



Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11) **EP 1 071 169 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**24.01.2001 Bulletin 2001/04**

(51) Int Cl.7: **H01R 13/633**

(21) Application number: **99114329.8**

(22) Date of filing: **21.07.1999**

(84) Designated Contracting States:  
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU  
MC NL PT SE**  
Designated Extension States:  
**AL LT LV MK RO SI**

(72) Inventor: **Stekelenburg, Albert  
Taipei (TW)**

(74) Representative:  
**LOUIS, PÖHLAU, LOHRENTZ & SEGETH  
Merianstrasse 26  
90409 Nürnberg (DE)**

(71) Applicant: **All-Line Inc.  
Taipei (TW)**

(54) **Electrical plug device**

(57) A plug device comprises a base with internal compartments; at least two connecting pins, extending from the base and being connected to conductive components; an upper cover, having two openings at a circumferential edge thereof, and fitted with the base; connecting wires extending through the openings in the upper cover and being connected to the conductive components; a push ring, having two end parts wider than the rest part of the push ring; a pivot journal with larger end being integrally provided on each of two end parts and fitting with the openings on the upper cover respectively. By pulling the push ring upwards, two wider end parts press against an upper surface of the receptacle and thus loosens the connection between said pins and said receptacle.

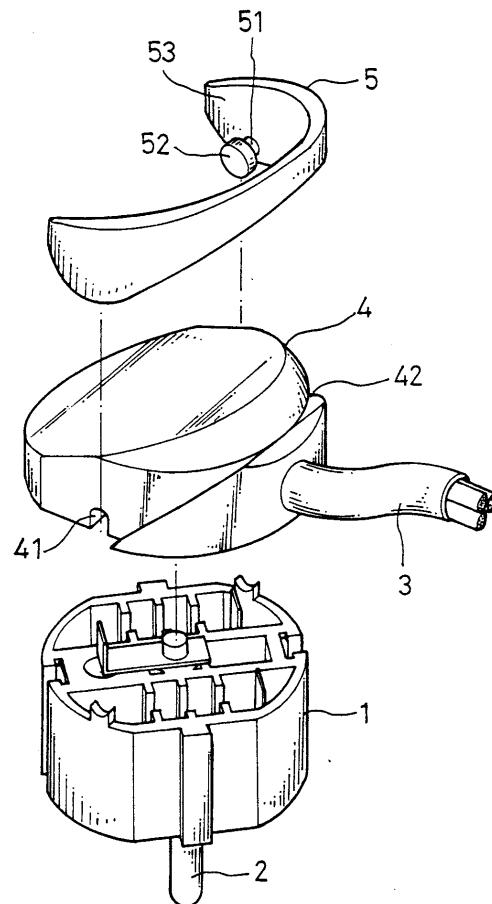


FIG. 1

EP 1 071 169 A1

**Description****BACKGROUND OF THE INVENTION**

## 1. Field of The Invention:

**[0001]** The present invention is related to a plug device, and particularly to a plug device, which is much easier for a plug to remove from a receptacle.

## 2. Description of Related Art:

**[0002]** For many years, the use of a plug has been an effective way of drawing current out of the main electrical power outlet. Since it is very easy and convenient to use, it has become an irreplaceable device for electrical appliances. The standardization of plugs makes it even more universal to the public.

**[0003]** There are two main types of plugs: the European three-pin plug and the normal two-pin plug. For the three-pin plug, there is a positive pin, a negative pin and a ground pin. When the plug is pushed onto the receptacle, the pins set into the holes. The pins are received in the receptacle holes. For safety reasons, no parts of the pins should be exposed outside the receptacle when the electric current is conducting. The same consideration exists for the normal two-pin plug when it is in use.

**[0004]** The main function of the plug is to draw current while the pins are inserted into a receptacle, and it can also be disconnected from drawing current as desired when it is removed from the receptacle. Therefore, from a stand point of view for designing a plug, it is necessary to consider not only the safety for the parts in the plug but also an easy attachment to and an easy removal from a receptacle.

**[0005]** As described above, when the pins of a prior art plug set into the receptacle holes, which are normally circular in shape, only a small portion on the upper cover of the plug is exposed outside the receptacle. Since the upper cover is usually small, it makes the removal of the plug from the receptacle a very tedious process. It is especially so, when the receptacle is at a corner of the wall or in situations where it is impossible to apply a direct force to remove the plug.

