

DESCRIPTION

Title of Invention

Absorbent Article

Technical Field

5 [0001]

The present disclosure relates to an absorbent article.

Background Art

[0002]

10 As the basic performance of absorbent articles, such as sanitary napkins and disposable diapers, has continued to improve with technological developments over many years, leakage prevention after absorption of excreta, such as menstrual blood and urine, has been generally
15 met. Recent developments are now directed towards absorbent articles with even higher performances.

[0003]

PTL 1, for example, describes a surface sheet (top sheet) for an absorbent article, having an air permeation
20 volume of 10 mL/cm²·sec or greater in the horizontal direction of under 10 cN/cm² pressure, and which states that such a surface sheet hardly brings the skin of a user into a hot and stuffy state.

Citation List

25 Patent Literature

[0004]

PTL 1 Japanese Unexamined Patent Publication No. 2003-126147

Summary of Invention

30 Technical Problem

[0005]

However, the surface sheet described in PTL 1, being provided with irregularities that do not easily collapse even when a load is applied in the thickness direction,
35 is designed so that air permeability is insured in the horizontal direction, and therefore it may be thick.

The present inventors have confirmed that an

absorbent article comprising the surface sheet described in PTL 1 has high heat retaining properties because of thickness thereof, which leads to a sense of heat and humidity, and sweating by the wearer during wear, making it difficult to completely avoid the problem of heat and humidity during wear.

[0006]

It is therefore an object of the present disclosure to provide an absorbent article that reduces heat and humidity during wear and has a smooth and dry skin contact surface of the top sheet even after absorption of excreta.

[Solution to Problem]

[0007]

As a result of diligent research directed toward solving the problems described above, the present inventors have found that the problems can be solved by an absorbent article comprising a liquid-permeable top sheet, a liquid-impermeable back sheet and an absorbent core between the liquid-permeable top sheet and liquid-impermeable back sheet, wherein the absorbent article has a heat retention of no greater than 45% and a rewetting rate of no greater than 10 mass%.

[Advantageous Effects of Invention]

[0008]

The absorbent article of the disclosure reduces heat and humidity during wear and has a smooth and dry skin contact surface of the top sheet even after absorption of excreta.

Brief Description of Drawings

[0009]

Fig. 1 is a diagram showing a moisture content measuring apparatus.

Fig. 2 is a diagram showing the positional relationship between a sensor of the moisture content measuring apparatus of Fig. 1 and a sample during measurement of moisture content.

Fig. 3 is a diagram showing an absorbent core in accordance with some embodiments of the disclosure.

Fig. 4 is a diagram showing an example of a nonwoven fabric with irregularities.

5 [0010]

Fig. 5 is a diagram illustrating a step in the production of a nonwoven fabric with irregularities.

Fig. 6 is a schematic view of a nonwoven fabric with irregularities and holes in accordance with some
10 embodiments.

Fig. 7 is a diagram illustrating an overlapping state of holes and compressions in an absorbent article in accordance with some embodiments.

Fig. 8 is a diagram showing an absorbent article in accordance with some embodiments of the disclosure.
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Fig. 9 is a graph showing the relationship between voltage and moisture content, obtained for Example 1.
[0011]

Fig. 10 is a graph showing the relationship between thickness at an excretory opening contact region and heat retention, obtained for Example 2.
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Fig. 11 is a graph showing the relationship between density at the excretory opening contact region and heat retention, obtained for Example 2.

Fig. 12 is a graph showing the relationship between density at the excretory opening contact region and rewetting rate, obtained for Example 2.
25

Description of Embodiments

[0012]

30 The absorbent article of the disclosure will now be explained in detail.

The absorbent article has a heat retention of no greater than about 45% and a rewetting rate of no greater than about 10 mass%, and the present inventors have found
35 that reduced heat and humidity during wear and greater smoothness and dryness even after absorption of excreta can be achieved when the heat retention of the absorbent

article is no greater than about 45% and the rewetting rate is no greater than about 10 mass%.

[0013]

5 The heat retention can be measured in the following manner.

(1) A KES-F7 Precise and Fast Thermal Property-Measuring Instrument THERMO LABO II, product of Kato Tech Corp., is prepared, the room temperature is set to 20°C and the humidity is adjusted to 60% RH.

10 (2) For measurement of the heat retention of a disposable diaper, a sample is cut to 12 cm in the lengthwise direction and 12 cm in the direction perpendicular to the lengthwise direction (the direction perpendicular to the lengthwise direction may hereunder be referred to simply as the "cross direction"), with the center of the excretory opening contact region as the center.

15 [0014]

For measurement of a sanitary napkin, since it is generally difficult to obtain a 12 cm × 12 cm sample, the sample is cut to 8 cm in the lengthwise direction and 8 cm in the cross direction, with the center of the excretory opening contact region as the center to obtain a 8 cm × 8 cm sample. In Fig. 8, an example of a 8 cm × 8 cm sample is indicated by references sign 40.

25 [0015]

(3) The sample is attached to a THERMO LABO II sample frame using double-sided tape. For a disposable diaper, the sample is attached to the sample frame according to the procedure for the measuring apparatus, while for a sanitary napkin, commercially available underwear, such as cotton underpants, cut to 12 cm × 12 cm, are attached to the sample frame using double-sided tape, and then the sample is attached onto the underpants using double-sided tape so that the sample is at the center of the sample frame.

35

(4) In the THERMO LABO II, the wind speed of the wind tunnel is set to 30 cm/sec and the temperature of the BT-Box is set to 30°C.

[0016]

5 (5) The heat Q_d required to keep the temperature of the sample-attached sample frame at 30°C is measured by using the THERMO LABO II.

(6) The heat Q_0 required in order to maintain the temperature of the sample frame at 30°C without a sample is also measured by using the THERMO LABO II. In the case of a disposable diaper, the heat Q_0 is measured with the sample frame alone placed in the BT-Box, while in the case of a sanitary napkin, the heat Q_0 is measured with the shorts-attached sample frame placed in the BT-Box.

15 (7) The heat retention is calculated by the following formula (1).

Heat retention (%) = $100 \times (Q_0 - Q_d) / Q_0$ formula (1)

[0017]

The heat retention of the absorbent article is no greater than about 45%; preferably no greater than about 43% and even more preferably no greater than about 42%. Higher heat retention produces a greater feeling of heat and a greater degree of sweating for the wearer, which leads to a sense of heat and humidity. The lower limit for the heat retention is about 0%. If the heat retention is near about 0%, it will be possible to approach a heat level near that obtained without wearing the absorbent article.

[0018]

30 The heat retention can be lowered, for example, by reducing the thickness of the absorbent article, and in particular by reducing the thickness of the absorbent article at the excretory opening contact region. Presumably, reducing the thickness of the absorbent article lowers the heat retention of the absorbent article by reducing the amount of highly heat-retaining

air present inside the absorbent article.

[0019]

Since the heat retention also varies depending on the density of the absorbent article as described hereunder, it is difficult to discuss the heat retaining properties simply based on the thickness of the absorbent article alone, but in order to achieve a heat retention of no greater than about 45%, the thickness of the absorbent article, and especially the thickness of the absorbent article at the excretory opening contact region, may be up to about 7 mm, up to about 6 mm, or up to about 5 mm, for example. The thickness of the absorbent article, and especially the thickness of the absorbent article at the excretory opening contact region, is preferably at least about 0.1 mm. This is because the total absorption of excreta will tend to be insufficient if the thickness of the absorbent article is less than 0.1 mm.

