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(71) **Demandeur/Applicant:**
BALTHAZAR, MICHEL, CA

(72) **Inventeur/Inventor:**
BALTHAZAR, MICHEL, CA

(74) **Agent:** NA

(54) **Titre : BARRETTE DE CHARGE MAITRESSE A SURVEILLANCE DE PUISSANCE A TRIPLES CHARGES ESCLAVES**

(54) **Title: POWER MONITORING MASTER LOAD STRIP WITH TRIPLE SLAVE LOADS**

(57) **Abrégé/Abstract:**

A horizontal electrical power strip device including a built in power plug, one master power outlet and triple slave power outlets controlled independently and simultaneously from each other through a master outlet. A power-sensing device (relay element) is coupled to a switch that allows the slave power outlets to be automatically turned on or off (controlled by the master outlet drawing sufficient current) and having different states simultaneously. Thus when current is being drawn from the master outlet the first slave is switched to an on (closed circuit) state, the second slave is switched to an off (open circuit) state while the third slave stays uninterrupted in an indefinite on (closed circuit) state. Having both simultaneously similar and opposite states of that to the master, the slave outlets offer a wide range of uses from power tools to home appliances including sharing of the same electrical power circuit.

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FIELD OF THE INVENTION

The present invention relates to a *horizontal electrical power strip device*, and more particularly, to a *horizontal electrical power strip device* that can be used in conjunction with power tools so as to allow secondary tools associated with a master tool to be automatically turned on or off simultaneously with the master tool being turned on or off, as well as simultaneously cutting off power to a third group of tools associated with the same master tool and furthermore with the possibility of continually supplying uninterrupted power to a forth group of tools.

The present invention also relates to a *horizontal electrical power strip device* that can be used in conjunction with, electrical and or electronic appliances, accessories and equipment in homes, offices, laboratories, construction sites and more, that when two or more appliances, accessories and or equipment are used simultaneously on a single 120 volts, 15 amp to 25 amp electrical circuit, and that without the use of power sharing by the *horizontal electrical power strip device*, would otherwise overload that circuit.

BACKGROUND OF INVENTION

In the passed power bars (power strips) either came with no overload protection or some overload protection. In some instances the auto overload protection must be manually reset, in other instances it will reset over a pre-set amount of time or when a normalized internal temperature is reached. No mater witch of the above situations the common result is, an automatic cutoff or shut down of power to some or all of the outlets. This until power is finely reset. Resulting in total or partial stopping of production (use of electrical power) for a pre-set or indefinite amount of time. In the case where there is no protection on the power strip the circuit fuse or breaker will (when overloaded) cut power until the fuse is replaced or breaker tripped back on.

More over most power bars cannot withstand more than 15 amps strain on either one of or the totality of their outlets. In some cases controlled power bars will compensate by shutting down one or more of the slave outlets to prevent a possible overload at or near 15 amps, and in other cases the power bar will shut down completely. Once again resulting in a shutdown of power and alternately the stopping of production.

Many power bars also come with serge protection for phone lines and computer communications LAN (local area network) protection.

Although these features may be useful in particular instances they do little or nothing to address and remedy the basic underling situations we wish to expose here.

The first example explaining the need for this new *horizontal electrical power strip device* will be one where, we feel primarily the construction and renovation industry is concerned. This example uses the full potential of all of the four different outlets simultaneously. It is understood in this example, like in most construction and renovation situations that only one extension cord, plugged into one 20-amp circuit is readily available.

A worker must use an electric tool (in this case a miter saw) thus creating dust. To remedy the dust situation he must use an electric vacuum cleaner with its suction hose connected directly to the saw's dust exhaust output. Concentrating on his work (measurements prior to the cut), the said worker forgets to start the vacuum before making a cut. Two problems occur, first dust flies everywhere and second the suction hose tends to block because of the absence of suction. By plugging the miter saw in the master outlet (0) of the *horizontal electrical power strip device* and by plugging the vacuum into the first slave outlet (1) of the *power strip*, the vacuum will start simultaneously with the saw (i.e. the saw controls the vacuum). Not only does this remedy the problem of the worker forgetting to start the vacuum, it also saves on electrical power because the vacuum stays on only for the exact duration of the cut (saw), more over not having to use the switch on the vacuum by leaving it in the on position, the worker can proceed to placing the vacuum further away from his immediate work space (i.e., behind the miter saw), providing him with a larger, safer and more productive environment.

