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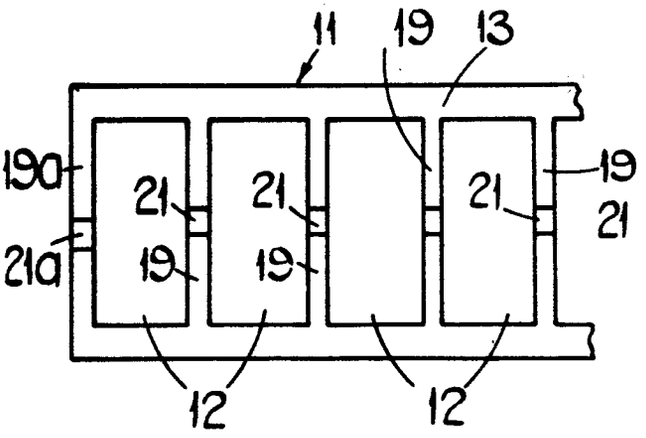
(54) Printed circuit edge connector.

(57) An electrical connector of the kind arranged to receive an edge of a printed circuit board or the like to make a plurality of electrical connections thereto. The connector includes a body (11) having an end face, and within the body are a plurality of parallel passages(12) which extend from the end face for receiving respective electrical terminals. The partition walls (19) which separate the passages from one another, each have therein a slot (21) for accommodating the edge of the printed circuit board or the like in use. At least one of the slots (21*a*) is so positioned in relation to the other slots 21 and the shape of the board to be received, that in order for the edge of the board to be received in each of the slots (21), (21*a*) the board and/or the body must be flexed from its rest configuration whereby after insertion of the board the inherent resilience of the flexed board and/or body (11) causes the edges of the slot or slots (21, 21*a*) to grip the board.

FIG.3



EP 0 000 623 A1

This invention relates to an electrical connector of the kind arranged to receive an edge of a printed circuit board or the like and to make a plurality of electrical connections thereto.

A problem which is found with electrical connectors of the kind specified is that the printed circuit board is a loose fit in the connector and can be disturbed by vibration in use to the detriment of the electrical connections. It is an object of the present invention to provide an electrical connector wherein this problem is minimised.

According to the invention an electrical connector of the kind specified includes a body having an end face, and a plurality of passages extending into said body from said end face for receiving respective electrical terminals the partition walls defining the passages each having therein a slot for accommodating the edge of the printed circuit board in use, so that the board can engage the terminals received in the passages in use, and at least one of said slots being so positioned in relation to the other slots and the shape of the board to be received, that in order for the edge of the board to be received by each of the slots, the board and/or the body must be flexed from its rest configuration whereby after insertion of the board, the inherent resilience of the flexed board and/or body causes the edges of said slot or slots to grip the board.

It is to be understood that the term "printed circuit board or the like" includes a flexible printed circuit supported on a plate-like carrier, and is also intended to include non-printed arrangements of a similar nature for example, a board or plate having conductive leads thereon the ends of which are bored and bend around the edges of the plate or board, and a plate or board carrying strip-like terminals at its edges.

Preferably the connector is intended for use with a planar board and the passages are thus co-planar, the slots being co-planar with the exception of the two outermost slots which are displaced in position to the same side of the plane of the other slots.

One example of the invention is illustrated in the accompanying drawings, wherein:-

Figure 1 is an end elevational view of an electrical connector;

Figure 2 is a plan view of the connector shown in Figure 1;

Figure 3 is a diagrammatic end elevational view to an enlarged scale of a part of the connector shown in Figure 1; and

Figure 4 is an enlarged view of a terminal utilised in the connector of Figure 1.

