.

As an alternative to the semi-permeable design, the mattress (121) may be constructed from two components and feature an impermeable layer on the underside, as well as a breathable section covering the sides and the surface.

Thus, the mattress (121) is impermeable at the bottom in all cases, but can retain at least some of the breathable properties of the baby and children cot through its surface and sides.

This property is utilised in a further embodiment in which the baby and children cot further comprises at least one air pad (123) for supplying the baby and children cot with air, wherein this at least one air pad (123) is arranged to the side and/or beneath the textile lying surface (1047) and is in fluidic connection (127) with an air filter device (125).

The supply of filtered and/or purified fresh air contributes significantly to the baby's peaceful and (in terms of sudden infant death syndrome) safe sleep. The at least one air pad (123) is arranged in such a way that no actual draught is created, but rather that the air flows slowly into the baby and children cot according to the invention.

The air pads (123) may, for example, be arranged on the fabric side walls (109a, 109b), in particular within the interstice (119), and allow fresh air to flow in from the side. The surrounding textile wall (117) may be made slightly less breathable so that the fresh air flows essentially into the baby and children cot of the invention and is not lost to the outside.

The (stale) air flowing back into the interstice (119) in equilibrium can be discharged to the outside.

The at least one air pad (123) may, for example, also be arranged beneath the textile lying surface (107) and allow fresh air to flow in from below. Combinations of lateral and underside inflow are also possible.

It is particularly preferred that the inflow of fresh air into the baby and children cot forms a fresh air bubble which rises slowly, carrying stale air with it and is replenished by the air pads (123).

Further objectives, features, advantages and possible applications are apparent from the following description of non-limiting embodiments of the invention, including with reference to the figures. All features described and/or illustrated, either individually or in any combination, form the subject-matter of the invention, irrespective of their inclusion in the claims or their reference thereto. The figures show:

Fig. I a schematic side view of the baby and children cot according to the invention in a preferred embodiment of the invention,

Fig. II a schematic front view of the baby and children cot according to the invention in the preferred embodiment of the invention shown in Fig. I,

Fig. III a schematic perspective view of the baby and children cot according to the invention in the preferred embodiment of the invention shown in Fig. I and Fig. II,

Fig. IV a schematic exploded view of the textile walls from the front in a preferred embodiment of the invention,

Fig. V a schematic exploded view of the textile walls (109a, 109b, 111a, 111b) in perspective in a preferred embodiment of the invention,

Fig. VI a schematic front view of the textile walls (109a, 109b, 111a, 111b) configured as a cocoon in a preferred embodiment of the invention,

Fig. VII a schematic perspective view of the textile walls (109a, 109b, 111a, 111b) configured as a cocoon in a preferred embodiment of the invention,

Fig. VIII a schematic sectional perspective view of the textile walls (109a, 109b, 111a, 111b) configured as a cocoon in a preferred embodiment of the invention, with an inserted mattress (121), and

Fig. IX a schematic front view of the baby and children cot according to the invention in a preferred embodiment of the invention, including air pads (123) and air filter devices (125).

Fig. 1 (does not exist)

Fig. 2 to Fig. 17 are described in more detail below in the main text.

Identical components are designated by the same reference numerals in Figures I to IX; however, for the sake of clarity, not all reference numerals are necessarily included in all illustrations.

Figure I shows a schematic side view of the baby and children cot according to the invention in a preferred embodiment of the invention. In this embodiment, the horizontal frame 101 is supported by two downwardly curved legs acting as strut elements 103,

which also feature feet (without reference numbers) for stability. These feet are removable, allowing the baby and children cot to be converted into a cradle in just a few simple steps.

Two support elements 105a, 105b (105b not shown here), which are attached to the frame 101, also extend upwards in an arched shape; together with the lying surface 107 (not shown here), they support the fabric side walls 109a, 109b (109b not shown here).

Two crossbars 113a, 113b are attached between the support elements 105a, 105b (105b not shown here), which span the textile end walls 111a, 111b, which are only indicated here. The reference symbol Z denotes the accordion-shaped configuration of the spring element.

