PATENT NO. 327603

AN ELECTRONIC CIRCUIT FOR SELF SENSING PIEZOELECTRIC ACTUATOR AND METHOD OF OPERATING THEREFOR

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ABSTRACT
The present disclosure relates to an electronic circuit for piezoelectric crystals in self sensing applications which can distinguish sensing and actuation signals using self sensing piezoelectric actuator. This invention is applicable for any mechanical structure using piezoelectric material. The present disclosure uses a single signal flow path for the signal applied to the piezoelectric patch in actuation mode and signal produced by the piezoelectric patch in sensing mode. The electronic circuit comprises a MOSFET switch operated by a trigger circuit which separates the signal applied to and the signal produced by the piezoelectric material by grounding the signal applied to the piezoelectric material.

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CLAIM 1

An electronic circuit for self sensing piezoelectric actuator comprising:

a function generator 8 for generating a sinusoidal signal;

a half wave rectifier 27 configured to receive the sinusoidal signal from the function generator 8 and generate a first signal during positive half cycle;

a piezoelectric patch 1 configured to produce a second signal during negative half cycle, upon being actuated by applying the first signal;

a MOSFET switch 14 operated by a trigger circuit configured to separate the signal applied to and the signal produced by the piezoelectric material 4 by grounding the signal applied to the piezoelectric material 4; and

a second amplifier 19 configured to receive only the signal produced by the piezoelectric material.