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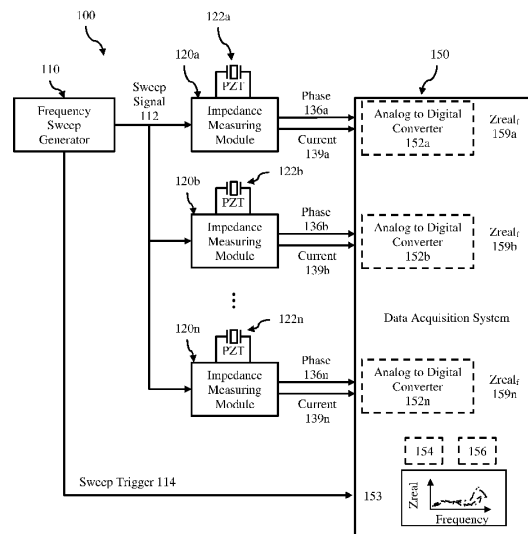


Figure 1A

(57) **Abstract:** A structural health monitoring system comprises frequency sweep generator which generates an AC which is simultaneously provided to multiple impedance measuring circuit modules. Each impedance measuring circuit module is connected to a piezoelectric transducer (PZT) which is placed on or embedded within the structure to be monitored. The impedance measuring circuit modules are each configured to generate two output signals. The first signal is a voltage proportional to the phase difference between the input sweep signal and the PZT current signal and the second signal is a voltage proportional to the current through the PZT. A data acquisition module digitises the signals and generates an estimate of the real component of the (complex) impedance across the PZT at the sweep frequency. The sweep generator is configured to generate multiple sweep signals each at a different frequency over a sweep frequency range to generate an impedance spectrum which can be used to detect structural changes such as cracking.

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