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Godard

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(54) **REMOTE DISPLAY AMMETER FOR POWER PLUG OR POWER STRIP**

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(73) Assignee: **The Wiremold Company**, West Hartford, CT (US)

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(21) Appl. No.: **10/960,844**

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(65) **Prior Publication Data**

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Related U.S. Application Data

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(51) **Int. Cl.**
G08B 21/00 (2006.01)
H02H 3/00 (2006.01)

(52) **U.S. Cl.** **340/664**; 340/635; 361/62; 361/63; 361/64

(58) **Field of Classification Search** ..... None
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,741,442 B1 * 5/2004 McNally et al. 361/166
7,141,891 B2 * 11/2006 McNally et al. 307/39
2002/0117902 A1 * 8/2002 Evers et al. 307/130
2005/0094336 A1 * 5/2005 Cleveland 361/64

* cited by examiner

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(57) **ABSTRACT**

A power strip is providing including a housing coupled to a first end portion of a power supply cord, the housing having an electrical receptacle mounted thereto and connected to the power supply cord, the power supply cord having a second end connectable to a power source. A current sensor is coupled to the power supply cord between the electrical receptacle and the second end for detecting electrical current flow through the power supply cord and providing an output signal that varies in proportion to the current flow through the power supply cord. A processing circuit coupled to the output of the current sensor includes a display device for displaying at least one of the current, voltage, power, and phase associated with the power supply cord at the current sensor. The display device can be remotely coupled to the power strip for positioning the display in a convenient location.

29 Claims, 8 Drawing Sheets

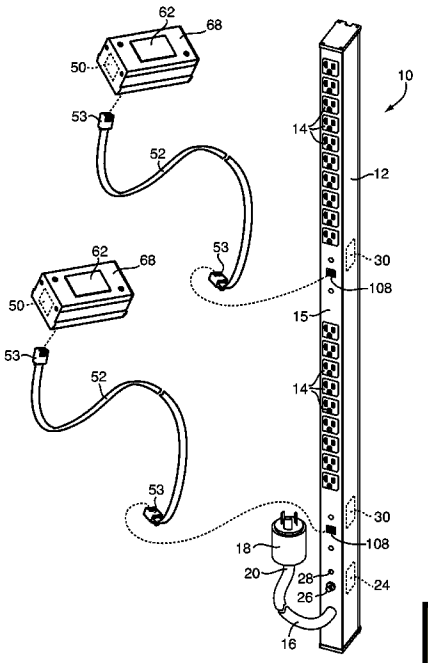

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EXHIBIT 1007

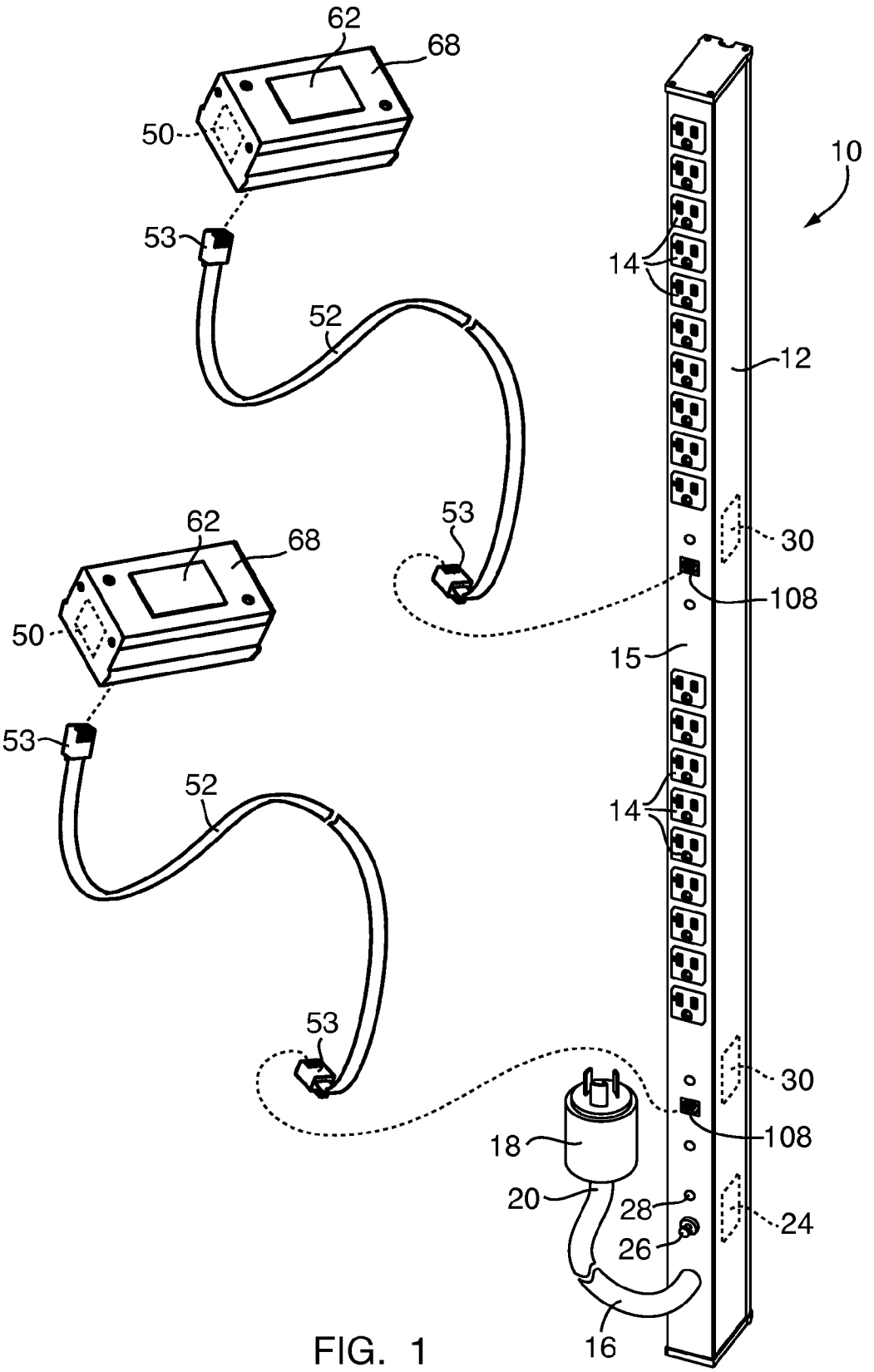
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FIG. 1

