(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 000 787**
B1

(12) # EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: **08.07.81**

(51) Int. Cl.³: **H 01 R 13/635**

(21) Application number: **78100640.8**

(22) Date of filing: **09.08.78**

(54) **Electrical connector provided with an ejector for disengaging the connector.**

(30) Priority: **10.08.77 US 823305**

(43) Date of publication of application:
21.02.79 Bulletin 79/4

(45) Publication of the grant of the European patent:
08.07.81 Bulletin 81/27

(84) Designated Contracting States:
BE CH DE FR GB NL SE

(56) References cited:
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US - A - 1 900 782
US - A - 2 142 284
US - A - 2 448 086
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EP 0 000 787 B1

Courier Press, Leamington Spa, England.

Electrical connector provided with an ejector for disengaging the connector.

BACKGROUND OF THE INVENTION

This invention relates to an electrical connector. More particularly, it relates to a connector for attaching an electrical cord to an electrical appliance, which connector includes an ejector by which it and the cord may be detached from the appliance.

Electrical appliances having detachable cords as well known. One advantage of such an appliance is that once the appliance is electrically activated, the cord can be detached therefrom and the appliance can be moved about freely and used without being restricted by the cord. However, certain appliances, particularly those having an outer cover made of metal, may become hot when electrically activated. To remove the cord from such an appliance is difficult without touching it. Also, when using certain electrical appliances, such as a heated hair drying cap, the user may not have one hand free to hold the cap while disconnecting the cord therefrom with another free hand.

Thus, it is desirable to equip an electrical cord with an electrical connector that can be detached from an appliance without touching the appliance and with one hand. The connector of the present invention solves these problems because it can be operated with one hand by application of finger pressure on the ejector of the connector.

Ejectors for use with electrical connectors are known. For instance, U.S. Pats. Nos. 1,900,782; 2,051,425; 2,134,345; 2,142,184; 2,703,869; and 3,440,405 as well as French Patent No. 2,084,656 disclose electrical connectors having ejectors which operate on a cam principle. U.S. Pats. Nos. 1,531,604; 2,259,799; 2,445,608; and 3,737,623 disclose bar or plunger operated ejectors. U.S. Pat. No. 2,955,273 discloses a spring operated ejector for an electrical connector. Other state of the art patents known to the applicants herein are U.S. Pats. Nos. 2,926,230; 3,417,214; 3,573,695; and 3,587,021.

In an electrical connector of the type shown in U.S. Pat. No. 2,142,184, an ejector is provided for disengaging the connector and an electrical cord attached thereto from an electrical appliance. The ejector includes first and second components. The first component is movable through and out of the connector to bear against the appliance when the connector engages the appliance and the second component is movable by the application of pressure thereon to cause movement of the first component against the appliance, whereof the connector is moved in an opposite direction and disengaged from the appliance.

SUMMARY OF THE INVENTION

According to the invention the first and second components are integral parts of a strip-like member, wherein the second component has the shape of a hinge extending out of the plane of the first component when the contacts engage the terminals, and being flat with the first component when pressure is applied thereto to disengage the contacts from the terminals.

The invention allows for a particularly easy handling of the ejector. While the connector is moved to engage the terminals the first component is pushed back causing the second component to extend out of the plane of the first component, whereas in disengaging the terminals finger-pressure is applied to the upstanding portion of the second component to push the first component forward. Furthermore, the ejector is cheap to manufacture, has a simple structure, needs no additional space, may be used for small and particularly flat connectors and lends itself to mass production.

BRIEF DESCRIPTION OF THE DRAWINGS

The electrical connectors of this invention are described in detail below and should be studied in conjunction with the drawings of this application, which are as follows:

Fig. 1 is a perspective view of an electrical connector of this invention having one end attached to a hair drying cap and the other end attached to an electrical cord.

Fig. 2 is an enlarged, plan view of the structures of Fig. 1 showing the electrical components thereof in dotted line.

Fig. 3 is a side view of the electrical connector of Fig. 1 showing particularly the ejector of the connector.

Fig. 4 is a side view of the electrical connector of Fig. 1 showing the ejector thereof after it has been operated to disengage the connector from the cap.

DETAILED DESCRIPTION OF THE INVENTION

An electrical connector of this invention is shown in Fig. 1, wherein it is indicated at 10. As described below, one end of the connector is removably attachable to an appliance, such as the hair drying cap generally indicated at 11 in Fig. 1, and the other end of the connector is fixedly attached to an electrical cord 12. The cord has at its other end a conventional plug 13 for connecting the appliance to a power source.

