

SOCKET ADAPTOR

5 FIELD OF INVENTION

The present invention relates to an electrical socket adaptor which may include a switch unit for selective connection of a number of electric plugs to a single mains power electrical outlet. The invention is particularly, but not exclusively, useful as an adaptor with which two or more sockets can be connected. This invention allows more than one such
10 socket adaptor to be used adjacent to each other simultaneously without any one of the socket being hindered from use.

BACKGROUND

Conventional socket adaptors which are used, for example as disclosed in GB2 273
15 825A or GB 2 288 926A are known. The socket adaptors include housing, a set of input terminals, sets of output terminals and link bars connecting the input terminals to corresponding output terminals. The link bars are mounted on an insulating support, the support and the link bars as a unit is able to push fit into the adaptor housing. The adaptor may be formed as a three way branching adaptor with the input terminals being formed as
20 pins projecting from a rearwardly projecting central position of the housing so as to provide a gap between the remainder of the housing and a mains outlet socket into which the adaptor is inserted. The configuration of the three way adaptor is shown in Figures 1 and 2 of the GB 2 273 825A and GB 2 288 926A. The three way branching adaptors provides three mains outlet sockets on the respective top side face with openings 6EA, 6LA and 6NA,
25 front face with openings 6NB, 6EB and 6LB and underside face with openings 6EC, 6LC and 6NC. With such configuration, two or more such socket adaptors can be used side by side with one of the side faces of the socket adaptors is adjacent to each other so that there is free access to all of the three main sockets at any one time. However this configuration does not provide the flexibility for selective turning on or turning off the electrical connection to
30 the plugs that are adapted to the three main sockets.

Nevertheless, three way branching socket adaptors having a switch are also known and is protected under UK Patent Design no. 3012858. However, the three way branching socket are on the top and bottom face and a side face. The socket adaptor has three main

sockets at respectively top face, side faces and front faces and a switch is located adjacent to the main socket on the front face. However with the configuration of the three outlet sockets, the sockets on either the top or any one of the side faces of the socket adaptor would not be accessible when two socket adaptors are positioned side by side with each other.

Accordingly, it is an object of the present invention to provide a three way socket adaptor will accommodate the possibility of using two or such three way socket adaptors side by side such that all the three sockets are accessible for adaptation to an electrical plug and a switch unit for triggering an electrical connection from the socket to the plug or to at least provide the public with a useful choice.

It is also an object of the present invention to provide a socket adaptor which has a switch unit incorporated in it in a push fit manner to provider convenient assembly or to at least provide the public with a useful choice.

It is also an object of the present invention to provide a socket adaptor which has a fuse which can engage with a switch unit or other incorporated in it in a push fit manner to provider convenient assembly or to at least provide the public with a useful choice. It is also an object of the present invention to provide a switch unit to be incorporated in a push fit manner to provider convenient assembly or to at least provide the public with a useful choice.

BRIEF DESCRIPTION OF THE INVENTION

In a first aspect of the present invention relates to a three way electrical socket adaptor of a kind which includes a housing i) from which there is presented a multi pin plug of a configuration capable of being inserted into a mains electrical outlet socket and ii) by which there is presented three sockets each capable of receiving an electrical multi pin plug to allow electrical connection of mains electrical power from said mains electrical outlet socket to a or each of said electrical multi pin plugs, said three way electrical socket adaptor characterised in that said housing provides each said socket at an exterior perimeter surface of said housing wherein said exterior perimeter surface at each said socket has a normal which is parallel to a plane with which the normal to the exterior perimeter surface from which said multi pin plug is also parallel to and wherein the normal of the exterior perimeter surface of all said sockets project in non parallel directions.

Preferably the exterior perimeter surface of said housing at each said socket has a normal which projects in a direction perpendicular to the normal of the exterior perimeter surface of an immediately adjacent said socket.

Preferably said housing is of a general box shaped exterior perimeter.

5 Preferably the exterior perimeter surfaces thereof at where said sockets are presented are substantially planar and the exterior perimeter surface from where said plug is presented is also substantially planar.

10 Preferably said housing provides a first of said exterior perimeter surfaces (herein after "back surface") from which there is presented said multi pin plug, a second of said exterior perimeter surfaces (herein after "front surface") from which there is presented a first of said sockets and a third of said exterior perimeter surfaces (herein after "top surface") from which there is presented a second of said sockets and a fourth of said exterior perimeter surfaces (herein after "bottom surface") from which there is presented a third of said sockets.

15 Preferably said back and front surfaces are parallel to each other.

Preferably said top and bottom surfaces are parallel to each other.

Preferably side exterior perimeter surfaces extend between said front, and back and bottom and top surfaces to thereby define a substantially enclosed housing, save for openings therein provided at least by said sockets.

20 Preferably side exterior perimeter surfaces are generally planar and each have a normal which extends lateral to the plane.

25 Preferably wherein switching means to interrupt the electrical connection between said multi pin plug (when connected to said mains electrical outlet) and each of said sockets is provided, manually actuable from the exterior of said housing by an actuating means of said switching means disposed from said housing.

30 Preferably switching means including means to interrupt the electrical connection between said multi pin plug (when connected to said mains electrical outlet) and each of said sockets is provided, manually actuable from the exterior of said housing by an actuating means of said switching means disposed from said housing at a surface thereof other than said back, front, top or bottom surface.

Preferably side exterior perimeter surfaces extend between said front, and back and bottom and top surfaces to thereby define a substantially enclosed housing, save for

openings therein provided at least by said sockets and wherein there is provided switching means to interrupt the electrical connection between said multi pin plug and each of said sockets, manually actuable from the exterior of said housing by an actuating means of said switching means disposed from said housing at a side exterior perimeter surface.

5 Preferably switching means includes said actuation means and is a unit (herein after "switching unit"), held by said housing.

Preferably switching unit includes a first connection terminal which by way of a push-fit engagement is in electrical connection with a connection terminal of, or which is in electrical connection with, one of the pins (live or neutral pins) of said multi-pin plug.

10 Preferably said first connection terminal is in push-fit engagement with a means providing a connection terminal which is in electrical connection with, one of the pins (live or neutral pins) of said multi-pin plug.

