

SANITARY ARTICLE:

This invention relates to an absorbent article having high antileakage properties. More particularly, it relates to an absorbent article such as a sanitary towel or napkin where the leakage along the depression between the buttocks of a user can be remarkably lowered.

Conventional absorbent articles, for example. sanitary napkins and disposable nappies or diapers basically comprise an absorber such as a cotton pulp or an absorbent paper sheet, an antileakage material provided at the bottom and sides of said absorber and a surface material placed thereon.

Recently, an absorbent article wherein a lengthwise side of an absorber is cut so as to form a dent to thereby allow the absorbent article to closely adhere to the crotch and thus prevent the leakage of a body fluid has been proposed. Further a process for inhibiting the leakage of a body fluid from the crotch has been proposed. These techniques produce certain results.

However, it is impossible by these methods to prevent the leakage of a body fluid along the depression between the buttocks which is frequently observed during sleep.

Thus there have been proposed various techniques to form a raised portion at the rear centre of an absorbent article to improve the adhesion of the absorbent article to the buttock depression thus solving the above-mentioned problem.

For example, one such technique comprises curving the rear part of an absorber so as to form a raised portion. However, this method essentially requires a highly complicated production process. In addition, it is unavoidable that the raised portion comprising a highly rigid material such as pulp or paper would give a serious feeling of physical discomfort to a user.

On the other hand, another proposed technique comprises placing a flexible material at the rear centre of an absorber so as to form a raised portion. In this method, a highly flexible raised portion would cause no feeling of physical discomfort. Once a compression stress caused by the body weight or motion of a user is applied to the raised portion, however, the raised portion is broken and shows no recovery even when the compression stress is removed. Therefore this product has a poor adhesiveness. The substantial disappearance of the raised portion as described above is particularly obvious when a body fluid is excreted and the raised portion is in a moist state. As a result, the desired inhibition of the leakage along the buttock depression can be hardly achieved.

Thus there has been no process which makes it possible effectively to inhibit the leakage of a body fluid along the buttock depression by improving the adhesion of an absorbent article to the buttocks without reducing comfort. Thus it has been impossible to overcome hygienic and psychological discomfort of users and helpers, in particular, during sleeping, which causes a serious problem.

Under these circumstances, the present inventors have conducted extensive studies in order to develop an absorbent article where the leakage of body fluid along the buttock depression can be effectively inhibited by improving the adhesion thereof to the buttocks without a reduction in comfort, thus completing the present invention.

According to this invention we provide a sanitary article comprising a liquid-retaining absorbent material wrapped by a sheet of material which is provided with pores on the top so that the top part is liquid permeable and is without pores on the bottom so that the bottom part is liquid impermeable, the article being substantially of rectangular form and provided with a pair of flexible flaps one of which extends laterally from each side, wherein the centre line of the flaps is spaced from the centre of the article towards the part of the article which, in use, is the front part so that the portion of the article rearward of the flaps is longer than the portion of the article forward of the flaps.

It is preferred that the dry compression recovery extent of the central part of the rear part is 25 percent or above.

It is also preferred that the _____ flaps are hydrophilic on the front surface to contact the skin of a user and then hydrophobic on the rear surface to be connected with a tape fastener.

It is preferred that the hydrophilic surface of the flaps has a water-absorbing rate of 200 seconds or less and the hydrophobic surface of the flaps has a water-absorbing rate of 500 seconds or more.

The invention provides another embodiment of the sanitary article being provided at a central part in the widthwise direction of the rear part of the article between the surface material and the absorbent with an elastic member, said central part having a modulus of compression rigidity of 15 to 38 percent, said central part having a dry compression recovery extent of 25 percent or more.

The invention provides a third embodiment of the sanitary article having a structure such that folded portions of the flaps are located below the absorbent when the article is used by a wearer.

Examples of the invention will now be described with reference to the accompanying drawings. Figs. 6 and 7 show sanitary napkins outside the scope of this invention.

