AUSTRALIA

PATENTS ACT 1952

B

APPLICATION BY ASSIGNEE OF INVENTOR

DECLARATION IN SUPPORT OF AN APPLICATION FOR A PATENT

NAME OF APPLICANT

In support of an application made by:

MOLNLYCKE AB

TITLE

for a patent for an invention entitled:

DISPOSABLE LIQUID-ABSORBING ARTICLE

FULL NAME AND ADDRESS OF SIGNATORY

I, Stefan Olsson

of Humlevägen 3G, 448 00 Floda, Sweden

do solemnly and sincerely declare as follows:

1. I am authorised by the above mentioned applicant for the patent to make this declaration on its behalf.

FULL NAME AND ADDRESS OF INVENTOR(S)

2. The name and address of each actual inventor of the invention is as follows:

LARS BOMAN, Alegardsgatan 404, S-43145 Molndal, Sweden.

SEE NOTES OVER

3. The facts upon which the applicant is entitled to make this application are as follows:

By virtue of an assignment dated May 12, 1987 between the inventor and the applicant.

DELETE PARAGRAPHS 3 AND 4 FOR NON CONVENTION APPLICATION

4. The basic application(s) as defined by Section 141 of the Act was (were) made as follows:

Country Sweden on May 27, 1986

in the name(s) Molnlycke AB

and in on

in the name(s)

PLACE AND DATE OF SIGNING

5. The basic application(s) referred to in the preceding paragraph was (were) the first application(s) made in a Convention country in respect of the invention the subject of this application.

Declared at Göteborg

this 6th day of March 1990

Signed

Position House Patent Counsel

GRIFFITH HACK & CO

PATENT AND TRADE MARK ATTORNEYS

MELBOURNE · SYDNEY · PERTH

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(54) Title
DISPOSABLE LIQUID-ABSORBENT

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(57) Claim

1. A disposable liquid-absorbing article such as a diaper, a sanitary napkin or the like comprising, an absorption body (1) surrounded by a casing which is liquid permeable at least in its portion (5) facing the user of the article, characterized in that the liquid-permeable body-contacting portion (5) of the casing consists of a thin, spun-bonded fibrous fabric layer composed of a hydrophobic material, and in that a similarly constructed hydrophobic fibrous layer of melt-bonded fiber fabric is applied between said casing portion and the absorption body, said latter layer (2) having a surface weight which is greater than that of the aforementioned casing portion..

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(81) Designated States: AU, BR, DK, FI, HU, JP, NO, US.

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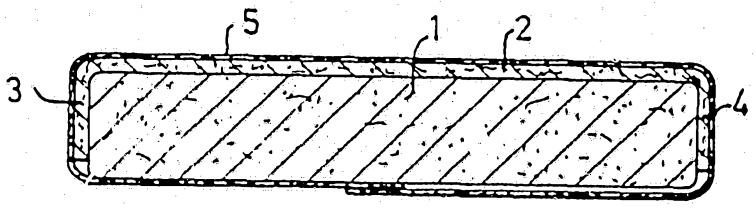
(54) Title: DISPOSABLE LIQUID-ABSORBING ARTICLE



(57) Abstract

Disposable liquid-absorbing article such as a diaper, a sanitary napkin or the like incorporating an absorption body (1) and a casing surrounding it. The distinguishing feature of the inventive article is that the body-contacting portion (5) of the casing is composed of a thin hydrophobic layer of fiber fabric of the spun-bonded type, and that there is applied between said casing portion and the absorption body (1) a likewise hydrophobic fiber fabric layer (2) of the melt-bonded type.

DISPOSABLE LIQUID-ABSORBING ARTICLE

The present invention relates to a disposable liquid-absorbing article such as a diaper, a sanitary napkin or the like comprising an absorption body surrounded by a casing which is liquid permeable at least in its portion facing the user of the article.

There must be placed very high demands on disposable articles in the form of diapers, sanitary napkins and the like with regard to the portion of the casing adapted for contact with the wearer's body during use of the article. On the one hand, this body-contacting portion must give a soft and pleasant feel to the skin for the wearer's comfort; that is the surface friction of the casing material should be low in order to avoid skin irritation caused by mechanical rubbing, and on the other hand the casing material in contact with the wearer's skin during use should be capable of remaining dry. Moreover, the portion in question should have an extremely high wear-resisting capacity to withstand wear from its contact with the wearer's skin. In addition, the surface layer must be capable of creating a certain distance between the skin and the absorption body in order to prevent re-wetting with fluid from the absorption body to the wearer's skin.