Figure II schematically shows the front view of the baby and children cot according to the invention in the preferred embodiment of the invention shown in Figure I, this representation being rendered semi-transparent to show the various seams between the parts.

The lying surface 107 is stretched within the frame 101, from which the textile side walls 109a, 109b extend to the support elements 105a, 105b via the arched seams 115a, 115b. In the foreground is the textile front wall 111a, shown in this embodiment with its three sub-elements 111a1, 111a2, 111a3. This textile end wall 111a is sewn to the lying surface 107 at the bottom via sub-element 111a1 and connected to the crossbar 113a at the top via sub-element 111a3. The springy nature of the textile end wall 111a is merely indicated by the rounded seams.

Figure III shows the baby and children cot of the invention, as depicted in Figures I and II, in a schematic perspective view. This type of representation clearly illustrates the accordion-shaped textile front wall 111a of the invention, with its sub-elements 111a1, 111a2 and 111a3 arranged at different angles to one another. It is also clearly visible how the cocoon formed by the textile walls 109a, 109b, 111a, 111b, with a lying surface 107 that slopes downwards, is effectively ‘suspended’ within the framework comprising the frame 101, support elements 105a, 105b and, preferably, crossbars 113a, 113b.

In addition to the illustration of the baby and children cot, arrows indicate the various tensile forces acting on the lying surface 107 and the sub-elements 111a1, 111a2, 111a3

and sub-elements 111b1, 111b2, 111b3 are shown, in particular to illustrate the accordion-shaped design of the textile end walls 111a, 111b. The angles α, β and γ are also shown here.

Figure IV and Figure V are schematic exploded views of the textile walls from the front and from a perspective view, respectively. To achieve an optimal distribution of tensile forces, the shapes of these individual parts are optimally coordinated with one another. Furthermore, the shape of the individual parts according to the invention has a decisive influence on the formation of the concave configuration of the two textile side walls 109a, 109b.

Figure VI shows a schematic front view of the cocoon formed by the textile walls 109a, 109b, 111a and 111b. This illustration serves once again to clarify the arrangement of the textile front wall 111a with its sub-elements 111a1, 111a2, 111a3 in relation to the textile side walls 109a, 109b. It can also be seen how the arched seams 115a, 115b are spaced apart from the attachment to the frame 101 (not shown here).

The cocoon shown in Figure VI is depicted in Figure VII as a schematic perspective view with the textile walls 109a, 109b, 111a, 111b in a preferred embodiment of the invention. This representation is rendered semi-transparent so that, in addition to the front textile end wall 111a, the rear textile end wall 111b is also visible. Although the angles between the sub-elements 111a1, 111a2, 111a3 and sub-elements 111b1, 111b2, 111b3, respectively, and the lying surface 107 are not shown here, the geometric relationships between the individual parts for generating the various tensile forces and for regulating them are nevertheless clear.

As mentioned above, from a structural point of view, the fabric side walls 109a, 109b, 111a and 111b, together with the lying surface 107, form a self-regulating system. In this system, the tensile forces of the textile side walls 109a, 109b and the lying surface 107 self-regulate; that is to say, when the tensile force on the lying surface 107 increases, the textile side walls 109a, 109b are drawn into an arch. This results from the shorter direct path from the lying surface 107 to the support elements 105a, 105b. Consequently, the textile side walls 109a, 109b are subjected to less tensile force due to the (relaxed) curvature, whereas the lying surface is under greater tension.

In the event of a minimal static change or deviation, the lying surface 107 is less taut, so that the textile side walls 109a, 109b are pulled less into the curve and are therefore more tautly stretched. This results in a constant spring force in the lying surface 107 at all times, due to the self-regulation created by the textile walls 109a, 109b, 111a, 111b, even if there are (minimal) variations in the type of fabric used, the relative fit and the design of the seams, or the correct cutting of the fabrics used. Furthermore, elastic zips or clips may be used to attach the fabrics to the frame 101, to the support elements 105a, 105b and/or to the crossbars 113a, 113b to assist the self-regulation.

