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(54) **Scalable contact member for electrical connectors**

(57) The invention relates to an electrically conductive contact member (1) for an electrical connector, comprising at least one terminal portion (2) adapted to be mechanically and electrically connected in a mounting direction (G) to at least one conductor, and at least one contact portion (4) adapted to contact a mating contact portion of a mating connector. Further, the invention relates to a sheet metal blank (14) for bending an electrically

conductive contact member (1) and a set of electrically conductive contact members (1). To provide a contact element for an electrical connector, in particular, for miniature connectors, which can be customized cost effectively, the at least one terminal portion (2) comprises a base section (2a), an adjustment section (2g) and a fixing section (2b), wherein said adjustment section (2g) extends between said fixing section (2b) and said base section (2a).

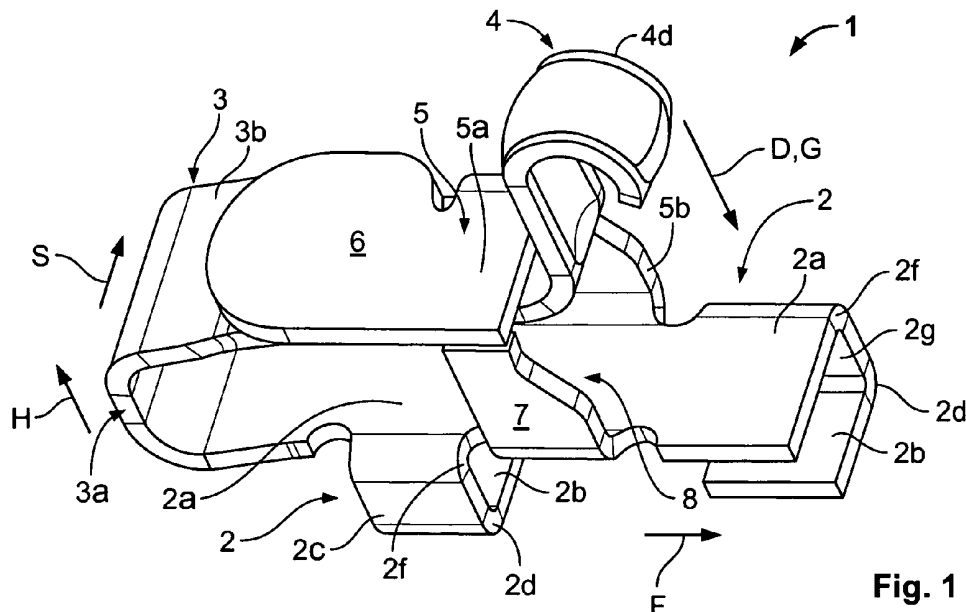


Fig. 1

Description

[0001] The invention relates to an electrically conductive contact member for an electrical connector, in particular, for a miniature connector, comprising at least one terminal portion adapted to be mechanically and electrically connected in a mounting direction to at least one conductor, and at least one contact portion adapted to contact a mating contact portion of a mating conductor.

[0002] Further, the invention relates to a sheet metal blank for bending an electrically conductive contact member and to a set of at least two electrically conductive contact members, the contact members having different outer dimensions.

[0003] Contact members of the type mentioned above are known and may be used, for example, for electrically coupling a radio frequency (RF) signal circuitry of a mobile phone to an antenna utilized to transmit and/or receive signals at designated frequencies. A typical antenna for wireless devices, for instance, a mobile phone, a smart phone, a PDA, a laptop or an MP3 player, may be assembled in the wireless device forming an integral part of the device. The antenna may be contacted by means of a contact member of the type mentioned above.

[0004] Typically, contact members of the abovementioned type are manufactured in a large scale production. Due to the common mass customization of wireless devices, the production of contact members also has to be customized to manufacture contact members having customized characteristics as customized dimensions. For adapting the contact member production to customized dimensions, manufacturing devices have to be adapted. Thus, a customized large scale production of contact members is expensive.

[0005] Therefore, the object of the present invention is to provide a contact element for an electrical connector, in particular, for miniature connectors, which can be customized more cost effectively.

[0006] This object is achieved by the present invention in that the at least one terminal portion comprises a base section, an adjustment section and a fixing section, wherein the adjustment section extends between the fixing section and the base section.

[0007] The solution according to the invention has the advantage that the dimensions of the terminal portion may be adapted by adjusting the distance between the fixing section and the base section. Thus, contact members with different dimensions may be manufactured by bending identical blanks. Preferably, customized contact members are formed from identical sheet metal blanks. For creating spring fingers which fit in a scaling range, in particular a height range of the sheet metal blanks, no additional design or calculation operations are needed. The same die may be used for manufacturing a variety of contact members. Thus, the needed time to market is decreased.