So far, there has been found no satisfactory method of fulfilling the requirements set forth above.

In general, the liquid-absorbing disposable articles of today have a hydrophobic fibrous layer placed in direct contact with the wearer's skin. Although this layer does in fact exhibit a certain protective effect against rewetting, it still lacks the capacity of presenting a well-functioning combination of surface softness and wear strength. To obtain a sufficient degree of wear strength in chemically bonded fiber fabrics, such large amounts of binding

agent have had to be intermixed that the fibrous layer has become rugged and given rise to an unpleasant feel when in touch with the skin.

It is also previously known to use melt-bonded types of fiber fabric consisting of thermoplastic fibers bonded to a surface pattern by means of melt bonding. As is the case with chemically bonded fiber fabrics, however, these latter layers as well become much too harsh with a high-density bonding pattern, whereas their wear strength will be insufficient when bonded too loosely.

Even the problem of creating the necessary spacing to the absorption body has remained unsolved with the types of prior art surface layers described in the foregoing.

In conventional articles there are frequently used a layer of cellulose wadding placed inside the hydrophobic surface layer, which per se provides a certain distance between surface layer and absorbent body, the cellulose wadding simultaneously serving to somewhat stabilize the absorption body which is generally composed of pulp fibers. There is however the drawback associated with cellulose wadding that it has a both liquid absorbing and liquid distributing effect, permitting in this manner liquid to spread and remain collected immediately underneath the surface layer of these known articles. Therefore, such a solution is far from satisfactory with regard to re-wetting.

Previous attempts have also been made in an effort to overcome the problem of rewetting by placing an insulation layer of airlaid hydrophobic fibers between the outer casing and the absorption body. This has indeed considerably eliminated rewetting while having instead created other significant drawbacks since it is hardly useful from a manufacturing viewpoint because of the difficulties associated with the

application of such layers at high manufacturing speeds while simultaneously maintaining a high-quality performance.

A most vital aspect, which has so far been neglected by manufacturers of diapers and sanitary napkins in the production of suitable casing portions intended for direct contact with the wearer's body, is the instantaneous absorption. If a casing layer is produced which is thick enough to prevent rewetting, the instantaneous absorption will be too low due to the tendency of overdimensioned hydrophobic layers to produce a liquid-repellent effect, which many times gives rise to leakage in conventional diapers and sanitary napkins.

Beyond the demands on wear strength, low surface friction and softness, there are thus also placed contradictory demands on the liquid insulating capacity of the liquid permeable casing.

With the present invention, however, there has been obtained a casing and an insulating layer intended for direct contact with the wearer's skin, said layer being superior to previously known material layers designed for this purpose. This object has been fulfilled in that the liquid permeable body-contacting casing portion of an article made in accordance with the invention consists of a thin, spun-bonded fibrous fabric layer composed of a hydrophobic material, and in that there is applied between said casing portion and the absorption body a similarly constructed, hydrophobic fibrous layer of melt-bonded fiber fabric, the surface weight of this last-mentioned layer being greater than that of the aforementioned casing portion.

The invention will be described in more detail below with reference to two exemplary embodiments illustrated in the accompanying drawings, of which

Figs. 1 and 2 show a first embodiment of an absorbent article made according to the invention,

whereas

Figs. 3 and 4 show a second embodiment thereof.

In the two embodiments shown, the absorption body 1 consists of so-called cellulose fluff pulp. On the side of the article facing the wearer during use, there is applied over the absorption body a hydrophobic fiber fabric layer 2 of the so-called melt-bonded type. This fabric layer consists of heat-bondable fibers made of polypropylene, for example, and being only locally heat-bonded for creating a voluminous insulating layer having fibrous, cushion-like protuberances formed between the local connecting points. The insulating fiber cushions serve to prevent rewetting with fluid from the absorption body, imparting to the layer in addition a spring back effect which is essential in this context because of the significant compression stresses the article is subjected to during use. The fiber fabric layer 2 obtained in this manner will have a high surface friction thereby making it useful as a reinforcing means for the absorption body 1, which has in itself a weak integrity and a lump-forming tendency due to the stresses occurring during use. To advantage, the fiber fabric layer 2 can have edge portions 3, 4 extending over the side margins of the absorption body 1, said edge portions 3, 4 preventing the side margins from rewetting the wearer's skin. For the sake of providing an effective insulation while simultaneously permitting maximum through-flow of liquid to the absorption body 1, the fiber fabric layer 2 should have a surface weight in the order of 20-30 g/m^2.

