PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : H01R

A2

(11) International Publication Number: **WO 98/59391**

(43) International Publication Date: 30 December 1998 (30.12.98)

(21) International Application Number: PCT/NZ98/00082

(22) International Filing Date: 11 June 1998 (11.06.98)

(30) Priority Data:
97/3729 20 June 1997 (20.06.97) ZA

(71) Applicants *(for all designated States except US)*: WOLFOWITZ, Freda [ZA/ZA]; 14 Charles Road, New Brighton, Sandton 2196 (ZA). NEWNHAM, Ross, Andrew [NZ/NZ]; 300a Richmond Road, Grey Lynn, Auckland (NZ).

(71)(72) Applicant and Inventor: WOLFOWITZ, Susanna, Helena [ZA/ZA]; 14 Charles Road, New Brighton, Sandton 2196 (ZA).

(74) Agents: PIPER, James, William et al.; James W. Piper & Co., Unicorn House, 300a Richmond Road, Grey Lynn, Auckland 1002 (NZ).

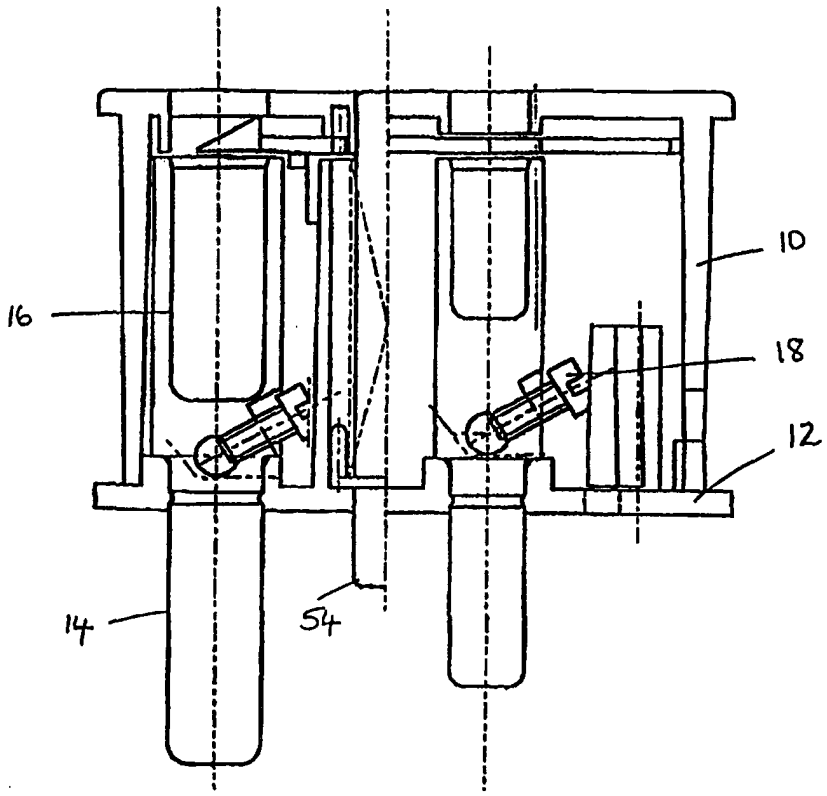
(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, 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, ML, MR, NE, SN, TD, TG).

Published
Without international search report and to be republished upon receipt of that report.

