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(54) Title: ELECTRICAL CONNECTOR FOR A DAUGHTER CARD

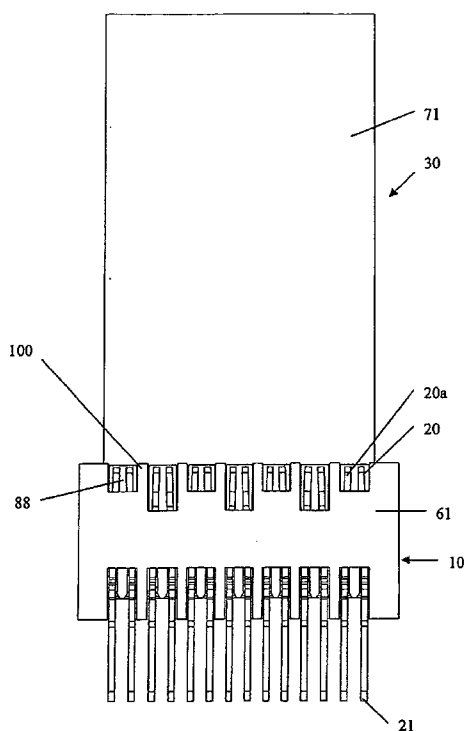


Figure 7

(57) Abstract: An electrical connector for receiving a daughter card having a plurality of conductive surfaces, said electrical connector comprising: an housing having a top, bottom, front side, back side and two ends, an elongated slot in said elongated housing, for receiving said daughter card, said slot open from the top of said housing, said slot running substantially parallel to the front and back sides of said housing, a plurality of passageways opening one side of said elongated slot, an electrical terminal pair in each said passageway, each said terminal pair adapted to engage one of said plurality of conductive surfaces on said daughter card and for electrically connecting said daughter card to said connector, wherein said terminal pairs has two terminals and said terminals converge towards each other and a central axis of said passageway.

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"ELECTRICAL CONNECTOR FOR A DAUGHTER CARD"**FIELD OF THE INVENTION**

The present invention relates to electrical connectors, particularly to electrical connectors for the connection of daughter cards, and has application to connectors engagable with daughter cards
5 having pad terminals for voltage regulation of electrical supply.

BACKGROUND OF THE INVENTION

The invention has application to the electrical interconnection of daughter cards and in particular
10 daughter cards for regulation of electrical supply. Daughter cards typically have pads that electrically connect the daughter card to the terminals of the connector.

Known connectors for daughter cards have terminals that are aligned parallel to a plane normal to the plane of the surface of the daughter card. Referring to Figure 8a a close up of the connector
15 and daughter card 30 of the prior art is shown, the daughter card has a pad 31 for connecting to the terminals 20, 20a of a connector. Because the terminals 20, 20a are close to the edges 35 of the pad 31 there is a possibility of the terminals connecting to an adjacent pad (not shown) and shorting out. Shorting out can possibly damage the connected cards or render a system using the connector inoperable.

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SUMMARY OF THE INVENTION

It would be desirable to provide a connector that reduces the chances of a short occurring or at least provides industry or the public with a useful choice.

25

In a first embodiment the present invention consists of an electrical connector for receiving a daughter card having a plurality of conductive surfaces, said electrical connector comprising:

a housing having a top, bottom, front side, back side and two ends,

an elongated slot in said elongated housing, for receiving said daughter card, said slot open

30 from the top of said housing, said slot running substantially parallel to the front and back sides of said housing,

a plurality of passageways opening one side of said elongated slot,

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an electrical terminal pair in each said passageway, each said terminal pair adapted to engage one of said plurality of conductive surfaces on said daughter card and for electrically connecting said daughter card to said connector,

5 wherein said terminal pairs has two terminals and said terminals converge towards each other and a central axis of said passageway.

In an alternative embodiment said connector includes a plurality of passageways and terminal pairs on a second side of said elongated slot.

10 In an alternative embodiment said passageway is substantially parallel to said ends, said passageway running substantially from the top of said housing to the bottom of said housing.