Preferably said switching unit includes said first connection terminal (herein after "plug connection terminal") which by way of a push-fit engagement is in electrical connection
15 with a connection terminal of, or which is in electrical connection with, one of the pins (live or neutral pins) of said multi-pin plug and wherein said switching unit includes three further connection terminals (herein after "socket connection terminals") one each provided for electrical connection therewith by a pin (neutral or earth) of a electrical plug associated or to associate with a respective socket and wherein a said means to selectively connect and
20 interrupt electrical connection is provided by said switching means and between said plug connection terminal and each of said socket connection terminals.

Preferably each said socket terminal with which a pin of an electrical plug when associated with a respective socket is capable of being push-fit engagable by a said pin to establish the electrical connection there between.

25 Preferably said housing holds a fuse having a first and second terminal end, said first connection terminal of said switch unit is push-fit engagable with said first terminal end of said fuse and said second terminal end of said fuse being in electrical connection with a pin (live or neutral) of said multi pin plug.

Preferably a fuse is electrically interposed between said first connection terminal and a
30 pin (live or neutral) of said multi pin plug.

Preferably said fuse is a cartridge fuse.

Preferably switch unit includes a switch housing which has means for engagement for engaging with said housing.

Preferably said means for engagement holds said switch unit in position relative to said housing.

- 5 Preferably said means to engage is/are a surface(s) of said switch housing which can slidingly engage with mating surfaces of said housing.

Preferably said switch unit is engaged to said housing by way selected from one of (a) push-fit, (b) clip-fit and (c) slide fit engagement.

Preferably said housing has an opening within which the switch housing is located.

- 10 Preferably said switching means has three means to interrupt electrical connection and three actuating means, one each for the three sockets.

Preferably said multi pin plug is of a kind which includes at least two pins, a first being the neutral pin and a second being the live pin and wherein each is provided disposed from said housing and extending parallel to the second mentioned normal.

- 15 Preferably said live and neutral pins are presented from said housing in a manner wherein an imaginary line extending through both said pins of said multi pin plug and perpendicular to said first mentioned normal, is perpendicular to said plane.

- In a second aspect of the present invention relates to a multi way electrical socket adaptor of a kind which includes a housing (i) from which there is presented a multi pin
20 plug of a configuration capable of being inserted into a mains electrical outlet socket and ii) by which there is presented at least two sockets each capable of receiving an electrical multi pin plug to allow electrical connection of mains electrical power from said mains electrical outlet socket to a or each of said electrical multi pin plugs, said multi way electrical socket adaptor characterised in that said housing holds a switch unit to interrupt the electrical
25 connection between said multi pin plug and each of said sockets said switch unit being manually actuable from exterior of said housing by an actuating means of said switch unit disposed from said housing at a surface thereof .

- Preferably switch unit includes a first connection terminal which by way of a push-fit engagement is in electrical connection with a connection terminal of, or which is in
30 electrical connection with, one of pins (a live or neutral pins) of said multi-pin plug.

Preferably wherein said first connection terminal is in push-fit engagement with a means providing a connection terminal which is in electrical connection with, one of the pins (live or neutral pins) of said multi-pin plug.

5 Preferably said switching unit includes said first connection terminal (herein after "plug connection terminal") which by way of a push-fit engagement is in electrical connection with a connection terminal of, or which is in electrical connection with, one of the pins (live or neutral pins) of said multi-pin plug and wherein said switching unit includes three further connection terminals (herein after "socket connection terminals") one each provided for electrical connection therewith by a pin (neutral or earth) of a electrical plug associated or
10 to associate with a respective socket and wherein a said means to selectively connect and interrupt electrical connection is provided by said switch unit and between said plug connection terminal and each of said socket connection terminals.

Preferably each said socket terminal with which a pin of an electrical plug when associated with a respective socket is capable of being push-fit engagable by a said pin to
15 establish the electrical connection there between.

Preferably said housing holds a fuse having a first and second terminal end, said first connection terminal of said switch unit is push-fit engagable with said first terminal end of said fuse and said second terminal end of said fuse being in electrical connection with a pin (live or neutral) of said multi pin plug.

20 Preferably a fuse is electrically interposed between said first connection terminal and a pin (live or neutral) of said multi pin plug.

Preferably said fuse is a cartridge fuse.

Preferably said switch unit includes a switch housing which has means for engagement for engaging with said housing.

25 Preferably said means for engagement holds said switch unit in position relative to said housing.

Preferably said means to engage is/are a surface(s) of said switch housing which can slidably engage with mating surfaces of said housing.

Preferably said switch unit is engaged to said housing by way selected from one of (a)
30 push-fit, (b) clip-fit and (c) slide fit engagement.

Preferably said housing has an opening within which the switch housing is located.

Preferably said switching means has at least two means to interrupt electrical connection and at least two actuating means, one each for the at least two sockets.

Preferably said housing provides each said socket at an exterior perimeter surface of said housing wherein said exterior perimeter surface at each said socket has a normal which is parallel to a plane with which the normal to the exterior perimeter surface from which said multi pin plug is also parallel to and wherein the normal of the exterior perimeter surface of all said sockets project in non parallel directions.

Preferably the exterior perimeter surface of said housing at each said socket has a normal which projects in a direction perpendicular to the normal of the exterior perimeter surface of an immediately adjacent said socket.

Preferably said housing is of a general box shaped exterior perimeter.

Preferably the exterior perimeter surfaces thereof at where said sockets are presented are substantially planar and the exterior perimeter surface from where said plug is presented is also substantially planar.

Preferably said housing provides a first of said exterior perimeter surfaces (herein after "back surface") from which there is presented said multi pin plug, a second of said exterior perimeter surfaces (herein after "front surface") from which there is presented a first of said sockets and a third of said exterior perimeter surfaces (herein after "top surface") from which there is presented a second of said sockets and a fourth of said exterior perimeter surfaces (herein after "bottom surface") from which there is presented a third of said sockets.

Preferably said back and front surfaces are parallel to each other.

Preferably said top and bottom surfaces are parallel to each other.

Preferably side exterior perimeter surfaces extend between said front, and back and bottom and top surfaces to thereby define a substantially enclosed housing, save for openings therein provided at least by said sockets.

Preferably side exterior perimeter surfaces are generally planar and each have a normal which extends lateral to the plane.

Preferably side exterior perimeter surfaces extend between said front, and back and bottom and top surfaces to thereby define a substantially enclosed housing, save for openings therein provided at least by said sockets and wherein said switch unit is at a side exterior perimeter surface.

