NOVEL WICKING FABRIC AND CLOTHING

Applicants: Francisco Guerra, Lexington, AL (US); Lesley Hatfield, Jones Creek, GA (US)

Inventors: Francisco Guerra, Lexington, AL (US); Lesley Hatfield, Jones Creek, GA (US)

Filed: Jul. 15, 2014

Related U.S. Application Data

Provisional application No. 61/846,168, filed on Jul. 15, 2013.

A fabric and method of making is provided whereby a sugar alcohol is disposed on wicking fabric to increase moisture wicking characteristics.

Publication Classification

Int. Cl. D06M 13/148 (2006.01)

U.S. Cl. D06M 13/148 (2013.01); D06M 2101/06 (2013.01)

USPC 442/118; 427/243
Evaporation Study: Unlaughered

Run 1
Run 2
Run 3

Mass (g)

Time (minutes)

Fig. 3
Evaporation Study:
3 Washes

Fig. 4
Evaporative Study: 6 Washes
Evaporation Study:
12 Washes

Fig. 7

Run 1
Run 2

Mass (g)

Time (minutes)
0 10 20 30 40 50
NOVEL WICKING FABRIC AND CLOTHING

INDEX TO RELATED APPLICATIONS

This application is a non-provisional of, and claims benefit to U.S. Provisional patent application Ser. No. 61/846, 168 filed Jul. 15, 2013 the disclosure of which is incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

Wicking fabrics are used to provide clothing articles that are typically subject to wetting. One such area in which wicking clothing is utilized is in athletic clothing and sleep garments for people who suffer from night sweats.

The subject invention has discovered a novel composition and method for improved wicking fabrics.

SUMMARY OF THE INVENTION

In one embodiment, the present invention is a fabric for use in wicking clothing comprising:

- fabric strands having micropores formed thereon; and
- a sugar alcohol disposed on said fabric strands.

Sugar alcohol (also known as polyhydric alcohol, polyalcohol, or glycol) have the general formula H2C(OH)ₙH₂.

Sugar alcohols include:
- Methanol (1-carbon)
- Glycol (2-carbon)
- Glycerol (3-carbon)
- Erythritol (4-carbon)
- Threitol (4-carbon)
- Arabitol (5-carbon)
- Xylitol (5-carbon)
- Ribitol (5-carbon)
- Mannitol (6-carbon)
- Sorbitol (6-carbon)
- Galactitol (6-carbon)
- Fucitol (6-carbon)
- Iditol (6-carbon)
- Inositol (6-carbon; a cyclic sugar alcohol)
- Volemitol (7-carbon)
- Isomalt (12-carbon)
- Maltitol (12-carbon)
- Lactitol (12-carbon)
- Maltotriitol (18-carbon)
- Maltotetraitol (24-carbon)

Polyglycerol

In one embodiment, a mixture of two or more sugar alcohols is used.

In a one embodiment, the sugar alcohol is sorbitol.

The fabric of the present invention is unique in exhibiting an increase of 10-80% of measured overall liquid moisture management capability versus fabric not having said disposed sugar alcohol.

Also contemplated is a method of producing wicking clothing, said method comprising the steps of:

- providing a fabric wherein said fabric has strands with micropores formed thereon;
- preparing a solution in a solvent containing between 0.1 to 10 g/liter of a sugar alcohol;
- disposing said sugar alcohol onto said fabric, whereby said disposing includes evaporation of said solvent.

In one embodiment, the preferred sugar alcohol is sorbitol.

The method solvent is aqueous, organic, or an aqueous-organic co-solvent.

Disposition occurs according to known and commercially acceptable methods.

The fabric of the invention provided reduction in microbial growth compared to untreated cotton fabric.

In the method the solvent is aqueous, organic, or an aqueous organic co-solvent.

The fabric and method of the present invention results in the fabric retaining 70-125% wicking property after 15 washings/laundrings compared to an unlaundered fabric.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

FIG. 1 is a graph of wicking height versus time across machine direction.

FIG. 2 is a graph of wicking height versus time with machine direction.

FIG. 3 is a graph of mass change over time in an evaporation study on unlaundered samples.