BRIEF DESCRIPTION OF THE DRAWINGS

15 Disclosed embodiments and methods of utilizing the invention will be further described, with reference to the accompanying Figures, by way of example only and without intending to be limiting, wherein;

20 Figure 1 is a perspective view of the connector of the present invention,

Figure 2 is a perspective view of the connector of the present invention with a daughter card about to be inserted,

25 Figure 3 is a perspective view of the connector of the present invention with a daughter card inserted,

Figure 4 a top view of the connector of the present invention,

30 Figure 5 a front view of the connector of the present invention,

Figure 6 is a front view of the connector of the present invention with a daughter card about to be inserted,

35 Figure 7 is a front view of the connector of the present invention with a daughter card inserted,

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Figure 8a is a front close up view of a connector of the prior art with a daughter card inserted, illustrating the interaction of the pads of the daughter card and the terminals of the connector,

Figure 8b is a front close up view of a connector and daughter card of Figure 7, illustrating the interaction of the pads of the daughter card and the terminals of the connector, and

Figure 9 is a sectioned view from the front of the connector of the present invention with a daughter card inserted,

Figure 10 is a transverse direction sectioned view of the connector of the present invention with a daughter card inserted, and

Figure 11 is an end sectioned view of the connector of the present invention with a daughter card inserted.

DETAILED DESCRIPTION OF THE DISCLOSED EMBODIMENTS

Referring to the Figures, it will be appreciated that the invention may be implemented in various forms and modes. The following description of the disclosed embodiment of the invention is given by way of example only.

Referring to Figures 1 to 7 and 9 to 11, the electrical connector of the present invention is illustrated. The electrical connector or socket 10 of the present invention includes a housing 1. The housing 1 includes an elongated slot 81 to receive a daughter card 30. A plurality of electrical terminals 20, 20a are embedded in the housing 1 for electrically connecting the daughter card 30 to another board (not illustrated).

As illustrated in the Figures the housing 1 includes a left wall 60, a right wall 64, a top wall 63, a bottom wall 66, a front wall 61 and a rear wall 65. The slot 81 is provided within the top wall 63 of the housing 1. The bottom wall 66 of the housing is placed in contact with a printed circuit board (not shown). A plurality of terminal passageways 88 extend from the top wall 63 of the housing 1 through the bottom wall 66 of the housing. Terminal passageways 88 exist in the front side 85 and the rear side 86 of the elongated slot 81. The terminal passageways 88 can in particular be seen in Figures 4, 5, 9, 10 and 11.

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Within each terminal passageway 88 is a pair of terminals 20, 20a that extend from the elongated slot 81 through the bottom of the housing 66 and in use are electrically connected to a printed circuit board (not shown). The housing 1 includes a plurality of terminal passageways 88 on both sides 85, 86 of the elongated slot 81. The passageways 88 run substantially parallel with the left 60 and right 64 walls of the housing.

A daughter card 30 suitable for use with the connector 10 includes connection pads or surfaces 31 along one side of the daughter card; the connection pads or surfaces 31 electrically connect the terminals 20, 20a of the connector 10 with the daughter card 30. A plurality of connection pads 31 may exist on a daughter card 30 and the daughter card 30 may have connection pads on both the front 71 and rear faces of the daughter card. The connection pads 31 are separated by a space 90 so that the pads do not short together.

Referring to Figure 8a in the prior art terminals 20, 20a are aligned substantially parallel with the left 60 and right 64 walls of the housing. The terminals 20, 20a are spaced apart so that the first terminal 20a of each terminal pair is near a first edge 35a of the daughter card pad 31. The second terminal 20 of the terminal pair is near the second edge 35 of the daughter card pad.

Referring in particular to Figure 8b in the connector of the present invention the contact portions of the terminal pairs 20, 20a converge towards each other, that is the ends 101, 102 of the terminals are not parallel with the left 60 and right 64 walls of the housing but are angled towards the centre axis 200 of the shared passageway 88.

The housing 1 and in particular the elongated slot 81 is sized such that when a daughter card 30 is inserted into the elongated slot 81 the pads 31 of the daughter card 30 are aligned so that the gap between the passageways 100 is aligned with the gap 90 between two adjacent pads 31. In such an alignment the terminals of the present invention are near the centre of each pad 31 and this ensures that the converging terminals 20, 20a of the present invention are less likely to short to an adjacent pad.

Although directions such as, for example, top, bottom, up and down have been used to describe various aspects of the invention, it is to be understood that these descriptions have been used to simplify the description of the invention and are not intended to limit the invention to the particular orientation described.

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The foregoing describes the invention with reference to the disclosed embodiment. Alterations and modifications as will be obvious to those skilled in the art are intended to be incorporated within the scope of the invention as defined in the accompanying claims.