The horizontal tensile force exerted by the lying surface 107 causes the textile walls 109a, 109b, 111a, 111b are drawn into a curve in an almost 360° oval orientation, so that the soft textile side walls 109a, 109b encircling the lying surface 107 form a buffer.

In this embodiment, the arch in the textile side walls 109a, 109b and the spring force in the lying surface 107 are not created, as in the prior art, by two conventional side walls, but by two different yet self-regulating directions of tension and tensile forces.

A schematic perspective view of the textile walls 109a, 109b, 111a, 111b, designed as a cocoon, together with the surrounding textile wall 117 is shown in Figure VIII. The cocoon is shown here in cross-section so that the interstice 119 is visible. A preferred embodiment of the invention comprises a mattress 121 adapted to the lying surface within the textile walls 109a, 109b, 111a, 111b, in the particularly preferred embodiment being of oval shape.

A further specific embodiment involves the provision of air pads 123, as shown in the schematic front view in Figure IX. As previously described, these air pads 123 serve to fill the baby and children cot of the invention with fresh air. To this end, the air pads 123 may be arranged in different positions at various locations. One option is lateral arrangement, preferably in the intermediate interstice 119, so that the fresh air from air pads 123.1 is introduced through the textile side walls 109a, 109b.

Alternatively, the fresh air can also be introduced via air pads 123.2, which are arranged below the interstice 119 and introduce the fresh air via this interstice 119 and the textile side walls 109a, 109b.

A third alternative comprises air pads 123.3, which are arranged below the lying surface 107 and through which fresh air flows into the interior of the baby and children cot. If a mattress 121 is provided in this particular embodiment, then, like the lying surface 107, it is also designed to be breathable / air-permeable.

As can be seen from Figure IX, an air filter unit 125 can conveniently be positioned directly beneath the baby and children cot, whereby it is in fluidic connection 127 with the air pads 123. To protect the baby or toddler from radiation / electromagnetic pollution that may emanate from the air filter unit 125, it has proved advantageous for at least the lying surface 107 to be provided with functional fibres or functional particles that ensure shielding. The mattress 121 and the textile walls 109a, 109b, 111a, 111b may also feature such functionalisation.

Some aspects of the present invention will be discussed in more detail below in conjunction with the further figures 2 to 17. In this description, reference numbers are used that differ in some cases; the correspondences of the reference numbers can be identified from the list of reference numbers appended at the end and from a concordance list.

In one embodiment of the invention, a lying surface 107 is formed from two tension walls (referred to above as the lying surface 107 and the textile side walls 109a, 109b), with tension wall 1 (hereinafter referred to as lying surface 107) being horizontally tensioned, tension wall 2 (hereinafter referred to as textile side walls 109a, 109b) being vertically tensioned, these tension walls 107, 109a, 109b are configured to interact with one another in such a way as to form a lying surface 107, whereby this lying surface 107 is always designed with the same desired springiness, even in the event of possible variations in the tension walls 109a, 109b, such as in the seam, material or shape (punching), always has the same desired springiness, resulting from the mutually balancing tension walls 107, 109a, 109b, due to the special arrangement and design of tension wall 1 (also 107) and tension wall 2 (also 109a, 109b).

In a preferred embodiment of the invention, improved structural stability is achieved by preferably at least four functional tension walls 109a, 109b, 111a, 111b, preferably with two of each being identical in form, function, design and tensile force.

Preferably, two identical tension walls 109a, 109b are attached to the respective opposite side walls (Configuration A) on the left and right.

Preferably, two further identically constructed novel functional tension end walls 111a, 111b (Configuration B) are created and attached to the respective opposite ends at the front and rear.