Fig. 1 is a plan view of an example of the absorbent article of the present invention, Fig. 3 is a sectional view of the article of Fig. 1 along line C - C', Figs. 2 and 4 are sectional views corresponding to Fig. 3 of other absorbent articles which are outside the scope of the present invention, Fig. 5 shows a process for fixing the absorbent article of the present invention to the clothing, Fig. 6 is a plan view of a conventional absorbent article, Fig. 7 is a sectional view of the article of Fig. 6 along line A - A', and Fig. 8 shows a process for fixing the same to the clothing.

Figs. 11 to 14 each show a schematic plan view of an example of the absorbent article of the present invention. However, the flaps are not shown in these figures. Fig. 15 shows load/displacement curves to be used in the determination of physical properties including modulus of compression rigidity. Fig. 16

shows a sanitary napkin simulation utilising elements of the present invention, wherein (a) is a plan view, (b) is a sectional view of (a) along line A - A' and (c) is a sectional view thereof along line B - B'. Fig.17 is a schematic sectional view of a device for the determination of physical properties such as modulus of compression rigidity. Fig.18 is a perspective view of a female hip model to be used in the determination of absorption in supine position.

The absorbent article according to the invention has flexible flaps or lugs which extend from both lateral sides of a position displaced lengthwise towards the front.

Different from a conventional absorbent article shown in Fig. 6, the absorbent article of the present invention involves flexible lugs 2 extended from the lateral sides at a position displaced lengthwise towards the front. Thus the length of the rear part of the absorbent material starting from the lug, which roughly corresponds to the point of the excretion of a body fluid, is longer than that of the front part thereof. In the conventional article of Fig. 6, namely, the lateral center line of the absorbent article 1 is substantially in line with the lateral center line A - A' of the lugs 2. In contrast thereto, the

lateral center line B - B' of the absorbent article 1 of the present invention of Fig. 1 is not substantially in line with the lateral center line C - C' of the lugs 2. Accordingly the area of the part covering the buttocks is relatively larger than that of the part covering the pubic part. As a result, the leakage from the buttocks can be remarkably suppressed in the latter case, even when the length of the absorber is the same or somewhat smaller than that of a conventional absorbent article. In the present invention, it is preferable that the lateral center line B - B' of the absorbent article is apart from the lateral center line C - C' of the lugs at least by 10 mm.

Furthermore, Fig. 3 shows a preferable example of the embodiment of the absorbent article of the present invention. In this embodiment, one surface of the absorber 6 is to be against the skin of a user and the other surface is to be against the clothing

of the user are covered respectively with a single sheet comprising surface materials 4 and 5. The surface material 4 on the surface to be against the skin of the user is liquid-permeable, while the surface material 5 on the surface to be against the clothing of the user is substantially liquid-impermeable. In this article, the lugs 2 and the liquid-impermeable part 5 would both act to contain the excreted liquid, thus achieving excellent antileakage properties.

Any surface material such as paper, nonwoven fabric, film, net and laminate thereof may be used in the present invention. Among these materials, films, nets and laminates with nonwoven fabrics are particularly preferable from the viewpoint of stickiness of the surface. When a film or a net is to be used, pores are provided on the surface to be against the skin of a user so as to _____

_____ achieve liquid-permeability. However the surface to be located against the clothing of the user is substantially liquid-impermeable as a result of the absence of pores so as _____ to improve the antileakage properties.

In the present invention, any lug 2 may be used so long as it is flexible, e.g. sufficiently flexible to be easily

bent so as to be fixed to the clothing 7 as shown in Fig. 5. However it is preferable to use a liquid-impermeable lug from the viewpoint of antileakage properties.

~~It is preferable to extend the antileakage material 3 from both lateral sides of the absorbent article to thereby form the lugs, since a simple structure can be achieved in this case.~~

The size of the lug 2 according to the present invention is not restricted but may vary depending on the size of the absorbent article. In the case of an overnight sanitary napkin 250 mm in length and 70 mm in width, the length and width of the lug may preferably range respectively from 30 to 70 mm and from 25 to 50 mm, taking stability and the ease in fixing the napkin to the clothing into consideration. The lug may preferably be displaced by 20 to 40 mm from the lateral center line of the absorbent article.

