United States Patent

Coon

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[54] QUICK RELEASE FEMALE PLUG

[72] Inventor: **James A. Coon**, 929 Drever St., W. Sacramento, Calif. 95691

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[52] **U.S. Cl.** ..... **339/75 P**
[51] **Int. Cl.** **H01r 13/20**
[58] **Field of Search** 339/74, 75–79, 339/82

[56] **References Cited**

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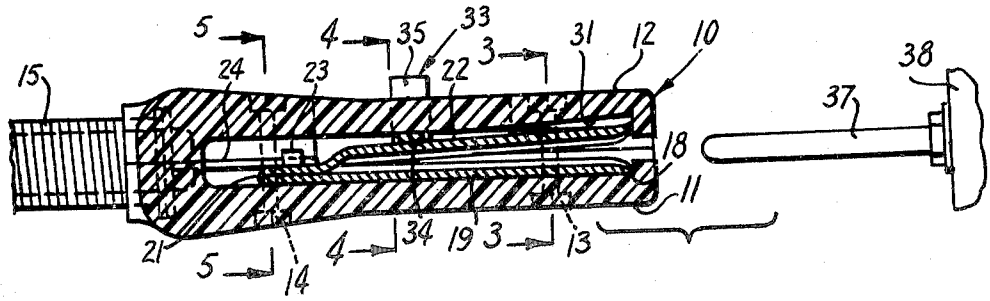
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Primary Examiner—Joseph H. McGlynn
Attorney—Alexander B. Blair

[57] **ABSTRACT**

A quick release female plug in which the socket portions of the female plug are resilient and are forced into engagement with the male prongs by means of a hand-actuated sliding cam bar engaged therewith.

