Fabrication of Slanted Electrodes in MEMS Devices (#7324)

A method to fabricate microelectronic mechanical systems (MEMS) devices with horizontal and slanted electrodes

Georgia Tech inventors have developed a method to fabricate slanted electrodes along with vertical and horizontal electrodes. This method incorporates wet-etching, a material removal method using liquid chemicals, on single-crystal silicon to create vertical, horizontal, and slanted electrodes with sub-micro gaps. Customized masks with the desired pattern are applied to the silicon to protect material that will not be removed. Wet-etching is used to first create the slanted electrodes, then the horizontal electrodes. These slanted electrodes are able to replace complicated systems of electrodes with one or two electrodes.

Benefits/Advantages

- **High Performance** – slanted electrodes provide more capabilities and possibilities for MEMS devices
- **Consolidated** – reduces the need for large systems of MEMS
- **Versatile** – MEMS with slanted electrodes can be applied to many applications

Potential Commercial Applications

- Gyroscopes
- Personal Navigation
- MEMS devices
- Healthcare

Background/Context for This Invention

Slanted electrodes are very enabling in capacitive microelectronic mechanical systems (MEMS) devices. Conventional MEMS fabrication processes are only capable of creating capacitive transducers in vertical or horizontal directions. Many applications require a complicated series of MEMS to achieve the desired function, which can decrease efficiency and performance.

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More Information

Publications

For more information about this technology, please visit:
https://licensing.research.gatech.edu/technology/fabrication-slanted-electrodes-mems-devices

Images:

The automated sequential delivery of multiple fluids. A varying number of delay gates imprinted in the branches are shown in the figure.

COVID-19 and flu saliva test on paper: (A) The automatic sequential delivery of multiple reagents required for virus test; (B) Water pouring into the device triggers the virus assay, allowing the presence of SARS-CoV-2 and influenza A & B viruses to be visually identified by the color changes in the corresponding detection spot