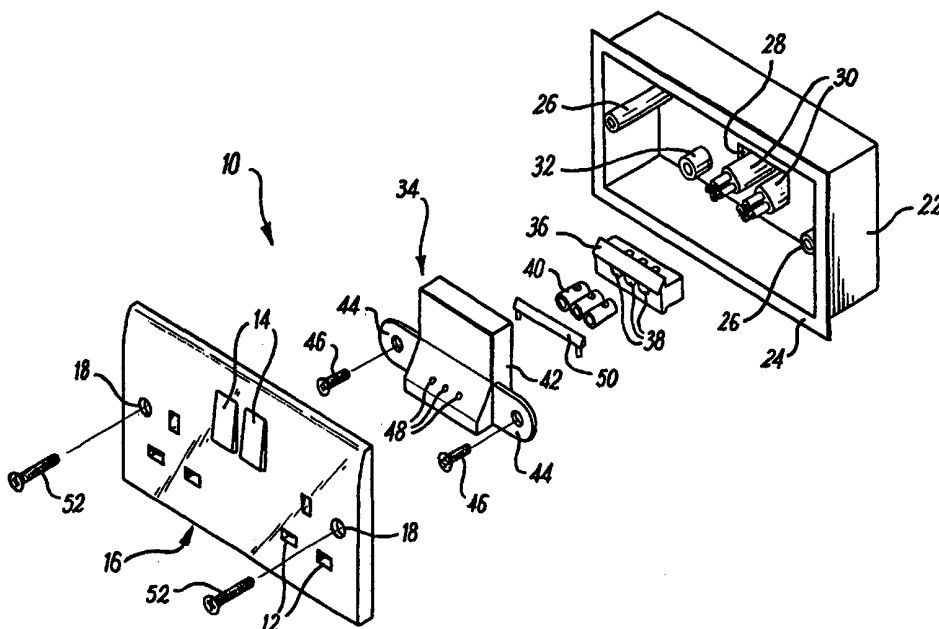




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<p>(21) International Application Number: PCT/GB00/00055</p> <p>(22) International Filing Date: 11 January 2000 (11.01.00)</p> <p>(30) Priority Data: 9900500.1 12 January 1999 (12.01.99) GB 9915790.1 7 July 1999 (07.07.99) GB</p> <p>(71) Applicant (for all designated States except US): VENUE REVENUE SERVICES LIMITED [GB/GB]; St. Kilda House, 13 Bondgate, Castle Donington, Derbyshire DE74 2NS (GB).</p> <p>(72) Inventor; and (75) Inventor/Applicant (for US only): ANTILL, Colin [GB/GB]; 27 The Netherlands, Coulsden, Surrey CR5 1NJ (GB).</p> <p>(74) Agent: SALES, Robert, Reginald; Swindell & Pearson, 48 Friar Gate, Derby DE1 1GY (GB).</p>	<p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p>	

(54) Title: ELECTRICAL ASSEMBLIES



(57) Abstract

An electrical assembly (10, 100) in the form of a plug socket, electrical socket, light fitting, switches or the like. The assembly (10, 100) includes a connecting part (34, 138) connectable to an electric supply and an operable part (16, 108, 120) removably mountable on the connecting part (34, 138) to provide an electrical connection therewith. The assembly (10, 100) being arranged such that on removal of the operable part (16, 108, 120) from the connecting part (34, 138) inadvertent access to the electrical connections is prevented thereby enabling the assembly (10, 100) to be readily fitted and/or changed by persons other than a qualified electrician.

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ELECTRICAL ASSEMBLIES

This invention concerns improvements in or relating to electrical assemblies, and particularly but not exclusively to assemblies such as electrical sockets, switches or light fittings.

Conventional electric plug sockets and light switches comprise a housing and a cover removably mountable thereon, which cover is connectable to the electricity supply. A disadvantage with this arrangement is that a qualified electrician is required to connect the socket or switch, which can be a particular disadvantage when decorating or the like when it is often advantageous for the cover to be removed from the housing. Also with this arrangement, it is only safe to have the cover removed if the electrical supply has been isolated.

In this specification the term "electrical assembly" is to be understood as including, assemblies such as electrical plug sockets, other electrical sockets, light fittings, switches and the like. The term "electrical connection box" is to be understood as meaning an open fronted box or similar, into which electrical wiring extends, and on which an electrical assembly is mountable so as to be connected to the wiring.

According to the present invention there is provided an electrical assembly, the assembly comprising a connecting part connectably mountable on an electrical connection box, and an operable part removably mountable on the connecting part, the assembly being arranged such that when the operable part is mounted on the connecting part an electrical connection is provided therebetween to connect the operable part to the electricity supply.

According to the present invention there is also provided an electrical assembly, the assembly comprising an open housing member mountable on a wall or other fixture, a connecting part mountable within the housing member and connectable to an electric supply entering the housing member, and an

operable part removably mountable on the housing member to substantially close same, the assembly being arranged such that when the operable part is mounted on the housing member the operable part engages with the connecting part so as to provide an electrical connection therebetween to connect the operable part to the electricity supply.

The assembly is preferably arranged such that when the operable part is mounted on the housing member, the operable part automatically engages with the connecting part to provide an electrical connection, and when the operable part is removed from the housing member the electrical connection is automatically broken.

