

Coating and Scaling of Material Stripes and Patterns

A method for scaling and coating continuous multi-material stripes and patterns

Georgia Tech Inventors have developed a method for scaling and coating continuous multi-material stripes and patterns. Conventional slot coating is widely recognized for its scalability, simplicity, and robustness across a wide range of coating fluids. Here, these advantages are extended to unconventional pattern requirements. The method involves depositing patterned film layers containing multiple materials from solution in a single processing step. A coating tool implementing this method contains the following features: separate inlets for multiple solution species, internal distribution of fluid to form a preliminary pattern flow, an internal slot where the solutions interact physically a laminar flow develops, a decrease in the width of the slot in the direction of flow, and outflow from the coating tool to a substrate via a liquid bridge(s). The novelty of this invention is the consolidation of deposition of multiple liquid solution species into a single process step and scaling of the pattern which is fundamentally enabled by the interaction of the liquid solution species.

Summary Bullets

- Exceptional flexibility with respect to material selection
- Highly scalable

Solution Advantages

- Exceptional flexibility with respect to material selection
- Highly scalable

Potential Commercial Applications

- Flexible hybrid electronics printed sensors (environmental, biomedical, etc.)
- Optoelectronic devices (photovoltaics, LEDs, solid-state lighting, printed battery electrodes)

Background and More Information

Scalable manufacturing of patterned thin films constitutes a persistent challenge for flexible electronics and printed sensors. Liquid-phase deposition techniques have long been promoted in both academic and industry literature; however, these techniques require costly pre-patterning or post-deposition subtractive steps. A need exists for single step deposition of patterned thin films that encapsulates all the advantages desirable for low-cost manufacturing at a large scale.

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IP Status

<p>The following patent has issued, and additional coverage is pending</p>: US11666936B2

Publications

[New printable thin films could help power Internet of Things](#), ET Telecom - Jan. 15, 2018

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