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DISPOSABLE DIAPER



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This invention relates to a disposable diaper and more particularly to such a diaper improved so that occurrence of urination can be visually recognized as soon as possible from the outside of the diaper.

Japanese Patent Application Disclosure No. 1993-200063 describes a breathable liquid-impervious sheet used as a backsheet in a disposable diaper. This sheet comprises a polyolefine plastic sheet containing grains of inorganic filler. The sheet presenting surfaces made rough by the presence of the grains is heat-embossed so that the heat-embossed regions may be smoothed. The smoothed regions of the sheet exhibit a sufficiently high light transmissivity to facilitate an absorbent pad wetted with urine to be visually recognized from the outside of the backsheet. Regions remaining rough, on the other hand, exhibit a poor light transmissivity and does not contribute to visual recognition of urination. These rough regions rather contribute to concealment of the stained absorbent pad.

The sheet of prior art having both the high light transmissivity and the concealing property must be subjected to a step of heat-embossing in addition to a step of sheet

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extrusion. With a consequence, a manufacturing cost may correspondingly increase.

It is an object of this invention to improve the backsheet used in the disposable diaper having both the high light transmissivity and the concealing property so as to be supplied at a low cost.

According to this invention, there is provided a disposable diaper comprising a liquid-pervious topsheet, a breathable liquid-impervious backsheet and a liquid-absorbent core disposed between these two sheets, wherein: the backsheet is made of a stretched plastic film containing grains of inorganic filler, the backsheet presents surfaces roughed by the presence of the grains and has a moisture permeability of $800 \sim 3000 \text{ g/m}^2 \cdot 24 \text{ hr}$ and a total light transmissivity of $60 \sim 85 \%$.

This invention includes preferred embodiments as will be described:

The backsheet is bonded to the core by means of hot melt adhesive agent to ensure that a situation in which the core has been wetted with urine can be visually recognized from the outside of the backsheet more easily in regions of the hot melt adhesive agent than in the remaining regions.

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Regions of the backsheet having been applied with the hot melt adhesive agent are substantially smoother than the remaining regions.

Fig. 1 is a partially cutaway perspective view showing a diaper according to this invention; and

Fig. 2 is a plan view showing the diaper as viewed from the side of a backsheet and as partially broken away.

The invention will be more fully understood from the description given hereunder with reference to the accompanying drawings.

A disposable diaper 1 shown by Fig. 1 in a partially cutaway perspective view comprises a liquid-pervious topsheet 2, a breathable liquid-impervious backsheet 3 and a liquid-absorbent core 4 disposed between these two sheets 2, 3 wherein the two sheets 2, 3 are bonded by means of hot melt adhesive agent 16 to each other along their portions extending outward beyond a peripheral edge of the core 4. Longitudinally of the diaper 1, front and rear waist regions 6, 7 and a crotch region 8 extending between these two waist regions 6, 7. In the crotch region 8, transversely opposite side edges of the diaper 1 are curved inward and these curved

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side edges are provided with elastic members 9 destined to be associated with leg-openings secured under tension thereto. A pair of tape fasteners 11 extend laterally from transversely opposite side edges of the rear waist region 7. The rear waist region 7 is provided along its longitudinal end with an elastic member 12 destined to be associated with a waist-opening. The elastic members 9, 12 are disposed between the topsheet 2 and the backsheet 3 and secured under tension to the inner surface of at least one of the topsheet 2 and the backsheet 3.

The topsheet 2 is made of a nonwoven fabric or porous plastic sheet and preferably has a moisture resistance of 0 ~ 200 mm as measured according to JIS-L-1092.

The backsheet 3 is made of a mono- or biaxially oriented plastic film, for example, a polyolefine based film containing grains of suitable inorganic filler such as calcium carbonate or barium sulfate. The backsheet 3 has a breathability of $800 \sim 3000 \text{ g/m}^2 \cdot 24 \text{ hr}$ as represented by a corresponding moisture permeability as measured in accordance with JIS-Z-0208. The backsheet 3 has a total light transmissivity of 65 ~ 85 % as measured in accordance with JIS-K-7105.

The core 4 comprises a mixture of fluff pulp and

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superabsorptive polymer particles molded in an hourglass-shape and then covered with tissue paper 13.

Fig. 2 is a partially cutaway plan view showing the diaper 1 as viewed from outside of the backsheet 3. The crotch region 8 is illustrated to be in a state enabling occurrence of urination to be visually recognized from the outside of the backsheet. The backsheet 3 is bonded to the tissue paper 13 covering the core 4 and the topsheet 2 by means of hot melt adhesive agent 16 applied to the backsheet 3 to form a plurality of straight stripes extending longitudinally of the backsheet 3. In the crotch region 8, the tissue paper 13 is wetted with urine discharged on the diaper 1 and this situation can be visually recognized from outside of the backsheet 3. Particularly in the stripe-like regions along which the backsheet 3 is in close contact with the tissue paper 13, the occurrence of urination distinctly appear in the form of plural lines as shown. The backsheet 3 has rough surfaces and such roughness substantially disappears in the regions of the hot melt adhesive agent 16. As a result, light diffusion significantly decreases in the regions which enables then the occurrence of urination to be visually recognized. It should be understood here that such effect of the hot melt adhesive agent can be obtained only when the

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moisture permeability and the total light transmissivity of the backsheet 3 are in the ranges, respectively. To make the effect more reliable, it is desirable to bind the hot melt adhesive agent and the backsheet 3 together when the hot melt adhesive agent is at a proper temperature to soften or slightly melt the backsheet 3.

It is possible without departing from the scope of the invention to apply the hot melt adhesive agent 16 in an appropriate pattern other than the rectilinear pattern as shown, for example, a spiral pattern.

With the disposable diaper as has been described hereinabove, it is unnecessary to subject the breathable liquid-impervious backsheet to any additional treatment such as the heat-embossing in other than the occurrence of urination can be visually recognized from the outside of the backsheet. Accordingly, the disposable diaper's backsheet according to this invention can be made at a low cost and the diaper can be supplied at a correspondingly low price.

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WHAT IS CLAIMED IS:

1. A disposable diaper (1) comprising a liquid-pervious topsheet (2), a breathable liquid-impervious backsheet (3) and a liquid-absorbent (4) core disposed between these two sheets (2), (3), wherein:

said backsheet (3) is made of a stretched plastic film containing grains of inorganic filler, said backsheet (3) presents surfaces roughed by the presence of said grains and has a moisture permeability of $800 \sim 3000 \text{ g/m}^2 \cdot 24 \text{ hr}$ and a total light transmissivity of $60 \sim 85 \%$.

2. The disposable diaper (1) according to Claim 1, wherein said backsheet (3) is bonded to said core (4) by means of hot melt adhesive agent (16) to ensure that a situation in which said core (4) has been wetted with urine can be visually recognized from the outside of said backsheet (3) more easily in regions of said hot melt adhesive agent (16) than in the remaining regions.

3. The disposable diaper (1) according to Claim 1, wherein regions of said backsheet (3) having been applied with said hot melt adhesive agent (16) are substantially smoother than

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the remaining regions.