[0020]

The thickness of the absorbent article may be measured using a TM600-L by Kumagai Riki Kogyo Co., Ltd., under conditions with a contact point tip diameter of 50 mm, a contact point lowering speed of 7.5 mm/sec and a measuring load of 50 gf.

[0021]

The heat retention can also be lowered by increasing the density of the absorbent article, and in particular by increasing the density of the absorbent article at the excretory opening contact region. Presumably, increasing the density of the absorbent article lowers the heat retention of the absorbent article by reducing the amount of highly heat-retaining air present inside the absorbent article.

[0022]

Since the heat retention will also vary depending on the thickness of the absorbent article, as explained above, it is difficult to describe the heat retaining

properties simply based on the density of the absorbent article, but to achieve a heat retention of no greater than about 45% the density of the absorbent article, and in particular the density of the absorbent article at the excretory opening contact region, may be at least about 0.04 g/cm³, at least about 0.05 g/cm³, at least about 0.06 g/cm³ or at least about 0.07 g/cm³, for example.

[0023]

The density of the absorbent article, and especially the density of the absorbent article at the excretory opening contact region, is preferably no greater than about 0.5 g/cm³ and more preferably no greater than about 0.3 g/cm³. This is because increasing the density of the absorbent article will tend to result in greater stiffness of the absorbent article.

[0024]

As used herein, "excretory opening contact region" generally refers to the region to be in contact with the excretory opening of the wearer, and in a disposable diaper it generally refers to the region in contact with the urinary area, while in a sanitary napkin it generally refers to the region in contact with the vaginal opening. When a region of large basis weight is present in the absorbent core for absorption of excreta, the region of large basis weight may be treated as the excretory opening contact region for convenience.

[0025]

Further as used herein, "center of the excretory opening contact region", in the case of an absorbent article with a flap, refers to the center of the flap in the lengthwise direction of the absorbent article and the center in the cross direction of the absorbent article, while in the case of an absorbent article without a flap, it refers to the center of the narrow section in the lengthwise direction of the absorbent core and the center in the cross direction of the absorbent article.

[0026]

Further as used herein, the density is calculated by cutting a sample of the absorbent article 2 cm in the lengthwise direction and 2 cm in the cross direction, with the center of the excretory opening contact region as the center of the sample, and measuring the mass m (g). The thickness h (mm) of the absorbent article may be the value measured with a TM600-L by Kumagai Riki Kogyo Co., Ltd., mentioned above.

The density D (g/cm³) is determined by the following formula (2).

$$D = m / (2 \times 2 \times 0.1 \times h) \quad \text{Formula (2)}$$

[0027]

The rewetting rate can be measured in the following manner.

(1) An acrylic board having an approximately 40 mm × 10 mm hole at the center is placed on the liquid-permeable top sheet of the absorbent article, with the center of the hole of the acrylic board roughly over the center of the excretory opening contact region of the absorbent article.

(2) Artificial menstrual blood is placed in an autoburette, and a total of 4 g of the artificial menstrual blood is dropped toward the center of the hole of the acrylic board from a height of about 10-15 mm.

The dropping speed of the artificial menstrual blood is approximately 95 mL/min.

[0028]

(3) After confirming that the artificial menstrual blood has been absorbed into the absorbent article, the acrylic board is removed, and after 1 minute has elapsed from the start of artificial menstrual blood dropping, 10 sheets of filter paper (No.2, size: 50 mm × 35 mm, product of Advantech Toyo, Inc.), with pre-measured mass (A), are placed on the top sheet with the excretory opening contact region as the center, and a weight is placed thereover to apply a pressure of 30 g/cm² onto the

filter paper.

(4) After 1 minute has elapsed from placement of the weight, the weight and filter paper are removed from the absorbent article and the mass (B) of the filter paper is measured.

[0029]

(5) The rewetting rate is calculated by the following formula (3).

Rewetting rate (mass%)

10
$$= 100 \times \{\text{mass (B)} - \text{mass (A)}\} / 4 \quad \text{Formula (3)}$$

The artificial blood is not particularly restricted so long as viscosity thereof is in the range of about 22-26 mPa·s, and for example, it may be prepared by mixing 80 g of glycerin, 8 g of CMC sodium salt, 10 g of NaCl, 4 g of NaHCO₃, 8 g of Red Pigment 102, 2 g of Red Pigment 2 and 2 g of Yellow Pigment 5, with 1000 cc of water.

[0030]

The rewetting rate of the absorbent article is no greater than about 10 mass%, preferably no greater than about 8 mass% and even more preferably no greater than about 7 mass%. This is because a higher rewetting rate will tend to produce a sticky feel upon application of pressure onto the absorbent article by sitting in a chair, for example, after excreta have been absorbed by the absorbent article. The lower limit for the rewetting rate is about 0 mass%. If the rewetting rate is near 0 mass%, the absorbent article will tend to maintain a smooth and dry state more easily after absorption of excreta.

[0031]

The rewetting rate can be lowered, for example, by increasing the density of the absorbent article, and especially by increasing the density at the excretory opening contact region of the absorbent article. It is believed that increasing the density of the absorbent article at the excretory opening contact region, in particular, reduces the distances between the fibers of

the nonwoven fabric in the absorbent article and the pulp in the absorbent core, thus producing a capillary phenomenon whereby excreta are drawn into and retained more easily in the absorbent article, so that the rewetting rate is lowered.

In order to achieve a rewetting rate of no greater than 10 mass%, the density of the absorbent article at the excretory opening contact region is preferably at least about 0.07 g/cm³, more preferably at least about 0.08 g/cm³ and even more preferably at least about 0.09 g/cm³.

[0032]

The density of the absorbent article at the excretory opening contact region, as mentioned above, is preferably no greater than about 0.5 g/cm³ and more preferably no greater than about 0.3 g/cm³. This is because increasing the density of the absorbent article will tend to result in greater stiffness of the absorbent article.

[0033]

The absorbent article has a moisture content on the skin contact surface of the top sheet of preferably no greater than about 20 mass%, more preferably no greater than about 18 mass% and even more preferably no greater than about 17 mass%. By lowering the moisture content of the skin contact surface of the top sheet, the moisture content on the uppermost part of the skin contact surface of the top sheet is reduced, allowing the skin contact surface of the top sheet to maintain a smooth and dry state even after absorption of excreta. The moisture content is preferably about 0.3 mass% or greater and more preferably about 1.0 mass% or greater. If the moisture content is too low, static electricity may tend to be generated during wear, depending on the weather.

The moisture content of the skin contact surface of the top sheet can be measured in the following manner.

[0034]

(1) The moisture content measuring apparatus shown in Fig. 1 is prepared, and adjusted to a room temperature of 20°C and a humidity of 60% RH. The details of the moisture content measuring apparatus will be described below.

(2) A plurality of samples with known moisture content are prepared, the voltage (V) between a pair of electrodes is measured for each sample, and a calibration curve is drawn.

