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ELECTRICAL PLUG WITH INTEGRATED SOCKET

BACKGROUND OF THE INVENTION

Field of the invention

The invention relates to an electrical plug, and particularly to an electrical plug possessing an integrated socket for connection with another plug.

Description of the Prior Art

Most electrical devices require independent power supply to work. This is conveniently achieved by connecting an electrical device to a electricity power outlet, such as a wall socket, using a connection plug which has a male portion that mates with the female portion of the power outlet. The plug is connected to one end of a wire. The other end of the wire is normally connected to a socket that mates with a corresponding male portion of the electrical device. This completes the set-up that allows electricity from the power outlet to be relayed to the electrical device.

A typical plug has only a male portion that comprises either two or three core pins, depending on the local power convention. A plug with three core pins is commonly known as a three-pin plug. The three core pins are named the live, neutral and earth pins in correspondence with their respective functions. There are three wires connected to the three core pins, and are correspondingly named the live, neutral and earth wires. The live core pin and live wire relay electricity to a device from the local power grid via a power outlet. The neutral core pin and neutral wire relay electricity from the device back to the power grid. The earth core pin and earth wire act as a safety device to relay current to the earth in the event of an electricity leakage due to a short circuit.

Among the differences between three-pin plugs and two-pin plugs is that the former have a fuse for disconnecting the electrical supply in the event of a current surge beyond a predetermined level that may be hazardous. Two-pin plugs have no earth wire and normally no fuse.

Most houses and offices are supplied with a limited number of power outlets. To increase the number of power supply sources it is common to use multiple socket adapters. Multiple socket adapters consist of a male portion for connection to an existing power outlet and at least two female portions for use as power supply sources. Therefore, a multiple socket plug increases the number of power supply sources and therefore allows more than one electrical device to be supplied with power simultaneously from a single existing socket.

Multiple socket adapters are normally manufactured without any fuse. The reason for this lack of a common fuse (or a fuse for each socket) is to ensure that failure of any one socket will not disrupt the electricity supply to the remaining sockets. Since there is no fuse, any failure of the sockets of a multiple socket adapter is normally caused by a connection fault.

One disadvantage of multiple socket adapters is, in the event that a certain socket fails, the power supply to a plug

connected thereto will be severed. Another disadvantage is that each multiple socket adapter has a limited number of sockets (normally a maximum of three), disallowing the simultaneous use of more electrical devices than the number of sockets available on the multiple socket adapter. Another disadvantage is that multiple socket adapters are manufactured and sold as individual units and therefore are potentially expensive. Yet another disadvantage is that, when in use, the wires of the electrical devices connected to a multiple socket adapter may become entangled or untidy because the sockets of the adapter are located just adjacent each other. One other disadvantage is that multiple socket adapters are manufactured with two or more sockets whereas most users often need only one extra power socket, but have to pay for the cost of the extra, unused, socket.

Apart from multiple adapter plugs, it is nowadays common to use adapters that consist of an assembly of at least two individual sockets, usually located adjacent each other. Such array adapters have essentially the same disadvantages as

multiple adapter plugs and are usually considerably more expensive.

The present invention arose partly from a consideration of these problems and how they may be overcome.

SUMMARY OF THE INVENTION

The invention has as its principal objective to provide a simple and cost-effective device for increasing the number of electricity supply sources. This objective is realised by the invention which comprises an electric plug that has an integrated socket to supply power to another electrical device that is plugged to the said integrated socket. The invention therefore provides a device that may be used as a plug, or a plug and socket simultaneously if the need arises.

For convenience, the device of the present invention will be referred to as a socket-plug.

With the use of the present invention, there will be no necessity to use a separate multiple socket adapter to increase the number of power supply sources since each plug socket-plug already comes with an in-built power supply socket.

In its general embodiment, the invention consists of an electrical plug that is adapted so that the plug has at least one integral female portion that forms the basis for supplying power to another plug connected thereto. The female portion consists of three conductive adapters that are connected to the terminals of the three core pins (that make up the male portion of the plug), and three apertures in the front cover of the plug that correspond to the three conductive adapters.

