X are arranged at constant intervals in the lateral direction Y, and the lateral grooves 45Y extending in the lateral direction Y are arranged at constant intervals in the longitudinal direction X. The small absorbent portions 46 are respectively located at the lattice cells partitioned by the longitudinal grooves 45X and the lateral grooves 45Y. The aforementioned thickness and basis weight of the first region 41F and the second region 41R refer to the thickness and basis weight of the small absorbent portions 46.

[0045]

In the napkin 1, the absorbent core 41--which includes the grooves 45 and the small absorbent portions 46 in the first region 41F and the second region 41R and includes the raised portion 42, the raised-portion boundary groove 43, and the raised-portion adjacent portion 44 in the middle region 41M--is integrally molded as a whole. "Integrally molded" means that the core is made by using the same material and formed integrally in a single step, as opposed to joining components that have been manufactured in separate steps by joining means such as an adhesive or compression.

[0046]

The aforementioned absorbent core 41 of the napkin 1 can be manufactured, for example, by employing a fiber-stacking device including a fiber-stacking drum 54 that has collecting/stacking depressions 55 in the outer peripheral surface thereof and that rotates in one direction R as illustrated in Fig. 5(a), and a duct (not illustrated) for supplying core material in an airborne and dispersed state onto the outer peripheral surface of the fiber-stacking drum 54.

A plurality of the collecting/stacking depressions 55 are formed in the outer peripheral surface of the fiber-stacking drum 54 at predetermined intervals in the circumferential direction. The bottom surface 56 of each collecting/stacking depression 55 is made, for example, of a mesh plate, and has a multitude of fine holes that function as suction holes.

[0047]

As illustrated in Fig. 5(a), a depression 56b for forming the middle region

41M of the absorbent core 41 is formed in a portion of the bottom surface 56 of a single collecting/stacking depression 55. First sparingly-air-permeable members 57 for forming the respective raised-portion boundary grooves 43, which are for partitioning the raised portion 42 and the raised-portion adjacent portions 44, are arranged at the bottom surface of the depression 56b. The first sparingly-air-permeable members 57 are arranged at positions corresponding to the respective raised-portion boundary grooves 43 and are fixed so as to project from the bottom surface of the depression 56b. Further, second sparingly-air-permeable members 58 for forming the respective grooves 45 are arranged at the bottom surface 56 in an upstream-side region and a downstream-side region which are adjacent to the depression 56b in the rotating direction R. The second sparingly-air-permeable members 58 are arranged at positions corresponding to the respective longitudinal grooves 45X and lateral grooves 45Y, and are fixed so as to project from the bottom surface 56 of the collecting/stacking depression 55. The first sparingly-air-permeable members 57 and the second sparingly-air-permeable members 58 may be air-impermeable members, and may be made, for example, of metal, plastic, or ceramic.

[0048]

Like known fiber-stacking devices including a fiber-stacking drum, by supplying core material, which is a mixture of a water-absorbing polymer and pulp fiber, into the duct while performing suction from the bottom surface of the collecting/stacking depression 55, the core material accumulates in the collecting/stacking depression 55 so as to have a predetermined shape, as illustrated in Fig. 5(b). The accumulation 40 is removed from the collecting/stacking depression 55, to obtain a precursor of an absorbent core 41. The absorbent core 41's precursor is then covered by a core-wrap sheet (not illustrated), is then cut by, for example, a rotary cutter, and transported in a transporting direction by a transporting means such as a belt conveyor. In this way, an absorbent core 41 is obtained. The thus-obtained absorbent core 41, which is covered by a core-wrap sheet (not illustrated), is entirely or partially pressurized and moderately compressed by, for example, being passed between a pair of rollers once or a plurality of times. Thus, the portion that has accumulated in the depression 56b becomes the raised portion 42 having a relatively large basis weight and thickness.

the shape illustrated in Fig. 10(b) was different from the absorbent core illustrated in Fig. 9 in terms that the raised portion 42' had a raised central portion 421X that does not span the entire width of the absorbent core 41. The thickness and the basis weight of the raised portion 42' were the same as those of the napkin of Example 1, and the thickness and the basis weight of the first region 41F' and the second region 41R' were the same as those of the napkin of Example 1. The entire length, in the longitudinal direction X, of the raised portion 42' was 63% of the entire length, in the longitudinal direction X, of the absorbent core 41'.