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Claims

1. An electrical connector for receiving a daughter card having a plurality of conductive surfaces, said electrical connector comprising:
 - an housing having a top, bottom, front side, back side and two ends,
 - 5 an elongated slot in said elongated housing, for receiving said daughter card, said slot open from the top of said housing, said slot running substantially parallel to the front and back sides of said housing,
 - a plurality of passageways opening one side of said elongated slot,
 - an electrical terminal pair in each said passageway, each said terminal in such terminal pair
 - 10 having a contact portion adapted to engage one of said plurality of conductive surfaces on said daughter card and for electrically connecting said daughter card to said connector,
 - wherein said terminal pairs has two terminals and said contact portions of such terminals converge towards each other and a central axis of said passageway.
- 15 2. An electrical connector for receiving a daughter card as claimed in claim 1 including a plurality of passageways and terminal pairs on a second side of said elongated slot.
3. An electrical connector for receiving a daughter card as claimed in claim 1 wherein said passageway is substantially parallel to said ends, said passageway running substantially from the top
- 20 of said housing to the bottom of said housing.
4. An electrical connector for receiving a daughter card as claimed in claim 2 wherein said passageway is substantially parallel to said ends, said passageway running substantially from the top of said housing to the bottom of said housing.

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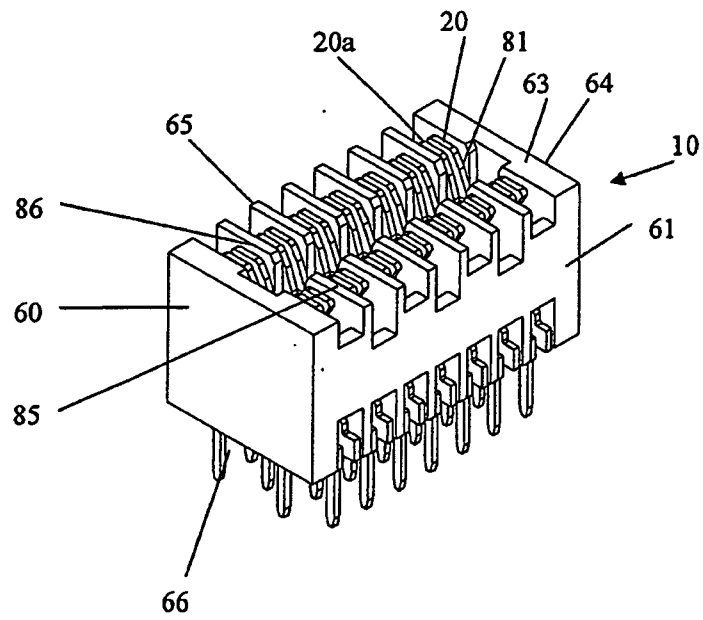


Figure 1

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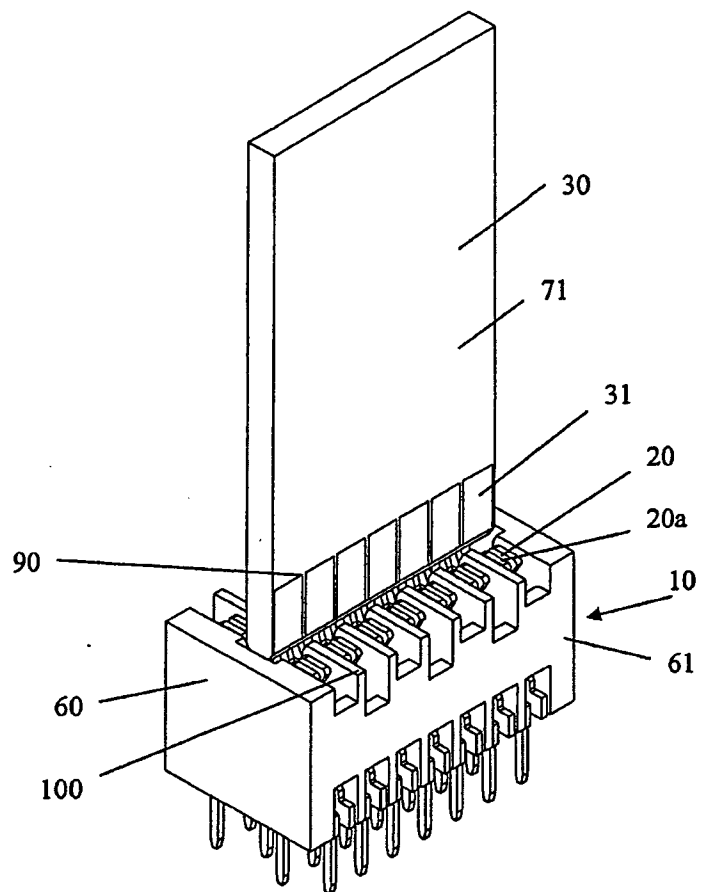