The advantages of such an integrated socket-plug are obvious. Two or more socket plugs may be connected to one another. In theory, it is possible to have a large array of these plugs, where each plug provides the female portion for mating with the next plug. Therefore, a number of electrical devices may draw power from a single existing power outlet.

In practice, a maximum of three plugs per electrical outlet is recommended.

A user does not have to purchase and use separate multiple adapter devices to overcome the problem of inadequate number of electricity outlets since each plug offers a socket for connection with the following plug.

The problem of entangled wires may not arise with the present invention as the plugs and their associated wires will be neatly arranged one after another.

In the present invention, the female adapter that connects to the live terminal is constructed in such a way that electricity flowing to that adapter will not be routed through the fuse. This is achieved by connecting the live female adapter directly to the terminal of the live core pin. Such a set-up will ensure that failure of a single or a plurality of plugs by fuse failure will not disrupt the power supply to all other plugs. In other words, a power failure to one electrical device due to fuse failure will not affect the power supply to all other electrical devices.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention in its various aspects is illustrated, but not limited, by the following description of an embodiment which refers to the accompanying drawings which are described below.

Figure 1 illustrates the interior of a typical three-pin plug.

Figure 2 shows a side view of a three pin-plug.

Figure 3 illustrates the interior of a plug in accordance with the present invention.

Figure 4 shows the adapter portion (female portion) of the invention.

Figure 5 is a sectional side view of the invention.

Figure 6 is an expanded sectional view as seen from the bottom of the apparatus of the invention.

Figure 7 shows two units of the invention coupled together in use.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In describing the preferred embodiments of the invention, which is illustrated in the drawings, specific terminology will be resorted to for the sake of clarity. However, it is not intended that the invention be limited to the specific terms so selected and it is to be understood that each specific term includes all technical equivalents which operate in a similar manner to accomplish a similar purpose.

With reference to Fig. 1 and Fig. 2, a typical plug, that has wires attached, has as its major components a housing (1) consisting of a front cover (2) and a back cover (3), a safety lock (4), a live core pin (5), neutral core pin (6), earth core pin (7) with corresponding live terminal (10), neutral terminal (11) and earth terminal (12), live wire (15), neutral wire (16), earth wire (17), and fuse receptacle (20). The neutral and earth wires (16 and 17) are

attached, respectively to the neutral and earth terminals (11 and 12). The live wire (15) is connected to a peg (23) that is in contact with one end of the fuse receptacle (20). The other end of the fuse receptacle (20) is connected to the live terminal (10).

In Fig. 1, the portions of the plug containing the live, neutral and earth terminals are respectively named L, N, and E.

In a typical plug, there is only a male portion (24) made up of the three core pins. Therefore, a plug can only function to relay power from a power outlet to an electrical device.

According to the preferred embodiment of the present invention, there is provided a plug having an integrated female portion (25) on the front cover (2) thereof to realise a socket-plug (30). The female portion (25) consists of three

orifices comprising a live orifice (10a), a neutral orifice (11a) and an earth orifice (12a). The three orifices (10a, 11a and 12a) have corresponding conductive adapters comprising a live adapter (10b), a neutral adapter (11b) and an earth adapter (12b). The said orifices (10a, 11a and 12a) share common longitudinal axes with the corresponding adapters (10b, 11b and 12b). The conductive adapters (10b, 11b and 12b) are connectable to the three corresponding core pin terminals (10, 11 and 12).

In the socket-plug of the present invention, the neutral and earth wires (16 and 17) are not connected directly the corresponding neutral and earth terminals (12 and 13). Rather, the neutral wire is connected to a L-shaped neutral peg (35) while the earth wire, likewise, is connected to a L-shaped earth peg (36). The foot portion of the L-shaped neutral and earth pegs (35 and 36) respectively form the neutral and earth terminals (11 and 12). This construction is a modification that is necessary for convenience of connecting the neutral and earth wires (16 and 17) to their respective core pins. In the present invention, the live wire

(15) is connected to a peg (23) as in a typical plug. The fuse receptacle (20), however, is displaced upward of its usual position and is disposed adjacent the live terminal (10). As illustrated in Fig. 6, the conductive female adapters (10b, 11b and 12b) are secured, typically by screws (38), to the feet portion of the corresponding L-shaped live peg (34), neutral peg (35) and earth peg (36).

