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(71) Applicant:
FRAMATOME CONNECTORS INTERNATIONAL
92400 Courbevoie (FR)

(72) Inventors:
- **Le Gallic, Hervé**
  72400 Cherreau (FR)
- **Ribeau, Pascal**
  72100 Le Mans (FR)

(74) Representative:
Beetz & Partner
Patentanwälte
Steinsdorfstrasse 10
80538 München (DE)

(54) Positioning and locking method and positioning and locking device for an input/output connector and connector having such a device

(57) The present invention relates to a positioning and locking method for a connector (2) intended to be surface-mounted on a printed circuit (6).

The method according to the invention is characterized in that a positioning device (12) having a projecting part (16) which is intended to rest on the plane of the printed circuit (6) is forcibly inserted into at least a first slot (10) and a second slot (11), these slots lying on either side of the housing (4) of the connector (2).

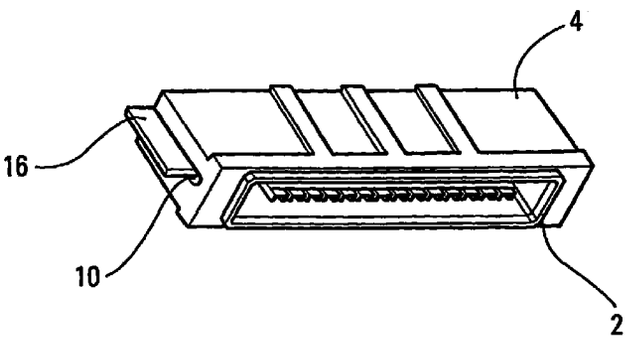

Fig. 1

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Description

[0001] The present invention relates to a positioning and locking method and to a positioning and locking device for an input/output connector.

[0002] The invention relates particularly to a positioning and locking method and to a positioning and locking device for an input/output connector used in a mobile telephone, the said device being fixed in the housing of the connector which is intended to be surface-mounted, for example on a printed-circuit board.

[0003] In this type of construction, it is necessary for all the contacts of the connector to be able to ensure a contact pressure sufficient for electrical transmission during the operation of the product, the surface-mounting of the connector and throughout the life of the device on which it is mounted, this being so sometimes under harsh handling conditions.

[0004] Thus, it has been found that, in order for this function to be effective, the bearing plane of the contacts of the connector must be coincident or at least almost coincident with the plane of the printed-circuit board (PCB). In fact, this coplanarity allows a so-called coplanarity requirement, necessary for implementation of the surface-mounting process, to be effectively met, which requirement means that any one of the contacts must lie within a maximum tolerance range relative to the bearing plane of the contacts of the connector on the printed circuit, this bearing plane thus defining the reference plane for the coplanarity.

[0005] Another constraint on the surface-mounting process comes from the fact that this tolerance range must be as small as possible. Furthermore, the dimensional constraints of the product, when printed-circuit boards intended for equipping miniaturized electronic devices such as portable telephones are involved, do not allow the contacts of the connector to be guided sufficiently accurately. As a result of the constraints described above, the bearing plane cannot be defined precisely and reproducibly, which leads to significant dispersion with regard to the coplanarity.

[0006] The object of the invention is to alleviate the drawbacks of the prior art that are described above.

[0007] According to the invention, to solve this coplanarity problem, a positioning device having a projecting part which is intended to rest on the plane of the printed circuit is forcibly inserted into a first slot and into a second slot, these slots lying on either side of the housing of the connector.

[0008] By virtue of this technique, the positioning devices position themselves relative to the known reference plane consisting of the surface on which these devices rest in their respective slots. The bearing plane of the pins of the connector is thus accurately and reproducibly defined.

[0009] Further features and advantages of the invention will emerge from the description which follows, given by way of non-limiting examples, with reference to the appended figures in which:

- Figure 1 shows a perspective view of the front face of a connector equipped with a positioning and locking device according to the invention;
- Figure 2 shows a perspective view of the rear face of the connector in Figure 1;
- Figures 3 and 4 show a plan view of the front face and of the rear face, respectively, of the connector in Figure 1;
- Figure 5 shows, diagrammatically and in partial cross section, a top plan view of the connector in Figure 1;
- Figure 6 shows diagrammatically a second embodiment of the invention.

[0010] Figures 1 and 2 show an input/output connector 2 for a mobile telephone, intended to be surface-mounted on a printed-circuit board 6 shown partially in Figure 5. The said connector 2 has contacts 8 intended for making an electrical connection with the printed circuit 6.