(54) Title: ELECTRICAL PLUG

(57) Abstract

An electrical plug assembly which obviates the need for a double adaptor in some cases, includes pins for insertion into a wall or other socket and which also includes one or more sockets integral with the pins for receiving one or more electrical plugs, the sockets corresponding with the pins of the second plug permitting mounting of the second and succeeding plugs in piggy–back fashion.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	**ES**	Spain	**LS**	Lesotho	**SI**	Slovenia
AM	Armenia	**FI**	Finland	**LT**	Lithuania	**SK**	Slovakia
AT	Austria	**FR**	France	**LU**	Luxembourg	**SN**	Senegal
AU	Australia	**GA**	Gabon	**LV**	Latvia	**SZ**	Swaziland
AZ	Azerbaijan	**GB**	United Kingdom	**MC**	Monaco	**TD**	Chad
BA	Bosnia and Herzegovina	**GE**	Georgia	**MD**	Republic of Moldova	**TG**	Togo
BB	Barbados	**GH**	Ghana	**MG**	Madagascar	**TJ**	Tajikistan
BE	Belgium	**GN**	Guinea	**MK**	The former Yugoslav Republic of Macedonia	**TM**	Turkmenistan
BF	Burkina Faso	**GR**	Greece			**TR**	Turkey
BG	Bulgaria	**HU**	Hungary	**ML**	Mali	**TT**	Trinidad and Tobago
BJ	Benin	**IE**	Ireland	**MN**	Mongolia	**UA**	Ukraine
BR	Brazil	**IL**	Israel	**MR**	Mauritania	**UG**	Uganda
BY	Belarus	**IS**	Iceland	**MW**	Malawi	**US**	United States of America
CA	Canada	**IT**	Italy	**MX**	Mexico	**UZ**	Uzbekistan
CF	Central African Republic	**JP**	Japan	**NE**	Niger	**VN**	Viet Nam
CG	Congo	**KE**	Kenya	**NL**	Netherlands	**YU**	Yugoslavia
CH	Switzerland	**KG**	Kyrgyzstan	**NO**	Norway	**ZW**	Zimbabwe
CI	Côte d'Ivoire	**KP**	Democratic People's Republic of Korea	**NZ**	New Zealand		
CM	Cameroon			**PL**	Poland		
CN	China	**KR**	Republic of Korea	**PT**	Portugal		
CU	Cuba	**KZ**	Kazakstan	**RO**	Romania		
CZ	Czech Republic	**LC**	Saint Lucia	**RU**	Russian Federation		
DE	Germany	**LI**	Liechtenstein	**SD**	Sudan		
DK	Denmark	**LK**	Sri Lanka	**SE**	Sweden		
EE	Estonia	**LR**	Liberia	**SG**	Singapore		

Electrical Plug

TECHNICAL FIELD OF THE INVENTION

This invention relates to an electrical plug.

BACKGROUND OF THE INVENTION

The conventional electrical adaptor has pins for insertion into a wall socket and has two or more sockets for receiving more than one electrical plug, usually of differing size and/or amperage.

When it is required to have more than one plug in use, it is always necessary to find an adaptor and, as every household, office and other institution knows, these are often misplaced or even lost.

It is an object of the present invention to overcome this disadvantage and further to provide a safe arrangement permitting multiple access to a plug point.

THE INVENTION

According to the invention, an electrical plug assembly including a first plug adapted to be inserted into a wall socket, the plug including one or more sockets electrically associated with the pins thereof for receiving a second plug, the second plug being similarly adapted to receive a third plug, the third and successive plugs being similarly adapted to receive subsequent plugs.

In the preferred form of the invention the sockets are integral with the pins.

Also in the preferred form of the invention, the poles are elongated to include an upper section including a cavity for receiving the pole of the plug above. In this form, the pole and socket are constructed in one piece and no secondary electrical connection is required.

These sockets may include slots to provide sufficient flexibility to ensure a tight and electrically conductive connection. In addition, or alternatively the sockets may be bowed to achieve the same results.

One or more suitable shielding formations may be provided as in conventional sockets to prevent insertion, particularly by children, of lengths of electrically conductive material such as wire, metal rods or even fingers.

Also in the preferred form of the invention, the plug includes a central cavity extending vertically therethrough, the cavity being adapted to receive a safety rod slidable therein, the rod being longer than the depth of the plug. This safety rod further includes an integral flange or the like stop formation to prevent it slipping out of the cavity, the flange including one or more vertical prongs.

Before insertion into a plug point, the safety rod protrudes from the base of the plug. When inserted, the protruding end is forced upwards by the surface of the socket, causing it to protrude above the plug. When a second plug is inserted the protruding top end of the rod engages a similar rod and cavity in the second plug, causing its rod to protrude above by an even greater distance. The addition of further plugs eventually results in the prong(s) of the uppermost rod engaging a corresponding hole(s) in the shielding plate of the uppermost plug preventing it sliding to permit insertion of a further plug. In this way the number of plugs used in piggy-back fashion may be limited for safety purposes. The distance that the uppermost rod protrudes from the uppermost plug also prohibits the insertion of a further plug.

In one form of the invention, the shielding formation comprises a plate slidable from a first position in which the sockets of the plug are shielded and a second position in which access to the sockets is permitted, upon insertion of the earth pin of the second plug to overcome the bias of a tension spring or the like. In one form, the spring is integrally moulded.

