Office de la Propriété Intellectuelle du Canada
Un organisme d'Industrie Canada

Canadian Intellectual Property Office
An agency of Industry Canada

CA 2630423 A1 2008/11/04

(21) 2 630 423

(12) DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION

(13) A1

(22) Date de dépôt/Filing Date: 2008/05/02
(41) Mise à la disp. pub./Open to Public Insp.: 2008/11/04
(30) Priorité/Priority: 2007/05/04 (DE102007021374.5-45)

(51) Cl.Int./Int.Cl. *D04H 3/00* (2006.01), *A61F 13/20* (2006.01), *A61F 13/511* (2006.01)

(71) Demandeur/Applicant:
CARL FREUDENBERG KG, DE

(72) Inventeurs/Inventors:
KAMIN-SCHULZ, ELISABETH, DE;
KNEHR, ERIC, DE;
HESS, MICHAEL, DE;
RUTSCH, PETER, DE

(74) Agent: BORDEN LADNER GERVAIS LLP

(54) Titre : COUCHE EXTERIEURE NON TISSEE AVEC FAIBLE COEFFICIENT DE FROTTEMENT POUR HYGIENE FEMININE, EN PARTICULIER POUR SERVIETTES HYGIENIQUES OU POUR FINS MEDICALES, ET ARTICLES D'ACCOMPAGNEMENT

(54) Title: NON-WOVEN COVER LAYER WITH LOW FRICTION COEFFICIENT FOR FEMININE HYGIENE, ESPECIALLY FOR TAMPONS, OR FOR MEDICAL PURPOSES AS WELL AS ARTICLES PROVIDED THEREWITH

(57) Abrégé/Abstract:
A non-woven cover layer for tampons for feminine hygiene or for medical purposes is described which includes one layer of multi-component filaments which include a component of a heat bondable thermoplastic heat sealable, whereby the multi-component filaments are endless filaments and whereby the endless filaments in first regions are bonded by thermal bonding and are unbonded in second regions located between the first, heat bonded regions.

ABSTRACT

A non-woven cover layer for tampons for feminine hygiene or for medical purposes is described which includes one layer of multi-component filaments which include a component of a heat bondable thermoplastic heat sealable, whereby the multi-component filaments are endless filaments and whereby the endless filaments in first regions are bonded by thermal bonding and are unbonded in second regions located between the first, heat bonded regions.

NON-WOVEN COVER LAYER WITH LOW FRICTION COEFFICIENT FOR FEMININE HYGIENE, ESPECIALLY FOR TAMPONS, OR FOR MEDICAL PURPOSES AS WELL AS ARTICLES PROVIDED THEREWITH

Description

Technical Field

The invention relates generally to non-woven cover layers as well as articles provided therewith and in particular to non-woven cover layers with low friction coefficient especially for articles of feminine hygiene, such as tampons or napkins as well as non-woven cover layers with low friction coefficient for medical purposes.

Prior Art

Non-woven cover layers are used in many areas, especially in the feminine hygiene field or for medical articles, in which they have both functional as well as aesthetic purposes. Functionally, properties of the surface can be positively influenced by the cover layer, for example their friction coefficient, their wear strength or the mechanical strength of the article itself can also be improved, in case it loses strength, for example, during the take up of body fluids.

A tampon as known from US 3,683,912 A has an outer, liquid permeable layer of polypropylene fibres. This wrapper is preferably a point wise embossed non-woven.

EP 1 035 819 B1 illustrates a tampon for the feminine hygiene as well as a product for the manufacture thereof, wherein a non-woven cover layer, which includes partially thermoplastic heat sealable fibres, is provided. The non-woven cover layer is thereby made of staple fibres. In order to reduce the friction coefficient of this non-woven cover layer, it is proposed to smoothen it by calendaring with smooth calendaring rollers. Although this smoothing is intended to result in a further reduced contact friction, the pore sizes are also reduced, since the fibres are flattened and melted together during the calendaring.

US 4,056,103 A further discloses a tampon with a non-woven wrapper made of staple fibres.

It is a general problem of the non-woven cover layers from the prior art that the fibre ends of the normally used staple fibres are exposed. This results in an increase in roughness and a lower wear comfort. Furthermore, the predefined cut length in combination with exposed fibre ends can results in an increased loss of fibres.