(3) Artificial menstrual blood is placed in an autoburette, and a total of 4 g of artificial menstrual blood is dropped toward the center of the excretory opening contact region of the liquid-permeable top sheet.

(4) After 1 minute as elapsed, the voltage is measured at 15 random locations in an area of 12 mm in the lengthwise direction and 30 mm in the cross direction of the absorbent article, with the center of the excretory opening contact region as the center, and the moisture content is calculated from the average value, based on the calibration curve.

[0035]

The moisture content measuring apparatus 1 shown in Fig. 1 comprises a sensor 2, which is an electrical capacitance-type moisture sensor, a sample stage 3 on which a sample to be measured, taken from an absorbent article, is placed, the sample stage having a raised surface for placement of the sample thereon, a support mechanism 5 which supports the sensor in such a manner that the contact pressure of the sensor with respect to the sample is essentially constant, a moving mechanism 6 which moves the sample, and a measuring mechanism 9 that measures the moisture content of the sample at multiple locations using the sensor, while moving the sensor relative to the sample by controlling the moving mechanism, thereby measuring the moisture content distribution of the sample.

[0036]

In the moisture content measuring apparatus 1 shown in Fig. 1, the sample stage 3 has a half-regular cylinder shape formed by cutting a regular cylinder on a plane passing through the central axis. Further, in the moisture content measuring apparatus 1 of Fig. 1, the support mechanism 5 is a balance capable of adjusting the load applied to the sample 4 by the location of a weight 8, and a constant load can be applied in the vertical direction indicated by B in Fig. 1 (hereunder also referred to as "direction B").

[0037]

In addition, in the moisture content measuring apparatus 1 shown in Fig. 1, the moving mechanism 6 can rotate the sample stage 3 around the central axis of the regular cylinder, along direction A, and can cause reciprocal movement of the sample stage 3 parallel to the central axis of the regular cylinder, i.e. in the direction from the foreground to the background in Fig. 1. By rotating the sample stage 3 in direction A and causing reciprocal movement of the sample stage 3 in the direction from the foreground to the background, the moving mechanism 6 allows the distribution of moisture content in the sample to be evaluated.

[0038]

In the moisture content measuring apparatus 1 shown in Fig. 1, the sensor 2 is connected via the support mechanism 5, and the moving mechanism 6 is directly connected to the measuring mechanism 9.

Further, in the moisture content measuring apparatus 1 of Fig. 1, the sample 4 is set on the sample stage 3, and an insulating film 7 is placed between the sensor 2 and sample 4, and covering the sample 4.

[0039]

The procedure for measurement of the distribution of moisture content in the sample 4 in the moisture content measuring apparatus 1 shown in Fig. 1 is as follows. First, the moisture content measuring apparatus 1 shown

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in Fig. 1 is prepared. Next, the sample 4 is placed on the raised surface of the sample stage 3, the insulating film 7 is set on the sample 4, and the sensor 2 is set on the sample 4 sandwiching the insulating film 7. The measuring mechanism 9 is then operated to control the moving mechanism 6, and the sample stage 3 is rotated in the direction A around the central axis of the regular cylinder of the sample stage 3 while the sample stage 3 is also moved in the direction from foreground to background. The sensor 2 is used during this time for measurement of the moisture content of the sample 4 at multiple locations. The moisture content distribution of the sample 4 can be measured by combining these measurements.

15 [0040]

The sensor used may be any commercially available electrical capacitance-type moisture sensor, and the electrical capacitance-type moisture sensor may have a cross-sectional shape, such as shown in Fig. 2.

20 The sensor 2 shown in Fig. 2 has a pair of electrodes 10a and 10b situated parallel across a predetermined spacing. The electrostatic capacity between the pair of electrodes 10a and 10b is measured through a metal wire. The sensor 2 shown in Fig. 2 also comprises an electrode-supporting member 11 to support the pair of electrodes 10a and 10b. In the sensor 2 shown in Fig. 2, the pair of electrodes 10a and 10b are mounted on the measuring side of the electrode-supporting member 11.

30 [0041]

The electrode-supporting member preferably has a relative dielectric constant, water content and water permeability equivalent to the insulating film described hereunder, to avoid affecting measurement of the moisture content. An example of a material for the electrode-supporting member is phenol resin, known by trade names, such as BAKELITE.

[0042]

While nothing is present between the pair of electrodes 10a and 10b in the sensor 2 shown in Fig. 2, according to a different configuration of the moisture content measuring apparatus, the aforementioned electrode-supporting member may also be situated between the pair of electrodes 10a and 10b. By situating the electrode-supporting member between the pair of electrodes 10a and 10b, it is possible to maintain a more constant spacing between the electrodes and the sample.

[0043]

The sensor 2 shown in Fig. 2 is in contact with the sample 4 through the insulating film 7. Since a load is applied in a constant vertical direction onto the sensor 2, the sensor 2 can measure the electrostatic capacity while a constant distance is maintained between the pair of electrodes 10a and 10b and the sample 4.

[0044]

The reason why the moisture content measuring apparatus includes an insulating film situated between the sensor and the sample and covering the sample, is as follows.

The absorption surface of an absorbent article, such as a disposable diaper, as the sample to be measured, often reaches a moisture content of nearly 100% after urination. When a moisture sensor is used to measure moisture content under such high moisture content conditions, part of the moisture will attach onto the sensor, especially near the electrodes, and can introduce error into the measurement results. Thus, placing an insulating film that is separate from the sensor between the sensor and the sample can prevent adhesion of moisture onto the sensor.

[0045]

In this type of moisture content measuring apparatus, the sensor itself does not need to have an insulating section to retain the condenser properties of

the electrodes, on the side in contact with the sample, as shown in Fig. 2. Further, the sensor may have an insulating section to retain the condenser properties of the electrodes on the side in contact with the sample, as in a known or commercially available electrical capacitance-type moisture sensor.

[0046]

In terms of the attribute of measuring moisture content, the insulating film preferably has a ratio with respect to permittivity in a vacuum (hereunder referred to simply as "relative dielectric constant") of no greater than about 30, more preferably no greater than about 20, even more preferably no greater than about 10 and yet even more preferably no greater than about 5. This is because a high relative dielectric constant can result in measurement error.

[0047]

Further, the insulating film preferably has a small and uniform film thickness to reduce measurement error.

The film thickness is preferably no greater than about 300 μm , more preferably no greater than about 200 μm , even more preferably no greater than about 100 μm , yet more preferably no greater than about 50 μm and yet even more preferably no greater than about 30 μm .

The uniformity is preferably such that the coefficient of variation of the film thickness measured at 30 arbitrary points is no greater than about 20%, more preferably no greater than about 10% and even more preferably no greater than about 5%.

The coefficient of variation is the value calculated by the following formula (4).

Coefficient of variation (%)

$= 100 \times \text{standard deviation} / \text{arithmetic mean}$ Formula (4)

[0048]

The insulating film also preferably has a low water content to reduce measurement error. This is because a

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high water content will result in a high relative dielectric constant of the insulating film, and may increase measurement error.

As a general standard for the water content, the
5 water content after immersion in water at 25°C for 24 hours is preferably less than about 3 mass%, more preferably less than about 1 mass% and even more preferably less than about 0.5 mass%.