FIG. 4 is a graph of mass change over time in an evaporation study on laundered samples after 3 washes.

FIG. 5 is a graph of mass change over time in an evaporation study on laundered samples after 6 washes.

FIG. 6 is a graph of mass change over time in an evaporation study on laundered samples after 9 washes.

FIG. 7 is a graph of mass change over time in an evaporation study on laundered samples after 12 washes.

FIG. 8 is a graph of mass change over time in an evaporation study on laundered samples after 15 washes.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The term wicking refers to the fabric’s ability to absorb liquid from the surface and into the material. Unlike conventional fabrics, which retain moisture, these fabrics use capillary action to wick sweat away much like a paper towel. Moisture wicking clothes are formed of fabric embedded with microscopic pores on the inner surface of the fabric. The fabric pulls perspiration away from the skin and spreads it across the surface and then evaporates into the air.

In the manufacturing of the fabrics of the present invention, reagents are disposed on fabric and for fabric fibers.

In one embodiment, a solution is prepared in which particles are impregnated into the fabric to which between about 0.1 to 10 grams/liter of Sorbitol (sugar alcohol extract) is added to the solution. This additive assists in the durability, endurance and overall performance of the properties of the fabric. Sorbitol is a derivative from apple, pear or prune extracts, is safe, environmentally friendly and is not found in hydrophilic compounds used in processing synthetic fibers. The addition of Sorbitol allows the properties of the fabric to remain present and active and the garment will suffer no loss of performance during the lifetime of the garment. Sorbitol aids in the integrity of the wicking process in multiple machine washings, enhancing and preserving the overall hydrophilicity of the garment.

The American Association of Textile Chemists and Colorists have developed test methods for the measurement, evaluation and classification of liquid moisture management
properties of textile fabrics. The test method produces objective measurements of liquid moisture management properties of knitted, woven and nonwoven textile fabrics. The results obtained with this test method are based on water resistance, water repellency and water absorption characteristics of the fabric structure, including the fabric’s geometric and internal structure and the wicking characteristics of its fibers and yarns (AATCC Test Method 195-2012).

[0031] A Moisture Management Tester (MMT) measures, evaluates and classifies liquid management properties of fabrics per AATCC Test Method 195. The MMT evaluates absorption properties by measuring changes in electrical conductivity. A specimen is horizontally placed between an upper and lower sensor having concentric pins. A predetermined amount of a prepared test solution is dropped on the center of the upper facing surface (skin side) of the test specimen. As the solution is transported throughout the specimen, changes in electrical resistance are measured and recorded. Resistance output is then used to calculate moisture content. Results are used to grade the fabric using predetermined indices.

[0032] It is contemplated that fabrics prepared according to the present invention exhibit increased and desirable characteristics when compared to other wicking fabrics.

[0033] The evaluated parameters include, but are not limited to:

- Wetting Time—WTT (top surface);
- Wetting Time—WTB (bottom surface);
- Absorption Rate—ART (top surface);
- Absorption Rate—ARB (bottom surface);
- Maximum Wetted Radius—MWRT
- (top surface) and MWRB (bottom surface),
- Spreading Speed—SST (top surface)
- and SSB (bottom surface),
- Accumulative One-way Transport Capability—(R), and


[0036] Grading—The grading classifies material moving moisture from the back to the face with higher values.

[0037] In one embodiment, fabric of the present invention exhibits an increase in OMCC of 10-80% versus untreated fabric of the same composition.

Evaluation and Testing

[0038] Samples prepared utilizing sorbitol at 10 g/liter were tested for evaporation and vertical wicking performance testing. This validation testing will be used to standardize the wicking and evaporation performance of the inventive fabric in its unlaundered condition and after numerous laundering cycles.

Experimental Summary

Evaporation Testing

[0039] The evaporation performance of the fabric was tested as follows:

Moisture Evaporation Rate

[0040] The fabric will be cut to 1 inch by 1 inch squares. Weigh each fabric square using a Mettler Toledo XS205 balance, which is to be kept open for the duration of the experiment. After weighing each sample, tare the balance and use a pipette to put one drop of water on the balance.