Referring to Fig. 2, the structures of cap 11 relevant to this invention include a plate 14 affixed to the outside of the cap, a heating element (not shown) within the cap, and electrical terminals 15 extending out of the cap through plate 14 and in electrical contact with the heating element. The structures of cord 12 relevant to this invention include wires 16 extending into connector 10. At the free end of each of the wires is a contact 17. The structure

of the contacts is not critical to this invention. Generally the contacts will have a structure corresponding to that of terminals 15, so that current may be delivered from the power source through plug 13, cord 12, contacts 17, and terminals 15 into the heating element of cap 11.

The structure of connector 10 is best shown in Fig. 3. The connector includes a base 18 and several openings. A first opening 19 is provided for receiving wires 16 of cord 12, as described above. A pair of openings (not shown) are provided in which contacts 17, which are attached to wires 16, are received. Finally, the irregular shaped opening 20, shown best in Fig. 3, is provided in which an ejector 21 is received. Opening 20 extends horizontally through base 18 from the end of connector 10 adjacent plate 14 into generally the center of the connector, where it widens and extends vertically upward to the top surface of the connector. The reason for the irregular shape of opening 20 will be apparent from the discussion below concerning ejector 21.

Referring again to Fig. 3, ejector 21 is made of, preferably, a flexible plastic and has essentially two portions. The first portion is flat and extends between the outermost end of the connector adjacent plate 14 and the upwardly extending section of opening 20. The second portion of ejector 21 has the shape of a "hinge" or is triangular in shape and extends out of the upwardly extending section of opening 20 of connector 10 when the connector is attached to cap 11.

When the ejector is in the position shown in Fig. 3, contacts 17 engage terminals 15, as shown in Fig. 2, and current may be delivered through the connector to heat the cap. To disengage the connector from the cap and prevent current flow thereto, finger pressure is applied to the hinge shaped portion of ejector 21, so that the ejector assumes the position shown in Fig. 4. As indicated by the arrow in Fig. 4, such a pressure application causes the first portion of ejector 21 to push against plate 14, thereby causing an oppositely directed movement of the connector and disengagement of terminals 15 from contacts 17. To facilitate "flattening" of ejector 21, flex points are provided in the ejector by slots 22. Further, once finger pressure is removed from the ejector, the hinge shaped portion of the ejector, which was flattened, resumes its initial shape shown in Fig. 3 and the ejector may again be operated.

Thus, with one hand, ejector 21 can be operated to detach connector 10 from cap 11 without the operator having to touch the cap.

Claims

1. An electrical connector (10) provided with an ejector (21) for disengaging the connector from an electrical appliance (11), said ejector (21) comprising first and second components, the first component being movable through and out of the connector to bear against the appliance when the contacts (17) of the connector engage the terminals (15) of the appliance and the second component being movable by the application of pressure thereon to cause movement of the first component against the appliance, whereby upon such a pressure application the connector is moved in a direction substantially opposite to the direction of movement of the first component, the contacts (17) are disengaged from the terminals (15), and the connector is disengaged from the appliance, characterized in that the first and second components are integral parts of a strip-like member, wherein the second component has the shape of a hinge extending out of the plane of the first component when the contacts engage the terminals, and being flat with the first component when pressure is applied thereto to disengage the contacts from the terminals.

2. The electrical connector of claim 1, characterized in that the second component has flex points (22), to facilitate change of its shape from being out of the plane of the first component to being flat with the first component.

Revendications

1. Connecteur électrique (10) muni d'un éjecteur (21) pour le dégager d'un appareil électrique (11), l'éjecteur (21) comprenant un premier et un deuxième composants, le premier composant pouvant passer à travers le connecteur et en sortir pour s'appuyer contre l'appareil quand les contacts (17) du connecteur s'appliquent aux bornes (15) de l'appareil, tandis que le deuxième composant peut être déplacé en y appliquant une pression pour entraîner le mouvement du premier composant contre l'appareil, de sorte que, lors d'une telle application de pression, le connecteur se déplace dans un sens pratiquement opposé au sens de mouvement du premier composant, les contacts (17) se dégagent des bornes (15) et le connecteur se dégage de l'appareil, caractérisé en ce que le premier et le deuxième composants font partie intégrante d'un élément en forme de bande, le deuxième composant ayant la forme d'une charnière située hors du plan du premier composant quand les contacts s'appliquent aux bornes et étant dans le même plan que le premier composant quand on y applique une pression pour dégager le contact des bornes.