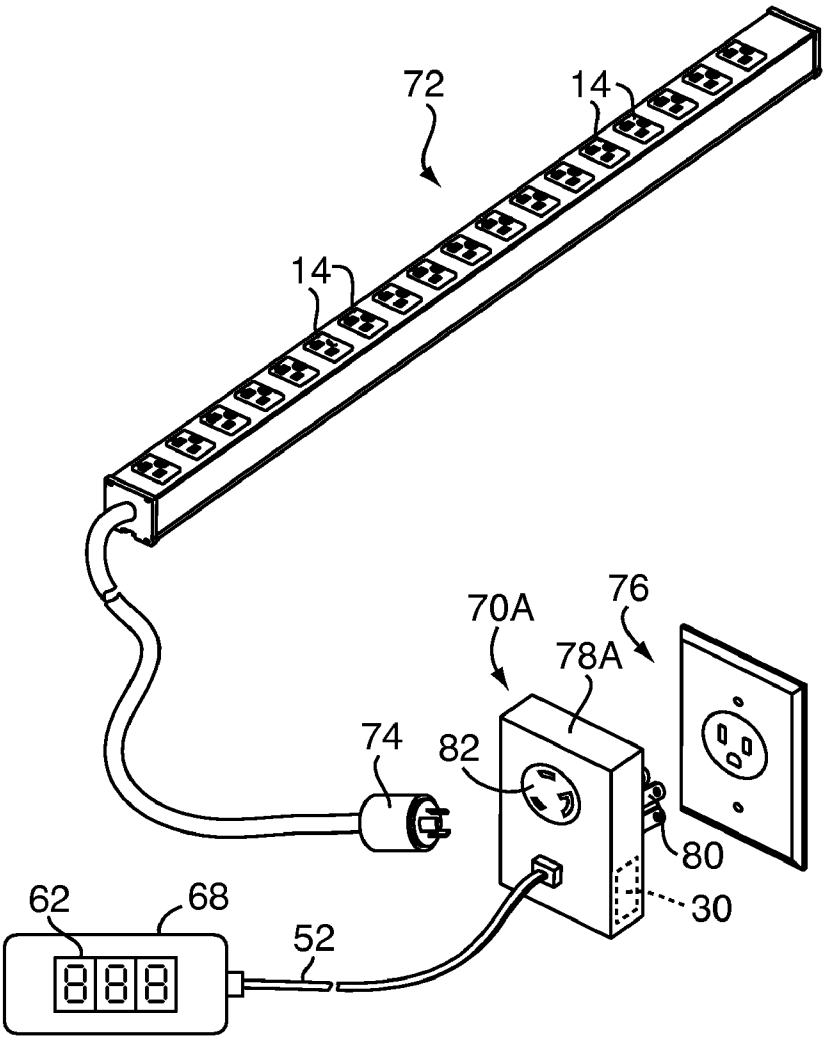
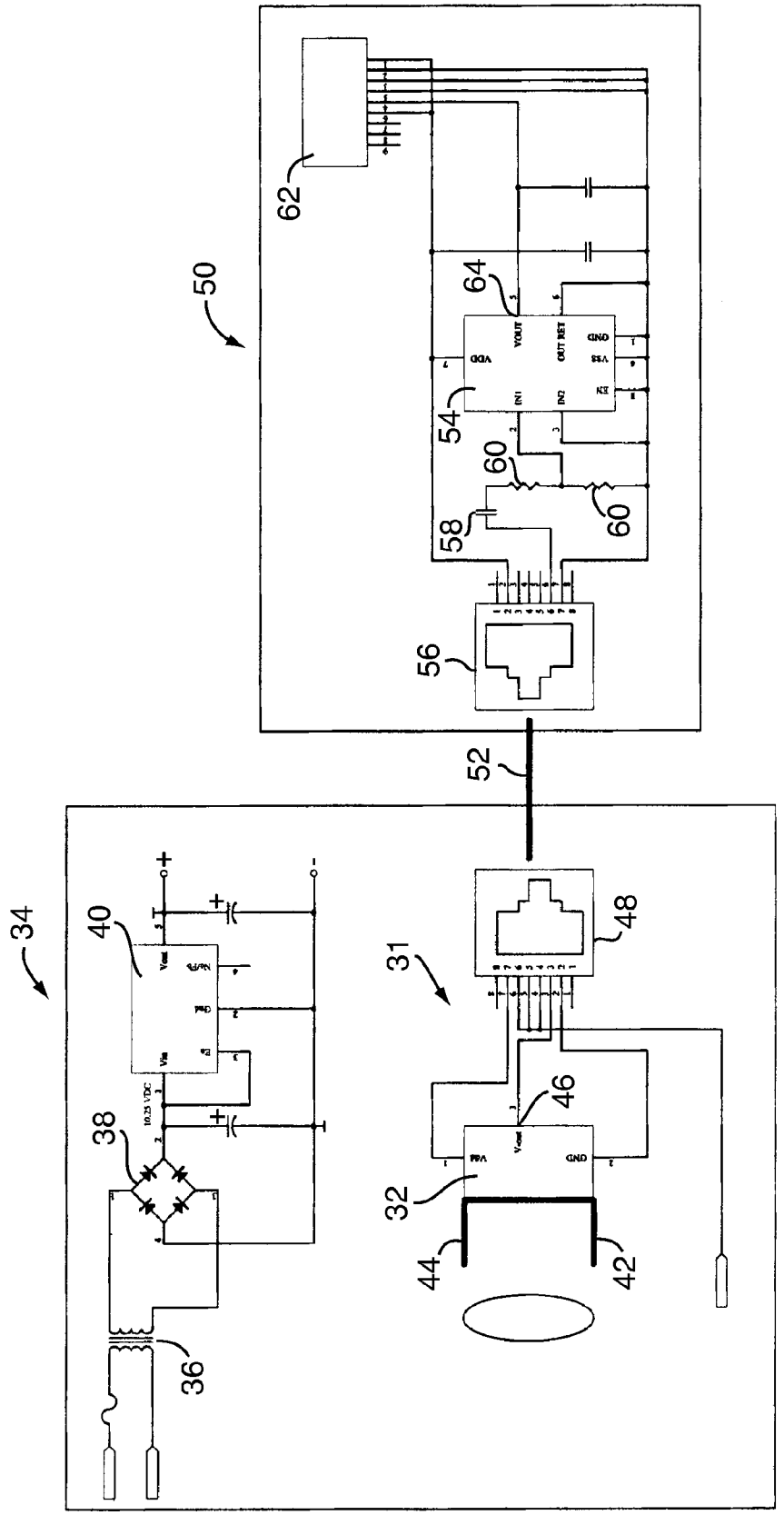


FIG. 2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62
64
VOUT
OUT RST
GND
VDD
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FIG. 3

