



(11) **EP 1 733 651 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
30.07.2008 Bulletin 2008/31

(51) Int Cl.:
A47C 21/06 ^(2006.01)

(21) Application number: **06120923.5**

(22) Date of filing: **19.09.2006**

(54) **Liquid-impermeable mattress cover**

Flüssigkeitsdichte Matratzenhülle

Liquide imperméable housse de matelas

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**
Designated Extension States:
AL BA HR MK RS

(30) Priority: **12.06.2006 DK 200600169 U**
28.06.2006 DK 200600866

(43) Date of publication of application:
20.12.2006 Bulletin 2006/51

(73) Proprietor: **Handelshuset Aldén & Olsson Aps**
2600 Glostrup (DK)

(72) Inventor: **Thygsen, Lars**
Havdrup 4622 (DK)

(74) Representative: **Plougmann & Vingtoft A/S**
Sundkrogsgade 9
P.O. Box 831
2100 Copenhagen Ø (DK)

(56) References cited:
GB-A- 1 012 503 **GB-A- 1 038 861**
US-A- 1 569 955 **US-A- 2 816 054**
US-A- 5 249 320

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 1 733 651 B1

Description

[0001] The present invention relates to mattress covers, also known as mattress protectors or pads, and in particular to mattress covers that are impermeable to liquid such as water, sweat, urine etc.

BACKGROUND OF THE INVENTION

[0002] Different types of protection are used to protect bed mattresses against e.g. urine. It is particularly relevant at hospitals and nursery homes, but it may also be desired at e.g. hotels or in private homes. A simple solution is to place a plastic film under the sheet, but that is uncomfortable to lie on due to the accumulated heat, the noise, and the relatively low friction and thereby sliding of the sheet on the plastic film. Furthermore, these products are often disposable or non-washable. The mattress protection item is often desired to provide a certain comfort as well as protecting the mattress from liquids such as urine and sweat. Mattress covers are known in the art, having a quilted padded bolster, and a liquid-impermeable layer fastened to the bolster along the edges thereof. Such mattress covers are very difficult to handle in a washing and drying process and in the succeeding making of the beds. The reason is that the impermeable layer and the rest of the mattress cover are movable relative to each other and therefore easily form folds in the impermeable layer and/or causes seam slippage. In order to provide a sufficiently impermeable membrane, the impermeable backing layer of these known mattress covers are formed by a laminated liquid-impermeable membrane. A further disadvantage of the known mattress cover is that the laminated impermeable layer makes a noise when the person lying in the bed moves around.

[0003] A liquid impermeable bed cover is described in US-A-5 249 320.

OBJECT OF THE INVENTION

[0004] It is an object of the present invention to provide a mattress cover which is impermeable to liquid, such as water, sweat, urine etc. even after a large number of washes.

[0005] It is a further object of the present invention to provide a mattress cover that is comfortable to lie on.

[0006] It is a further object of the present invention to provide a mattress cover that is easy to handle in an industrial laundry.

[0007] It is a further object of the present innovation to provide a mattress cover that can withstand washing and cleaning at temperatures high enough to remove all unwanted kinds of bacteria, without the cover loosing any of its properties necessary to fulfill its purpose.

SUMMARY OF THE INVENTION

[0008] The object of the invention may be obtained by a mattress cover according to claim 1.

5 **[0009]** Hereby it is obtained that the liquid-impermeability of the mattress cover is maintained and the layer is fixed.

[0010] In one embodiment the upper layer and the padding are joined by quilting.

10 **[0011]** Alternatively or additionally, in an embodiment the padding is made from polyester hollow fibres or other synthetic fibres.

[0012] Alternatively or additionally, in an embodiment the fabric of the liquid-impermeable layer is made from polyester, polyurethane or other synthetic composition.

15 **[0013]** In the choice of material for the mattress cover, it must be ensured that it can be completely disinfected from unwanted bacteria through an industrial washing process, and that the fibres maintain their other properties (e.g. liquid-impermeability, colour, softness, strength etc) when submitted to such washing processes. By forming the various parts of the mattress cover in synthetic fibres this can be obtained at lower washing temperatures than what is necessary for natural fibres such as cotton or other celluloid fibres.