The insulating film preferably also has low water
10 permeability. A general standard for low water permeability is a level such that the sensor and especially the electrodes are not wetted by water during measurement. This is because it may not be possible to accomplish measurement of the electrostatic capacity if
15 the electrodes are wetted by water.

[0049]

The material of the insulating film is not particularly restricted so long as it satisfies the performance described above, and examples include
20 polyamide, melamine, epoxy, polyethylene, polypropylene, polyvinylidene chloride, polyvinyl chloride and polymethylpentene materials.

The moisture content measuring apparatus, comprising the insulating film described above, can measure samples
25 having moisture contents in a very wide range, such as preferably about 0 mass%-100 mass%, more preferably about 1 mass%-90 mass% and even more preferably about 5 mass%-80 mass%.

[0050]

30 By using the moisture content measuring apparatus it is possible to measure the moisture content on the skin contact surface of a top sheet in an easy and highly reproducible manner, but a commercially available electrical capacitance-type moisture sensor may also be
35 used, with an insulating film placed between them, for measurement of the moisture content on the skin contact surface of the top sheet.

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[0051]

In order to exhibit one or more of the effects discussed herein, preferably the thickness of the absorbent article at the excretory opening contact region is no greater than about 7 mm and the density of the absorbent article at the excretory opening contact region is at least about 0.07 g/cm³, more preferably the thickness of the absorbent article at the excretory opening contact region is no greater than about 6 mm and the density of the absorbent article at the excretory opening contact region is at least about 0.07 g/cm³, even more preferably the thickness of the absorbent article at the excretory opening contact region is no greater than about 5 mm and the density of the absorbent article at the excretory opening contact region is at least about 0.07 g/cm³, and yet even more preferably the thickness of the absorbent article at the excretory opening contact region is no greater than about 5 mm and the density of the absorbent article at the excretory opening contact region is at least about 0.075 g/cm³.

[0052]

As mentioned above, the thickness of the absorbent article at the excretory opening contact region is preferably at least about 0.1 mm. This is because the total absorption of excreta will tend to be insufficient if the thickness is less than 1 mm. The density of the absorbent article at the excretory opening contact region is preferably no greater than about 0.5 g/cm³ and more preferably no greater than about 0.3 g/cm³. This is because increasing the density will tend to result in greater stiffness of the absorbent article.

[0053]

The basis weight of the absorbent core used in the absorbent article, at the excretory opening contact region, is not particularly restricted so long as it is in a range such that the absorbent article has a heat retention of no greater than about 45% and a rewetting

rate of no greater than about 10 mass%, and for example, it may be about 250-500 g/m², about 250-400 g/m² or about 250-350 g/m². If the basis weight of the absorbent core at the excretory opening contact region is reduced, the rewetting rate will tend to be increased, and if the basis weight of the absorbent core at the excretory opening contact region is increased, a stiffer feeling will tend to be experienced during wear.

[0054]

The basis weight of the absorbent core used in the absorbent article, in regions other than the excretory opening contact region, is preferably smaller than the basis weight at the excretory opening contact region, and for example, it may be no greater than about 300 g/m², no greater than about 200 g/m² or no greater than about 100 g/m². If the basis weight of the absorbent core is high in regions other than the excretory opening contact region, the rewetting rate will tend to be reduced and the heat retention will tend to increase due to the thickness, while a stiff feeling during wear will tend to be experienced if the thickness is reduced by compressing.

The basis weights of the absorbent core in the excretory opening contact region and in regions other than the excretory opening contact region can be modified by changing the amount of for example, pulp in the absorbent core.

[0055]

In the absorbent core used in the absorbent article in accordance with some embodiments of the invention, a plurality of compressions are preferably present across the entire absorbent core surface, formed by compressing areas of the absorbent core in the thickness direction. Compressions distributed over of the entire surface of the absorbent core can increase the density of the absorbent core, and therefore the density of the absorbent article, while also lowering the heat retention

and rewetting rate of the absorbent article.

[0056]

Fig. 3 is a diagram showing an absorbent core in accordance with some embodiments of the invention. In the absorbent core 21 shown in Fig. 3, the left side is to be placed on the front of the wearer during wear, and the right side is to be placed on the back of the wearer during wear. In the absorbent core 21 of Fig. 3, the plurality of compressions 23 are present or distributed over the entire surface of the absorbent core 21, and the excretory opening contact region 22 of the absorbent core 21 is indicated by a dotted line.

[0057]

The shape, area and number of the compressions are not particularly restricted, but preferably compressions with small areas are interspersed essentially evenly, as shown in Fig. 3. This is because interspersing the compressions essentially evenly can reduce the area ratio of the compressions, which have low absorption of excreta, while reducing the thickness of the absorbent article.

In the absorbent core in accordance with some embodiments of the invention, the plurality of compressions may be arranged so that the absorbent article can deform with relative ease along the body shape of the wearer. For example, as exemplarily illustrated in Fig. 3, by arranging roughly rectangular (or elongated) compressions across the surface of the absorbent core in the front (left) and rear (right) portions of the absorbent core, with the lengthwise direction of the compressions matching the cross direction of the absorbent core, at fixed spacings in the cross direction of the absorbent core, the absorbent article will be relatively easily deformed along the shape of the buttock region of the wearer.

[0058]

Further, by arranging the compressions 23 at fixed

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spacings in the lengthwise direction of the absorbent core in the regions of the absorbent core contacting the groin area of the wearer, as exemplarily shown in Fig. 3 on opposite (upper and lower) sides of the excretory opening contact region 22 in the cross direction, with the lengthwise direction of the compressions 23 matching the lengthwise direction of the absorbent core 21, the absorbent article will be able to follow the body of the wearer more closely when the legs are closed.

Moreover, by reducing the number (or density) of compressions 23 in the excretory opening contact region 22 of the absorbent core 21, as shown in Fig. 3, the excretory opening contact region 22 expands more easily, allowing greater amounts of excreta to be more easily absorbed. The area of each compression may also be reduced in the excretory opening contact region to facilitate absorption of larger amounts of excreta.

[0059]

In the roughly rectangular compressions of the absorbent core, the long diameters (dimensions) are preferably about 1.0-3.0 mm and more preferably about 1.5-2.5 mm, and the short diameters (dimensions) are preferably about 0.2-2 mm and more preferably about 0.3-1.0 mm. If the shapes of the compressions are too small the compressing will tend to be insufficient, and if their shapes are too large, the stiffness of the absorbent article will be increased, tending to impair the feel during wear.

[0060]

In the absorbent core, the area ratio of a total area of the compressions to the entire area of the compressed surface of the absorbent core on which the compressions are formed is preferably about 1-10% and more preferably about 2-5%. If the area ratio is too low the compressing will be insufficient, resulting in increased thickness of the absorbent core and absorbent article and tending to lower the density of the absorbent

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article, while if the area ratio is too high, the stiffness of the absorbent article will tend to increase, reducing the amount of absorption.

5 The area ratio can be calculated by multiplying the area of each compression by the number of compressions of the absorbent core, and dividing this by the entire area of the compressed surface of the absorbent core.
[0061]

10 The compressions are preferably arranged in a zigzag type, such as a square zigzag or 60° zigzag type on the absorbent core. This will help prevent distribution in the thickness and density of the absorbent core.