Figure 2

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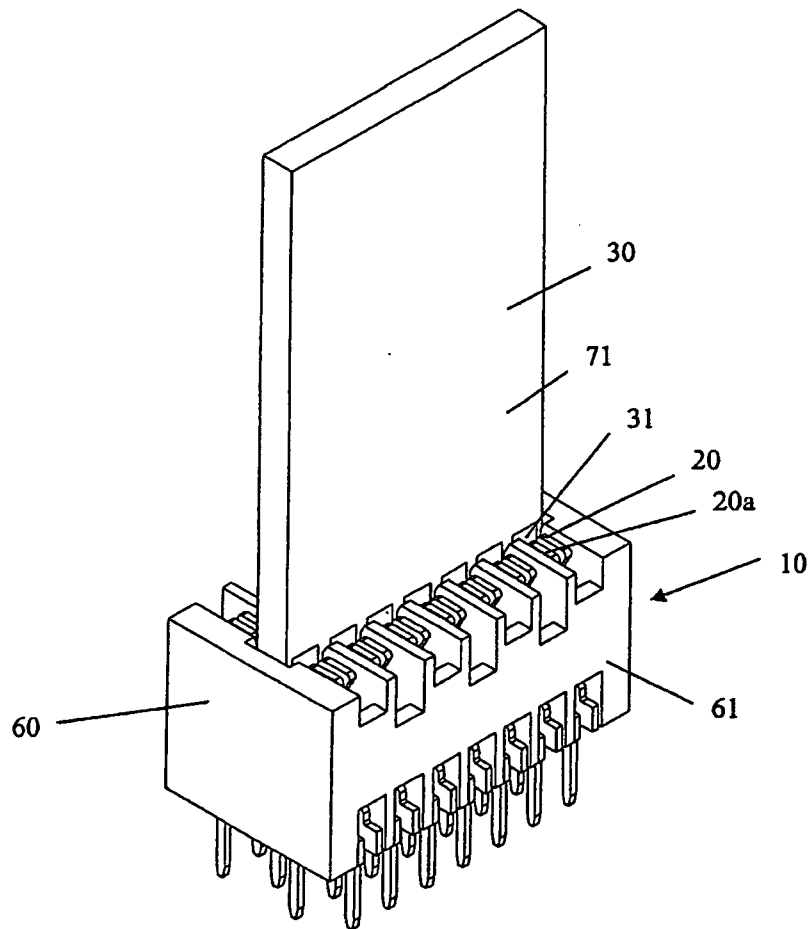


Figure 3

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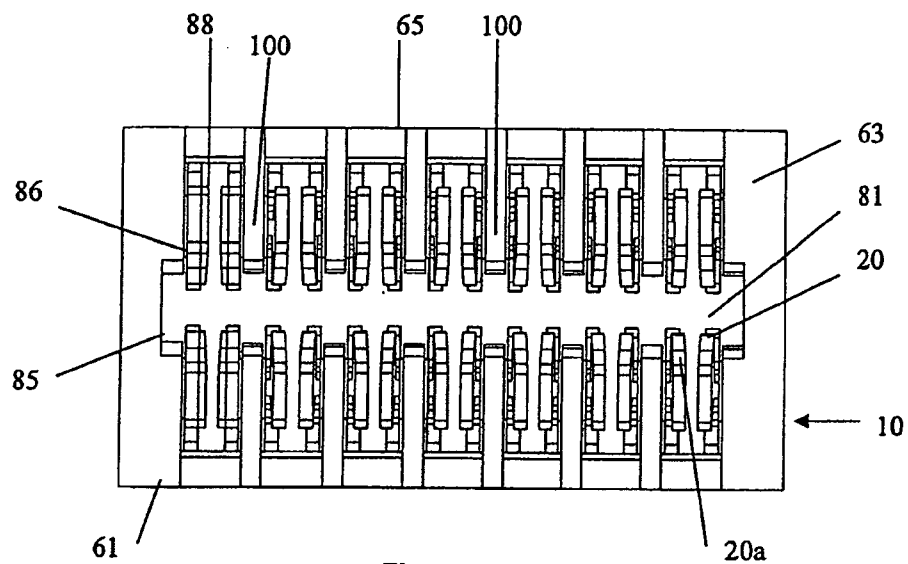