Description of the Invention

Starting from the above described prior art, it is an object of the invention to provide a non-woven cover layer for tampons which combines lower friction with higher stretch and avoids the disadvantages of exposed fibre ends.

The invention therefore provides a non-woven cover layer for tampons, especially for feminine hygiene or medical purposes. The non-woven cover layer includes at least one layer with multi-component filaments which include at least one component of a thermoplastic heat bondable material, whereby the multi-component filaments are endless filaments and whereby the endless filaments in first regions are compressed and bonded through thermal bonding and are unbonded in second regions located between the first, thermally bonded regions. Preferably, the endless filaments in the first regions are pressed together and held in place by thermal bonding through the melting of the thermoplastic heat sealable material and in second regions are unbonded between the first heat sealed, or thermally bonded regions.

The filaments can, for example, have a sheath-core geometry. In that case the material with the lower friction coefficient is used as the sheath material for the achievement of a lower friction.

However, preferably, at least two of the components and, thus, all components in bi-component filaments form regions of the filament surface.

Also, in accordance with the invention, endless filaments are used instead of staple fibres. Staple fibres are thereby understood to be fibres with lengths which reach into the decimetre range. Since bonding of the filaments is carried out only in regions, a large area smoothing as suggested in EP 1 035 813 B1 is not present. Nevertheless, a non-woven fabric with a surface which has a soft impression is provided in accordance with the invention. By using endless filaments and thereby also avoiding loose fibre ends, one can surprisingly also forego a fibre cross-section in which the whole surface of the filaments is made of a polymer with low friction coefficient. An advantageous influence is found even when, or especially when the mentioned low friction polymer is present in only some segments of the surface of the filament. In that case, a low friction coefficient is achieved and a mechanic and/or thermal smoothening is obviated. It is therefore provided that the different components of the filaments, or when more than two components are present, at least two of the components, also respectively form parts of the sheath surface of the filaments. This provides a significant advantage over known non-woven cover layers wherein sheath-core fibres are used in which the whole sheath consists of a low friction polymer for the reduction of friction.

At the same time, protruding fibre ends are avoided with the endless filaments so that nevertheless a smooth surface is achieved. Accordingly, the non-woven is preferably mainly, especially preferably exclusively made of endless filaments. It is, however, not impossible that a small amount of staple fibres can be present without essentially losing the advantages of the invention, as long as the portion of exposed fibre ends is sufficiently small.

The multi-component filaments furthermore prevent that during the local or regional hot bonding the filaments at the edges of the first regions are not or at least rarely squished together and their cross-section changed in such a way that a separation of the filament results and exposed ends are generated. Compared to the polypropylene fibres suggested according to US 3,683,912 A, this results in an improved strength, smoothness and also elasticity.

By using endless multi-component filament an increased tensile strength is also achieved compared to staple fibre non-wovens.

A multi-component filament within the meaning of the invention is thereby especially a filament in which the individual components take up different regions of the filament cross-section and its surface. The components can differ especially in their melting or softening temperatures. In a preferred embodiment of the invention, bi-component filaments with a thermoplastic low melting and a high melting component are used. The different melting points make it possible that during the localized hot melt bonding the lower melting regions of the filaments are melted together, while the higher melting parts essentially retain their structure so that these parts result in continuous strands in the bonded or melted together first regions. It is thereby also achieved that the filaments at the edges of the first regions do not separate during melting and form open ends.

It is further preferred that the higher melting component is selected from the group of the polyester derivatives and mixtures thereof. Especially preferably, polyester derivatives of the group of polyethyleneterephthalate (PET), polytrimethyleneterephthalate (PTT), polybutylenterephthalate (PBT) and polylacticacid (PLA) are used. For lower melting components, polymers of the group of the polyolefins especially polyethylene and polypropylene, are suitable. Compared to pure polyethylene or polypropylene fibres, a combination with a polyester derivative improves the wetting behaviour of the non-woven and thereby leads to an improved transfer of liquids into the liquid absorbing inner part of the tampon which is surrounded by the non-woven cover layer.