A third aspect of the present invention relates to a multi way electrical socket adaptor of a kind which includes a housing (i) from which there is presented a multi pin plug of a configuration capable of being inserted into a mains electrical outlet socket and ii) by which there is presented at least two sockets each capable of receiving an electrical multi pin plug to allow electrical connection of mains electrical power from said mains electrical outlet socket to a or each of said electrical multi pin plugs, said multi way electrical socket adaptor characterised in that there is provided within said housing, a fuse having two electrical connection terminals, a first terminal engaged in electrical connection with one selected from the live and neutral pins of said multi pin plug and the other terminal presented for push fit engagement by one of i) a switch unit capable of being engaged to the housing which will provide means for interrupting the electrical connection between said multi pin plug and each of said sockets said switch unit being manually actuable from exterior of said housing by an actuating means of said switch unit disposed from said housing at a surface thereof, and ii) an insert capable of being engaged to the housing which provides direct (and uninterruptible) electrical connection to the sockets for engagement by a respective live or neutral pin of an electrical multi pin plug,.

Preferably said switch unit includes a first connection terminal which by way of a push-fit engagement is in electrical connection with the other connection terminal of said fuse.

Preferably said insert includes a first connection terminal which by way of a push-fit engagement is in electrical connection with connection terminal of said fuse.

Preferably said fuse is electrically interpose between said first connection terminal of one of said switch unit and said insert and a pin (live or neutral) of said multi pin plug.

Preferably said fuse is a cartridge fuse.

A fourth aspect of the present invention relates to a switch unit for engagement with a multi way electrical socket adaptor of a kind which includes a housing i) from which there is presented a multi pin plug of a configuration capable of being inserted into a mains electrical outlet socket and ii) by which there is presented at least two sockets each capable of receiving an electrical multi pin plug to allow electrical connection of mains electrical power from said mains electrical outlet socket to a or each of said electrical multi pin plugs, said switch unit comprising:

a switch unit housing from which there is presented actuation means disposed at an exterior surface of said switch unit housing, said actuator means controlling a means to

connect/ interrupt electrical connection between a first switch unit connection terminal and a second switch unit connection terminal, said first switch unit connection terminal capable of push fit engagement with a connection terminal of said housing which is in electrical connection with one of a live or neutral pins of said multi pin plug and wherein said second
5 switch unit connection terminal is provided for electrical connection with a pin of said electrical multi pin plug

Preferably said second switch unit connection terminal is provided for engagement by a pin of said electrical multi pin plug.

Preferably said second switch unit connection terminal has a form capable of being push
10 fit engagable by a pin of the electrical multi pin plug.

Preferably there are at least two actuator means each with a corresponding means to connect/ interrupt, to each control electrical connection between said first switch unit connection terminal and separate second switch unit connection terminals, one each for an engagement with a separate electrical multi pin plug.

15 Preferably a bus bar is provided engaged with said first switch unit connection terminal.

Preferably said first switch unit connection terminal is formed as a unit with a bus bar distributing electricity to each of said means to connect/ interrupt. This invention may also be said broadly to consist in the parts, elements and features referred to or indicated in the specification of the application, individually or collectively, and any or all combinations of
20 any two or more of said parts, elements or features, and where specific integers are mentioned herein which have known equivalents in the art to which this invention relates, such known equivalents are deemed to be incorporated herein as if individually set forth.

BRIEF DESCRIPTION OF THE DRAWINGS

25 A preferred form of the present inventions will now be described with reference to the accompanying drawings in which

Figure 1 is a restrictive view of a socket adaptor wherein no switch unit is incorporated,

Figure 2 is a perspective view of a socket adaptor similar to that shown in Figure 1
30 but wherein a switch unit has been incorporated with housing,

Figure 3 is a front view of the socket adaptor of Figure 2,

Figure 4 is a bottom view of the socket adaptor of Figure 3,

Figure 5 is a top view of the socket adaptor of Figure 2,

Figure 6 is a side view of the socket adaptor of Figure 2,

Figure 7 is a view from the other side of the socket adaptor of Figure 2,

Figure 8 is a back view of the socket adaptor of Figure 2,

5 Figure 9 is a drawing used with reference to explaining the geometry of the components provided by the socket adaptor of Figure 2,

Figure 10 is a perspective view illustrating further details regarding that of the geometry of the socket adaptor of the present invention,

Figure 11 is a front view of the explanatory figure of Figure 10,

10 Figure 12 is a front view of a pair of socket adaptors engaged with a wall mounted or socket strip provided outlet socket,

Figure 13 is a front view of two adjacent sockets engaged with a socket outlet (whether wall mounted or adaptor strip provided),

15 Figure 14 is a front view of two alternatively configured socket adaptors in adjacent relationship engaged with a power outlet,

Figure 15 is a perspective view of a socket adaptor wherein there is shown engaged therewith a plurality of switches preferably provided in the form of a switch unit,

Figure 16 is a perspective view of switch unit engagable with the housing of the socket adaptor,

20 Figure 17 is a perspective view of part of the housing of the socket adaptor and its related switch unit prior to being engaged with the part of the housing,

Figure 18 is a perspective view of part of the switch unit,

25 Figure 19 is a perspective view of another part of the switch unit which clips with that part as shown in Figure 18 to create as a unit assembly, a switch unit which has switching buttons corresponding to each of the sockets that the socket adaptor provides,

Figure 20 is a perspective view of a socket adaptor illustrating the provision of fuse which may be incorporated with the housing,

Figure 21 is a perspective partially exploded view of the switch unit components shown in Figure 18,

30 Figure 22 is a partially assembled but exploded view of the socket adaptor of the present invention,

Figure 23 is a perspective view of the two part housing in an open condition and wherein the components for establishing the electrical connections are assembled with the housing,

Figure 24 is an exploded view of the switch unit of Figure 16,

5 Figure 25 is a plain view of part of the housing as shown in Figure 23, and

Figure 26 is a plain view of part of the housing as shown in Figure 23.

DETAILED DESCRIPTION OF THE INVENTION

With reference to Figure 1 there is shown a socket adaptor 1 which includes a plug
10 which is capable of being inserted into a power outlet for a mains electrical supply. The socket adaptor 1 includes a housing 3 from which the plug 2 is disposed. The plug 2 is presented having its electrical connection pins 4 directed for insertion into a socket of a mains supply. Various countries have various standards for the provision of pins of an electrical plug and it will be appreciated that whilst one example is shown in the
15 accompanying drawings and described herein, pins of different size and configuration can be utilized for providing a socket adaptor 1 of the present invention. As herein shown, the plug 2 consists of three pins a first being for connection to the live terminal of a socket of a main supply, a second being the neutral pin for engagement with the neutral connection of an electrical supply and a third being an earth pin which is engaged to the earth lead of an
20 electrical supply.