**SUMMARY OF THE INVENTION**

**[0006]** An object of the present invention is to provide a plug device, with which it is much easier for users to remove a plug from a receptacle.

**[0007]** Another object of the present invention is to provide a plug device, with which it is possible for plug pins being firmly attached to a receptacle easily.

**[0008]** A further object of the present invention is to provide a plug device, with which it is possible for user to apply a direct force while removing the plug device from a receptacle.

**BRIEF DESCRIPTION OF THE DRAWINGS**

**[0009]** The present invention can be more fully understood by an embodiment described hereinafter with reference to accompanying drawings, in which:

Fig. 1 is a disassembled perspective view of a preferred embodiment in the present invention;

Fig. 2 is an assembled perspective view of the preferred embodiment shown in Fig. 1;

Fig. 3 is a plan view of Fig. 2, illustrating the embodiment in a state of inserting into a receptacle;

Fig. 4 is plan view similar to Fig.3, illustrating the embodiment in a state of removing from the receptacle;

Fig. 5 is a plan view of another embodiment in the present invention, illustrating a normal two-pin plug being in a state of attaching the receptacle; and

Fig. 6 is a plan view similar to Fig. 5, illustrating a normal two-pin plug being removed from the receptacle.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

**[0010]** Referring to Figs. 1-4, the basic components of the present inventions comprise of the following: a receptacle, a base 1 for the plug, two or more pins 2, some connecting wires 3, an upper cover 4 and a push ring 5.

**[0011]** The base 1 is made of an insulating material. The inner part of the base is divided into small compartments so that the conductive plates can be received therein. This part is the prior art and it will not be further discussed here.

**[0012]** The pins 2, which are also prior art, are made of conducting materials. They extend out from the base 1 and are connected to the conducting plates by wire. When the plug is inserted into the receptacle, it is connected to the main circuit.

**[0013]** The connecting wires 3, which are also prior art, are fitted through the hole provided in the upper cover 4 and connected to electrical appliances. Since the other end of the wires is connected to the conductive plates in the main base 1 of the plug, therefore the electrical appliances can receive the electricity from the main circuit via the pins 2.

**[0014]** When assembling the upper cover 4, it is fitted onto the base 1. Therefore it is designed to have the same size and shape as base 1. The hole on one side of the upper cover 4 is for connecting the wires.

**[0015]** In the present invention, only one part of the plug is different from a conventional one. The difference is the upper cover 4. An opening 41 is provided on each of the two lateral sides of the upper cover 4. As illustrated in the figures, this opening 41 can be a recess at the bottom end of the cover 4. When the cover 4 is fitted to the base 1, the opening 41 becomes a hole. The main

purpose of this opening 41 is to be fit by the push ring 5. In order to keep a harmonized outer appearance after fitting the push ring 5, a cutout part 42 is formed to accommodate the push ring 5. The upper cover 4 is also made of insulated materials.

**[0016]** The push ring 5 is a curved shape ring and has a size and a shape corresponding to the upper cover 4, especially for fitting the cutout part 42. A pivot journal 51 is provided at both end parts 53 of the push ring 5 respectively on the inner surfaces thereof to correspond the openings 41. The pivot journals 51 each have a size accommodating to the opening 41 such that the push ring 5 is able to rotatably engage with the openings 41. In order to provide a more stable connection, an outer end 52 of respective pivot journal 51 has a larger diameter than the rest part thereof. This will prevent the pivot journals 51 from slipping out of the opening 41 during rotation. As illustrated in the figures again, it can be observed that the respective end part 53 is wider than the rest part of the push ring 5 and each of the pivot journals 51 is located near the bottom of each of the end parts. That is, the distance between the respective pivot journal 51 and the top surface of the respective end part 53 is greater than the perpendicular distance between the respective pivot journal 51 and the bottom surface of the rest part on the push ring 5.

**[0017]** Please referring to Fig. 2 again, the assembled perspective view of the plug device according the present invention illustrates the push ring 5 can be rotated in a range of certain angle with respect to the upper cover 4.

**[0018]** Please referring to Fig. 3, when the plug device is pushed into a receptacle, the base 1 with the pins 2 are received in the hole. This means that the both the base 1 and the pins 2 are fully inserted under a top surface A of the receptacle. In other words, the only parts that are exposing above the top surface A are the upper cover 4, the connecting wires 3 and the push ring 5. At this time, the lower edge of the respective pivot journal 51 is flushed with the lower end of the upper cover 4 and lies above the top surface A of the receptacle.

