

(19)



(11)

EP 2 770 584 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
27.08.2014 Bulletin 2014/35

(51) Int Cl.:
H01R 12/58 (2011.01) H01R 12/72 (2011.01)

(21) Application number: **14156705.7**

(22) Date of filing: **26.02.2014**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA ME

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(30) Priority: **26.02.2013 IT BO20130080**

(54) **A connecting element to a printed circuit card, and a printed circuit card group**

(57) A connecting element (1) to a printed circuit card (2), comprising: a main body (3), comprising a first edge portion (4) and a second edge portion (5), opposite one another; a first terminal (6) which originates from the first edge portion (4) of the main body (3) such as to engage in a first hole of the printed circuit card (2); a second terminal (7) which originates from the first edge portion (4) of the main body (3) such as to engage in a second hole of the printed circuit card (2); a first tab (8) which develops perpendicularly from the main body (3) such as to contact a surface of the printed circuit card (2); a

second tab (9) which develops perpendicularly from the main body (3) such as to contact the surface of the printed circuit card (2); the first tab (8) and the second tab (9) developing on opposite sides with respect to the main body (3); a third terminal (10) which originates from the second edge portion (5) of the main body (3) and which is conformed such as to engage with an electrical connector. The main body (3) has a planar development and the first tab (8) and the second tab (9) originate from the first edge portion (4) of the main body (3).

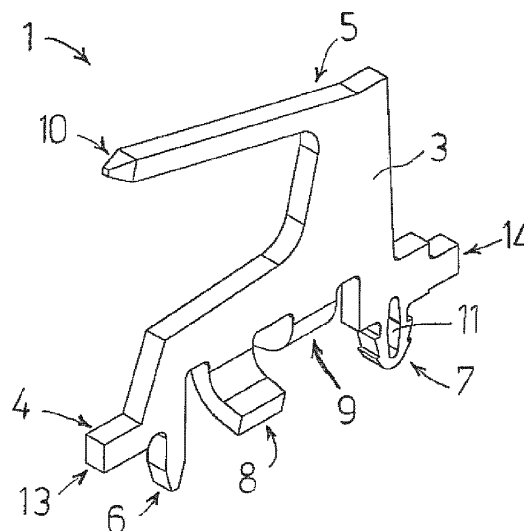


FIG 2

Description

[0001] The present invention relates to the technical sector concerning a connecting element to a printed circuit card; further, the invention relates to a printed circuit card group.

[0002] Document US 5 618 187 discloses a connecting element to a printed circuit card; this connecting element is made of a metal material which is tin-solderable to a printed card circuit and which is electrically conductive, and comprises: a main U-shaped body, comprising a first edge portion and a second edge portion, opposite one another; a first terminal originating from the first edge portion of the main body so as to engage in a first hole of the printed circuit card; a second terminal originating from the first edge portion of the main body in order to engage in a second hole of the printed circuit card; a first tab which develops perpendicularly from the main body in order to contact a surface of the printed circuit card; a second tab which develops perpendicularly from the main body in order to contact the surface of the printed circuit card; the first tab and the second tab developing from opposite sides with respect to the main body; a third terminal which originates from the second edge portion of the main body and which is conformed such as to engage with an electrical connector. The aim of the present invention consists in providing a connecting element to a printed circuit card which is more compact with respect to the card of the prior art cited above, which connecting element makes an electrical connection between the printed circuit card and an electrical connector connectable to the connecting element possible.

[0003] The aim is obtained by means of a connecting element to a printed circuit card, according to claim 1.

[0004] The connecting element of the invention exhibits a main body having a planar development and the first terminal, the second terminal, the first tab and the second tab which originate from the same edge portion of the main body; this combination of characteristics enables having a minimum-size connecting element (and therefore more compact with respect to the known element) compatibly with the function which it is to perform.

[0005] Specific embodiments of the invention will be described in the following of the present description according to what is set out in the claims and with the aid of the appended tables of drawings, in which:

- figure 1 is a lateral view illustrating a connecting element object of the present invention, which connecting element is fixed to a printed circuit card;
- figures 2, 3, 4 are respectively a perspective view, a lateral view and a view from above of the connecting element of figure 1.

[0006] With reference to the appended tables of drawings, (1) denotes in its entirety a connecting element to a printed circuit card (2), object of the present invention.

[0007] The connecting element (1) is made of a metal material that is tin-solderable to a printed circuit card (2) and which is electrically conductive.

