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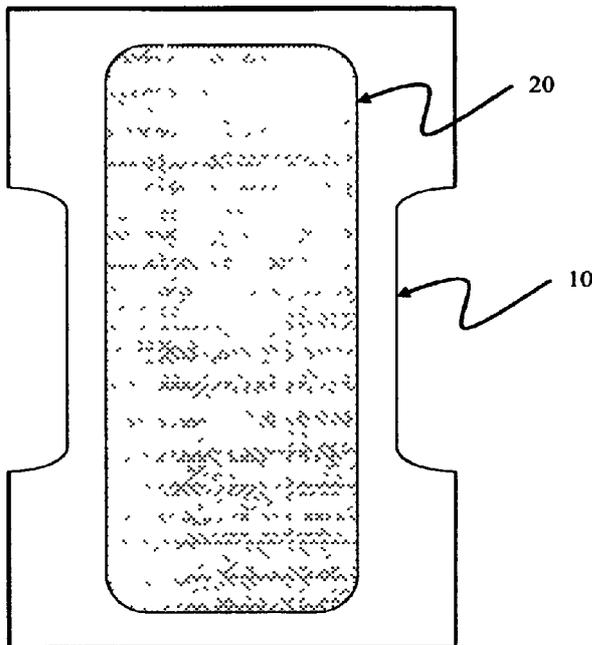
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(54) **Title:** ABSORBENT PRODUCT WITH DEHYDRATION DETECTION SYSTEM



(57) **Abstract:** The present invention discloses an absorbent garment having a liquid permeable top sheet, a liquid impermeable back sheet and an absorbent core positioned there between. The absorbent core comprises synthetic fibers and super absorbent particulate wherein these two components are a color that are distinct from each other. It is possible to approximate the volume of any liquid discharge by measuring the approximate diameter of the mark made by the liquid swelled super absorbent particulate.



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ABSORBENT PRODUCT WITH DEHYDRATION DETECTION SYSTEM

BACKGROUND OF INVENTION

5 Dehydration occurs when your body loses too much fluid. This can happen when you stop drinking water or lose large amounts of fluid through diarrhea, vomiting, sweating, or over exertion. Not drinking enough fluids can cause muscle cramps and faintness. Usually your body can reabsorb fluid from your blood and other body tissues, but by the time you become severely dehydrated, you no longer have enough fluid in your body to get blood to your organs, and you may
10 go into shock, which is life threatening.

This issue is particularly acute in babies and some of the iniirmed, whom are less able to communicate their symptoms that are clinical indicators of dehydration. In addition, babies and children have increased chances of becoming dehydrated because a greater proportion of their bodies are made of water. Also, children have a higher metabolic rate so they use more water.
15 Adding to the severity of dehydration, children typically will not drink when they are not feeling well.

Some baby diapers and adult incontinent diapers are sometimes equipped with "wetness indicators" that can aid in providing a visual cue that the wearer has wet the diaper, information useful to the caregiver. However, in a conventional wood fluff type absorbent diaper, if the liquid
20 insult is less than 30 milliliters, the liquid may wick within the fluff preventing the liquid from reaching the graphic wetness indicator. See for example U.S. Patent No. 4,022,211 to Timmons *et al.*, U.S. Patent No. 4,192,311 to Felfoldi, U.S. Patent No. 4,231,370 to Mroz *et al.*, U.S. Patent No. 4,738,674 and U.S. Patent No. 5,766,212 to Jitoe *et al.*

Accordingly, there is a need in the art for a novel and low cost absorbent garment that can
25 provide a visual indicator to a caregiver and provide a means to determine the approximate amount of the volume of the liquid insult.

SUMMARY OF INVENTION

The present invention discloses an absorbent garment having a liquid permeable top sheet, a liquid impermeable back sheet and an absorbent core positioned there between. The absorbent core
5 **comprises synthetic fibers and super absorbent particulate wherein these two components are visually distinct colors. It is possible to approximate the volume of any liquid discharge by measuring the approximate diameter of the mark made by the liquid swelled super absorbent particulate.**

In accordance with another aspect, the present invention discloses a method for detecting
10 **dehydration in a person comprising the steps of placing an absorbent garment on a person for a clinically meaningful period of time, said absorbent garment having a liquid permeable top sheet, a liquid impermeable back sheet; and an absorbent core positioned in between that is constructed of colored synthetic fibers and super absorbent particulate. The next step is to visually inspect the absorbent garment to determine the amount of liquid body exudates released within said period of**
15 **time. The volume of the liquid exudates can be approximated by measuring the median diameter of the mark created.**

The above and other aspects and advantages of the present invention will become apparent from the following detailed description of the preferred embodiments.