This advantage is achieved especially with bi-component filaments with a so-called pie geometry. It is however possible to use multi-component filaments with pie geometry. Apart from the pie geometry, a so-called side-by-side geometry is also possible in which the components in cross-section take up sections lying side by side.

In bi-component filaments with pie geometry, the two components are present in the form of strands extending in longitudinal direction along the filament, whereby the strands viewed in cross-section of the filament are sector-shaped and sectors of the two materials alternate along the circumference.

So far, sheath-core fibres are often used as low friction fibres in which the sheath is made by a low friction, however expensive, polyethylene. A non-woven is achieved in this manner which has the surface properties of polyethylene, but the further properties of which are however modified by the material of the core. One would therefore expect that a filament geometry in which both low friction as well as stronger friction polymer equally form the filament surface, results in a non-woven which has a less satisfactory total surface. Surprisingly, this is not the case with a non-woven in accordance with the invention with filaments having a pie geometry. Although the surface is made of two polymers, it is low friction.

Furthermore, when hydrophobic polyolefins are used as a component, the generally better wetting behaviour of the other component becomes effective. Generally, independent of the type of the component, the sector-shaped strands of the higher melting components of a filament can separate during the bonding by melting and pressing and can better interlock with the lower melting components. A structure with high tear strength is achieved thereby even with very small surface bonding. Preferably, high component filaments with at least six sectors are used, which means three sectors of each material. Especially advantageous pie filaments for this application include bi-component filaments of PET/PE.

Further preferred are bi-component filaments with sheath-core geometry in which, as known from the prior art, the sheath mantle is formed of a low friction material. Especially preferably, the sheath-core filaments are formed on the basis of the PET/PE, whereby PET forms the core and PE the sheath component.

In a preferred embodiment of the invention, the portion of PET in the pie filaments or sheath-core filaments is between 10 and 90 wt%. Preferably, portions of more than 40, especially preferably more than 50 wt% are referred, especially in the range of 60 to 90 wt%.

According to a further development of the invention, an additional lowering of the friction values can be achieved by a hydrophyllizing of the filaments.

The first regions in which the filaments are bonded with one another in the plane are preferably completely surrounded by second regions in order to achieve a stretchability of the non-woven in all directions. The first regions can thereby be constructed as spaced apart bonding points distributed over the surface.

Furthermore, a high density of bonding points on the surface is advantageous for the mechanical properties of the non-woven cover layer, both with respect to strength and reduction in friction, and as for a homogeneous appearance of the surface. Preferably, the surface density of the bonding points is more than 60 points per square centimetre. It is furthermore advantageous for the before mentioned properties when the first regions, such as especially the bonding points, have lateral dimensions smaller than 1 millimetre or represent surfaces smaller than 1 square millimetre.

It is further preferred for a good permeability of the non-woven when the surface of the first regions does not exceed 30%, preferably 25% of the total surface.

In order to manufacture the non-woven cover layer, multi-component endless filaments are spun and deposited on a support. The solidification by melting of the first regions together is then carried out by way of a heated embossment roller, the protruding heated structure of which compresses the laid fabric and melts the filaments at those locations. For the manufacture of absorbing products, such as articles for feminine hygiene, especially tampons, or medical articles, such as plasters, bandages or wound dressings, the absorbent material is combined with the non-woven cover layer and the non-woven cover layer is fixed with the absorbent material in the desired shape.

Non-woven cover layers in accordance with the invention are distinguished by low friction and a correspondingly high smoothness, by a low adhesion to skin and by a very good further processability because of the easy heat bonding with other materials.

Non-woven cover layers in accordance with the invention can therefore be used not only for tampons, but also for napkins. Such non-woven cover layers can also be used for medical articles, especially plasters, bandages or wound dressings and as cover layers for bags for ostomies, especially also because of their good heat bondability with the bag material.

A non-woven cover layer in accordance with the invention can be provided with an antibacterial finish, especially in the field of medical applications, for example in a known manner by a finish with silver. Such a finish can serve, among other things, to reduce the generation of smell upon contact with the skin.

A non-woven cover layer in accordance with the invention can also be finished to be hyrdophyllic, hydrophobic or with alternating hydrophyllic and hydrophobic zones.