This novel functional design, comprising Configuration A and Configuration B, is harmonised in terms of spring force to the arrangement defined by the frame 101, 105a, 105b and the lying surface 107, in order to guarantee the same spring force across the entire lying surface 107

In Figures 2 to 17, all identical components are designated by the same reference numerals; however, for the sake of clarity, not all reference numerals are necessarily included in all illustrations. However, individual reference marks may be used differently.

The description of Figures 2 to 7 relates to a preferred embodiment of the functional tension walls according to the invention. The advantages over the prior art result from two tension walls which balance each other out.

In Figure 2A, A denotes the lying surface in the frame of the baby and children cot. To create a lying surface, a preferably elastic material is tensioned in such a way that a load-bearing yet springy lying surface is created. Due to the circular arrangement of the frame, all tensile forces A1 are aligned in the same direction.

In Figure 2C, C denotes the lying surface, which is preferably oval in shape. B1 denotes the frame of the baby and children cot, which is oval in shape. C1 and C2 are the tensile forces that tension an elastic material in such a way as to create a load-bearing yet springy lying surface.

The tensile forces C1 and C2 differ from the other tensile forces. This is because the narrow, tapered ends of the baby and children cot, in contrast to the large central area, require a different tensile force in order to create a uniform static unit within the lying surface. The tensile forces C1 must be designed to be stronger, as they must provide greater static stability over a larger area than the tensile forces C2, which are responsible for a smaller, tapered lying surface.

In Figure 3A, the same static unit is to be constructed as in Figure 2C. The only difference is that the cot frame is rectangular.

Figure 4 shows two views illustrating the two directions of tensile force: the horizontal tensile force and the vertical tensile force. The vertical tensile force is denoted by B in Figure 4. This vertical tensile force B, together with the horizontal tensile force from Figures 2 and 3 (tensile forces A and C), creates a resultant tensile force and a lying surface stabilised by two tensile walls.

Figure 5A illustrates the resultant tensile force described in Figure 4. It is the resultant tensile force arising from the vertical tensile force C and the horizontal tensile force F. The resulting lying surface is B.

In Figure 5A1, the tensile force F1 exerts a stronger pull. This causes the vertical tensile force and the side wall C1 to be pulled into a bend. Furthermore, the resulting tensile force R1 shifts in the direction of the horizontal tensile force.

This shape-forming, forced bending of the vertical side wall is described in detail in Figure 7.

Figure 6 shows a side view. This side view illustrates the stronger tensile force acting in the horizontal direction, denoted as F1, and the vertical tensile wall C, which is pulled outwards (in the direction of the horizontal tensile force F1). Consequently, the vertical tensile wall C, which is actually designed as a straight tensile wall, is pulled into a bend: C1. This newly created tensile wall C1 bends with its inner side towards the lying surface B1 and is pulled by the horizontally acting tensile force F1 in the direction of the outer frame.

This newly created lying surface B1 is created by a stronger tensile force F1 as well as by a tensile force C1 pulled into the bend. However, this embodiment of the invention is based on the following feature:

The lying surface B1, formed by the two tension walls C1 and F1, is self-adjusting and self-regulating even in the event of variations in the material of the side walls, the stitching, or the die-cuts in the cocoon parts.

This is because the side wall C1, which is pulled into the bend, has its spring force increased and its tensile force reduced, the greater the tensile force exerted by the horizontal tensile force F1.

Should the tensile force F1 be weaker, the side wall C1, which is pulled into the bend, has a weaker spring force, is designed to be straighter and has a greater tensile force. Thus, imbalances in the tensile forces regulate themselves and, through the interaction of the tensile forces, create the consistently desired elasticity, stability and structural integrity in the lying surface B1.

Figure 7 describes in detail the forced bending of the side wall and the interaction of both tensile walls (vertical and horizontal).

In the functional sequence shown in A: two tensile forces, F1 and F2, create a resultant tensile force R.

In B, the curvature of the frame is shown; its oval shape and the oval lying surface, in conjunction with the two tensile forces described, support and reinforce the curved shape of the lateral vertical tensile force / side wall.