[0008] The adjustment section may connect the base section and the fixing section physically and electrically.

Preferably, the adjustment section protrudes from the base section. The adjustment section may serve to adjust the height of the terminal portion. The adjustment section can be provided with one or two bends to dispose the fixing section under the base section.

[0009] With respect to a sheet metal blank as mentioned above, the problem is solved by the present invention in that the at least one terminal portion is provided with a base section, a fixing section and an adjustment section, the fixing section and the adjustment section protruding from the base section, the adjustment section extending between the fixing section and the base section.

[0010] The adjustment section may serve as a spacer and as a support between the base section and the fixing section, to set up a predetermined distance between the base section and the fixing section when the contact member is bent.

[0011] With regard to the above mentioned set of contact members, the problem is solved in that the contact members of the set are shaped from identical sheet metal blanks.

[0012] The solution according to the invention may be combined in any way with the following further advantageous embodiments, respectively, and further improved.

[0013] According to a first advantageous embodiment of a contact member according to the invention, the fixing section can be bent or crimped substantially in mounting direction under the base section to decrease the width of the contact member, resulting in a space saving concept.

[0014] The fixing section may be adapted to be soldered onto a printed circuit board (PCB). Alternatively or additionally, the fixing section may be provided with at least one opening for screwing or clinching the contact member to a PCB or a housing. The fixing section can be formed as engaging members for generating a positive lock with a connector housing or to be press-fitted to a housing.

[0015] In a further advantageous embodiment of the present invention, the base section and the fixing section can extend substantially in parallel. Therefore, the adjustment section may be provided with a 180° bend or with two 90° bends. The 90° bends can be disposed at ends of a straight section. The adjustment section can comprise a straight section extending in mounting direction, acting as support and as mechanical and electrical connection between the base section and the fixing section. The straight section may extend substantially transversely with respect to the base section and/or the fixing section.

[0016] For a space saving design, the terminal portion can be substantially U-shaped. The base section and the fixing section may form legs of a U; the adjustment section may form the bow of a U. Depending on the adjusted height of the terminal portion, the width of the fixing section may be larger or smaller than the width of the base section.

[0017] To improve the stability of the contact member

when the contact member is positioned on a conductor, or to reinforce the mechanical and electrical connection between the contact member and a connected conductor at a mounted state, the contact member may comprise at least two terminal portions.

[0018] According to a further advantageous embodiment, the adjustment sections of the at least two terminal portions may be located at opposing ends or opposing sides of the contact member to increase the stability of the contact member. Additionally, the terminal portions may be arranged symmetrically with regard to a centre plane of the contact member,

[0019] Further, to prevent the contact member from tilting during mounting the contact member and/or to reinforce the contact member when the contact member has been affixed or soldered to a conductor, the fixing sections of the at least two terminal portions can extend in opposing directions.

[0020] In a further advantageous embodiment of a contact member according to the invention, the contact member may be shaped as a spring contact. The contact member may comprise a spring portion that electrically connects the terminal portion to the contact portion, the contact portion being supported by the spring portion movably in a displacement direction. Hence, in case the contact member is used for contacting an antenna to a wireless device, the mechanical interference of the contact portion with a counter conductor results in an elastic bias force ensuring the electrical contact between the antenna and the counter conductor, when the antenna is assembled, for example, onto a PCB of a wireless device.

[0021] To pre-tension the spring portion, the contact member can comprise a holding portion that provides a stop against which the spring leg is pressed.

[0022] For an adjustment of the height of the contact portion, the contact portion may have a height adjustment span within which the contact portion can be bent back with respect to the terminal portion. By bending back the contact portion, the position of a contact clip at the contact portion can be adjusted. The contact tip may be located at the contact portion, at a face pointing against the displacement direction, or against a mating direction in which the contact member can be mated to a counter contact member.

[0023] The contact portion may have a middle portion protruding against the displacement direction and an end portion being bent back in displacement direction. Dependent on the aimed height of the contact portion, sections of the height adjustment span may be assigned to the middle portion and/or to the end portion of the contact portion while the contact member is bent. For obtaining a maximum height of the contact portion, the adjustment span may be fully incorporated into the middle portion. To obtain a minimum height of the contact portion, the height adjustment span can be formed to a part of the end portion.