In a preferred embodiment, the non-woven cover layer is further provided with openings, preferably openings with diameters or lateral dimensions of less than 0.3 mm. These openings in the non-woven allow an especially good liquid transport, for example, for the drying of wounds, with a simultaneous retention of a low friction coefficient.

A non-woven cover layer as suggested in accordance with the invention can also be used in fields outside products for hygiene and/or for medical applications. A possible application is found in the fields of gardening and agriculture or construction. The non-woven cover layers can be used, for example, for the strengthening of edges of agricultural non-wovens and geo-textiles. The already high strength of the material can be further increased by calendaring.

Further areas of application are the use of the non-woven as packaging material and for textiles. For the use as textiles, one thinks especially of covers for headrests, roofing membranes, as well as protective clothing made of or with the non-woven in accordance with the invention.

Brief Description of the Drawings

The invention will be further described in the following by way of the attached drawings.

Fig. 1 shows an electron microscope image of a non-woven cover layer in plan view;

Fig. 2 shows the non-woven cover layer of Fig. 1 at a higher magnification;

Fig. 3 is a schematic cross-section through a bi-component filament with pie geometry; and

Fig. 4 is an electron microscope image of the cross-sectional surfaces of sheath-core filaments on the basis of the PET/PE.

Description of the Invention

Figure 1 shows an electron microscope image of a non-woven cover layer 1. The non-woven cover layer consists of endless bi-component filaments 3 which have as one component a thermoplastic, heat sealable material. The filaments 3 are in first, point form, spaced apart regions 5 bonded to one another in that the thermoplastic heat sealable material is melted by local compression of the web and heating. In second regions 7, which surround the first regions 5, the filaments 3 are not bonded with one another so that in these regions 7 a high permeability for liquid exists on one hand and on the other hand a certain stretchability of the non-woven is present. This guarantees that the absorbent material of a tampon or of another absorbent product wrapped in or surrounded by the non-woven cover layer has a volume expansion reserve so that the absorbent material can fully exploit its liquid absorbing property with volume expansion.

Figure 1 furthermore illustrates that the first regions 5 only take up a small part of the surface of the non-woven cover layer 1. The predominant surface portion on the other hand is taken up by the regions 7 in which the filaments 3 are not bonded with one another.

In the example shown in Figure 1, the surface portion of the first regions 5 is especially smaller than 25%. As is apparent from the scale illustrated under the electron microscope image, the first regions 5 are also relatively small. In particular, the lateral dimensions of the regions are clearly smaller than 1 mm. Preferably, the regions 5 have a square shape with side lengths of about 500 micrometer. Furthermore, the surface density of the bonding points in the example illustrated in Figure 1 lies above 60 bonding points per square centimetre.

Figure 2 shows in higher magnification the edge region of a bonding point. Within the bonding point or the first region 5, it is apparent that the filaments 3 melt bonded with one another and compressed have respectively split into several strands lying side-by-side. These strands are formed of the sectors of the high melting component of the filaments in bi-component-pie-geometry. The low melting component is melted and acts as melt bonding adhesive, which connects the strands of higher melting components of the filaments 3 with one another. In the example shown in Figures 1 and 2, pie filaments with 16 sectors, which means respectively 8 sectors of the high melting and low melting components were used.

Figure 3 schematically illustrates such a pie filament in cross-section. The filament 3 includes overall 16 respectively alternating sectors 31 and 32. The sectors 31 consist thereby of a low melting, heat sealable thermoplastic, preferably polyethylene (PE) or polypropylene (PP). The further sectors 32 include a higher melting polyester derivative, preferably polyethyleneterephthalate (PET). In the example illustrated in Figure 3, all sectors have the same size. Correspondingly, the two components also have equal volume portions and similar weight portions.

For practical applications, the sectors 31 and 32 can also take up different angular sections. Especially, the sectors 32 of higher melting PET can also be larger so that the major volume portion of the filament is formed by this plastic. Although PET has a higher friction co-efficient than PE, an overall low friction is still achieved. In general, it is preferred when the adhesive component or the lower melting heat sealable thermoplastic takes up a volume portion of at most 40%. A distribution of 70 wt % PET to 30 wt % PE or PP is especially preferred.

In the electron microscope image of the cross-sectional surfaces of PET/PE-core-sheath filaments of Figure 4 one can clearly see the core 41 of the filaments 3 which is surrounded by a sheath 42.