In one preferred form of the present invention, the socket adaptor 1 also provides from its housing, sockets such as socket 5, 6, 7. In this form of the present invention the socket adaptor 1 presents three sockets 5, 6, 7 with which electrical plugs (not shown) of for example tooling or appliances or office equipment can be engaged. In this form of the
25 invention the socket adaptor 1 is a three way socket adaptor. Each of the sockets 5, 6, 7 is or provides terminals with which the pin of an electrical plug (not shown) can engage to become electrically connected to the mains power supplier via the plug 2. Each of the sockets 5, 6, 7 is presented from the housing in a manner such that a separate electrical plug (not shown) can engage with a respective socket without clashing with any plugs engaged
30 with the other sockets of the socket adaptor 1. Accordingly the sockets 5, 6, 7 are presented spaced sufficiently apart to achieve such.

The housing 3 of the socket adaptor is made from a plastics and insulative material and houses the electrical connection between the plug 2 and the connection terminals of each of the sockets 5, 6, 7, with which an electrical plug (not shown) can engage. Such electrical connections may be fused or non-fused and may be switched or non-switched. In the most preferred form the electrical connection that can be established between at least one of the terminals (preferably the live terminals) of the plug and the terminals of the sockets are both switched and fused. A switch unit 8 is preferably provided disposed from the housing which presents switch buttons which are manually actuable by a finger or digit of a person. Each are capable of interrupting the supply of electricity between the plug 2 and a respective socket 5, 6, 7. A fuse 9 preferably of a cartridge style is also associated with the housing and preferably kept within a location of the housing capped by a capping member which can be removed for access to the fuse for purpose of its removal and/or replacement. Reference will hereinafter be made in respect of the manner in which the electrical connections between the plug 2 and the sockets 5, 6, 7 and the switching unit 8 and fuse is established.

The three way socket adaptor as herein already referred to, provides the sockets 5, 6, 7 in a manner which allows a plurality of socket adaptors 1 to be inserted into adjacent wall sockets or strip connector sockets as for example shown in Figures 12 – 14. A wall socket 11 may consist of a plurality of socket outlets 12 which are positioned in close proximity and adjacent to each other. They are normally spaced sufficiently widely apart to allow for plugs to engage into a respective socket outlet 12 without such plugs interfering with each other. However electrical plugs connected to a lead delivering power from the mains via the wall outlet to an appliance are normally of a size which is relatively small allowing for fairly proximate spacing to be established between adjacent socket outlets 12 of a wall outlet 11. Socket adaptors 1 however are normally of a bulkier size than of an individual electrical plug. It is however undesirable to provide a wall outlet of a larger spacing between socket outlets 12 in order to accommodate bulkier sized socket adaptors as such adds to the cost of a wall outlet. In the most preferred form of the three way socket adaptor 1 of the present invention, the sockets 5, 6, 7 are presented from the housing 3 in a manner such that when engaged with a socket outlet 12 of a wall outlet, the three sockets 5, 6, 7 are presented to be engageable by an electrical plug (not shown) in a manner which will not interfere with the provision of another like socket outlet or plug engaged with a socket outlet

12 adjacent to that where the three way socket adaptor is engaged. This is as a consequence of the location at which the sockets 5, 6, 7 are provided from the housing. The housing is in the most preferred form a substantially box shaped perimeter. Whilst other surfaces other than that falling within the box shape perimeter may be provided by the three way socket adaptor, it can be seen that the plug 2 and the sockets 5, 6, 7 are disposed from surfaces which each present a normal N , which lie or are parallel to a plane $P1$. With reference to Figure 9, it can be seen that the upper socket 5 provided at surface $S2$ has a normal $N1$. The front socket 6 is provided at surface $S1$ and having a normal $N1$. The lowest socket 7 is provided at surface $S3$ having a normal $N3$. The plug 2 provided a surface $S2$ has normal $N4$. All of these normals extend in a plane $P1$ as shown in figures 10 and 11. Accordingly no sockets are provided from the housing which extend out of this plane. There are for example no sockets provided on the side walls $S6, 7$. Accordingly when a socket adaptor 1 is engaged with socket outlet 12 of a wall outlet 11, none of the sockets 5, 6 or 7 are presented from the housing 3 in a direction wherein when an adjacent socket outlet 12 is occupied by a plug or a socket adaptor, that no plug access is provided to such a socket of the socket adaptor 1. Whilst references is herein made to a wall outlet which provides socket outlet 12 in a horizontal array, it will be appreciated that slight modification to the socket adaptor 1 of the present invention to allow for the similar objectives to be achieved in a socket outlet which has a vertical array. Whilst in the preferred, the live and neutral electrical connection pins for L and N as for example shown in Figure 8 allow the drawing of an imaginary line X through the terminals where such line is also perpendicular to the plane $P1$, a change in the orientation of these pins to provide that line X to be perpendicular to its position as shown in Figure 8 will allow for a socket adaptor to be modified for engagement with a wall outlet providing an array of socket outlets 12 in a vertical direction. That of course is dependent on the orientation of the sockets of the socket outlets 12 of the wall outlet 11 in a vertical array of such outlets. The most preferred form, the live and neutral pins L and for N are positioned extending from the housing 3 with their longitudinal directions parallel to the plane $P1$. Also they are parallel to the normal $N1$ of the line X drawn perpendicular to plane $P1$ extends through the pins N and for L.

30 In the most preferred form, the housing presents its perimeter surfaces at where the sockets 5, 6, 7 and the plug 2 are provided, all substantially perpendicular to each other. However this need not be so and the surfaces are $S2$ and $S3$ may be angled to the

perpendicular of the surfaces S1 and S4. Furthermore whilst reference is herein made to the surfaces of the housing and the normal thereto, it would be appreciated that not all of the surface at where a socket or the plug of the adaptor is provided will be substantially planer. It is only the region of the surface of the housing where a socket or the plug is provided that
5 will be substantially planer but regions outward from where the socket or the plug are provided may not be planeer and this is for example shown with reference to figure 6 in respect of the back surface S4.