[0024] In a further advantageous embodiment of a con-

tact member according to the present invention, the contact portion may comprise a bulge which is adapted to form a contact tip and which extends along the full length of the contact portion. In particular, the bulge may overlap the height adjustment span to ensure that at least a portion of the bulge is disposed at a predetermined position of the contact tip.

[0025] In a further advantageous embodiment of a sheet metal blank for a contact member according to the present invention, the contact portion may comprise a height adjustment span within which the contact portion can be bent back with respect to the terminal portion to adjust the contact height.

[0026] To not effect the spring portion when the terminal portions are customized or scaled, the at least one fixing section and the at least one adjustment section may extend transversally to a forward direction.

[0027] In a further advantageous embodiment of the set according to the invention, the set may comprise at least two contact members according to the present invention, which are formed from identical sheet metal blanks as described above, wherein at least one of the at least two contact members has a contact height and/or a terminal height which differs from the contact height and/or from the terminal height of the other contact member.

[0028] The invention will be described hereinafter in greater detail and in an exemplary manner using advantageous embodiments and with reference to the drawings. The described embodiments are only possible configurations in which, however, the individual features as described above can be provided independently of one another or can be omitted. In the drawings:

Fig. 1 is a schematic perspective view of a first exemplary embodiment of a contact member according to the invention;

Fig. 2 is a schematic side view of the embodiment of Fig. 1;

Fig. 3 is a schematic top view of the embodiment of Figs. 1 and 2;

Fig. 4 is another schematic side view of the embodiment of Figs. 1 to 3;

Fig. 5 is a schematic bottom view of the embodiment of Figs. 1 to 4;

Fig. 6 is a schematic perspective view of a second embodiment of a contact member according to the present invention;

Fig. 7 is a schematic side view of the second embodiment according to Fig. 6;

Fig. 8 is a schematic top view of the second embod-

iment according to Figs. 6 and 7;

Fig. 9 is another schematic side view of the second embodiment according to Figs. 6 to 8;

Fig. 10 is a schematic bottom view of the second embodiment according to Figs. 6 to 9;

Fig. 11 shows schematic side views of both embodiments according to Fig. 1 to 10;

Fig. 12 is a schematic top view of a sheet blank for bending a contact member according to the first or to the second embodiment.

[0029] First, a contact member 1 configured according to the invention will be described with reference to Fig. 1, which shows a first embodiment of a contact member 1 having an increased height.

[0030] The contact member 1 is made of an electrically conductive material for example metal, in particular, stainless steel. Preferably, the contact member 1 is bent from one piece of stamped sheet metal, in particular from a sheet blank as shown in Fig. 11. The contact member 1 comprises two terminal portions 2, a spring portion 3, a contact portion 4 and a holding portion 5.

[0031] The terminal portions 2 are adapted to be mechanically and electrically connected to at least one conductor, for example a conductor on a printed circuit board, in a mounting direction G. The terminal portions 2 each have a base section 2a and a fixing section 2b, wherein the fixing section 2b is bent back from the base section 2a. The terminal portions 2 are arranged successively in a forward direction F. A first terminal portion 2 is located adjacent to the spring portion 3, a second terminal portion 2 is disposed at an end of the contact member 1 pointing in forward direction F. The fixing section 2b of the first terminal portion 2 is bent back transversely to the forward direction F and in the direction of the holding portion 5. The fixing section 2b of the second terminal portion 2 is bent back in an opposite direction, transversely to the forward direction F and away from the holding portion 5.

[0032] Both terminal portions 2 comprise an adjustment section 2g which extends between the base section 2a and the fixing section 2b. The adjustment sections 2g extend in a direction H, transversely to the forward direction F, and provide a height adjustment. The adjustment sections are framed by bends 2d, 2f. Dependent on the bends 2d, 2f of the terminal portions 2, in particular, the position of a bend 2d, the distance between the base section 2a and an underlying soldered conductor or affixed printed circuit board or housing can be adjusted. Both the fixing sections 2b and the base sections 2a are shaped substantially planar. They extend in parallel to the forward direction F and transversely to the mounting direction G. The mounting direction G runs parallel to a displacement direction D in which the contact portion 4 may be displaced when the contact member 1 has mated

with a counter connector. The displacement direction D may extend in parallel with the mounting direction G as shown in Fig. 1, or transversely or perpendicular to the mounting direction G.