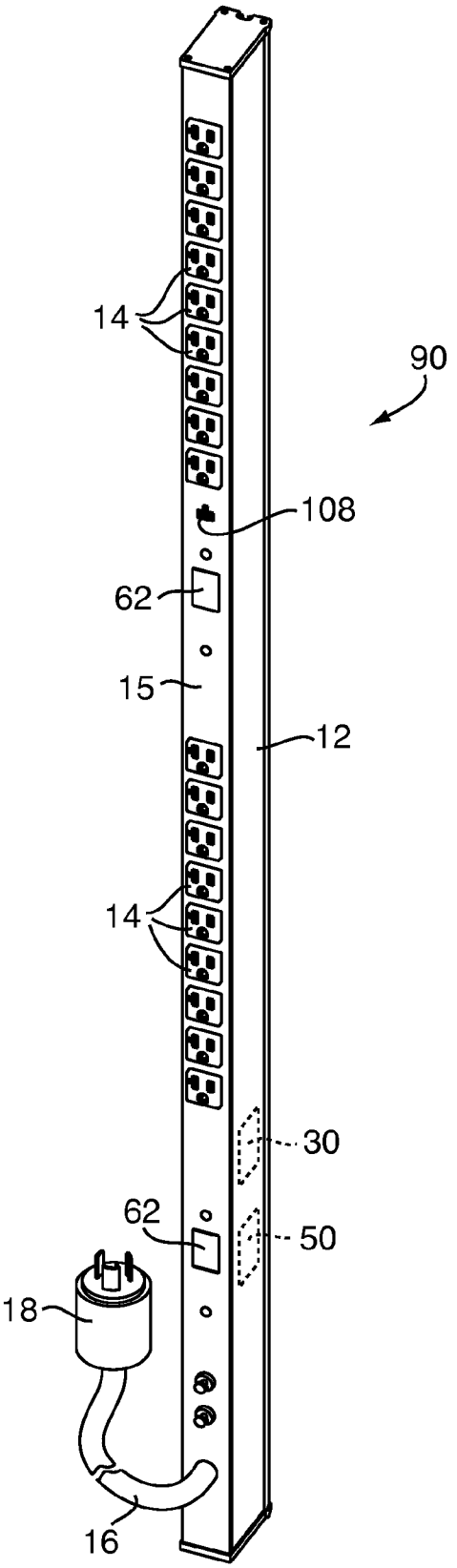

FIG. 4

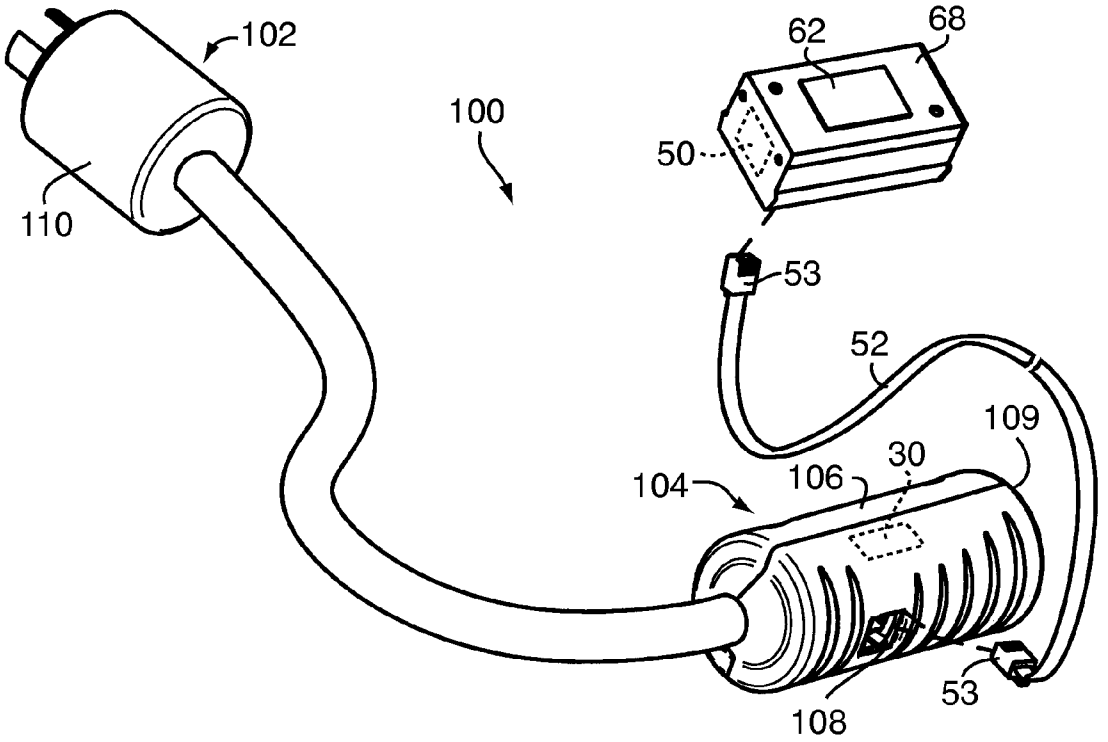

FIG. 5

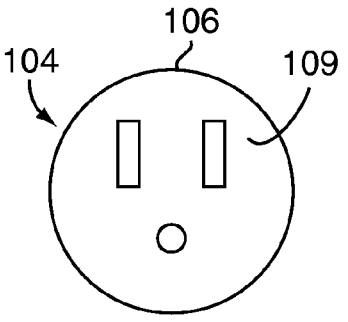

FIG. 5A

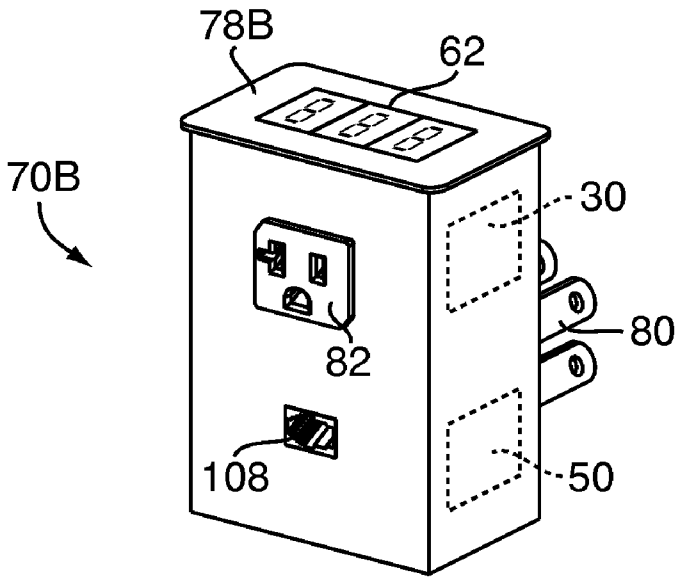

FIG. 6

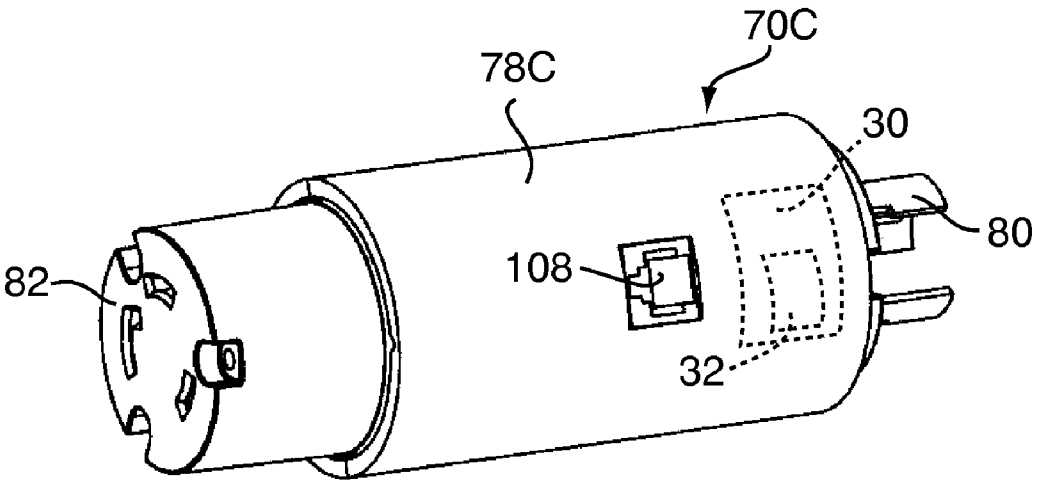

FIG. 7

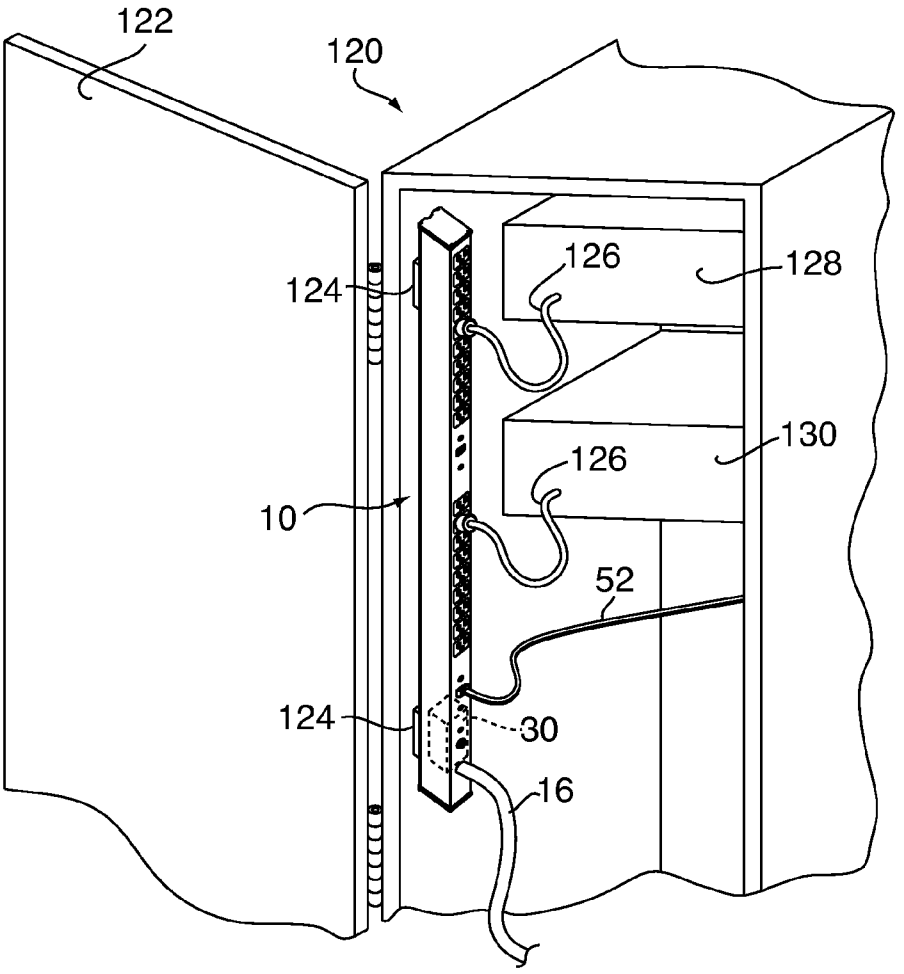
122
120
126
128
124
126
130
10
52
124
30
16

FIG. 8

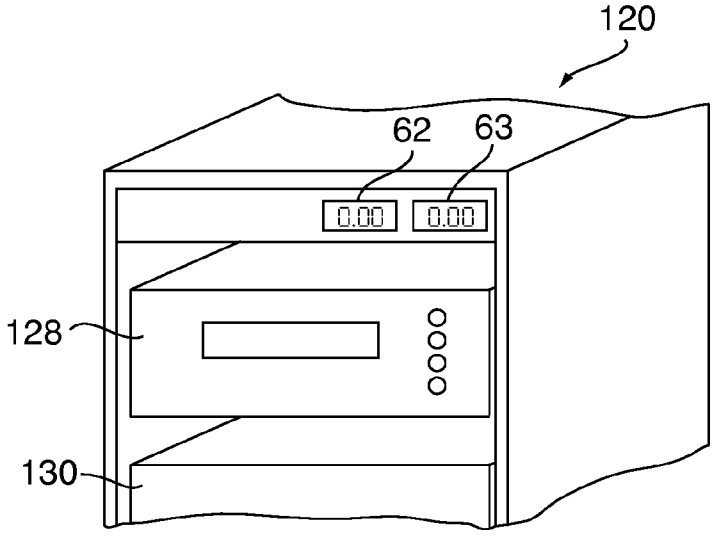
120
62
63
0.00
0.00
128
130

FIG. 9

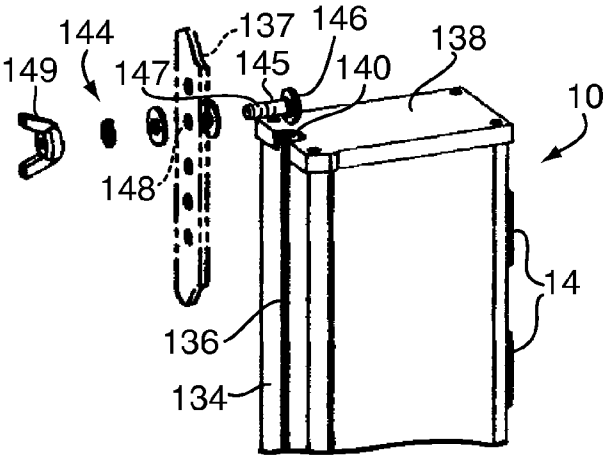

FIG. 11

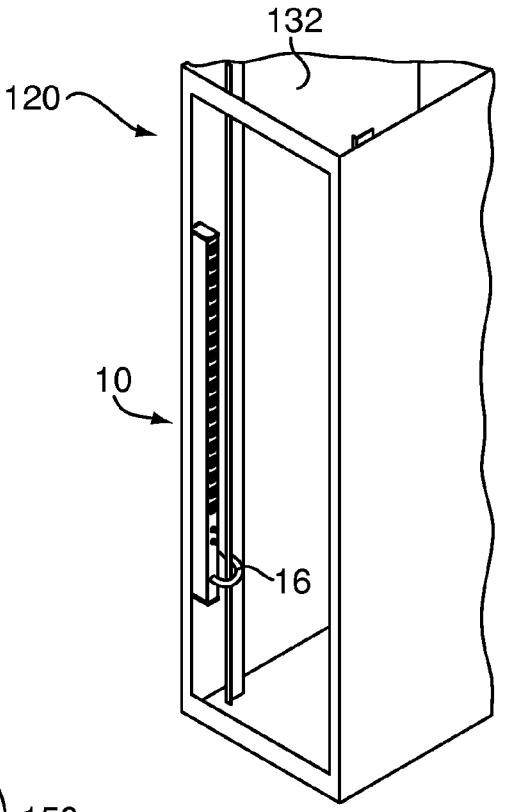

FIG. 10

