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(54) **SPACER FABRIC FOR MATTRESS PAD**

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(57) **ABSTRACT**

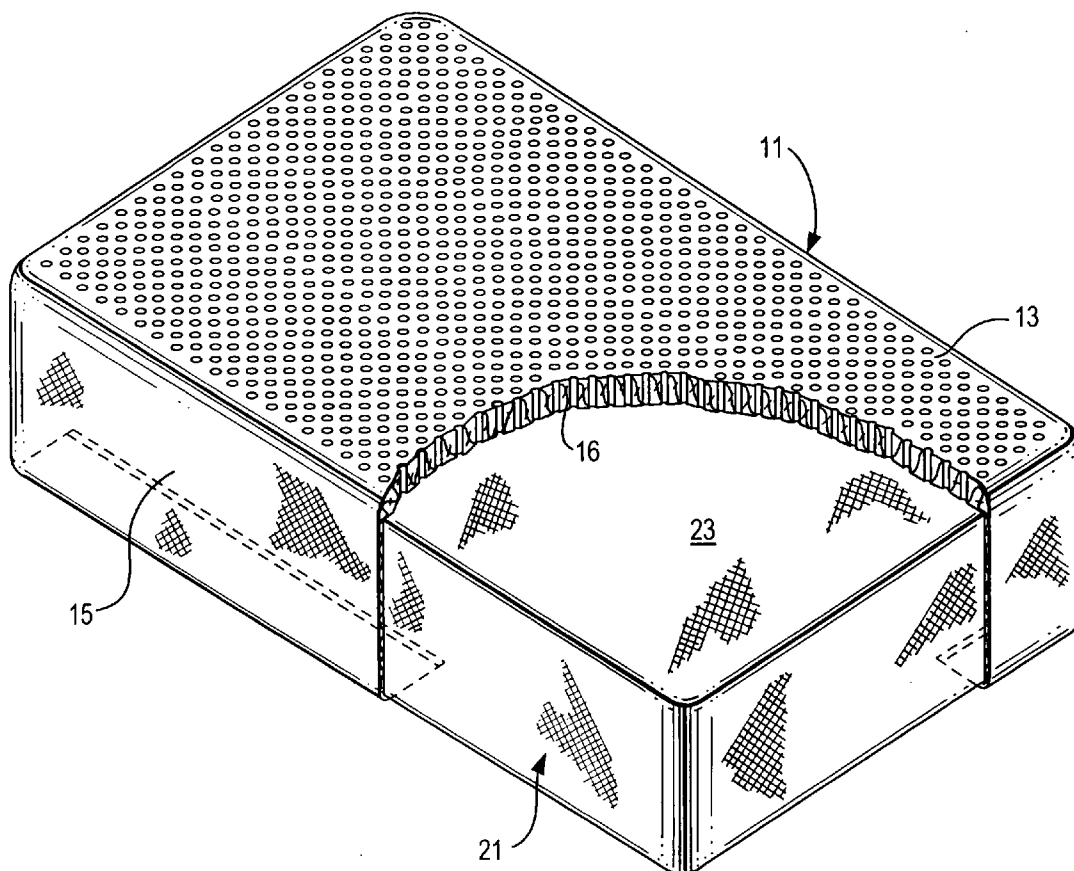
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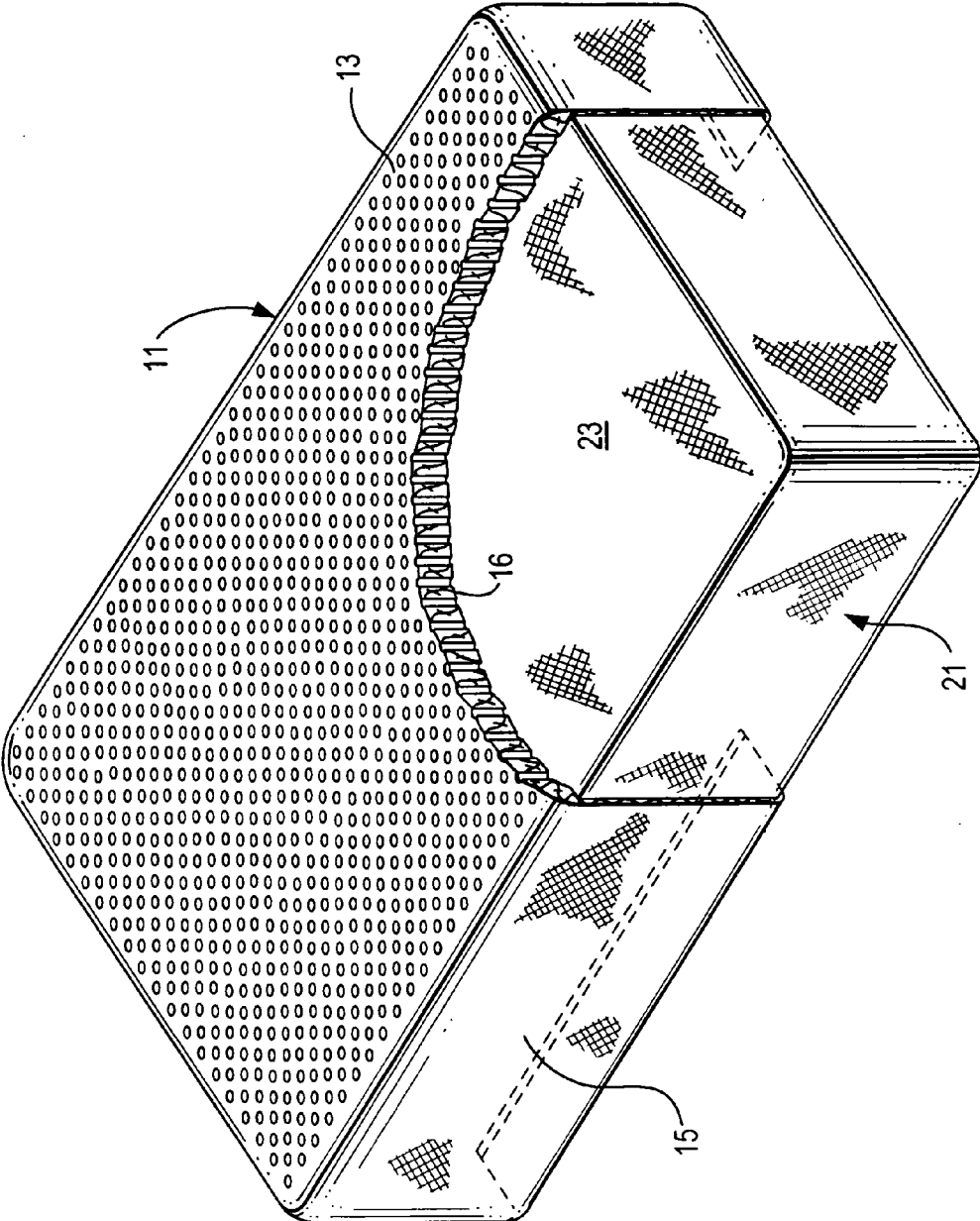
(22) Filed: **Oct. 26, 2004**