20 **[0014]** In an embodiment, the liquid-impermeable layer comprises a laminated fabric.

25 **[0015]** In another embodiment, the liquid-impermeable layer of the mattress cover comprises a fabric having a liquid impermeable coating. The coating of the liquid-impermeable layer may preferably be made from polyurethane, acrylic or the like. Alternatively, the liquid-impermeable layer may be formed by a laminated fabric.

30 **[0016]** In any of the above mentioned embodiments, the mattress cover may further comprise a peripheral skirt, adjustable straps, anchor style elastic bands in combination or as individual methods for fixation of the mattress cover on a mattress.

35 **[0017]** The object of the invention may also be obtained by a method of manufacturing a mattress cover according to claim 10.

40 **[0018]** In an embodiment the liquid impermeable layer is provided by coating a sheet of synthetic fibres.

45 **[0019]** The invention is particularly useful in hospitals, nursery homes and the like.

BRIEF DESCRIPTION OF THE DRAWINGS

50 **[0020]** In the following the invention and in particular preferred embodiments thereof will be described in detail with reference to the drawings in which:

Fig. 1, schematically and in a sectional view shows a prior art mattress cover formed by a tick having a padding, and a liquid-impermeable layer fastened thereto;

Fig. 2 shows schematically and in a sectional view

a mattress cover according to an aspect of the invention;

Fig. 3, in a perspective view, shows an embodiment of the mattress cover shown in Fig. 2 before the liquid-impermeable layer 4 is fastened thereto;

Fig. 4, schematically and in a sectional view shows a mattress cover according to another aspect of the invention;

Fig. 5, in a perspective view, shows an embodiment of the mattress cover shown in Fig. 4; and

Fig. 6, in a sectional view shows the mattress cover shown in Fig. 3, further comprising a peripheral skirt for fixation of the mattress cover on a mattress;

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0021] Fig. 1 shows, schematically, a prior art mattress cover 1 comprising a tick 2 formed by an upper layer 2a and a lower layer 2b, a padding 3, and a liquid-impermeable layer 4. The liquid-impermeable layer 4 is only fastened to the tick 2 at the hem 5 thereof.

[0022] Figs. 2 and 4 show a mattress cover 1 according to two aspects of the invention.

According to the first aspect of the invention shown in Fig. 2, the tick of the mattress cover 1 comprises an upper layer 2a and a lower layer 2b, a padding 3 there between and a liquid permeable layer 4, forming a backing of the mattress cover 1.

[0023] Fig. 3 shows schematically that the tick 2 and the padding 3 are joined e.g. by quilting before the liquid-impermeable layer 4 is fastened thereto. The actual pattern of the quilting may differ from the one illustrated in Fig. 3. The liquid-impermeable layer 4 is fastened to the tick 2 at the hems 5 and a number of positions (10, see fig. 6) across the surface, where the fastening positions may follow the quilting pattern. The fastening should be carried out by a method that does not destroy the liquid-impermeable coating such as inverted quilting/stitching which does not penetrate the liquid-impermeable layer 4. The quilting/stitching must penetrate the padding 3 and the upper layer 2a for proper fixation of these layers, or it may only involve the liquid-impermeable layer 4 and the lower layer 2b adjacent thereto (if layer 2b is used). The quilting/stitching may be made in any desired pattern. An alternative method for fixation may be pin-sonic or other known heat setting processes.

[0024] According to the second aspect of the invention shown in Fig. 4, the mattress cover 1 comprises an upper layer 2a, a padding provided under the upper layer 2a and a liquid permeable membrane or layer 4 forming a backing for the mattress cover and substituting the lower layer 2b in the first aspect of the invention.

[0025] In both aspects, the liquid-impermeable layer 4

comprises a fabric and a coating (not shown) or a laminated fabric. When a coating is used, the coating is preferably added to the fabric before the joining of the mattress cover 1 to ensure an even and liquid-impermeable surface. The coating may typically be polyurethane, but other materials, such as PTFE, that ensure the liquid impermeability of the layer may also be used.

[0026] For all embodiments, the properties of the materials must not be significantly influenced by a large number of washes at temperatures high enough to ensure the necessary cleaning of the actual material used for the mattress cover 1. As an example, the mattress cover 1 may be made from polyester fabric for the tick 2 and hollow polyester fibres for the padding 3. The fabric of the liquid-impermeable layer 4 may also be polyester which may have a looser texture than the tick 2.

