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[54] **PREAMPLIFIER WITH ADJUSTABLE INPUT RESISTANCE**

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[52] **U.S. Cl.** **327/581**; 327/553; 327/559

[58] **Field of Search** 307/520, 521, 307/490, 264, 304; 327/551, 552, 553, 555, 558, 559, 581, 50, 63

[56] **References Cited**

PUBLICATIONS

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[57] **ABSTRACT**

A monolithic CMOSFET integrated circuit which includes a first MOSFET integrant transistor having a gate area chosen to provide a desired range of resistance when operated in its triode region which constitutes (i) a preamplifier, (ii) a voltage controlled resistance (VCR) device, and (iii) a high-pass filter when capacitive with a transducer. Preferred operating characteristics are achieved by including an active CMOSFET linearization network including a pair of second and third integrant MOSFET transistors having only one-hundredth (1/100th) to one-tenth (1/10th) the gate area of the first transistor. The present invention operates with a reduction in distortion resulting from the filtering effect of the combined capacitive reactance of the sensor and the resistance of the resistor. This reduction in distortion occurs at frequencies greater than the corner frequency (the frequency which is equal to the inverse product of the capacitance in farads times the resistance in ohms) and is due to the high-pass filter formed by the sensor and the resistor. Stated in terms of well known capacitor-resistor pole theory, the high-pass filter effect is based upon the "transducer capacitance-preamplifier input resistance pole" (i.e., such "pole" with reference to the capacitance characteristic of the capacitive transducer and the preamplifier input resistance provided by a CMOSFET I.C. device or devices as aforesaid). This distortion is less than that which would have been expected as a consequence of the non-linearity of prior art MOSFET VCRS. Due to this high pass filter effect, the distortion rolls off at approximately 20 db/decade of frequency.

2 Claims, 3 Drawing Sheets