Mechanical Process For Creating Particles Using Two Plates

Tech ID: 27482 / UC Case 2007-234-0

SUMMARY

UCLA researchers in the Department of Chemistry and Biochemistry & Physics and Astronomy have developed a novel method to lithograph two polished solid surfaces by using a simple mechanical alignment jig with piezoelectric control and a method of pressing them together and solidifying a material.

BACKGROUND

This technology relates to the process and system for making microparticles and nanoparticles. Applications include lithography and patterning microelectronic and nanoelectronic structures for MEMS technology. The global market for MEMS devices and production equipment was worth $11.7 billion in 2014. This market is expected to reach $12.8 billion in 2015 and $21.9 billion by 2020. In the internet of things, MEMS technology, as well as microscopic particle production, is heavily utilized in commercial applications.

INNOVATION

Researchers at UCLA have developed a novel method for microparticle fabrication that is more efficient than the current lithographic practices of using optical exposure to create LithoParticles. The basic concept is to make microscale and nanoscale particles by 1) using a solid patterned form, 2) depositing a material into the form made using lithography to 3) create discontiguous depressions or other predetermined discrete features (i.e. desired particle shapes) 4) turning the deposited material into a solid (if it is not already) and 5) separating the solid particulates of deposited material from the patterned form which usually involves dispersing the particles in fluid.

With a solid patterned form, which can be re-used, particles can be made without the need for complex expensive exposure systems such as optical lithography or electron-beam lithography. This lithographic process provides robust means of producing shape-designed particles in parallel at higher throughput levels than single optical systems.

APPLICATIONS

- Patterning microelectronic and nanoelectronic structures and circuits
- Microelectromechanical systems (MEMS) devices
- Integrated circuits for use in electronic devices
- PCB design for use in electronic devices
- Accelerometers
- Gyroscopes
- Pressure Sensors
- Chemical and Gas Sensors

ADVANTAGES

- More Cost Effective- in IC manufacturing, lithography typically accounts for about 30 % of the cost of manufacturing
- Don’t need to be run continuously
- Higher throughput levels System and run particle formation in parallel

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INVENTORS

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OTHER INFORMATION

KEYWORDS

Micro, Nano, Lithography, MEMS, Manufacturing, patterning, microelectronics fabrication, Mechanical process, creating particles in fluid, template, LithoParticles, nanoparticles, microparticles

CATEGORIZED AS

- **Nanotechnology**
  - Electronics
  - Materials
  - NanoBio
  - Other
  - Tools and Devices
- **Communications**
  - Internet
  - Wireless
- **Computer**
  - Hardware
  - Security
  - Software
- **Engineering**
  - Engineering
- **Semiconductors**
  - Assembly and Packaging
  - Design and Fabrication
  - Processing and Production

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,562,892	10/22/2013	2007-234

- **Sensors & Instrumentation**
  - Analytical
  - Environmental Sensors
  - Medical
  - Physical Measurement
  - Position sensors
  - Process Control
  - Scientific/Research

RELATED CASES

2007-234-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Process For Creating Stable Double Emulsions
- Measuring Size Distributions of Small-Scale Objects
- Process For Recycling Surfactant In Nanoemulsion Production
- Method of Making Multicomponent Nanoemulsions
- Novel Multi-Scale Pre-Assembled Phases of Matter
- Ultrastable Nanoemulsions In Disordered And Ordered States
- Process For Sorting Dispersed Colloidal Structures
- Shape-Controlled Particles Having Subparticle Geometrical Features

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