Figure 4

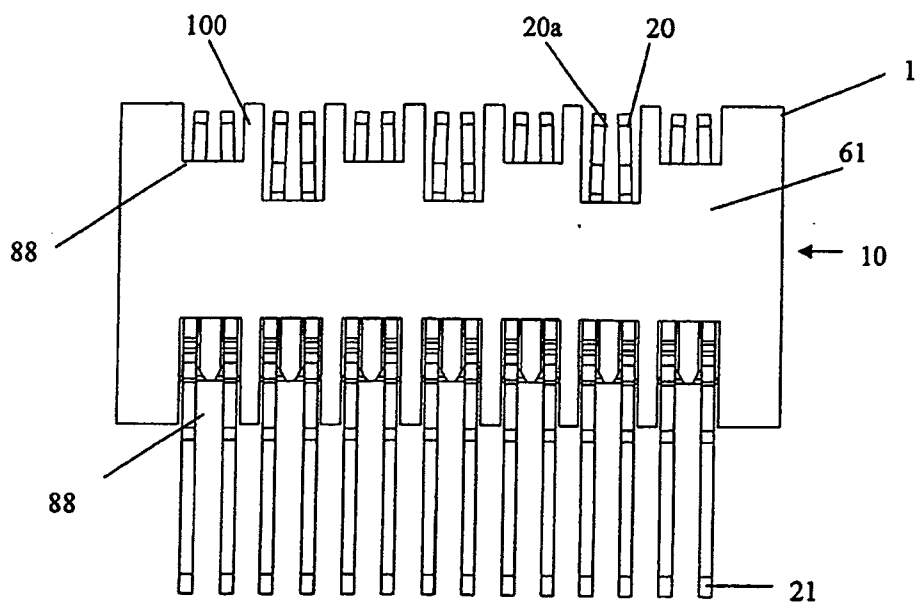


Figure 5

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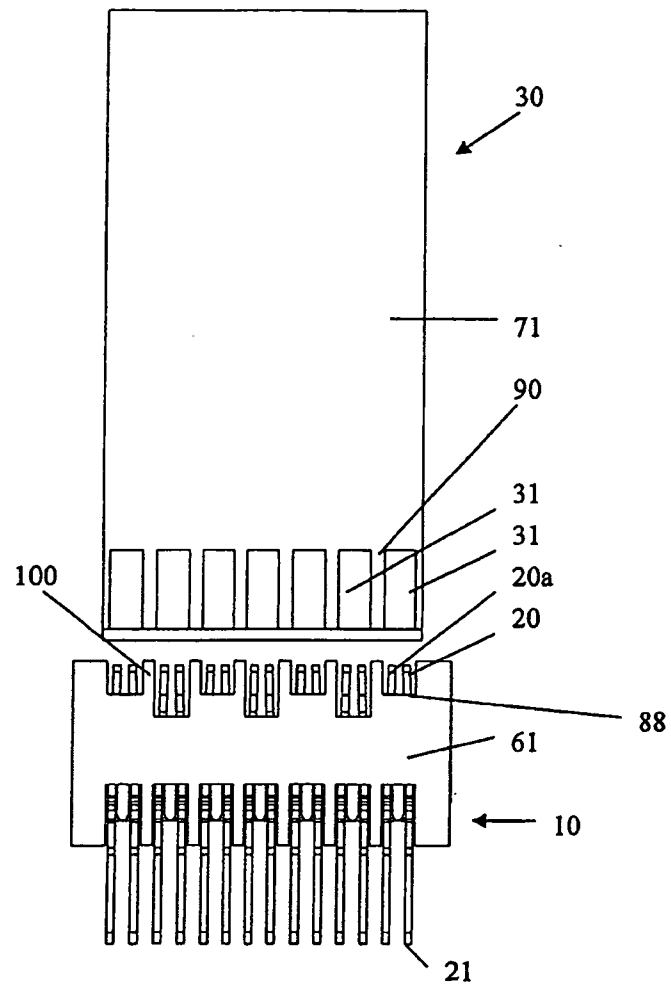