Examples of the absorber to be used in the present invention include known ones such as aggregates of pulp, rayon or synthetic fibers, polymer absorbers and foamed materials. It is preferable to use a

mixture of a hydrophilic fiber such as rayon with a synthetic fiber such as polyester for the surface to be opposed to the skin of a user so as to reduce stickiness.

Any antileakage material may be used in the present invention so long as it is liquid-impermeable. Examples thereof include films, nonwoven fabrics, water-repellent papers and laminates thereof. Among these materials, a laminate of a film and a nonwoven fabric is preferable from the viewpoint of texture. It is still preferable, as shown in Fig. 3, that a laminate of a film and a nonwoven fabric is used in such a manner that the nonwoven fabric is opposed to the body of a user.

In order to more firmly fix the absorbent material to the clothing, it is preferable to add a tackifier or a non-slip agent to the lugs or the absorbent material per se.

The absorbent article of the present invention is not restricted by the examples described in detail

above but various modification may be done within the above-mentioned scope.

An absorbent article of the present invention shows a considerable decrease in leakage from the buttocks when compared with conventional ones. In particular, the article of Figure 3 which involves a liquid-impermeable part in the surface material opposed to the clothing shows a remarkable decrease in leakage from the crotch, which suggests that it is an ideal absorbent article.

Flaps having one hydrophilic surface and the other hydrophobic surface

The article of the invention preferably has flexible flaps having one hydrophilic surface and one hydrophobic surface, giving improved absorption of a high viscosity liquid.

The flaps may be produced from non-woven fabric, film or a foamed material.

It is preferred that the front surface to contact the skin of a wearer of the article is made of a porous non-woven fabric. The front surface may alternatively be made of a

heat-fused non-woven fabric of synthetic resin fibers, such as polyester fibers or conjugated fibers of polyester and another material. The gauge of the fibers is preferably 2 or more denier, especially from 3 to 6 denier. The front surface may be further treated with a surfactant. Melt adhesion of the fibers is ensured by blowing with hot air. After the blowing, it is better to heat the surface.

It is preferred that the rear surface to contact the clothes of the wearer is made of a non-porous synthetic resin film, such as a sheet of polyethylene having a density of 30 to 50 g/m² and a laminate of some different resin layers.

The front surface layer and the rear one are preferably melt bonded to each other. Between them, an absorbent paper may be inserted.

elastic material

Preferably, a sanitary article according to the invention having flaps which are hydrophilic on the top surface and hydrophobic on the bottom surface is provided

_____ at least on a central part (in the lateral direction) of the rear part of the article between the surface material and the absorbent with an elastic member, said central part having a modulus of compression rigidity, as herein defined, of 15 to 38 per cent, said central part having a dry compression recovery extent, as herein defined, of 25 per cent or more.

We have found out that the problem of satisfying the mutually-inconsistent requirements of improving the adhesion of an absorbent article to the buttocks and preventing the discomfort in use can be satisfied by providing an elastic material having a high flexibility and a high compression recovery between a surface material and an absorber at least at a central part in the widthwise direction of the rear part of the absorbent article.

As described above, the elastic material should have a certain flexibility in order to avoid the discomfort during use. This flexibility is expressed numerically as the modulus of compression rigidity which will be described in detail in the Examples. The modulus of compression rigidity may be calculated by multiplying the ratio of the compression work done practically measured in a compression test at the rear center of the absorbent article under given conditions

(corresponding to the area of the figure ADBC in Fig./5) to the compression work done when the absorbent article is assumed to be completely elastic (corresponding to the area of the triangle ABC in Fig./5) by 100. A lower modulus of compression rigidity indicates that the elastic material is more flexible. In order to impart an appropriate flexibility to the absorbent article, the modulus of compression rigidity should be 38% or below, preferably 32% or below. When the adhesion is taken into consideration, the modulus of compression rigidity should be 15% or above, preferably 20% or above. When it is lower than 15%, the rise is too flexible and thus it is difficult to maintain the shape of the rise. In this case, therefore, the poor adhesion is a disadvantage.

Thus it is preferred in the present invention that the modulus of compression rigidity ranges from 15 to 39%, preferably from 20 to 32%.