**Related U.S. Application Data**

(60) Provisional application No. 60/515,171, filed on Oct. 27, 2003.

A spacer fabric in combination with an infant mattress pad is provided. The spacer fabric has three parts or components knitted together to form a fabric with two breathable outer fabric layers and a breathable cushioned middle defined by yarns interconnecting the two layers. The spacer fabric is incorporated into an infant mattress pad in order to create an infant safety and comfort system designed to help reduce the risk of sudden infant death syndrome (SIDS) and also to provide infants with enhanced comfort.





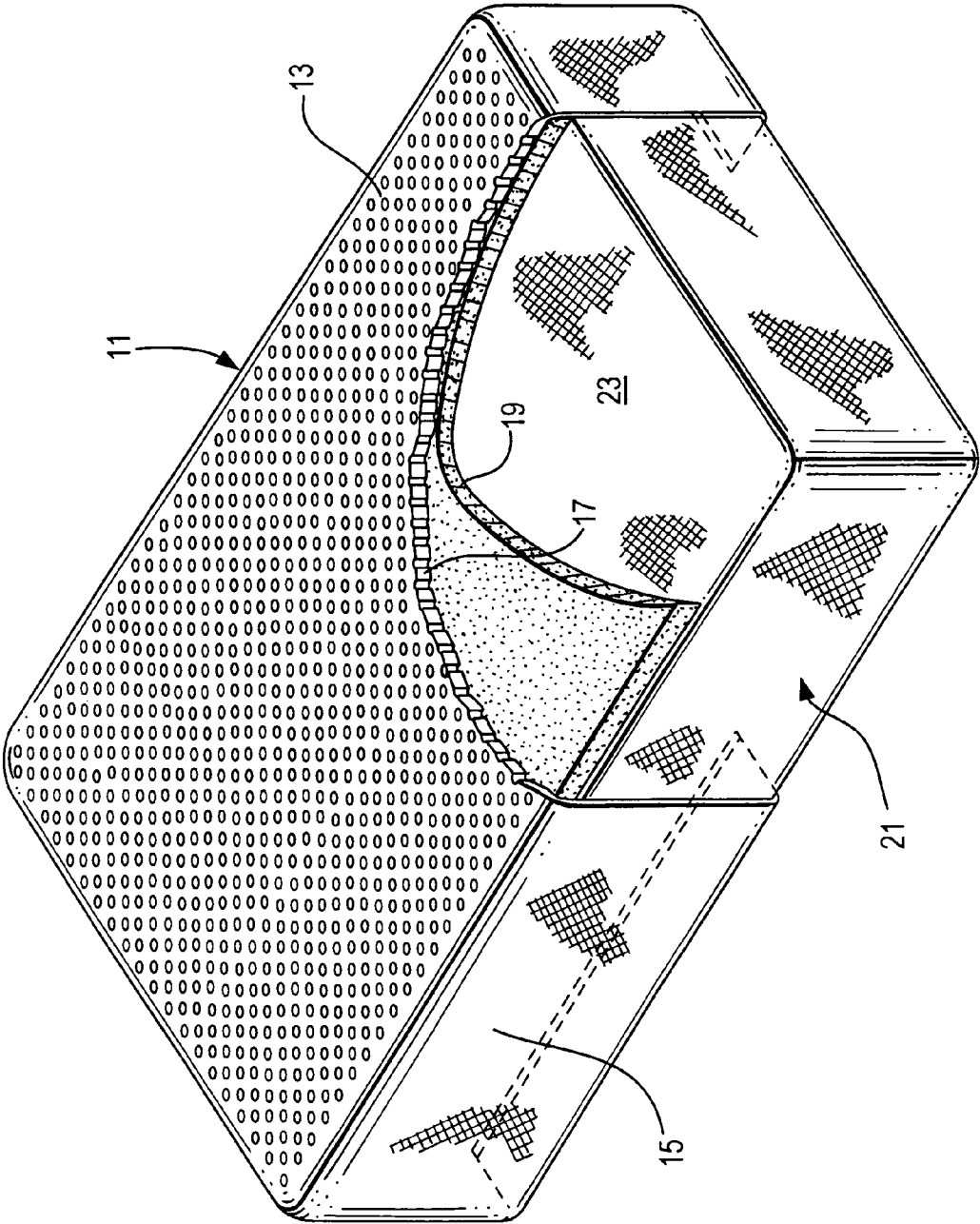


FIG. 2

**SPACER FABRIC FOR MATTRESS PAD**

[0001] This application claims priority benefit of provisional application No. 60/515,171, filed Oct. 27, 2003.

**BACKGROUND OF THE INVENTION**

[0002] This application relates to an infant mattress pad, and, more particularly, to an infant mattress pad which incorporates a spacer fabric.

[0003] It is known that SIDS (sudden infant death syndrome) occurs in infants primarily under six months of age. While there is no definitive proof as to why SIDS occurs, there is a significant medical school of thought that says SIDS occurs when an infant re-breathes its own carbon dioxide. Although SIDS risk has been shown to be lowered significantly when an infant sleeps on its back, the risk nonetheless remains. Also, many infants, even if placed on their back to sleep, can roll over, increasing the SIDS risk.

[0004] Indeed, infants are known to turn over or maneuver themselves into positions which make it hard for them to breath. Also, doctors sometimes recommend for infants to sleep on their stomach for reasons such as reflux and head deformity. Moreover, sometimes parents will put their infants on their stomachs to sleep better. Any of these reasons therefore, put an infant at higher risk for SIDS.

[0005] Accordingly, it would be desirable to provide a sleeping environment for infants which reduce the risk of SIDS as much as possible.

**SUMMARY OF THE INVENTION**

[0006] Generally speaking, in accordance with the invention, a spacer fabric in combination with an infant mattress pad is provided.

[0007] The spacer fabric has three parts or components knitted together to form a fabric defined by two breathable outer fabric layers and a breathable cushioned middle comprising yarns interconnecting the two layers. The spacer fabric is incorporated into an infant mattress pad in order to create an infant safety and comfort system designed to help reduce the risk of sudden infant death syndrome (SIDS) and also to provide infants with enhanced comfort.

[0008] Medical school of thought suggests the risk of SIDS is reduced by having an infant sleep on a mattress pad made of a fabric material which utilizes breathable spacer fabric. Such a pad allows the infant to rest above the mattress itself, leaving room for carbon dioxide gas to defuse along a lower level than the level that the infant rests. This reduces the carbon dioxide amount that the infant breaths, which, in turn, reduces the risk of SIDS.