15 The compressions are preferably arranged at approximately 1-10 mm spacings, and more preferably approximately 2-6 mm spacings, between adjacent compressions. This will also help prevent distribution in the thickness and density of the absorbent core.
[0062]

20 The structure of the absorbent core is not particularly restricted, and for example, an absorption core formed from absorbent fibers, such as pulp, and any desired absorbent core material, such as SAP (super-absorptive polymer), may be covered with a liquid-permeable tissue or the like.
25 [0063]

The liquid-permeable top sheet used in the absorbent article in accordance with some embodiments of the invention is not particularly restricted so long as the absorbent article has a heat retention of no greater than 45% and a rewetting rate of no greater than 10 mass%, and a through-air nonwoven fabric is a common example.
30

In order to exhibit one or more of the effects discussed herein, the liquid-permeable top sheet is preferably a nonwoven fabric with irregularities having a plurality of ridges and a plurality of recesses extending in the lengthwise direction of the absorbent article, alternating in the cross direction of the absorbent
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article (this will hereunder be referred to simply as "nonwoven fabric with irregularities").

[0064]

Fig. 4 is a diagram showing an example of a nonwoven fabric with irregularities. The nonwoven fabric with irregularities 24 shown in Fig. 4 has a plurality of ridges 25 and a plurality of recesses 26 (only one is shown in Fig. 4) extending in the lengthwise direction of the absorbent article, and alternating in the cross direction of the absorbent article.

[0065]

The nonwoven fabric with irregularities can be produced by any known or to be developed method, such as the methods described in Japanese Unexamined Patent Publication No. 2008-25081 (US Patent Publication No.2009/282660) or Japanese Unexamined Patent Publication No. 2008-25082 both of which are incorporated by reference herein in their entirety. Specifically, as shown in Fig. 5, for example, a fiber web 30 may be placed on a roll having a supporting member 29, such as a mesh, and a fluid may be sprayed from fluid nozzles 31 onto the fiber web 30, to form a nonwoven fabric with irregularities 24. In the region of the nonwoven fabric with irregularities 24 which is directly under the nozzles through which the fluid is to be sprayed, the fibers are sorted in the cross direction CD that is perpendicular to the machine direction MD, forming recesses along the machine direction MD. The fibers collect in the region between each nozzle, forming ridges along the machine direction MD.

[0066]

Steam may be mentioned as an example of the fluid, and a spray volume of approximately 5-15 (nL/m²) may be used, for example. Since a recess is formed in the nonwoven fabric directly under each fluid nozzle through which the fluid is blasted, with ridges being formed adjacent to the recesses, the fluid nozzle spacing may be

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designed so as to form the desired ridge heights and pitch of irregularities.

[0067]

5 There are no particular restrictions on the fibers in the fiber web and in the nonwoven fabric with irregularities formed from the fiber web, and for example, they may be polyethylene fibers, polyethylene terephthalate fibers, or combinations thereof.

10 The basis weight of the fiber web, and the average basis weight of the nonwoven fabric with irregularities formed from the fiber web, is preferably about 10-50 g/m² and more preferably about 20-50 g/m². If the basis weight is too low, the top sheet may tear during use. If the basis weight is too high, the thickness of the top sheet
15 will be greater, tending to increase the heat retention of the absorbent article.

[0068]

20 The heights of the ridges in the nonwoven fabric with irregularities are preferably about 0.5-2.0 mm and more preferably about 0.7-1.5 mm. The heights of the recesses are preferably about 0.3-0.7 mm and more preferably about 0.5-0.6 mm.

25 The pitch of the irregularities in the nonwoven fabric with irregularities is preferably about 2-6 mm and more preferably about 3-5 mm.

30 As used herein, "heights of the ridges" refers to the heights from the bottom section of the nonwoven fabric to the top parts of the ridges, as indicated by h_1 in Fig. 4, and "heights of the recesses" refers to the heights from the bottom section of the nonwoven fabric to the bottom sections of the recesses, as indicated by h_2 in Fig. 4. The pitch of the irregularities is the distance from one ridge to adjacent ridge thereof, as indicated by p in Fig. 4.

35 [0069]

In the absorbent article, the liquid-permeable top sheet is more preferably a nonwoven fabric with

irregularities and holes, the irregularities having, on the skin contact surface, a plurality of heights and a plurality of recesses extending in the lengthwise direction of the absorbent article and alternating in the direction perpendicular to the lengthwise direction, and portions of the plurality of recesses having holes where no nonwoven fabric is present (this will hereunder also be referred to as "nonwoven fabric with irregularities and holes"). If the liquid-permeable top sheet has holes, excreta will be drawn more easily into the interior of the absorbent core through the top sheet.

[0070]

Fig. 6 is a schematic view of a nonwoven fabric with irregularities and holes in accordance with some embodiments. The nonwoven fabric with irregularities and holes 32 shown in Fig. 6 has holes 33 where the nonwoven fabric is not present in the recesses 26.

The holes preferably have diameters of approximately 2.0-2.5 mm in the lengthwise direction of the absorbent article and diameters of approximately 0.5-1.5 mm in the cross direction of the absorbent article, and the spacings between adjacent holes in the same recesses are preferably about 2.0-2.5 mm.

The heights of the ridges, the heights of the recesses, the pitch of the irregularities and the diameters of the holes may be measured using an electron micrograph.

[0071]

The holes can be easily produced by the process for producing a nonwoven fabric with irregularities shown in Fig. 5, for example, wherein a supporting member 29 is altered from a mesh or the like into a support having protrusions and depressions that are parallel to the cross direction perpendicular to the machine direction, in an alternating fashion in the machine direction. The holes may be formed at sections of crossing between the fluid ejected from the fluid nozzles 31 and the

protrusions of the support.

[0072]

In accordance with some embodiments of the present invention, in which the absorbent core has compressions and the liquid-permeable top sheet is a nonwoven fabric with irregularities and holes, preferably the holes and the compressions at least partially overlap in the thickness direction of the absorbent article, as shown in Fig. 7.

Fig. 7 is a diagram illustrating an overlapping state of holes and compressions in an absorbent article in accordance with some embodiments. Fig. 7 is a view of the absorbent article from the skin contact surface of the liquid-permeable top sheet, with a portion of the absorbent article extracted. In Fig. 7, the compressions of the absorbent core are indicated by dotted lines for illustration. Further, the regions where the holes and compressions overlap in Fig. 7 are indicated by 34.

If the absorbent article has a plurality of regions 34 in which the holes and compressions overlap, absorbed excreta will pass through the regions 34 where the holes and compressions overlap, and be rapidly absorbed into the absorbent core.

[0073]

The absorbent article in accordance with some embodiments of the invention may also comprise an optional second sheet (not shown) between the liquid-permeable top sheet and the absorbent core.

The second sheet may be a nonwoven fabric, such as a through-air nonwoven fabric, or a biodegradable resin, such as a polylactic acid-based nonwoven fabric.

