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(54) **LOW POWER, SCALABLE MULTICHANNEL HIGH VOLTAGE CONTROLLER**

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(57) **ABSTRACT**

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A low voltage control circuit is provided for individually controlling high voltage power provided over bus lines to a multitude of interconnected loads. An example of a load is a drive for capillary channels in a microfluidic system. Control is distributed from a central high voltage circuit, rather than using a number of large expensive central high voltage circuits to enable reducing circuit size and cost. Voltage is distributed to each individual load and controlled using a number of high voltage controller channel switches connected to high voltage bus lines. The channel switches each include complementary pull up and pull down photo isolator relays with photo isolator switching controlled from the central high voltage circuit to provide a desired bus line voltage. Switching of the photo isolator relays is further controlled in each channel switch using feedback from a resistor divider circuit to maintain the bus voltage swing within desired limits. Current sensing is provided using a switched resistive load in each channel switch, with switching of the resistive loads controlled from the central high voltage circuit.

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H02J 1/00 (2006.01)

(52) **U.S. Cl.** **307/29**; 361/170; 361/173; 710/305; 702/286; 307/39; 204/602

(58) **Field of Classification Search** 307/18, 307/24, 29, 38, 39, 64, 82, 86; 361/170, 361/173, 174; 710/305; 702/286; 204/602
See application file for complete search history.

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16 Claims, 5 Drawing Sheets