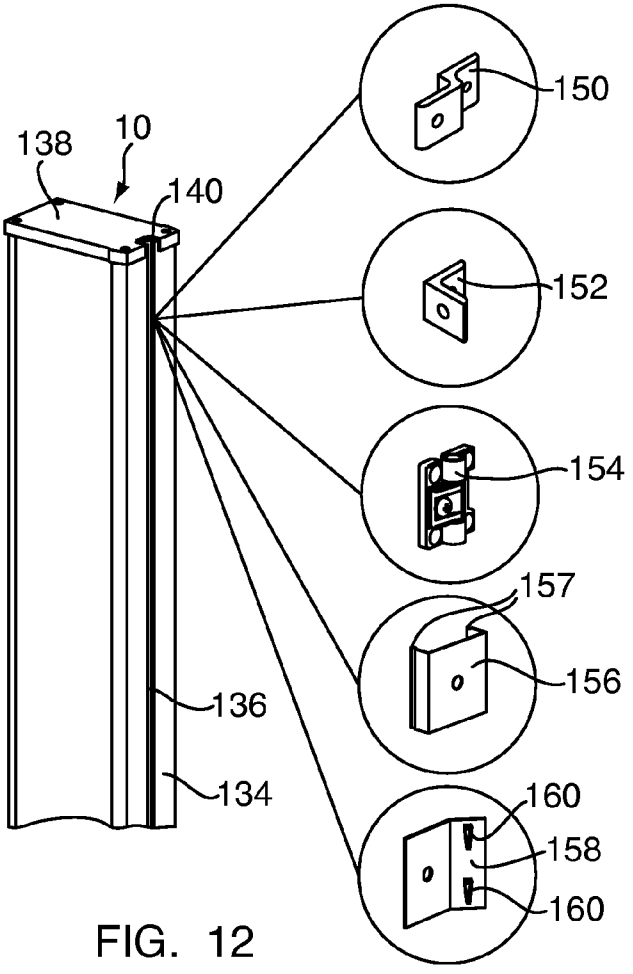

FIG. 12

REMOTE DISPLAY AMMETER FOR POWER PLUG OR POWER STRIP

CROSS REFERENCE TO RELATED APPLICATIONS

This application claims priority to U.S. Provisional Patent Application No. 60/519,434 filed on Nov. 12, 2003 entitled "Cabinet Mounting For Power Strip" and U.S. Provisional Patent Application No. 60/546,246 filed on Feb. 20, 2004 entitled "Remote Readout for Power Plug or Power Strip". The disclosure of each of the above-identified provisional applications is incorporated herein by reference.