Referring to the drawing, the electrical connector includes a moulded synthetic resin body 11 having therein a plurality of passages 12 of rectangular cross-section. The passages 12 are parallel and co-planar, and each open at an end face 13 of the body 11, the passages 12 extending at right angles to the end face 13. Each of the passages receives an electrical terminal 14 having deformable tags 15, 16 whereby the terminal is electrically and physically connected to a conductive lead in use. Each of the terminals 14 includes a pair of resilient arms 17 between which a planar component can be gripped, the terminal making electrical connection to the planar component. Each of the terminals 14 is received in a respective passage 12 with its arms 17 extending towards the end face 13 of the body. Each terminal includes a latch 18 which in use co-operates with a shoulder within the respective passage to resist movement of the terminal 14 relative to the body in a direction away from the end face 13.

The electrical connector is intended to make electrical connection to an edge region of a printed circuit board. The printed circuit board is planar, and has a plurality of exposed contact regions adjacent one edge thereof. The contact regions are equal in number to the passages and therefore terminals 14 of the body 11.

In order that the printed circuit board may be inserted into the body 11 sufficiently far to engage the edge region of the printed circuit board between the arms 17 of the terminals 14 the partition walls 19 of the body which define between them the passages 12 are formed with slots 21 of width sufficient to accommodate the thickness of the printed circuit board. The positioning of the slots 21 is such that the board when accommodated by the slots 21 is engaged between the limbs 17 of the terminals 14.

In order that the body 11 firmly grips the printed circuit board the slots 21a of the two end partition walls 19a are offset from the plane of the remaining slots 21. The two slots 21a are offset in the same direction from the plane of the remaining slots 21 and thus in order for the printed circuit board to be engaged in the body it is necessary for the printed circuit board to be flexed from its normal planar configuration so as to engage simultaneously in the slots 21 and 21a. Upon release of the printed circuit board after insertion into the slots 21, 21a the inherent resilience of the printed circuit tending to restore the printed circuit board to its planar configuration, causes the printed circuit board to bear tightly against the walls of the slots 21 21a so that the printed circuit board is gripped in the body.

It will be understood that in some constructions the flexure necessary to introduce the printed circuit board into the slots of the partition walls could be flexure of the body or flexure of both the body and the printed circuit board. Furthermore, while in the construction described the two outermost slots 21a are displaced it is to be understood that other slots could be displaced in addition to, or instead

of the outermost slots. The displacement of the chosen [illegible] is in excess of the clearance between the width of the slots and the thickness of the board.

It is to be understood that while a printed circuit board has been referred to above, the connector can be used with a flexible printed circuit supported on a panel or the like, and with arrangements of a similar nature such as boards having the bared ends of conductive leads bent around an edge thereof and boards having strip-like terminals clipped or otherwise secured at an edge thereof.

In all of the arrangements envisaged above, some means will be provided for locating the printed circuit board laterally relative to the body so that the terminals received within the passages engage the appropriate conductive regions of the printed circuit board or the like. For example the body can be provided with a wall or walls which engage an edge or edges of the printed circuit board to ensure correct lateral location.

CLAIMS

1. An electrical connector of the kind arranged to receive an edge of a printed circuit board or the like to make electrical connection thereto, including a body having an end face, and a plurality of passages extending into said body from said end face for receiving respective electrical terminals, the partition walls defining the passages each having therein a slot for accommodating the edge of the printed circuit board in use, so that the board can engage the terminals received in the passages in use, and at least one of the said slots being so positioned in relation to the other slots and the shape of the board to be received, that in order for the edge of the board to be received by each of the slots, the board and/or the body must be flexed from its rest configuration whereby after insertion of the board the inherent resilience of the flexed board and/or body causes the edges of said slot or slots to grip the board.

2. An electrical connector as claimed in claim 1 intended for use with a planar board or the like, the passages of the connector being co-planar and the slots being co-planar with the exception of the two outermost slots which are displaced in position to the same side of the plane of the other slots.

3. An electrical connector substantially as hereinbefore described with reference to the accompanying drawings.

FIG.1.