4 Claims, 6 Drawing Figures



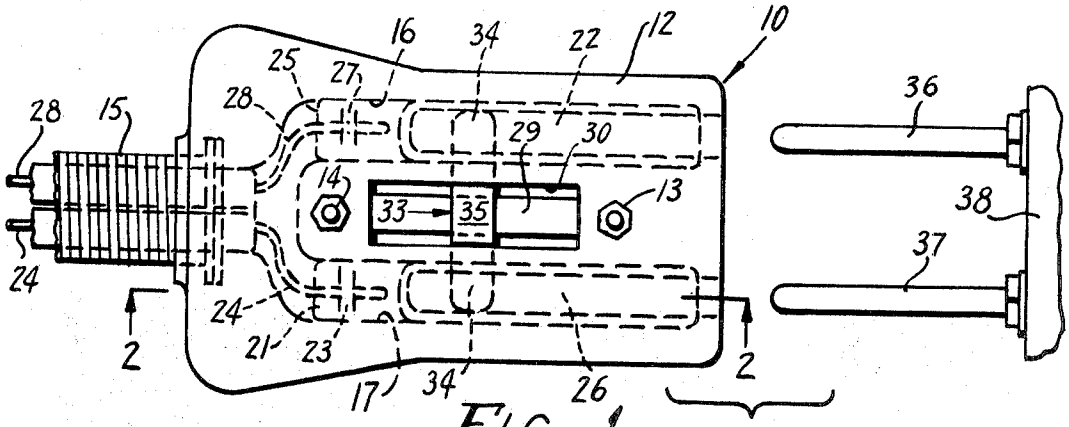


FIG. 1

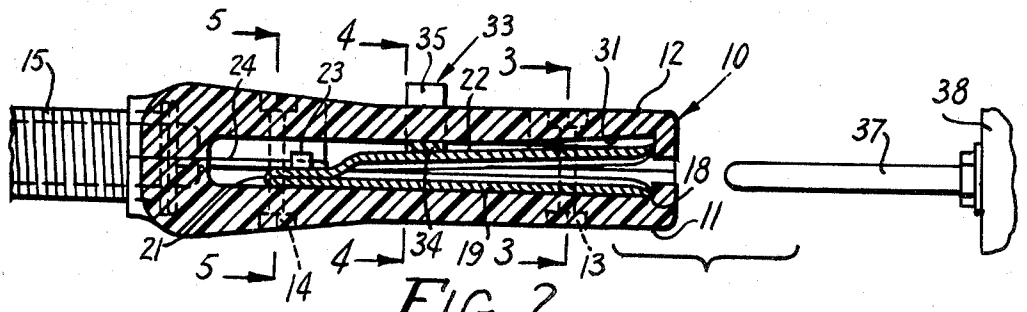


FIG. 2

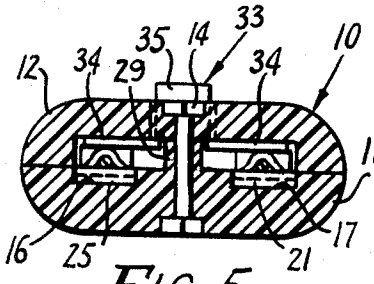


FIG. 5

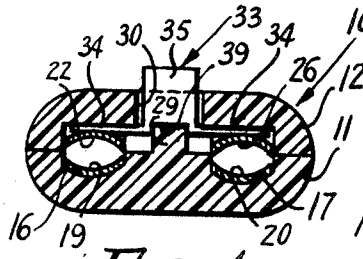


FIG. 4

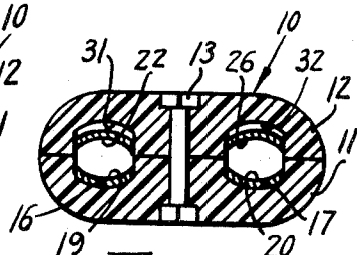


FIG. 3

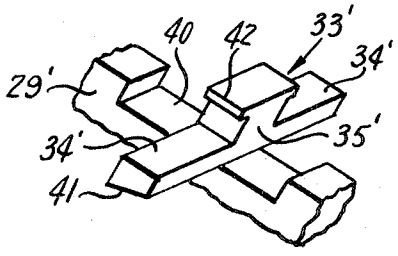


FIG. 6

INVENTOR.
JAMES A. COON
BY
Alexander B. Blair
ATTORNEY.

QUICK RELEASE FEMALE PLUG

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to female electric plugs of the type which are used to connect with the male electric prongs on appliances such as toasters, coffeepots, electric irons, and other appliances utilizing resistance heating in the appliance.

2. Description of the Prior Art

Present-day female plugs are normally pushed onto the male prongs protruding from the electric appliance. The tightness of the socket members in the female plug make it quite difficult to push on and pull off the female plug from the male prongs. Normally back and forth side twisting motions are used in order to remove the female plug and this in time invariably causes damage to the male prongs particularly in their connection to the appliance. Often times outright breakage of the portion of the appliance supporting the male prongs occurs.

SUMMARY OF THE INVENTION

A female electric plug is provided with a sliding cam bar for pressing the socket portions of the female plug into tight engagements with the male prongs of an electric appliance. The sliding cam plug is hand actuated and can be moved to permit the disengagement of the socket portions from the male prong prior to sliding the female plug off of the male prongs.

The primary object of the invention is to provide a female electric plug which is inexpensive to manufacture and which can be readily engaged and disengaged from the male prongs of an electric appliance.

Other objects and advantages will become apparent in the following specification when considered in light of the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of the invention illustrated in a position disengaged from the male prongs;

FIG. 2 is a longitudinal sectional view taken along the line 2—2 of FIG. 1 looking in the direction of the arrows;

FIG. 3 is a transverse section taken along the line 3—3 of FIG. 2 looking in the direction of the arrows;

FIG. 4 is a transverse section taken along the line 4—4 of FIG. 2 looking in the direction of the arrows;

FIG. 5 is a transverse sectional view taken along the line 5—5 of FIG. 2 looking in the direction of the arrows; and

FIG. 6 is a fragmentary perspective view of a modified form of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in detail wherein like reference characters indicate like parts throughout the several figures the reference numeral 10 indicates generally a quick release female electric plug constructed in accordance with the invention.

The plug 10 consists of a lower rigid insulating body 11, an upper rigid insulating body 12, a pair of bolts 13, 14 securing the body 11 to the body 12 and an electric wiring harness 15 to provide electricity to the plug 10. The body 11 has a pair of spaced-apart parallel channels 16, 17 formed therein and extending from a point 18 spaced inwardly from the end of the body 11 opposite the wiring harness 15 to a point adjacent the opposite end of the plug.

An elongate arcuate contact 19 is seated in the channel 16 and a second elongate arcuate contact 20 is seated in the channel 17. The contact 19 is reverted at 21 and has integrally secured thereto an arcuate contact member 22 which is arranged in diverging opposed relation to the contact member 19. A wire terminal 23 is formed on the reverted portion 21 of the contact 19 and a wire 24 extending from the wiring harness 15 is connected thereto.