[0011] In order to ensure quasi-coplanarity of the bearing plane of the contacts 8 with the plane of the printed-circuit board 6, a positioning device 12 having a projecting part 16 which is intended to rest on and be soldered to the plane of the printed circuit 6 is forcibly inserted into a first slot 10 and into a second slot 11, these slots lying on either side of the housing 4 of the connector 2.

[0012] The projecting part 16 may have either a flat shape, as may be seen in Figure 5, or the shape of a sinusoidal having at least two lobes 22, 24, as illustrated in Figure 6.

[0013] Furthermore, the positioning device includes a locking means 26 which makes it possible for a plug to be fixed to the connector 2.

[0014] Thus, pulling on the plug does not affect the soldered joints insofar as the plug is essentially supported by the positioning and locking device.

[0015] In this way, the device according to the invention, because of its design, allows two functions - positioning and locking - to be carried out, which functions are normally fulfilled independently by two independent devices.

[0016] As may be seen in Figure 6, illustrating the second embodiment of the invention, the projecting parts 16 has the shape of a sinusoid having two lobes 22 and 24. Advantageously, the mid-axis Δ of the two lobes 22 and 24 is in alignment with the plane of the printed-circuit board 6 which forms the reference plane for positioning the connector.

[0017] The device according to the invention is reversible so that, by turning it through an angle of 180°, it is possible to insert it just as well in the left side slot 10 as in the right side slot 11. This makes it possible to simplify the mass production of the positioning and locking device, in order to meet the growth in the use of increas-

ingly miniaturized portable telephones.

[0018] Furthermore, because of their sinusoidal shape, the lobes 22, 24 intended to be soldered to the pads 25 on the printed circuit (this not being shown) help to form, during soldering, a meniscus which ensures excellent retention.

[0019] Of course, the device according to the invention is not limited to this application and can be used with any smart-card reader connector having contacts intended to be surface-mounted on a printed-circuit board and in which quasi-coplanarity of the bearing plane of the said contacts with the plane of the printed-circuit board is necessary.

Claims

1. Positioning and locking method for a connector (2) intended to be surface-mounted on a printed circuit (6), characterized in that a positioning device (12) having a projecting part (16) which is intended to rest on the plane of the printed circuit (6) is forcibly inserted in a first slot (10) and a second slot (11) respectively, these slots lying on either side of the housing (4) of the connector (2).

2. Positioning and locking device for a connector (2), the said connector (2) being intended to be surface-mounted on a printed circuit (6), characterized in that it has a plane part (14), intended to be forcibly inserted into a slot (10, 11) made laterally in the housing (4) of the connector (2), and a part (16) projecting outwards from the said slot (10, 11) and being intended to rest on and be soldered to the plane of the printed circuit (6).

3. Device according to Claim 2, characterized in that the projecting part (16) is flat.

4. Device according to Claim 2, characterized in that the projecting part (16) has the shape of a sinusoid having at least two lobes (22, 24).

5. Device according to one of Claims 2 to 4, characterized in that it includes a locking means (26) which allows a plug to be fixed to the connector (2).

6. Device according to Claim 5, characterized in that the sinusoid has two lobes (22, 24) having their mid-axis Δ parallel to the plane of the printed-circuit board (6) which forms the reference plane for the coplanarity.

7. Device according to one of Claims 2 to 6, characterized in that it is reversible so that, by turning it through an angle of 180°, it may be inserted into either of the lateral slots (10, 11).

8. Input/output connector (2) for a mobile telephone, having contacts (8) intended to be surface-mounted on a printed-circuit board (6) characterized in that it includes a positioning and locking device according to any one of Claims 1 to 7.