[0033] The spring portion 3 electrically connects the terminal portions 2 to the contact portion 4. The contact portion 4 is supported by the spring portion movably in displacement direction D. The mechanical interference of the contact portion 4 with a counter conductor (not shown) results in an elastic bias force. This bias force ensures the electrical contact between the contact portion 4 and a counter conductor, when a connector provided with a contact member 1 according to the invention is assembled, for example, onto a PCB of a wireless device. The spring portion 3 comprises a spring bend 3a and a spring leg 3b which is located between the spring bend 3a and the contact portion 4.

[0034] The contact portion 4 extends against displacement direction D to provide a protruding mechanical and electrical contact for a mating connector. To form a rounded contact surface, the contact portion 4 is formed from a tongue or strip of sheet metal to a substantially U-shaped or hook-shaped form. A bow-shaped or arc-shaped section of the contact portion 4 forms a convexly-shaped contact face, which points substantially against the displacement direction D. To allow for elastically displacing the contact portion 4 when a counter contact is applied onto the contact portion 4, the contact portion 4 is resiliently supported and elastically biased by the spring portion 3.

[0035] The holding portion 5 serves for biasing the spring portion 3. The holding portion 5 extends from the terminal portions 2 against the displacement direction D and clamp-like engages behind the spring portion 3. The holding portion 5 comprises a stop 5a, at which the spring portion 3 abuts, and a support section 5b, which physically connects the stop 5a to the terminal portion 2. The stop 5a serves to restrain the spring leg 3b, which at an unmated state of the contact member 1 is pressed against or biased by the stop 5a. The support section 5b extends between the stop 5a and the terminal portions 2 and rigidly connects the stop 5a to a bridge portion 8. The bridge portion 8 is situated between both terminal portions 2 and, in displacement direction D, on a common level with the base sections 2a. The bridge portion 8 extends between and physically connects the base sections 2a.

[0036] From the stop 5a, a substantially planar picking platform 6 protrudes against the forward direction F and substantially in the direction of the spring bend 3a. The picking platform 6 provides a substantially planar picking face, which faces against the displacement direction D and allows for coupling the contact member 1 to a picking head of a vacuum picker.

[0037] A restraining portion 7 as well as the support section 5b serve to support and/or to guide the spring portion 3, when external forces act onto the spring portion transversely to the deflection direction D.

[0038] Fig. 2 is a schematic side view of the contact member of Fig. 1. The contact portion 4 is provided with a bulge 4a which protrudes against the displacement direction D and provides a convexly rounded contact face. The bulge 4a is located at the convexly-shaped side of the substantially shaped contact portion 4, which faces against displacement direction D. An annular point 4b of the bulge 4a may serve as contact tip 4b. Opposing the bulge 4a, the contact portion 4 has an indentation 4c, which is punched into the contact portion 4 to form the bulge 4a.

[0039] The contact member 1 has an overall height H1, which equals the sum of the heights H2, H3 and H4. The height H2 is defined by a main body 9 of the contact member 1, which comprises the base sections 2a of the terminal portions 2 and the spring portion 3. Thus, the height H2 is defined by the spring characteristics of the spring portion 3. Above the main body 9, the contact portion 4 extends against the displacement direction D and defines a contact height H3. At the bottom of the contact member 1, the distance between the main body 9 and a conductor located under the contact member 1 is defined by the terminal height H4. When a contact member 1 according to the present invention is scaled, the spring characteristics remain preferably unchanged, whereas the contact height H3 and the terminal height H4 may be customized.

[0040] In particular, the contact height H3 and the terminal height H4 can be adjusted to scale the contact member 1. Based on an invariable sheet metal blank, which is shown in Fig. 11, the position of the contact bend 4d of the contact portion 4 may be varied to obtain a predetermined contact height H3. Correspondingly, the position of the bends 2d of the terminal portions 2 can be varied to obtain a predetermined terminal height H4.

[0041] Dependent on the position of the contact bend 4d at the spring portion 4, the length ratio of a middle portion 4e and an end portion 4f varies. Thus, the length h of the end portion 4f is increased or decreased, whereas the contact height H3 is decreased or increased.

[0042] Correspondingly, the terminal height H4 may be adapted by changing the position of the bends 2d. An increased height H4 results in decreased widths of W1, W2 of the fixing sections 2b.

[0043] Fig. 3 is a top view of the first embodiment of a contact member 1. The contact portion 4 and the spring portion 3 extend symmetrically with respect to a common plane of symmetry M, which extends in displacement direction D. Accordingly, the fixing sections 2b are arranged symmetrically with respect to the plane of symmetry M.