Associated with the housing of 3 is a switch which is preferably a switch unit 8. The switch unit 8 is capable of providing an interruption of the power supply between the plug
10 and the sockets 5, 6, 7. The switch unit 8 preferably includes a switch for a respective socket 5, 6, 7 for the purposes of the interruption of power supply between such a socket and the plug. Whilst in one form as shown for example in Figure 1, the socket adaptor 1 does not include any switching features, in an alternative form of the present invention such a switch unit 8 as shown in Figure 2 is provided. In the socket adaptor of the present
15 invention where a switch unit 8 is provided, it may well be that the socket adaptor is only a two way adaptor providing only two sockets for engagement by electrical plugs (not shown). In such an alternative configuration of the present invention it may furthermore be that the preferred geometry of the positioning of the sockets of the socket adaptor and the plug 2 does not comply with the orientations described with reference to Figures 9 – 11.

20 The switch unit 8 includes a switch unit housing 13 which holds the electrical components of the switch unit in place. The switch unit is a unit of assembled components and is engageable with the housing 3 of the socket adaptor. Such engagement is preferably by a clipping or sliding engagement which simultaneous to such engagement will establish or provide for establishing electrical connection between the components of the housing for the
25 purposes of allowing electrical connection to be established between the plug 2 and/or the said sockets 5, 6, 7. The switch unit housing 13 is preferably slidably engagable with the housing 3 when the housing 3 is in a separated condition. With reference to Figure 22, the housing preferably consists of a base moulding 14 and a lid moulding 15. The base moulding 14 and lid moulding 15 are engagable to each other to establish an assembled
30 housing 3 as shown in Figure 1 or 2. However the base and lid mouldings 14, 15 are separable to allow for the interior of the housing to become exposed. The switch unit 8 is capable of being slidably engaged into a rebate 16 of the base moulding 14 and at which the

switch unit 8 will become located to be presented from the housing 3 to present the switch buttons 17 at or proximate a perimeter surface of the housing 3. When fully inserted into the rebate 16 of the housing 3 the switch unit is held in a secure position by the housing. Such insertion of the switch unit 8 with the housing as mentioned or simultaneously provide to present for electrically connection the components of the switch unit 8 for allowing the establishment and interruption of electricals for power supply between a or the said sockets 5, 6, 7 and the plug 2. In the configuration of the socket adaptor 1 which provides a three way outlet configuration with the benefit of preventing clashing of the outlets with a plug or a socket adaptor engaged to a socket outlet 12 of a wall outlet 11, the switch unit is preferably provided to a side surface which extends between the back, front, top and bottom surfaces from which the plug 2 and the sockets 5, 6, 7 are disposed. Accordingly the switch unit 8 may for example be presented from surface S7 or S6 with reference to for example Figures 3 and 7. Provision of such at these side surfaces and directly inwardly of the housing 3 therefrom, is where sufficient space in the interior of the housing 3 will be provided for accommodating the body of the switch unit 8. The switch unit 8 may be provided on the front face S1 of housing 3 but in order to accommodate the body of the switch unit 8 within the housing 3, the socket adaptor would be of a greater height (i.e. the distance between S2 and S3) in order to accommodate the switch unit in such a location yet still provide the socket adaptor as a three way adaptor.

However the switch unit may also be incorporated in a housing providing only a two way socket adaptor and in such the location of the switch unit in respect of the housing may have more significant freedom of choice. In the most preferred form the switch unit 8 will as a assembly of components but in a unitary form provide a link bar 32 to create a single power inlet to the switch unit for each of the switch buttons 17 which are actuable by a finger of a user each to control the motion of a rocker arm 18 made of a metal material. The link bar 32 is analogous to a bus bar. The link bar 32 is provided to be contactable to all of the rocker arm 18 and its power input is provided via plug terminal connector 20. The rocker arm 18 is rotational between two positions, a first allowing for electrical connection to be established between the plug and a respective socket and another position that such an electrical connection is interrupted. The rocker arm is pivotally mounted about pivot axles 19. The rocker arms 18 may be in permanent electrical connection to one electrical terminal side of the switch unit and through it rotation about the axle 19 come in and out of

intermittent contact with a circuit connected to the other terminal sides of the switch unit. With reference to Figure 21, the first terminal side of the switch unit, preferably consists of a terminal connector (plug terminal connector 20) the plug terminal connector 20 is preferably in permanent electrical connection with the rocker arms 18. When engaged with the housing, the plug terminal connector is in electrical connection with one of the live or neutral pins of the plug 2. In a most preferred form when assembled with the housing, the switch unit 8 provides the plug terminal connector in electrical engagement with the live pin for L of the plug 2. Upon assembly of the switch unit 8 with the housing 3, the plug terminal connector 20 becomes electrically connected with components in electrical connection the pin 4L. The plug terminal connector 20 as can be seen is of a configuration which can clip with a member in such electrical connection. The plug electrical connector 20 preferably includes a clip which can snap fit or push fit or slide fit over such components. Such a push fit connection is established upon the insertion or sliding engagement of the switch unit within the rebate 16 until it is driven to its fully engaged condition with the housing or at least the base moulding 14 of the housing 3. The plug terminal connector and in fact all of the electrical connections established between the plug 2 and the terminals of the sockets 5, 6, 7 are provided by the conductive components made from a sheet of metal material. No electrical wiring is preferably used for such purposes. On the opposite electrical side to the plug terminal connector from the rocker arms 18 are conductive elements providing socket terminal connectors 21, 22, 23 the socket terminal connectors 21, 22 and 23 are presented within said housing for engagement thereof preferably by the live terminal pins of a electrical plug (not showing) to be engaged with the socket adaptor of the present invention. The socket terminal connectors 21, 22 and 23 include a pair of drawers within which a pin of an electrical plug can slidingly engage to establish an electrical connection therewith. In the preferred form three such socket side terminal connectors are provided for the purposes of establishing power supply between the plug and three of the sockets of the three way socket configuration of one preferred form of the present invention. A direct electrical connection may be established between the neutral pin 4N of the plug 2 and the terminals of the socket of each of the sockets presented for engagement by the neutral pin of an electrical plug (not shown). For example the socket side neutral terminal connection 23 for the front socket 6 is shown presented with reference to figure 17. Also shown are the bottom socket earth terminal connector 24.

