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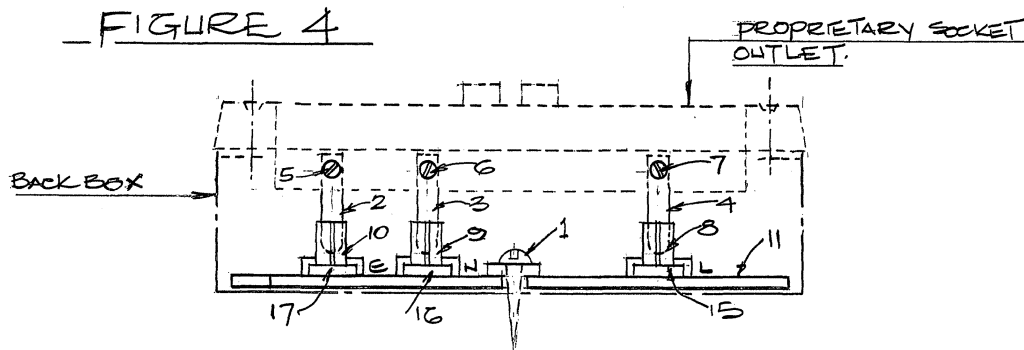
(51) INT CL:
H02G 3/16 (2006.01)

(56) Documents Cited:
GB 2404097 A GB 2394603 A
GB 2359674 A GB 1422428 A
US 6870099 B1 US 4165443 A

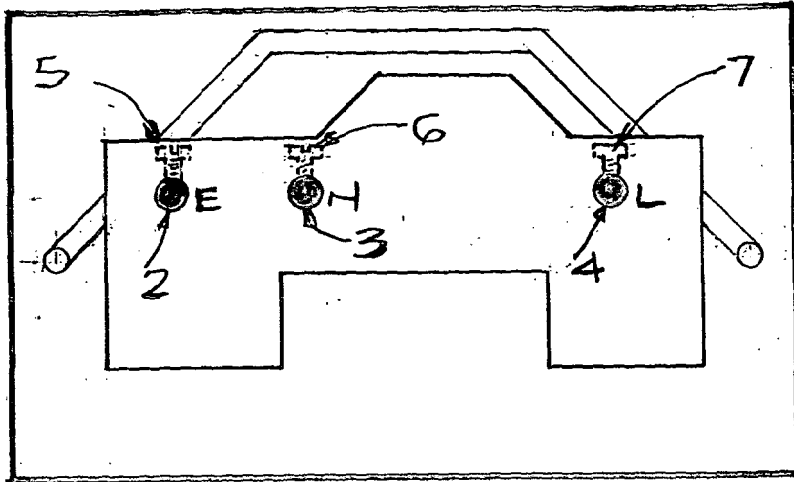
(58) Field of Search:
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(54) Title of the Invention: **Electrical interface assembly**
Abstract Title: **Electrical interface assembly**

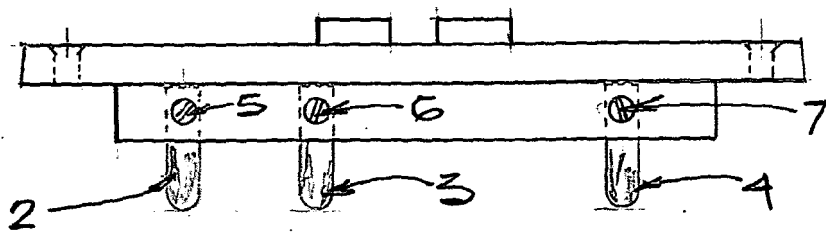
(57) The invention relates to the installation of back boxes and electrical faceplates (sockets, outlets, switches, etc). Male connecting pins 2, 3, and 4 are fixed into the connection terminals on the faceplate. An interface assembly 11 matching the pin layout of the faceplate, containing female friction grip connectors, is mounted within an electrical back box and connected to the circuit wires. The interface assembly may include an orientation indicator and the wiring terminations may be colour coded. The pins may be round. The connectors and terminations may be built into the back box so that a separate interface assembly is not required. The interface assembly allows for the circuit wiring to be terminated within the back box at the same time as the first fix wiring, reducing waste and eliminating the practice of leaving excess cables, protruding from back boxes, which exposes them to damage from subsequent trades in the construction process. As the circuit wiring is fixed in position to the interface assembly it eliminates the need for trial positioning of the wires within the back box, when attempting to fit the connected faceplate, and the wiring is not disturbed when the faceplate is added.



PLAN INDICATING VIEW OF SOCKET TO PIN
INTERFACE ARRANGEMENT & BACK BOX.