[0041] Record the mass of the water. Place the fabric square on top of the water in the balance and record the total combined mass of water and fabric. Record the mass reading every 10 minutes until there is no change, meaning the water is completely evaporated. Plot the recorded masses as a function of time to produce an evaporation curve for the fabric. This test can be repeated after the fabric undergoes a standardized laundering and drying procedure to simulate a life cycle analysis of the fabric’s evaporation properties. All testing will be performed in triplicates.

Vertical Moisture Wicking Rate

[0042] Cut 10 inch by 1.5 inch samples from both the length and width of the fabric.

[0043] Mark the fabric at nine, 1 inch intervals beginning at 0.25 inch from the end of the sample. Use only a small mark on the edge of the sample—do not mark across the full width as the ink’s properties could interfere with the wicking. Fill a 1000 mL beaker with water and heat it on a hot plate to approximately 90°F to simulate human sweat. Clamp the fabric to a ring stand overhanging the beaker and hotplate so that the 0.25 inch end of the sample is completely submerged in the warm water. Record the height of the water rising up the fabric at 1 minute intervals, using the 1 inch markings on the fabric as a guide. Plot the recorded heights as a function of time to create a wicking curve for the fabric. This test can be repeated after the fabric undergoes a standardized laundering and drying procedure to simulate a life cycle analysis of the fabric’s vertical wicking properties. All testing will be performed in triplicates.

[0044] The fabric was cut into one inch squares, and the mass of the fabric was recorded over time as it allowed a certain amount of water to evaporate. The mass was recorded at 10 minute intervals on a Mettler Toledo XS205 balance. Two drops of distilled water from a Pasteur pipette were used for each test to give an appreciable amount of water to absorb and evaporate.

[0045] The fabric was tested in the unlaundered condition, and after 3, 6, 9, 12, and 15 launderings. Note: The unlaundered fabric was tested in triplicate and laundered samples in duplicate. The individual test data were plotted as mass versus time, as shown in FIGS. 3-8.

Vertical Wicking

[0046] The vertical wicking performance of the fabric was tested in accordance with the provided textile test protocol. The fabric was cut into 10 inch by 1.5 inch strips both in-the-machine direction and across-the-machine direction (FIGS. 1-2).

[0047] Each fabric strip was clipped to a vertical holder and the opposite end was submerged in a beaker of 90°F distilled
water. The height of the water wicking up the fabric was measured at one minute intervals. The fabric was tested in the unlauned condition, and after 3, 6, 9, 12, and 15 launderings. Testing was terminated when three height readings were the same. The unlauned sample was tested in triplicate and the laundered samples in duplicate. The averaged data were plotted as height versus time, as shown in FIGS. 1 and 2.

IV. Test Results

[0048] FIGS. 3-8 are plots of the evaporation data, showing the change in mass over time for each run. The numerical data for these plots is provided in Tables 1-3. The unlauned fabric allowed the water to evaporate within 30 minutes. For 3-15 launderings, the evaporation rate remained steady at an average of 50 minutes. The results of the evaporation testing show the fabric absorbs moisture and removes it via evaporation to the atmosphere. The fabric will perform in the range of data averages as shown by this testing.

[0049] The plots of the wicking data, both across-the-machine direction (FIG. 1) and in-the-machine direction (FIG. 2) demonstrate the fabric’s wicking performance. The numerical data for these tests is provided in Appendix B. All of the samples initially wick faster, with a gradual slowing until completely stopping at the end of the test. There was more slightly more variation in the wicking rate in the samples cut in-the-machine direction compared to those cut in the across-the-machine direction. The test results show the fabric wicks or removes moisture per the standard.