The contact 20 is reverted at 25 identically to the contact 19 and has an arcuate contact 26 integrally secured thereto and extending in diverging opposing relation to the contact 20. An electric terminal 27 is formed on the reverted portion 25 to receive an electric wire 28 extending from the wiring harness 15.

An elongate generally rectangular partition 29 is integrally formed on the lower body 11 on the upper face thereof intermediate the channels 16, 17 and parallel thereto. The partition 29 extends substantially above the lower body 11 and underlies a generally rectangular opening 30 formed in the upper body 12.

The upper body 12 has a pair of channels 31, 32 extending longitudinally thereof and overlying the channels 16, 17. The channels 31, 32 diverge from the channels 16, 17 toward the end 18 of the channel 16. The channels 31, 32 are slightly wider than the contact members 22, 26 so that these members may move freely therein toward and away from the contact members 19, 20.

A cam slider indicated generally at 33 consists of a bar 34 which extends horizontally to contact both the contact member 22 and the contact member 26 on one side and the body 12 on the other side. A button 35 extends upwardly through the opening 30 above the body 12 for engagement by the fingers of the user to move the cam block 33 longitudinally of the opening 30. Movement of the cam block 33 in the opening 30 toward the open end of the female plug 10 causes the contact members 22, 26 to be forced toward the contact members 19, 20 to tightly grip the male prongs 36, 37 which extend from an appliance shown fragmentarily at 38. The cam block 33 has a recess 39 formed in the lower face thereof overlying the partition 29 and into which the partition 29 extends to form a guide for the cam block 33 in its movement within the opening 30.

In the use and operation of the invention illustrated in FIGS. 1 through 5 the cam block 33 is moved as far away from the open end of the plug 10 as the opening 30 will permit and the plug 10 is moved onto the prongs 36, 37 in the conventional manner. Following the insertion of the prongs 36, 37 into the plug 10 the cam block 33 is moved as far as possible toward the open end of the plug 10 compressing the contact members 22, 26 into engagement with the prongs 36, 37 to form a tight mechanical and electrical contact therebetween. The reverse procedure is followed in removing the plug 10 from the prongs 36, 37 in that the cam block 33 is first moved in the opening 32 releasing the pressure of the contact members 22, 26 on the prongs 36, 37 whereupon the plug 10 is easily and quickly removed from the prongs 36, 37.

In FIG. 6 a modified form of the invention is illustrated wherein the partition 29' has a rectangular recess 40 formed in the upper face thereof and the cam block 33 has a bar 34' which extends straight across the recess 40 and has a sloping cam face 41 formed on the underside thereof for engagement with the contact members 22, 26 (not shown in this view). A button 35' extends upwardly from the bar 34' and has a generally rectangular cap 42 formed on its upper end. With the exception of the structural differences illustrated in FIG. 6 the plug that it is used with is otherwise identical to the structure illustrated in FIGS. 1 through 5.

The metal contact members 19, 20, 22, 26 are in prior art devices formed of relatively heavy brass or bronze in order to remain stiff enough to make good contact with the male prongs 36, 37. In the present invention, these contact members can be made of much lighter material since they are not dependent upon the strength of their own material for the contact with the prongs.

Having thus described the preferred embodiments of the invention, it should be understood that numerous structural modifications and adaptations may be resorted to without departing from the spirit of the invention.

What is claimed is:

1. A quick release female plug comprising a pair of detachably connected body members, a pair of contact mem-

bers mounted in one of said body members, a second pair of contact members individually integrally secured to said first pair of contact members in divergent opposed relation with said second pair of contact members extending upwardly into the other of said body members, hand-slidable means mounted in the other of said body members for contacting said second pair of contact members for camming said second pair of contact members toward said first pair of contact members, and a generally rectangular partition formed on said one body and extending longitudinally thereof projecting upwardly into said other body, said hand-actuated means provided with a recess engaging over said partition to provide a guide for said hand actuated means.

2. The plug of claim 1, wherein said pairs of contact members have completely smooth surfaces with no projections or teeth extending therefrom.

3. The structure of claim 1 wherein said hand-slidable means includes a bar perpendicular to and in contact with said second pair of contact members on its lower side and in contact with said body on its upper side and having a sloping cam surface on its lower side.

4. The plug of claim 3, including means extending from the upper side of said bar in slidable engagement with the outer top surface of said other of said body members for stabilizing said slidable means and preventing said slidable means from falling into said one of said body members.

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