9. Portable telephone, characterized in that it includes a connector according to Claim 6.

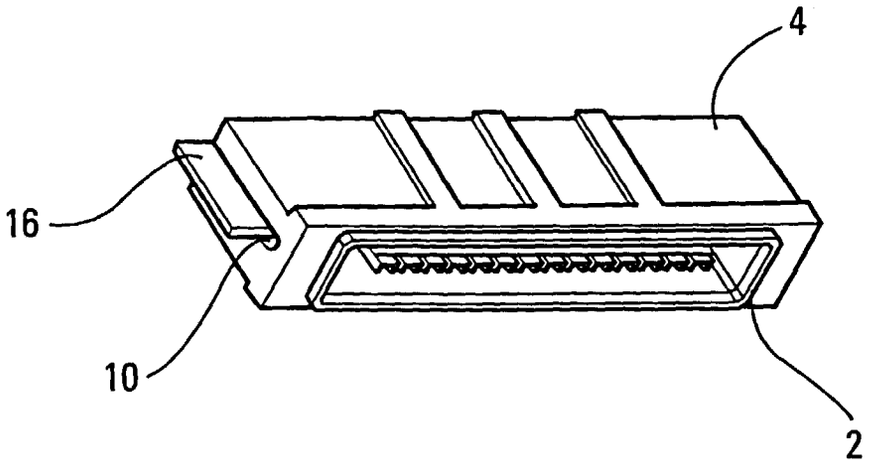