Like the direct connection that can be established between the earth terminals and the neutral terminals may likewise be directly connected as between the neutral pin 4N of the plug and the neutral terminals of the sockets 5, 6, 7. When the switch unit 8 is fully in position in respect of the housing 3, its socket side terminal connectors are presented with the housing in an appropriate location to establish direct connection therewith by the live
5 pins of an electrical plug to be engaged with the sockets 5, 6, 7.

Whilst a direct electrical connection between the plug terminal connector 20 of switch unit and the live terminal pin 4L may be established, in a further alternative, there may be provision of a fuse intermediate thereof. The fuse 9 is preferably provided
10 intermediate of the live pin for and the plug terminal connector 20 of the switch unit 8. The fuse 9 is preferably push fit engagable with the plug terminal connector 20 and a terminal connector 25 engaged in electrical connection with the live pin 4L of the plug 2. Preferably the fuse is retained within a separate compartment 27 within which the terminal connector 25 is presented. The terminal connector 20 of the switch unit is able to penetrate into the
15 compartment 27 via the openings 28 of the compartment 27 and from internal of the housing once the switch unit is engaged with the housing, its terminal connector 20 is presented in a relationship relative to the terminal connector 25 to allow for a cartridge fuse 9 to be engaged with each of the terminal connectors. The cartridge fuse 9 is of a kind which consists of a cylindrical body within which a fusable wire extends between terminal
20 ends 29 and 30. A capping member 10 or lid to the compartment 27 is preferably provided to enclose the compartment when the fuse has been engaged therewith.

Further optional features in respect of the present invention is the possibility for the switch as a unit 8 to be provided to be accommodated with the housing on one or other of the side faces S6 or S7 thereof. It may be that the housing includes a dual rebate one on
25 each of the faces S6 and S7 to allow for the option of reconfiguring the socket adaptor. With reference to Figure 12, there is shown two adjacent socket adaptors engaged with a socket outlet 12 of a wall outlet 11 and wherein the switch units have been provided on opposite faces of the housing 3 of each of the socket adaptors. Two rebates are provided. The socket adaptor may also include a capping member engagable with the rebate which
30 does not hold a switch unit so as to there by close the rebate which would otherwise have been occupied by a switch unit. Indeed the socket adaptor may only include one rebate and

with the ability for such a rebate to be selectively engaged by either a switch unit 8 or by a cover or lid (i.e. in a configuration where the socket adaptor is unswitched).

Another further optional feature is the possibility that the socket adaptor can be used with or without the switch unit. Without a switch unit, the fuse terminal is able to be
5 engaged by a bypass link bar which distributes electricity to the socket terminal.

CLAIMS

1. A three way electrical socket adaptor of a kind which includes a housing i) from which there is presented a multi pin plug of a configuration capable of being inserted into a mains electrical outlet socket and ii) by which there is presented three sockets each
5 capable of receiving an electrical multi pin plug to allow electrical connection of mains electrical power from said mains electrical outlet socket to a or each of said electrical multi pin plugs, said three way electrical socket adaptor characterised in that said housing provides each said socket at an exterior perimeter surface of said housing wherein said exterior perimeter surface at each said socket has a normal which is parallel to a plane
10 with which the normal to the exterior perimeter surface from which said multi pin plug is also parallel to and wherein the normal of the exterior perimeter surface of all said sockets project in non parallel directions.
2. A three way electrical socket adaptor as claimed in claim 1 wherein the exterior
15 perimeter surface of said housing at each said socket has a normal which projects in a direction perpendicular to the normal of the exterior perimeter surface of an immediately adjacent said socket.
3. A three way electrical socket adaptor as claimed in claim 1 or claim 2 wherein said
20 housing is of a general box shaped exterior perimeter.
4. A three way electrical socket adaptor as claimed in claims 1 to 3 wherein the exterior
perimeter surfaces thereof at where said sockets are presented are substantially planar and the exterior perimeter surface from where said plug is presented is also substantially
25 planar.
5. A three way electrical socket adaptor as claimed in claim 1 wherein said housing provides a first of said exterior perimeter surfaces (herein after "back surface") from which there is presented said multi pin plug, a second of said exterior perimeter surfaces
30 (herein after "front surface") from which there is presented a first of said sockets and a third of said exterior perimeter surfaces (herein after "top surface") from which there is

presented a second of said sockets and a fourth of said exterior perimeter surfaces (herein after "bottom surface") from which there is presented a third of said sockets.

- 5 6. A three way electrical socket adaptor as claimed in claim 5 wherein said back and front surfaces are parallel to each other.
7. A three way electrical socket adaptor as claimed in claim 5 or 6 wherein said top and bottom surfaces are parallel to each other.
- 10 8. A three way electrical socket adaptor as claimed in claims 5 wherein side exterior perimeter surfaces extend between said front, and back and bottom and top surfaces to thereby define a substantially enclosed housing, save for openings therein provided at least by said sockets.
- 15 9. A three way electrical socket adaptor as claimed in claims 5 wherein side exterior perimeter surfaces are generally planar and each have a normal which extends lateral to the plane.
- 20 10. A three way electrical socket adaptor as claimed in any one of claim 1 to 9 wherein switching means to interrupt the electrical connection between said multi pin plug (when connected to said mains electrical outlet) and each of said sockets is provided, manually actuatable from the exterior of said housing by an actuating means of said switching means disposed from said housing.
- 25 11. A three way electrical socket adaptor as claimed in claim 5 wherein switching means including means to interrupt the electrical connection between said multi pin plug (when connected to said mains electrical outlet) and each of said sockets is provided, manually actuatable from the exterior of said housing by an actuating means of said switching means disposed from said housing at a surface thereof other than said back, front, top or bottom
30 surface.

