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### (54) METHODS AND APPARATUS TO REDUCE OFFSET AND GAIN ERROR IN MULTISTAGE CURRENT SENSE **AMPLIFIERS**

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#### (57)ABSTRACT

An example apparatus includes: a transconductance stage including: a fully differential amplifier configured to generate a differential current based on a voltage input; and a transistor configured to be controlled by an output of the fully differential amplifier and source current from an input of the fully differential amplifier; and a transimpedance stage coupled to the transconductance stage, the transimpedance stage including: resistor circuitry configured to convert the differential current into a differential voltage using a first resistance, a second resistance, and a third resistance; and a differential amplifier configured to convert the differential voltage to a single-ended voltage, which represents the voltage input.