[0087]

{Comparative Example 3}

A napkin of Comparative Example 3 was prepared as in the napkin of Example 1, except that an absorbent core 41' having the shape illustrated in Fig. 10(c) was used to manufacture a sanitary napkin. The absorbent core 41' having the shape illustrated in Fig. 10(c) was different from the absorbent core illustrated in Fig. 9 in terms that the raised portion 42' had a raised central portion 421X that does not span the entire width of the absorbent core 41, and that the raised central portion 421X was formed in a cross-shape. The thickness and the basis weight of the raised portion 42' were the same as those of the napkin of Example 1, and the thickness and the basis weight of the first region 41F' and the second region 41R' were the same as those of the napkin of Example 1. The entire length, in the longitudinal direction X, of the raised portion 42' was 63% of the entire length, in the longitudinal direction X, of the absorbent core 41'.

[0088]

{Evaluation}

The rigidity of the napkin of Example 1 and the napkins of Comparative Examples 1 to 3 were evaluated according to the following method.

First, the napkin of Example 1 and the napkins of Comparative Examples 1 to 3 that were prepared were stored in a test room at a temperature of 23°C and humidity of 50% for 24 hours. These napkins were then employed as measurement samples, and the rigidity value thereof was measured under the same environmental conditions according to the Handle-O-Meter method (JIS L-1096). A

Handle-O-Meter from Daiei Kagaku Seiki Mfg. Co., Ltd. (model type HOM-200) was used. The measurement sample was placed on a sample stage with the non-skin-side sheet facing downward such that the longitudinal direction of the sample was at right angles to the 10-mm-wide slot. Then, starting from a position located 10 mm away toward the front zone side from the raised portion's tip end on the front zone side, the blade of a penetrator was lowered at positions of every 10 mm toward the raised portion at a constant speed of 200 mm/min, and the maximum value indicated by an indicator (load meter) when the penetrator was pressed-in to a depth of 8 mm was read off. Five samples were measured for each of the napkin of Example 1 and the napkins of Comparative Examples 1 to 3. The respective average values of the measurement results are shown in Fig. 11.

[0089]

As is clear from the results shown in Fig. 11, in the napkin of the Example 1, the rigidity value increases smoothly in a region around the raised portion's tip end on the front zone side, compared to the napkins of Comparative Examples 1 to 3. It was found that the napkin of Example 1 was capable of deforming flexibly and was less likely to form bent/folded portions because there was no section where the rigidity increased sharply. By using the napkin of Example 1, the napkin is less likely to cause uncomfortableness to the wearer thanks to excellent conformability to the shape of the body, and also sufficient absorption performance can be expected because the napkin is less likely to form a gap between it and the wearer's skin, even if the napkin is attached slightly out of position.

Industrial Applicability

[0090]

According to the invention, the absorbent article is less likely to cause uncomfortableness to the wearer thanks to excellent conformability to the shape of the body, and also sufficient absorption performance can be achieved because the absorbent article is less likely to form a gap between it and the wearer's skin, even if the absorbent article is attached slightly out of position.

CLAIMS

1. An absorbent article comprising an absorbent core having a shape that is long in a longitudinal direction corresponding to a wearer's front-to-rear direction, the absorbent article having a front zone and a rear zone, wherein:

the absorbent core has a first region located on the front zone side, a second region located on the rear zone side, and a middle region located between the first region and the second region;

the absorbent core includes, in the middle region, a raised portion that has a greater thickness than the thickness of the first region and that of the second region;

in a planar view of the absorbent core, the raised portion has a maximum width portion at which the length in a lateral direction, which is orthogonal to the longitudinal direction of the absorbent core, becomes the greatest;

the length, in the lateral direction, at the maximum width portion is the same as the length, in the lateral direction, of the absorbent core;

the raised portion includes a raised central portion in which the maximum width portion is formed so as to extend over a predetermined length in the longitudinal direction and conform to both lateral side edges of the absorbent core which extend along the longitudinal direction;