[0008] The connecting element (1) comprises: a main body (3), comprising a first edge portion (4) and a second edge portion (5), opposite one another; a first terminal (6) which originates from the first edge portion (4) of the main body (3) such as to engage in a first hole (not illustrated) of the printed circuit card (2); a second terminal (7) which originates from the first edge portion (4) of the main body (3) such as to engage in a second hole (not illustrated) of the printed circuit card (2); a first tab (8) which develops perpendicularly from the main body (3) such as to contact a surface of the printed circuit card (2); a second tab (9) which develops perpendicularly from the main body (3) such as to contact the surface of the printed circuit card (2); the first tab (8) and the second tab (9) developing on opposite sides with respect to the main body (3); a third terminal (10) which originates from the second edge portion (5) of the main body (3) and which is conformed such as to engage with an electrical connector (not illustrated).

[0009] The main body (3) of the connecting element (1) has a planar development, and the first tab (8) and the second tab (9) originate from the first edge portion (4) of the main body (3).

[0010] The main body (3) has a planar development, and therefore develops parallel to a plane. This ensures the compactness of the connecting element (1), in combination with the fact that the first terminal (6), the second terminal (7), the first tab (8) and the second tab (9) originate from the same first edge portion (4) of the main body (3).

[0011] The first terminal (6) and the second terminal (7) of the connecting element (1) enable realising the mechanical fixing, by soldering, of the connecting element (1) with the printed circuit card (2). Instead, the first tab (8) and the second tab (9) combine to stabilize the mechanical fixing of the connecting element (1) to the printed circuit (2).

[0012] The connecting element (1) can carry the electric current between an electrical connector connected to the third terminal (10) and the printed circuit card (2); for example, the connecting element (1) can be made equipotential to the positive pole or the negative pole of the printed circuit card (2). In this case, the surface portions of the printed circuit card (2) which are in contact with the first tab (8) and the second tab (9) will have the same electrical potential as the electrical connector.

[0013] The connecting element (1) is preferably in a single body.

[0014] The main body (3) is preferably a plate.

[0015] The first hole of the printed circuit card (2) is preferably afforded in the surface of the printed circuit card (2); likewise, the second hole of the printed circuit card (2) is preferably afforded in the surface of the printed circuit card (2).

[0016] The first terminal (6), the second terminal (7),

the first tab (8) and the second tab (9) are preferably arranged along the first edge portion (4) in the following succession: the first terminal (6), the first tab (8), the second tab (9) and the second terminal (7).

[0017] The second terminal (7) is preferably provided with a through-hole (11) such as to enable a friction coupling of the second terminal (7) with the second hole of the printed circuit card (2).

[0018] The connecting element (1) is moved towards the printed circuit card (2) in a perpendicular direction to the printed circuit card (2) (arrow X1 of figure 1). The coupling of the connecting element (1) with the printed circuit card (2) is completed when the first terminal (6) engages with the first hole, the second terminal (7) engages by friction fitting with the second hole and the first tab (8) and the second tab (9) contact the surface of the printed circuit card (2), see figure 1. The first tab (8) and the second tab (9) are dimensioned and arranged along the first edge portion (4) so as to enable the connecting element (1) to remain perpendicular with respect to the printed circuit card (2) up to completion of the soldering process (preferably a soldering by recasting).

[0019] The present invention further relates to a printed circuit card group (12) comprising the connecting element (1) and the printed circuit card (2).

[0020] The first tab (8) and the second tab (9) are preferably soldered to the surface of the printed circuit card (2) by means of surface mounting technology (SMT), wherein the first terminal (6) and the second terminal (7) are soldered to the printed circuit card (2) with a Pin in Paste modality.

[0021] The SMT technology and the PIP mode are widely known and not further described in detail.

[0022] The connecting element (1) preferably comprises a first end (13) which originates from the first edge portion (4) of the main body (3) and a second end (14) which originates from the first edge portion (4) of the main body (3) and which is opposite the first end (13); and wherein the first end (13) and the second end (14) are soldered to the surface of the printed circuit card (2) by means of surface mounted technology (SMT). The first end (13) soldered to the printed circuit card (2) and the second end (14) soldered to the printed circuit card give a still greater mechanical resistance to the fixture of the connecting element (1) to the printed circuit card (2).

[0023] In this way, the assembly and soldering operations of the connecting element (1) to the printed circuit card (2) advantageously include the smallest number of steps possible and consequently they are particularly rapid. In fact, the connecting element (1) can be coupled to the printed circuit card (2) as described above; thereafter, the group (12) comprising the connecting element (1) and the printed circuit card (2) can be inserted in an oven at a temperature for example of about 230°C; after the recasting, and once the group (12) has cooled, the connecting element (1) is soldered to the printed circuit card (2).

[0024] The above has been described by way of non-

limiting example, and any constructional variants are understood to fall within the protective scope of the present technical solution, as claimed in the following.

