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3,225,324

SOCKET FOR MICRO-MODULES

Filed March 18, 1964

FIG. 1

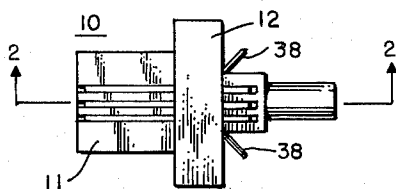


FIG. 2

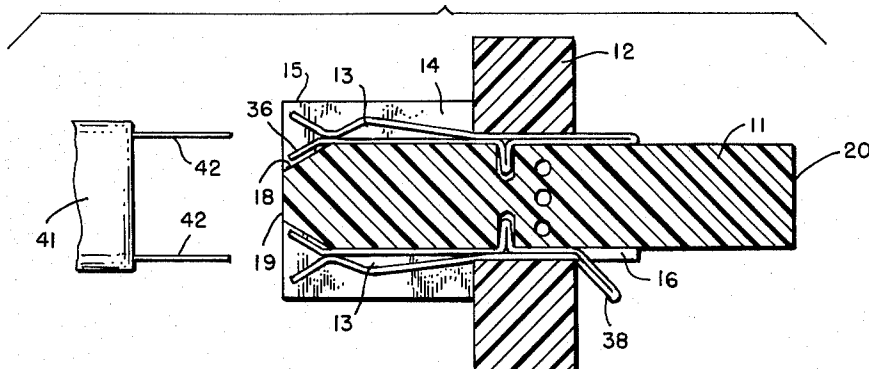


FIG. 3

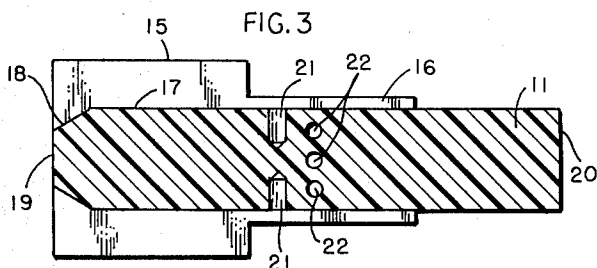


FIG. 4

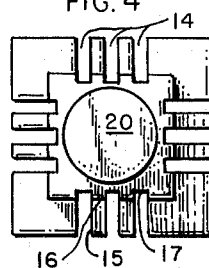


FIG. 6

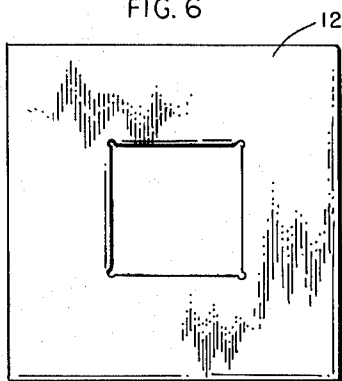
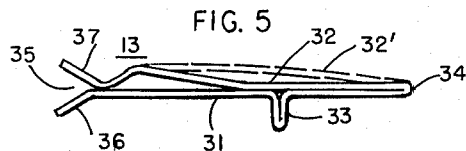


FIG. 5



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SOCKET FOR MICRO-MODULES

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5 Claims. (Cl. 339—192)

This invention relates to socket connectors and more particularly to very small multi-connector sockets of the type which are adapted to receive small diameter module pins.

The socket of this invention is designed primarily as a test socket with possible use in maintenance and test equipment. Some of the uses of this type of socket are in module acceptance, environmental and reliability tests. This socket is designed to accept the relatively long leads needed for in-process-testing of modules. Previous socket designs which were designed for equipment applications are not suitable to in-process-testing.

It is therefore an object of this invention to provide a socket connector particularly suitable for in-process-testing of micro-modules.

Another object of this invention is the provision of a socket which is of relatively simple design and which may be easily assembled.

A further object of this invention is to provide a novel socket connector.

The socket of this invention consists of a body, clamping plate and a plurality of spring contacts. The contacts are placed in slots which run longitudinally along the body, a tab on each contact extending into an adjacent hole in the body. When the contacts are in place, a clamping plate is slid into position over the contacts and is retained by bending the protruding ends of the contacts. The contacts are initially formed so that the assembly of the plate pre-loads the working end of the contacts. The bent lead portion of the contact may then be soldered to external leads which are to be connected to a module by the socket.

The invention will be more clearly understood from the following detailed description when read in conjunction with the accompanying drawing in which:

FIG. 1 is a side elevational view of a socket constructed in accordance with this invention;

FIG. 2 is a longitudinal cross-sectional view of the socket of FIG. 1 taken along line 2—2. Included in this figure is a portion of a module adapted to be connected to the socket;

FIG. 3 is a cross-sectional view of the body portion of the socket;

FIG. 4 is an end view of the body portion of the socket;

FIG. 5 is a view of one of the contacts used in the socket; and

FIG. 6 is a view of the clamping plate.