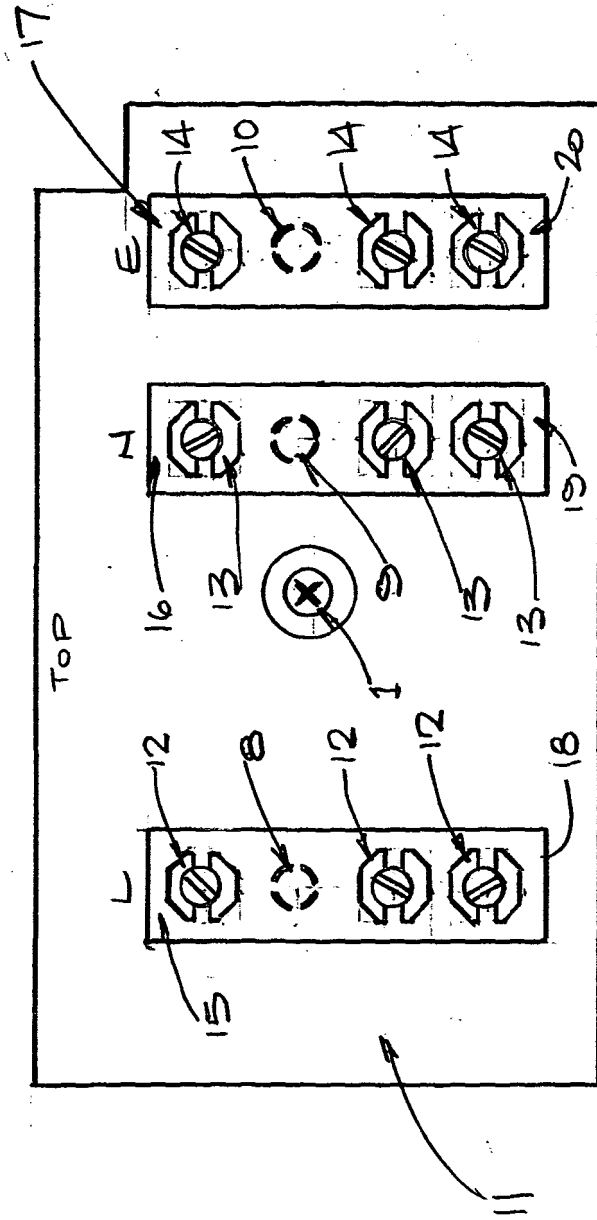
FIGURE 1

REVERSE VIEW OF SOCKET
OUTLET INDICATING CONNECTING
PIN POSITIONS.

FIGURE 2

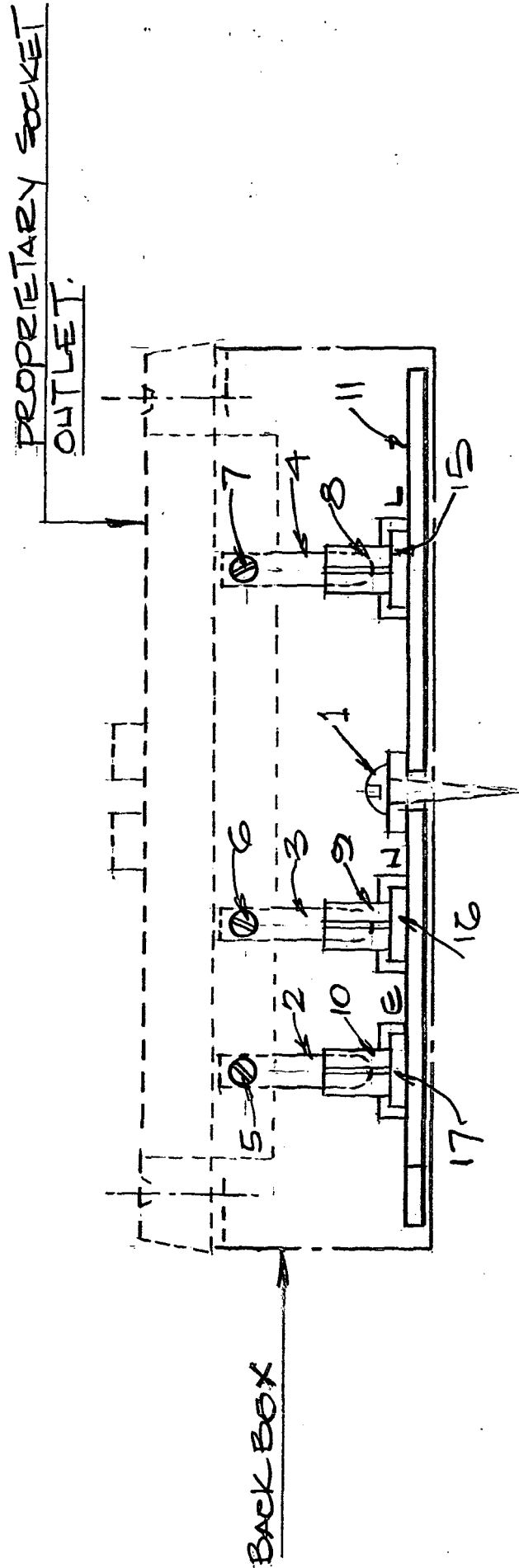
PLAN VIEW OF SOCKET
OUTLET INDICATING PROJECTING
PIN ARRANGEMENT.