The back sheet may be one produced from a polyester, polyacrylonitrile, polyvinyl chloride, polyethylene, polypropylene, polystyrene, polyethylene terephthalate or polyvinyl alcohol, for example. Further, the back sheet may be a poromeric film, non-poromeric film, porous film or the like made from high-density polyethylene/low-

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density polyethylene.

[0074]

When the absorbent article comprises a second sheet, it preferably has a plurality of compressions formed by compressing together the liquid-permeable top sheet and the second sheet in the direction of lamination (thickness direction of the absorbent article). Compressing together the top sheet and the second sheet will facilitate intake of excreta from the top sheet into the absorbent core. Since the fiber density will tend to be high and the fibers will tend to rise in the thickness direction of the absorbent article at the edges of the compressions, excreta will be drawn in more easily from the top sheet into the absorbent core.

[0075]

The absorbent article in accordance with some embodiments of the invention may comprise a liquid-permeable top sheet, an optional second sheet and a plurality of compressions formed by compressing them together with the absorbent core in the direction of lamination. Compressing together the liquid-permeable top sheet, the optional second sheet, and the absorbent core will facilitate intake of excreta from the top sheet into the absorbent core. This is because the fiber density will tend to be high and the fibers will tend to rise in the thickness direction of the absorbent article at the edges of the compressions.

[0076]

Fig. 8 is a diagram showing an absorbent article in accordance with some embodiments of the disclosure. The absorbent article 35 shown in Fig. 8 comprises a liquid-permeable top sheet 36, a second sheet (not shown), an absorbent core 21, a back sheet (not shown) and a side flap 37. The absorbent article 35 shown in Fig. 8 has compressions 38 formed by compressing the top sheet and the second sheet, and compressions 39 formed by compressing the top sheet, the second sheet and the

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absorbent core.

[0077]

A method for producing the absorbent article in accordance with some embodiments of the invention will now described.

The absorbent article in accordance with some embodiments of the invention may be produced by any method commonly used in the technical field, without any particular restrictions.

As an example, the absorbent core can be formed by dispersing an optional absorbent (for example, SAP) into absorbent fibers (for example, pulp) having the desired basis weight, and covering the absorbent fibers with a liquid-permeable tissue. The absorbent core may also be compressed to adjust the density and thickness of the absorbent article that is to be formed. The compressing may be accomplished using any means known to those skilled in the art or to be developed, for example, as described in Japanese Unexamined Patent Publication No. 2009-273722 (US Patent publication No. 2011/118691), which is incorporated by reference herein in its entirety.

[0078]

Next, the liquid-permeable top sheet, the optional second sheet, and the absorbent core, are laminated using an adhesive or the like. If desired, the liquid-permeable top sheet and the second sheet may be compressed together first, and then laminated over the absorbent core.

Next, compressing is carried out, if desired, on the top sheet, the optional second sheet, and the absorbent core.

After then laminating a back sheet on the absorbent core using an adhesive or the like, it is cut to the desired shape to produce an absorbent article in accordance with some embodiments of the invention.

[0079]

The absorbent article in accordance with some embodiments of the invention may be, for example, a sanitary napkin or disposable diaper, which absorbs excreta to a certain extent.

5 Examples
[0080]

The disclosure will now be explained with examples, with the understanding that the disclosure is not meant to be limited to the examples.

10 [Example 1]

Reference samples 1-7 were fabricated with different moisture contents, by adding prescribed amounts of water to cottons available under the trademark SILCOTT™ (Unicharm Corp.). The reference samples were then
15 allowed to stand in a sealed state at 20°C for 1 day.
[0081]

The moisture content measuring apparatus shown in Fig. 1 was prepared, Reference samples 1-7 were each placed on the sample stage of a moisture content
20 measuring apparatus, and their moisture contents were measured. The contact pressure of the sensor for each sample was 8 g/cm².

The results are shown in Table 1 and Fig. 9.

[0082]

25 Table 1

	1	2	3	4	5	6	7
Moisture content (mass%)	8.23	33.6	52.6	66.5	73.5	79.7	83.1
Voltage (V)	0.18	0.65	1.70	1.87	2.21	2.44	2.72

[0083]

When a calibration curve passing through the zero point was drawn by the least square method based on the
30 obtained data, the following relationship (5):

$$y = 32.7x \text{ formula (5)}$$

was obtained between the moisture content y and the voltage x.

[0084]

[Example 2]

An absorbent article having the shape shown in Fig. 8 was produced from the top sheet shown in Table 2, a desired second sheet, an absorbent core, and a back sheet.

[0085]

In Table 2, nonwoven fabric 1 used as the top sheet is a nonwoven fabric with irregularities and holes (basis weight: 35 g/m², ridge height: 1.1 mm, recess height: 0.5 mm, irregularities pitch: 1.0 mm, hole diameter: 2.5 mm (lengthwise direction of absorbent article) × 1 mm (cross direction of absorbent article), adjacent hole spacing: 2.5 mm), formed by working a fiber web composed of core-sheath fibers with a core/sheath of polyethylene terephthalate/high-density polyethylene (fiber size: 3 dtex, fiber length: 45 mm), by the method described in Japanese Unexamined Patent Publication No. 2008-25082.

[0086]

The nonwoven fabric 2 was a through-air nonwoven fabric (basis weight: 35 g/m², thickness: 1.1 mm) formed by through-air working of a fiber web composed of core-sheath fibers with a core/sheath of polyethylene terephthalate/high-density polyethylene (fiber size: 3 dtex, fiber length: 45 mm).

The porous film was a polyethylene film containing 3 mass% titanium oxide (basis weight: 23 g/m²), having holes opened therein using the process disclosed in US Patent No. 5733628 (thickness: 1.1 mm, diameter: 0.80 mm (MD) × 0.57 mm (CD), open area: 23%).

[0087]

In Table 2, the second sheet was a through-air nonwoven fabric (basis weight: 20 g/m², thickness: 0.19 mm) formed by through-air working of a fiber web composed of core-sheath fibers of polyethylene terephthalate/high-density polyethylene (fiber size: 3 dtex, fiber length: 45 mm).

Further, in Table 2, the absorbent core was formed

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by placing pulp with the basis weight listed in Table 2 on liquid-permeable tissue, dispersing a small amount of SAP in the pulp, covering the pulp with tissue, and then compressing (except for No.6).

5 The back sheet in Table 2 was a polyethylene film (basis weight: 24 g/m²).

[0088]

The top sheet and second sheet were laminated using an adhesive, the top sheet and second sheet were
10 compressed, and then an adhesive was used for lamination of the absorbent core onto the second sheet, the top sheet, second sheet and absorbent core were compressed, an adhesive was used to laminate a back sheet onto the absorbent core, and the stack was cut to the shape of the
15 absorbent article to complete the absorbent article.

For absorbent article No.8, no second sheet was used. The top sheet was compressed, and then an adhesive was used to laminate the absorbent core onto the top sheet, the top sheet and absorbent core were compressed,
20 an adhesive was used to laminate the back sheet onto the absorbent core, and the stack was cut to the shape of the absorbent article to complete the absorbent article.

The structures of the absorbent articles No.1-10, and their thicknesses and densities, are shown in Table
25 2.