The connecting part may be arranged to substantially prevent inadvertent access to the electrical connection thereto when the operable part is removed from the housing member.

The operable part may be mountable on the housing member by one or more threaded engagement members engageable in a respective threaded hole or holes.

Engagement parts are preferably provided respectively on the connecting part and the operable part to provide an electrical connection therebetween. The engagement parts may comprise pins and corresponding sockets to receive the pins. The pins are preferably provided on the operable part with the sockets on the connecting part. The sockets may be arranged so as to be automatically closed when pins are not located therein.

A separate socket may be provided for each of the live, neutral and earth connections. A shutter or shutters is preferably provided for at least the live, and desirably also at least the neutral connections. The or each shutter is preferably arranged to be urged to a closed condition but moveable to an open condition, and desirably upon a pin being inserted in the earth connection.

The operable part may comprise two detachable sections. Releasable securing means are preferably provided engageable between the sections of the operable part. The operable part is preferably arranged such that the securing means are substantially inaccessible when the operable part is mounted on the connecting part. The securing means may comprise one or more screws.

The detachable sections preferably comprise a front cover section and a base section. The base section preferably comprises all the electrical connections of the operable part. The front cover section may comprise a moulding and desirably only a moulding. The front cover section may be interchangeable with other front cover sections.

Releasable securing means are preferably provided engageable between the operable part and the connecting part. Said securing means may be accessible on or through the operable part and desirably the front cover section. The securing means may comprise one or more screws. Alternatively the securing means may comprise a snap fit arrangement or other engageable formations.

The connecting part is preferably arranged to substantially close an electrical connection box when mounted thereon. Recesses may be provided in the connecting part to accept projections on the operable part, and said projections may locate terminals which receive pins or other elements of an item which is mountable on the electrical connection box.

Connections may be provided on a rear side of the connecting part for connecting to the electrical supply entering the electrical connection box.

The electrical assembly may be in the form of any of an electrical plug socket, other electrical socket, light switch, or light fitting, with the operable part suitably configured.

Embodiments of the present invention will now be described by way of

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example only and with reference to the accompany drawings, in which:-

Fig. 1 is a diagrammatic exploded perspective view of a first electrical assembly according to the invention;

Fig. 2 is a diagrammatic cross sectional view of the assembly of Fig. 1;

Fig. 3 is a diagrammatic rear perspective view of a component of the assembly of Fig. 1;

Fig. 4 is a similar view to Fig. 1 of a second electrical assembly according to the invention;

Fig. 5 is a rear perspective view of a component of the assembly of Fig. 4;

Fig. 6 is a rear perspective view of the component of Fig. 5 with a further component mounted thereon;

Fig. 7 is a front view of the further component of Fig. 6; and

Fig. 8 is a rear view of a still further component of the assembly of Fig. 4.

Figs. 1 to 3 of the drawings show an electrical assembly 10 in the form of a double plug socket assembly. The assembly 10 comprises conventional plug openings 12 and switches 14 on a front cover 16. Mounting holes 18 are provided on each side of the cover 16 as is conventional. The connections within the cover 16 are conventional except that they connect to three rearwardly facing pins 20 which extend from the back of the cover 16.

The assembly 10 also comprises a relatively conventional housing 22 locatable in an opening in a wall. A flange 24 is provided around the perimeter of the open front face of the housing 22. Conventional threaded passages 26 are provided on each side of the housing 22 to mount the cover 16. An opening 28 is provided in the rear of the housing 22 through which two electrical cables 30 extend from the ring main of a respective building. A further pair of threaded passages 32 are provided spaced from each other at a lower part of the housing 22, extending from the back wall of the housing a shorter distance than the cover mounting threaded passages.

The assembly further includes a connecting part 34. The part 34 comprises a connecting body 36 with three through passages 38 extending from

upwardly pointing openings to openings facing towards the cover 16. In the part of the passages 38 facing towards the cover 16 are provided conventional threaded barrel sockets 40, one for each of the live, neutral and earth connections. Grub screws 41 are provided on the sockets 40 for clamping wires therein. The screws 41 are engageable from the side of the body 36 away from the cover 16.

The part 34 comprises a main body 42 to which the connecting body 36 is mountable. The main body 42 has two side lugs 44 with through holes to permit mounting thereof to the housing 22 by engagement of screws 46 in the further threaded passages 32. Three openings 48 are provided through the face of the main body 42 which points away from the housing 22. The openings 48 are spaced to correspond with the pins 20 on the cover assembly 16, and also the passages 38. Located behind the openings 48 is a spring loaded shutter 50 which is arranged to be urged to close the openings 48.

In use the assembly 10 is connected to the ring main cables 30 which extend into the connecting housing 36, by a qualified electrician. The connecting housing 36 is then mounted on the main body 42, which is attached to the housing 22 using the screws 46. The assembly 10 is now secure and safe in that the shutter 50 will have automatically closed the openings 48. When it is required to use the assembly 10 the cover 16 can be mounted in a conventional fashion using screws 52 engaging in the threaded passages 26. As the cover 16 is mounted on the housing 22 the pins 20 automatically engage in the openings 48 and urge the shutter 50 away therefrom. This provides an automatic electrical connection and therefore can be fitted by persons other than a qualified electrician. The cover 16 can readily be removed, for example during decoration, or if it is required to be replaced by a different type, colour or style. The cover 16 can simply be removed by undoing the screws 52. As the pins 20 are withdrawn from the openings 48 the electrical connection is broken and the shutter 50 automatically closes off the openings 48, thereby preventing any inadvertent contact with the live electrical connections.