Figure 6

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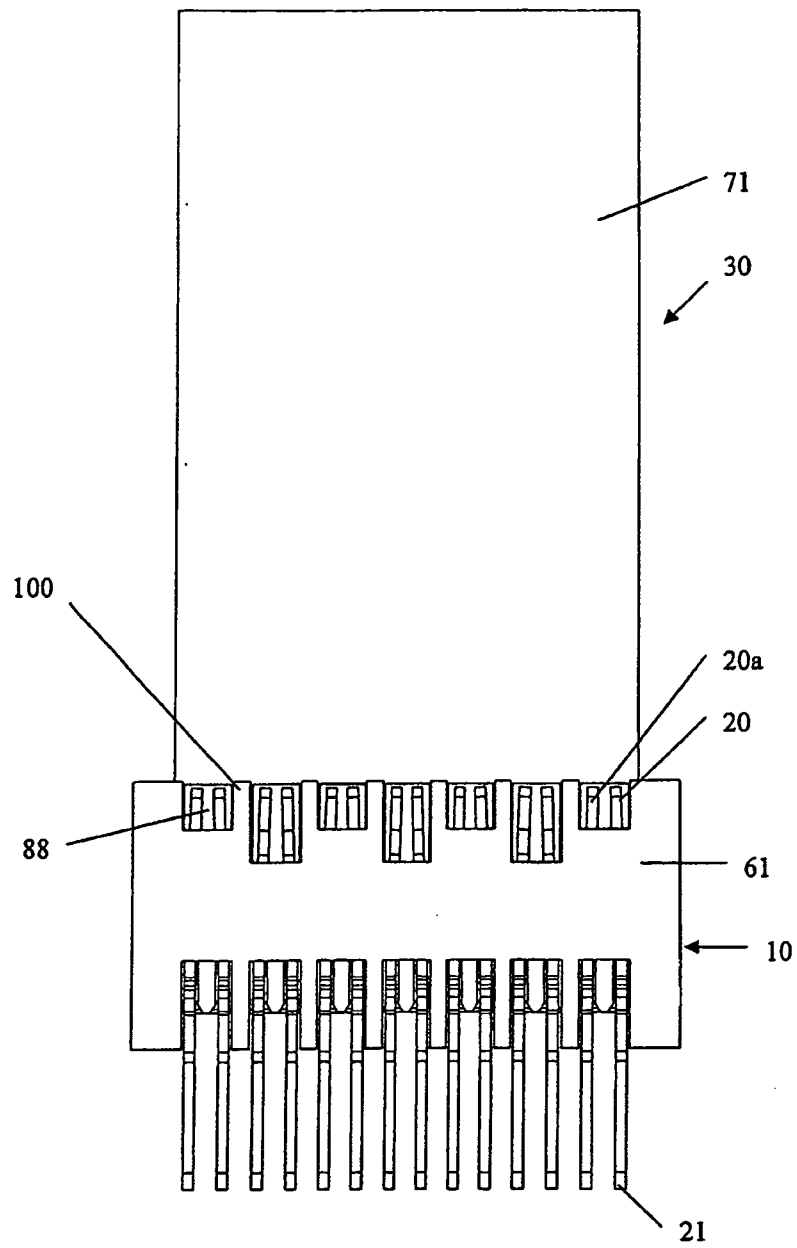


Figure 7

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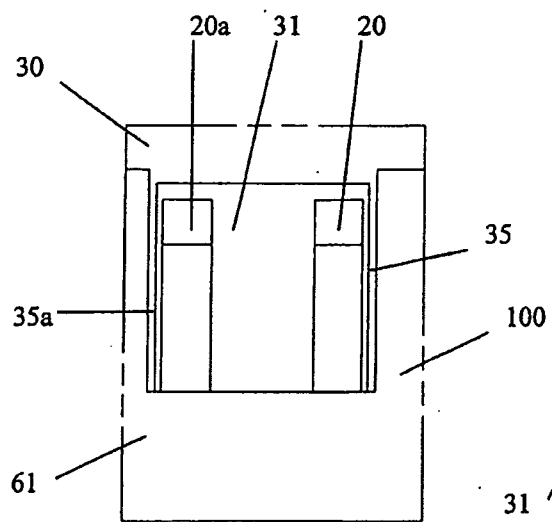