[0009] Accordingly, it is an object of the invention to provide an improved infant sleeping environment.

[0010] Another object of the invention is to provide an improved mattress pad for infant mattresses and cribs.

[0011] A further object of the invention is to provide a mattress pad system which utilizes breathable spacer fabric.

[0012] Still other objects and advantages will, in part, be obvious and will, in part, be apparent from the following description.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0013] For a fuller understanding of the invention, reference is made to the following description, taken in connection with the accompanying drawings, in which:

[0014] FIG. 1 is a perspective view of a first embodiment of the inventive mattress pad as applied to a mattress; and

[0015] FIG. 2 is a second embodiment of the inventive mattress pad as applied to a mattress.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

[0016] Spacer fabric, also known as double needle bar fabrics (typically knitted on a double needle bar machine) or 3-dimensional fabric, is typically made by knitting two fabric layers. The two fabric layers could be the same or different, i.e. mesh or solid. The spacer fabric further includes separator yarns interdisposed between the two layers, creating a 3 dimensional cushioned material fabric construction which is highly breathable. Such spacer fabrics and their manufacture are well known in the art. Any yarn can be used to knit spacer fabrics, including polyester, nylon, spandex, cotton, polyester, polypropylene, or any other naturally occurring or man-made fiber used for knitting. Spacer fabric may also be prepared by weaving or other known technologies.

[0017] Now referring to FIG. 1, a first embodiment of the inventive mattress pad is shown and generally indicated at 11. Mattress pad 11 is defined by a body portion 13 of substantially the same size as top portion 23 of mattress 21 as well as an integrally formed border portion 15. Body portion 13 is defined by a single layer 16 made of a spacer fabric material of the type described hereinabove, while border portion 15 is made from a solid non-spacer fabric material. In this regard, the fabric of border portion 15 will preferably have an elastic trim sewn therealong and has a width which substantially matches the wall thickness of mattress 21. Border portion 15 is not made of a spacer fabric material in order to reduce the use of spacer fabric in the construction of pad 11. Thus, body portion 13 of pad 11 is sized to be disposed substantially over top portion 23 of mattress 21. Moreover, because border portion 15 of pad 11 is elastic, pad 11 will have a snug fit over mattress 21, preventing the bunching thereof.

[0018] In a second embodiment, as shown in FIG. 2, body portion 13 of mattress pad 11 is constructed with an upper layer 17 comprising a spacer fabric, as described hereinabove, and an underlying layer 19 of a breathable foam material for adding resiliency to body portion 13 of pad 11. Also, since body portion 13 incorporates underlying layer 17 of a foam material, production of pad 11 is made more cost-effective since it enables the overall use of a smaller percentage of spacer fabric in pad 11.

[0019] In accordance with the invention, body portion 13 of pad 11 has a thickness of between about 0.1 inches and 1.0 inches and preferably a thickness of between about 0.15 and 0.25 inches. If body portion 13 of pad 11 incorporates both an upper layer of spacer fabric and an underlying layer of a foam material, the upper layer will have a thickness of between about 0.1 and 0.5 inches (preferably between 0.15 and 0.25 inches), while the underlying layer will have a thickness of between about 0.1 and 0.75 inches (preferably

between about 0.2 and 0.3 inches). Moreover, in this embodiment, the upper and underlying layers remain co-extensive with each other when applied to the mattress.

[0020] The inventive pad of the invention will reduce infant rashes from saliva and other fluids by allowing such dispensed fluids to drain to the bottom of the spacer fabric that defines the body portion, keeping the infant away from the dispensed fluids. Further, by utilizing moisture management technologies in the spacer fabric material such as, but not limited to utilizing special fibers such as Hydrofil (modified version of nylon) and Coolmax (modified version of polyester), knitting the fabric to have a desired mesh size of between about 200 microns and 0.5 inches (preferably between 0.1 and 0.25 inches) and/or a desired fabric density of between about 75 stitches per square inch and 2,400 stitches per square inch (preferably between 300 and 600 stitches per square inch), and/or finishing the fabric by applying a wicking agent to the fabric, or to the yarns, before knitting. As a result, fluids will be wicked away from the infant, thereby allowing faster drying.

[0021] The inventive pad will be made from 100% hypoallergenic materials, such as nylon, polyester, spandex and polypropylene. This will help prevent allergies and maintain better breathing while the infant is sleeping.

[0022] In accordance with the invention, the body portion of the inventive pad will be constructed to be extremely soft by, for example, using textured (crimped) yarn and microdenier (yarn fibers or filaments of less than one denier), special knitting constructions such as open or closed loops of the yarns, and/or using certain fabric finishings prior to cutting and sewing, such as jet scouring, brushing, and/or sanding of the fabric.