12. A three way electrical socket adaptor as claimed in claim 5 wherein side exterior perimeter surfaces extend between said front, and back and bottom and top surfaces to thereby define a substantially enclosed housing, save for openings therein provided at least by said sockets and wherein there is provided switching means to interrupt the electrical connection between said multi pin plug and each of said sockets, manually actuable from the exterior of said housing by an actuating means of said switching means disposed from said housing at a side exterior perimeter surface.
13. A three way electrical socket adaptor as claimed in any one of claims 10 to 12 wherein switching means includes said actuation means and is a unit (herein after "switching unit"), held by said housing.
14. A three way electrical socket adaptor as claimed in claim 13 wherein switching unit includes a first connection terminal which by way of a push-fit engagement is in electrical connection with a connection terminal of, or which is in electrical connection with, one of the pins (live or neutral pins) of said multi-pin plug.
15. A three way electrical socket adaptor as claimed in claim 14 wherein said first connection terminal is in push-fit engagement with a means providing a connection terminal which is in electrical connection with, one of the pins (live or neutral pins) of said multi-pin plug.
16. A three way electrical socket adaptor as claimed in any one of claims 13 to 15 wherein said switching unit includes said first connection terminal (herein after "plug connection terminal") which by way of a push-fit engagement is in electrical connection with a connection terminal of, or which is in electrical connection with, one of the pins (live or neutral pins) of said multi-pin plug and wherein said switching unit includes three further connection terminals (herein after "socket connection terminals") one each provided for electrical connection therewith by a pin (neutral or earth) of a electrical plug associated or to associate with a respective socket and wherein a said means to selectively connect and interrupt electrical connection is provided by said switching

means and between said plug connection terminal and each of said socket connection terminals.

17. A three way electrical socket adaptor as claimed in claim 16 wherein each said
5 socket terminal with which a pin of an electrical plug when associated with a respective socket is capable of being push-fit engagable by a said pin to establish the electrical connection there between.

18. A three way electrical socket adaptor as claimed in claims 13 or 14 wherein said
10 housing holds a fuse having a first and second terminal end, said first connection terminal of said switch unit is push-fit engagable with said first terminal end of said fuse and said second terminal end of said fuse being in electrical connection with a pin (live or neutral) of said multi pin plug.

15 19. A three way electrical socket adaptor as claimed in claims 13 or 14 wherein a fuse is electrically interposed between said first connection terminal and a pin (live or neutral) of said multi pin plug.

20. A three way electrical socket adaptor as claimed in claim 18 or 19 wherein said fuse
20 is a cartridge fuse.

21. A three way electrical socket adaptor as claimed in any one of claims 13 to 20
wherein switch unit includes a switch housing which has means for engagement for engaging with said housing.

22. A three way electrical socket adaptor as claimed in claim 21 wherein said means for
25 engagement holds said switch unit in position relative to said housing.

23. A three way electrical socket adaptor as claimed in claim 21 to 22 wherein said
30 means to engage is/are a surface(s) of said switch housing which can slidingly engage with mating surfaces of said housing.

24. A three way electrical socket adaptor as claimed in claims 13 to 23 wherein said switch unit is engaged to said housing by way selected from one of (a) push-fit, (b) clip-fit and (c) slide fit engagement.

5 25. A three way electrical socket adaptor as claimed in claims 21 to 24 wherein said housing has an opening within which the switch housing is located.

26. A three way electrical socket adaptor as claimed in claims 10 to 25 wherein said switching means has three means to interrupt electrical connection and three actuating means, one each for the three sockets.

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27. A three way electrical socket adaptor as claimed in anyone of claims 1 to 12 wherein said multi pin plug is of a kind which includes at least two pins, a first being the neutral pin and a second being the live pin and wherein each is provided disposed from said housing and extending parallel to the second mentioned normal.

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28. A three way electrical socket adaptor as claimed in claim 27 wherein said live and neutral pins are presented from said housing in a manner wherein an imaginary line extending through both said pins of said multi pin plug and perpendicular to said first mentioned normal, is perpendicular to said plane.

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29. A multi way electrical socket adaptor of a kind which includes a housing (i) from which there is presented a multi pin plug of a configuration capable of being inserted into a mains electrical outlet socket and ii) by which there is presented at least two sockets each capable of receiving an electrical multi pin plug to allow electrical connection of
25 mains electrical power from said mains electrical outlet socket to a or each of said electrical multi pin plugs, said multi way electrical socket adaptor characterised in that said housing holds a switch unit to interrupt the electrical connection between said multi pin plug and each of said sockets said switch unit being manually actuable from exterior of said housing by an actuating means of said switch unit disposed from said housing at a
30 surface thereof.

30. A multi way electrical socket adaptor as claimed in claim 29 wherein switch unit includes a first connection terminal which by way of a push-fit engagement is in electrical connection with a connection terminal of, or which is in electrical connection with, one of pins (a live or neutral pins) of said multi-pin plug.

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31. A multi way electrical socket adaptor as claimed in claim 30 wherein said first connection terminal is in push-fit engagement with a means providing a connection terminal which is in electrical connection with, one of the pins (live or neutral pins) of said multi-pin plug.

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32. A multi way electrical socket adaptor as claimed in any one of claims 29 to 31 wherein said switching unit includes said first connection terminal (herein after "plug connection terminal") which by way of a push-fit engagement is in electrical connection with a connection terminal of, or which is in electrical connection with, one of the pins (live or neutral pins) of said multi-pin plug and wherein said switching unit includes three further connection terminals (herein after "socket connection terminals") one each provided for electrical connection therewith by a pin (neutral or earth) of a electrical plug associated or to associate with a respective socket and wherein a said means to selectively connect and interrupt electrical connection is provided by said switch unit and between said plug connection terminal and each of said socket connection terminals.

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33. A multi way electrical socket adaptor as claimed in claim 32 wherein each said socket terminal with which a pin of an electrical plug when associated with a respective socket is capable of being push-fit engagable by a said pin to establish the electrical connection there between.

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34. A multi way electrical socket adaptor as claimed in claims 29 or 30 wherein said housing holds a fuse having a first and second terminal end, said first connection terminal of said switch unit is push-fit engagable with said first terminal end of said fuse and said second terminal end of said fuse being in electrical connection with a pin (live or neutral) of said multi pin plug.