Claims

1. A connecting element (1) to a printed circuit card (2), **characterised in that** the connecting element (1) is made of a metal material that is tin-solderable to a printed circuit card (2) and which is electrically conductive; and **in that** it comprises:

a main body (3), comprising a first edge portion (4) and a second edge portion (5), opposite one another;

a first terminal (6) which originates from the first edge portion (4) of the main body (3) such as to engage in a first hole of the printed circuit card (2);

a second terminal (7) which originates from the first edge portion (4) of the main body (3) such as to engage in a second hole of the printed circuit card (2);

a first tab (8) which develops perpendicularly from the main body (3) such as to contact a surface of the printed circuit card (2);

a second tab (9) which develops perpendicularly from the main body (3) such as to contact the surface of the printed circuit card (2);

the first tab (8) and the second tab (9) developing on opposite sides with respect to the main body (3);

a third terminal (10) which originates from the second edge portion (5) of the main body (3) and which is conformed such as to engage with an electrical connector;

characterised in that:

the main body (3) has a planar development;

the first tab (8) originates from the first edge portion (4) of the main body (3);

the second tab (9) originates from the first edge portion (4) of the main body (3).

2. The connecting element (1) of the preceding claim, wherein the second terminal (7) is provided with a through-hole (11) such as to enable a friction coupling of the second terminal (7) with the second hole of the printed circuit card (2).
3. A printed circuit card group (12), comprising a connecting element (1) and a printed circuit card (2) according to any one of the preceding claims.
4. The group (12) of the preceding claim, wherein the

first tab (8) and the
second tab (9) are soldered to the surface of the
printed circuit card (2) by means of surface mounting
technology (SMT), wherein the first terminal (6) and
the second terminal (7) are soldered to the printed
circuit card (2) with a Pin in Paste modality.

5. The group (12) of claim 3 or 4, wherein the connect-
ing element (1) comprises a first end (13) which orig-
inates from the first edge portion (4) of the main body
(3) and a second end (14) which originates from the
first edge portion (4) of the main body (3) and which
is opposite the first end (13); and wherein the first
end (13) and the second end (14) are soldered to
the surface of the printed circuit card (2) by means
of surface mounted technology (SMT).

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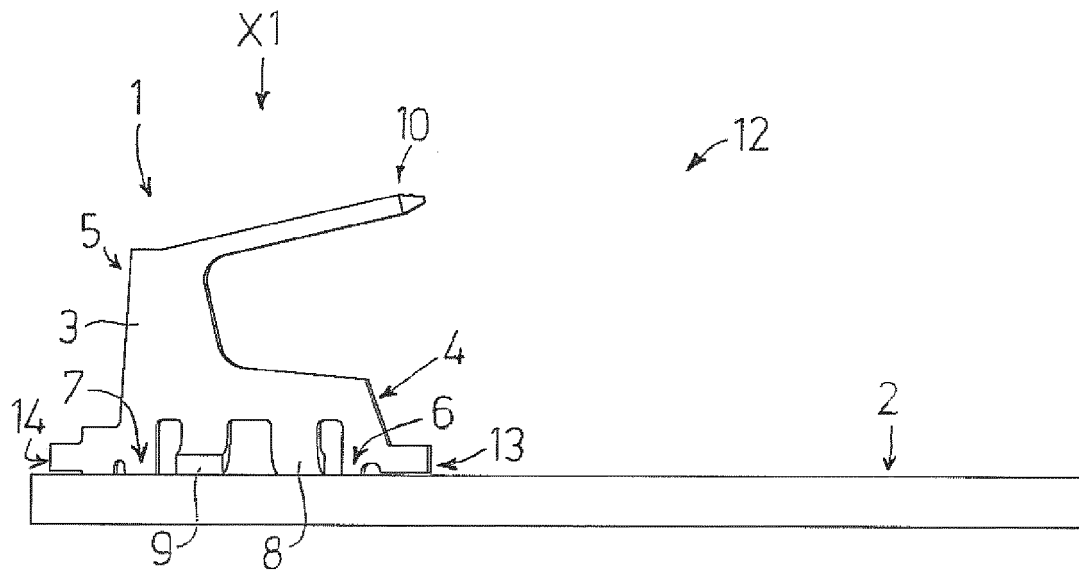


