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(54) **OPTICAL-DETECTION SYSTEMS AND METHODS FOR DETERMINING STATE OF ENGAGEMENT OF MATING CONNECTORS, AND EQUIPMENT INCORPORATING SAME**

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CPC G01N 19/00; A61M 1/28; F23D 3/16; H02H 3/02; H03K 17/18

See application file for complete search history.

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(57) **ABSTRACT**

A connector-engagement-state detection system for detecting states of engagement of a connector with a connector receiver and for detecting one or more fault states within the detection system itself so as to prevent false engagement state information. In some embodiments, the detection system includes a light source that emits detection light and a light sensor that detects the detection light. The connector-receiver and/or connector are configured, and the light source and the light sensor are located relative to one another so that some of the detection light reaches the sensor regardless of whether or not the connector is fully engaged with the connector-receiver. This arrangement allows for the determination of one or more faults within the detection system itself, such as a faulty light source or faulty detector.

32 Claims, 4 Drawing Sheets