Referring to the invention as shown in FIGS. 1 and 2 there is shown a socket generally designated as 10 comprising two separate dielectric pieces, a body 11 and a clamping plate 12. In the particular embodiment described, twelve contacts 13 are secured in the body 11 by the clamping plate 12.

The body 11, which is shown separately in FIGS. 3 and 4, contains twelve longitudinal slots 14, three of which are on each side of the body. The slotted portion of body 11 is divided into two sections, 15 and 16, the walls of the slots being higher in section 15 than in section 16. The base 17 of each slot has a tapered portion 18 where the slot gets progressively deeper toward the working end 19 of body 11. The gripping end 20 of body 11 is circular in cross-section to permit easy handling of the socket. The body contains twelve holes, half of them

numbered 21 being closer to end 19 than the other half which are numbered 22. The depth of the holes is such that holes on adjacent sides of body 11 must be longitudinally offset to prevent intersection thereof.

Contact 13 is shown alone in FIG. 5. It consists of a pair of legs, a flat leg 31 and a bowed leg shown in its normal position by dashed lines 32. The two legs are joined at the lead end 34 of the contact. When the contact 13 is secured in the socket, as will be explained below, the bowed portion 32' is forced against the flat leg 31 for a substantial portion of their lengths as indicated at 32. A tab 33, which extends laterally from the flat leg 31, is formed by bending leg 31. A working end 35 is formed by bending two adjacent sections of legs 31 and 32' so that they diverge at sections 36 and 37.

Assembly of the contact will now be described referring again to FIG. 2. The twelve contacts 13 fit freely into the slots 14 and are positioned lengthwise by the tabs 33 which extend into the small holes 21—22 in the socket body 11. It is noted that half of the tabs will be located along flat leg 31 so that they will extend into holes 21 while the other half will be located nearer to lead end 34 of the contact so that they will extend into holes 22. When all of the contacts are in place the clamping plate 12, which is shown alone in FIG. 6, is slid into position over end 20 and section 16 of the slots so that it abuts section 15 of the slots. The clamping plate is retained in this position by bending the lead end of each contact away from the body, thereby also forming a solder tab 38. The contacts are initially formed so that the assembly of the plate pre-loads the working end of the contact. Furthermore, the tendency of leg 32 to bear against clamping plate 12 securely holds the contact in place. When the socket is assembled, the tapered portion 18 of the slots receives leg 36 of the working end of the contact.

FIG. 2 shows a module 41 having twelve pins 42 which may be received by and make electrical contact with contacts 13. Thus the testing of micromodules may be accomplished without the necessity of soldering wires to the small diameter module pins thereby avoiding the risk of damaging the module or pins.

Various changes and modifications may be made to the described embodiment of this invention without departing from the spirit thereof. For example, the socket could accept a circular array of pins by utilizing a circular body having slots of equal depth or by utilizing the rectangular body shown in the preferred embodiment, but having slots of different depths. The latter modification would require that the hole in the clamping plate be designed accordingly.

What is claimed is:

1. A socket connector comprising: an elongated body of insulating material having a plurality of longitudinal slots around the periphery thereof, said body having a working end and a gripping end, said slots having side-walls which are high at said working end and which abruptly become lower for the remainder of said slot, each slot having a hole therein in the region of said lower side-walls; a plurality of contacts, one being positioned at the base of each of said slots, each of said contacts comprising a bowed leg and a flat leg joined at one end of said contact, said flat leg having a laterally projecting tab which extends into said holes, the end of said contact legs opposite said one end diverging from one another to form a receptacle for pins to which the socket is to be connected; and a clamping plate positioned over the lower walled portion of said slots so that said plate abuts the higher walled portion of said slots and said one end of said contacts protrudes from said clamping plate on a side thereof opposite to that which abuts said higher walled portion of said slots, said one end being bent away from said body at the point where it protrudes from said plate.

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2. A socket connector comprising: an elongated body of insulating material having a plurality of longitudinal slots around the periphery thereof, said body having a working end and a gripping end, each of said slots having a hole in the base thereof approximately midway between said ends, said slots having sidewalls which are low in the vicinity of said holes and which abruptly become higher toward said working end; a plurality of contacts, one being positioned at the base of each of said slots, each of said contacts having two adjacent legs which diverge at one end to form a receptacle for connector pins and which are joined at the end opposite said one end to form a solder tab, one of said legs having a projecting tab which extends into the hole of the slots in which said contact is positioned; and a clamping plate positioned over the portion of said slots having low walls, the solder tab of said contacts extending through said clamping plate and being bent away from said body.

3. A socket as set forth in claim 2 in which the two legs of said contacts tend to spring apart so that the action of

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said clamping plate in compressing said contacts into their respective slots pre-loads the working ends thereof.

4. A socket as set forth in claim 2 in which said body is substantially square in cross-section in the vicinity of said slots and circular in cross-section at said gripping end.

5. A socket as set forth in claim 4 wherein said holes on adjacent sides of said body are in planes which are perpendicular to the axis of said body but which are longitudinally displaced.

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