

ABSORBENT ARTICLE

This invention relates to an absorbent article such as a napkin or pad for incontinence or catamenial purposes, e.g. a sanitary towel or pad, which is intended to be worn together with or within an undergarment (hereinafter "briefs") in the crotch region.

Conventional absorbent articles, such as catamenial napkins, basically include a liquid permeable inner layer, a liquid impermeable outer antileakage layer and a liquid retentive absorbent element interposed therebetween. In recent years the absorptive ability of such articles has increased due to the development and introduction of new materials, such as absorbent polymers, for the absorbent element instead of the conventional cotton-like pulp or absorbent paper. It has also been proposed that a liquid permeable sheet, which is rendered permeable by forming tiny perforations in a hydrophobic sheet, together with a non-woven fabric as a conventional fibre aggregate be used as the outer sheet in order to improve the absorptive ability.

However, even in an absorbent article which incorporates a new material and in which each component element has a high efficiency, sideward leakage of fluid still occurs frequently in actual use. For example, in the case of catamenial napkins, blood leaks sidewardly due to one reason or another and ultimately reaches the briefs, which is an inconvenient phenomenon and means that the full potential efficiency of the absorbent napkin has not been fully realised.

Regardless of the efficiency of each individual component, the three main causes of leakage of catamenial napkins are as follows:-

(1) When the user fixes a catamenial napkin to briefs, its position is inevitably offset either to the left or the right with respect to the crotch portion of the briefs and there is a portion of the crotch which is not adequately protected by the napkin from the beginning.

(2) Even if the user successfully fixes a catamenial napkin in the generally correct position, i.e. in the generally central area of the briefs, the napkin is frequently twisted or deformed, in use, into a rolled-up state in which a longitudinal edge of the napkin overlaps with the central portion because of movement of the user, and an edge region of the crotch portion which was initially covered by the napkin becomes exposed due to such deformation.

(3) When the user moves vigorously, it is impossible to fix a catamenial napkin firmly to the crotch portion of briefs only by fixing means such as adhesive, which is usually provided, and the napkin is displaced from its desired position to expose a portion of the crotch portion.

Leakage caused by the above factors is also greatly affected by the briefs which are worn. For example, if the width of the crotch portion, in particular, is substantially greater than that of the napkin or if the fit with the user's body is bad and loose, leakage tends to occur comparatively easily.

In order to solve these problems, many proposals have been made in which an absorbent article is provided with a pair of flexible flaps extending in the

widthwise direction away from the central portion of a respective longitudinal edge of the absorbent article (Japanese Patent Early Laid-open Publication Nos. Sho 60-75058, Hei 1-111002 and Hei 2-13455). In this case the crotch portion of the briefs, when in use, is sandwiched and retained between the flaps in order to stabilise the absorbent article in the briefs, thereby improving its antileakage properties.

For example, the sanitary napkin described in Japanese Patent Early Laid-open Publication No. Sho 60-75058 is designed such that extending from the centre of each of the vertical sides of the absorbent layer there is a flexible flap formed of liquid permeable material and liquid impermeable antileakage material, which flap, in use, can be pulled out from the edge of the briefs and fixed to the outer surface of the briefs by fixing and connecting means disposed on the rear surface of the flap, thereby locating and stabilising the sanitary napkin and improving its antileakage properties. In order that this sanitary napkin may exhibit its full antileakage capability, it is important that the absorbent layer be positioned so that both sides face upward when the briefs are worn. If the briefs are worn in this manner as just mentioned, leakage can be prevented to some extent, but the following problems arise:

A) The pulling out of the flaps from both sides of the crotch of the briefs does not always leave the napkin correctly positioned so that it is sometimes displaced or twisted into an irregular form ab initio, whereby leakage occurs.

B) If the width of the crotch portion of the briefs is greater than that of the absorbent layer, it

is difficult to fix the sanitary napkin to the briefs or it can happen that the napkin cannot be firmly secured to the crotch portion because a region of the crotch portion is bent thereby reducing its area.

C) Even if the pair of flaps are firmly secured in position and an antileakage wall portion is successfully formed at each side of the absorbent layer as described in B), it sometimes happens that the antileakage wall portion is twisted toward and contacts the outer surface of the absorbent layer and stains the flaps with blood. Thus although staining of the briefs can be prevented by the flaps to some extent, it sometimes happens that even the flaps become stained while the wearer is moving and the inner crotch portion becomes stained with blood by the stained flaps.