On the other hand, the elastic material should show a high compression recovery, at least in the dry state, in order to prevent the substantial disappearance of the rise as described above. This compression recovery can be expressed numerically as a dry compression recovery rate which will be described in

detail in the Examples hereinafter. The dry compression recovery rate can be calculated by multiplying the ratio of the compression recovery work done practically measured in a compression recovery test under given conditions (corresponding to the area of the figure AEBC in Fig. |5) to the compression work done (corresponding to the figure ADBC in Fig. |5) by 100. A higher dry compression recovery rate indicates that the elastic material shows higher compression recovery. In order to impart an appropriate compression recovery to the absorbent article, the dry compression recovery rate should be 25% or above, preferably 28% or above.

When a fluid is exhausted and the rise is moist, the leakage of the fluid along the buttocks depression can be more effectively inhibited by providing an excellent adhesion of the absorbent article to the depression. Thus it is preferable that the elastic material also has a high wet compression recovery rate. The compression recovery in a wet state can be expressed numerically as a wet compression recovery rate which will be described in detail in the Examples hereinafter. In order to impart an appropriate compression recovery to the elastic material, the wet compression recovery rate should be 25% or above,

preferably 28% or above.

In the present invention, it is preferred that an elastic material having a flexibility and a compression recovery, each as described above, is provided between a surface material and an absorber at least at a central part in the widthwise direction of the rear part.

Figs. |1 to |4 ^{show schematically} ~~show~~ each ^{an} embodiment of the absorbent article of the present invention. *These figures illustrate features not directly related to the flaps, which are omitted for clarity.*

As Fig. |1 shows, the absorbent article of the present invention should preferably comprise an elastic material |2 having a flexibility and a compression recovery, each as described above, at a central part in the widthwise direction of the rear part of the absorbent article |1. As Figs. |2 to |4 show, it is also possible to provide said elastic material |2 at other part(s) in addition to the rear central part. However it is undesirable to provide the elastic material |2 at both sides in the widthwise direction of the front part, since the adhesion of the absorbent article to the buttocks depression might be lowered in this case. Furthermore, it is preferable that no elastic material |2 is present in the front part of the absorbent article |1 in order to achieve close adhesion, as shown in Figs. |1 and |2. Namely, it is preferable

that the elastic material 12 be provided exclusively at the central part in the widthwise direction of the rear part of the absorbent material, as shown in Fig. 1. However, an absorbent article showing considerably high antileakage properties and good comfort in use can be obtained even when the elastic material 12 is provided in the manner as shown in Fig. 12 or 13, so long as both of the flexibility and compression recovery of said elastic material fall within the desirable range. That is to say, the position of the elastic material can be widely varied by taking the flexibility and compression recovery thereof into consideration.

In the present invention, the size of the elastic material is not particularly specified, since it may vary depending on the size of the absorbent article and the properties of the elastic material. In an absorbent article of approximately 250 mm in length and 75 mm in width to use over night, however, a length, width

and thickness of the elastic material preferably range respectively from 20 to 250 mm, from 10 to 60 mm and from 5 to 50 mm, still preferably from 50 to 150 mm, from 20 to 40 mm and from 20 to 40 mm.

Any elastic material

may be used so long as it has a modulus of compression rigidity of 15 to 38% and a dry compression recovery rate of 25% or above. Thus, neither its shape nor its composition is particularly restricted. It may be made of, for example, fibrous or foamed material. From the viewpoints of productivity and cost, fiber aggregates may be preferably employed. Among these materials, a so-called web where short fibers slightly interlock together is particularly preferable. Fibers constituting said web may preferably have a fineness of 2 to 8 denier (d), still preferably 3 to 6 d, and a fiber length of 5 to 7 mm, still preferably 10 to 20 mm. The sectional view of the fiber is preferably hollow or odd-shaped, by taking the compression recovery into consideration.

