Device for Conformal Coating of 3D Devices with Biological Materials

Tech ID: 24797 / UC Case 2015-224-0

BRIEF DESCRIPTION

A novel multi-nozzle device enables uniform, mask-free conformal coating of complex three-dimensional surfaces, including delicate biological materials

FULL DESCRIPTION

This innovative technology utilizes a closely spaced array of spring-loaded micronozzles that adapt to the shape of complex 3D surfaces, allowing precise and uniform deposition of coating materials such as cell-laden collagen without damaging shear stresses. Each nozzle can be individually controlled or operated collectively to dispense bioactive gels or other materials, achieving smooth, consistent coatings ideal for biomedical microdevices and tissue engineering scaffolds. The system supports patterning capabilities and offers superior resolution through high nozzle density and small nozzle size.

SUGGESTED USES

- Coating of tissue engineering scaffolds for regenerative medicine.
- Biomedical microdevice surface functionalization.
- Bioimprinting of cells and biological layers onto complex shapes.
- Fabrication of organ and tissue constructs with precise biological coatings.
- Advanced additive manufacturing processes involving soft gel deposition.

ADVANTAGES

- Mask-free coating eliminates the need for complex masking processes.
- Spring-loaded micronozzle array conforms precisely to intricate 3D surface geometries.
- Gentle coating method suitable for shear-sensitive biological materials like collagen with living cells.
- Individual nozzle control enables complex patterning and multi-material deposition.
- High resolution and uniform layer thickness on curved and flat surfaces.
- Improved coating uniformity using the “Express and Press” deposition technique.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,245,614	04/02/2019	2015-224

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OTHER INFORMATION

CATEGORIZED AS

- **Medical**
  - Devices
- **Engineering**
  - Other

RELATED CASES

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