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Figs. 4 to 8 of the drawings show a second electrical assembly 100 which is also in the form of a double socket assembly with plug openings 112 and switches 114. The assembly 100 is mountable on a conventional electrical connecting box (not shown) such as a dry lining box, by screws 106 engaging in the conventional mounting holes.

The assembly 100 comprises a front cover 108 which provides the openings 102 and further openings 110 through which the switches 104 extend. Mounting holes 112 are provided in angled side edges of the cover 108. The cover 108 also has angled top and bottom edges to define a cavity behind the rear surface 114 of the cover 108. Extending from the rear surface 114 are four spaced cylindrical projections 116 which are provided with threaded axial holes. Three further shorter projections 118 with unthreaded co-axial openings are provided in a generally central triangular configuration for a purpose hereinafter to be described.

The assembly 100 also comprises a terminal part 120 which when combined with the front cover 108 defines the operable part of the assembly 100. The terminal part 120 is substantially locatable within the recess defined by the sloping edges of the front cover 108. The terminal part 120 is mountable to the front cover by screws 122 extendible through holes 124 on the rear of the part 120 and engageable within the holes in the projections 116. The part 120 comprises recesses 126 to receive the live and neutral pins of plugs extendible through the respective openings 102; and also through openings 128 to receive the earth pins of plugs extending through the respective openings 102. A relatively conventional sprung arrangement 130 is provided for closing the recesses 126 until a pin is inserted in the openings 128.

Three pins 132 extend rearwardly from the part 120 in a triangular configuration considered to be unique in electrical connections worldwide. The heads of the pins 132 locate in the openings in the further projections 118 in the front cover 108 when the part 120 is mounted on the cover 108. The pins 132 are connected by electrical tracks 134 to electrically connect with plug pins

when located respectively in the recesses 126 and openings 128. The arrangement of the tracks 134 is relatively conventional and is thus not described in any detail. The switches 104 operatively connect within the tracks 134. Recesses 136 are provided in the sides of the part 120 for a purpose hereinafter to be described.

The assembly 100 also comprises a connecting part 138. The part 138 comprises a moulding 140 which is of a size to close an electrical connection box and be mountable thereon by the screws 106 extending through holes 145 in the moulding 140. A flange 141 extends around the edge of the part 138. On the front face of the moulding 140 a projection 142 is provided on each side with a threaded hole 144 therein in which screws 146 are engageable, the screws 146 extending through the holes 112 in the front cover 108 to mount the cover 108 and hence operable part on the connecting part 138. The projections 142 are shaped to extend through the recesses 136 when the terminal part 120 is located on the connecting part 138. Inverted T-shaped recesses 147 are provided in the moulding 140 to accept the recesses 126 and openings 128 when the operable part is mounted on the connecting part. Three openings 148 are also provided extending through the moulding 140 to accept the pins 132.

A connection arrangement 150 is provided on the rear of the moulding 140. The arrangement 150 comprises a sprung shutter 152 with a spring 154 which closes the openings 148 which correspond to the live and neutral terminals, these being the upper two openings 148, unless a pin 132 extends through the earth (lower) opening 148. The shutter 152 and spring 154 are mounted on a panel 156 with three openings 158 extending therethrough to receive the pins 132. Mounted on the rear of the panel 156 are conventional screw terminal blocks 160 for mounting the electrical supply cables and connecting with the pins 132. The earth terminal block connects via a track 162 to the holes 145 to earth the screws 106. A cover 164 is mountable by screws 166 to hold the arrangement 150 on the back of the moulding 140.

In use, where a house is wired either initially or during rewiring, the electric main is connected to the arrangement 150 in a conventional manner and the connecting part 138 is mounted on the electrical connection box by the screws 106. With the connecting part 138 fitted a safe arrangement is provided and this would be particularly suited during decoration, or finishing of a new house. The flange 141 can be painted up to or slightly onto or wallpaper can be applied up to or thereonto. For instance during new house building, workers may require an electrical supply and a special adapter could be provided to plug into the openings 148. As the configuration of these openings is unique, no conventional plug will fit thereinto, but a special adapter could be provided for use in appropriate circumstances.

When it is required to use the electric socket in a conventional manner the operable part is fitted onto the connecting part 138. The front cover 108 which is in the form of a single moulding can be chosen as is required for style, colour etc. This is fitted onto the terminal part 120 prior to mounting on the connecting part 138. As the screws 122 are only accessible from the rear of the terminal part 120, the front cover 108 cannot be removed therefrom. The operable part is secured on the connecting part 138 using the screws 146.

The assembly 100 is usable with existing and/or conventional electrical connecting boxes. This permits the appearance of the electric socket or other arrangement to readily be transformed by changing the front cover 108. If required the front cover 108 could provide a different type of connection for example one or more of the plugs could be blanked off and this may be useful for example in a young child's bedroom. As only the front cover 108 which is a single moulding requires replacement, this means that the appearance of sockets in for example a single room or a whole house could be inexpensively changed as and when required.