[0027] Fastening of the liquid-impermeable layer 4 to the rest of the mattress cover 1 ensures that they do not move relative to each other. Thereby both the handling of a mattress cover 1, such as during washing and making of the bed is improved compared to a mattress cover 1 where the layers are only joined at the hem 5.

[0028] The impermeability of the mattress cover 1 may be tested e.g. by simply pouring a glass of water on the upper fabric 2a of the mattress cover 1 and checking that it does not penetrate the liquid-impermeable layer 4. Since the product is expected to have to be washed a large number of times, it must also be ensured that it is still liquid-impermeable after a significant number of washes at the necessary temperatures.

[0029] The impermeability of the mattress cover has been tested in accordance with DS/EN 20811:1993 by accredited laboratory. Furthermore the mattress cover has been tested in accordance with and complies with DS/EN 1276 and DS/EN 1040. These tests performed on mattress covers having tick made from synthetic fibres at both 60° and 95° wash.

[0030] Fig. 6 shows schematically a sectional view of a mattress cover 1 having a peripheral skirt 6 to cover, wholly or partly, the sides of a mattress (not shown) on which the mattress cover 1 is placed. A purpose of such a skirt 6 is to keep the mattress cover 1 in place both when making the bed and when the bed is in use. Another purpose may be to protect the sides of the mattress, and still another purpose may be for aesthetic reason. The skirt 6 may have an elastic band 7 at the hem 5 to ease the placing of the mattress cover 1. It may also comprise other means for placing and keeping the mattress cover in position, such as adjustable straps or anchor style elastic bands (not shown). Such straps or elastic bands may also be used for fastening a mattress cover not comprising skirts.

[0031] The above describes a mattress cover but it is also within the scope of the invention to concept for making other products such as pillow covers / protectors / pads, seat covers for cars, blankets etc..

Claims

1. A mattress cover (1) comprising an upper layer (2a) having a hem (5), a padding (3) provided under the upper layer (2a), and a liquid-impermeable backing layer (4), wherein the liquid-impermeable layer (4) is fastened to the upper layer and the padding (3) at the hem (5) of the upper layer (2a) and at least at two or more additional points (10) by inverted stitching so that the liquid-impermeable (4) layer is not penetrated by the stitching.
2. A mattress cover (1) according to claim 1, wherein the upper layer (2a) and the padding (3) are joined by quilting.
3. A mattress cover (1) according to claim 1 or 2, wherein the fastening of the liquid-impermeable layer (4) to the upper layer (2a) and the padding is done by quilting.
4. A mattress cover (1) according to any of the preceding claims, wherein the padding (3) is made from polyester hollow fibres or other synthetic fibres.
5. A mattress cover (1) according to any of the preceding claims, wherein the fabric of the liquid-impermeable layer (4) is made from polyester, polyurethane or other synthetic composition.
6. A mattress cover (1) according to any of the preceding claims, wherein the liquid-impermeable layer (4) comprises a laminated fabric.
7. A mattress cover (1) according to any claims 1-5, wherein the liquid-impermeable layer (4) comprises a fabric having a liquid-impermeable coating.
8. A mattress cover (1) according to claim 7, wherein the coating of the liquid-impermeable layer (4) is made from polyurethane, acrylic or the like.
9. A mattress cover (1) according to any of the preceding claims, further comprising a peripheral skirt, adjustable straps, anchor style elastic bands in combination or as individual methods for fixation of the mattress cover (1) on a mattress.
10. A method of manufacturing a mattress cover (1) comprising an upper layer (2a) having a hem (5), a padding (3) provided under the upper layer (2a), and a liquid-impermeable backing layer (4), said method comprising the steps of:
 - joining the upper layer (2a) and the padding (3);
 - fastening a liquid-impermeable layer (4) to the upper layer (2a) and the padding (3) at the hem (5) of the upper layer (2a) and at least at two or

more additional points (10) by inverted stitching so that the liquid-impermeable layer (4) is not penetrated by the stitching.