Further properties of several non-woven cover layers in accordance with the invention are listed in the following Tables 1 and 2.

Table 1: Non-woven cover layers of Pie filaments on the basis of PE/PET

		Non-Woven 1	Non-Woven 2	Non-Woven 3	Non-Woven 4	Non-Woven 5	Non-Woven 6
Polymer		PE/PET	PE/PET	PE/PET	PE/PET	PE/PET	PE/PET
Ratio		50:50	30:70	30:70	30:70	30:70	30:70
Cross-sectional shape		16 Pie	16 Pie	16 Pie	16 Pie	16 Pie	16 Pie
Weight	g/m^2	12,0	17,0	15,0	17,0	17,3	16,3
EN-thickness	mm	0,10	0,12	0,12	0,10	0,15	0,14
HZK longitudinally	N	11,0	24,2	15,5	40,6	35,1	36,3
HZK D longitudinally	%	22,0	25,8	22,0	32,0	66,9	66,7
M 05% longitudinally	N	6,0	14,5	9.5	18,5	10,2	10,9
M 10% longitudinally	N	9,0	17,5	12,0	22,5	12,3	13,4
M 15% longitudinally	N	9,5	20,0	13,5	25,5	14,4	15,6
M 20% longitudinally	N	9,5	22,0	14,5	28,1	16,4	17,7
M 25% longitudinally	N	11,5	23,0	15,0	32,5	20,9	21,6
HZK Transverse	N	7,5	24,2	18,0	32,5	20,9	21,6
HZK D Transverse	%	24,0	33,4	30,8	32,0	57,3	54,3
M 05% Transverse	N	4,0	11,5	8,5	11,0	6,3	5,8
M 10% Transverse	N	5,5	14,0	10,5	13,5	8,2	8,2
M 15% Transverse	N	6,5	16,5	12,5	15,5	9,5	9,7
M 20% Transverse	N	7,0	19,0	14,5	17,0	10,8	11,2
M 25% Transverse	N	7,0	21,0	16,0	18,5	12,1	12,8
Heat Bonded Surface	%	11,1	24,5	24,5	24,5	11,1	11,1
Thickness of the heat bonded points	P/cm^2	64,4	71,5	71,5	71,5	64,4	64,4

Table 2: Non-woven cover layers of sheath-core filaments on the basis of PE/PET (Sheath: PE; Core: PET)

		Non-woven 7	Non-woven 8	Non-woven 9	Non-woven 10
Polymer		PE/PET	PE/PET	PE/PET	PE/PET
Ratio		30:70	30:70	30:70	40:60
Weight	g/m^2	13,7	14,0	14,0	15,3
Cross-sectional shape		Sheath-Core	Sheath-Core	Sheath-Core	Sheath-Core
EN-thickness	mm	0,12	0,16	0,12	0,15
HZK longitudinally	N	15,0	22,1	18,4	19,7
HZK D longitudinally	%	35,9	41,0	39,8	46,8
M 05% longitudinally	N	6,7	9,7	7,8	7,0
M 10% longitudinally	N	8,7	11,9	9,9	9,5
M 15% longitudinally	N	10,2	13,7	11,5	11,2
M 20% longitudinally	N	11,7	15,5	13,1	12,8
HZK Transverse	N	15,5	10,8	12,8	16,2
HZK D Transverse	%	59,3	36,1	45,2	65,4
M 05% Transverse	N	2,9	3,2	2,8	2,1
M 10% Transverse	N	5,3	5,3	5,1	4,7
M 15% Transverse	N	6,6	6,7	6,5	6,1
M 20% Transverse	N	7,7	7,8	7,7	7,3
Heat Bonded Surface	%	12,0	12,0	12,0	12,0
Thickness of the heat bonded points	P/cm^2	64,0	64,0	64,0	64,0

All listed non-woven cover layers of Table 1 were made of PE/PET bi-component endless filaments in pie geometry with 16 sectors. In non-woven 1, the ratio of the two components was 50:50. In all other listed non-wovens, the PET component was predominant. The non-woven cover layers listed in Table 2 were made of PE/PET bi-component endless filaments with sheath-core geometry with a ratio of the two components of 30:70 and 40:60.