In one form of the invention the plate element includes three formations, which may be semi-circular, elliptical or triangular, the formations being positioned to shield the sockets when the plate is in the first position described hereabove, the plate further being slidable between the cover of the plug and a fastening plate.

A system of guides and slots may be provided for the plate.

In the preferred form of the invention the fastening plate is substantially triangular in shape and orientated oppositely to the triangular positioning of the sockets, the fastening plate being affixed to the cover by means of pins at each apex thereof. In this form the cover includes on the interior surface thereof a pair of parallel guides extending from the live and neutral sockets towards the earth socket. These guides preferably extend inwardly towards the earth socket and around the rear thereof.

Also in this form the shape of at least the front section of the plate is defined by the guides, the plate including a middle and a rear slot for accommodating the safety rod and the rear pin of the fastening plate respectively.

This differs from the arrangement described in RSA Patent 80/3086 which comprises a shutter in the form of a cam which rotates upon insertion of the earth pin to permit access to the sockets.

The plug of the invention may, of necessity, be deeper than conventional plugs in order to accommodate the second or further additional plugs, the different design may be adopted for flatter plugs.

It will also be appreciated that a nest of plugs according to the invention may be employed - in other words a plurality of piggy-back plugs may be used, thereby avoiding the use of adaptors.

EMBODIMENT OF THE INVENTION

An embodiment of the invention is described below with reference to the accompanying drawings in which:

Figure 1 is a sectional side view through a plug according to the invention;

Figure 2 is a similar view of a plurality of plugs stacked in piggy-back fashion;

Figure 3 is a sectional side view of an integral pole - socket combination;

Figure 4 is a plan view of the plug with the cover removed;

Figure 5 is a bottom view of the cover;

Figure 6 is an exploded view of the cover;

and

Figure 7 is a front view of a safety rod.

In Figure 1 the plug of the invention is shown to comprise a hollow two part structure being a cover 10 and a shell 12. The plug includes poles 14 which are longer than conventional plug poles in order to accommodate an integral socket 16 in electrical communication therewith. The pole-socket combination (see Figure 3) comprises an electrically-conductive material and is made in one piece requiring no secondary electrical connection between the pole and socket.

The plug is constructed to allow the insertion of a second and subsequent plug into the first in piggy-back fashion as shown in Figure 2.

In Figure 3, the integral pole-socket combination 14, 16 is shown. Electrical contact is made at a point between the socket and pole by means of a conventional screw-in connector 18.

Turning to Figure 4, the layout of the plug is shown. Electrical wiring is fed in at 20 and the earth, live and neutral wires are connected to the earth 22, live 24 and neutral 26 poles by means of the screw in connectors 18. Central hole or cavity 28 is for the accommodation of a safety rod (Figure 7), the operation of which is described herebelow.

In Figures 5 and 6, the cover 30 and protective sliding plate 32 are shown. The protective plate is necessary to prevent insertion of fingers, conductive material and the like which could lead to accidents, injury or harm. The sliding plate has semi-circular formations 34 which shield the sockets of the plug when the plate is in its protective position to which it is biased by an integral tension spring. Upon insertion of the earth pin of a second plug, the protective plate slides backwards, uncovering the sockets for insertion of the plug poles.

The protective plate slides between the interior surface of the cover 30 and a triangular fastening plate 36 which is attached to the cover by means of pins at 38, 40 and 42. The plate has a rear slot 44 for accommodating rear pin 42 during sliding, as well as a central slot 46 for accommodating a safety rod (see below). Guides or tracks 48 are provided which define the shape of the protective plate and maintain it on course during sliding.

The plug of the invention includes a safely feature to prevent overloading of the circuits by stacking of too many plugs. The safety feature comprises a rod 50 which is slidable in the central vertical cavity in the body of the plug. The rod is a predetermined distance longer than the depth or height of the plug and protrudes 54 from the bottom thereof (see Figure 1).

When the plug of the invention is inserted into a mains socket, the protruding portion 54 of the rod engages the wall socket and is pushed upwards to protrude above the top of the plug. When a second plug is fitted into the first, the protruding rod forces a similar rod in the second plug upwards, causing an even greater protrusion 56 thereabove. Successive insertion of a third and fourth plugs result in increasing protrusions 58 and 60.