In the embodiment of Figs. 1 and 2, the absorption body 1 as well as the fiber fabric layer 2 are enclosed in a casing 5 made of a hydrophobic fibrous fabric of the so-called spun-bonded type. This fiber fabric is produced of endless fibers of poly-

propylene for example, giving a smooth, soft surface with a low surface friction and imparting simultaneously to said layer a very high strength. The fiber fabric layer 5 of the spun-bonded type should be made very thin and have a surface weight of less than 15 g/m^2.

Such a thin layer of fiber fabric is necessitated by the need of securing a sufficiently high instantaneous through-flow of liquid from the user to the absorption body 1.

In the first exemplary embodiment shown in Figs. 1 and 2, the fiber fabric layer 2 of the melt-bonded type is not connected to the casing itself, which is an advantage by the two layers then being somewhat mutually displaceable, reducing thereby the irritating frictional contact with the skin of the user.

In the second embodiment shown in Figs. 3 and 4, the portions corresponding to similar portions in the first embodiment shown in Figs. 1 and 2 have been given the same reference numerals.

In both of the two embodiments shown, the two fiber fabric layers 2, 5 cover the body-contacting side of the absorption body during use and, as indicated by the second embodiment shown in Figs. 3 and 4, extend further with edge portions 6,7 beyond the margins of the absorption body where they are affixed by melt-bonding both to one another and to the edge portions 8 of a liquid-tight plastic film 9 applied to the opposite side of the absorption body. By securing the edge portions with the casing 5, 9, the wear strength of the article made in accordance with the second embodiment shown here will be increased. Owing to the high surface friction in the melt-bonded type of fiber fabric layer 2, there has further been accomplished a good frictional bonding with the absorption body 1 which, as a result of the frictional affixation imparted to its casing 5, 9 by the layer 2, will then

be anchored thereto, which also adds to its strength.

As is also the case with the first embodiment shown in Figs. 1 and 2, the two fiber fabric layers referred to in the second embodiment shown in Figs. 3 and 4 are not interconnected within the area of the article facing the wearer during use.

The invention is not restricted to the embodiments described and illustrated in the foregoing, since a plurality of modifications are conceivable within the scope of the patent claims.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A disposable liquid-absorbing article such as a diaper, a sanitary napkin or the like comprising, an absorption body (1) surrounded by a casing which is liquid permeable at least in its portion (5) facing the user of the article, characterized in that the liquid-permeable body-contacting portion (5) of the casing consists of a thin, spun-bonded fibrous fabric layer composed of a hydrophobic material, and in that a similarly constructed hydrophobic fibrous layer of melt-bonded fiber fabric is applied between said casing portion and the absorption body, said latter layer (2) having a surface weight which is greater than that of the aforementioned casing portion.

2. An absorbant article according to Claim 1, characterized in that the casing portion (5) made of spun-bonded fiber fabric has a surface weight less than approx. 15 g/m^2.

3. An absorbent article according to Claim 2, characterized in that the layer (2) made of melt-bonded fiber fabric has a surface weight in the order of 20-30 g/m^2.

4. An absorbent article according to any one of Claims 1 to 3, characterized in that the casing in its entirety consists of a thin spun-bonded fiber fabric layer.

5. An absorbent article according to any one of the preceding claims, characterized in that the liquid permeable casing portion (5) facing the user of the article extends beyond the absorption body (1) with edge portions around the whole circumference thereof, said edge portions being connected to similar edge portions (8) of a liquid impermeable, second casing portion (9) applied to the opposite side of the absorption body, and in that also the melt-bonded fiber fabric layer (2) placed inside the liquid permeable casing portion (5) extends beyond the absorption body while being secured circumferentially therearound to the casing portions constituting the casing of the article.

6. An absorbent article according to any one of the preceding claims, characterized in that the two fiber fabric layers (2,5) of the spun-bonded and the melt-bonded type, respectively, are non-secured in relation to one another within the body-contacting area during use of the article.