FIGURE 3



- FRONT VIEW OF
ELECTRICAL INTERFACE CARD

FIGURE 4



PLAN INDICATING VIEW OF SOCKET TO PIN

INTERFACE ARRANGEMENT & BACK BOX.

Electrical Interface Assembly

Description

Electrical Interface Assembly

The invention relates to the works associated to the installation of back boxes and electrical faceplates (sockets, outlets, switches, etc).

Currently within electrical installations, in both new and rewire applications, considerable time is spent by electricians terminating the circuit wiring and making the terminal connections to faceplates and similar electrical surface devices.

The interconnecting wiring associated to this type of installation is typically, insulated twin and earth cable, from which spurs to additional sockets and the like, are wired from the terminals of the faceplates.

Back boxes are used to support and secure the faceplates which are manufactured in metal, plastic and similar materials. Back boxes can be fitted into block work or similar substrates, speed fixing back boxes are used for plasterboard partitioning and surface mounted back boxes are available.

During the carcass wiring / first fix process, cabling is generally left projecting from the back box and is exposed to damage from subsequent trades which follow first fix, and up to second fix, when the termination connections are made and the faceplate fitted.

The installation of faceplates (switches, socket outlets and the like) is called the second or final fix, and normally follows the plastering and decoration processes within the installation.

Fitting of the faceplates requires cutting back of excess cable and stripping individually insulated conductors to fit within the confines of the back box. Each conductor is arranged to terminate within the terminals available on the faceplate. During this operation, due to limitations of space within the back box, manoeuvring and trail fitting of the socket outlet, the terminations can become loose and lead to poor electrical continuity.

The faceplate is usually secured into position by visible face fixing screws. Some are provided with a surface mounted cover to hide fixing screws.

This description refers to the wiring and use of manufactured back boxes, faceplates, (sockets, switches, outlets or similar surface mounted equipment), herein described and referred to as proprietary equipment.

The invention has a number of separate connecting pins which are attached to the existing faceplate connection terminals and a matching interface assembly, which is located within

and attached to the back box. The interface assembly is used as the terminations for the circuit wiring and arranged to match the manufacturer's proprietary equipment.

The invention will enable the use of manufacturer's proprietary equipment to be installed without modification and will provide an effective interfacing solution, located in the back box, between that proprietary equipment and the building wiring.

It will serve the need of both new installations together with retrofit rewiring applications.

As well as preventing damage to exposed wires between first and second/final fix, the invention eliminates multiple trial fitting of proprietary equipment and thus prevents poor electrical continuity.

The invention will enable a simple plug in connection/engagement arrangement between the proprietary equipment and the wiring. It will therefore increase overall installation efficiency and simplify subsequent redecoration activities.

The invention will not require any changes to many of the currently installed or retailed back boxes but it is expected that some future back boxes or faceplates may be manufactured, to include the interface, sockets or connectors.

Figures 1 and 2 indicate male pins (2,3,4), which are provided of appropriate diameter, length and electrical conductivity to suit each connection, such as the line, neutral and earth positions on the onboard terminal connections within the proprietary equipment.

The male pins are normally cylindrical in shape, but may be different shapes to enable product differentiation between different manufacturers and suppliers.

The pins are secured to the proprietary equipment following the manufacturers recommended method, (for example by utilising the machined securing screws supplied with the equipment), indicated in Figures 1 and 2, items (5, 6, 7).

Female connections with appropriate friction grips, (such as sprung rings), matching the faceplate pin layout, (again using the example of line, neutral and earth) Figure 3, (8, 9, 10), are located within the interface assembly on a conductor base (15,16, 17) and secured on an insulated mounting body (11)

Connected to female friction connections shown in Figure 3 (8, 9, 10) are, terminations which provide three additional circuit wiring connection terminations, (12, 13, 14). Each group are separately situated on the insulated mounting body (11).