[0044] The picking platform 6 faces against the displacement direction D. For mating the contact member 1 with a picking device, the picking platform 6 comprises a planar picking face 6a. The picking face 6a provides a picking area.

[0045] Fig. 4 is a schematic side view of a contact member 1 according to the present invention at a resting

position. At the resting position, the spring leg 3b presses against the stop 5a. The stop 5a is provided with a stop surface 5c which faces the spring leg 3b in displacement direction D. The spring leg 3b comprises a parallel section 3c, which extends parallel to the substantially planar stop surface 5c. At the resting position, the parallel section 3c of the spring leg 3b abuts the stop surface 5c. Against the forward direction F, the spring leg 3b continues into an inclined section 3d. The inclined section 3d reaches the spring bend 3a and the parallel section 3c. In forward direction F, the distance in displacement direction D between the inclined section 3d and the holding portion 5 decreases.

[0046] The contact portion 4 comprises a height adjustment span 4g within which the contact portion 4 can be bent back with respect to the terminal portion 2 to adjust the contact height H3. Dependent on the position of the contact bend 4d, a part of the height adjustment span 4g is incorporated to the middle portion 4e and another part of the height adjustment span 4g is incorporated into the end portion 4f. Thus, the length h of the end portion 4f is increased or decreased when the position of the contact bend 4d is modified, whereas the contact height H3 is contrarily decreased or increased.

[0047] The contact portion 4 is provided with a bulge 4a which extends over the whole length of the contact portion 4. Thus, when the contact portion 4 is bent to obtain chosen dimensions, in particular, to obtain a chosen contact height H3, it is assured that at least a section of the bulge 4a covers the area of the contact portion 4 which physically contacts a counter contact or which forms the contact tip 4b.

[0048] The terminal portions 2 have the same height H4, but different lengths L1 and L2. The length L2 of the terminal portion 2 at the end of the contact member 1 pointing in forward direction F is larger than the length L1 of the second terminal portion 2. Due to the enlarged length L2, the fixing section 2b is increased in compliance with the location of the contact portion 4.

[0049] Fig. 5 is a schematic bottom view of a contact member 1 according to the invention. The fixing sections 2b extend from opposing sides of the contact member 1 and perpendicularly to the displacement direction D. The width W1 of one fixing section 2b corresponds to the width W2 of the other fixing section 2b. Both fixing sections 2b overlap the plane of symmetry M transversely to the forward direction F. Thus, it is assured that the contact member 1 does not tilt when it is positioned on a conductor for soldering. Both fixing sections 2b have a rectangular shape which defines seat areas 2b. The seat areas 2b provide substantially planar faces pointing in displacement direction D.

[0050] Figs. 6 to 10 show a second embodiment of a contact member 1 according to the present invention, and the same reference numerals have been used. Since most of the details illustrated therein are identical to the first embodiment, only the differences thereto will be described in more detail.

[0051] The second embodiment of the contact member 1 can also be bent from a sheet metal blank according to Fig. 11, which is identical to the sheet metal blank used for forming the first embodiment of Figs. 1 to 5. For scaling the heights H4 and H3 of the contact member 1, the bends 2d of the terminal sections 2 are displaced against the displacement direction D and located adjacent to the bends 2f. The contact bend 4d of the spring portion 4 is displaced in displacement direction D.

[0052] As can be seen in Fig. 7, the displacement of the bends 2d and 4d results in a reduction of the overall height H1. By displacing the contact bend 4d in displacement direction D, the end portion 4f is elongated while the middle portion 4e is shortened. By displacing the bend 2d against displacement direction D, the terminal height H4 is shortened.

[0053] The displacement of the bend 2d can be limited to a maximum value, at which the bend 2d abuts a bend 2f of the terminal portion 2. Further, at a maximum displacement of the bend 2d, the width W1 of the fixing section 2b may correspond to the overall width W of the contact element 1.

[0054] Figs. 6 to 10 may show a contact member 1 at a minimum overall height H1. As shown in Fig. 8, the fixing section 2b at the end pointing in forward direction F overlaps the base section 2a. The fixing section 2b which is located adjacent to the spring portion 3 overlaps the spring leg 3b transversely to the displacement direction D. Both fixing sections 2b do not extend over the overall width W. As shown in Fig. 10, the width W1 and W2 of the fixing sections 2b correspond to the overall width W of the contact member 1.

[0055] Fig. 9 is a schematic side view of a contact member 1 with a shortened overall length H1. As the contact height H3 has been shortened, the height adjustment span 4g is incorporated into the end portion 4f of the contact portion 4. The incorporation of the height adjustment span 4g results in a spare length E, which is bent back in displacement direction D.

