WARF
Wisconsin Alumni Research Foundation

TECHNOLOGY LICENSING OPPORTUNITY

Methods and Devices for Precisely Dispensing Microvolumes of Fluids

INVENTORS • Max Lagally, Amit Lal, Chung Hoon Lee, Bradley Larson

WARF: P01201US

View U.S. Patent No. 6,874,699 in PDF format.

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a microplotter device that can achieve exceptionally small and regular spot sizes without photolithography.

OVERVIEW

Many applications exist for devices that can deposit tiny volumes of fluids, including flexible electronics and biological microarrays. One of these methods uses quill pins (limited to creating 75-micron diameter spots) that are dipped into biological solutions and then tapped onto a surface to create microarrays.

Inkjet printers have also attracted a great deal of attention because they are inexpensive and can rapidly deposit fluid in spots as small as 50 microns in diameter. In addition, inkjets can rapidly print circuit patterns defined by software onto a substrate; however, this process for creating custom-design circuits has been limited because it requires a photolithographic patterning step to form dense microcircuits. The ability to deposit features of ever tinier size and to produce custom circuits without the use of photolithography is becoming increasingly important.

THE INVENTION

UW-Madison researchers have developed a microplotter device that can deposit spots or lines on the order of 5 micrometers in size for several applications, including biological microarrays and polymer-based circuits. The device consists of a nozzle for depositing fluid, which is connected to a positioning system that is controlled by customized software on a desktop computer. The nozzle, composed of a micropipette fastened to a piece of piezoelectric, deposits small features through ultrasonics.

THE WARF ADVANTAGE

Since its founding in 1925 as the patenting and licensing organization for the University of Wisconsin-Madison, WARF has been working with business and industry to transform university research into products that benefit society. WARF intellectual property managers and licensing staff members are leaders in the field of university-based technology transfer. They are familiar with the intricacies of patenting, have worked with researchers in relevant disciplines, understand industries and markets, and have negotiated innovative licensing strategies to meet the individual needs of business clients.

APPLICATIONS

- Biological microarrays
- Flexible electronics
- Polymer-based circuits

KEY BENEFITS

- Achieves exceptionally small and regular spot sizes without the need for photolithography
- Handles a wide range of fluid viscosities
- Can be continuously actuated to form lines, arcs, towers of high aspect ratio and other shapes
- Nozzles are significantly less expensive to construct than prior ring-type ultrasonic nozzles.
- Nozzles can possess significantly smaller diameters and be accurately charged with minimal amounts of fluid.
- Results in less waste of expensive or difficult-to-synthesize fluids

ADDITIONAL INFORMATION

Tech Fields
Research Tools - Arrays
Micro & Nanotech - Microarrays

CONTACT INFORMATION

For current licensing status, please contact Jeanine Burmania at jeanine@warf.org or 608-960-9846.