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(54) **SYSTEMS AND METHODS FOR UNIVERSAL INPUT POWER SUPPLY BI-DIRECTIONAL BATTERY CHARGER**

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(57) **ABSTRACT**

A system for an AC to DC PFC converter includes a first phase switch group connected to a first node to receive power from a first phase of a voltage source; a second phase switch group connected to a second node to receive power from a second phase of the voltage source; a third phase switch group connected to a third node to receive power from a third phase of the voltage source; a neutral phase switch group connected to a fourth node to be connected to a ground terminal of the voltage source; a first switch connected to the first node and the second node; and a second switch connected to the second node and the third node.

