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Jakupi

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(54) **DETECTING POWER LINE CARRIER PRESENCE IN A BRANCH CIRCUIT AND IMPROVING AF DETECTION AND NUISANCE TRIPPING IN CAFI/DF BREAKER**

(71) Applicant: **Schneider Electric USA, Inc.**,
Andover, MA (US)

(72) Inventor: **Andi Jakupi**, Marion, IA (US)

(73) Assignee: **Schneider Electric USA, Inc.**, Boston,
MA (US)

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(57) **ABSTRACT**

A method and system are provided to detect the presence of an arc fault signal on a circuit of a power distribution system. The method and system can involve: sampling a signal measuring electrical activity on the circuit, the sampled signal corresponding to a signal strength of the electrical activity on the circuit, the sampled signal comprising a plurality of sample segments; for each sample segment, computing segment properties including a signal-to-noise ratio and a root-mean-square; generating a pattern representing a presence of any signal transition over a signal sample period for the sampled signal according to the computed segment properties for each sample segment of the sampled signal; and determining a presence of an arc fault signal based on the generated pattern and predetermined pattern(s) of PLC activity on the circuit.