the raised portion includes: a front-side projection in which its length, in the lateral direction, becomes narrower than the maximum width portion from the raised central portion toward the front side; or a rear-side projection in which its length, in the lateral direction, becomes narrower than the maximum width portion from the raised central portion toward the rear side;

the absorbent core includes, in the middle region, a raised-portion boundary groove defining a boundary between the raised portion and a portion other than the raised portion; and

the raised-portion boundary groove extends along both lateral sides forming the front-side projection or along both lateral sides forming the rear-side projection, and is formed so as to span the entire length, in the lateral direction, of the absorbent core.

2. The absorbent article according to claim 1, wherein the raised portion

includes the front-side projection and the rear-side projection.

3. The absorbent article according to claim 2, wherein:

the front-side projection is singular in quantity and is arranged at a front end portion, in the longitudinal direction, of the raised central portion;

the rear-side projection is singular in quantity and is arranged at a rear end portion, in the longitudinal direction, of the raised central portion; and

each of the front-side projection and the rear-side projection is formed such that its length in the lateral direction gradually decreases from both lateral sides which extend along the longitudinal direction toward an apex located in a central portion in the lateral direction.

4. The absorbent article according to any one of claims 1 to 3, wherein the raised portion does not have, on a skin-facing surface side, a depression in which the basis weight is lower than the basis weight of the first region and that of the second region in the absorbent core.

5. The absorbent article according to any one of claims 1 to 4, wherein the raised portion is formed so as to have a higher basis weight than the basis weight of the first region and the basis weight of the second region in the absorbent core.

6. The absorbent article according to any one of claims 1 to 5, wherein:

the absorbent core includes, in the middle region, a raised-portion boundary groove defining a boundary between the raised portion and a portion other than the raised portion; and

the raised-portion boundary groove is formed so as to span the entire length, in the lateral direction, of the absorbent core.

7. The absorbent article according to any one of claims 1 to 6, wherein the raised-portion boundary groove is formed so as to have a lower basis weight than the basis weight of the first region and the basis weight of the second region in the absorbent core.

8. The absorbent article according to any one of claims 1 to 7, wherein:

the raised portion includes a raised central portion in which the maximum width portion is formed so as to extend over a predetermined length in the longitudinal direction and conform to both lateral side edges of the absorbent core which extend along the longitudinal direction; and

in a cross-sectional view, the raised central portion is formed such that its basis weight decreases from its central portion in the lateral direction toward both lateral sides which extend along the longitudinal direction.

9. The absorbent article according to any one of claims 1 to 8, wherein the absorbent core includes a continuous layer that is not divided/separated over the entire planar direction.

10. The absorbent article according to any one of claims 1 to 9, wherein:

the absorbent article includes a skin-side sheet forming a skin-facing surface, a non-skin-side sheet forming a non-skin-facing surface, and the absorbent core interposed between the two sheets;

the absorbent core includes a raised-portion boundary groove defining a boundary between the raised portion and a portion other than the raised portion, and includes, in the middle region, a raised-portion adjacent portion in a region other than the raised portion and the raised-portion boundary groove;

the absorbent article includes, as a linear groove formed by compressing and integrating the skin-side sheet and the absorbent core, a pair of longitudinal compressed grooves that extend along the absorbent core's longitudinal direction; and

the longitudinal compressed grooves are formed so as to run longitudinally through the raised portion, the raised-portion boundary groove, and the raised-portion adjacent portion along the longitudinal direction.

11. The absorbent article according to any one of claims 1 to 10, wherein:

a groove extending in the lateral direction is arranged in each of the first region and the second region of the absorbent core; and

the basis weight of a material forming the absorbent core is lower in the

groove than in a portion other than the groove in the first region and the second region.

12. The absorbent article according to any one of claims 1 to 11, wherein:

a groove extending in the longitudinal direction is arranged in each of the first region and the second region of the absorbent core; and

the basis weight of a material forming the absorbent core is lower in the groove than in a portion other than the groove in the first region and the second region.

13. The absorbent article according to any one of claims 1 to 12, wherein the absorbent core is made by integral molding.