The assemblies thus described provide considerable advantages over existing arrangements. The assemblies are though of relatively conventional and straightforward construction and can thus be inexpensively and robustly

manufactured. It is to be realised that the invention is usable in a wide range of applications for example with different plug sockets as are used in different localities. Also the invention is usable in other electrical applications. For example light switches of any type can be made according to the invention. Similarly, light fittings, or other sockets for use with shaver or other specific plugs can be made. The invention is particularly useful with wall light fittings. In these different applications corresponding covers are provided.

Various other modifications may be made without departing from the scope of the invention. Obviously the number of pins and openings and their configuration can be varied dependent on the particular application, and/or to avoid being compatible with any existing configuration anywhere in the world. Different means may be provided for mounting the components together, and rather than screws snap fit or other engageable formations may be appropriate. Different means may be provided for closing the openings when the cover is removed, and in certain instances this may not be necessary.

Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

CLAIMS

1. An electrical assembly (10,100) comprising a connecting part (34,138) connectably mountable on an electrical connection box, and an operable part (16,108,120) removably mountable on the connecting part (34,138) the assembly (10,100) being arranged such that when the operable part (16,108,120) is mounted on the connecting part (34,138) an electrical connection is provided therebetween to connect the operable part (16,108,120) to the electricity supply.
2. An electrical assembly (10) comprising an open housing member (22) mountable on a wall or other fixture, a connecting part (34) mountable within the housing member (22) and connectable to an electric supply entering the housing member (22), and an operable part (16) removably mountable on the housing member (22) to substantially close same, the assembly (10) being arranged such that when the operable part (16) is mounted on the housing member (22) the operable part (16) engages with the connecting part (34) so as to provide an electrical connection therebetween to connect the operable part (16) to the electricity supply.
3. An electrical assembly (10,100) according to claim 1 or 2 characterised in that the assembly (10,100) is arranged such that when the operable part (16,108,120) is mounted on the connecting part (34,138) or housing member (22), the operable part (16,108,120) automatically engages with the connecting part (34,138) to provide an electrical connection, and when the operable part (16,108,120) is removed from the housing member (22) the electrical connection is automatically broken.
4. An electrical assembly (10,100) according to any of the preceding claims, characterised in that the connecting part (34,138) is arranged to substantially prevent inadvertent access to the electrical connection thereto when the operable part (16,108,120) is removed from the connecting part (34,138) or housing member (22).

5. An electrical assembly (10,100) according to any of the preceding claims, characterised in that engagement parts (20,48,132,148) are provided respectively on the connecting part (34,138) and the operable part (16,108,120) to provide an electrical connection therebetween.
6. An electrical assembly (10,100) according to claim 5, characterised in that the engagement parts (20,48,132,148) comprise pins (20,132) and corresponding sockets (48,148) to receive the pins (20,132).
7. An electrical assembly (10,100) according to claim 6, characterised in that the pins (20,132) are provided on the operable part (16,120) with the sockets (48,148) on the connecting part (34,138).
8. An electrical assembly (10,100) according to claim 6 or 7, characterised in that the sockets (48,148) are arranged so as to be automatically closed when pins (20,132) are not located therein.
9. An electrical assembly (10,100) according to any of claims 6 to 8, characterised in that a separate socket (48,148) is provided for each of the live, neutral and earth connections.
10. An electrical assembly (10,100) according to claim 9, characterised in that a shutter (50,152) or shutters is provided for at least the live, and/or at least the neutral connections.
11. An electrical assembly (10,100) according to claim 9 or 10, characterised in that the or each shutter (50,152) is arranged to be urged to a closed condition but moveable to an open condition upon a pin (20,132) being inserted in the earth connection.
12. An electrical assembly (100) according to any of the preceding claims characterised in that the operable part (108,120) comprises two detachable sections (108,120) .

13. An electrical assembly (100) according to claim 12, characterised in that the detachable sections (108) comprise a front cover section and a base section (120).
14. An electrical assembly (100) according to claim 13, characterised in that the base section (120) comprises all the electrical connections of the operable part (108,120).
15. An electrical assembly (100) according to claim 13 or 14, characterised in that the front cover section (108) comprises a moulding.
16. An electrical assembly (100) according to claim 15, characterised in that the front cover section (108) only comprises a moulding.
17. An electrical assembly (100) according to any of claims 13 to 16, characterised in that the front cover section (108) is interchangeable with other front cover sections.
18. An electrical assembly (100) according to any of claims 12 to 17 characterised in that releasable securing means (122) are provided engageable between the sections (108,120) of the operable part.
19. An electrical assembly (100) according to claim 18 characterised in that the operable part is arranged such that the securing means (122) are substantially inaccessible when the operable part (108,120) is mounted on the connecting part (138).
20. An electrical assembly (100) according to claims 18 or 19 characterised in that the securing means (122) comprise one or more screws (122).
21. An electrical assembly (10,100) according to any of the preceding claims, characterised in that releasable securing means (52,142,146) are provided engageable between the operable part (16,108) and the connecting part (34,138)

or housing member (22).