The elastic material may comprise, for example, a hydrophilic material such as a cellulose polymer, a hydrophobic material such as a polyolefin polymer or a polyester polymer or a mixture of a hydrophilic material with a hydrophobic material. It may preferably comprise polyester fibers from the viewpoint of compression recovery. Furthermore, the elastic material may preferably have appropriate hydrophilic properties from the viewpoint of absorptivity. Namely, it is preferable that the elastic material

be a mixture of a hydrophilic material with a hydrophobic material. A web comprising polyester fibers and rayon fibers at a ratio by weight ranging from 40/60 to 80/20 is particularly preferable. When the surface of the hydrophobic material is hydrophilically treated in this case, the hydrophilic properties of the whole elastic material can be more delicately controlled. Thus it is highly desirable to use such a material.

The surface material, absorber and anti-leakage material of the absorbent article according to the present invention are not particularly critical and any materials used in the preparation of known conventional absorbent articles may be used folded portions of the flaps

The sanitary article of the invention may have a structure such that folded portions of the flaps are located below the absorbent when the article is being worn. This will prevent the sanitary article from slipping out of the correct position.

The article displays excellent comfort in use and is superior in antileakage properties when the wearer is in the supine position.

In particular, the samples ~~of Examples 4 to 6~~, each having an elastic material exclusively at the central part in the widthwise direction of the rear part and showing a wet compression recovery rate higher than 25%, showed excellent antileakage properties.

On the other hand, the sample of Comparative Example 4 having no elastic material showed poor antileakage properties. The sample of Comparative Example 5 having an elastic material of a modulus of compression rigidity exceeding 38% was inferior not only ⁱⁿ comfort during use but also in antileakage properties because of the low dry and wet compression recovery rates. Further, the sample of Comparative Example 6 showing a modulus of compression rigidity lower than 15% showed poor antileakage properties.

Thus it is concluded that the comparative samples are unsatisfactory as absorbent materials.

[Example]

To further illustrate the usefulness of the present invention, and not by way of limitation, the

following Examples will be given.

Example 1 and Comparative Examples 1 to 3.

A sanitary napkin of the present invention comprising the following surface material, absorber and antileakage material as shown in Fig 3 and others as shown in Figs. 2,4 and 7 were prepared. Each lug was 50 mm in length and 35 mm in width. In the case of the sanitary napkin of the present invention, and comparative examples 1 and 2, the line B - B' was 30mm apart from the line C - C' (cf. Fig. 1).

Surface material: A polyethylene film was laminated on a heat-bonded nonwoven fabric mainly comprising polyolefin and the obtained integral material was embossed so as to form pores. This surface material was provided in such a manner that the film was present on the surface to be opposed to the skin.

Absorber: An absorbent paper, a cotton pulp and a polymer absorber were successively laminated so as to give a sheet of 250 mm in length and 70 mm in width.

Antileakage material: A polyethylene film was laminated onto a heat-bonded nonwoven fabric comprising a polyester fiber. The integral material thus obtained was provided in such a manner that the film

was opposed to the clothing.

The amounts of a test liquid absorbed by each sanitary napkin thus obtained until leakage was observed from the crotch (in orthostatic position) or from the nates (in supine position) were measured by using a manikin.

Table 1 shows the results. A larger value indicates the higher antileakage properties at the crotch or buttocks.

Table 1

	Structure		Absorption (g) (orthostatic)	Absorption (g) (supine)
	plan view	sectional view		
Comp. Ex. 1	Fig. 1	Fig. 2	5.95	7.61
 Ex. 1	do.	Fig. 3	9.88	11.45
Comp. Ex. 2	do.	Fig. 4	5.38	6.34
Comp. Ex. 3	Fig. 6	Fig. 7	5.36	3.28

Simulation Tests 4 to 18 and Comparative Examples 4 to 6

From a commercially available sanitary napkin (Laurier Overnight of Kao Corporation) "Laurier" is a Registered Trade Mark, having

an absorber of 250 mm in length and 75 mm in width, a surface material and an antileakage material were removed. Then an elastic material/2 of the composition shown in Table 2 was laminated on the given position of an absorber/4 shown in Fig. 16 in such a manner that the lower end of the elastic material was always in line with the lower end of the absorber/4 while the elastic material was arranged so as to be always symmetric in the widthwise direction. Further, a surface material/3 comprising a heat-bonded polyester nonwoven fabric and an antileakage material/5 comprising a laminate of wet polyester nonwoven fabric and an ionomer resin film were provided to thereby give a sanitary napkin simulation sample/1', which is outside the scope of this invention. Fig. 16 (a) is a plan view of the sanitary napkin simulation sample 11' (b) is a sectional view of (a) along A - A' while (c) is the sectional view thereof along line B - B'.