In any event, if the known absorbent articles described above are correctly fixed in the right position with respect to the briefs, leakage due to reasons 1 to 3 above can be prevented to some extent, but if the briefs are a poor fit to the user's body or have a crotch portion which is wider than the absorbent layer, the flaps cover the outer surface of the absorbent article. As a result, leakage can not necessarily be prevented effectively and the flaps become stained and in turn stain the inner crotch portion with blood. This can result in great embarrassment to the wearer.

An object of the present invention is thus to provide an absorbent article, such as a sanitary towel, which can simply and reliably be secured to an undergarment, such as a pair of briefs, regardless of the shape of the undergarment and its fit to the user's body and which is scarcely twisted or deformed even if

the user is physically active and which can maintain its initial position throughout its period of use and which furthermore can effectively prevent leakage, particularly sideward leakage.

5 According to the present invention an absorbent article such as a catamenial napkin includes a liquid permeable sheet and a liquid impermeable sheet and a liquid retentive absorbent element interposed therebetween, which together constitute an absorbent body, and
10 the article further includes a pair of fixing elements connected to respective side edges of the absorbent body and each carrying a first adhesive area which is readily separably adhered to a second adhesive area on the impermeable sheet without the interposition of a
15 removable release sheet, the fixing elements being movable after separating the adhesive connection to a position in which they extend laterally outwardly beyond the absorbent body.

20 Preferably, the fixing elements are constituted by a part of one or both of the permeable sheet and the impermeable sheet. The fixing elements normally comprise a laminate of the permeable and impermeable sheets.

25 The first adhesive area may be of generally elongate shape and may extend adjacent to the absorbent body along part or all of the length of the body. The first adhesive area may comprise separate portions, spaced apart in the direction of the length of the absorbent body. The second adhesive area on the impermeable sheet to which the first adhesive area adheres normally has a
30 shape which is substantially the same as the first adhesive area.

Further features and details of the invention will be apparent from the following specific description of four specific embodiments, given by way of example only,

with reference to the accompanying drawings, in which:-

Figure 1(a) is a plan view from below of the first embodiment of a catamenial napkin in accordance with the invention in a folded state;

5 Figure 1(b) is a cross-section through the folded portion of the napkin of Figure 1(a);

Figure 2 is a plan view from below of the napkin of Figure 1 in an unfolded state;

10 Figure 3 is a plan view from below of a catamenial napkin of the second embodiment in a folded state;

Figure 4 is a plan view from below of the napkin of Figure 3 in an unfolded state;

Figure 5(a) is a plan view from below of a third embodiment of a catamenial napkin in an unfolded state;

15 Figure 5(b) is a cross-section through the napkin of Figure 5(a) in a folded state, taken through the widest portion of the napkin as viewed in Figure 5(a);

Figure 5(c) is a similar view to Figure 5(b) of an alternative construction of the third embodiment; and

20 Figure 6 is a plan view from below of a fourth embodiment of a catamenial napkin.

Referring firstly to Figures 1(a), 1(b) and 2, the first embodiment has a liquid permeable inner surface material forming the top sheet 2, a liquid impermeable material forming the lower antileakage sheet 3 and a liquid retentive absorbent layer or element 4 interposed between the sheets 2 and 3 forming a generally elongate absorbent body, or main body.

25 A part of the top sheet and the antileakage sheet 3 extends laterally outwardly from each side edge of the absorbent body to form a pair of wing-like fixing elements 5. These parts, or fixing elements, have a generally trapezoidal shape and are integral with the top sheet 2 and impermeable sheet 3.

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The fixing elements 5 are located slightly forward of the longitudinal centre of the catamenial napkin 1. In use, the crotch portion of a pair of briefs is wrapped around by the fixing elements 5 and enclosed between them and the back surface of the catamenial napkin 1 thereby fixing the catamenial napkin to the briefs.

The outer surface of the antileakage sheet 3 provides the back surfaces of the fixing elements 5 and carries a first adhesive area 6 on each fixing element. The antileakage sheet 3 also carries two second adhesive areas 7 (see Figure 2) on the back surface of the main body of the napkin, each of which is located so as to be in registry with one of the first adhesive areas, when the fixing elements are folded back along a respective side edge of the main body of the napkin against the back surface of the main body (as shown in Figures 1(a) and 1(b)).