### TABLE 1

#### Evaporation Data

<table>
<thead>
<tr>
<th>Time (min)</th>
<th>Unlauned Run 1</th>
<th>Unlauned Run 2</th>
<th>Unlauned Run 3</th>
<th>3 Washings Run 1</th>
<th>3 Washings Run 2</th>
<th>3 Washings Run 3</th>
<th>6 Washings Run 1</th>
<th>6 Washings Run 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.1951</td>
<td>0.2043</td>
<td>0.1895</td>
<td>0.2087</td>
<td>0.198</td>
<td>0.1951</td>
<td>0.2021</td>
<td>0.1951</td>
</tr>
<tr>
<td>10</td>
<td>0.1727</td>
<td>0.1791</td>
<td>0.1656</td>
<td>0.1976</td>
<td>0.1834</td>
<td>0.1787</td>
<td>0.1814</td>
<td>0.1787</td>
</tr>
<tr>
<td>20</td>
<td>0.1518</td>
<td>0.1565</td>
<td>0.1448</td>
<td>0.1877</td>
<td>0.1665</td>
<td>0.1697</td>
<td>0.1635</td>
<td>0.1697</td>
</tr>
<tr>
<td>30</td>
<td>0.1446</td>
<td>0.1461</td>
<td>0.1371</td>
<td>0.1783</td>
<td>0.1522</td>
<td>0.1424</td>
<td>0.1482</td>
<td>0.1424</td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td>0.1654</td>
<td>0.1387</td>
<td>0.1348</td>
<td>0.1428</td>
<td>0.1348</td>
</tr>
<tr>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td>0.16</td>
<td>0.135</td>
<td>0.137</td>
<td>0.1347</td>
<td>0.137</td>
</tr>
<tr>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td>0.1345</td>
<td>0.1346</td>
<td>0.1346</td>
<td>0.1345</td>
<td>0.1345</td>
</tr>
</tbody>
</table>

### TABLE 2

#### Wicking Data

<table>
<thead>
<tr>
<th>Time (min)</th>
<th>Across Machine Directions</th>
<th>Unlauned Run 1</th>
<th>3 Washings Run 1</th>
<th>6 Washings Run 1</th>
<th>9 Washings Run 1</th>
<th>Average Height (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.85</td>
<td>1.45</td>
<td>1.25</td>
<td>1.5</td>
<td>1.5</td>
<td>1.55</td>
</tr>
<tr>
<td>2</td>
<td>2.3</td>
<td>1.9</td>
<td>1.95</td>
<td>1.93</td>
<td>2</td>
<td>2.05</td>
</tr>
<tr>
<td>3</td>
<td>2.68</td>
<td>2.18</td>
<td>2.25</td>
<td>2.25</td>
<td>2.38</td>
<td>2.5</td>
</tr>
<tr>
<td>4</td>
<td>2.97</td>
<td>2.45</td>
<td>2.5</td>
<td>2.58</td>
<td>2.63</td>
<td>2.75</td>
</tr>
<tr>
<td>5</td>
<td>3.2</td>
<td>2.68</td>
<td>2.68</td>
<td>2.8</td>
<td>2.88</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>3.42</td>
<td>2.9</td>
<td>2.83</td>
<td>3</td>
<td>3.13</td>
<td>3.18</td>
</tr>
<tr>
<td>7</td>
<td>3.67</td>
<td>2.9</td>
<td>2.95</td>
<td>3.2</td>
<td>3.25</td>
<td>3.38</td>
</tr>
<tr>
<td>8</td>
<td>3.75</td>
<td>3.1</td>
<td>3.05</td>
<td>3.3</td>
<td>3.38</td>
<td>3.5</td>
</tr>
<tr>
<td>9</td>
<td>3.88</td>
<td>3.23</td>
<td>3.18</td>
<td>3.43</td>
<td>3.55</td>
<td>3.68</td>
</tr>
<tr>
<td>10</td>
<td>4</td>
<td>3.3</td>
<td>3.33</td>
<td>3.58</td>
<td>3.68</td>
<td>3.75</td>
</tr>
<tr>
<td>11</td>
<td>4.07</td>
<td>3.45</td>
<td>3.33</td>
<td>3.63</td>
<td>3.83</td>
<td>3.9</td>
</tr>
<tr>
<td>12</td>
<td>4.2</td>
<td>3.6</td>
<td>3.38</td>
<td>3.75</td>
<td>3.95</td>
<td>3.95</td>
</tr>
<tr>
<td>13</td>
<td>4.22</td>
<td>3.73</td>
<td>3.45</td>
<td>3.88</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>14</td>
<td>4.35</td>
<td>3.8</td>
<td>3.55</td>
<td>3.93</td>
<td>4.13</td>
<td>4.1</td>
</tr>
<tr>
<td>15</td>
<td>4.43</td>
<td>3.9</td>
<td>3.63</td>
<td>4.08</td>
<td>4.18</td>
<td>4.1</td>
</tr>
<tr>
<td>16</td>
<td>4.43</td>
<td>3.95</td>
<td>3.68</td>
<td>4.2</td>
<td>4.33</td>
<td>4.25</td>
</tr>
<tr>
<td>17</td>
<td>4.4</td>
<td>3.98</td>
<td>3.75</td>
<td>4.25</td>
<td>4.38</td>
<td>4.25</td>
</tr>
<tr>
<td>18</td>
<td>4</td>
<td>3.75</td>
<td>4.25</td>
<td>4.38</td>
<td>4.33</td>
<td>4.33</td>
</tr>
<tr>
<td>19</td>
<td>4</td>
<td>3.75</td>
<td>4.1</td>
<td>4.4</td>
<td>4.4</td>
<td>4.4</td>
</tr>
<tr>
<td>20</td>
<td>4</td>
<td></td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td></td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
</tr>
</tbody>
</table>
**TABLE 3**