The safety rod 50 (Figure 7) includes a integral flange 62 having a pair of spaced apart vertical prongs 64. In the particular example illustrated in Figure 2, a stack of no more than four plugs is permitted and accordingly, once the fourth plug is in place, prongs 64 engage holes 66 in the sliding plate and prevent it sliding away, preventing insertion of a further plug.

CLAIMS

1.

An electrical plug assembly includes a first plug adapted to be inserted into a wall socket, the plug including one or more sockets electrically associated with the pins thereof for receiving a second plug, the second plug being similarly adapted to receive a third plug, the third plug and successive plugs being similarly adapted to receive subsequent plugs.

2.

An electrical plug according to claim 1 in which the sockets are integral with the pins.

3.

An electrical plug according to claim 1 and claim 2 in which the pole and socket are constructed in one piece.

4.

An electrical plug according to any of the above claims in which the sockets include slots to provide sufficient flexibility to ensure a tight and electrically conductive connection.

5.

An electrical plug according to any of the above claims in which the sockets are bowed.

6.

An electrical plug according to any of the above claims which includes a central cavity

extending vertically therethrough, the cavity being adapted to receive a safety rod slidable therein, the rod being longer than the depth of the plug.

7.

An electrical plug according to claim 6 in which the safety rod further includes an integral flange or the like stop formation to prevent it slipping out of the cavity, the flange including one or more vertical prongs.

8.

An electrical plug according to claims 6 and 7 in which prior to insertion into a plug point, the safety rod protrudes from the base of the plug, the rod upon insertion being urged upwards to protrude above the plug; the protrusion in turn engaging a similar rod in a second and further plugs in turn resulting in successively increasing protrusions until the extent of the protrusion prohibits further addition of plugs.

9.

An electrical plug according to any of the above claims in which one or more suitable shielding formations may be provided as in conventional sockets to prevent insertion of foreign objects.

10.

An electrical plug according to any of the above claims in which the shielding formation comprises a plate slidable from a first position in which the sockets of the plug are shielded and a second position in which access to the sockets is permitted, upon insertion of the earth pin of the second plug to overcome the bias of a tension spring or the like.

11.

An electrical plug according to claim 10 in which the spring is integrally moulded.

12.

An electrical plug according to claim 10 in which the plate element includes three formations, which may be semi-circular, elliptical or triangular, the formations being positioned to shield the sockets when the plate is in the first position described hereabove, the plate further being slidable between the cover of the plug and a fastening plate.

13.

An electrical plug according to claim 10 in which a system of guides and slots may be provided for the plate.

14.

An electrical plug according to claim 12 in which the fastening plate is substantially triangular in shape and orientated oppositely to the triangular positioning of the sockets, the fastening plate being affixed to the cover by means of pins at each apex thereof.

15.

An electrical plug according to claim 14 in which the cover includes on the interior surface thereof a pair of parallel guides extending from the live and neutral sockets towards the earth socket, the guides extending inwardly towards the earth socket and around the rear thereof.

16.

An electrical plug according to claim 14 in which the shape of at least the front section of the

plate is defined by the guides, the plate including a middle and a rear slot for accommodating the safety rod and the rear pin of the fastening plate respectively.

17.

An electrical plug according to claim 8 in which the prongs of the uppermost rod engage a pair of corresponding holes in the sliding plate.