2. Connecteur électrique selon la revendication 1, caractérisé en ce que le deuxième composant présente des points de flexion (22) pour faciliter son changement de configuration, depuis une forme où il est hors du plan du premier composant à une forme où il est dans le même plan que le premier composant.

Patentansprüche

1. Elektrischer Steckverbinder mit Lösevorrichtung zum Trennen des Steckverbinders vom Anschluß eines elektrischen Geräts, wobei die Lösevorrichtung aus zwei Komponenten besteht, von denen die erste innerhalb des Steckverbinders bewegbar und bei eingestecktem Steckverbinder an das Gerät andrückbar ist und von denen die zweite Komponente durch Druckanwendung bewegbar ist und die Bewegung der ersten Komponente gegen das Gerät verursacht, so daß bei dieser Druckanwendung der Steckverbinder entgegengesetzt zur Bewegungsrichtung der ersten Komponente bewegbar ist und die Kontakte von den Gegenkontakten des Gerätes gelöst werden, dadurch gekennzeichnet, daß die erste und zweite Komponente gemeinsame Bestandteile eines streifenförmigen Bauteils (21) sind und die zweite Komponente in Form eines Scharniers ausgebildet ist, das sich bei eingestecktem Steckverbinder (10) außerhalb dere Ebene der ersten Komponente erstreckt und bei Druckanwendung zum Trennen der Kontakte (17) von den Gegenkontakten (15) flach ist.

2. Elecktrischer Steckverbinder nach Anspruch 1, dadurch gekennzeichnet, daß die zweite Komponente Biegestellen (22) aufweist, mit denen die Formänderung aus der Lage außerhalb der Ebene der ersten Komponente in die zur ersten Komponente flache Lage erleichtert ist.

FIG. 1

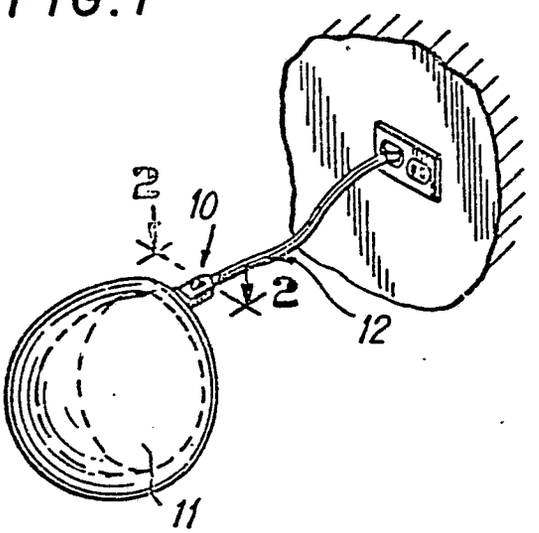

FIG. 2

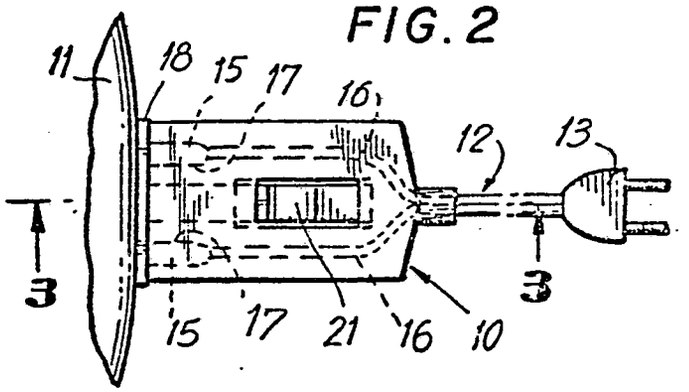

FIG. 3

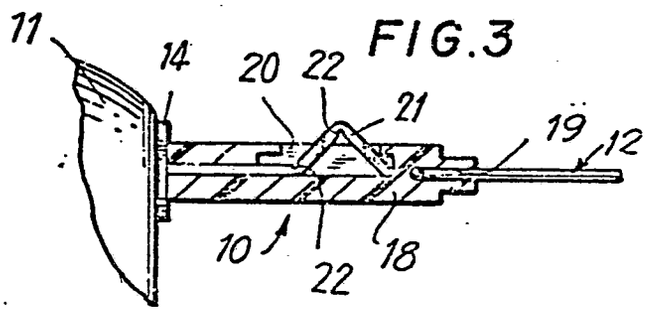

FIG. 4