Fig. 1

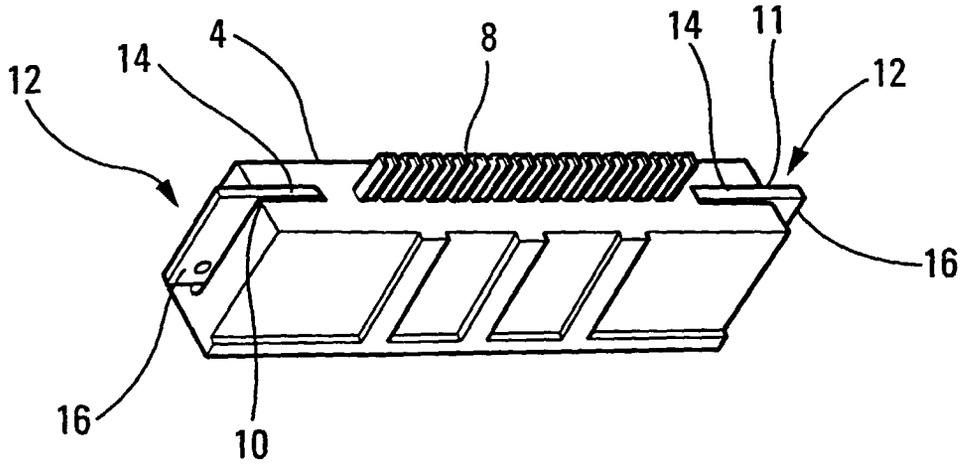

Fig. 2

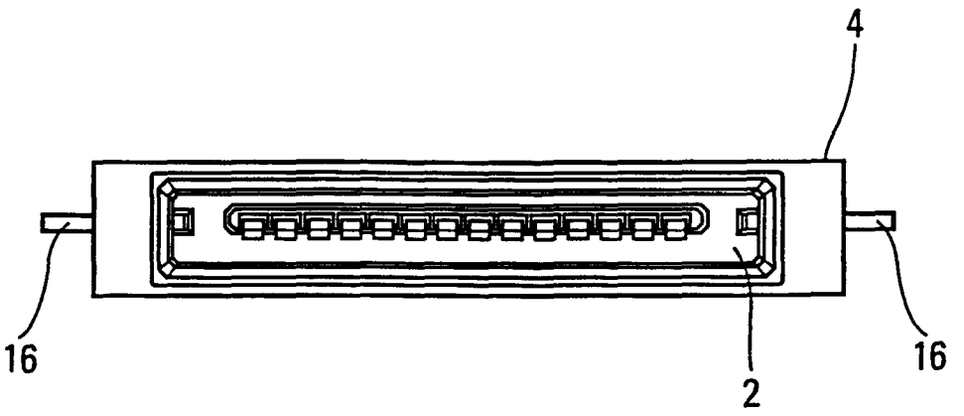

Fig. 3