**[0019]** Please referring to Fig. 4, when attempting to remove the plug device, the push ring 5 is pulled upwards and the ring 5 rotates with respect to a pivotal axis of the respective pivot journal 51. Since the end parts 53 is wider, the lower surface of the end parts 53 press against the surface A such that a counter force is induced to loosen the plug device from the receptacle to a certain extent. This allows the plug device to be removed from the receptacle very easily.

**[0020]** As shown in Fig. 5, a second embodiment of the plug device in the present invention is illustrated. It can be seen in Fig. 5 that the plug device is applied to a popularly used two-pin plug and receptacle. It has the same principle as the three-pin plug device shown in Figs. 3 and 4. Since the two pins are the only parts that has to be embedded in the receptacle. Therefore, a push ring 6 is attached directly to the base above the

pins. In this way, the same effect can be achieved.

**[0021]** Therefore, with the implementation of the present invention, the difficulties encountered during removal of a prior art plug can be avoided substantially. Furthermore, the plug device of the present invention is designed to fix receptacle holes tightly and thus increase a transmission efficiency of electricity. In addition, the push ring in the plug device of the present invention is moved in the same direction as the plug device removal. Thus the force to remove the plug device can be applied more directly and more efficiently.

**[0022]** While the invention has been described with reference to preferred embodiments thereof, it is to be understood that modification or variations may be easily made without departing from the spirit of this invention, which is defined by the appended claims.

### Claims

1. A plug device for fitting with a receptacle, comprising:

a base (1), being made of an insulated material and being then internally separated into compartments for holding conductive components; at least two connecting pins (2), being made of a conductive material, extending from said base (1) and being connected to said conductive components;

an upper cover (4), being made of an insulated material, having two openings (41) at a circumferential edge thereof, and fitting with said base;

connecting wires (3), an end of said wires extending through said two openings (41) in the upper cover (4) and being connected to said conductive components;

a push ring (5), being a curved shape in correspondence to said upper cover (4), having two end parts (53) wider than the rest part of said push ring (5), a pivot journal (51) with larger end being integrally provided on each of said two end parts (53) at an inner wall and near a bottom surface thereof, said pivot journal (51) fitting with said two openings (41) on said upper cover (4) respectively;

whereby, by pulling said push ring (5) upwards, said two wider end parts (53) press against an upper surface of the receptacle and thus loosens the connection between said pins (2) and said receptacle.

2. An plug device for fitting with a receptacle according to claim 1, wherein said openings (41) on said upper cover forms a hole when said cover (4) is fitted with the base (1).

3. A plug device for fitting with a receptacle according to claim 1, wherein said upper cover (4) has a cutoff part for said push ring (5) to fit in.
4. A plug device for fitting with a receptacle according to claim 1, wherein the outer end (52) of said pivot journal (51) has a larger diameter than the rest part of said pivot journal (51) itself and thus avoid slippage of said push ring (5) during rotation.
5. A plug device for fitting with a receptacle according to claim 1, wherein said plug device is an Europe type plug.
6. A plug for fitting with a receptacle according to claim 1, wherein said pins (2) at least comprise a negative pin and a positive pin.
7. A plug device for fitting with a receptacle according to claim 1, wherein a ground pin can be added.
8. A plug device for fitting with a receptacle according to claim 1, wherein the push ring (6) is built on said base near the pins for a two-pin plug.