FIELD OF THE INVENTION

The present invention generally relates to power strips and power cords and more particularly to a power strip and power cord including a remote display ammeter.

BACKGROUND OF THE INVENTION

Electronic cabinets generally are provided with power strips built into the cabinet for ease in plugging in electronic equipment provided within the cabinet. Typically, such power strips are permanently mounted on the back of the cabinet which makes the power strip accessible from the rear of the cabinet, the cabinet typically being provided with a rear door for this purpose. In use, such conventional installations sometimes make it awkward to reach the power strip for purposes of plugging and unplugging equipment to the outlets provided in the power strip, and for checking the status of the power input to the cabinet itself. The power strips generally provide for circuit protection as a result of one or more circuit breakers mounted in the power strip.

In other applications, such as machinery or large appliances, power cords are usually located at the rear of or lower portion of the appliances or machines being powered such that access to the power cord for monitoring the status of the current or power usage is often limited.

Based on the foregoing, it is the general object of the present invention to provide a power strip or power cord that improves upon, or overcomes the problems and drawbacks associated with prior art devices.

SUMMARY OF THE INVENTION

The present invention provides a power strip including a housing coupled to a first end portion of a power supply cord, the housing having an electrical receptacle mounted thereto and electrically connected to the first end portion of the power supply cord, the power supply cord having a second end connectable to a power source. Typically, the second end of the power supply cord includes an attached male plug for connecting the power strip to an electrical outlet or a power cord.

A current sensor is coupled to the first end portion of the power supply cord between the at least one electrical receptacle and the second end, the current sensor for detecting electrical current flow through the power supply cord. The current sensor providing an output that varies in proportion to the current flow through the power supply cord.

A processing circuit is coupled to the output of the current sensor for converting an output voltage of the current sensor to a DC voltage proportional to the electrical current flow detected in the power supply cord. A display device is coupled to the processing circuit for displaying one of the current, voltage, power, and phase associated with the power supply cord at the current sensor.

In one embodiment of the power strip of the present invention, the display device is mounted in the housing of the power strip. Alternatively, a remote cable is provided connectable between the housing of the power strip and an ammeter housing such that the display device is positionable remote from the power strip for displaying the status of the electrical load of the devices connected to the power strip in a convenient location.

The present invention also provides a versatile mounting system for mounting the power strip to a surface. The mounting system improves upon the general configuration of a rectangular cross section of the power strip by providing a T-shaped slot in a rear face, opposite the face which has the female outlets. This T-shaped slot can be used to mount the power strip on conventional screws provided in the cabinet, such that they stand off from the wall in which the strip will be mounted. The T-shaped slot allows the strip to be slid over the heads of a plurality of such screws, following which the screws can be tightened as required.

Alternatively, the power strip having a T-shaped slot or mounting keyway, can be provided with uniquely designed mounting accessories, in the form of brackets, or clips, for use in mounting the power strip, depending upon the needs of a user, in a particular electronic cabinet/enclosure or to other mounting surfaces. One form of bracket useful in mounting the power strip is of Z-shape so as to provide an offset mounting with a Z-bracket coupled to the T-slot.

Another type of mounting bracket is an L-shaped bracket which can be used for mounting the power strip at a right angle relative to a surface to which the L-shaped bracket is mounted.

A swivel bracket is also described, and allows the power strip to be rotated in the cabinet by the user after installation so as to facilitate to an even greater extent the versatility of the mounting to accommodate the user's needs in plugging and unplugging electronic equipment from the power strip.

Finally, a springed mounting clip configuration of generally U-shape is adapted to encircle the rear wall portion of the power strip defining the T-slot, to allow the entire unit to be quickly and easily removed or mounted in the cabinet without need for additional hardware. Accordingly, the T-slot is not utilized with the U-shape mounting clips.

A drop-in clip is also disclosed which when mounted directly on the unit allows the power strip to be installed with a drop-in mounting method, again requiring no additional hardware.

It will be apparent that each cabinet enclosure, equipment rack, or other mounting surface for the power strip will present unique mounting requirements.

Accordingly, the present invention seeks to provide a number of components along with a power strip having a T-shaped slot in the rear face so that the power strip can be mounted in/to a variety of enclosures, racks, and other surfaces so as not to require a skilled artisan for field installation.

Additionally, the present invention provides a power cord including a cable having a male plug connector attached at a first end of the cable and a female plug connector attached at a second end of the cable. One of the male and female plug connectors including a housing having a current sensor mounted therein and connected to the cable for detecting the electrical current flow therethrough. An ammeter housing is provided including a processing circuit and a display device mounted therein for displaying the status of the electrical draw through the power cord at a location remote from the

power cord. For example, if the power cord is utilized on a floor or under machinery, the ammeter housing can be positioned in an accessible area for convenient viewing or monitoring of the status of the electrical draw through the power cord.

In another aspect of the present invention, a power cord adapter is provided having a housing including a first side having a male plug connector extending therefrom and a second side having a female plug connector mounted thereto or defined thereby. The male and female plug connectors are electrically connected one to the other via a plurality of wires disposed inside the housing in a conventional manner. A current sensor is mounted in the housing and connected to one of the wires for detecting electrical current flow through the wire and provides an output signal that varies in proportion to the current flow detected. A processing circuit including a display device are coupled to the current sensor for displaying characteristics of the electrical draw through the power cord adapter.

In yet another aspect of the present invention a cabinet for housing electrical equipment is provided. The cabinet having a first side defining an opening for mounting electrical equipment therein and a second side having a power strip in accordance with the present invention removably mounted thereto for providing power to the electrical equipment. The power strip including a remote display device for displaying at least one of the current, voltage, power, and phase associated with the power supply cord at the current sensor. The display device is mounted to the first side of the cabinet such that the electrical draw associated with the power strip can be conveniently viewed from the first side of the cabinet.

The foregoing and still other objects and advantages of the present invention will be more apparent from the detailed explanation of the preferred embodiments of the invention in connection with the accompanying drawings wherein throughout the figures, like reference numerals describe like elements of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a power strip in accordance with the present invention.

FIG. **2** is an exploded perspective view of a power cord adapter according to the present invention shown as connectable between a conventional power strip and a wall outlet.

FIG. **3** is a schematic drawing of one embodiment of each of supply, sensing and processing circuits in accordance with the present invention.

FIG. **4** is a perspective view of another embodiment of a power strip according to the present invention.

FIG. **5** is a perspective view of a power cord and remote ammeter in accordance with the present invention.