In all non-wovens, the surface portion of the first regions 5 or the heat bonding points with at most 24.5% lies under 25%.

The variables “M 05%”, “M 10%”,..., “M 25%” designate the modules at a stretch corresponding to the respective given percentage. The label “longitudinally” or “transverse” designates the direction of the stretch in relation to the direction of manufacture of the non-woven fabric.

The label “HZK” represents the maximum tensile strength. This variable is also given respectively for a tensile load in longitudinal and transverse direction. Without limitation to the examples listed in Table 1, a maximum tensile strength of in the worst case at least 7 N can be achieved in the case of non-woven cover layers made of pie endless filaments. Non-woven fabrics such as non-woven 2 to 6 listed in Table 1 generally have more than 60% per weight PET, or a PE/PET ratio of 30:70, can generally be characterized also by maximum tensile load of at least 15 N. In the case of the non-woven cover layers of sheath-core material in Table 2, maximum tensile load of at least about 11 N were achieved with a PE/PET ratio of 30:70.

The variable HZK D further designates the stretch under load at the maximum tensile load. As is apparent from Tables 1 and 2, all examples have a maximum stretch which independent of the direction of tension is 22% or more. Without limitation to the listed examples, non-woven cover layers in accordance with the invention can therefore be characterized in further development of the invention and in addition by a stretch at maximum tensile load independent of the direction of tension which is at least 20%.

Furthermore, the fibre detachment on tampons with non-woven cover layers in accordance with the invention made of pie endless bi-component filaments was determined in comparison with conventional tampons in a use test. In this use test, the tampons were first tested by way of a Syngina-Standard Process of the EDANA in a synthetic vagina. In this standard process known to the person skilled in the art, a test liquid is used which is prepared as follows: 10 grams of sodium chloride were added per litre of distilled or de-ionized water as well as 0.5 grams of dye. The following substances can be used as dyes:

- acidic fuchsine, for example Fisher F97 Certified Biological Stain, Color Index No. 42685, Fisher Scientific Company,
- Fruit red dye, E 144,
- Cochineal red or Ponceau, E 124,
- FD &C Red #40.

A condom with a tear strength in the range between 17 MPa and 30 MPa, measured according to ASTM D 3492-83 and ASTM D 3492-97 is used in the chamber of the Syngina apparatus and a tampon is inserted into the condom. The condom is subjected in the chamber with a hydrostatic pressure of 180 ± 10 millimetre while the test liquid is supplied to the tampon by way of an infusion pump through an infusion needle in an amount of 50 ± millimetre per hour, whereby the infusion needle contacts the forward end of the tampon.

The test is continued until the first drop of test liquid exits from the apparatus, which means up to the point in time at which the test liquid seeps through the tampon.

After completion of the Syngina test, the tampon is removed from the synthetic vagina and the set up is flushed. The test was carried out with three tampons for each tampon type. The flushed out fibres were collected, dried and weighed. The result was calculated back to the fibre loss of a single tampon.

The conventional tampons thereby have a non-woven cover layer, which was point- wise bonded just like the non-woven fabrics in accordance with the invention, but was not made of multi-component endless filaments, but of staple fibres. The fibre detachment was in the conventional tampons 2 milligrams of the fibre per tampon, while in the tampons with non-woven cover layers in accordance with the invention, the fibre detachment was, depending on the temperature during the solidification, only 1 milligram or even unmeasurably small.

Tampons with non-woven cover layers in accordance with the invention can therefore be characterized in further development of the invention in such a way that their fibre loss in the use test is at least 50% lower, preferably at most half as high as with a tampon with a point-wise consolidated staple fibre non-woven as non-woven cover layer.

Especially, tampons with non-woven cover layers in accordance with the invention can be characterized in further development of the invention without limitation to the above mentioned measurement results in that the fibre loss of a tampon on average in a

Syngina test is at most 1.5 milligrams, preferably not more than 1.1 milligram or even smaller than 0.5 milligrams.

The characteristic of the always small fibre loss and the few if not missing fibre ends as observed in the non-woven cover layers in accordance with the invention is among other things especially advantageous, since small injuries and inflammation of the contacted tissue during use can be reduced.