Figure 8a

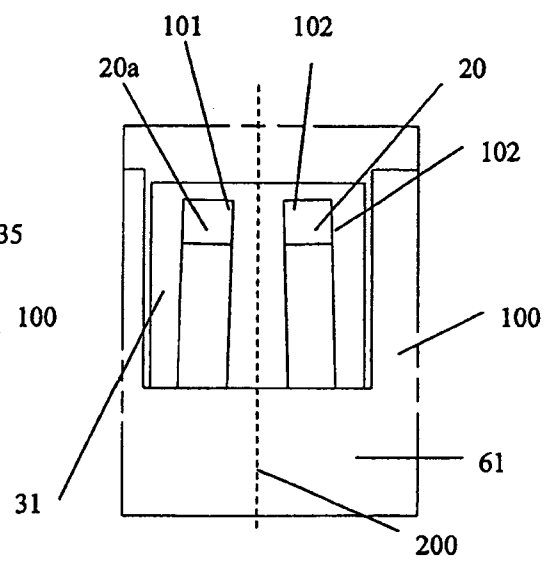


Figure 8b

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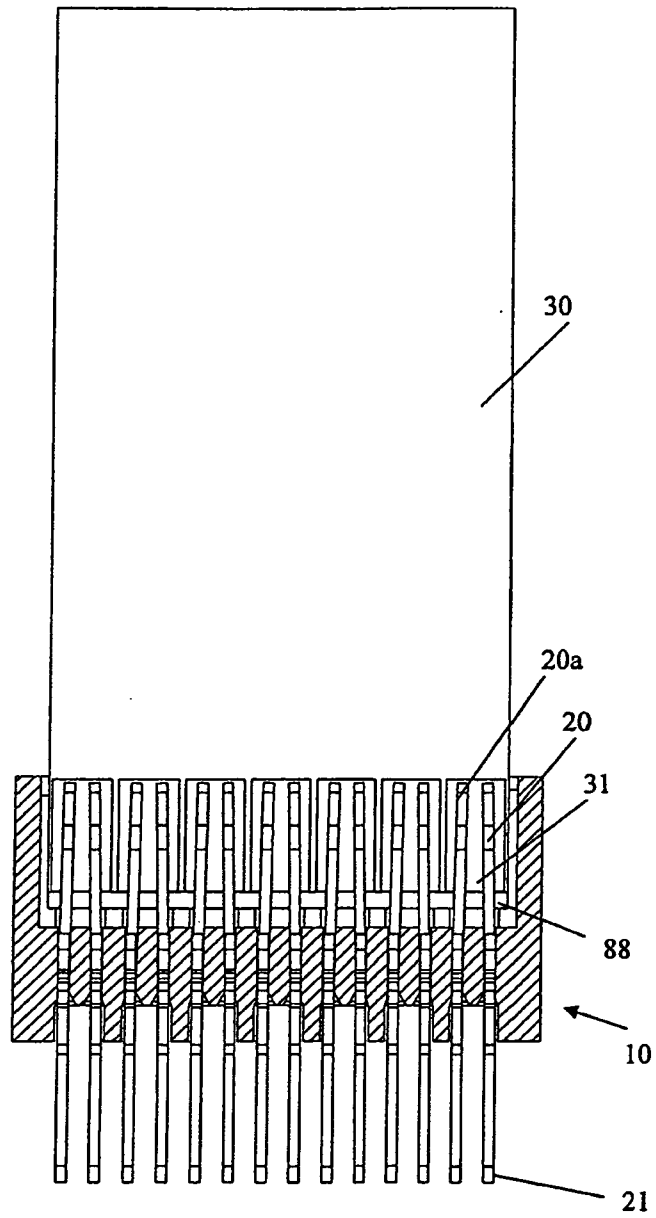


Figure 9

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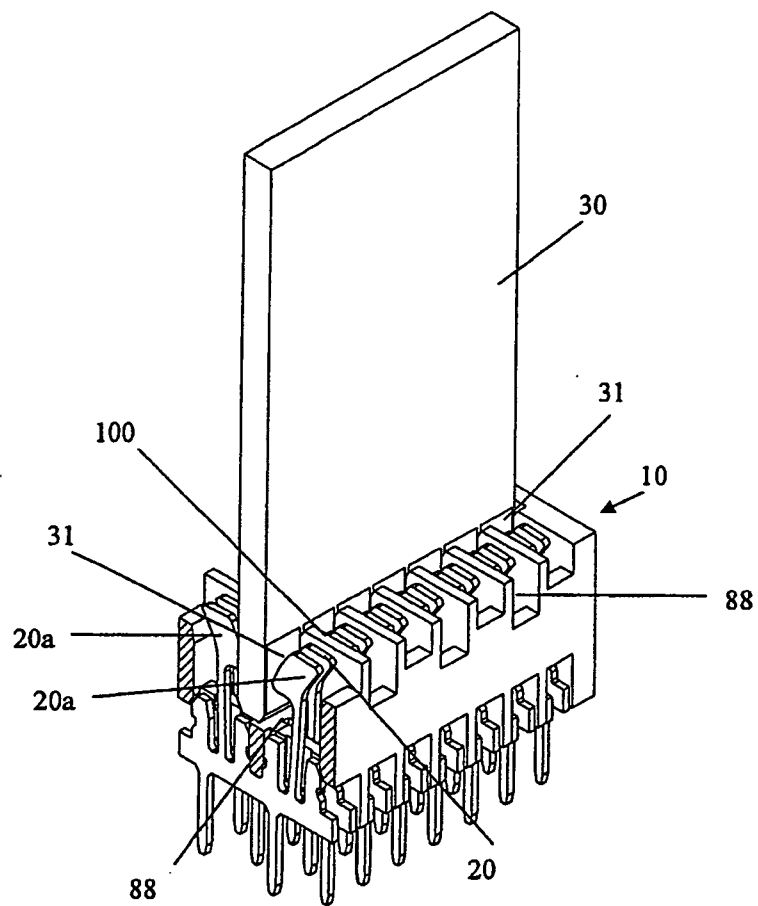


