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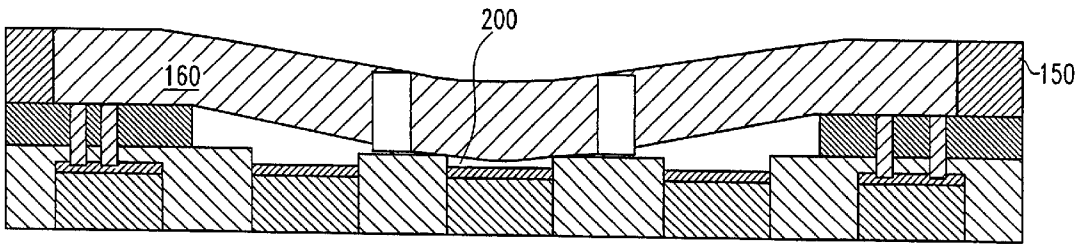
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(54) Title: METHOD OF FABRICATING MICRO-ELECTROMECHANICAL SWITCHES ON CMOS COMPATIBLE SUBSTRATES



(57) Abstract: A method of fabricating micro-electromechanical switches (MEMS) using a process starting with a copper damascene interconnect layer, made of metal conductors inlaid in a dielectric (150). All, or portions, of the interconnects are recessed to a degree sufficient to provide a capacitive air gap when the switch is in the closed state, as well as provide space for a protective layer of, for example, Ta/TaN. The metal structures defined within the area specified for the switch act as actuator electrodes to pull down the movable beam (160) and provide one or more paths for the switched signal to traverse. The advantage of an air gap is that air is not subject to charge storage or trapping that can cause reliability and voltage drift problems. Instead of recessing the electrodes to provide a gap, one may just add dielectric on or around the electrode. The next layer is another dielectric layer which is deposited to the desired thickness of the gap formed between the moveable beam (160) that forms the switching device. Vias are fabricated through this dielectric to provide connections between the metal interconnect layer and the next metal layer which will also contain the switchable beam. The via layer is then patterned and etched to provide a cavity area which contains the lower activation electrodes as well as the signal paths. The cavity is then back-filled with a sacrificial release material.

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