Micropatterned Superhydrophobic Textile for Enhanced Biofluid Transport

Tech ID: 23295 / UC Case 2013-605-0

ABSTRACT

Researchers at the University of California, Davis have developed a new mechanism of removing liquid from the skin's surface. The invention presents significant advantages over currently marketed moisture-wicking technologies.

FULL DESCRIPTION

Current moisture wicking materials function by using capillary forces generated by hydrophilic yarns to wick liquid from human skin. As the fabric becomes wetter or humidity increases, the sweat wicking capacity generated by capillary force diminishes. Thus, the moisture wicking capacity can be significantly diminished through perspiration or humid environmental conditions.

UC Davis researchers have developed a micropatterned superhydrophobic textile that harnesses surface tension forces to more effectively wick moisture. Because the textile does not rely on capillary forces, fluids can be transported in a controllable, continuous manner, not diminished by increases in moisture or humidity. Micropatterns comprised of superhydrophilic yarn function to draw moisture unidirectionally across superhydrophobic fabric. Thus, liquid is not absorbed but transported by the micropattern structures, so the fabric stays light. Additionally, the fabric is waterproof and self-cleaning.

APPLICATIONS

- Fast sweat removal
- Alternative to a diaper or pad that facilitates uniform distribution in absorbent material to prevent leakage
- Dressing for high-exudate or chronic wounds
- Textile-based microfluidic chips (i.e., pregnancy test strips)
- Water collection network
- Water-oil separation

FEATURES/BENEFITS

- Improved moisture-wicking properties
- Waterproof
- Self-cleaning
- Lightweight

RELATED MATERIALS

- Interfacial microfluidic transport on micropatterned superhydrophobic textile. Xing, S., et al. - 03/28/2013

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,480,462	11/01/2016	2013-605

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Microfluidic Dispenser for Automated, High-Precision, Liquids Handling
- Digital Droplet Microflowmetry Enabled by Interfacial Instability
- Digital Droplet Infusion System for High-Precision, Low-Volume, Delivery of Drugs or Nutritional Supplements
- Digital Meter-On-Chip with Microfluidic Flowmetry

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OTHER INFORMATION

KEYWORDS

Biofluid transport, Hydrophobic textile, Moisture-wicking, Diaper absorbency, Waterproof fabric, Microfluidic chips, High performance fabric, Filter, Athletic apparel, Membrane

CATEGORIZED AS

- **Biotechnology**
  - Health
- **Environment**
  - Other
- **Materials & Chemicals**
  - Other
  - Textiles

RELATED CASES

2013-605-0, 2014-536-0

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