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BRIEF DESCRIPTION OF DRAWINGS

Figure 1 illustrates a top view of a conventional diaper showing the absorbent synthetic core.

5 Figure 2 illustrates a cross-sectional view of the absorbent core showing the synthetic fibers.

Figure 3 illustrates how liquid exudates volume could be approximated by measuring the median diameter of the mark.

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DETAILED DESCRIPTION OF INVENTION

The invention relates to an absorbent garment having a liquid permeable top sheet, a liquid impermeable back sheet and an absorbent core positioned there between. The absorbent core
5 comprises synthetic fibers and super absorbent particulate wherein the super absorbent particulate is a color that is visually distinct from the synthetic fibers. It is possible to approximate the volume of any liquid discharge by measuring the approximate diameter of the mark made by the liquid swelled super absorbent particulate when viewed through the back sheet.

FIGURE 1 is a plan view of an absorbent garment (diaper or brief) in its uncontracted state
10 with the center oval area showing the absorbent core 20 and diaper chassis 10. Typical diaper construction consists of a liquid pervious top sheet, a liquid impermeable back sheet and an absorbent core sandwiched there between. It is understood that a variety of absorbent garment constructions know in the art could incorporate the absorbent core of the present invention.

FIGURE 2 shows a cut away cross-section of absorbent garment, showing synthetic fiber
15 matrix 30, super absorbent particulate 40 and wrap 50, top sheet 60 and back sheet 70.

Figure 3 shows bottom view of a soiled absorbent garment with absorbent core 20 and chassis 10. When the absorbent garment is soiled the median diameter of soil mark 22 approximates the volume of liquid exudate. For example, it has been found that when 10 milliliters of liquid are poured onto a diaper with the synthetic fiber core, the resultant mark created will have
20 the median diameter of about 10 centimeters. The same was found for 5 and 15 milliliters, i.e. a median diameter of 5 centimeters correlated with a volume of 5 milliliters and a median diameter of 10 centimeters correlated with a volume of 10 milliliters.

The "top sheet" of the present invention can be any permeable polymeric plastic non-woven sheet known in the state of the art. A suitable top sheet may be made from apertured plastic films,
25 polyolefin fibers (e.g. polyethylene or polypropylene fibers) or combinations thereof. It is understood that additional layers may be present between the absorbent core and the top sheet.

The "absorbent core" can be any synthetic material known in the state of the art that can be made into tow. Such materials include synthetic materials such as polyolefins, rayon, polycarbonates and cellulose acetate. Polyolefins include polypropylene and polyethylene. An
30 added criterion of any synthetic fibers is that it needs to have a color that is visually distinct from the super absorbent particulate used. If the synthetic fiber is colored this would increase its visibility, assisting machine line operates in trouble shooting during the manufacturing process.

The super absorbent particulate of the present invention can be any conventional water-swallowable material such as synthetic hydrogel polymer. These include polyacrylic acids. Again, the super absorbent particulate needs to have a visually distinct color from the synthetic fiber used.

5 The "back sheet" of the present invention can be any impermeable polymeric plastic and/or non-woven sheet known in the state of the art. A suitable back sheet may be made from films polyethylene, polypropylene, polyester, nylon, and polyvinyl chloride and blends of these materials. It is understood that additional layers may be present between the absorbent core and the back sheet. It is preferable that the back sheet be a color that is distinct from the super absorbent particulate. Typically, the back sheet should not contain designs that will interfere in the ability to measure the
10 liquid exudates mark.

While particular embodiments and/or individual features of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other changes and modifications can be made without departing from the spirit and scope of the invention. Further, it should be apparent that all combinations of such embodiments and features are possible
15 and can result in preferred executions of the invention. Therefore, the appended claims are intended to cover all such changes and modifications that are within the scope of the invention.