The resulting bending C from all configurations is tensile force F1, tensile force F2, the resulting R, and the curvature of the frame described under B.

The description of Figures 8 to 17 relates to the implementation of the two functional tensile wall systems according to the invention. Figures 8 to 17 illustrate the improvements.

In Figure 8, a lying surface 3 is created, consisting of two identical opposing wall systems, System 1 and System 2. These two wall systems work in harmony with one another and are each adapted within their respective wall system to the existing structural requirements. The wall systems 1 are large-area and responsible for a large lying surface requiring cushioning. The wall systems 2 are located in the narrowing, smaller lying surface area as well as at the ends of the sloping horizontal arches of the cot frame. These are adapted to the structural challenges of a taut, smaller lying surface.

Wall system 1 therefore works in harmony with wall system 2. Wall system 2 must exhibit a high spring characteristic. This is because a smaller, tapered support surface needs to be cushioned, and because of the horizontal arches, which slope downwards towards the end, limiting the length of the wall system and thus restricting its spring force.

Figure 9 illustrates the solution to the challenge for wall system 2. The lying surface X is well cushioned in the centre by the large surrounding side walls 1. In order to implement the narrowing ends with a shortened wall (due to a sloping frame) in a manner that is equally soft and statically adapted in terms of cushioning, a functional system wall (wall system 2) is employed in accordance with the implementation of the invention.

The system wall (corresponding to textile end walls 111a, 111b) consisting of 2, 2.1, 2.2 (corresponding to sub-elements 111a1, 111b1, 111b3, 111a2, 111b2, 111b3) is an arrangement of various wall sections which function as a single wall through stitching. As described in A, this wall has a certain length, the same length as wall 1. It can therefore elastically compensate for the structural forces at the ends along its entire length. However, in order to be integrated precisely and accurately into the shape of the cot frame, with its sloping horizontal curves, a zigzag wall is created, as described in B, functioning in a manner comparable to an accordion or a spring coil.

The advantage of this functional system wall is that its length – and therefore its elasticity – is fixed. However, thanks to its zigzag design, it can still be fitted into a smaller, predefined space.

Figure 10 shows a preferred embodiment of this system wall. The system wall, in its zigzag form, consists of tension force 2 pulling vertically outwards, tension force 3 pulling vertically inwards, and tension force 4 pulling vertically outwards. The horizontal tension force 1 is thus provided with soft suspension by the system wall 2 / 3 / 4.

Figure 11 describes all the functions served by the system tension walls, as well as the interaction of the lateral tension walls.

In A + G, the side wall described above and its systemic tension function are described in conjunction with the frame. The side wall, which is bent inwards as a result, provides excellent cushioning for the lying surface of the cocoon X.

In B, B1 and B2, the tensile force is shown, which is shortened along its entire length B2 by the zigzag shape B1

This is also reflected in the design (B1, B2): the height (in frame G) of the functional wall and the actual length Y of the functional wall, as also described in B3. In Y and X, the expansion force of the system wall is described by the spring action. Simply by extending the individual walls through elasticity, the system wall extends below the X-axis. This is a suspension mechanism resulting from the extension of the individual walls due to the elasticity of the material.

In C, a spring action of the system wall is shown by increasing the angles between the system walls. Due to the zigzag design, an angle of 45°, for example, is created in the resting state without load. Under load, this angle is extended to over 45°, for example 50° or more. Thanks to the zigzag design and the elastic material, the system wall created is extremely soft in its spring action and is therefore ideally suited for the static balancing of the narrowing lying surface.

The suffix B describes the material used in the tension walls. As the system wall attached to it not only springs downwards but also connects the large side walls and springs together as a single unit, the material is also stretched laterally. This results in the lateral tensile force S, which actually reduces the downward tensile force S1 through its elasticity. The force acting laterally to the tensile force S persists even without a load.
It is therefore important to create an extremely soft suspension in the system wall at the ends by implementing the measures described in B and C.