The second part of this first example concurs with the former, to which we shall add a portable air compressor. The compressor shall be used to provide air for a tool (in this case a nailer). Air compressors automatically shuffle from an on to an off position depending on weather or not the predefined air supply is sufficient or not for the nailer. To prevent the compressor from

automatically turning on at the same time as the saw and vacuum, the compressor shall be plugged into the second slave outlet (2). Thus preventing an otherwise overload situation, as we consider the total amount of electrical power needed to supply both the saw, vacuum and compressor together is way above the maximum limit of a 20-amp circuit breaker or fuse.

The third part of this first example concurs with the two former, to which we shall add a utility work light. The light shall be used for example to provide constant uninterrupted light for the said worker. For the light to operate without being influenced in any way by any of the above said tools it shall be connected to the third slave outlet (3).

This second example explaining the need for the *horizontal electrical power strip device* will be one where, we feel primarily the home, office and laboratory is concerned. In this example the first scenario, uses the full potential of all of the four different outlets simultaneously and the following scenarios use different partial to full potential combinations.

In a typical home, office or laboratory kitchen, we often find a refrigerator, microwave oven, electric clock and many other plug-in appliances. In the same spirit as the first example we know for a fact that we cannot use on a same 15-amp standard electrical circuit, a refrigerator simultaneously with a microwave oven, or a toaster with a kettle or even a toaster oven with a coffee machine not to mention a dishwasher with any of the previous appliances. Most new kitchens are fitted with two separate circuits to accommodate for such situations. But with the never-ending additions to our kitchen environments, the basic existing wiring setup does not suffice any more. More and more appliances will have to share a common 15-amp circuit.

Again as in the first tool example, the combinations of uses in the kitchen are almost endless. For the purpose of keeping the text as brief as possible in the following two scenarios one can readily replace just about any appliance by an other.

In a kitchen where certain appliances want to be moved away from one outlet to another so that the counter space becomes a more agronomic working area, a microwave oven will share a common outlet with a refrigerator and an electric clock. Once the *horizontal electrical power strip device* is plugged into the wall outlet, we start by plugging the microwave oven into the master outlet (0) and then plug the refrigerator into the second slave outlet (2), only then will neither of them ever function at the same time. To prevent unwanted cutoff of electrical power to the refrigerator, which could happen if the door to the microwave was left open after use (thus commanding the microwave inner light to be left on) causing the refrigerator to stay off, a buzzer or night-light will be plugged into the first slave outlet (1), to alarm the operator of this potential situation. Finely the clock or timer that needs continuous uninterrupted power is plugged into the third slave (3) outlet.

A second scenario with endless combinations and various partial usages of the *horizontal electrical power strip device* is demonstrated next.

In a kitchen where a dishwasher is added to existing underlying cabinet space but no electrical outlet is available and the closest alternative being the refrigerator's outlet, one can first unplug the refrigerator from its original outlet, replacing it with the *horizontal electrical power strip device*. Then proceeding by first plugging the dishwasher into the master outlet (0) and finely plugging the refrigerator into the second slave outlet (2), thus in this example there is no need for the slave outlets (1 and 3). Moreover each time the dishwasher is running, the refrigerator's electrical power supply is temporarily cut off. Usually a dishwasher cycle is about 50 minutes, thus hardly affecting the set temperature inside the refrigerator. Secondly because the refrigerator is plugged into the second slave outlet (2) the shuffling on and off of the refrigerator during its normal cycle will not affect the dishwasher nor will it interrupt the dishwasher's cycle.