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35. A multi way electrical socket adaptor as claimed in claims 29 or 30 wherein a fuse is electrically interposed between said first connection terminal and a pin (live or neutral) of said multi pin plug.
36. A multi way electrical socket adaptor as claimed in claim 34 or 35 wherein said fuse
5 is a cartridge fuse.
37. A multi way electrical socket adaptor as claimed in any one of claims 29 to 36 wherein said switch unit includes a switch housing which has means for engagement for engaging with said housing.
10
38. A multi way electrical socket adaptor as claimed in claim 37 wherein said means for engagement holds said switch unit in position relative to said housing.
39. A multi way electrical socket adaptor as claimed in claim 37 or 38 wherein said
15 means to engage is/are a surface(s) of said switch housing which can slidably engage with mating surfaces of said housing.
40. A multi way electrical socket adaptor as claimed in claims 29 to 39 wherein said
20 switch unit is engaged to said housing by way selected from one of (a) push-fit, (b) clip-fit and (c) slide fit engagement.
41. A multi way electrical socket adaptor as claimed in claims 37 to 40 wherein said housing has an opening within which the switch housing is located.
- 25 42. A multi way electrical socket adaptor as claimed in claims 29 to 41 wherein said switching means has at least two means to interrupt electrical connection and at least two actuating means, one each for the at least two sockets.
- 30 43. A multi way electrical socket adaptor as claimed in claim 29 wherein said housing provides each said socket at an exterior perimeter surface of said housing wherein said exterior perimeter surface at each said socket has a normal which is parallel to a plane with which the normal to the exterior perimeter surface from which said multi pin plug is

also parallel to and wherein the normal of the exterior perimeter surface of all said sockets project in non parallel directions.

44. A multi way electrical socket adaptor as claimed in claim 43 wherein the exterior
5 perimeter surface of said housing at each said socket has a normal which projects in a
direction perpendicular to the normal of the exterior perimeter surface of an immediately
adjacent said socket.

45. A multi way electrical socket adaptor as claimed in claim 43 or claim 44 wherein
10 said housing is of a general box shaped exterior perimeter.

46. A multi way electrical socket adaptor as claimed in claims 43 to 45 wherein the
15 exterior perimeter surfaces thereof at where said sockets are presented are substantially
planar and the exterior perimeter surface from where said plug is presented is also
substantially planar.

47. A multi way electrical socket adaptor as claimed in claim 43 wherein said housing
provides a first of said exterior perimeter surfaces (herein after "back surface") from
20 which there is presented said multi pin plug, a second of said exterior perimeter surfaces
(herein after "front surface") from which there is presented a first of said sockets and a
third of said exterior perimeter surfaces (herein after "top surface") from which there is
presented a second of said sockets and a fourth of said exterior perimeter surfaces (herein
after "bottom surface") from which there is presented a third of said sockets.

48. A multi way electrical socket adaptor as claimed in claim 47 wherein said back and
25 front surfaces are parallel to each other.

49. A multi way electrical socket adaptor as claimed in claim 47 or 48 wherein said top
30 and bottom surfaces are parallel to each other.

50. A multi way electrical socket adaptor as claimed in claims 47 wherein side exterior perimeter surfaces extend between said front, and back and bottom and top surfaces to thereby define a substantially enclosed housing, save for openings therein provided at least by said sockets.

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51. A multi way electrical socket adaptor as claimed in claims 47 wherein side exterior perimeter surfaces are generally planar and each have a normal which extends lateral to the plane.

10 52. A multi way electrical socket adaptor as claimed in claim 47 wherein side exterior perimeter surfaces extend between said front, and back and bottom and top surfaces to thereby define a substantially enclosed housing, save for openings therein provided at least by said sockets and wherein said switch unit is at a side exterior perimeter surface.

15 53. A multi way electrical socket adaptor of a kind which includes a housing (i) from which there is presented a multi pin plug of a configuration capable of being inserted into a mains electrical outlet socket and ii) by which there is presented at least two sockets each capable of receiving an electrical multi pin plug to allow electrical connection of mains electrical power from said mains electrical outlet socket to a or each of said
20 electrical multi pin plugs, said multi way electrical socket adaptor characterised in that there is provided within said housing, a fuse having two electrical connection terminals, a first terminal engaged in electrical connection with one selected from the live and neutral pins of said multi pin plug and the other terminal presented for push fit engagement by one of i) a switch unit capable of being engaged to the housing which will provide a
25 means for interrupting the electrical connection between said multi pin plug and each of said sockets said switch unit being manually actuable from exterior of said housing by an actuating means of said switch unit disposed from said housing at a surface thereof, and ii) an insert capable of being engaged to the housing which provides direct (and uninterruptable) electrical connection to the sockets for engagement by a respective live
30 or neutral pin of an electrical multi pin plug.

54. A multi way electrical socket adaptor as claimed in claim 53 wherein said switch unit includes a first connection terminal which by way of a push-fit engagement is in electrical connection with the other connection terminal of said fuse.

5 55. A multi way electrical socket adaptor as claimed in claim 53 wherein said insert includes a first connection terminal which by way of a push-fit engagement is in electrical connection with the other connection terminal of said fuse.

10 56. A multi way electrical socket adaptor as claimed in claims 54 or 55 wherein said fuse is electrically interpose between said first connection terminal of one of said switch unit and said insert and a pin (live or neutral) of said multi pin plug.

57. A multi way electrical socket adaptor as claimed in any one of the preceding claims wherein said fuse is a cartridge fuse.

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58. A switch unit for engagement with a multi way electrical socket adaptor of a kind which includes a housing i) from which there is presented a multi pin plug of a configuration capable of being inserted into a mains electrical outlet socket and ii) by which there is presented at least two sockets each capable of receiving an electrical multi pin plug to allow electrical connection of mains electrical power from said mains electrical outlet socket to a or each of said electrical multi pin plugs, said switch unit comprising:

20 a switch unit housing from which there is presented actuation means disposed at an exterior surface of said switch unit housing, said actuator means controlling a means to connect/ interrupt electrical connection between a first switch unit connection terminal and a second switch unit connection terminal, said first switch unit connection terminal capable of push fit engagement with a connection terminal of said housing which is in electrical connection with one of a live or neutral pins of said multi pin plug and wherein said second switch unit connection terminal is provided
25 for electrical connection with a pin of said electrical multi pin plug
30

59. A switch unit as claimed in claim 58 wherein said second switch unit connection terminal is provided for engagement by a pin of said electrical multi pin plug.

60. A switch unit as claimed in claim 58 wherein said second switch unit connection terminal has a form capable of being push fit engagable by a pin of the electrical multi pin plug.

61. A switch unit as claimed in claim 58 where there are at least two actuator means each with a corresponding means to connect/ interrupt, to each control electrical connection between said first switch unit connection terminal and separate second switch unit connection terminals, one each for an engagement with a separate electrical multi pin plug.

62. A switch unit as claimed in claim 61 wherein a bus bar is provided engaged with said first switch unit connection terminal.

63. A switch unit as claimed in claims 61 or 62 wherein said first switch unit connection terminal is formed as a unit with a bus bar distributing electricity to each of said means to connect/ interrupt.