22. An electrical assembly (10,100) according to claim 21, characterised in that said releasable securing means (52,142,146) are accessible on or through the operable part (16,108).

23. An electrical assembly (10,100) according to claim 22 when dependent on any of claims 13 to 20, characterised in that said releasable securing means (142,146) are accessible on or through the front cover section (108).

24. An electrical assembly (10,100) according to any of claims 21 to 23, characterised in that said releasable securing means (52,142,146) comprise a snap fit arrangement or other engageable formations.

25. An electrical assembly (10,100) according to any of the preceding claims, characterised in that the connecting part (34,138) is arranged to substantially close an electrical connection box or the housing member (22) when mounted thereon.

26. An electrical assembly (10,100) according to any of the preceding claims, characterised in that recesses (48,148) are provided in the connecting part (34,138) to accept projections (20,132) on the operable part (16,120).

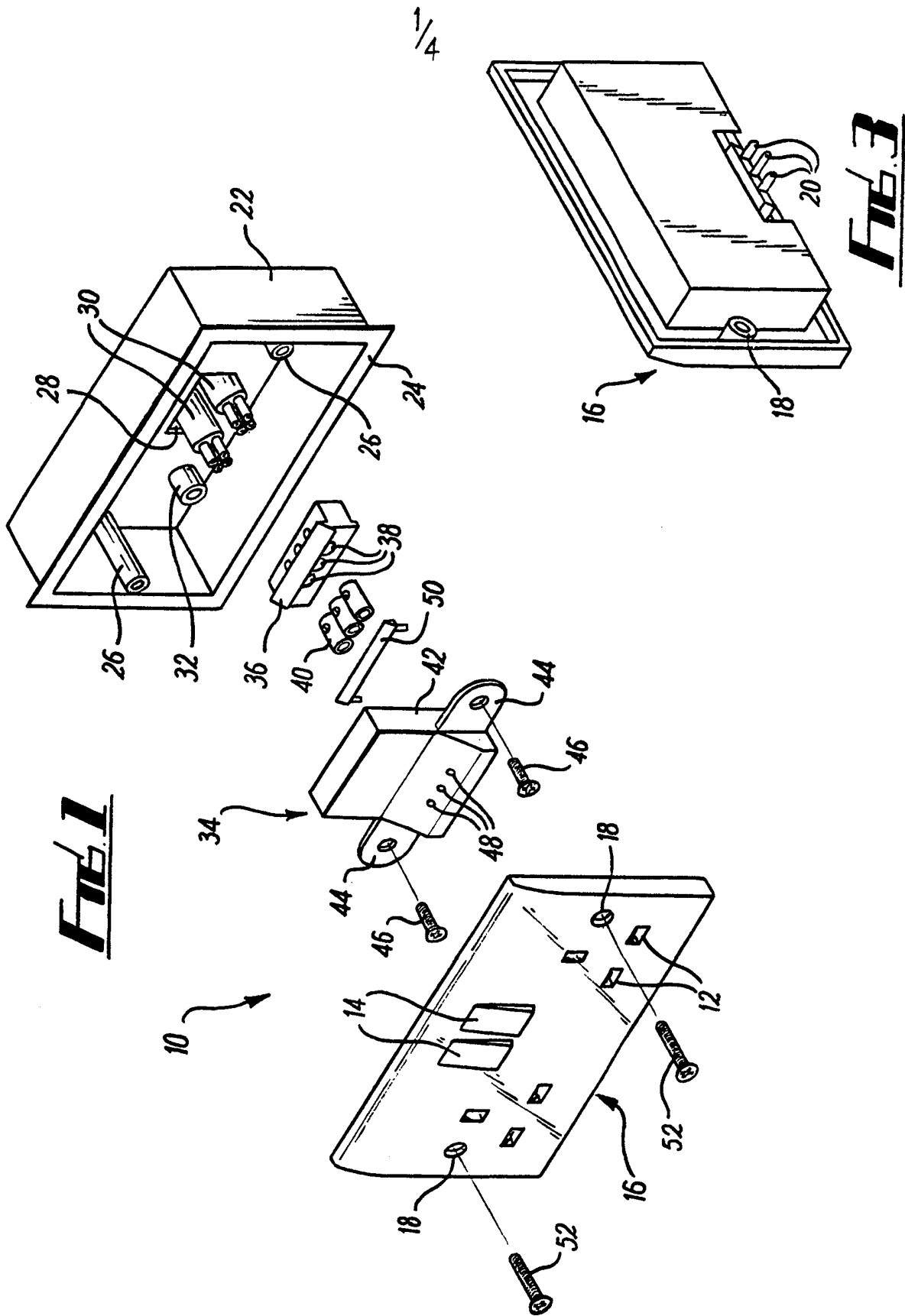
27. An electrical assembly (10,100) according to claim 26, characterised in that the projections (20,132) locate terminals which receive pins or other elements of an item which is mountable on the assembly (10,100).

28. An electrical assembly (10,100) according to any of the preceding claims, characterised in that connections (36,160) are provided on a rear side of the connecting part (34,138) for connecting to the electrical supply entering the electrical connection box or housing member (22).

29. An electrical assembly (10,100) according to any of the preceding claims,

characterised in that the electrical assembly (10,100) is in the form of any of an electrical plug socket, other electrical socket, light switch, or light fitting, with the operable part suitably configured.