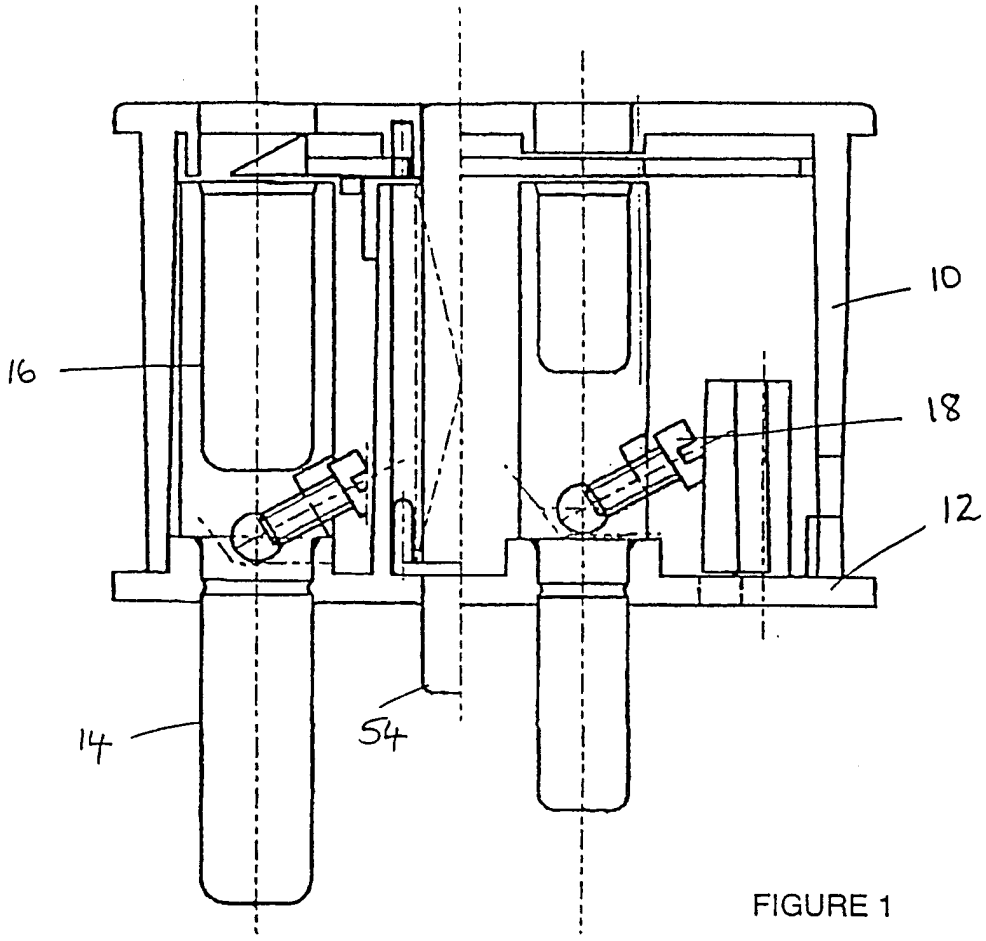


FIGURE 1

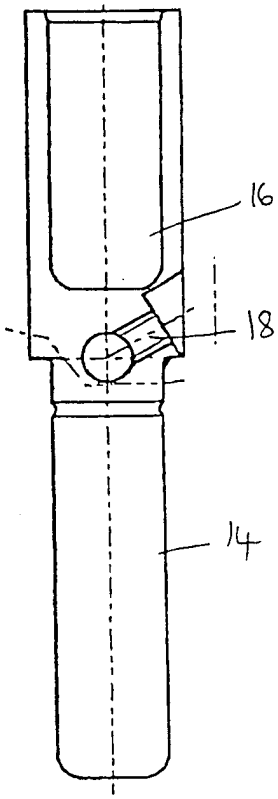