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CLAIMS**I claim:**

1. An absorbent garment comprising:
 - 5 a. a liquid permeable top sheet;
 - b. a liquid impermeable back sheet; and
 - c. an absorbent core positioned there between comprising:
 - i. colored synthetic fibers; and
 - ii. super absorbent particulate;wherein the super absorbent particulate is a color that is visually distinct from the colored synthetic fibers.
- 10 2. The absorbent product of claim 1, wherein the synthetic fibers are selected from the group consisting of rayon, polypropylene, cellulose acetate or polyethylene.
- 15 3. The absorbent product of claim 1, wherein the colored synthetic fibers are selected from the group consisting of blue, red, orange, green or purple synthetic fiber.
4. A method for detecting dehydration in a person comprising:
 - 20 a. placing an absorbent garment on a person for a clinically meaningful period of time, said absorbent garment having:
 - i. a liquid permeable top sheet;
 - ii. a back sheet; and
 - iii. an absorbent core comprising, colored synthetic fibers and super absorbent
 - 25 b. visually inspecting the absorbent garment to determine the amount of liquid body exudates released within said period of time.
5. The method of claim 4 wherein the method includes the step of measuring the median diameter of the mark created by the liquid exudates, wherein the median diameter approximates the volume of the liquid exudate.
- 30 6. An absorbent garment comprising:

- a. a liquid permeable top sheet;
- b. a back sheet; and
- c. an absorbent core positioned there between comprising:
 - iii. synthetic fibers; and
 - iv. super absorbent particulate;

5 wherein the super absorbent particulate is a color that is visually distinct from the synthetic fibers.

- 10** 7. The absorbent product of claim 6, wherein the synthetic fibers are selected from the group consisting of rayon, polypropylene, cellulose acetate or polyethylene.