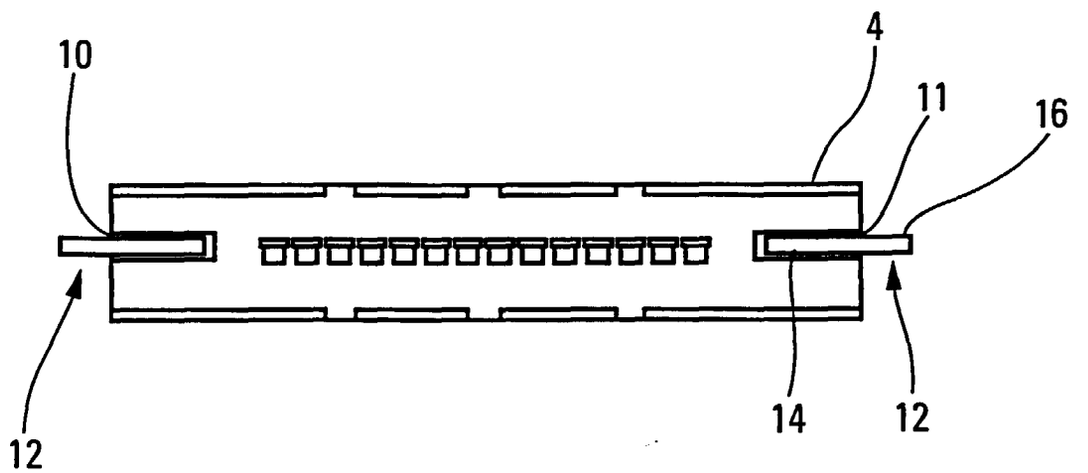

Fig. 4

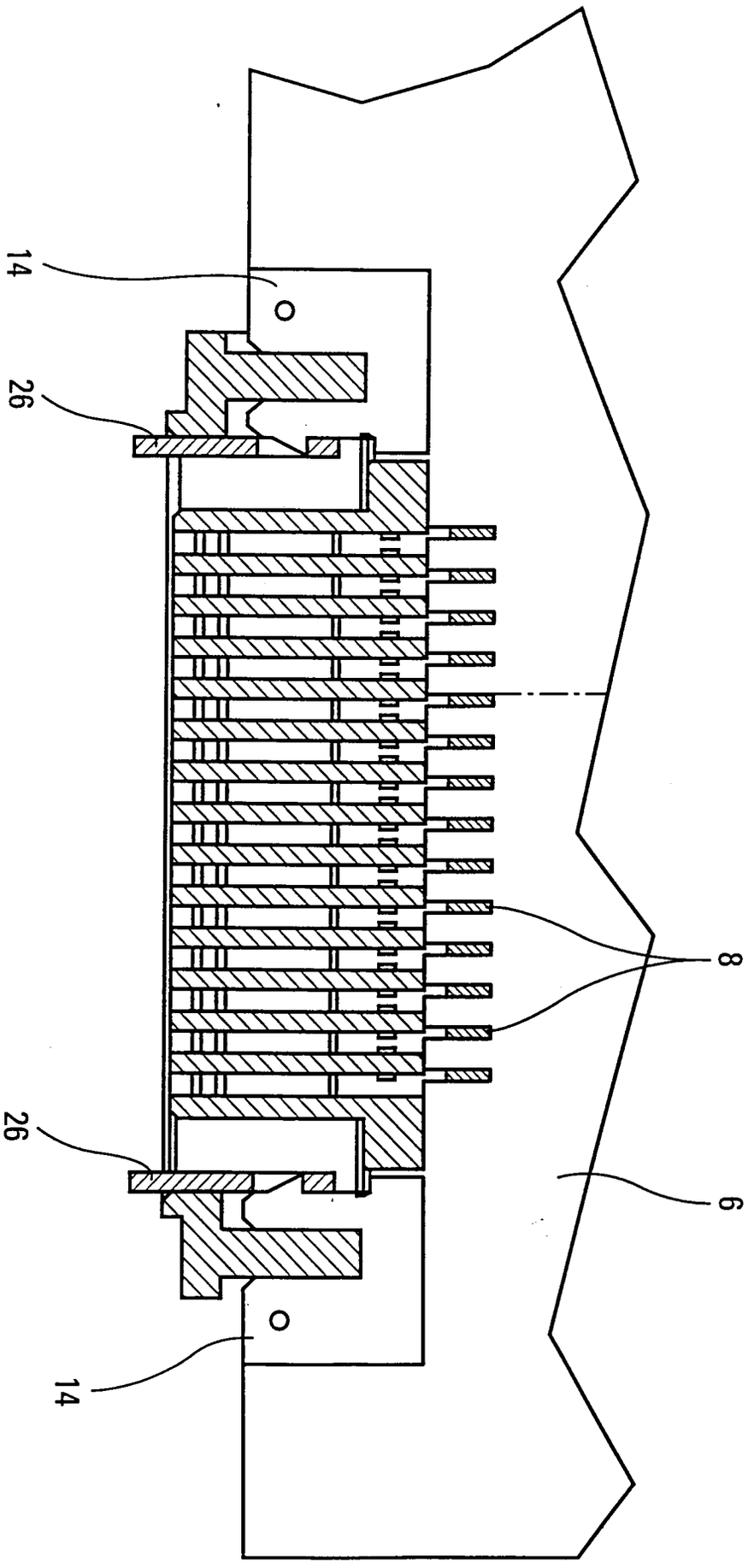

Fig. 5

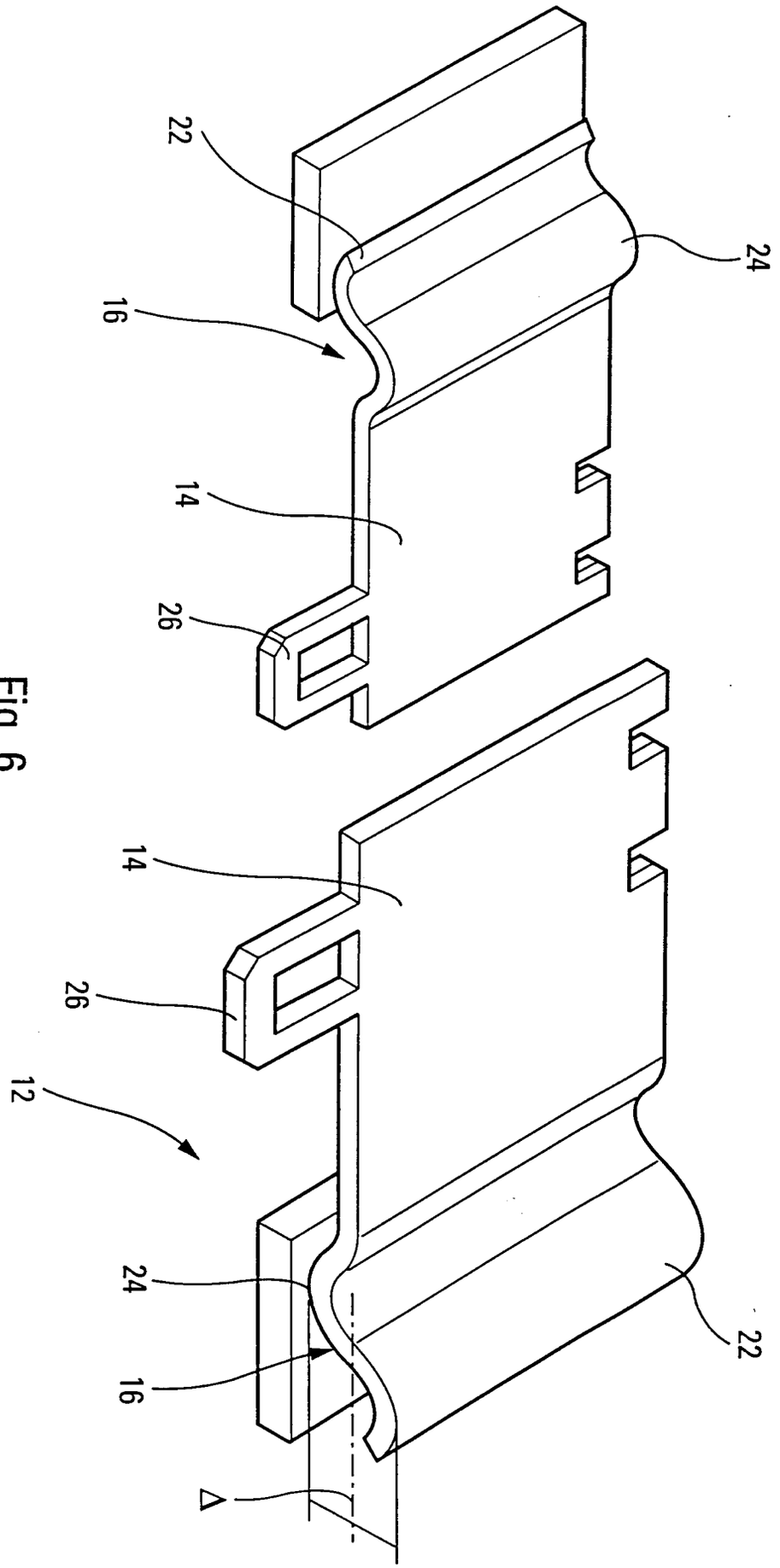

Fig. 6