30. Any novel subject matter or combination including novel subject matter disclosed, whether or not within the scope of or relating to the same invention as any of the preceding claims.



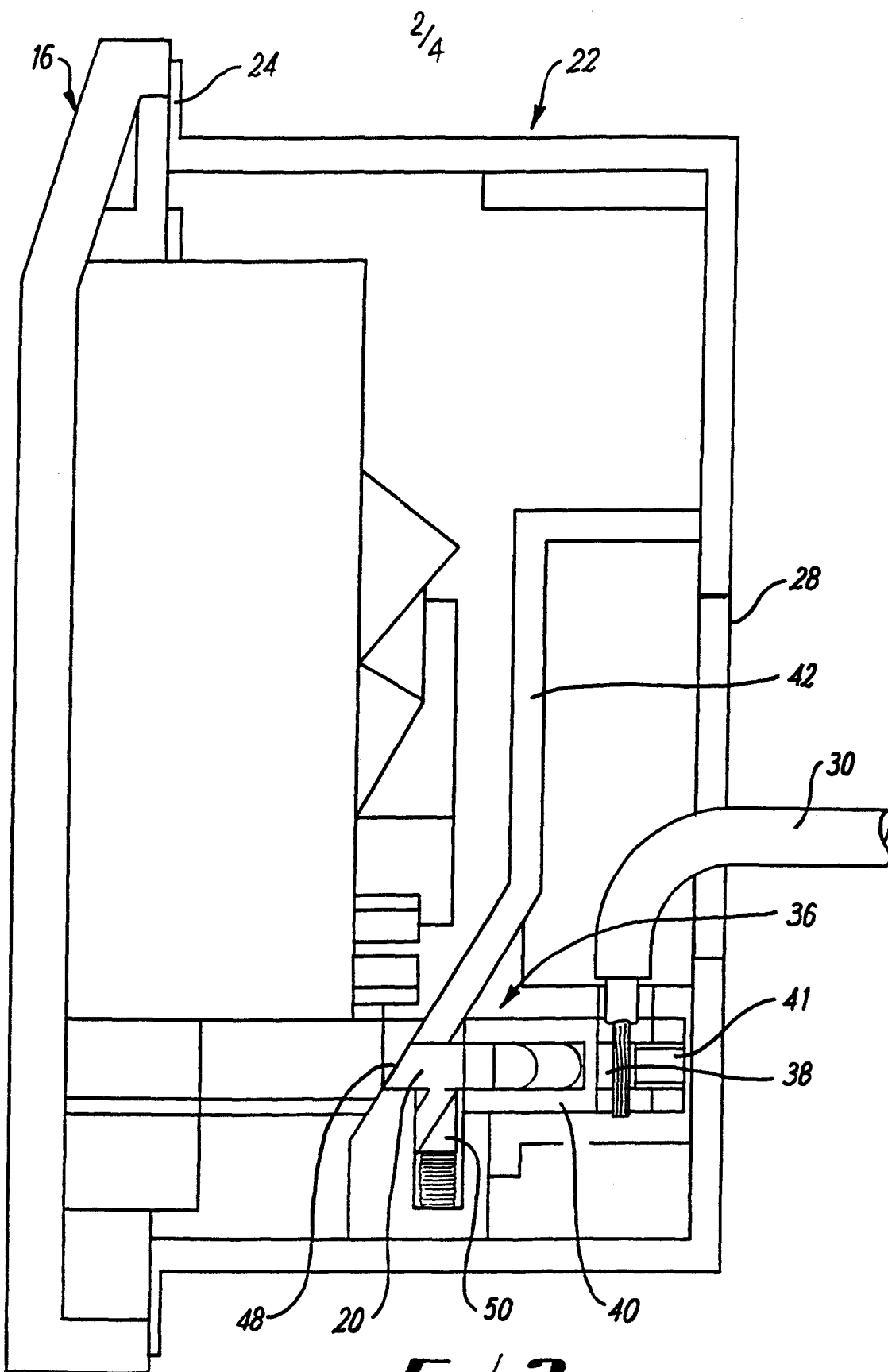


FIG. 2

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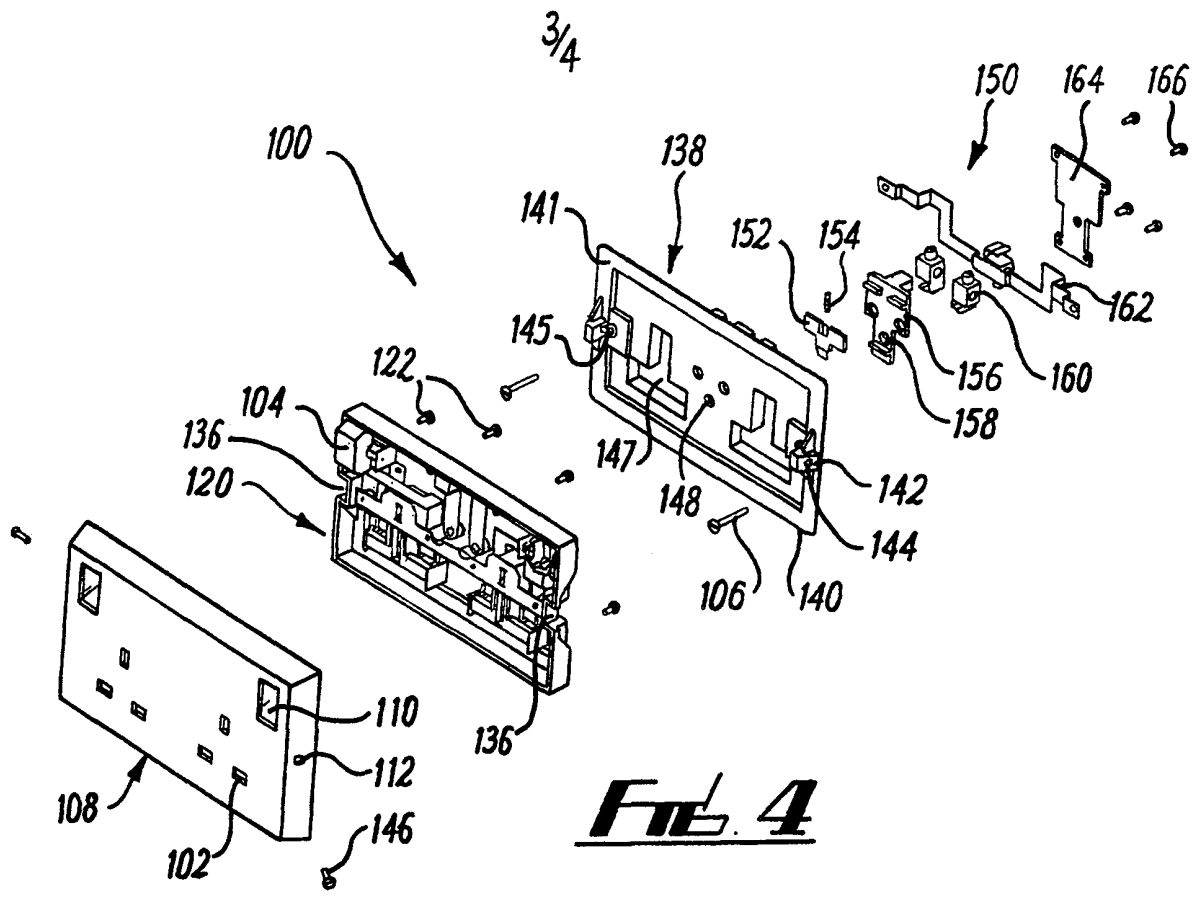


