is a further need for an improved receptacle that prevents the receptacle from being energized when an unsafe electrical condition is detected.

While the solution described in the following text and the attached figures largely focuses on examples of improved receptacles for use with refrigerated shipping containers, those in the field will recognize that the improved receptacles can be used in other applications. The improved receptacles described herein can be useful in providing electrical power to any device. Furthermore, the embodiments described herein can be applied to other electrical devices including switches and indicators.

SUMMARY

An aspect of the present invention provides an interlocking socket for coupling to a connector of a load, the interlocking socket comprising:

a receptacle configured to receive the connector;

a microcontroller coupled to the receptacle, the microcontroller operable for testing for one or more faults in the connector, a conductor coupling the load and the connector, or the load.

Another aspect of the present invention provides a switching device for coupling to a load, the switching device comprising:

a conductor; and

a microcontroller coupled to the conductor, the microcontroller operable for testing for one or more faults in the conductor or the load coupled to the conductor.

Another aspect of the present invention provides an indicator device for coupling to a load, the indicator device comprising:

a conductor; and

a microcontroller coupled to the conductor, the microcontroller operable for testing for one or more faults in the conductor or the load coupled to the conductor; and

an indicator for providing a result of the testing performed by the microcontroller, the indicator being visual, audible, or both visual and audible.

The present application relates to testing and monitoring of an electrical connection. In one embodiment, the disclosure provides for an interlocking socket for coupling to a connector of a load, wherein the interlocking socket comprises a receptacle designed to receive the connector. The interlocking socket further comprises a microcontroller coupled to the receptacle, the microcontroller operable for testing for one or more faults in the connector, a conductor, or the load coupled to the connector. The interlocking socket can include a switching device (such as a breaker, safety disconnect switch, relay, starter, contactor, etc.) that can be controlled by the microcontroller to provide a direct safety interlock to disconnect a power circuit or maintain the power circuit in a disconnected state so that power is not delivered to the load when an unsafe condition is detected.

In another embodiment, the disclosure provides for a microcontroller coupled to a switching device, wherein the switching device can include a breaker, safety disconnect switch, relay, starter, contactor, or any other type of switch known to those in this field, that is manually operated. The microcontroller is operable for testing for one or more faults in a conductor coupled to the switching device or a load that can be coupled to the switching device. If the microcontroller detects a fault or unsafe condition, the microcontroller can actuate an indicator which indicates that the switch should not be activated.

These and other aspects, objects, features, and embodiments will be apparent from the following description and the appended claims.