11. A method of manufacturing a mattress cover (1) according to claim 10, wherein the liquid-impermeable layer (4) is fastened to the upper layer (2a) and the padding by quilting.
12. A method of manufacturing a mattress cover (1) according to claim 10 or 11, wherein the liquid impermeable layer (4) is provided by coating a sheet of synthetic fibres.

Patentansprüche

1. Matratzenhülle (1), umfassend eine Oberschicht (2a) mit einem Saum (5), eine unter der Oberschicht (2a) vorgesehene Füllung (3) und eine flüssigkeitsdichte Unterschicht (4), worin die flüssigkeitsdichte Unterschicht (4) an der Oberschicht und der Füllung (3) am Saum (5) der Oberschicht (2a) und wenigstens an zwei oder mehreren zusätzlichen Punkten (10) durch umgekehrte Naht befestigt ist, so dass die flüssigkeitsdichte Schicht (4) von der Naht nicht durchdrungen ist.
2. Matratzenhülle (1) nach Anspruch 1, worin die Oberschicht (2a) und die Füllung (3) durch Steppnaht verbunden sind.
3. Matratzenhülle (1) nach Anspruch 1 oder 2, worin die Befestigung der flüssigkeitsdichten Schicht (4) an der Oberschicht (2a) und der Füllung durch Steppnaht geschehen ist.
4. Matratzenhülle (1) nach irgendeinem der vorhergehenden Ansprüche, worin die Füllung (3) aus Polyesterhohlfasern oder anderen synthetischen Fasern hergestellt ist.
5. Matratzenhülle (1) nach irgendeinem der vorhergehenden Ansprüche, worin das Gewebe der flüssigkeitsdichten Schicht (4) aus Polyester, Polyurethan oder einer anderen synthetischen Zusammensetzung hergestellt ist.
6. Matratzenhülle (1) nach irgendeinem der vorhergehenden Ansprüche, worin die flüssigkeitsdichte Schicht (4) ein laminiertes Gewebe umfasst.
7. Matratzenhülle (1) nach irgendeinem der Ansprüche 1-5, worin die flüssigkeitsdichte Schicht (4) ein Gewebe mit einer flüssigkeitsdichten Beschichtung umfasst.
8. Matratzenhülle (1) nach Anspruch 7, worin die Be-

schichtung der flüssigkeitsdichten Schicht (4) aus Polyurethan, Acryl oder ähnlichem hergestellt ist.

9. Matratzenhülle (1) nach irgendeinem der vorhergehenden Ansprüche, weiterhin umfassend einen Umfangsrand, einstellbare Gurte, ankerartige elastische Bänder in Kombination oder als individuelle Maßnahmen zur Befestigung der Matratzenhülle (1) auf einer Matratze. 5
10. Verfahren zum Herstellen einer Matratzenhülle (1), umfassend eine Oberschicht (2a) mit einem Saum (5), eine unter der Oberschicht (2a) vorgesehene Füllung (3) und eine flüssigkeitsdichte Unterschicht (4), das Verfahren umfassend die Schritte: 10
 - Verbinden der Oberschicht (2a) und der Füllung (3);
 - Befestigen einer flüssigkeitsdichten Schicht (4) an der Oberschicht (2a) und der Füllung (3) am Saum (5) der Oberschicht (2a) und wenigstens an zwei oder mehreren zusätzlichen Punkten (10) durch umgekehrte Naht, so dass die flüssigkeitsdichte Schicht (4) von der Naht nicht durchdrungen ist. 20
11. Verfahren zum Herstellen einer Matratzenhülle (1) nach Anspruch 10, worin die flüssigkeitsdichte Schicht (4) an der Oberschicht (2a) und der Füllung durch Steppnaht befestigt ist. 30
12. Verfahren zum Herstellen einer Matratzenhülle (1) nach Anspruch 10 oder 11, worin die flüssigkeitsdichte Schicht (4) durch Beschichten eines Tuchs aus synthetischen Fasern bereitgestellt ist. 35

Revendications

1. Housse de matelas (1) comprenant une couche supérieure (2a) ayant un ourlet (5), un rembourrage (3) prévu sous la couche supérieure (2a), et une couche de support imperméable aux liquides (4), dans laquelle la couche imperméable aux liquides (4) est fixée à la couche supérieure et au rembourrage (3) au niveau de l'ourlet (5) de la couche supérieure (2a) et au niveau d'au moins deux points supplémentaires, ou plus, (10) par couture inversée de façon à ce que la couche imperméable aux liquides (4) ne soit pas pénétrée par la couture. 40
2. Housse de matelas (1) selon la revendication 1, dans laquelle la couche supérieure (2a) et le rembourrage (3) sont joints par piquage. 45
3. Housse de matelas (1) selon la revendication 1 ou 2, dans laquelle la fixation de la couche imperméable aux liquides (4) sur la couche supérieure (2a) et le 50

rembourrage est effectuée par piquage.