Staying consistent with the above scenario, here are a few other examples. We have replaced the dishwasher previously using the master outlet (0) and the refrigerator previously using the second slave outlet (2)

Example (A) A TV master outlet (0) with an Air conditioner second slave outlet (2) in the same room on the same circuit.

Example (B) A humidifier master outlet (0) with a Heater second slave outlet (2) in the same room on the same circuit.

Example (C) A potable water pump master outlet (0) with a sump pump second slave outlet (2) in a basement on the same circuit. In this example the potable water has priority over the sump pump.

Example (D) A sump pump master outlet (0) with a potable water pump in the second slave outlet (2) and a buzzer as an alarm in first slave outlet (1). In this example the sump pump has priority over the potable water but lets the user be warned that the sump pump is running through the use of the buzzer. If desired the buzzer may be extended to another area (room or building level) with

an ordinary extension cord.

SUMMARY OF THE INVENTION

The present invention relates to a quadruple *horizontal electrical power strip device* (figure 3) including a built in power plug (8), one master power outlet (0) and triple slave power outlets (1-2-3) controlled independently from each other and simultaneously through the master outlet (0). A power-sensing device, *relay element* (9) is coupled to a SPDT switch (10) allows the slave power outlets (1-2) to be automatically turned on or off (under the control of the master plug (0) drawing sufficient current) and having different states simultaneously from each other. Thus when sufficient current is being drawn from the master outlet (0) the first slave (1) is switched to an on (closed circuit) state, the second slave (2) is switched to an off (open circuit) state while the third slave (3) stays uninterrupted indefinitely in an on (closed circuit) state. Having both simultaneously similar and opposite states of that to the master (0), the slave outlets (1-2-3) offer a wide range of uses. Four diode lights (4-5-6-7) with different colors and, solid to flashing states, are placed on the front panel adjacent their relative outlets to identify the different changes (if any) in states of electrical power to each of the individual power outlets (0-1-2-3). The relay element (9) is insensitive (unresponsive) to any changes in power consumption under 10 watts passing through the master outlet (0). This makes it possible to use a tool or appliance with low power consumption during it's off state (for example a control panel or led lighted buttons), in the master outlet (0). In other words as long as the tool or appliance uses less than 10 watts it will not trip the SPDT switch (9). All electrical conductor parts, relay, and switching devices are built to meet a maximum of a 25-amp, 120 volts alternating current resistance so as to withstand tools with heavy electrical consumption. All four outlets (0-1-2-3) wiring is grounded and the physical shape of the *horizontal electrical power strip device* (figure 3) is designed so that no grounded plug can be inserted backwards. The physical spacing between all of the outlets (figure 3) is 3.9 cm on center, to permit the use of larger commercial plugs to be inserted next to each other in any order, keeping in mind that the exact physical disposition of each plug to be used simultaneously may not be a matter of choice.

