



18 FEB. 86 - 03983

7 = 5

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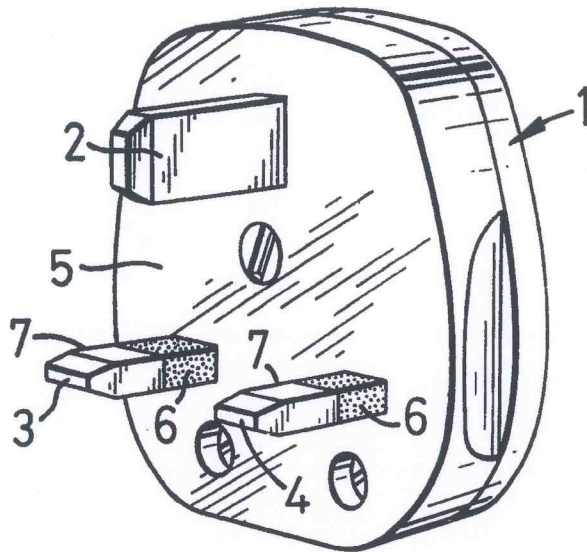


FIG. 1

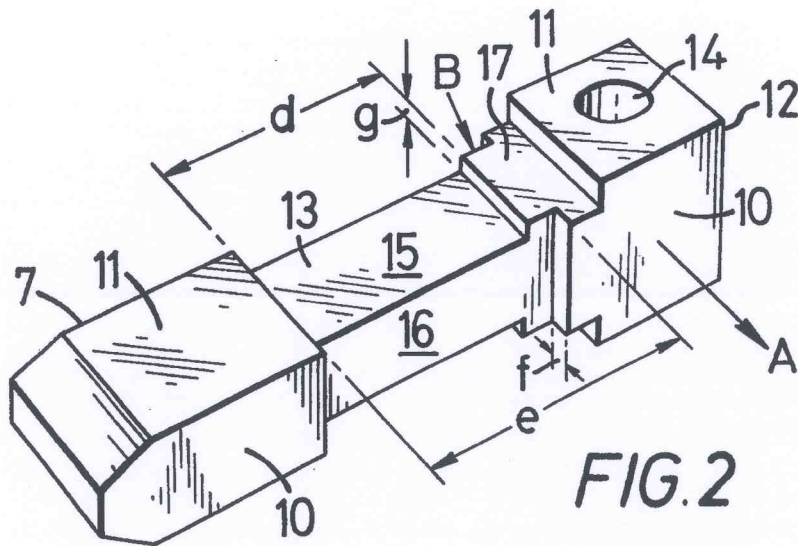


FIG. 2

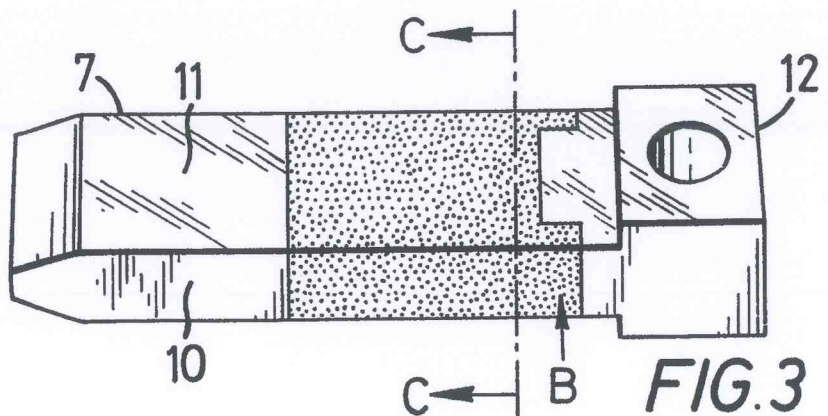


FIG. 3



## SPECIFICATION

**Manufacturing Method for Insulated Pins for Electric Plugs**

5 This invention relates to a method of manufacturing rectangular pins for mounting in an electric plug body and in particular wherein the exposed portions of the pins have insulated faces adjacent the plug body.

10 GB—1 181 370 describes an electric plug wherein the current carrying pins have insulated material moulded thereon to provide an insulating shield extending around and along substantially one half of the length of the pin projecting from the plug  
15 body. In this way, a person introducing or withdrawing a plug to and from a socket cannot contact the current carrying portion of the pin because of that insulation. The pins are formed by firstly cutting off parts of an extruded section of  
20 metal and secondly cutting shallow grooves in the sides by milling or brooching. The insulation can be moulded around the pin by injection moulding with the pins ejected from the mould. Alternatively, two mould parts can be employed to form the insulation.  
25 In both cases, there is concern that flash spews in the form of a thin film or layer can remain adhered to the current carrying portion of the pin.

It is an object of the present invention to provide a method of manufacturing such insulated  
30 rectangular pins for mounting in an electric plug body wherein the chances of such flash spews are reduced.

According to one aspect of the invention there is provided a method of manufacturing rectangular  
35 pins for mounting in an electric plug body, wherein the pins have insulated faces adjacent the plug body when mounted therein, the method comprising the steps:—

(a) forming said pins with a groove in each side at  
40 a location whereby, in use, the grooves are at least adjacent the plug body and wherein one to three of said grooves extend further into said body relative to the other grooves;

(b) locating the pins in a mould;

45 (c) injecting a plastics material into said mould via a gate provided in said extended groove(s);

(d) demoulding the pin.