4. Housse de matelas (1) selon l'une quelconque des revendications précédentes, dans laquelle le rembourrage (3) est constitué de fibres creuses de polyester ou d'autres fibres synthétiques. 5
5. Housse de matelas (1) selon l'une quelconque des revendications précédentes, dans laquelle le tissu de la couche imperméable aux liquides (4) est constitué de polyester, de polyuréthane ou d'une autre composition synthétique. 10
6. Housse de matelas (1) selon l'une quelconque des revendications précédentes, dans laquelle la couche imperméable aux liquides (4) comprend un tissu stratifié. 15
7. Housse de matelas (1) selon l'une quelconque des revendications 1 à 5, dans laquelle la couche imperméable aux liquides (4) comprend un tissu ayant un revêtement imperméable aux liquides. 20
8. Housse de matelas (1) selon la revendication 7, dans laquelle le revêtement de la couche imperméable aux liquides (4) est constitué de polyuréthane, d'acrylique ou analogues. 25
9. Housse de matelas (1) selon l'une quelconque des revendications précédentes, comprenant en outre une jupe périphérique, des sangles réglables, des bandes élastiques du style à ancrage de manière combinée ou comme procédés individuels pour la fixation de la housse de matelas (1) sur un matelas. 30
10. Procédé de fabrication d'une housse de matelas (1) comprenant une couche supérieure (2a) ayant un ourlet (5), un rembourrage (3) prévu sous la couche supérieure (2a), et une couche de support imperméable aux liquides (4), ledit procédé comprenant les étapes consistant à : 35
 - joindre la couche supérieure (2a) et le rembourrage (3) ;
 - fixer une couche imperméable aux liquides (4) sur la couche supérieure (2a) et le rembourrage (3) au niveau de l'ourlet (5) de la couche supérieure (2a) et au moins au niveau de deux points supplémentaires, ou plus, (10) par couture inversée de façon à ce que la couche imperméable aux liquides (4) ne soit pas pénétrée par la couture. 40
11. Procédé de fabrication d'une housse de matelas (1) selon la revendication 10, dans lequel la couche imperméable aux liquides (4) est fixée sur la couche supérieure (2a) et le rembourrage par piquage. 45

- 12.** Procédé de fabrication d'une housse de matelas (1) selon la revendication 10 ou 11, dans lequel la couche imperméable aux liquides (4) est fournie en recouvrant une nappe de fibres synthétiques.