FIGURE 3

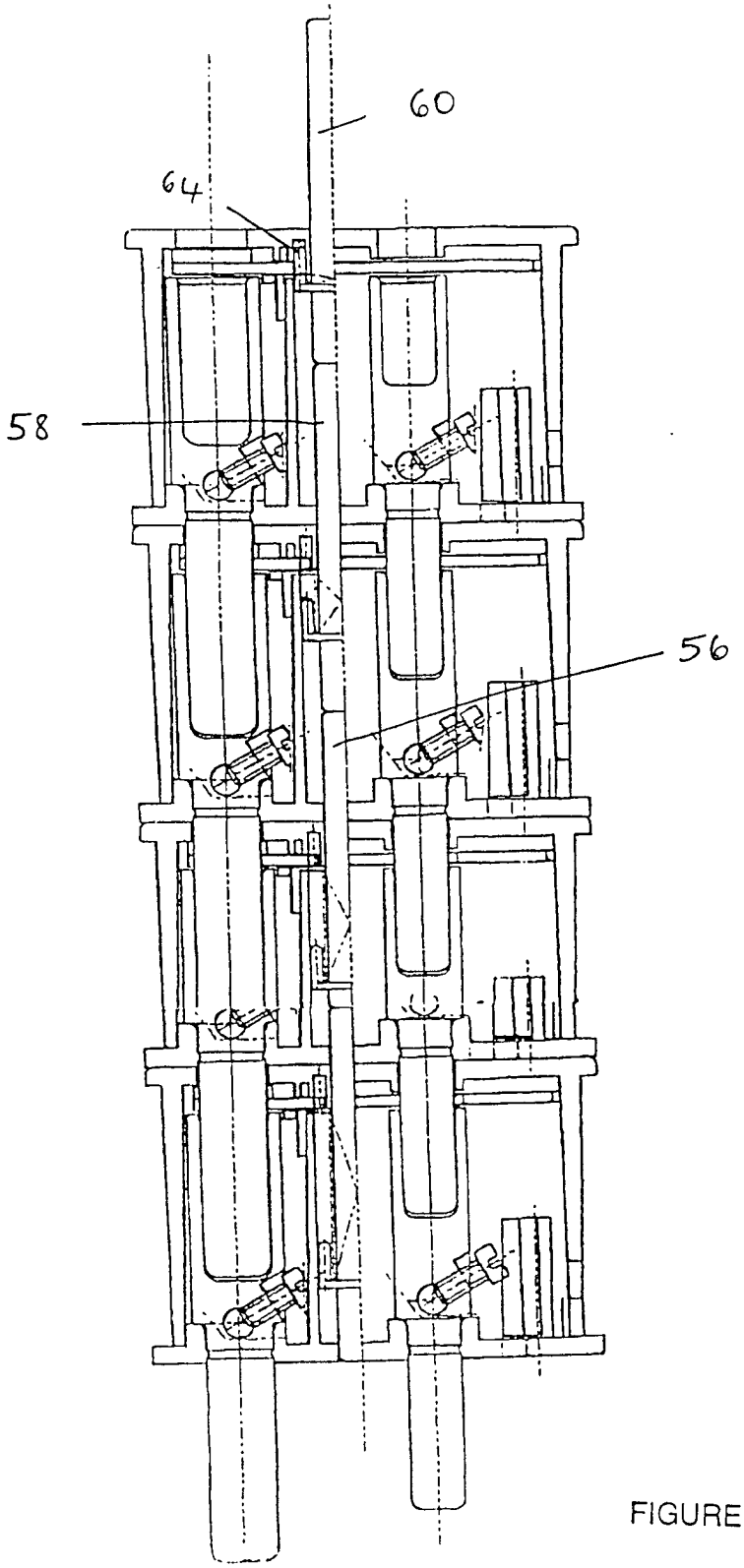


FIGURE 2

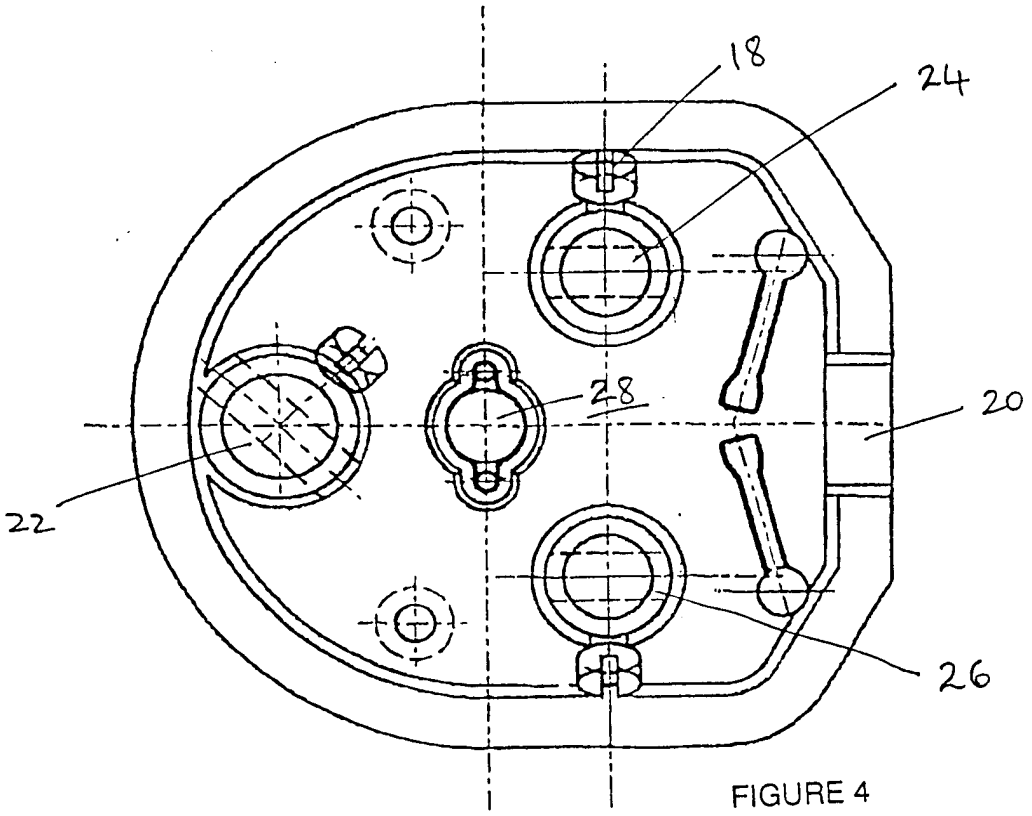