Figure 10

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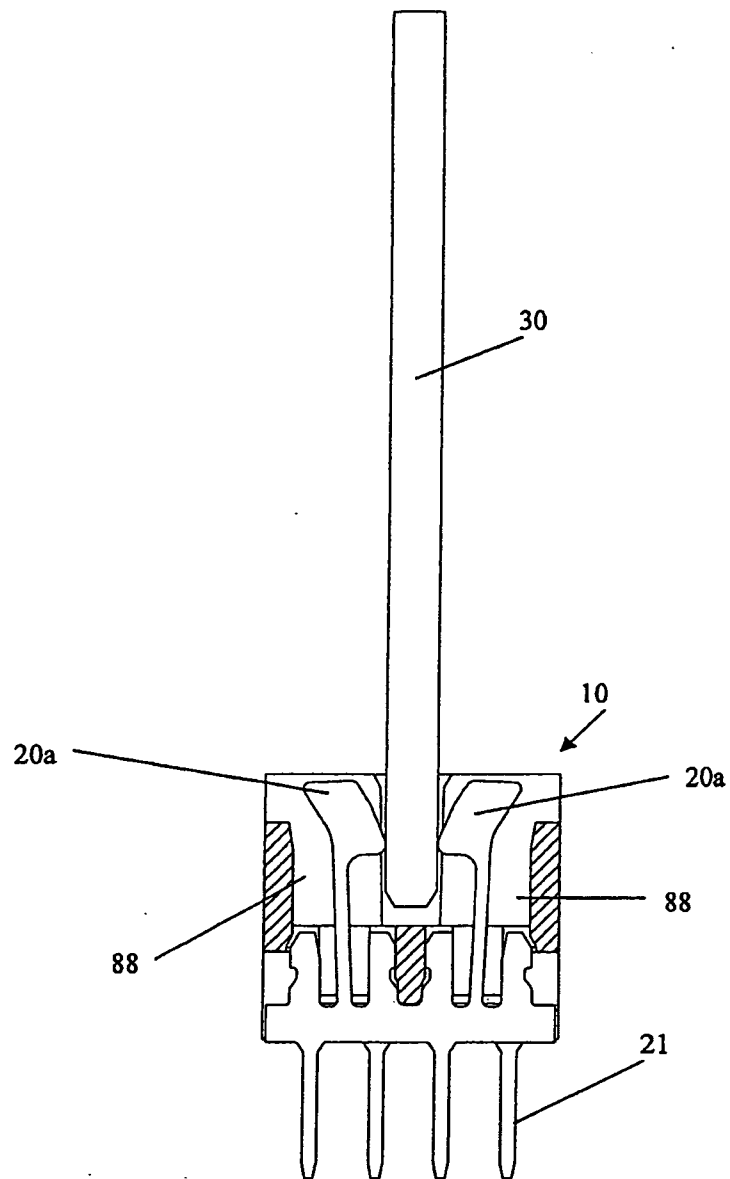


Figure 11

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2008/008988

A. CLASSIFICATION OF SUBJECT MATTER
INV. H01R12/18

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H01R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 575 791 B1 (KORSUNSKY IOSIF [US]) 10 June 2003 (2003-06-10) column 2, line 36 - column 3, line 39	1
A	US 6 042 386 A (COHEN THOMAS S [US] ET AL) 28 March 2000 (2000-03-28)	
A	GB 1 400 605 A (BURNDY CORP) 9 July 1975 (1975-07-09)	



Further documents are listed in the continuation of Box C.



See patent family annex.

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Bertin, Michel

INTERNATIONAL SEARCH REPORT

Information on patent family members

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