In use, the catamenial napkin 1 may thus be surely fixed to a pair of briefs by means of these two pairs of adhesive areas 6 and 7. The adhesive used in the first and second adhesive areas 6 and 7 are of a type having a relatively low adhesive strength which requires no separate backing paper (release sheet), the arrangement is such that even if the first and second adhesive areas 6 and 7 are firmly adhered to each other, they may be separated easily. One example of an adhesive suitable for the purpose is disclosed in Japanese Utility Model Early Laid-open Publication No. Sho 59-153304. Beneath the weak adhesive on each of the adhesive areas 6 and 7, adjacent the surface of the antileakage sheet 3, is a layer of an adhesive having a relatively high adhesive strength, the weak adhesive being applied on the inner layer of strong adhesive to form an outer layer, to form a two-layer structure. By forming the adhesive areas 6

and 7 with this two-layer structure, the adhesive on the areas 6 and 7 can be firmly bonded to the antileakage sheet 3. When, initially, the fixing elements are folded back, the opposed weak outer layers of the adhesive areas 6 and 7 are bonded to each other, resulting in a relatively weak bond. The adhesive areas 6 and 7 can thus easily be separated and it is not necessary to use a separate backing paper (release sheet). The strong adhesive is preferably, for example, of acrylic type or rubber type, while the weak adhesive is preferably, for example, of acrylic type. The strength of these adhesives can be adjusted by known methods.

In the catamenial napkin 1 of this embodiment, an antislip portion 8 is formed over generally the entire surface of the antileakage sheet 3 on the main body of the napkin. The antislip portion 8 can be formed by applying, for example, a polymer having a glass transition temperature T_g of 0°C or less and including foamed expandable polymer beads (as described in Japanese Patent Early Laid-open Publication No. SHO 63-73959).

The inner sheet 2, antileakage sheet 3 and absorbent element 4 are preferably formed of material which is known for these purposes.

A way in which the first embodiment of catamenial napkin 1 is used will now be described.

The fixing elements 5 are first peeled away and folded out from the body of the catamenial napkin 1, from the state as shown in Figure 1 to that shown in Figure 2 where the fixing elements 5 extend outwardly from the main body of the napkin. The back surface of the catamenial napkin 1 is then brought into contact with the inner surface of the crotch portion of a pair of briefs and the napkin is fixed to the crotch portion by means of the second adhesive areas 7. Then the fixing elements 5

are folded inwardly around each side edge of the crotch portion and the adhesive areas 6 or the fixing elements 5 are bonded to the outer surface of the crotch portion, thereby securing the catamenial napkin 1 to the crotch portion. When the briefs, with the catamenial napkin 1 secured thereto as described above, are worn the catamenial napkin 1 remains secured by the fixing elements 5 whilst being able to deform in accordance with the configuration of the wearer's crotch region and thus to intimately contact the crotch region of the wearer.

In the first embodiment, before the napkin is used, the first adhesive areas 6 on the fixing elements are bonded to the second adhesive areas 7. When the catamenial napkin 1 is to be worn, the fixing elements 5 may be easily unfolded and pulled out from the side edges of the crotch portion of a pair of briefs. Since the catamenial napkin 1 is bonded to the inner surface of the crotch portion by means of the second adhesive areas 7, when the fixing elements 5 are folded around and bonded to the outer surface of the crotch portion by means of the adhesive areas 6, the napkin is prevented from slipping. Accordingly, the fixing operation is very simple and convenient to perform correctly. Furthermore, whilst the briefs are being worn, the combination of the antislip portion 8 and the first and second pairs of adhesive areas 6 and 7 ensures that the napkin is securely fastened to the briefs. As a result, the catamenial napkin 1 is not displaced, in use, and is stably retained in its initial position. Even if the shape of the crotch portion of the briefs undergoes considerable distortion due to the wearer's physical activity or movements, the catamenial napkin 1 conforms to the change in shape of the crotch portion whilst remaining fixed to the crotch portion in the same general

orientation: the napkin is thus prevented from becoming twisted. As a result, there is a reduced risk of the briefs and/or the crotch region of the wearer becoming stained with blood.