FIGURE 1

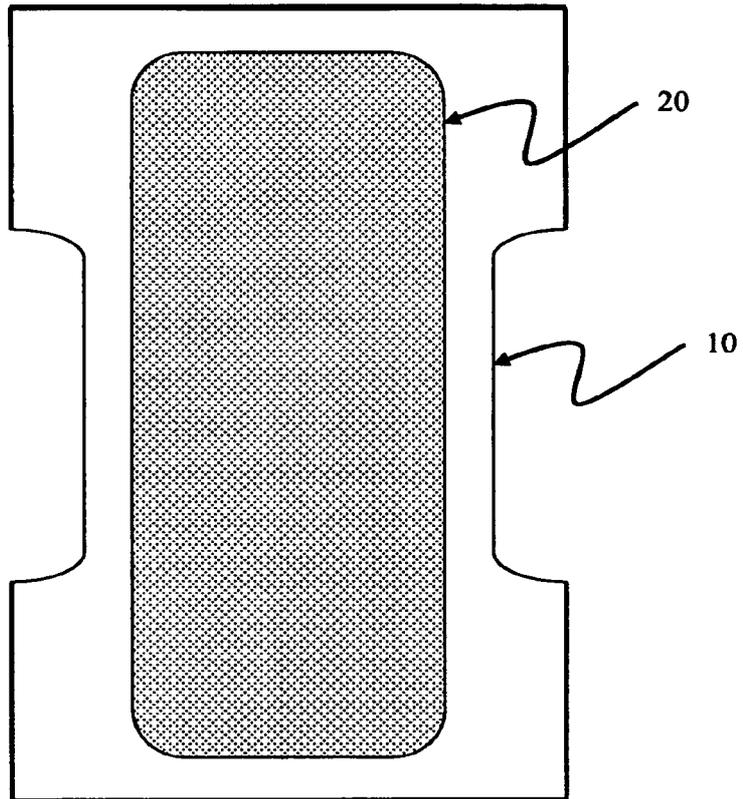


FIGURE 2

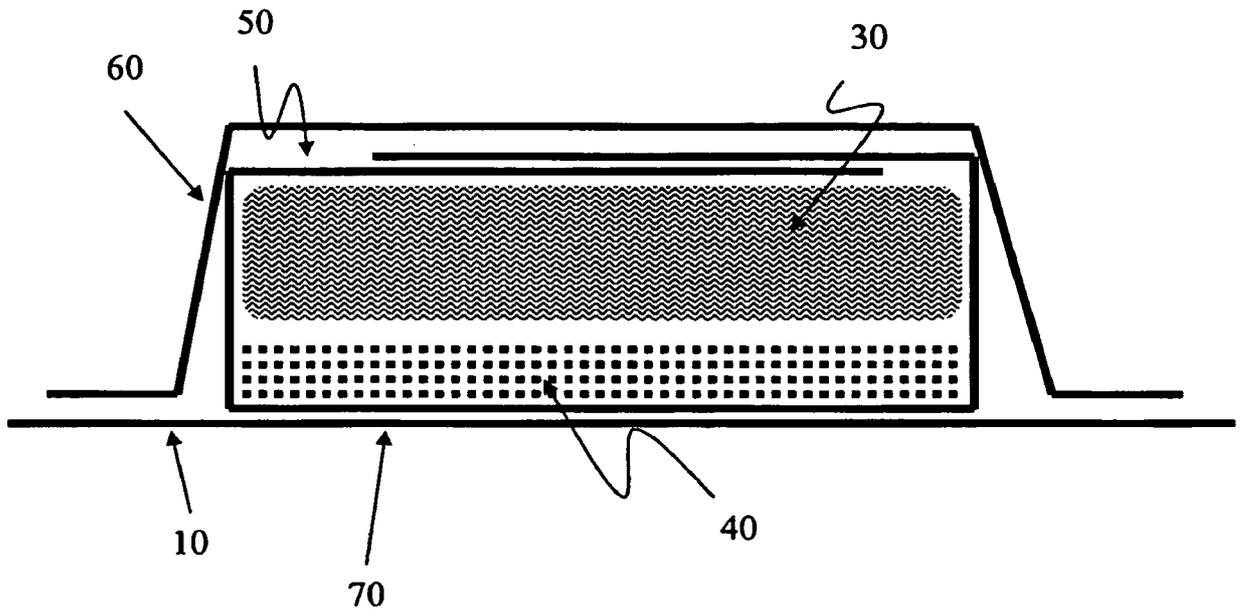
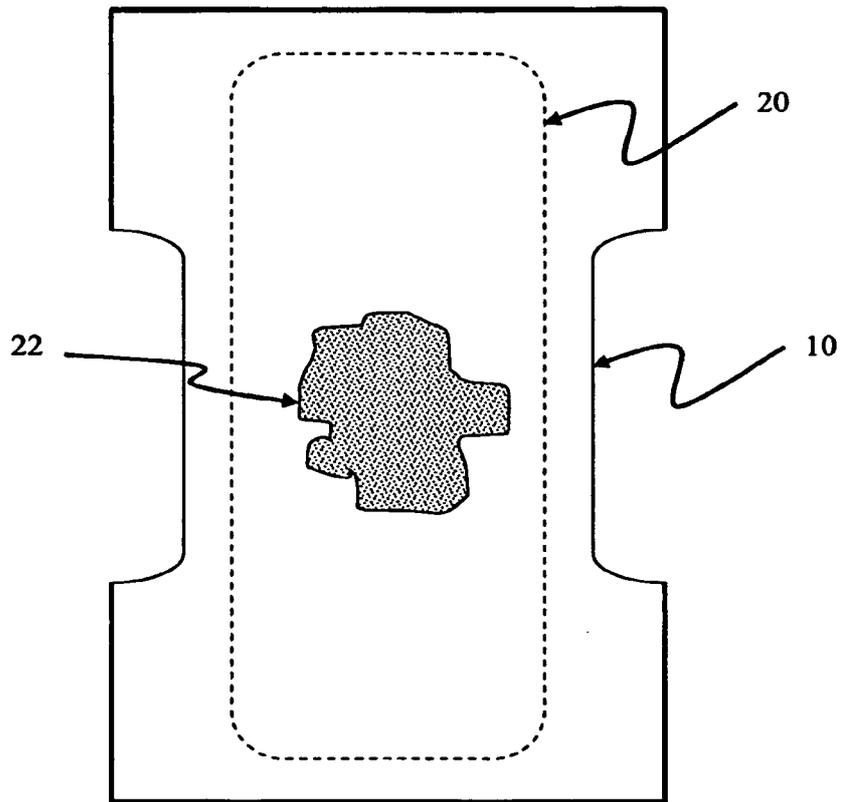


FIGURE 3



INTERNATIONAL SEARCH REPORT

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PCT/US07/06865

A CLASSIFICATION OF SUBJECT MATTER

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USPC - 604/378

According to International Patent Classification (IPC) or to both national classification and IPC

B FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC(8) - A61 F 378 (2007 10)

USPC - 604/378

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PatBase

C DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No |
|-----------|---|----------------------|
| Y | US 2006/0069367 A 1 (WAKSMUNDZKI et al) 30 March 2006 (30 03 2006) entire document | 1-7 |
| Y | US 2004/0132377 A 1 (FUJIKAWA et al) 08 July 2004 (08 07 2004) paragraph [0038] | 1-4, 6-7 |
| Y | US 2006/0160455 A 1 (SUGYO et al) 20 July 2006 (20 07 2006) paragraphs [0204,0212,0245] | 5 |

Further documents are listed in the continuation of Box C

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