It is apparent to the person skilled in the art, that the invention is not limited to the before described exemplary embodiments, but can be varied in many ways. Especially, the features of the individual examples can also be combined with one another.

CLAIMS:

1. Non-woven cover layer including at least one layer with multi-component filaments which includes at least one component of a thermoplastic heat bondable material, whereby the multi-component filaments are endless filaments and whereby the endless filaments in first regions are compressed and bonded through thermalbonding and are unbonded in second regions located between the first thermally bonded regions.

2. The non-woven cover layer according to claim 1, wherein the multi-component filaments are bi-component filaments with a thermoplastic lower melting component and a higher melting component.

3. The non-woven cover layer according to claim 2, wherein the higher melting component is selected from the group of polyester derivatives and mixtures thereof.

4. The non-woven cover layer according to claim 3, wherein the group of polyester derivatives includes polyethyleneterephthalate (PET), polytrimethyleneterephthalate (PTT), polybutylenterephthalate (PBT) and polylacticacid (PLA).

5. The non-woven cover layer according to any one of claims 2 to 4, wherein the lower melting component is selected from the group of polyolefins.

6. The non-woven cover layer according to claim 5, wherein the lower melting component is polyethylene and/or polypropylene.

7. The non-woven cover layer according to any one of claims 1 to 6, wherein at least two of the components form regions of the filament surfaces.

8. The non-woven cover layer according to any one of claims 2 to 7, wherein the bi-component filaments have a pie or sheath-core geometry.

9. The non-woven cover layer according to claim 8, wherein the bi-component filaments are pie or sheath-core filaments of PET/PE.

10. The non-woven cover layer according to claim 9, wherein the portion of PET in the pie or sheath-core filaments is between 10 and 90 wt %.

11. The non-woven cover layers of claim 10, wherein the portion of PET is between 60 and 90 wt %.

12. The non-woven cover layer according to any one of claims 1 to 11, wherein the at least one layer of multi-component filaments is thermally consolidated and/or bonded by way of spaced apart bonding points distributed over the surface.

13. The non-woven cover layer according to claim 12, wherein the surface density of the bonding points is higher than 60 points per square centimetre.

14. The non-woven cover layer according to any one of claims 1 to 13, wherein the first regions have lateral dimensions smaller than 1 millimetre.

15. The non-woven cover layer according to one of claims 1 to 14, wherein the surface of the first regions make up a portion of the total surface which is not more than 30%.

16. The non-woven cover layer of claim 15, wherein the portion of the total surface is not more than 25%.

17. The non-woven cover layer according to any one of claims 1 to 16, wherein the non-woven cover layer has a maximum tension strength of at least 7 N, preferably at least 15 N.

18. The non-woven cover layer according to claim 17, wherein the maximum tensile strength is at least 15 N.

19. The non-woven cover layer according to any one of claims 1 to 18, wherein the non-woven cover layer has a stretch at maximum tension load independent of the direction of tension of at least 20%.

20. The non-woven cover layer according to any one of claims 1 to 19, wherein the non-woven cover layer has openings, preferably openings with diameters or lateral dimensions of less than 0.3 millimetre.

21. Articles for feminine hygiene, especially tampons or feminine napkins, including a non-woven cover layer according to any one of claims 1 to 20.

22. Tampons with a non-woven cover layer according to any one of claims 1 to 20, wherein the average fibre loss of the tampon in the Syngina is at most 1.5 milligram, preferably not more than 1.1 milligram.

23. The tampons with a non-woven cover layer as defined in claim 22, wherein the average fibre loss is not more than 1.1 milligrams.

24. Medical article, especially wound plaster, wound wrap or wound cover layer, including a non-woven cover layer according to one of claims 1 to 20.

Application number / numéro de demande: 2630423

Figures: 1; 2; 3; 4

Pages:

Unscannable item(s)
received with this application
To inquire if you can order a copy of the unscannable items, please visit the CIPO WebSite at HTTP://CIPO.GC.CA

Item(s) ne pouvant être balayés
Documents reçus avec cette demande ne pouvant être balayés.
Pour vous renseigner si vous pouvez commander une copie des items ne pouvant être balayés, veuillez visiter le site web de l'OPIC au HTTP://CIPO.GC.CA