

# AUBURN UNIVERSITY

## INNOVATION ADVANCEMENT & COMMERCIALIZATION

### Contact

Brian Wright  
Auburn University  
Innovation Advancement  
& Commercialization  
334-844-4977  
[brian.wright@auburn.edu](mailto:brian.wright@auburn.edu)  
<http://iac.auburn.edu/>  
Reference: MEMS Vibration Filter

### Inventors



*Dr. Robert Dean*  
Associate Professor  
Department of Electrical and  
Computer Engineering



*Dr. George Flowers*  
Professor  
Dept. of Mechanical Engineering  
Dean of Graduate School

[Click here](#) for a listing of  
Auburn's patents available  
for immediate licensing

[Click here](#) for a listing of  
Auburn's available physical  
science technologies

Follow Auburn IAC



Auburn University is an equal opportunity  
educational institution/employer

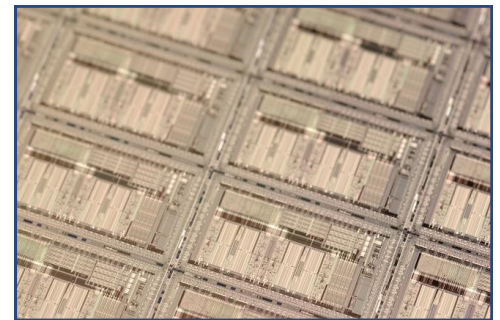
## A MEMS Device to Filter Mechanical Vibrations

### Overview

Auburn University is seeking licensees for a device that filters mechanical vibrations in MEMS devices. This invention is based on comb drive actuators that provide multi-dimensional vibration isolation and tunable damping of vibrations at less cost and/or with better performance than current alternatives.

### Advantages

- Provides sufficient levels of vibration damping for MEMS devices
- Creates a tunable system, providing greater control
- More broadly applicable than fluidic packaging
- Expected to be less expensive than fluidic packaging



### Description

Some micromachined (or MEMS) devices, such as many MEMS gyroscopic sensors, are extremely sensitive to and adversely affected by high frequency vibrations, which may be present in the environment in which the sensors are used. In order to use these devices in mechanically harsh environments, they must be protected from high frequency vibrations. This can be accomplished by fabricating a MEMS vibration filter and incorporating it into the sensor package to isolate the sensor die from high frequency vibrations. Passive and previous spring-based vibration filters have been investigated for this purpose. Unfortunately, they lack tunability and/or fail to achieve sufficient damping.

Auburn's comb drive actuator-based system provides sufficient and tunable mechanical damping of MEMS devices, expected to be at less cost than other methods (such as fluidic packaging). This technology performs vibration isolation by detecting relative motion between comb elements and then generating an appropriate electrostatic force to counteract the undesirable relative motion. This active damping approach improves upon the spring-mass-damper vibration isolation MEMS structure, provides tenability for broader applications and provides more flexibility.

### Licensing Opportunities

- Issued US Patent: [7,355,318](#)
- This patent is available for [immediate non-exclusive licensing](#) through Auburn's customizable ["Ready to Sign" licensing program](#).
- Similar patents are available in the [Electronics field](#).