5 Furthermore, in the first embodiment, since the first and second adhesive areas 6 and 7 can be fastened together and separated from each other easily, there is no need for separate backing or release paper to be used between the adhesive areas 6 and 7. Thus, the cost of
10 backing paper can be saved from the total manufacturing cost and therefore the catamenial napkin 1 can be produced economically.

 It should be understood that the catamenial napkin of this embodiment may, as a modification, have no
15 antislip portion 8.

 Referring now to Figures 3 and 4, the second embodiment of catamenial napkin is the same as the first embodiment except that the antislip portion 8, covering virtually the entire surface of the antileakage sheet 3,
20 is replaced by an adhesive applied generally centrally at the rear of the antileakage sheet 3. A third adhesive area 8' is thus provided to which a separate backing paper 9 is attached when the napkin is not in use. Accordingly, the adhesive area 8' of the second
25 embodiment corresponds to the antislip portion 8 of the first embodiment. Thus, the second embodiment is used in the same way, with the same advantages, except that additional time and labour are required to remove the backing paper 9 before the catamenial napkin 1 is worn.
30 The second embodiment may be constructed such that a backing paper is not required, as in the first embodiment.

 Referring now to Figures 5(a), 5(b) and 5(c), in the third embodiment, the fixing elements 15 are provided

with lugs 15', flap portions 20, and fold lines 22. However, elongate adhesive areas are provided on each side of the fold lines 22, the first adhesive areas 16 being on the flap portions 20 and second adhesive areas 17 being on the main body. In this embodiment, the second adhesive areas 17 correspond to the first adhesive areas 16, that is to say, they constitute portions of the back surface of the absorbent body to which the first adhesive areas adhere when the fixing elements are folded. The adhesive areas are constituted as in the first and second embodiments. The third embodiment may be constructed in two ways. In the first (see Figure 5(b)), the inner sheet 12 and the antileakage sheet 13 together form the fixing elements 15, and are bonded together over the entire area of the fixing elements. In the second construction (see Figure 5(c)), the inner sheet 12 does not comprise part of the fixing elements. The side edges of the inner sheet 12 are folded around the absorbent element 14 and bonded to the antileakage sheet in the region of the fold lines 22. The fixing elements 15 comprise only the antileakage sheet 3.

Referring now to Figure 6, the fourth embodiment of catamenial napkin 11 is the same as the third, except that the first and second adhesive areas 16 and 17 are divided into a front part and a rear part with respect to the length of the napkin, and the widths of the portions are greater than in the sixth embodiment.

The third and fourth embodiments of catamenial napkin 11 may be more securely attached to the crotch portion of a pair of briefs than the first and second embodiments, although the way in which they are used is substantially the same.

The present invention is not limited to the embodiments described.

The fixing elements in all the embodiments may comprise a separate member attached to the main body, rather than being an extension of the inner sheet, antileakage sheet or both.

- 5 The invention is also applicable to other absorbent articles, such as incontinent pads, catamenial pads, etc.



CLAIMS

1. An absorbent article including a liquid permeable sheet, a liquid impermeable sheet and a liquid retentive absorbent element interposed there- between, which together constitute an elongate absorbent body, the article further including a pair of fixing elements connected to respective side edges of the absorbent body and each carrying a first adhesive area which is readily separably adhered to a second adhesive area on the impermeable sheet without the interposition of a removable release sheet, the fixing elements being movable after separating the adhesive connection to a position in which they extend laterally outwardly beyond the absorbent body.

2. An absorbent article as claimed in Claim 1 in which the fixing elements are constituted by a part of one or both of the permeable sheet and the impermeable sheet.

3. An absorbent article as claimed in Claim 2 wherein the fixing elements comprise a laminate of the permeable and impermeable sheets.

4. An absorbent article as claimed in any one of the preceding claims wherein the first adhesive area is of generally elongate shape and extends adjacent to the absorbent body along part or all of the length of the body.

5. An absorbent article as claimed in Claim 4 wherein the first adhesive area comprises separate



portions spaced apart in the direction of the length of the absorbent body.

5 6. An absorbent article as claimed in Claim 4 or Claim 5 wherein the second adhesive area on the impermeable sheet has substantially the same shape as the first adhesive area.

10 7. An absorbent article substantially as herein specifically described with reference to Figures 1(a), 1(b) and 2, to Figures 3 and 4, to Figures 5(a), 5(b) and 5(c) or to Figure 6.