FIG. **5**A is an end view of the power cord of FIG. **5**.

FIG. **6** is a perspective view of another embodiment of a power cord adapter according to the present invention.

FIG. **7** is a perspective view of yet another embodiment of a power cord adapter according to the present invention.

FIG. **8** is a partial perspective view of a rear side of a cabinet for storing electrical equipment in accordance with the present invention.

FIG. **9** is a partial perspective view of a front side of the cabinet of FIG. **8**.

FIG. **10** is a partial perspective view of the rear side of another embodiment of a cabinet for storing electrical equipment in accordance with the present invention.

FIG. **11** is a perspective view of the rear side of a power strip according to the present invention including a T-slot for mounting the power strip to a surface.

FIG. **12** is a perspective view of a rear side of the power strip of FIG. **11** shown with a plurality of corresponding mounting brackets in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. **1**, an exemplary embodiment of a power strip in accordance with the present invention is shown generally at **10**. The power strip **10** includes a housing **12** having a plurality of electrical outlets **14** mounted to a front face **15** of the housing. The electrical outlets **14** are electrically connected to a first end portion (not shown) of a power supply cord **16** in a conventional manner for providing electrical power to the outlets. A male plug **18** is attached to a second end **20** of the power supply cord **16**. Typically, the male plug **18** is connected to an electrical outlet **76** (shown in FIG. **2**) for providing electrical power to the power strip **10**.

The power strip **10** includes a circuit breaker **24** also mounted to the front face **15** of the housing **12** and including a reset button **26** and overcurrent indicator **28**. The circuit breaker **24** opens in the event of an overcurrent condition and provides overcurrent protection to electrical equipment associated with the power strip **10**.

Referring to FIGS. **1** and **3**, the power strip **10** includes a current sensor module **30** mounted in the housing **12** and including a current sensor **32** (shown in FIG. **3**) and a power supply generally referred to by the reference numeral **34**. In the FIG. **3** embodiment, the power supply **34** includes a transformer **36** coupled to the power supply cord **16**, a rectifier **38** and voltage regulator **40** supplying electrical power, V_{DD}=+5 volt to the current sensor **32**. In other embodiments of the present invention, the current sensor **32** could be battery powered.

As also shown in FIG. **3**, a sensing circuit **31** includes the current sensor **32** having current sensing terminals **42** and **44** connectable to a wire of the power supply cord **16** for detecting the electrical current flow therethrough. Typically, the current sensor **32** includes a Hall effect sensor that detects the current flow through the power supply cord **16** and provides an output voltage proportional thereto at an output terminal **46** of the current sensor. In the FIG. **3** embodiment, an RJ45 connector **48** is coupled to the outputs of the current sensor **32** for connecting the sensing circuit **31** to a processing circuit **50** via a remote cable **52**.

In a preferred embodiment of the present invention, the current sensor **32** is an Allegro® MicroSystems, Inc., ACS750 current sensor having a supply voltage Vcc of approximately 5 volts for sensing currents in a range of approximately −50 to +50 Amperes. The output of the Allegro® MicroSystems current sensor has a positive slope (>Vcc/2) when an increasing current flows from the sensing terminal **38** to sensing terminal **36**. The Allegro® current sensor provides an electrical offset voltage or quiescent output voltage which is the output of the current sensor when the current flow in the power supply cord **16** is zero equal to Vcc/2 or approximately 2.5 volts. Thus, the current sensor **32** provides an AC output voltage having a first portion proportional to the detected current flow in the power supply cord **16** and a second portion equal to the offset voltage.

Referring again to FIG. **3**, the processing circuit **50** includes a processor **54** coupled to the outputs of the current sensor **32** via a coupler **56** that is connectable to an end of

the remote cable **52**. A capacitor **58** removes a DC component of the output signal of the current sensor **32** and series resistors **60** and **62** divide the amplitude of the output of the current sensor compatibility with and further processing by the processor **54**. In the preferred embodiment, the processor **54** includes an RMS to DC converter for converting the AC portion of the output of the current sensor into a proportional DC voltage. In a preferred embodiment, the DC voltage output from the RMS to DC converter is in a range of 0 to 200 mV and is then converted accordingly for displaying of characteristics of the electrical draw associated with the power strip **10** at the current sensor **32**. As shown in FIG. **3**, a voltmeter and/or display device **62** is coupled to the output **64** of the processor **54** for converting the output of the processor **54** and displaying one of the current, voltage, power and phase of the power supply cord **16** at the current sensor **32**. In a preferred embodiment the display device **62** includes a panel DC voltmeter model SP400 made by Lascar Electronics, Inc. of Erie, Pa.

Still referring to FIG. **1**, the processing circuit **50** and display device **62** are housed in an ammeter housing **68** that is coupled to current sensor module **30** and the housing **12** via a remote cable **52**. The remote cable **52** includes male couplers **53** at the ends thereof for removably connecting the remote cable to the power strip **10** via a female coupler **108**. In other embodiments of the power strip **10**, the processing circuit **50** and ammeter housing **68** is coupled to the current sensor module **30** via a wireless connection for wireless transmission of the output of the current sensor **32** to the processing circuit **50**. Alternatively, the power strip **10** or processing circuit **50** can be coupled to a computer network such as a LAN so that a computer can be utilized for monitoring or analysis of the power utilized by the power strip and devices coupled thereto.

FIG. **4** is an illustration of another embodiment of a power strip **90** in accordance with the present invention. The power strip **90** is similar in construction and operation to the power strip **10** of FIG. **1**, except that both the processing circuit **50** and display device **62** are mounted inside the housing **12**. A female coupler **108** is also provided and mounted to the housing **12** for connecting an additional remote ammeter housing **68** including a processing circuit **50** to the output of the current sensor module **30**.

Referring to FIG. **2**, the present invention provides a power cord adapter, generally referred to by the reference number **70**A. As shown in FIG. **2**, the power cord adapter **70**A is connectable between a conventional power strip **72** having a male plug **74** and an electrical outlet, generally referred to as **76**. The power cord adapter **70**A includes a housing **78**A having a male plug **80** extending from a first side of the housing and a female plug connector **82** mounted to another side of the housing. The male and female plug connectors **80** and **82** are electrically coupled one to the other via a plurality of wires disposed inside the housing **78**A in a conventional manner. In the FIG. **2**, configuration, the power cord adapter **70**A monitors the electrical draw of the power strip **72** at the male plug **74**. A current sensor module **30** including a current sensor **32** are mounted in the housing **78**A for electrical connection with at least one wire coupled to the male plug **74**. The ammeter housing **68** houses the processing circuit **50** and display device **62** and is coupled to the current sensor module **30** via the remote cable **52**. The operation of the current sensor module **30** and processing circuit **50** are the same as set forth above with respect to the power strip **10**. Accordingly, the power cord adapter **70**A is compatible with any power strip or power cord for monitoring and displaying the electrical draw of appliances coupled thereto.

FIG. **6** shows a power cord adapter **70**B according to the present invention that is similar to the power cord adapter **70**A of FIG. **2** wherein the housing **78**B includes the processing circuit **50** and display device **62** mounted therein. A coupler **108** is provided connected to the processing circuit **50** for connecting an additional remote voltmeter and/or display device **62** to the power cord adapter **70**B.