DESCRIPTION OF EMBODIMENT

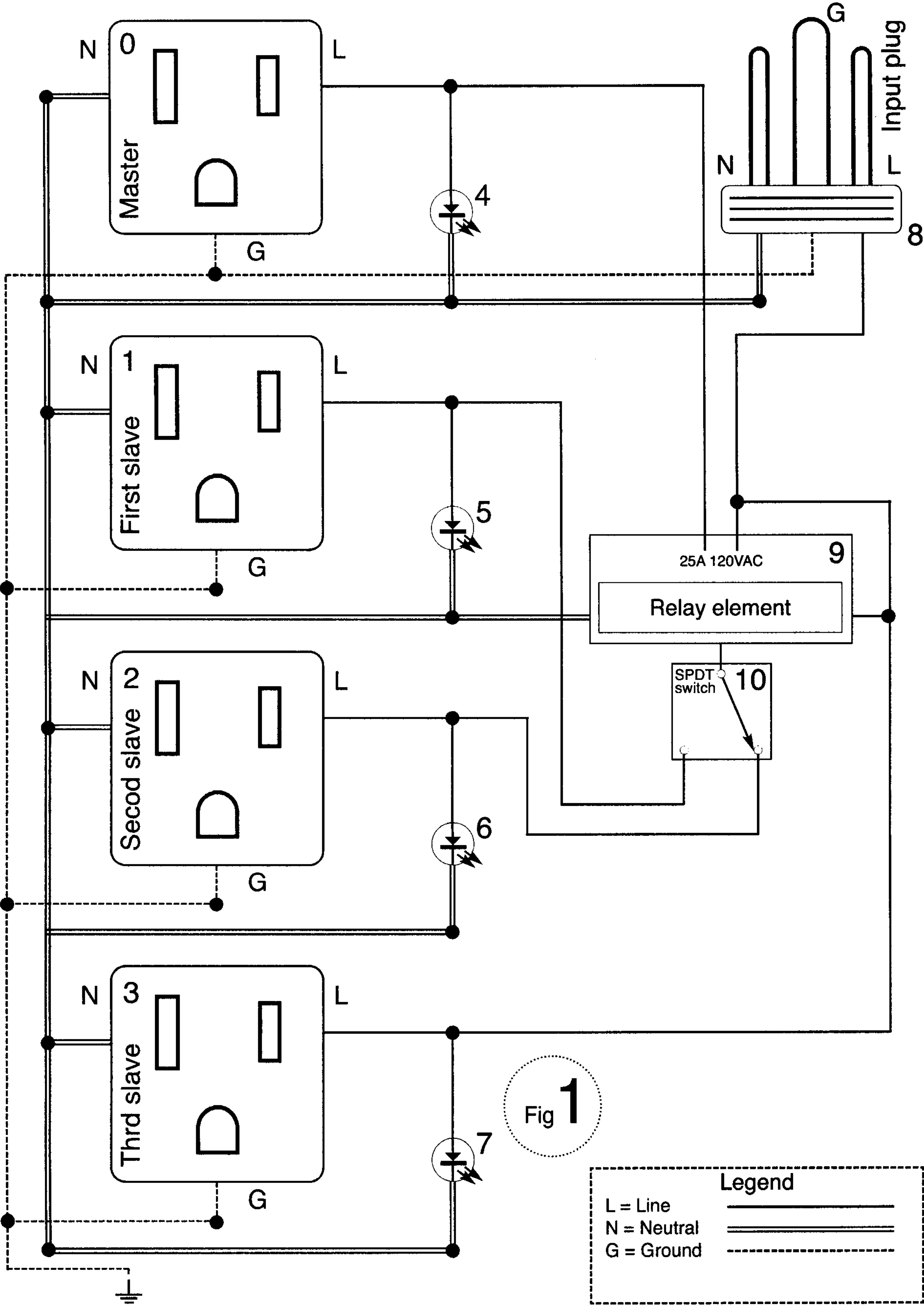
The physical design is also an important aspect of the invention for a number of reasons. Because the total distance from the wall outlet to the most outer part of the power strip body is 4cm (figure 2), the four outlets (0-1-2-3) are installed on the bottom side at a 90 degree angle to it's own built in plug (8). This in-turn uses up less counter space when plugged to the wall at the back end of a counter. Also it lets the user see the four led lights (figure 5) (4-5-6-7) that face him when all is plugged in during normal and optimal use. On each end of the power strip (figure 2 and 6) are removable metal brackets (11), if desired a permanent installation in front of, behind or under a counter or workbench is made possible by screwing the removable metal brackets (11) to the base material. If the brackets are not needed or are of any inconvenience they may safely be removed from the *horizontal electrical power strip device* at any time.