<table>
<thead>
<tr>
<th>Time (minutes)</th>
<th>Unlaundered</th>
<th>3 Washings</th>
<th>6 Washings</th>
<th>9 Washings</th>
<th>12 Washings</th>
<th>15 Washings</th>
<th>Average Height (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.78</td>
<td>1.5</td>
<td>1.1</td>
<td>1.5</td>
<td>0.63</td>
<td>1.38</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>2.25</td>
<td>1.9</td>
<td>1.55</td>
<td>1.93</td>
<td>0.93</td>
<td>1.9</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>2.67</td>
<td>2.2</td>
<td>1.83</td>
<td>2.25</td>
<td>1.25</td>
<td>2.3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>2.92</td>
<td>2.5</td>
<td>2.05</td>
<td>2.58</td>
<td>1.5</td>
<td>2.58</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>3.07</td>
<td>2.75</td>
<td>2.18</td>
<td>2.8</td>
<td>1.75</td>
<td>2.75</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>3.25</td>
<td>2.9</td>
<td>2.38</td>
<td>3</td>
<td>1.93</td>
<td>2.93</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>3.5</td>
<td>3</td>
<td>2.63</td>
<td>3.2</td>
<td>2.13</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>3.62</td>
<td>3.1</td>
<td>2.65</td>
<td>3.3</td>
<td>2.25</td>
<td>3.2</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>3.8</td>
<td>3.2</td>
<td>2.75</td>
<td>3.43</td>
<td>2.38</td>
<td>3.25</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>3.8</td>
<td>3.33</td>
<td>2.88</td>
<td>3.58</td>
<td>2.58</td>
<td>3.3</td>
<td>11</td>
</tr>
<tr>
<td>11</td>
<td>3.93</td>
<td>3.45</td>
<td>2.93</td>
<td>3.63</td>
<td>2.7</td>
<td>3.43</td>
<td>12</td>
</tr>
<tr>
<td>12</td>
<td>4.03</td>
<td>3.55</td>
<td>3.08</td>
<td>3.75</td>
<td>2.8</td>
<td>3.43</td>
<td>13</td>
</tr>
<tr>
<td>13</td>
<td>4.07</td>
<td>3.68</td>
<td>3.13</td>
<td>3.88</td>
<td>2.88</td>
<td>3.5</td>
<td>14</td>
</tr>
<tr>
<td>14</td>
<td>4.18</td>
<td>3.8</td>
<td>3.2</td>
<td>3.93</td>
<td>2.93</td>
<td>3.5</td>
<td>15</td>
</tr>
<tr>
<td>15</td>
<td>4.25</td>
<td>3.88</td>
<td>3.3</td>
<td>4.08</td>
<td>3.08</td>
<td>3.65</td>
<td>16</td>
</tr>
<tr>
<td>16</td>
<td>4.25</td>
<td>3.9</td>
<td>3.38</td>
<td>4.2</td>
<td>3.13</td>
<td>3.75</td>
<td>17</td>
</tr>
<tr>
<td>17</td>
<td>4.25</td>
<td>3.95</td>
<td>3.38</td>
<td>4.25</td>
<td>3.13</td>
<td>3.75</td>
<td>18</td>
</tr>
<tr>
<td>18</td>
<td>4.4</td>
<td>4.1</td>
<td>4.1</td>
<td>4</td>
<td>4.25</td>
<td>4.25</td>
<td>19</td>
</tr>
<tr>
<td>19</td>
<td>4.1</td>
<td>4.1</td>
<td>4.1</td>
<td>4.25</td>
<td>4.25</td>
<td>4.25</td>
<td>20</td>
</tr>
<tr>
<td>20</td>
<td>4.2</td>
<td>4.2</td>
<td>4.2</td>
<td>4.25</td>
<td>4.25</td>
<td>4.25</td>
<td>21</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>22</td>
</tr>
</tbody>
</table>

