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(54) **MEMS FLUIDIC ACTUATOR**

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264/401; 73/146, 504.15, 540.12, 715; 257/416
See application file for complete search history.

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(57) **ABSTRACT**

The present invention comprises a novel, lightweight, massively parallel device comprising microelectromechanical (MEMS) fluidic actuators, to reconfigure the profile, of a surface. Each microfluidic actuator comprises an independent bladder that can act as both a sensor and an actuator. A MEMS sensor, and a MEMS valve within each microfluidic actuator, operate cooperatively to monitor the fluid within each bladder, and regulate the flow of the fluid entering and exiting each bladder. When adjacently spaced in an array, microfluidic actuators can create arbitrary surface profiles in response to a change in the operating environment of the surface. In an embodiment of the invention, the profile of an airfoil is controlled by independent extension and contraction of a plurality of actuators, that operate to displace a compliant cover.

8 Claims, 11 Drawing Sheets