In this way, the insulating plastics material is inserted via the extended portion which is not  
50 visually apparent when the pin is mounted in the plug body. This gives a more pleasing and more precise looking plug pin. Furthermore, any flash spews that still occur coat the plug pin within the plug body. This does not cause problems since  
55 contact wires connected to the pin are connected by means of screws or rivets applied against a conductor which is inserted through an aperture formed in the pin. The actual surfaces responsible for connecting the electric plug pin to the contact  
60 surfaces of a plug socket to not have any significant flash spews. Finally, any faults occurring around the gate are not exposed to view when the pin is mounted in the electric plug body.

65 Preferably, two of said grooves are formed to extend further into said plug body relative to the

other. This allows a symmetrical injection of plastics material during the manufacturing process.

70 According to another aspect of the invention there is provided a plug pin suitable for use in the aforementioned method of manufacturing rectangular pins comprising:—

a rectangular cross section pin formed with a groove in each side at a location wherein the grooves are at least adjacent the plug body  
75 mounted therein, and one to three of said grooves being formed to extend further into said plug body when mounted therein relative to the other grooves.

Examples of the present invention will now be described with reference to the accompanying  
80 drawings, in which:—

Figure 1 illustrates an electric plug embodying the present invention,

Figure 2 illustrates a plug pin embodying the present invention,

85 Figures 3 illustrates the plug pin of Figure 2 after application of insulation thereto.

Referring to Figure 1, an electric plug 1 includes three pins 2, 3 and 4 extending from a lower surface 5 thereof. The pin 2 comprises an earth pin whereas the pins 3 and 4 are identical current carrying pins. It will be appreciated that the specific number of pins employed in Figure 1 is not to be considered to limit the present invention in any way. Each of the current carrying pins includes an insulated portion 6 located  
90 adjacent the plug body and extending substantially half-way down the exposed portion of the current carrying pins so that only a lower portion 7 of each pin is available to make contact with contacting surfaces of a reciprocal electric socket.

100 Referring now to Figures 2 and 3, the electric pin 3 or 4 is formed from an elongate bar of conductive metal extruded from an extrusion head in the direction of arrow A. Each pin is formed by cutting off a length of that bar accordingly, the side face 10 of the pin is a cut surface whereas the top face 11 and bottom face (not shown) are surfaces defined by the extrusion head. As can be seen from Figure 2, the lower portion 7 of the pin connects to an upper portion of the pin 12 via a reduced cross section intermediate portion 13. The upper section 12 comprises a generally square shaped portion having an aperture 14 drilled therethrough for receiving a conductor in known way when the pin is mounted in an electric plug and a portion 17 as  
115 shown. The intermediate portion 13 comprises respective grooves 15 on upper and lower faces of the pin and having a length (d) and respective grooves 16 on the side faces and having length (e). It will be apparent that length (e) is greater than length (d). The groove 16 is formed by milling (or the like) the cut surface 10 to a required groove depth (f). The length (d) and groove depth (g) are defined by the extrusion head. Typically, depth (g) corresponds to depth (f).  
120

125 The pin shown in Figure 2 is located in a mould having surfaces defining a cross section corresponding to the end portion 7 right up to and including portion 7. A gate for injection of insulating plastics material is located on the mould to lie  
130 substantially in or on the extra portion of the groove



16 which extends beyond the groove 5. The position of the gate indicated generally by the letter (B) in Figures 2 and 3. Figure 3 shows the pin of Figure 2 after moulding of the insulation thereon. Once plastics material is injected into the appropriate mould, solidified and the pin demoulded the general cross section of the lower section 7 of the pin extends right the way to the upper square portion 12. It can be seen that the insulation extends further up the pin on the side faces 16 than the top faces 13. Thus, any residual plastics material from the gate position is located at the upper portion of the side faces 16. When the pin of Figure 3 is mounted in a plug body as shown in Figure 1, then only the pin on the left hand side of line C—C as shown in Figure 3 is exposed.

Consequently, it can be seen that any fault occurring in the insulation in the region of the gate B does not show when the pin is mounted in the electric plug body. Furthermore, any flash spews occurring at the gate region are also not exposed. This gives the electric plug a superior visual appearance compared with hitherto known such plugs.

It will be apparent that the present invention is not limited to plug pins having the specific cross section shown in the drawings and the extended grooves can be formed in one to three of the plug pins shown in the drawings.

## 30 CLAIMS

1. A method of manufacturing rectangular pins for mounting in an electric plug body wherein the pins have insulated faces adjacent the plug body when mounted therein, the method comprising the steps of:—

35 (a) forming said pins with a groove in each side at a location whereby, in use, the grooves are at least adjacent the plug body and wherein one to three of said grooves extend further into said body relative to the other grooves,

40 (b) injecting plastics material into said mould via a gate provided in said elongated portion,

(d) demoulding the pin.

2. A method as claimed in claim 1 wherein two of said grooves extend further into said body relative to the other grooves.

3. A plug pin suitable for use in any preceding claim comprising an extruded rectangular cross section pin formed with a groove in each side at a location wherein the grooves are at least adjacent the plug body when mounted therein, and one to three of said grooves being formed to extend further into and plug body when mounted therein relative to the other grooves.

4. A method of manufacturing rectangular pins for mounting in an electric plug body, wherein the pins have insulated faces adjacent the plug body when mounted therein, substantially as herein described with reference to the accompanying drawings.

5. A plug pin substantially as herein described with reference to the accompanying drawings.