Office of Technology Licensing • 2150 Shattuck Avenue, Suite 510 • Berkeley, California 94720-1620 • 510.643.7201

TECHNOLOGY/BUSINESS OPPORTUNITY

Non-Confidential Disclosure

Improved Design for Bi-Material, Thermo MEMS Sensors and Actuators.

(UCB Case No.: B03-061)

Abstract

The market potential of MEMS-based sensors and actuators is enormous. However, many potential applications of these devices have physical and geometric constraints that are problematic for existing bi-material, cantilever designs. To address this problem, researchers at the University of California at Berkeley have devised a clever new design for bi-material, thermo-activated, MEMS sensors and actuators.

In contrast, to cantilever-based designs, this Berkeley structure only deflects in the vertical direction with no change in angle at its end points. These characteristics enable multiple modules of a bi-material to be connected in a series and satisfy boundary conditions at the connection points between each module. The resulting series of bi-material modules can be fabricated in a variety of patterns to meet specific physical and geometric constraints of the sensor/actuator device -- this is particularly useful in the design of dense sensor/actuator arrays with fixed-size pixels.

Furthermore, each bi-material module that is incorporated into the structure contributes to its aggregate sensitivity and performance, thereby enabling this design to offer greater sensitivity and performance in comparison to conventional bi-material structures. The new design can be fabricated using conventional IC processes such as PECVD and E-beam metal evaporation.

The improved features of this bi-material structure are conducive to variety of applications including infared and heat-activated optical sensors and actuators.

Applications

- Dense arrays of actuators and sensors with fixed-size pixels
- Infared and heat-activated optical sensors and actuators

Features/Benefits

- Modularized layouts that can address physical and geometric design constraints
- Greater thermo-mechanical sensitivity and overall performance

Contact

Curt A. Theisen (CAT)
Associate Director
510.643.7201 (phone)
510.642.4566 (fax)
curt@berkeley.edu