In another embodiment of the invention, the neutral and earth wires (16 and 17) are connected directly the corresponding neutral and earth terminals (12 and 13) and the fuse receptacle (20), is disposed in its usual position as in existing plugs.

In operation, the socket-plug (30) of the invention is connected to an existing power outlet using its male portion (24). The integral female portion (25) of the plug may then be used as an additional power socket. The power socket may be used for connection with an ordinary plug. It may also be used for connection of another socket-plug (40), which then

allows this second plug to act as a power source for connection of yet another plug. .

Those skilled in the art will appreciate that more than one female part may be constructed per plug, so that one socket-plug acts as a multiple adapter plug. Also, it will be possible, with appropriate modification to the device of the invention, to fabricate a plug whereby the plug connected thereto in use will be connected at different possible angles of connection. However, it will be appreciated that the preferred embodiment of the invention described herein is the easiest to fabricate and therefore should also be the most economical.

Accordingly, it is stated that the embodiments of the invention described herein are only meant to facilitate understanding of the invention and should not be construed as limiting the invention to those embodiments only. The skilled person will appreciate that a variety of embodiments of the invention other than those described herein may be

constructed without departing from the scope of the invention as claimed.

The embodiments of the invention described herein are only meant to facilitate understanding of the invention and should not be construed as limiting the invention to those embodiments only. Those skilled in the art will appreciate that the embodiments of the invention described herein are susceptible to variations and modifications other than those specifically described. It is to be understood that the invention includes all such variations and modifications which fall within the scope of the invention as claimed.

CLAIMS

1. An electrical plug (30) for relaying current to an electrical device, the said plug (30) having a male portion (24) consisting of at least three core pins (5, 6 and 7) comprising a live core pin (5), neutral core pin (6) and earth core pin (7) for insertion into a power supply socket, at least two of the said core pins (5, 6 and 7) connectable to wires (15, 16, 17) to relay current to the said electrical device,

characterised in that

said electrical plug (30) is adapted to have at least one integral female portion (25) for connection with the male portion of at least one other electrical plug having at least two core pins.

2. An electrical plug (30) according to claim 1, wherein said female portion (25) comprises conductive adapters (10b, 11b, 12b) connectable to said core pins (5, 6, 7) and corresponding orifices (10a, 11a and 11b) for receiving the male portion of said other electrical plug.
3. An electrical plug (30) according to claim 1 or 2, wherein there is one female portion (25) provided on said plug.
4. An electrical plug (30) according to claim 3, wherein said female portion (25) is located on the front cover (2) of said housing (1).
5. An electrical plug (30) according any preceding claim, wherein there is provided a fuse receptacle (20) connectable with the live wire (5).

6. An electrical plug (30) according to any preceding claim, wherein the said neutral (11) and earth (12) terminals are L-shaped and adapted so that the corresponding neutral (6) and earth (7) wires are connectable to the foot of said terminals (11 and 12), and the said fuse receptacle (20) is displaced upward and adjacent the live terminal (10).
7. An electrical plug (30) according to any one of claims 1 to 5, wherein the said wires (15, 16, 17) are connectable directly to the corresponding core pin terminals (10, 11 and 12).
8. An electrical plug (30) according any preceding claim, wherein the male portion consists of three core pins.
9. An electrical plug (30) according to claim 1 or 2, wherein the said female portion (25) is adapted to mate with the male portion of a plug having two core pins.

10. An electrical plug (30) according to claim 9, wherein the said female portion (25) comprises two orifices adapted to mate with the male portion of a plug having two core pins.