[0023] The inventive pad will be easy to wash, which will keep the infant as clean as possible.

[0024] The invention may be expanded to include the use of an infant mattress pad made from other breathable fabric materials. By way of example, the body portion of the mattress pad may be defined by a regular mesh fabric as a top layer and a foam material as the bottom layer; both layers are, as with the embodiment shown in FIG. 2, discussed hereinbefore, integrally formed together.

[0025] The invention accordingly comprises the features of construction, combination of elements and arrangement of parts as shown and described in the preceding description. The scope of the invention is defined by the following claims.

1. An infant mattress pad comprising a body portion of which at least a part thereof is made from a spacer fabric material.

2. The infant mattress pad of claim 1, further including a border portion integrally formed around the body portion.

3. The infant mattress pad of claim 1, wherein said spacer fabric material comprises two fabric layers and a plurality of interconnecting or separator yarns disposed therebetween.

4. The infant mattress pad of claim 1, wherein the two fabric layers of said spacer fabric material are made from either the same or different fabric materials.

5. The infant mattress pad of claim 1, wherein said two fabric layers of said spacer fabric material have a construction selected from the group consisting of a mesh construction and a solid construction.

6. The infant mattress pad of claim 1, wherein said spacer fabric material is made from a yarn selected from the group consisting of polyester, nylon, spandex; cotton, polyester, propylene, other naturally occurring yarns, and man-made fibers.

7. The infant mattress pad of claim 2, wherein said border portion includes an elastic trim sewn therealong.

8. The infant mattress pad of claim 2, wherein said border portion is made from a fabric material different than that of said spacer fabric material.

9. The infant mattress pad of claim 1, wherein the spacer fabric material is made from yarn comprising a textured yarn having yarn fibers of a denier less than one.

10. The infant mattress pad of claim 1, wherein said body portion has a thickness of between about 0.1 and 1.0 inches.

11. The infant mattress pad of claim 1, wherein said body portion of said pad includes an upper layer incorporating said spacer fabric and a lower layer of a breathable foam material.

12. The infant mattress pad of claim 11, wherein said upper layer has a thickness of between about 0.1 and 0.5 inches and said lower layer has a thickness of between about 0.1 and 0.75 inches.

13. The infant mattress pad of claim 1, wherein said spacer fabric material is treated with a wicking agent.

14. The infant mattress pad of claim 1, wherein said spacer fabric material is finished by a finishing process selected from the group consisting of a scouring, brushing and sanding.

15. The infant mattress pad of claim 1, wherein the spacer fabric material has a mesh size of between about 200 microns and 0.5 inches.

16. The infant mattress pad of claim 1, wherein said spacer fabric has a fabric density of between about 75 stitches per square inch and 2,400 stitches per square inch.

17. An infant mattress pad comprising;

a mattress having a top portion, a bottom portion and a continuous side wall; and

a mattress pad sized for selectively covering said mattress of which at least a substantial portion thereof is made from a spacer fabric material.

18. The bedding system of claim 17, wherein said mattress pad comprises a body portion and an integrally formed border portion therearound.

19. The bedding system of claim 17, wherein said body portion of said pad is of a size and width which is substantially the same as that of said top portion of said mattress.

20. The bedding system of claim 17, wherein said border portion of said pad has a width which is at least substantially the same as that of said side wall of said mattress.

21. The bedding system of claim 17, wherein said body portion of said pad includes an upper layer incorporating said spacer fabric material and a lower layer of a breathable foam material.

22. The bedding system of claim 21, wherein said lower layer of breathable foam material abuts against said top portion of said mattress when said pad is fitted thereover.

23. The bedding system of claim 17, wherein said pad has a thickness of between about 0.1 and 1.0 inches.

24. The bedding system of claim 21, wherein said upper layer has a thickness of between about 0.1 and 0.5 inches and said lower layer has a thickness of between about 0.1 and 0.75 inches.

25. The bedding system of claim 17, wherein said spacer fabric material has a mesh size of between about 200 microns and 0.5 inches and fabric density of between about 75 stitches per square inch and 2,400 stitches per square inch.

26. An infant mattress pad comprising a body portion of which at least a substantial part thereof is made of a breathable fabric material.

27. The infant mattress pad of claim 26, wherein said breathable fabric material is selected from the group consisting of a mesh fabric material and a spacer fabric material.

28. The infant mattress pad of claim 26, wherein said pad includes a top layer of said breathable fabric material and an underlying layer of a foam material.

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