FIGURE 4

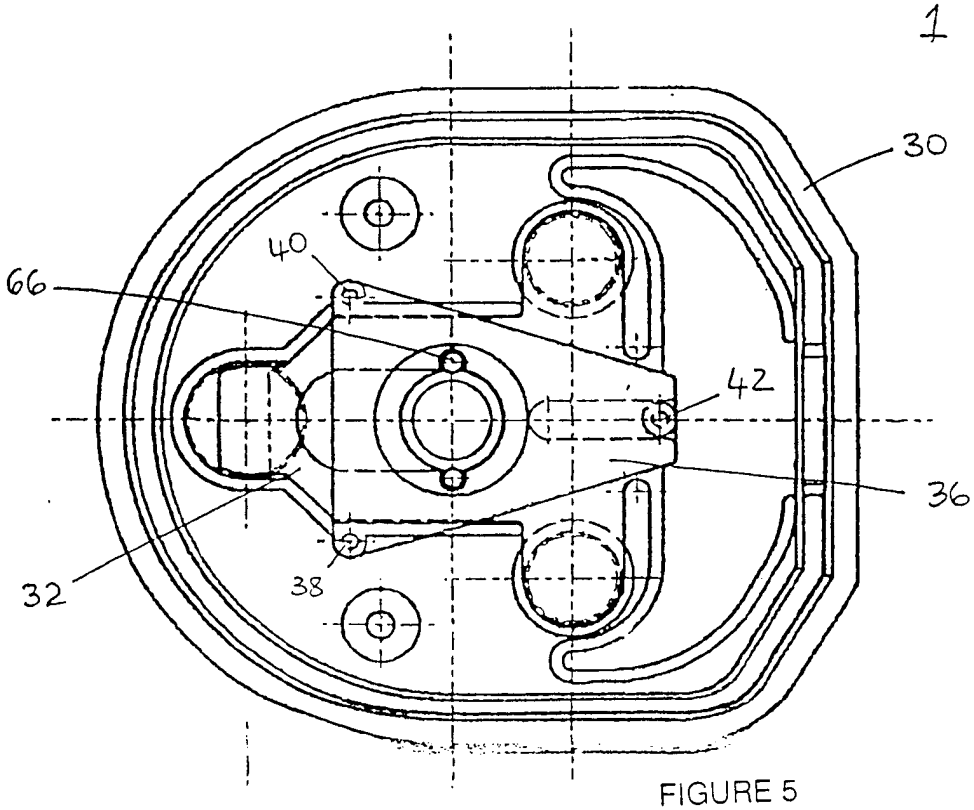


FIGURE 5