**Growth Promotion Study Description:**

A study was performed utilizing the prepared sample with 10 g sorbitol/liter to compare promotion of growth of *Candida albicans*. Sample material of the present invention was compared to generic cotton material for the study.

The general study parameters were as follows:

1. A representative 1 inch square (approx) of each material to be tested was placed into a 24-hour broth of the challenge organism and shaken for 2 minutes.
2. A 1 inch square (approx) of each material was placed into sterile water and taken through the entire process to serve as controls.
3. After the 2 minute shaking period, specimens were removed from the broth/sterile water and shaken dry to remove all free liquid.
4. The “shake dried” specimens were placed into dry, sterile petri dishes and incubated for 48 hours.
5. After initial incubation, specimens were placed onto the appropriate growth media and incubated for 48 hours.
6. After final incubation, the materials were visually examined for comparison. Growth colonies were also counted to provide a numerical comparison. Digital photographs of the inoculated specimens were taken and are provided for review.

No growth was observed on the control specimens and values are presented.

Observations/colony counts did indicate that the inventive material tested was less promotive of *Candida albicans* growth than was the generic cotton material.

Test according to EPA SM 9215 B and results in Table 4.

**TABLE 4**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Results (CFU/g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLANK 1</td>
<td>None Detected</td>
</tr>
<tr>
<td>BLANK 2</td>
<td>None Detected</td>
</tr>
<tr>
<td>Experimental Sample 1</td>
<td>8.0</td>
</tr>
<tr>
<td>Experimental Sample 2</td>
<td>None Detected</td>
</tr>
<tr>
<td>Cotton Fabric 1</td>
<td>54.0</td>
</tr>
<tr>
<td>Cotton Fabric 2</td>
<td>14.0</td>
</tr>
</tbody>
</table>

While the invention has been described in its preferred form or embodiment with some degree of particularity, it is understood that this description has been given only by way of example and that numerous changes in the details of construction, fabrication, and use, including the combination and arrangement of parts, may be made without departing from the spirit and scope of the invention.

What is claimed is:

2. The fabric of claim 1 wherein said sugar alcohol is sorbitol.
3. The fabric of claim 2 exhibiting an increase of 10-80% of measured overall liquid moisture management capability versus fabric not having said disposed sugar alcohol.
4. A method of producing wicking clothing, said method comprising the steps of:
   - providing a fabric of claim 1 wherein said fabric has strands with micropores formed thereon;
   - preparing a solution in said solvent containing between 0.1 to 10 g/liter of a sugar alcohol;
   - disposing said sugar alcohol onto said fabric, whereby said disposing includes evaporation of said solvent;
   - incorporating said fabric with sugar alcohol into an article of clothing;
said fabric providing a reduction in microbial growth compared to untreated cotton fabric.

5. The method of claim 4 wherein said sugar alcohol is sorbitol.

6. The method of claim 4 wherein said solvent is aqueous, organic, or an aqueous organic co-solvent.

7. The method of claim 4 wherein the fabric retains 70-125% wicking property after 15 washings compared to an unlaundered fabric.

* * * * *