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(54) **DUAL-RANGE LINEARIZED TRANSIMPEDANCE AMPLIFIER SYSTEM**

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See application file for complete search history.

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(57) **ABSTRACT**

A transimpedance amplifier system is disclosed which simultaneously generates a low-gain output signal and a high-gain output signal from an input current signal using a single transimpedance amplifier having two different feedback loops with different amplification factors to generate two different output voltage signals. One of the feedback loops includes a resistor, and the other feedback loop includes another resistor in series with one or more diodes. The transimpedance amplifier system includes a signal linearizer to linearize one or both of the low- and high-gain output signals by scaling and adding the two output voltage signals from the transimpedance amplifier. The signal linearizer can be formed either as an analog device using one or two summing amplifiers, or alternately can be formed as a digital device using two analog-to-digital converters and a digital signal processor (e.g. a microprocessor or a computer).

26 Claims, 6 Drawing Sheets