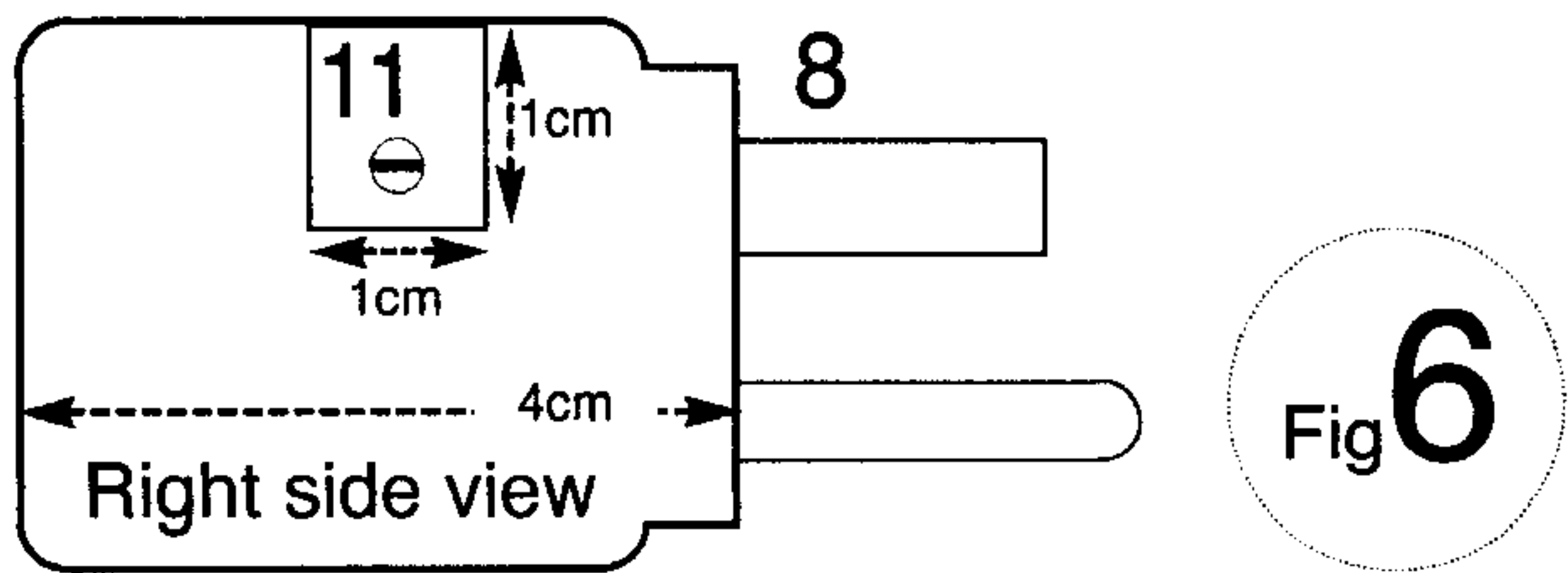
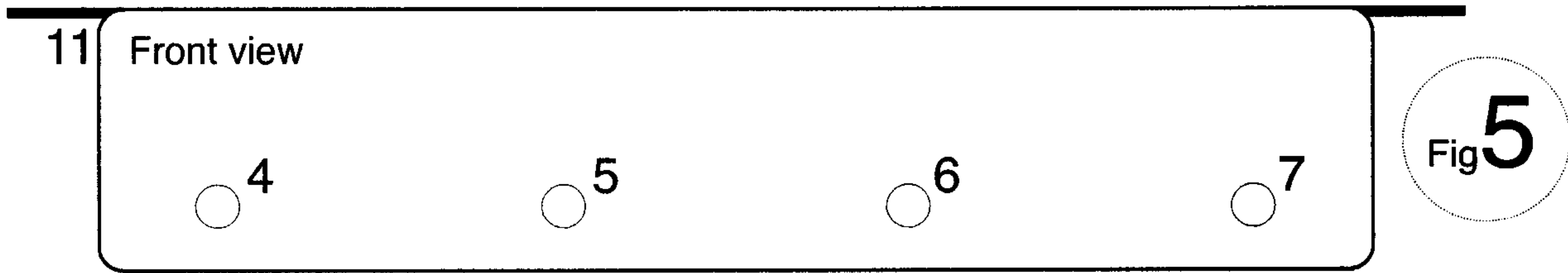
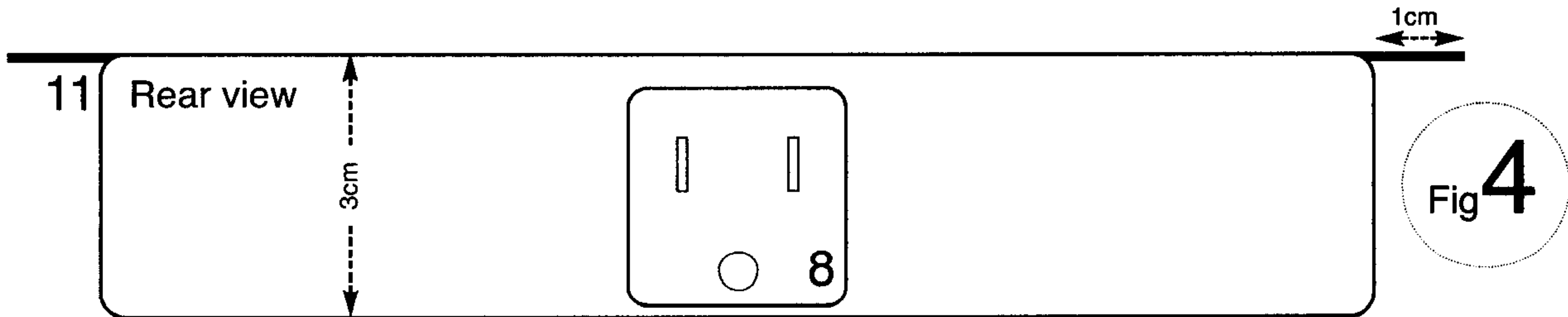
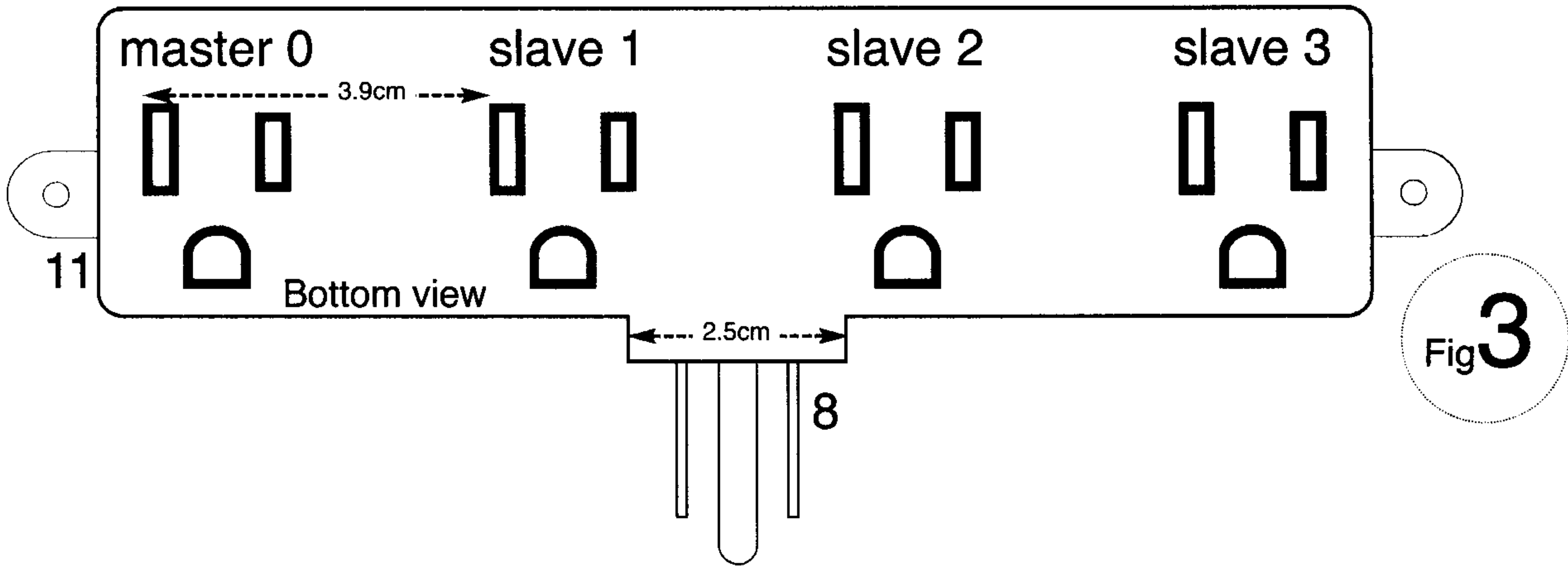
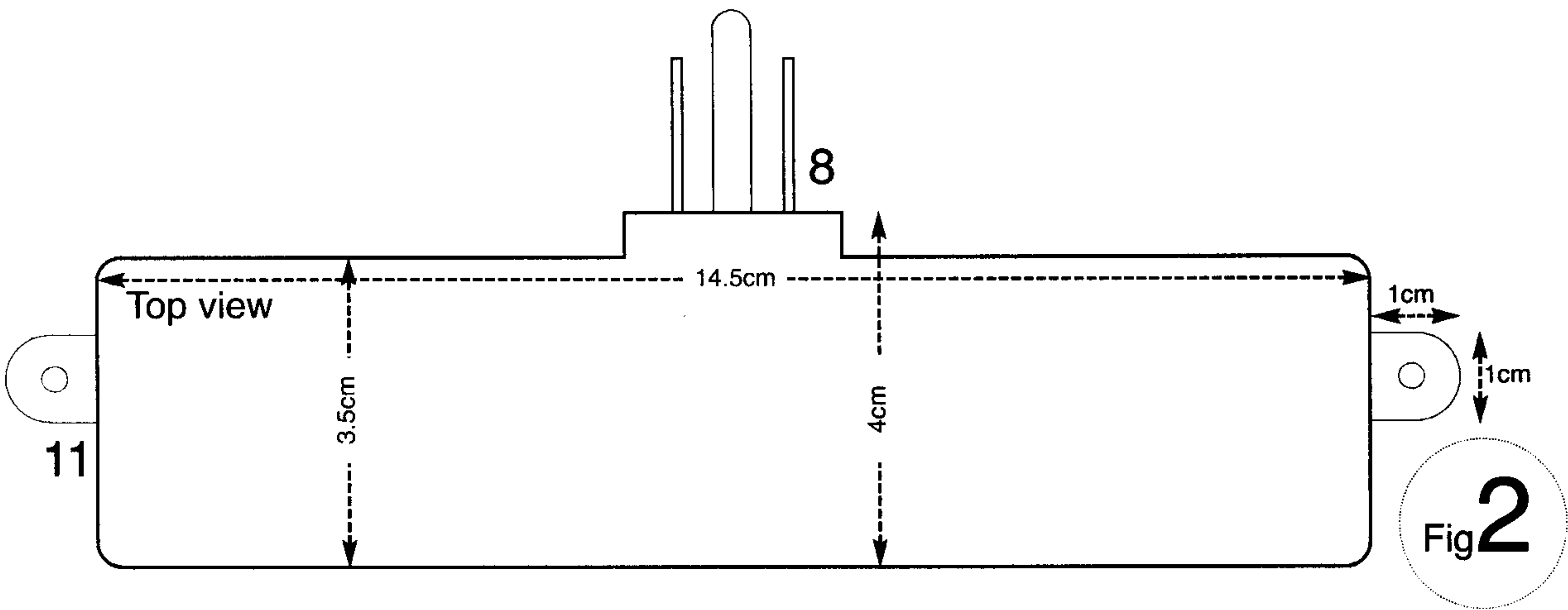
Keeping in mind the different environments the *power strip* will be used in. Particular attention must be set to the outer body material. A rubberized plastic material able to with stand temperatures of +40 to – 40 degrees centigrade, must completely seal the inner parts to the outer environment including resisting water, saltwater and common petroleum products i.e. all grades of motor oil, form work oil, liquid tar and basic cleaning solvents. Moreover the sealed body must contain sparking (sparks caused by i.e. the switch element) of all internal parts and contacts to its internal environment, making it safe to be used near flammable gasses and liquids. Also the outer body material must be able to withstand at least a 500 lbs crush pressure on it's total surface area, while keeping all inner parts uncrushed and in good working condition.

