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(71) Applicant: **NORTHROP GRUMMAN SYSTEMS CORPORATION** [US/US]; 2980 Fairview Park Drive, Falls Church, Virginia 22042-4511 (US).

(72) Inventors: **CHERIE, Bouchaib**; c/o Northrop Grumman Systems Corporation, 2980 Fairview Park Drive, Falls

Church, Virginia 22042 (US). **POULIQUEN, Philippe**; c/o Northrop Grumman Systems Corporation, 2980 Fairview Park Drive, Falls Church, Virginia 22042 (US).

(74) Agent: **SUTCH, Matthew J.** et al.; DORITY & MANNING, P.A., P. O. BOX 1449, GREENVILLE, South Carolina 29602-1449 (US).

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(54) Title: DYNAMIC TRANSLINEAR CURRENT MULTIPLIER FOR ANALOG COMPUTING

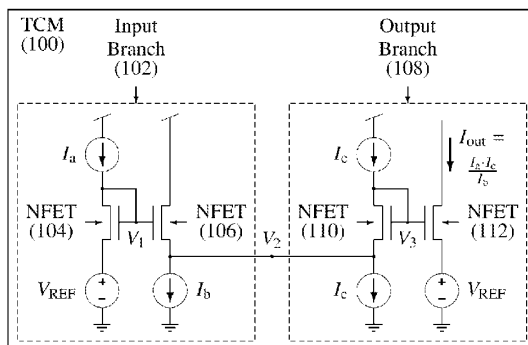


FIG. 1A

(57) **Abstract:** According to some other aspects of the present disclosure, an electrical circuit comprises a first capacitive element, a first transistor, a second capacitive element, and a second transistor. The circuit receives a first input current, a second input current, a third input current, and an input voltage. The circuit is configured to generate a first voltage by providing the input voltage and the first input current to the first transistor. The first voltage difference is the difference between the first voltage and the input voltage, and is logarithmically related to the first input current. The circuit may also be configured to store the first voltage as the first charged state of the first capacitive element. The circuit is further configured to generate a second voltage by providing the second input current and the first charged state of the first capacitive element to the first transistor. The second voltage difference is the difference between the first voltage and the second voltage, and is logarithmically related to the second input current. The circuit is additionally configured to generate a third voltage by providing the second voltage and the third input current to the second transistor. The third voltage difference is the difference between the third voltage and the second voltage, and is logarithmically related to the third input current. The circuit may also be configured to store the third voltage as the second charged state of the second capacitive element. The circuit is further configured to generate an output current by providing the input voltage and the second charged state of the second capacitive element to the second transistor. The output current is exponentially related to the fourth voltage difference, which is the difference between

[Continued on next page]

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the third voltage and the input voltage. The output current is equivalent to a ratio of a product of the first and third input currents to the second input current.