[0089]

Table 2

Absorbent article No.	Top sheet	Second sheet	Absorbent core			Thickness ¹⁾ (mm)	Density ¹⁾ (g/cm ³)
			Basis weight (g/m ²)	Excretory opening contact region	Compressing		
1	Nonwoven fabric 1	+	300	100	+	4.8	0.08
2	Nonwoven fabric 1	+	400	100	+	4.1	0.12
3	Nonwoven fabric 1	+	500	100	+	4.1	0.14
4	Nonwoven fabric 1	+	200	100	+	4.2	0.07
5	Nonwoven fabric 1	+	100	100	+	3.9	0.05
6	Nonwoven fabric 1	+	300	100	-	7.8	0.05
7	Nonwoven fabric 1	+	300	300	+	4.3	0.09
8	Nonwoven fabric 1	-	300	100	+	4.0	0.09
9	Nonwoven fabric 2	+	300	100	+	4.0	0.09
10	Porous film	+	300	100	+	3.6	0.10

¹⁾Value for absorbent article in excretory opening contact region.

[0090]

The heat retentions, rewetting rates and moisture contents on the skin contact surfaces of the top sheets of the absorbent articles No.1-10, as well as commercial products Sofy Bodyfit, with wings (21 cm) (hereunder, "BFR") by Unicharm Corp., Sofy Bodyfit Slim, Regular daily use, with wings 21 cm (hereunder, "FUWAPITA") by Unicharm Corp., and Sofy Hadaomoi, Heavy regular daily use, with wings (hereunder, "HADAOMOI") by Unicharm Corp., are shown in Table 3, together with the thicknesses and densities of the absorbent articles at the excretory opening contact regions. The heat retention, rewetting rate and moisture content were measured according to the methods described in the present specification.

[0091]

Further, Fig. 10 shows the relationship between thickness and heat retention of absorbent articles at the excretory opening contact region, for absorbent articles No.1-10 and commercially available absorbent articles consisting of BFR, FUWAPITA, and HADAOMOI, and Fig. 11 shows the relationship between density and heat retention of the absorbent articles at the excretory opening contact region. Fig. 12 shows the relationship between density and rewetting rate of the absorbent articles at the excretory opening contact region, for absorbent articles No.1-10.

[0092]

Table 3

Absorbent article No.	Thickness ¹⁾ (mm)	Density ¹⁾ (g/cm ³)	Heat retention	Rewetting rate	Moisture content
1	4.8	0.08	42%	6.9%	14.7%
2	4.1	0.12	39%	-	17.0%
3	4.1	0.14	38%	0.9%	15.7%
4	4.2	0.07	39%	15.3%	14.1%
5	3.9	0.05	38%	21.6%	17.3%
6	7.8	0.05	47%	7.1%	15.4%
7	4.3	0.09	39%	0.3%	16.0%
8	4.0	0.09	39%	7.4%	16.7%
9	4.0	0.09	39%	10.8%	16.3%
10	3.6	0.10	36%	3.6%	21.3%
BFR	9.6	0.06	50%	0.8%	43.4%
FUWAPITA	7.7	0.07	47%	1.3%	22.8%
HADAOMOI	9.1	0.06	48%	0.3%	18.8%

¹⁾Value for absorbent article in excretory opening contact region.

[0093]

5 From Fig. 10 and Fig. 11 it is seen that heat retention is lowered by reducing the thickness of the absorbent article at the excretory opening contact region and by increasing the density of the absorbent article at the excretory opening contact region. Fig. 12 shows that
10 increasing the density of the absorbent article at the excretory opening contact region lowers the rewetting rate.

[0094]

When absorbent articles No.1-No.10, and BFR,
15 FUWAPITA and HADAOMOI were used by several subjects, the obtained responses indicated that reduced heat retention and rewetting rate resulted in less heat and humidity during wear, and smoother and dryer feel even after absorption of excreta. Also, absorbent articles No.1, 3,
20 7, 8 and 10, and No.2, which had heat retentions of no greater than 45% and rewetting rates of no greater than 10 mass%, exhibited notable resistance to heat and humidity during wear. Absorbent articles No.1-3, and 7-8, which had moisture contents on the skin facing of the
25 top sheets of no greater than 20 mass%, also exhibited a notable smooth and dry feel.

This application claims the benefit of Japanese Patent Application No. 2010-253203 the entire disclosure of which is incorporated by reference herein.

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[0095]

Specifically, the present disclosure relates to the following aspects.

[Aspect 1]

5 An absorbent article comprising a liquid-permeable top sheet, a liquid-impermeable back sheet and an absorbent core between the liquid-permeable top sheet and liquid-impermeable back sheet,

10 wherein the absorbent article has a heat retention of no greater than 45% and a rewetting rate of no greater than 10 mass%.

[0096]

[Aspect 2]

15 The absorbent article according to aspect 1, wherein the moisture content of the skin contact surface of the liquid-permeable top sheet is no greater than 20 mass%.

[Aspect 3]

20 The absorbent article according to aspect 1 or 2, wherein the thickness of the absorbent article at the excretory opening contact region is no greater than 7 mm, and the density of the absorbent article in the excretory opening contact region is 0.07 g/cm³ or greater.

[0097]

[Aspect 4]

25 The absorbent article according to any one of aspects 1 to 3, wherein the basis weight of the absorbent core in the excretory opening contact region is in the range of 250-500 g/m².

[Aspect 5]

30 The absorbent article according to any one of aspects 1 to 4, wherein the basis weight of the absorbent core in regions other than the excretory opening contact region is lower than the basis weight in the excretory opening contact region.

35 [0098]

[Aspect 6]

The absorbent article according to any one of

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aspects 1 to 5, wherein the absorbent core has a plurality of compressions formed by compressing portions of the absorbent core in the thickness direction, over the entire surface of the absorbent core.

5 [0099]

[Aspect 7]

The absorbent article according to aspect 6, wherein the liquid-permeable top sheet is a nonwoven fabric having, on the skin contact surface, irregularities in which a plurality of ridges and a plurality of recesses, extending in the lengthwise direction of the absorbent article, are arranged in an alternate direction perpendicular to the lengthwise direction.

[0100]

15 [Aspect 8]

The absorbent article according to aspect 7, wherein the liquid-permeable top sheet is a nonwoven fabric with irregularities and holes, and the holes are portions of the plurality of recesses where the nonwoven fabric is not present, and

the holes of the liquid-permeable top sheet and the compressions of the absorbent core in the absorbent article at least partially overlap in the thickness direction of the absorbent article.

25 [0101]

[Aspect 9]

The absorbent article according to any one of aspects 1 to 8, wherein

the absorbent article further comprises a second sheet between the liquid-permeable top sheet and the absorbent core, and

the absorbent article has a plurality of compressions formed by compressing the liquid-permeable top sheet and the second sheet together in the direction of their lamination.

35 [0102]

[Aspect 10]

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The absorbent article according to any one of aspects 1 to 9, wherein the absorbent article has a plurality of compressions formed by compressing the liquid-permeable top sheet, a second sheet as desired, and an absorbent core, together in the direction of their lamination.

[0103]

In addition, the present disclosure relates to the following U1 to U18.

[U1]

An absorbent article comprising a liquid-permeable top sheet, a liquid-impermeable back sheet and an absorbent core between the liquid-permeable top sheet and the liquid-impermeable back sheet,

wherein the absorbent article has a heat retention of no greater than 45% and a rewetting rate of no greater than 10 mass% in an excretory opening contact region of the absorbent article.