The physical properties and performance of the sanitary napkin simulation sample thus obtained were determined by the following methods. Table 2 shows the results.

- (1) Modulus of compression rigidity, dry compression recovery rate and wet compression recovery rate

Procedure

A Tensilon type RTM-25 (mfd. by Toyo Baldwin Co.) was employed. First, a pressure-sensing plate/7 of 30 mm in diameter was attached to the tip of a compression lead cell/6 shown in Fig./7, which will be referred to merely as the cell hereinafter. This cell was slowly lowered and gently contacted with a sample stand in such a manner that the distance between the pressure-sensing plate and the sample stand was assumed to be zero when a load of 5 kg was recorded.

Next, the cell/6 was raised by 20 mm and the simulation sample/1' was placed on the sample stand/8 in such a manner that the surface of the sample to be opposed to the skin was directed upward. Then the cell/6 was lowered. When a load of 5 kg was recorded, the cell was raised up to the starting position. The load/displacement curve thus obtained was recorded.

The determination was conducted under the following conditions:

rate of cell lowering and rise: 10 mm/min

full scale of recording sheet: 10 kg

scanning rate of recording sheet: 100 mm/min.

Calculation

Fig./5 shows the load/displacement curve recorded on the sheet. Curves ADB and AEB are load/displacement

curves recorded respectively during lowering and rise of the cell. The former is generally located above the latter. The area of the triangle ABC and that of the figure AEBC in this sheet were measured and the modulus of compression rigidity and the dry compression recovery rate were calculated according to the following equations:

$$\text{modulus of compression rigidity (\%)} = \text{ADBC}/\text{ABC} \times 100$$

$$\text{dry compression recovery rate (\%)} = \text{AEBC}/\text{ADBC} \times 100$$

(2) Wet compression recovery rate

10 cc of deionized water was pipetted onto the central part in the widthwise direction of the rear part of the sanitary napkin simulation sample and rapidly absorbed thereby. Immediately after the absorption, the same test as the one described in the above item (1) was conducted and the wet compression recovery rate was calculated according to the following equation:

$$\text{wet compression recovery rate (\%)} = \text{AEBC}/\text{ADBC} \times 100.$$

(3) Absorption period

The time required for the absorption of a given amount of a test liquid by the central part in the widthwise direction of the rear part of the sanitary napkin simulation sample was defined as the absorption period.

(4) Absorption in supine position

A female hip model 19 in the supine position was provided with the sanitary napkin simulation model 11' in the manner as shown in Fig. 18. A test liquid was fed to the model 11' via a tube 10 and absorbed by the sample 11'. The amount of the test liquid absorbed until the leakage became discernible was defined as the absorption in supine position.

(5) Feeling of physical discomfort.

Healthy female adults were allowed to wear the sanitary napkin simulation samples and the feeling of physical disorder thereof was organoleptically evaluated according to the following criteria

- 1: feeling of considerable physical discomfort
- 2: feeling of somewhat physical discomfort
- 3: feeling of little physical discomfort