25

30

35

40

45

50

55

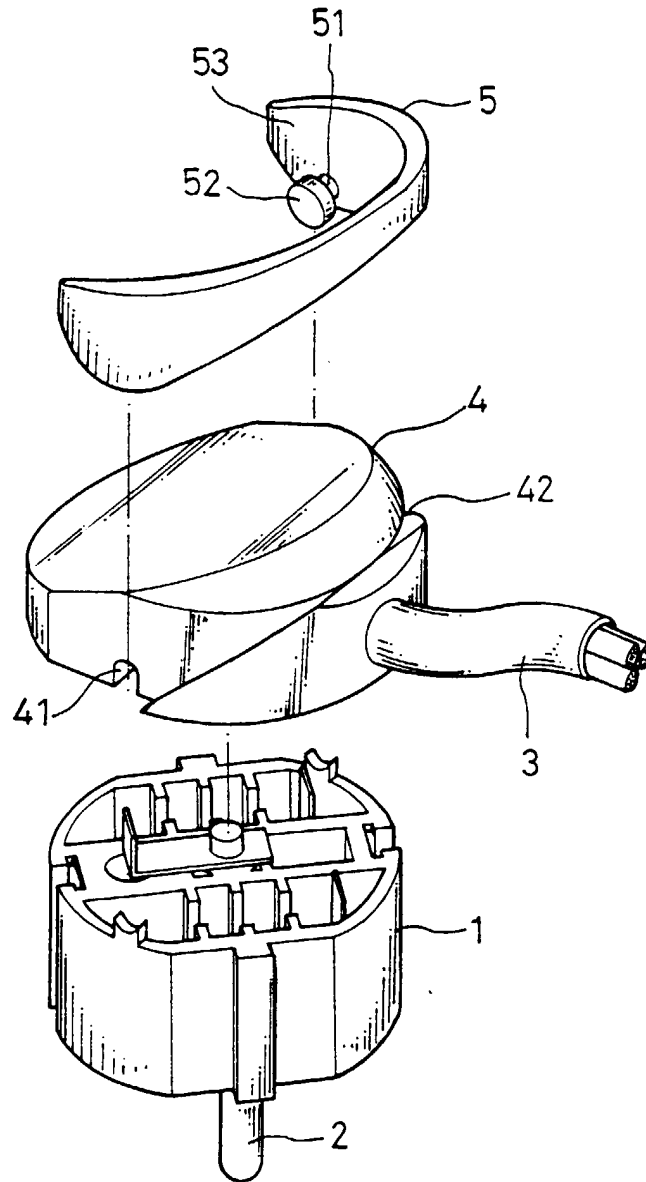


FIG. 1

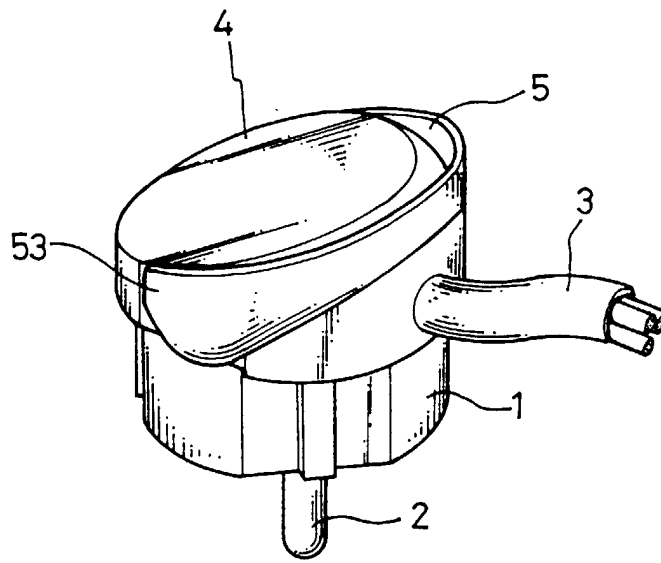


FIG. 2

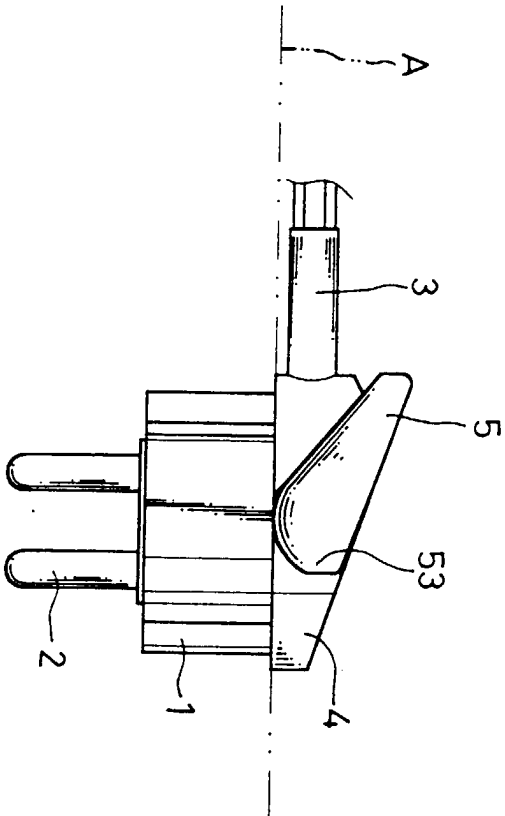


FIG. 3

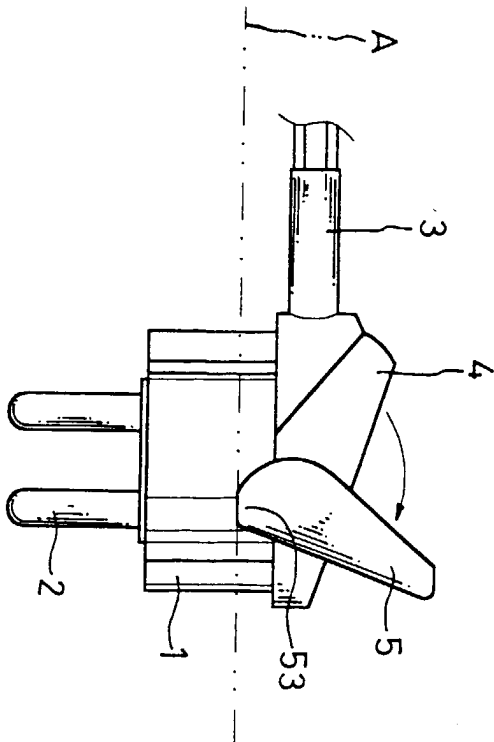


FIG. 4

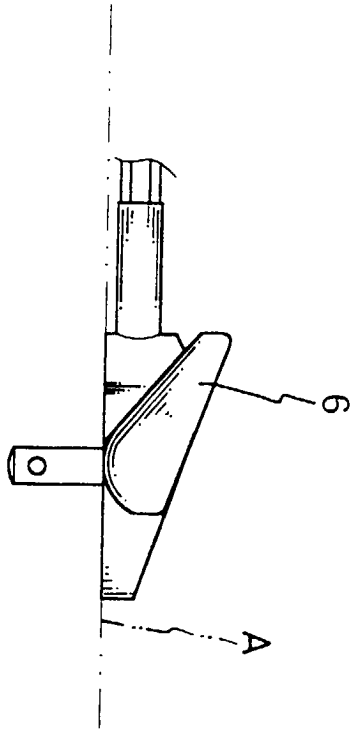


FIG. 5

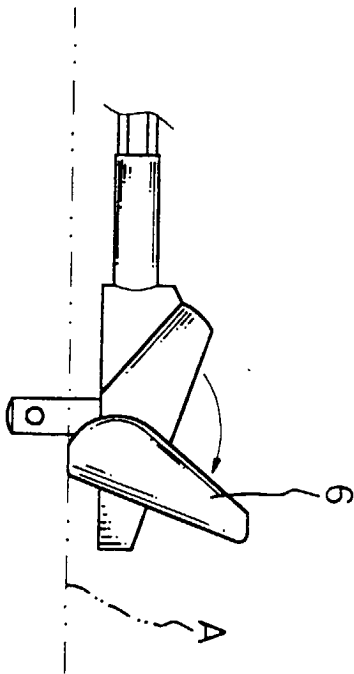


FIG. 6



European Patent  
Office

EUROPEAN SEARCH REPORT

Application Number  
EP 99 11 4329

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 5 679 014 A (LAN-JEN TSANG) 21 October 1997 (1997-10-21)	1-4,8	H01R13/633
Y	* column 1, line 66 - column 3, line 7 * ---	5-7	
Y	WO 96 23333 A (PAIGE INNOVATIONS INC) 1 August 1996 (1996-08-01) * page 3, line 25 - page 6, line 25 * ---	5-7	
X	US 5 915 997 A (LAN-JEN TSANG) 29 June 1999 (1999-06-29) * column 3, line 20 - line 25 * -----	1-4,8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			H01R
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		2 December 1999	Demo1, S
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P4/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 11 4329

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

02-12-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5679014 A	21-10-1997	NONE	
WO 9623333 A	01-08-1996	NONE	
US 5915997 A	29-06-1999	AU 695884 A CA 2214860 A DE 29721271 U FR 2772194 A	27-08-1998 08-03-1999 12-02-1998 11-06-1999

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82