What is claimed is:

- 1-A quadruple horizontal electrical power strip device including a built in power plug, one master power outlet and triple slave power outlets controlled independently and simultaneously from each other through a master outlet. A power-sensing device (relay element) coupled to a switch allowing two slave power outlets to be automatically turned on or off (under the control of the master outlet drawing sufficient current) and having different states simultaneously. Thus when sufficient current is being drawn from the master outlet the first slave is switched to an on (closed circuit) state, the second slave is switched to an off (open circuit) state while the third slave stays uninterrupted indefinitely in an on (closed circuit) state.
- 2- The power strip device in claim 1, wherein the state of electrical current in the master outlet is indefinitely in an on (closed circuit) state.
- 3- The power strip device in claim 1 and 2, wherein the state of electrical current in the first slave outlet is in opposite state of the second slave outlet and vice versa.
- 4- The power strip device in claim 1, 2 and 3, wherein when less than 10 watts of electrical power is used in the master outlet the state of electrical current in the first slave outlet is in an off (open circuit) state.
- 5- The power strip device in claim 1, 2, 3 and 4, wherein when more than 10 watts of electrical power is used in the master outlet the state of electrical current in the first slave outlet is in an on (closed circuit) state.
- 6- The power strip device in claim 1, 2,3,4 and 5, wherein the state of the third slave outlet is indefinitely in an on (closed circuit) state.
- 7- The power strip device in claim 1, comprising a said relay element being an electromechanical relay device.
- 8- The power strip device in claim 1, comprising a said relay element being an optical relay device.
- 9- The power strip device in claim 1, comprising a said relay element being a solid-state relay device.
- 10- The power strip device in claim 1, comprising a said relay element being a reed switch device.
- 11-The relay element in claims 7,8,9, and 10 being insensitive (unresponsive) to less than 10 watts.
- 12-The relay element in claims 7,8,9, 10 and 11 having a maximum of 25 amp rating at 120 volts A.C.
- 13- The power strip device in claim 1, comprising a said switch being a SPDT switch coupled to any of the relay elements described in claims 7 through 10.
- 14- The SPDT switch in claim 13 having a maximum of 25 amp rating at 120 volts A.C.
- 15- The power strip device in claim 1, comprising a said built in, self contained plug.
- 16- The said built in, self contained plug in claim 15 constructed at a fixed 90 degree angle to its outlets.
- 17- The power strip device in claim 1, comprising a total of four outlets that sit side by side on the same face and having a distance of 3.9cm on center from each other.
- 18- The power strip device in claim 1, comprising a rubberized plastic body.
- 19-The rubberized plastic body in claim 18, able to withstand and be usable at temperatures of +40 to – 40 degrees centigrade.
- 20- The power strip device in claim 1, comprising a body that is water resistant.
- 21- The power strip device in claim 1, comprising a body that is saltwater resistant.

- 22- The power strip device in claim 1, comprising a body that is basic motor oil resistant.
- 23- The power strip device in claim 1, comprising a body that is basic formwork oil resistant.
- 24- The power strip device in claim 1, comprising a body that is cold liquid tar resistant.
- 25- The power strip device in claim 1, comprising a body that is basic cleaning solvent resistant.
- 26- The power strip device in claim 1, comprising a sealed spark free body.
- 27- The power strip device in claim 1, comprising a body that has a crush resistance of up to 500 lbs. - 226 kg. on its total surface area, at 68 degrees Fahrenheit - 20 degrees Celsius.
- 28- The power strip device in claim 1, comprising a body with four diode lights.
- 29- The four diode lights in claim 28, having four different colors and two different states from solid to flashing.
- 30- The power strip device in claim 1, comprising a body with one removable metal bracket at each end.





Legend

Scale: 1 cm to 1 cm = 100%

N.B. When the same number appears in different figures it represent the same part.