[0056] Fig. 11 shows side views of the first and the second embodiment of a contact member 1 which are provided with different dimensions. The contact height H3 may be modified within a dimension range R1, the terminal height H4 may be modified within a dimension range R2. Thus, basing on a top spring level 10 and a bottom spring level 11, which may be predefined by the dimensions of the spring portion 3, a tip level 12 and a fixing level 13 may be scaled independently to adapt the contact member 1 to different applications.

[0057] Fig. 12 shows a sheet metal blank 14 according to the present invention. The identical sheet metal blank 14 is used to form both embodiments of a contact member described above. Hence, the same reference numerals are used.

[0058] The sheet metal blank 14 comprises, as well as the contact member 1, two terminal portions 2 and a contact portion 4. The contact portion 4 is physically and electrically connected to the terminal portions 2 by a

spring portion 3. Between the terminal portions 2 extends a bridge portion 8 from which the holding portion 5 and the restraining section 7 protrude in opposite directions.

[0059] The terminal portions 2 are each provided with a base section 2a, a fixing section 2b and an adjustment section 2g. The fixing sections 2b and the adjustment sections 2g protrude from the base sections 2a. Each adjustment section 2g extends between a fixing section 2b and a base section 2a. The adjustment sections 2g serve to adjust the height of the terminal portions 2. Dependent on the objective height of the terminal portion 2, an adjustment section 2g can be incorporated into the fixing section 2b or arranged between the bends 2d, 2f when the contact member is bent. Thus, the adjustment sections 2g provide the fixing sections 2b with an additional length. The dimension of the additional length corresponds to the height dimension which can be added to the height of the terminal portion 2, when the contact member 1 is scaled to an increased height.

[0060] The contact portion 4 is formed as an elongated strip which extends from the spring portion 3. The contact portion 4 comprises a height adjustment span 4g. Within the height adjustment span 4g the bend 4f (see Fig. 4, Fig. 9) may begin. Starting from a predetermined length of the adjustment span 4g, which may correspond to an objected scale factor, the contact portion 4 can be bent back with respect to the terminal portion 2 or in displacement direction D to adjust the height of the contact portion 4. Thus, the position of a contact tip 4b, which can be directed against a mating direction or against the displacement direction D, can be adapted. Depending on from where the contact portion 4 is bent, the adjustment span may be incorporated into a middle portion 4e or into a bent portion 4f (see Fig. 4, Fig. 9) of the contact member 1.

[0061] Within a set of at least two contact members 1, which are formed from identical sheet metal blanks 14, at least one of the at least two contact members 1 can have a contact height H3 and/or a terminal height H4 which differs from the contact height H3 and/or from the terminal height H4 of at least one other contact member 1.

[0062] As the contact member is adapted to be applied to miniature connectors, the maximum overall height H1 of the contact member may be between 2 mm and 3 mm. The overall length of the contact member may be less than 3,5 mm and the overall width less than 1 mm. The overall width of the contact portion can be about 0,5 mm. The widths W1, W2 of the fixing sections may be between 0,65 mm and 0,95 mm.

[0063] The preload force, which acts between the spring leg and the holding portion, can be about 0,3 - 0,5 N. At a maximum deflection of the spring portion, the preload force or the resulting contact force can increase up to about 1 N or up to more than 1 N.