[0104]

[U2]

The absorbent article according to U1, wherein the moisture content of the skin contact surface of the liquid-permeable top sheet is no greater than 20 mass%.

[U3]

The absorbent article according to U1 or U2, wherein the thickness of the absorbent article at the excretory opening contact region is no greater than 7 mm, and the density of the absorbent article in the excretory opening contact region is 0.07 g/cm³ or greater.

[0105]

[U4]

The absorbent article according to any one of U1 to U3, wherein the basis weight of the absorbent core in the excretory opening contact region is in the range of 250-500 g/m².

[U5]

The absorbent article according to any one of U1 to

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U4, wherein the basis weight of the absorbent core in regions other than the excretory opening contact region is lower than in the excretory opening contact region.

[0106]

5 [U6]

The absorbent article according to any one of U1 to U5, wherein the absorbent core has a plurality of compressions in which the absorbent core is compressed in the thickness direction of the absorbent article, and which are distributed over the entire surface of the absorbent core.

[U7]

The absorbent article according to U6, wherein the liquid-permeable top sheet is a nonwoven fabric having, on the skin contact surface, irregularities in which a plurality of ridges and a plurality of recesses, extending in the lengthwise direction of the absorbent article, are arranged alternately in a cross direction perpendicular to the lengthwise direction.

20 [0107]

[U8]

The absorbent article according to U7, wherein the liquid-permeable top sheet further includes holes in portions of the plurality of recesses where the nonwoven fabric is not present, and

the holes of the liquid-permeable top sheet and the compressions of the absorbent core at least partially overlap in the thickness direction of the absorbent article.

30 [0108]

[U9]

The absorbent article according to any one of U1 to U8, further comprising:

a second sheet between the liquid-permeable top sheet and the absorbent core, and

a plurality of compressions in which the liquid-permeable top sheet and the second sheet are compressed

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together in the thickness direction of the absorbent article.

[0109]

[U10]

5 The absorbent article according to U9, further comprising

 a plurality of compressions in which the liquid-permeable top sheet, the second sheet, and the absorbent core are compressed together in the thickness direction of the absorbent article.

[0110]

[U11]

 The absorbent article according to U3, wherein the density of the absorbent article in the excretory opening contact region is no greater than 0.5 g/cm^3 .

15

[U12]

 The absorbent article according to U5, wherein the basis weight of the absorbent core in the regions other than the excretory opening contact region is no greater than 300 g/m^2 .

20

[0111]

[U13]

 The absorbent article according to U6, wherein the compressions in at least one of a front portion or a rear portion of the absorbent core are elongated in a cross direction perpendicular to the lengthwise direction of the absorbent article, and are arranged at fixed spacings in the cross direction.

25

[U14]

 The absorbent article according to U13, wherein the compressions, in regions on opposite sides of the excretory opening contact region in the cross direction, are elongated in the lengthwise direction of the absorbent article.

30

35 [0112]

[U15]

 The absorbent article according to U13, wherein a

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density of the compressions in the excretory opening contact region is lower than in regions other than the excretory opening contact region.

[U16]

5 The absorbent article according to U13, wherein an area of each compression in the excretory opening contact region is smaller than in regions other than the excretory opening contact region.

[0113]

10 [U17]

 The absorbent article according to U13, wherein each compression has a long dimension of 1.0-3.0 mm, a short dimension of 0.2-2 mm, and the spacings between the compressions are 1-10 mm.

15 [U18]

 The absorbent article according to U13, wherein an area ratio of a total area of the compressions to the entire area of the surface of the absorbent core on which the compressions are formed is about 1-10%.

20 References Signs List

[0114]

1 Moisture content measuring apparatus

2 Sensor

3 Sample stage

25 4 Sample

5 Support mechanism

6 Moving mechanism

7 Insulating film

8 Weight

30 9 Measuring mechanism

10a, 10b Electrodes

11 Electrode-supporting member

21 Absorbent core

22 Excretory opening contact region

35 23 Compression

24 Nonwoven fabric with irregularities

25 Ridge

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- 26 Recess
- 27 Center section
- 28 Side section
- 29 Supporting member
- 5 30 Fiber web
- 31 Fluid nozzle
- 32 Nonwoven fabric with irregularities and holes
- 33 Hole
- 34 Region of overlap between hole and compression
- 10 35 Absorbent article
- 36 Top sheet
- 37 Side flap
- 38 Compression formed by compressing top sheet and second sheet
- 15 39 Compression formed by compressing top sheet, second sheet and absorbent core.
- 40 8 cm × 8 cm sample

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CLAIMS

Claim 1

An absorbent article comprising a liquid-permeable top sheet, a liquid-impermeable back sheet and an absorbent core between the liquid-permeable top sheet and the liquid-impermeable back sheet,

wherein the absorbent article has a heat retention of no greater than 45% and a rewetting rate of no greater than 10 mass%.

Claim 2

The absorbent article according to claim 1, wherein the moisture content of the skin contact surface of the liquid-permeable top sheet is no greater than 20 mass%.

Claim 3

The absorbent article according to claim 1 or 2, wherein the thickness of the absorbent article at the excretory opening contact region is no greater than 7 mm, and the density of the absorbent article in the excretory opening contact region is 0.07 g/cm^3 or greater.

Claim 4

The absorbent article according to any one of claims 1 to 3, wherein the basis weight of the absorbent core in the excretory opening contact region is in the range of $250\text{--}500 \text{ g/m}^2$.

Claim 5

The absorbent article according to any one of claims 1 to 4, wherein the basis weight of the absorbent core in regions other than the excretory opening contact region is lower than the basis weight in the excretory opening contact region.

Claim 6

The absorbent article according to any one of claims

1 to 5, wherein the absorbent core has a plurality of compressions formed by compressing portions of the absorbent core in the thickness direction, over the entire surface of the absorbent core.

5

Claim 7

The absorbent article according to claim 6, wherein the liquid-permeable top sheet is a nonwoven fabric having, on the skin contact surface, irregularities in which a plurality of ridges and a plurality of recesses, extending in the lengthwise direction of the absorbent article, are arranged in an alternate direction perpendicular to the lengthwise direction.

15 Claim 8

The absorbent article according to claim 7, wherein the liquid-permeable top sheet is a nonwoven fabric with irregularities and holes, and the holes are portions of the plurality of recesses where the nonwoven fabric is not present, and

20

the holes of the liquid-permeable top sheet and the compressions of the absorbent core in the absorbent article at least partially overlap in the thickness direction of the absorbent article.

25

Claim 9

The absorbent article according to any one of claims 1 to 8, wherein

the absorbent article further comprises a second sheet between the liquid-permeable top sheet and the absorbent core, and

30

the absorbent article has a plurality of compressions formed by compressing the liquid-permeable top sheet and the second sheet together in the direction of their lamination.

35

Claim 10

The absorbent article according to any one of claims 1 to 9, wherein the absorbent article has a plurality of compressions formed by compressing the liquid-permeable top sheet, a second sheet as desired, and an absorbent core, together in the direction of their lamination.

5