DATED this 15th day of January 1989

MOLNLYCKE AB
By Their Patent Attorneys:

GRIFFITH HACK & CO
Fellows Institute of Patent
Attorneys of Australia

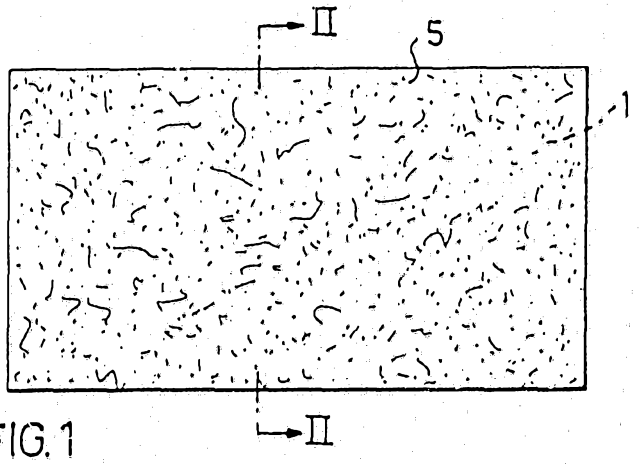


FIG. 1

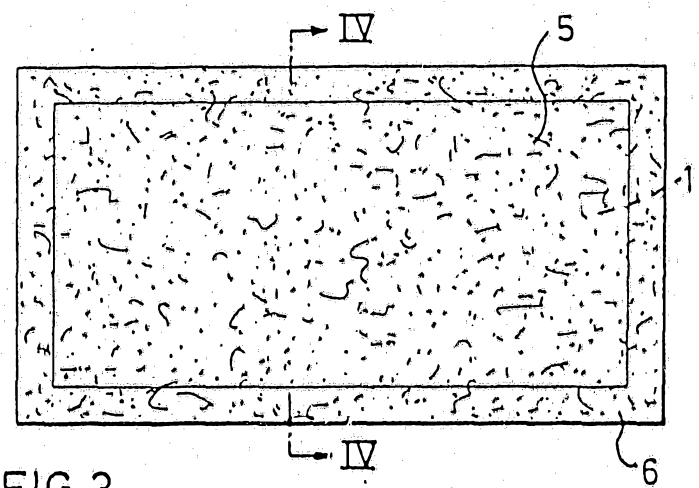


FIG. 3

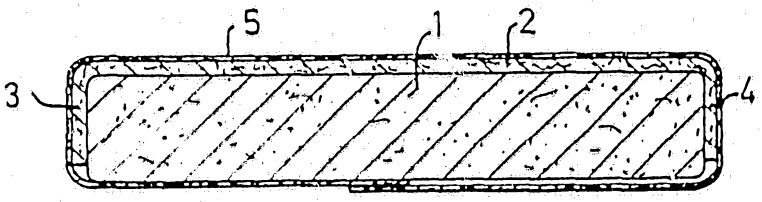


FIG. 2

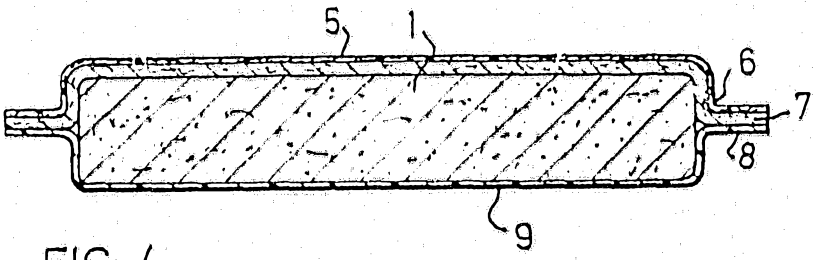


FIG. 4

INTERNATIONAL SEARCH REPORT

International Application No PCT/SE87/00250

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC [4]

A 41 B 13/02, A 61 F 13/16 // A 61 L 15/00

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
IPC 4	A 41 B 13/02; A 61 F 13/00, /02, /16, /18
US Cl	128:155, 156, 290, 390; 604:358-390

Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched [8]

SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category [10]	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
Y	SE, B, 379 635 (MO OCH DOMSJÖ AB) 20 October 1975	1, 4-6
A	US, A, 4 047 531 (H KARAMI) 13 September 1977	1, 5-6
Y	US, A, 4 307 721 (Y TSUCHIYA ET AL) 29 December 1981 & GB, 2055690 FR, 2463222 DE, 3029315 JP, 56023949	1-6
A	US, A, 4 392 861 (G BUTTERWORTH ET AL) 12 July 1983	1, 4-6

* Special categories of cited documents: [10]

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
1987-08-27	1987 -08- 31
International Searching Authority	**Signature of Authorized Officer**
Swedish Patent Office	Leif Karnsäter Leif Karnsäter

LH