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(54) **PHOTOVOLTAIC SYSTEM, RELAY DETECTION METHOD, AND POWER SUPPLY SYSTEM**

(71) Applicant: **Huawei Digital Power Technologies Co., Ltd.**, Shenzhen (CN)

(72) Inventors: **Li LU**, Shenzhen (CN); **Kai XIN**, Shanghai (CN); **Xinyu YU**, Shanghai (CN); **Yunfeng LIU**, Shanghai (CN)

(73) Assignee: **Huawei Digital Power Technologies Co., Ltd.**, Shenzhen (CN)

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(57) **ABSTRACT**

A photovoltaic system, a relay detection method, and a power supply system. When a fault, for example, sticking of the relay is detected, the controller stops sending a PWM driver gating signal to the inverter, and stops driving of a switch transistor in the inverter, and the inverter stops outputting power, and then determines whether a voltage difference between two ends of the relay is greater than a preset value, to determine whether the relay is faulty. The controller stops sending the PWM driver gating signal to the inverter only within a preset phase range of a voltage of the filter capacitor, to ensure that the voltage of the filter capacitor has a large value. Because the voltage of the filter capacitor is large, an alternating current grid-to-ground voltage is pulled up, to avoid detecting the fault as an alternating current grid-to-ground short circuit.