Figure 12, under 3.6, describes the various loads: F0 (no load), F1 (medium load) and F2 (heavy load).

Figure 12, under 3.5, shows how the lying surface X is pulled downwards in a spring-like manner by opening the angles and extending the system wall sections.

Figure 12, Drawing 12.1, demonstrates how important this spring action is for balancing. There is a long X-axis and a lying surface of width Y located in the centre. The Y-axis and X-axis, which intersect at the ends, are reduced in size within the lying surface and thus limited in their spring force if a functional wall is not used.

The sequence of sub-figures 2, 3, 4 and 5 in this illustration describes the respective functions of the side walls 2/4, as well as the functions of the end functional walls 3/5.

The unloaded state of the lying surface is shown in Figures 2 and 3, and the loaded state in Figures 4 and 5.

Figures 13, 14.1, 14.2 and 14.3 illustrate various embodiments of a possible baby and children cot, frame and arrangement of the functional walls. Figure 14.2 shows a baby and children cot copied from the prior art, albeit only visually. Functionally, the system walls of the invention are retained in the inner area; only the outer wall is retained for the preferred and highly beneficial ventilation function, in that the outer walls are fitted but are not effective in terms of forces, or are only insignificantly effective. Figure 15 describes three top views, A, B and D, regarding the effect of the tensile forces and the structure of the system tension walls. C shows a holographic view of the tension walls.

In sub-figure A, the large opposing tension walls shown in 1 act as a buffer on the lying surface 3. 2 shows the smaller system tension walls (zigzag, accordion, spring tension, wall system), which must have the same spring force as the system tension walls shown in 1 in order to create/provide the same suspension for the lying surface 3, allowing it to lower/spring evenly under load.

In B, the tension walls of the side walls are shown under 1, and the tension walls of the end wall systems under 2. Furthermore, the tensile force resulting from the forces between the intersecting tension walls (1, 2) is shown under 3. These tensile forces under 3 are intended to create a tensile force that acts uniformly all around the lying surface.

D shows the longer X-axis and the shorter Y-axis with the tensile forces derived from them, which, in their interaction, create uniform suspension across the entire lying surface.

C shows the holographically depicted layout and a preferred embodiment of the design and configuration of both tension wall systems.

The lying surface 6 is created by the two tension walls 1 and 2 of the longitudinal tension walls, as well as the corresponding end tension walls, consisting of a systemic functional wall (zigzag suspension accordion).

The end tension walls consist of the balancing parts 3, 3.1, 3.2, which generate the tensile force vertically, as well as, under 5 and 5.1, preferably supporting side parts, which connect the two wall systems to one another.

Figure 16 shows the individual components that together form the structural framework of the entire cocoon. Shown here under 1 is the horizontal tensile force and under 2 the vertical tensile force (which, as described, is drawn into a bend). Furthermore, the lying surface is shown under 6 and the system wall under 4; these are shown broken down further in sections 5.3, 5.2, 5.1 and 5 to illustrate the lateral tensile forces and connections in the wall systems in greater detail. Thus, the tension wall (end wall system) is responsible for the vertical suspension, adapted to the suspension of the side walls, as well as the connection of the end walls and the side walls within a harmonious structural system.

Figure 17 shows a possible suspension mechanism, which is preferably attached to the frame at point A and used at point A1 to secure the cocoon. B is a suspension system that supports any tensile forces under load. Furthermore, B could be adjusted in terms of tensile force and its suspension via manual operation (for example, a screw mechanism, but not exclusively).

