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(54) **FABRICATION OF A MAJORITY LOGIC GATE HAVING NON-LINEAR INPUT CAPACITORS**

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(57) **ABSTRACT**

A new class of logic gates are presented that use non-linear polar material. The logic gates include multi-input majority gates. Input signals in the form of digital signals are driven to non-linear input capacitors on their respective first terminals. The second terminals of the non-linear input capacitors are coupled a summing node which provides a majority function of the inputs. The majority node is then coupled driver circuitry which can be any suitable logic gate such as a buffer, inverter, NAND gate, NOR gate, etc. In the multi-input majority or minority gates, the non-linear charge response from the non-linear input capacitors results in output voltages close to or at rail-to-rail voltage levels. Bringing the majority output close to rail-to-rail voltage eliminates the high leakage problem faced from majority gates formed using linear input capacitors.