FIG. 4

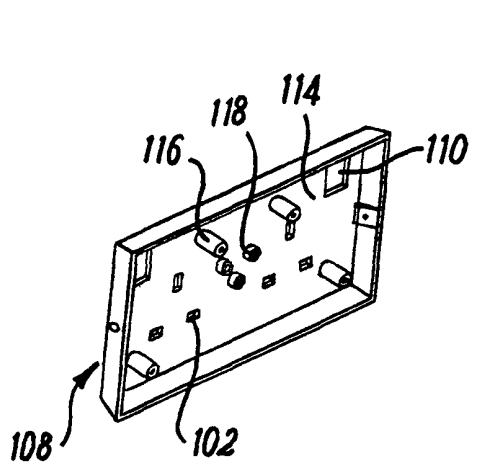


FIG. 5

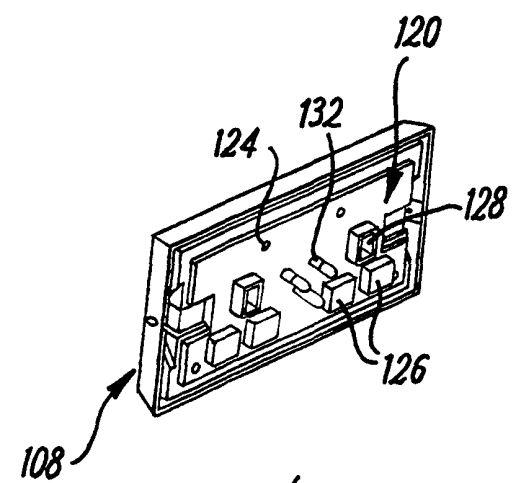


FIG. 6

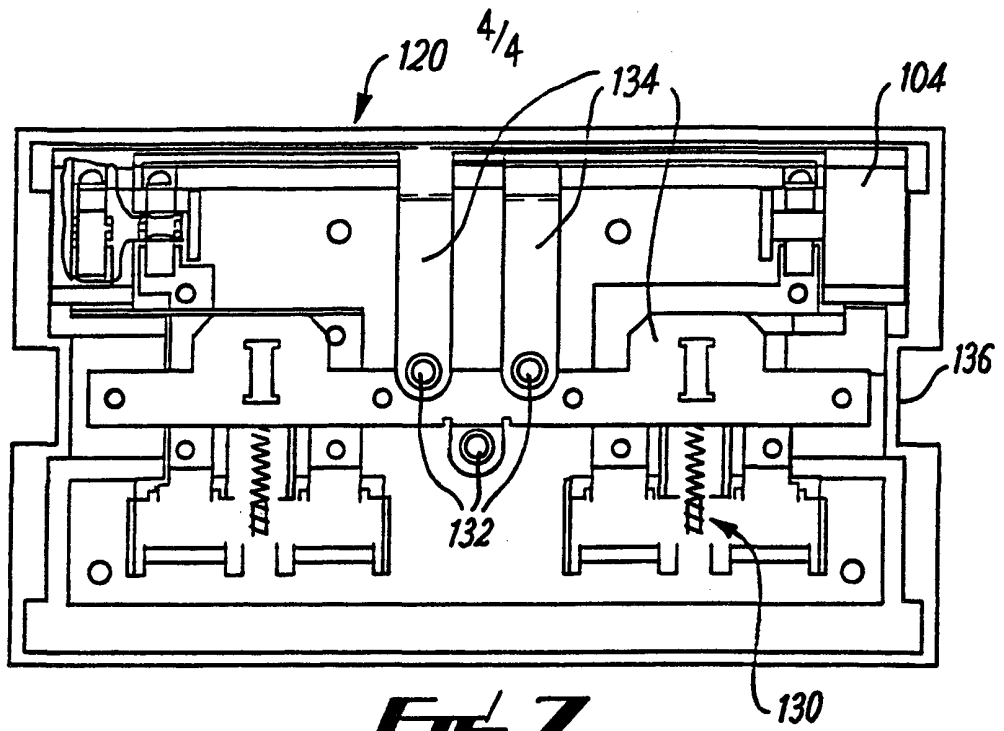


FIG. 7

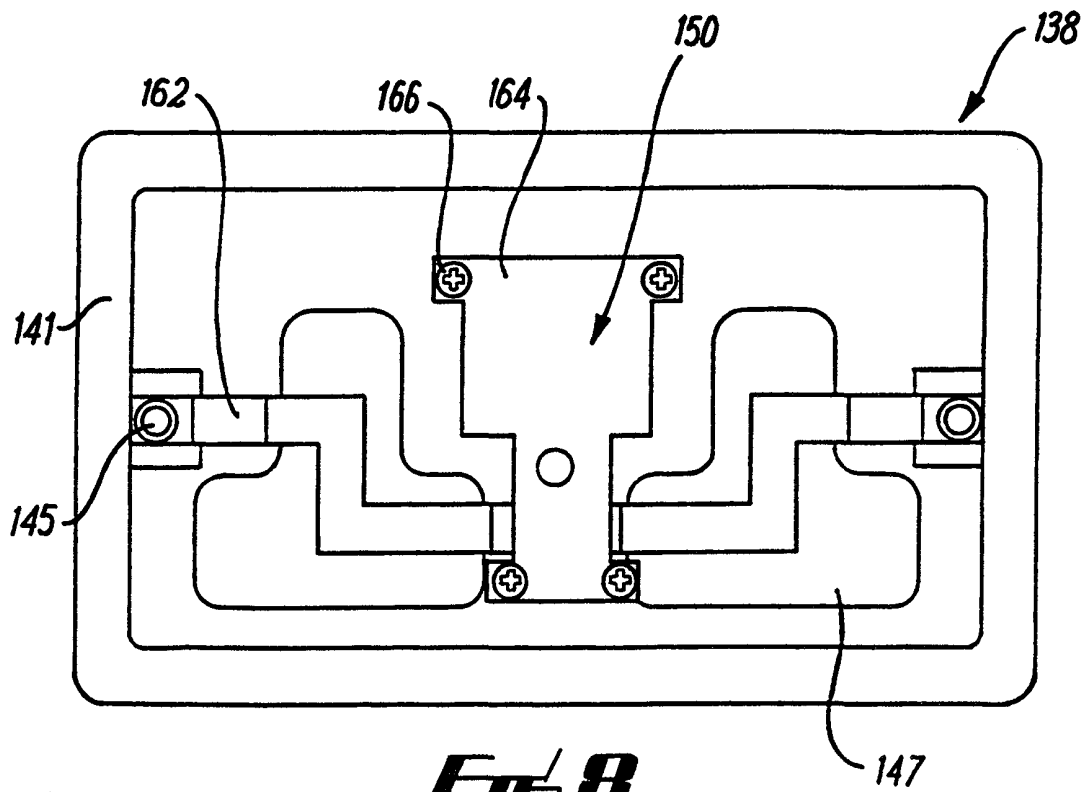


FIG. 8

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 00/00055

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01R13/453 H01R13/639 H01R13/447

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H01R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 702 259 A (LEE CHIU-SHAN) 30 December 1997 (1997-12-30) column 2, line 56 -column 3, line 31; figures 1,6	1,3-15, 29
A	EP 0 763 875 A (SCHNEIDER ELECTRIC SA) 19 March 1997 (1997-03-19) abstract; figure 1	1-30
A	US 3 865 456 A (DOLA FRANK PETER) 11 February 1975 (1975-02-11) column 1, line 51 -column 3, line 3; figure 7	1-30
A	US 3 775 726 A (GRESS R) 27 November 1973 (1973-11-27) column 2, line 64 -column 3, line 68; figures 1,2	1-30
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Further documents are listed in the continuation of box C. Patent family members are listed in annex.

* Special categories of cited documents :

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Date of the actual completion of the international search 11 May 2000	Date of mailing of the international search report 18/05/2000
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INTERNATIONAL SEARCH REPORT

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