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(54) **ARC FAULT DETECTION METHOD AND APPARATUS**

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See application file for complete search history.

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(57) **ABSTRACT**

Load current from an electrical AC supply circuit is monitored so that both high frequency (10-100 kHz), and low frequency (60 Hz) signal current components are measured over certain time periods. A high frequency energy component is measured in an integral fashion, e.g., summing a plurality of samples taken. A certain amount of high frequency energy during a half-cycle is required to indicate an arc event. A certain number of these arc events per half-cycle must occur within a specific time period to indicate the presence of an arc. The root-mean-square (RMS) value of the low frequency energy component is used to determine the severity of the arc. The higher the amperage of the load current arc, the faster the arc fault circuit interrupter (AFCI) will respond by disconnecting the arcing load from the AC supply circuit, e.g., fewer number of arc events necessary for tripping of the AFCI.

16 Claims, 12 Drawing Sheets