5

10

15

20

25

30

35

40

45

50

55

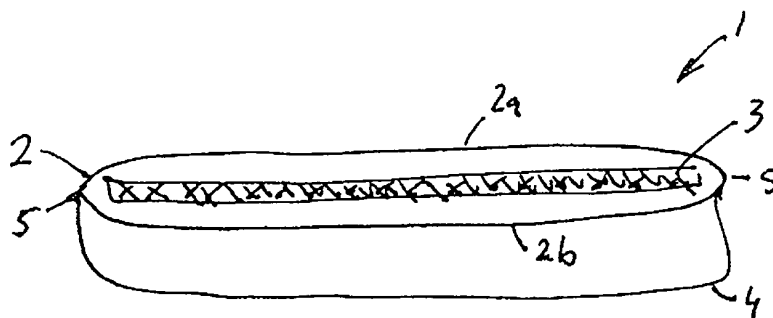


Fig. 1 prior art

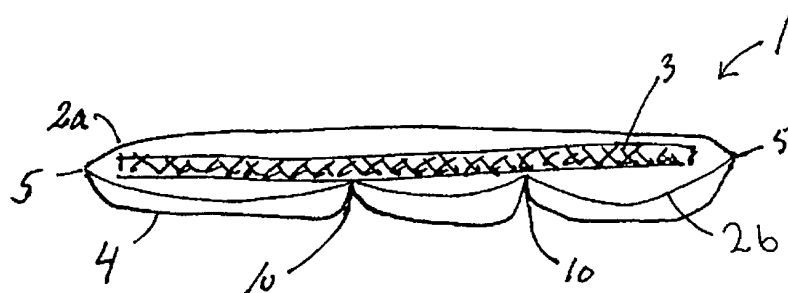


Fig. 2

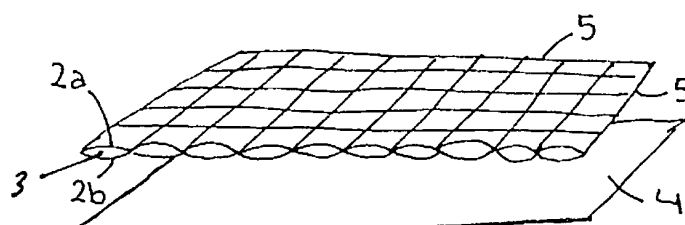


Fig. 3

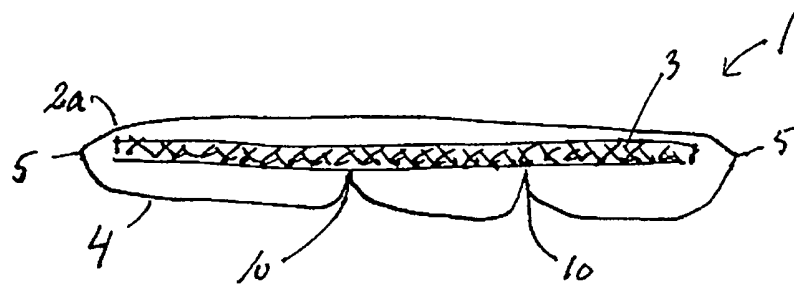


Fig. 4

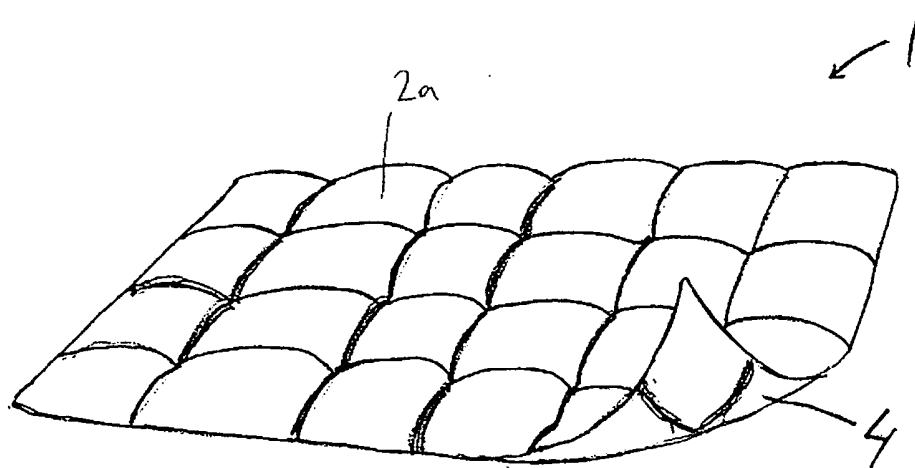


Fig. 5

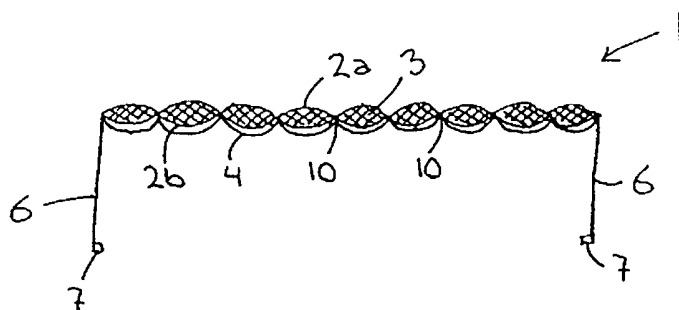


Fig. 6

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 5249320 A [0003]