Referring to FIG. **7**, another embodiment of a power cord adapter in accordance with the present invention is generally referred to by the reference numeral **70**C. The power cord adapter **70**C includes a housing **78**C having a male plug **80** and female plug connector **82** mounted at opposing ends of the housing. The power cord adapter **70**C includes a plurality of wires disposed inside the housing **78**C and electrically connecting the male and female plug connectors **80** and **82** respectively, in a typical fashion known in the art. A current sensor module **30** is mounted interior the housing **78**C and includes a current sensor **32** coupled to one of the wires coupling the male and female plugs **80**, **82** together for detecting the electrical current flow therethrough as described above. A coupler **108** is mounted to the housing **78**C and electrically connected to the output of the current sensor **32** for connecting a processing circuit **50** including a remote voltmeter and/or display device **62** to the power cord adapter **70**C.

Referring to FIG. **5** a power cord **100** in accordance with the present invention includes opposing male and female plug ends, generally **102** and **104** respectively. The female plug end **104** is coupled to one end of the power cord **100** and includes a plug housing **106** having a female plug connector **109** and current sensor module **30** mounted therein. The female plug connector **109** (shown in FIG. **5**A) is electrically connected to one end of the power cord **100** as is known in the art. The current sensor module **30** includes a current sensor **32** (shown in FIG. **3**) electrically connected to a wire of the power cord **100** as set forth above with respect to the power cord **16** of FIG. **1**. A female coupler **108** is mounted to the plug housing **106** and coupled to the current sensor **32** for connecting the current sensor to a remote ammeter housing **68** via a remote cable **52** and coupler **53** as discussed hereinabove with respect to the power strip **10** of FIG. **1**. As shown in FIG. **5**, the remote ammeter housing **68** includes a display device **62** for displaying characteristics of the electrical draw of appliances coupled to the power cord **100** at the female plug end **104** as detected by the current sensor **32**. In other embodiments of the power cord **100**, the current sensor module **30** can be mounted in a housing **110** at the male plug end **102** for monitoring the electrical draw at the male plug end **102** and a power source coupled thereto.

FIG. **8** shows a cabinet for housing electrical equipment according to the present invention generally referred to by the reference numeral **120**. The cabinet **120** includes a rear access door **122**, the door being shown in an open position so as to reveal the interior of the cabinet from a rear side. A power strip **10** in accordance with the present invention is mounted on swivel brackets **124**, allowing the power strip to be rotated relative to the cabinet in order to facilitate plug-in connections between power cords **126** for the equipment **128**, **130** and the power strip. The power strip **10** includes a power cord **16** as described above, which is connectable to a source of power by conventional means.

As shown in FIG. **9**, a front side of the cabinet **120** provides access to the electrical equipment **128**, **130**

mounted therein. A display device **62** and/or remote ammeter/voltmeter **63** is mounted to the front side of the cabinet **120** for viewing from the front side of the cabinet. The ammeter/voltmeter **63** may be of analog variety, but preferably is a digital device.

The display device **62** and/or remote ammeter/voltmeter **63** is coupled to the power strip **10** via the remote cable **52** and is operable in conjunction with a processing circuit **50** as set forth above. The processing circuit **50** can be housed either in the housing **12** of the power strip **10** or within the ammeter housing **68** as discussed above. FIG. **10** is an illustration of the cabinet **120** without the rear access door **122** to show the power cord **16** as arranged to exit the cabinet through a side wall **132** of the cabinet.

Referring to FIG. **11**, a rear side **134** of the power strip **10** defines a T-slot **136** for mounting the power strip **10** to a surface **137** shown in dashed lines. An end cap **138** of the power strip **10** defines a T-slot **140** corresponding to the T-slot **136** defined by the rear side **134** of the power strip. The surface **137** represents any surface the power strip **10** is mounted to such as the sidewall **132** of the cabinet **120**. A bolt and nut fastener assembly generally referred to by the reference number **144** couples the power strip **10** to the surface **137**. As shown in FIG. **11**, the fastener assembly **144** includes a bolt **145** having a head **146** that is receivable in the T-slot **134** and a threaded portion **147** that extends outwardly from the T-slot **134** and through a corresponding mounting hole **148** defined by the surface **137**. A nut **149** threadably secureable to the threaded portion **147** of the bolt **145** secures the power strip **10** to the surface **137**. As shown in FIG. **11**, and is common in the art, flat washers, lock washers, lock nuts, or other types of fasteners and accessories can be used with the bolt **145** or substituted therefor. Accordingly, as arranged in FIG. **11**, the power strip **10** is slidable along the T-slot relative to the surface **137** by loosening the fastener assembly **144**.

FIG. **12** shows the power strip **10** having a T-slot **136** defined at a rear side **134** thereof. Also shown in FIG. **6** is a plurality of mounting brackets that can be used for mounting the power strip **10** in various applications including mounting the power strip **10** inside of an electronic cabinet **120**.

Alternatively, and as supplied by the manufacturer of the power strip **10** in the form of a kit, mounting accessories are provided with the understanding that each cabinet, enclosure, rack or other application is unique, and might require different solutions for mounting the power strip to the enclosure or frame of the individual unit which is to be equipped with a power strip in accordance with the present invention.

Referring again to FIG. **12**, a Z-bracket **150** is illustrated which is designed to offset the power strip **10** in order to afford improved access to the front face **15** of the power strip and to the female outlets **14** provided therein, as well as to the circuit breakers **24** which are generally also provided in the front face of the power strip.

Also, provided by the manufacturer of the power strip **10**, are L-brackets **152** which allow mounting of the power strip at a right angle to a surface. For example, the L-brackets **152** are useful to mount the power strip **10** to a sidewall **132** of the cabinet **120** such that the front face **15** of the power strip **10** can be mounted facing the rear of the cabinet to provide better access to the female outlets **14** mounted thereto.

Even more versatile are the swivel brackets **154** provided by the power strip manufacturer and illustrated in FIG. **12** that will allow the power strip **10** to be rotated through approximately 270° depending upon its location within the cabinet or other structure to which the power strip is mounted, thereby providing ready access to the front face **15** of the power strip **10**.

Spring clip **156**, are also provided which are mountable to a surface **137** and provide clip portions **157** between which the rear face **134** of the power strip **10** is engageable, without requiring the T-slot **136**. The spring clips **156** provide for the removal and replacement of the power strip **10** without the need for tools.

Drop-in clips **158** are also provided and include key-hole slots **160** to allow the power strip **10** to be installed in a "drop and hold" assembly, again requiring no tools.

While exemplary embodiments of the present invention have been shown and described, various modifications and substitutions may be made thereto without departing from the spirit and scope of the invention. Accordingly, it is to be understood that the present invention has been described by way of illustration and not limitation.

What is claimed is:

1. A power strip comprising:

a housing coupled to a first end portion of a power supply cord, the housing having at least one electrical receptacle mounted thereto and electrically connected to the first end portion of the power supply cord, the power supply cord having a second end connectable to a power source;

a current sensor coupled to the first end portion of the power supply cord between the at least one electrical receptacle and the second end, the current sensor for detecting electrical current flow through the power supply cord and providing an output signal that varies in proportion to the current flow through the power supply cord;

a processing circuit coupled to the output of the current sensor and including means for processing the output signal of the current sensor for displaying characteristics of the electrical current flow detected in the power supply cord, the processing circuit coupled to a display device, the display device for displaying at least one of the current, voltage, power, and phase associated with the power supply cord at the current sensor; and

a remote cable coupled between the output of the current sensor and an input of the processing circuit such that the processing circuit and the display device are positionable remote from the housing.

2. The power strip according to claim **1** further comprising a sensor circuit including the current sensor and a power supply electrically connected to the current sensor and the first end portion of the power supply cord, the power supply for providing electrical power to the current sensor.