FIG 1

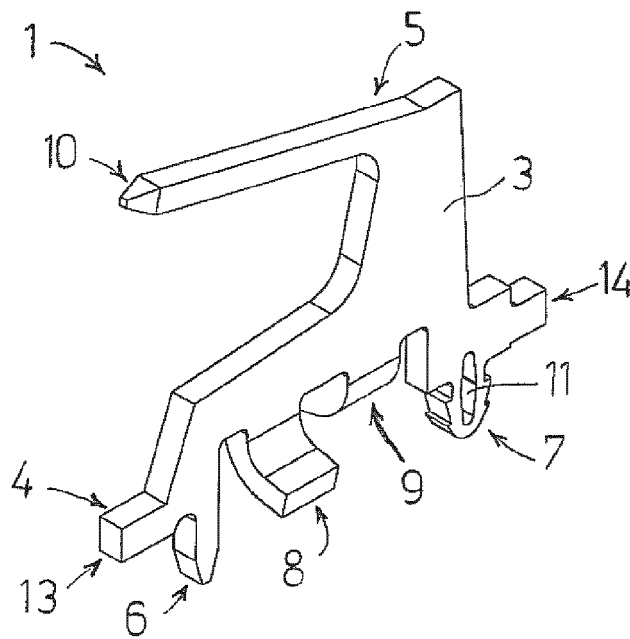
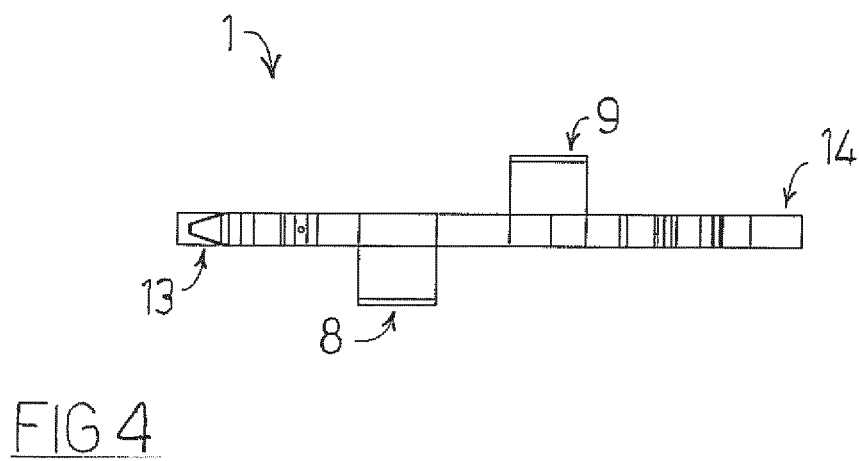
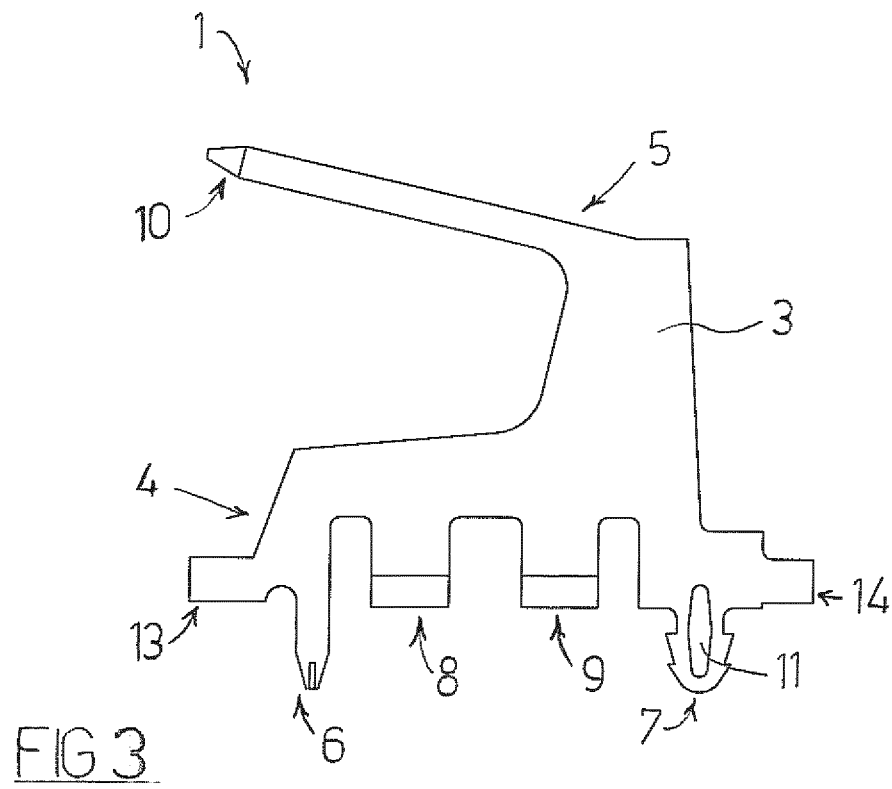


FIG 2





EUROPEAN SEARCH REPORT

Application Number
EP 14 15 6705

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
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| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
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| The Hague | | 28 April 2014 | Pugliese, Sandro |
| CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document | | | |

EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 14 15 6705

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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