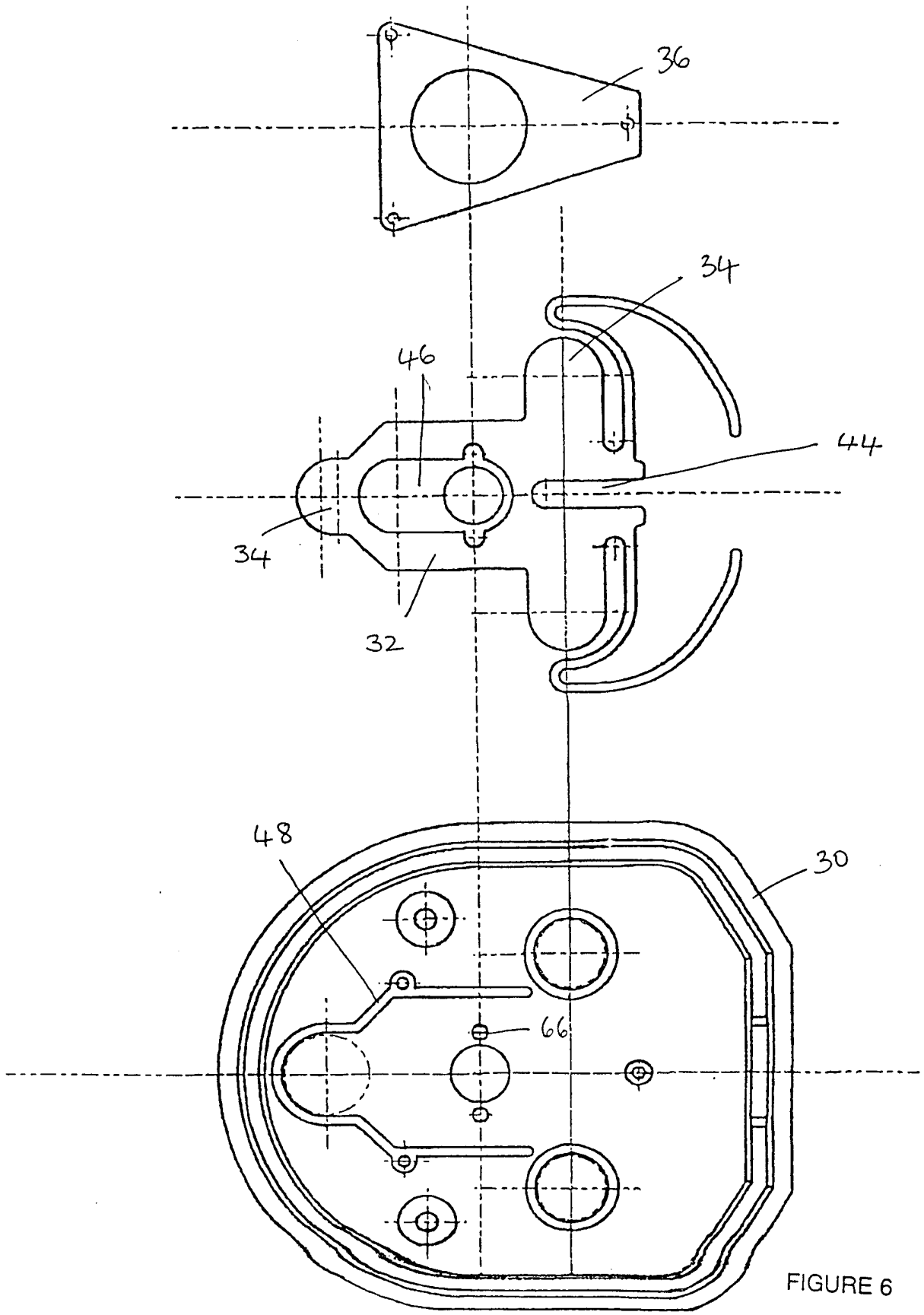


FIGURE 6

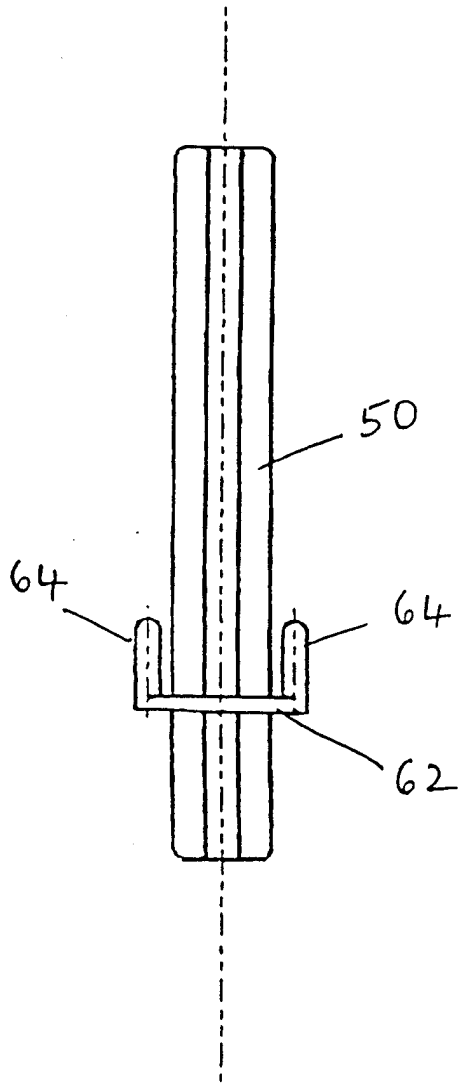


FIGURE 7