

-1-

BREAST-MILK ABSORBENT PAD

The present invention relates to a breast-milk absorbent pad and, more particularly, to a breast-milk absorbent pad used by women during their breast-feeding.

Conventional breast-milk absorbent pads generally comprise a liquid-permeable inner sheet, a liquid-impermeable outer sheet and a liquid-absorbent core formed of a mixture of fluff pulp fibers and superabsorbent polymer powders in a conic-shape.

However, such known breast-milk absorbent pads as mentioned above are inconvenient in that an attempt to obtain an agreeable touch for a woman's breasts would result in pads which are too soft to be kept in its conic-shape and to be easily inserted between a woman's brassieres and breasts. On the other hand, an attempt to facilitate the pads to be kept in the conic-shape would result in pads which are too hard to afford an agreeable touch.

As for a liquid absorption property of the breast-milk absorbent pad, a relatively soft pad is generally characterized by a density of fluff pulp fibers used for the core lower than that of a relatively hard pad and inferior to the hard pad in liquid diffusing as well as liquid holding

0-1810002

properties in spite of its high instantaneous liquid absorption rate. Consequently, only a region of the core being in contact with a woman's nipples will be moistened but a peripheral region of the core remains dry and eventually the pad will be disposed although the pad still has an ability of liquid absorption in reserve. On the other hand, a relatively hard pad is generally characterized by a density of fluff pulp fibers higher than that of the soft pad and has a high liquid diffusing property but is inferior to the soft pad in the liquid absorption rate which is too low to overtake secretion of breast-milk if it is active.

An objection of the invention is to solve the problems as described above by adjusting a fiber density in the core of the breast-milk absorbent pad so that the density may be lower in a central region than in a peripheral region of the core.

The object set forth above is achieved, according to the invention, by a breast-milk absorbent pad comprising a liquid-permeable inner sheet, a liquid-impermeable outer sheet and a liquid-absorbent core disposed between these two sheets, wherein at least 30% by weight of the liquid-absorbent core comprises hydrophilic fibers so arranged to have a gradient of fiber density lower in a central region

and higher in a peripheral region of the core, preferably, increasing and, more preferably, gradually increasing from the central region toward the peripheral region of the core.

With the breast-milk absorbent pad of such construction, the feeling for a woman's nipples can be improved by decreasing the fiber density in the central region of the core to make this region softer than the peripheral region of the core while a shape stability of the pad can be improved by increasing the fiber density in the peripheral region to make this region harder than the central region.

Fig. 1 is a perspective view of a breast-milk absorbent pad according to the invention; and

Fig. 2 is a vertical sectional view of the breast-milk absorbent pad.

Referring to Figs. 1 and 2, a pad 1 comprises a liquid-permeable inner sheet 2, a liquid-impermeable outer sheet 3 and a liquid-absorbent core 4 disposed between these two sheets 2, 3, and is generally in a conic-shape having a height of 25 to 45mm and a diameter of 80 to 140mm. The inner and outer sheets 2, 3 are bonded to each other along portions thereof extending outward beyond a periphery of the core 4.

The inner sheet 2 is made of liquid-permeable material

such as a woven or nonwoven fabric and the outer sheet 3 is made of liquid-impermeable material such as a plastic film or, if desired, a liquid-repellent treated woven or nonwoven fabric. The core 4 contains at least 30% by weight of hydrophilic fibers such as fluff pulp fibers or rayon fibers and a mixture of them and may additionally contain at most 20% by weight of thermoplastic synthetic fibers which have been subjected or not to a well known treatment making the thermoplastic synthetic fibers hydrophilic. Such synthetic fibers contribute to thermoformability, weldability and liquid diffusing property of the core. Furthermore, superabsorbent polymer powders may be uniformly mixed into the core 4 or may be spreaded over an intermediate plane of the core 4 in the direction of its thickness like a sandwich. At least the hydrophilic fibers of the fibrous materials used to form the core 4 are arranged so as to have a fiber density lower in the central region and higher in the peripheral region of the core 4, preferably, increasing and, more preferably, gradually increasing from the central region toward the opening peripheral edge of the core 4. For example, the fluff pulp fibers are uniformly distributed in the pad as a whole in a density of 145g/m^2 , then compressed so that a density may be in a range of 0.1 to 0.15g/cm^3 inside

a central circular region defined by a radius of 15 to 25mm and gradually increase outwardly from the central circular region to a range of 0.25 to 0.30g/cm³ at the peripheral region, and so that a thickness of the core may also gradually increase outwardly from the central region toward the peripheral region. The term "fiber density" used in the embodiment means the number of individual fibers contained in a unit volume, but the fiber density in the present invention should not be restricted in this meaning.

With the pad 1 of such construction, the central region thereof is relatively soft and feels agreeable for a woman's nipple. On the other hand, the peripheral region is hard sufficiently to be kept in shape and facilitate the pad to be inserted between a woman's brassieres and the breasts. Secreted milk can rapidly permeate the pad from region of a lower fiber density toward the region of a higher fiber density, i.e., from the central region toward the peripheral region of the core 4. Therefore, the secreted breast-milk can spread all over the core and completely use it. In other words, the breast-milk absorbent pad 1 eliminates the wastefulness that the pad still having a milk absorbing capacity in reserve must be disposed.

The breast-milk absorbent pad according to the invention

feels agreeable for a woman's nipple and is well kept in shape, since the fibrous material of the liquid-absorbent core has a gradient of fiber density lower in the central region and higher in the peripheral region of the pad. In addition, permeation of the secreted milk toward the peripheral region is sufficiently rapid to prevent the central region of the pad from being unacceptably moistened. This feature contributes to improve comfortableness to wear and allows the liquid absorptive materials of the core to be completely and effectively utilized.



What is claimed is:

1. A breast-milk absorbent pad comprising:
a liquid-permeable inner sheet;
a liquid-impermeable outer sheet;
a liquid-absorbent core disposed between said inner sheet and said outer sheet; and
at least 30% by weight of said core comprising hydrophilic fibers so arranged to have a gradient of fiber density lower in a central region and higher in a peripheral region of said core.
2. A breast-milk absorbent pad according to Claim 1, wherein the fiber density of said core increasing from the central region toward the peripheral region of said core.
3. A breast-milk absorbent pad according to Claim 1, wherein said core is compressed so that said fiber density may gradually increase from the central region toward the peripheral region of said core.
4. A breast-milk absorbent pad according to Claim 1, wherein said core is compressed so that a thickness of said core may gradually increase from the central region toward the peripheral region of said core.
5. A breast-milk absorbent pad according to Claim 1, wherein said core is harder in the peripheral region than in



-8-

the central region of said core.

6. A breast-milk absorbent pad according to Claim 1, wherein said core contains at most 20% by weight of thermoplastic synthetic fibers and is thermoformed.

7. A breast-milk absorbent pad according to Claim 1, wherein said core is generally formed in a conic-shape.