Reference Signs

101	horizontal frame	(also: frame)
103	strut element	(also: frame)
105a, 105b	support elements	(also: frame)
107	textile lying surface	(also: tension wall 1)
109a, 109b	textile side walls	(also: tension wall 2, functional tension wall)
111a, 111b	textile end walls	(also: functional tension wall, functional tension end walls)
111a1, 111a2, 111a3	Sub-elements of textile end walls	
111b1, 111b2, 111b3	Sub-elements of textile end walls	
113a, 113b	crossbars	
115a, 115b	arched seam	
117	circumferential textile wall	
119	interstice	
121	mattress	
123	air pads	
125	air filter unit	
127	fluid-dynamic connection	
Z	accordion-shaped design	

Fig. 2 to Fig. 7

A, A1, A2	horizontal forces through tension wall 1/textile lying surface 107
B, B1	tensile forces on side wall
C, C1, C2	tensile forces on side wall
F, F1, F2	tTensile force (horizontal in Fig. 5)
R, R1	resultant tensile force
X, X1	distance from the seam start of the side walls to the edge of the textile lying surface
X	lying surface

Fig. 8

1	side wall, functional wall
2, 2.1, 2.2	end wall, functional wall, end wall elements
3	lying surface/functional wall 1

Fig. 7, Fig. 9 :

A, B, C, C1	condition descriptions
X Lying surface	
F, F1	tensile forces
X, y	change in length due to tensile and spring forces
1	side wall, functional wall
2, 2.1, 2.2	elements of textile end wall – corresponds to: 111a1, 111a2, 111a3, 111b1, 111b2, 111b3

Fig. 10

1	textile lying surface/functional wall 1
2, 3, 4	textile end wall elements – corresponds to: 111a1, 111a2, 111a3, 111b1, 111b2, 111b3,
	spring element tensioning end wall
5	strut element – corresponds to 103
6	load-bearing element – corresponds to 105a, 105b
7	horizontal frame – corresponds to 101
X	lying surface
G	frame
S, S1	fabric, tensile strength of the fabric
A	condition description at the point of force application between the lying surface and the side wall/end wall
R	resultant force
F1, F2	tensile forces
B	side wall
B1	extended path of the side wall due to the zigzag design in the fabric
X	total height with the side wall folded
B2	extended path of the side wall due to the unfolded zigzag design in the fabric
Y	total height with the side wall extended
KG	weight of the child lying on the surface
C, C1, C2, C3	description of the state, extension of the side wall and change in angular relationships due to the child's weight on the lying surface

Fig. 12

X	lying surface
X, Y	extension of the lying surface
x, y	reference points in the unloaded state
KG	weight of the child
F, F1, F2, F0	acting tensile forces
1	neutral state of the lying surface
2, 2.1, 2.2, 2.4	state after tensioning of the lying surface
3, 3.1, 3.2, 3.3	force distribution in the end wall
3.5	force distribution in the end wall at different angles between the end wall's component elements
3.6.	change in spring travel length at different angles between the end wall's component elements
4, 4.1, 4.2, 4.3	side wall, force distribution in the side wall following loading of the lying surface X
5, 5.1, 5.2, 5.3	force distribution in the end wall following loading of the lying surface X

Fig. 13

A	front wall sub-assembly
B	front wall sub-assembly

C	front wall sub-assembly
D	supporting element
E	side wall

Fig. 14.1

A	inner side wall/functional wall
B1, B2	front wall sub-assemblies
C, C1	supporting element
D	textile lying surface (107), functional wall 1
E	horizontal frame (101)

Fig. 14.2

A	outer side wall/decorative wall
B1, B2	front wall sub-elements
C, C1	supporting element
D	textile lying surface (107), functional wall 1
E	horizontal frame (101)

Fig. 14.3

A	inner side wall
B, B1, B2	front wall sub-elements
C, C1	supporting element
D	textile lying surface (107), functional wall 1
E	horizontal frame (101)

Fig. 15

3	textile lying surface (107), functional wall 1
X, Y	tensile forces in ((D)
A, C	alternative lying surface, shape of the cocoon-forming side and end elements
1,2,3	acting tensile forces in (B)
1, 2, 3, 3.1, 3.2, 4, 5, 5.1, 6	sub-elements for alternative shapes in (A) and (C)

Fig. 16

6	lying surface
1	horizontal section of side wall
2	side wall
3	partial element of end wall
4	tension element of end wall
5, 5.1, 5.2, 5.3	partial elements of end wall