3. The power strip according to claim **1** wherein the sensor circuit and the processing circuit include terminals for removably coupling the remote cable therebetween.

4. The power strip according to claim **3** wherein the terminals include RJ45 connectors.

5. The power strip according to claim **1** wherein the current sensor includes a Hall effect current sensor.

6. The power strip according to claim **1** wherein the output signal of the current sensor includes an output voltage and the processing circuit includes means for converting the output voltage to a DC voltage proportional to the electrical current flow detected in the power supply cord.

7. The power strip according to daim **6** wherein the means for converting the output voltage of the current sensor to a DC voltage includes an RMS to DC converter.

8. The power strip according to claim 1 further comprising an ammeter housing wherein the processing circuit and the display device are housed in the ammeter housing.

9. The power strip according to claim 1 wherein the output voltage of the current sensor includes a quiescent portion and a variable portion, the variable portion corresponding to the current flow detected in the power supply cord.

10. The power strip according to claim 1 further comprising a male plug coupled to the second end of the power supply cord for connecting the power supply cord to a power source.

11. The power strip according to claim 1 wherein the housing further comprises a T-slot defined in a surface thereof for mounting the housing to a surface.

12. A power strip comprising:

a housing coupled to a first end portion of a power supply cord, the housing having at least one electrical receptacle mounted thereto and electrically connected to the first end portion of the power supply cord, the power supply cord having a second end connectable to a power source;

a current sensor coupled to the first end portion of the power supply cord between the at least one electrical receptacle and the second end, the current sensor for detecting electrical current flow through the power supply cord and providing an output signal that varies in proportion to the current flow through the power supply cord;

a processing circuit coupled to the output of the current sensor and including means for processing the output signal of the current sensor for displaying characteristics of the electrical current flow detected in the power supply cord, the processing circuit coupled to a display device, the display device for displaying at least one of the current, voltage, power, and phase associated with the power supply cord at the current sensor; and

a wireless transmitter coupled to the output of the current sensor for wireless transfer of the output signal of the current sensor to the processing circuit wherein processing circuit and the display device are positionable remote from the housing.

13. The power strip according to claim 12 further comprising an ammeter housing wherein the processing circuit and the display device are housed in the ammeter housing.

14. A power cord comprising:

a multiple wire cable including a first end having a male plug connector attached thereto and a second end having a female plug connector attached thereto;

one of the male and female plug connectors including a housing having a current sensor mounted therein, the current sensor coupled to a wire of the cable between the male and female plug connectors, the current sensor for detecting electrical current flow through the cable and providing an output signal that varies in proportion to the current flow;

a processing circuit coupled to the output of the current sensor and including means for processing the output signal of the current sensor for displaying characteristics of the electrical current flow detected in the cable, the processing circuit coupled to a display device, the display device for displaying at least one of the current, voltage, power, and phase associated with the power cord at the current sensor;

a remote cable connected between an output of the current sensor and the processing circuit such that the display device can be positioned at a location remote from the power cord.

15. The power cord according to claim 14 further comprising an ammeter housing wherein the processing circuit and the display device are disposed in the ammeter housing.

16. The power cord according to claim 14 wherein the remote cable is removably connectable between the housing of the one of the male and female plug connectors and the ammeter housing.

17. The power cord according to claim 14 wherein the current sensor includes a Hall effect current sensor.

18. The power cord according to claim 14 wherein the output signal of the current sensor includes an output voltage and the processing circuit includes means for converting the output voltage to a DC voltage proportional to the electrical current flow detected in the power supply cord.

19. The power cord according to claim 18 wherein the means for converting the output voltage of the current sensor to a DC voltage includes an RMS to DC converter.

20. The power cord according to claim 14 further comprising means for wireless transfer of the output signal of the current sensor to the processing circuit such that the display device is positionable remote from the power cord.

21. A power cord adapter comprising:

a housing having first and second ends;

a male plug connector extending from the first end of the housing;

a female plug connector mounted to the second end of the housing;

a plurality of wires electrically connecting the male and female plug connectors one to the other and disposed in the housing;

a current sensor mounted in the housing and coupled to one of the wires between the male and female plug connectors, the current sensor for detecting electrical current flow through the one of the wires and having an output terminal providing an output signal that varies in proportion to the current flow;

a first electrical coupler mounted to the housing and connected to the output terminal of the current sensor;

a processing circuit having an input connected to a second electrical coupler and including means for converting the output voltage of the current sensor to a DC voltage proportional to the electrical current flow detected in the cable coupled to a display device, the display device for displaying at least one of the currents, voltage, power, and phase associated with the cable at the current sensor;

a remote cable removably connectable between the first and second electrical couplers for transferring the output of the current sensor to the processing circuit such that the display device can be positioned at a location remote from the cable.

22. The power cord according to claim 21 wherein the first and second electrical couplers include RJ45 connectors.

23. The power cord according to claim 21 further comprising an ammeter housing wherein the processing circuit and the display device are disposed in the ammeter housing.

24. A power cord adapter comprising:

a housing having first and second ends;

a male plug connector extending from the first end of the housing;

a female plug connector defined by the second end of the housing;

a plurality of wires electrically connecting the male and female plug connectors one to the other and disposed in the housing;

a current sensor mounted in the housing and coupled to one of the wires between the male and female plug

connectors, the current sensor for detecting electrical current flow through the one of the wires and having an output terminal providing a voltage that varies in proportion to the current flow therethrough;

a processing circuit coupled to the output of the current sensor and including means for converting the output voltage of the current sensor to a DC voltage proportional to the electrical current flow detected in the one of the wires coupled to a display device, the display device for displaying at least one of the current, voltage, power, and phase associated with the one of the wires at the current sensor;

the display device mounted in the housing.

25. The power cord adapter according to claim **24** wherein the housing further comprises a connector coupled to an output of the processing circuit for coupling a remote display device thereto.

26. A cabinet for housing electrical equipment comprising:

a first side defining at least one opening for mounting electrical equipment therein;

a second side having a power strip removably mounted thereto for providing power to the electrical equipment;

the power strip including a housing coupled to a first end portion of a power supply cord, the housing having at least one electrical receptacle mounted thereto and electrically connected to the first end portion of the power supply cord, the power supply cord having a second end extendable outwardly from the second side of the cabinet and connectable to a power source;

a current sensor mounted in the housing and coupled to the first end portion of the power supply cord between the at least one electrical receptacle and the second end, the current sensor for detecting electrical current flow through the power supply cord and having an output providing a voltage that varies in proportion to the current flow through the power supply cord;

a processing circuit coupled to the output of the current sensor and including means for converting the output voltage of the current sensor to a DC voltage proportional to the electrical current flow detected in the power supply cord coupled to a display device, the display device for displaying at least one of the current, voltage, power, and phase associated with the power supply cord at the current sensor; and wherein

the display device is mounted to the first side of the cabinet.

27. The cabinet according to claim **26** further comprising a remote cable coupled between the output terminal of the current sensor and the processing circuit wherein both of the processing circuit and the display device are positionable at a location remote from the power strip.

28. The cabinet according to claim **27** further comprising an ammeter housing wherein the processing circuit and the display device are disposed in the ammeter housing, the ammeter housing being mounted to the cabinet such that the display device is viewable from the first side of the cabinet.

29. The cabinet according to claim **26** wherein the housing includes a surface defining a T-slot for removably mounting the power strip to a surface of the cabinet.

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