Solar Cells Track Sun

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WARF: P120269US01

Inventors: Hongrui Jiang, Chensha Li, Ye Liu

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a passive tracking mechanism that allows solar cells to continuously face the sun.

Overview

Maximizing how much sunlight strikes a solar panel is one tactic to boost efficiency. Some approaches have tried to imitate heliotropic plants by repositioning the panels to follow the sun. Unfortunately, these systems require tracking mechanisms that are costly, complex and waste power. Other efforts have focused on special materials that directly respond to sunlight. Until now, such designs have tended to fatigue and quickly fail.

The Invention

UW–Madison researchers have developed a passive solar tracking system utilizing materials that move in response to sunlight.

In the system, a solar cell panel is supported by flexible posts. The posts are made from a composite material, including a liquid crystal elastomer. This material has properties that cause it to contract and tilt when exposed to heat. To further exploit such properties, the material is embedded with carbon nanotubes that act as miniature heat sources, absorbing sunlight and giving off warmth.

Applications

- Solar cell technology

Key Benefits

- Increases sunlight exposure
- Enhances solar cell output
- Doesn't require power
- Eliminates the need for complicated electromechanical parts
- Works with many types of solar cells

Additional Information

For More Information About the Inventors

- Hongrui Jiang

Related Technologies

- WARF reference number P120342US01 describes a photovoltaic supercapacitor for direct solar energy conversion and storage.

- WARF reference number P04002US describes efficient photovoltaic cells that use carbon nanotubes as the photoconducting material.

Publications

- Li C., Liu Y., Huang X. and Jiang H. 2012. Direct Sun-Driven Artificial Heliotropism for Solar Energy Harvesting Based on Photo-Thermo-Mechanical Liquid Crystal Elastomer Nanocomposite. Adv. Funct. Mater. 22, 5166-5174.

Tech Fields

- Clean Technology : Solar, wind & water technologies

For current licensing status, please contact Michael Carey at mcarey@warf.org or 608-960-9867