Claims

1. Baby and children cot comprising
   - a horizontal frame (101),
   - at least one strut element (103) attached to the frame (101),
   - at least two support elements (105a, 105b) attached to the frame (101) ,
   - a textile lying surface (107) stretched within the frame (101) by a fastening mechanism,
   - two textile side walls (109a, 109b) stretched between the support elements (105a, 105b) and the lying surface (107), and
   - two textile end walls (111a, 111b),

   wherein these textile end walls (111a, 111b) consist of at least two interconnected sub-elements (111a1, 111a2, 111b1, 111b2) which are attached to the ends of the textile side walls (109a, 109b) and to the textile lying surface (107) and each form an inclined wall element,

   wherein the first sub-element (111a1, 111b1) points outwards from the textile lying surface (107) at a first angle α and the second sub-element (111a2, 111b2) is arranged inwards at a second angle β in the opposite direction, such that the two sub-elements (111a1, 111a2, 111b1, 111b2) span a spring element.

2. The baby and children cot according to claim 1, wherein the seams between the textile side walls (109a, 109b) and the textile lying surface (107) are arranged at a predetermined distance from the attachment to the frame (101).

3. The baby and children cot according to claim 1 or 2, further comprising two crossbars (113a, 113b) secured between the support elements (105a, 105b), wherein the at least two textile end walls (111a, 111b) consist of at least three sub-elements (111a1, 111b1, 111b3, 111a2, 111b2, 111b3),

   wherein the third sub-element (111a3, 111b3) is arranged at a third angle γ pointing outwards and upwards in the opposite direction to the second sub-element (111a2, 111b2) and is secured to the crossbars (113a, 113b), such that the three sub-elements (111a1, 111b1, 111b3, 111a2, 111b2, 111b3) extend the tensioned spring element.

4. The baby and children cot according to any one of claims 1 to 3, wherein the two support elements (105a, 105b) extend in an arched manner between the two end faces of the frame (101), such that, starting from an arched seam (115a, 115b) between the textile lying surface (107) and the textile side wall (109a, 109b), this textile side wall (109a, 109b) is concavely tensioned by a support element (105a, 105b) that curves upwards and the two textile end walls (111a, 111b).

5. The baby and children cot according to any one of claims 1 to 4, wherein the fabric of the fabric lying surface (107) and/or the fabric side walls (9a, 9b) and/or the fabric end walls (111a, 111b) is an at least partially elastic fabric which is at least partially breathable.

6. The baby and children cot according to any one of claims 1 to 5, wherein the fabric of the textile lying surface (107) and/or the textile side walls (109a, 109b) and/or the textile end walls (111a, 111b) comprises functional fibres and/or functional particles.

7. The baby and children cot according to claim 6, wherein the functional fibres and/or functional particles have electromagnetic shielding properties.

8. The baby and children cot according to any one of claims 1 to 7, further comprising a circumferential textile wall (117) which is arranged at the edge of the textile lying surface (107) or on the frame (101) and extends at least outside the textile side walls (109a, 109b), whereby a interstice (119) is created between the surrounding textile wall (117) and the textile side walls (109a, 109b).

9. The baby and children cot according to any one of claims 1 to 8, further comprising a mattress (121) arranged on the textile lying surface (107), which is adapted in its outer shape to the shape of the textile lying surface (107), wherein the mattress (121) is at least partially breathable.

10. The baby and children cot according to claim 9, wherein the mattress (121) is semi-permeable, such that moisture does not reach the textile lying surface (107) through the mattress (121).

11. The baby and children cot according to claim 9, wherein the mattress (121) has a two-component structure and comprises a dense layer on the underside and a breathable section extending over the sides and the surface.

12. The baby and children cot according to any one of claims 1 to 11, further comprising at least one air pad (123) for supplying air to the baby and children cot, wherein this at least one air pad (123) is arranged to the side and/or beneath the textile lying surface (107) and is in fluidic connection (127) with an air filter device (125).