Table 2

	Elastic material				Physical properties			Performance		
	Composition (ratio)	Basis weight (g/m ²)	Length (mm)	Width (mm)	Modulus of compression rigidity (%)	Dry compression recovery rate (%)	Wet compression recovery rate (%)	Absorption period (sec.)	Absorption in supine position (g)	Feeling of physical disorder
Simulation tests										
4	Ray (100%)	130	80	30	37.6	29.5	24.5	7	29	2
5	Ray/PET (70%/30%)	"	"	"	32.6	30.4	26.5	8	41	2
6	Ray/PET (50%/50%)	"	"	"	31.1	31.0	27.6	10	58	3
7	Ray/PET (30%/70%)	"	"	"	29.2	31.9	29.7	13	72	3
8	PET (100%)	"	"	"	26.4	36.1	32.4	18	55	3
9	Ray/PET (30%/70%)	65	"	"	33.0	30.5	26.7	8	50	3
10	"	200	"	"	25.8	33.4	31.9	15	62	2
11	"	130	40	"	30.0	31.7	29.8	12	60	3
12	"	"	120	"	29.4	32.1	30.0	13	59	3
13	"	"	250	"	30.5	31.8	30.5	14	54	2
14	"	"	80	15	29.1	32.0	30.4	12	56	3
15	"	"	"	75	28.8	32.3	29.8	15	57	2
16	"	"	250	"	29.0	31.9	30.2	17	27	2
17	Ray (100%)	"	250	30	37.9	30.0	23.4	7	25	2
18	"	"	80	75	37.6	29.7	23.0	8	27	2
Comp. Ex. 4	none	"	"	"	44.7	24.8	17.3	5	12	3
5	kraft pulp (100%)	130	80	30	40.9	23.2	16.7	6	20	1
6	PP (100%)	"	"	"	13.6	26.3	24.5	22	23	3

Note) Ray: rayon fiber (4 d x 15 mm).

PP: polypropylene fiber (1.5 d x 15 mm).

PET: polyester fiber (4 d x 15 mm).

The present invention is related to the invention that is the subject of our co-pending application number (GB 2268708A) 9222141.5_A. That application relates to a method of absorbing menstrual fluid by means of a sanitary article comprising a liquid-retaining absorbent material between a liquid-permeable top sheet material and a liquid-impermeable anti-leakage bottom sheet material, the article being substantially of rectangular form and provided with a pair of flexible flaps one of which extends laterally from each side, wherein the lateral centre line of the flaps is spaced from the centre of the article towards the part of the article which, in use, is the front part, wherein the sanitary article is fitted with the top sheet material facing the wearer and with the end of the article towards which the flaps are displaced at the front.

CLAIMS

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1. A sanitary article comprising a liquid-retaining absorbent material wrapped by a sheet of material which is provided with pores on the top so that the top part is liquid permeable and is without pores on the bottom so that the bottom part is liquid impermeable, the article being substantially of rectangular form and provided with a pair of flexible flaps one of which extends laterally from each side, wherein the centre line of the flaps is spaced from the centre of the article towards the part of the article which, in use, is the front part so that the portion of the article rearward of the flaps is longer than the portion of the article forward of the flaps.
2. A sanitary article according to claim 1, in which the dry compression recovery extent, as herein defined, of the central part (in the lateral direction) of the rear part is 25 percent or above.
3. A sanitary article according to any preceding claim in which the flaps are hydrophilic on the top surface to contact the skin of a user and hydrophobic on the bottom surface.

4. A sanitary article according to claim 3 in which the hydrophilic surface of the flaps has a water-absorbing rate of 200 seconds or less and the hydrophobic surface of the flaps has a water-absorbing rate of 500 seconds or more.

5. A sanitary article according to any preceding claim which is provided at least on a central part (in the lateral direction) of the rear part of the article between the surface material and the absorbent with an elastic member, said central part having a modulus of compression rigidity, as herein defined, of 15 to 38 percent, said central part having a dry compression recovery extent, as herein defined, of 25 percent or more.

6. A sanitary article according to claim 5, in which the elastic material is provided exclusively at the central part of the rear part.

7. The sanitary article according to any preceding claim which has a structure such that folded portions of the flaps gets located below the absorbent when the article is used by a wearer.

8. A sanitary article for overnight use according to any preceding claim having a length of 250mm, a width



of 70mm, and in which the length and width of each flap is respectively from 30 to 70mm and from 25 to 50mm.

9. A sanitary article according to claim 8, wherein the flap is displaced by 20 to 40mm towards the front of the article from the lateral centre line of the article.

10. A sanitary article according to claim 9, when appendant to claim 5, wherein the length, width and thickness of the elastic material are respectively from 20 to 250mm, from 10 to 60mm, and from 5 to 50mm.

11. A sanitary article according to claim 10, wherein said length, width and thickness are respectively from 50 to 150mm, from 20 to 40mm and from 20 to 40mm.

12. A sanitary article according to claim 1 and substantially as described herein with reference to the accompanying drawings.