Claims

1. Electrically conductive contact member (1) for an electrical connector, comprising at least one terminal portion (2) adapted to be mechanically and electrically connected in a mounting direction (G) to at least one conductor,
and at least one contact portion (4) adapted to contact a mating contact portion of a mating connector, **characterized in that** the at least one terminal portion (2) comprises a base section (2a), an adjustment section (2g) and a fixing section (2b), wherein said adjustment section (2g) extends between said fixing section (2b) and said base section (2a).
2. Contact member (1) according to claim 1, **characterized in that** the fixing section (2b) is bent or crimped substantially in mounting direction (G) under the base section (2a).
3. Contact member (1) according to claim 1 or 2, **characterized in that** the base section (2a) and the fixing section (2b) extend substantially in parallel.
4. Contact member (1) according to one of claims 1 to 3, **characterized in that** the terminal portion (2) is substantially U-shaped.
5. Contact member (1) according to one of claims 1 to 4, **characterized in that** the contact member (1) comprises at least two terminal portions (2).
6. Contact member (1) according to one of claims 1 to 5, **characterized in that** the adjustment sections (2g) of the at least two terminal portions (2) are located at opposing ends of the contact member (1).
7. Contact member (1) according to one of claims 1 to 6, **characterized in that** the fixing sections (2b) of the at least two terminal portions (2) extend in opposing directions.
8. Contact member (1) according to one of claims 1 to 7, **characterized in that** the contact member (1) comprises a spring portion (3) that electrically connects the terminal portion (2) to the contact portion (4), the contact portion (4) being supported by the spring portion (3) movably in a displacement direction (D).
9. Contact member (1) according to one of claims 1 to 8, **characterized in that** the contact member (1) comprises a holding portion (5) that provides a stop (5a) against which the spring leg (3b) is pressed.
10. Contact member (1) according to one of claims 1 to 9, **characterized in that** the contact portion (4) has a middle portion (4e) protruding against a displacement direction (D) and an end portion (4f) being bent back in displacement direction (D).
11. Contact member (1) according to one of claims 1 to 10, **characterized in that** the contact portion (4) comprises a bulge (4a) which is adapted to form a contact tip (4b) and which extends along the full length of the contact portion (4).
12. Sheet metal blank (14) for bending an electrically conductive contact member (1) according to one of claims 1 to 12, comprising at least one terminal portion (2) and at least one contact portion (4), **characterized in that** the at least one terminal portion (2) is provided with a base section (2a), a fixing section (2b) and an adjustment section (2g) extending between the fixing section (2b) and the base section (2a), the fixing section (2b) and the adjustment section (2g) protruding from the base section (2a).
13. Sheet metal blank (4) according to claim 12, **characterized in that** the contact portion (4) comprises a height adjustment span (4g) within which the contact portion (4) can be bent back with respect to the terminal portion (2) to adjust the contact height (H3).
14. Sheet metal blank (4) according to claim 13, **characterized in that** the at least one fixing section (2b) and the at least one adjustment section (2g) extend transversally to a forward direction (F).
15. Set of at least two electrically conductive contact members (1) according to any one of claims 1 to 11, the contact members having different outer dimensions, **characterized in that** the contact members (1) of the set are shaped from identical sheet metal blanks.