The wiring terminals will typically be a slotted and machine screwed assembly, or other such connector, such as a push spring connector, to enable adequate conductor connection.

The interfaces are each mounted on a common singular conductor base assembly and each are separately insulated as denoted by (15, 16, 17) as indicated in Figure 3.

Figure 3 additionally includes colour coded and identity markers (18, 19, 20) which are provided (appropriate to the regulations and language of a country), to ensure accurate positioning of circuit wiring and enables visual inspection of connected wiring to correct polarity points.

The interface incorporates a directional symbol to aid correct orientation such as an arrow or the word 'top'.

The interface assembly can be fixed with a screw (1) through the existing central screw hole within the back box arrangement. The flexible grip provides sufficient stability friction for the holding of the interface card, whilst allowing sufficient lateral levelling and adjustment to ensure that the proprietary faceplate is accurately aligned to the horizontal elevation.

As the circuit wiring is fixed in position to the interface assembly, it eliminates the need for trial positioning of the wires within the back box, when attempting to fit the connected faceplate. Figure 4 illustrated the alignment of proprietary faceplate and back box, with the interface assembly positioned.

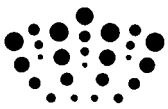
The interface assembly allows for the initial proprietary faceplate to be installed at final fix, without the need for a qualified electrician.

Subsequent or repeated removal and/or replacement of the faceplate over many years, is possible, enabling faceplates to be removed and replaced for decorating or replacement faceplates to be installed without disturbance to the circuit wiring.

Future proprietary equipment could encompass some, each or all of the features described within the foregoing, by manufacturing inclusive elements within the proprietary equipment. For example the interface device could be moulded into a plastic back box at manufacture, using alternative female friction grips or non cylindrical pins.

Claims

1. An electrically insulated interface assembly, with orientation indicator, comprising of insulated, identifiable and colour coded wiring terminations, round female friction grips, with a number of adjustable length, cylindrical male pins for connection to a proprietary electrical faceplate, enabling simple connection and removal of the faceplate.
2. An interface assembly according to claim 1, with shaped connecting pins and matching female friction grips.
3. An interface assembly according to claim 1, with female friction grips to match a proprietary faceplate with built in male connection pins.
4. An arrangement of female friction grips and wiring terminations built into a back box manufactured from an insulating material, so as to enable the functionality of claim 1 without the requirement for a separate interface assembly.
5. An interface assembly according to claim 1, where the method of attachment to the back box is by a method other than a centralised locating screw.
6. An interface assembly according to claim 1, where the circuit wiring terminations are made by sprung clamps or other method to the slotted screw friction clamp terminals
7. An interface card according to claim 1 where the female friction grips are by other means than sprung rings, for example by splayed cone grips or sprung levers.
8. An electrically insulated terminal board according to claim 1, for the purpose of interconnecting circuit wiring to faceplates.
9. An interface assembly which enables the removal and replacement of the faceplate without interference or disturbance to the circuit wiring contained within the back box.



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Examiner: Paul Nicholls

Claims searched: 1 - 9

Date of search: 12 April 2012

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-3, 5-9	US 4165443 A (FIGART et al) - See faceplate 14, round pins 80, 82 and 84, colour coding (column 2 lines 46-55), orienting of mounting boxes (column 2 line 66 - column 3 line 2)
X,Y	X: 9; Y: 1-3, 6, 8	GB 2359674 A (COWLING) - See figure 3, round pins 48, 49 and 51; colour coding at page 4 lines 14-18
X,Y	X: 9; Y: 1-3, 6, 8	GB 2394603 A (PRINGLE) - See figures 2B and 5, sockets 244 and 246 for round pins, different shape of socket 242 to orient faceplate, page 9 lines 24-29
X,Y	X: 9; Y: 1-3, 6, 8	GB 2404097 A (RICHARDSON) - See figures 1-4, also page 5 lines 15-24 regarding orienting of module
X,Y	X: 9; Y: 1-3, 6, 8	GB 1422428 A (HADELEC) - See figure 4, round pins 18; positioning of sockets 9 and cut-off corner provide orientation indicator
X,Y	X: 9; Y: 1-3, 6, 8	US 6870099 B1 (SCHULTZ et al) - See figure 3; colour coding at column 4 lines 24-29

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

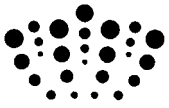
H2E

Worldwide search of patent documents classified in the following areas of the IPC

H02G

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC



International Classification:

Subclass	Subgroup	Valid From
H02G	0003/16	01/01/2006