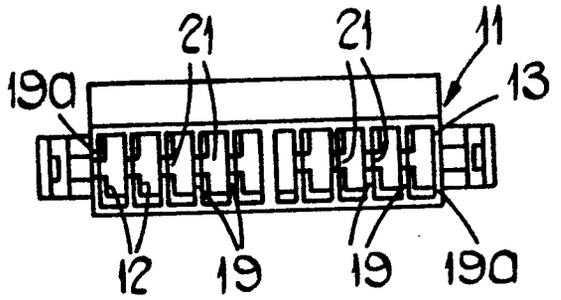


FIG.2.

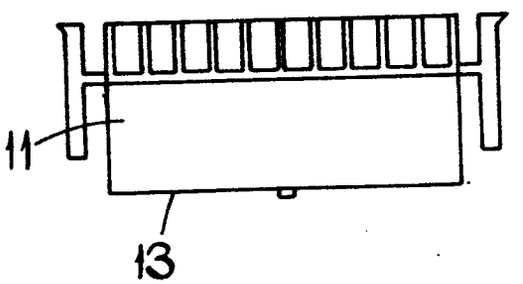


FIG.3

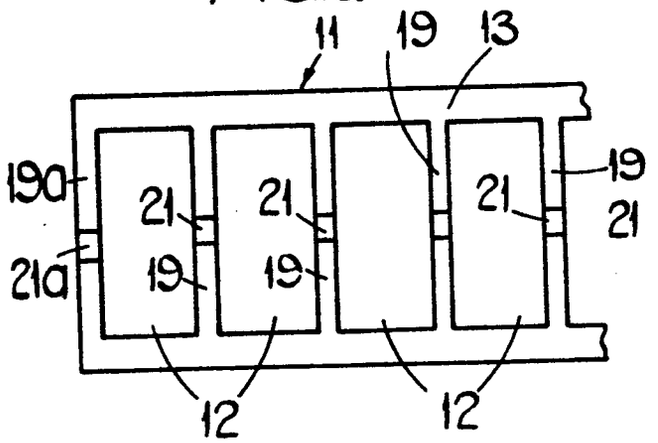
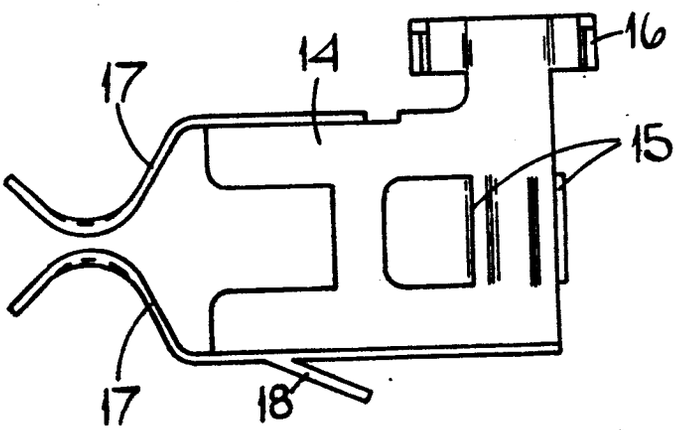


FIG.4.



European Patent Office

EUROPEAN SEARCH REPORT

Application number
EP 78 30 0098

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
A	GB - A - 1 363 352 (PLESSEY) * Page 2, lines 51-62; page 4, lines 10-34; figures *	1
A	GB - A - 974 133 (CARR FASTENER) * Page 2, lines 4-11; figures *	1
A	DE - A - 2 004 420 (KUPFER-ASBEST) * Page 12, paragraph 1; figures *	1

CLASSIFICATION OF THE APPLICATION (Int. Cl.²)

H 05 K 1/06
H 01 R 13/62

TECHNICAL FIELDS SEARCHED (Int.Cl.²)

H 05 K 1/04
H 05 K 1/06
H 01 R 13/62
H 01 R 23/02

CATEGORY OF CITED DOCUMENTS

X: particularly relevant
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	16-10-1978	RAMBOER

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