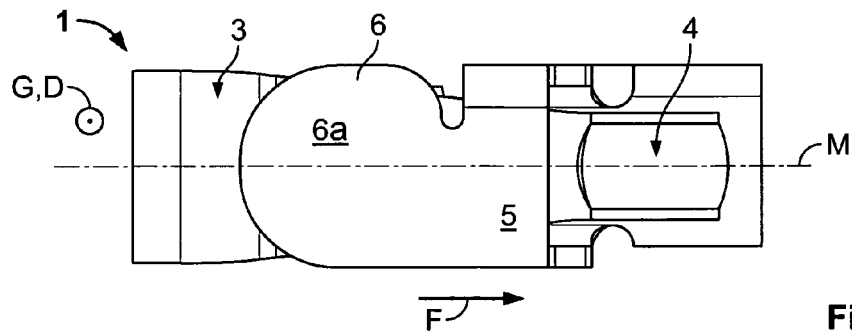


Fig. 3

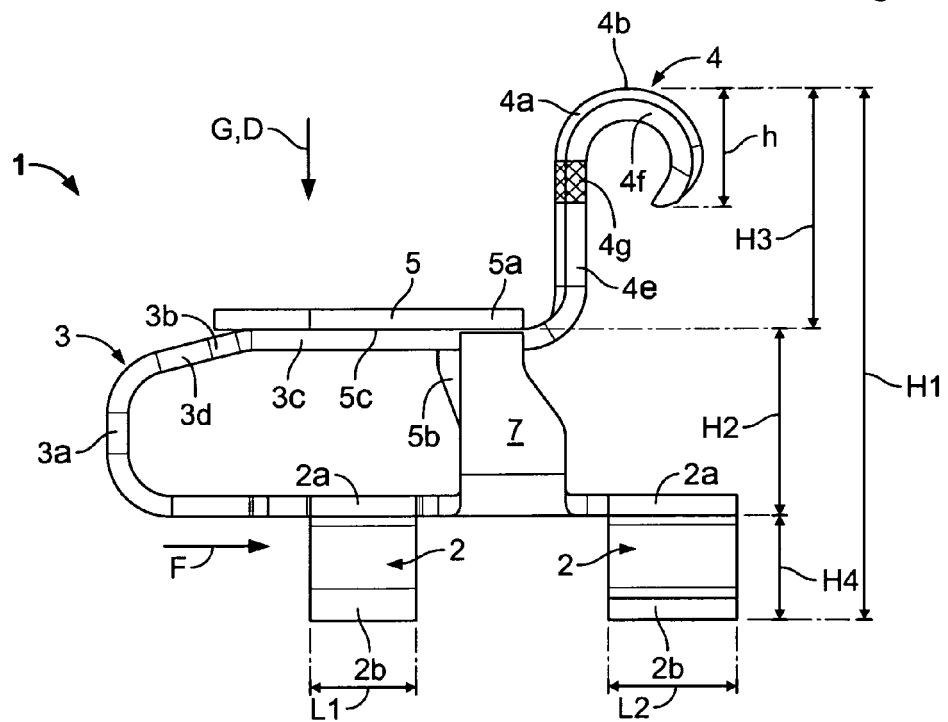


Fig. 4

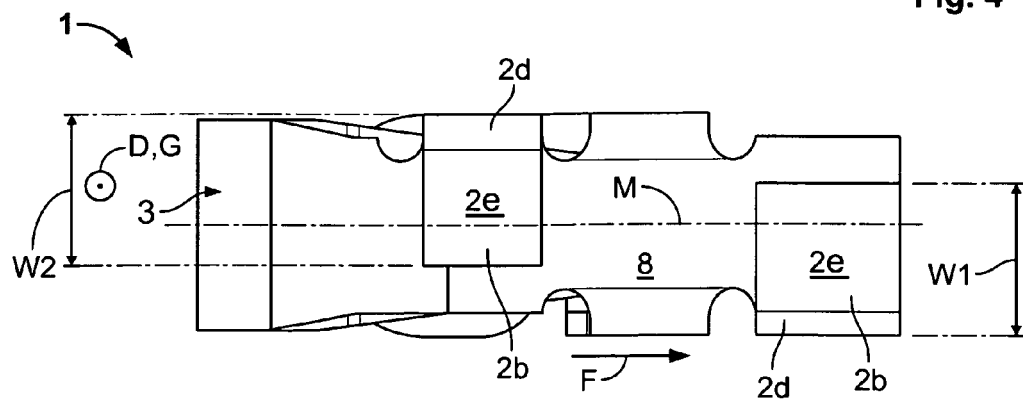


Fig. 5

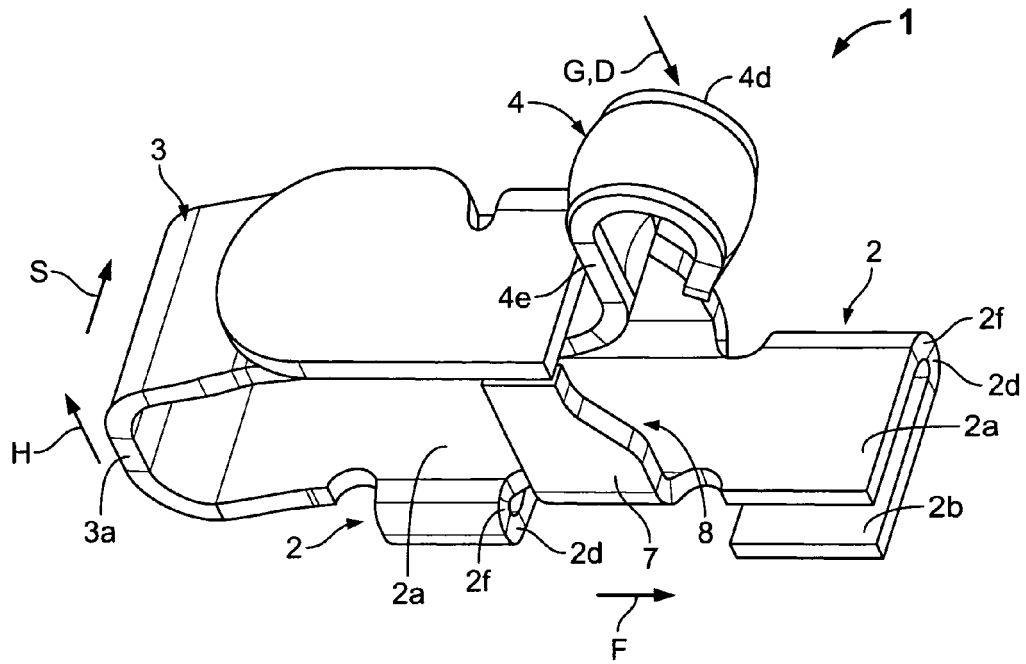


Fig. 6

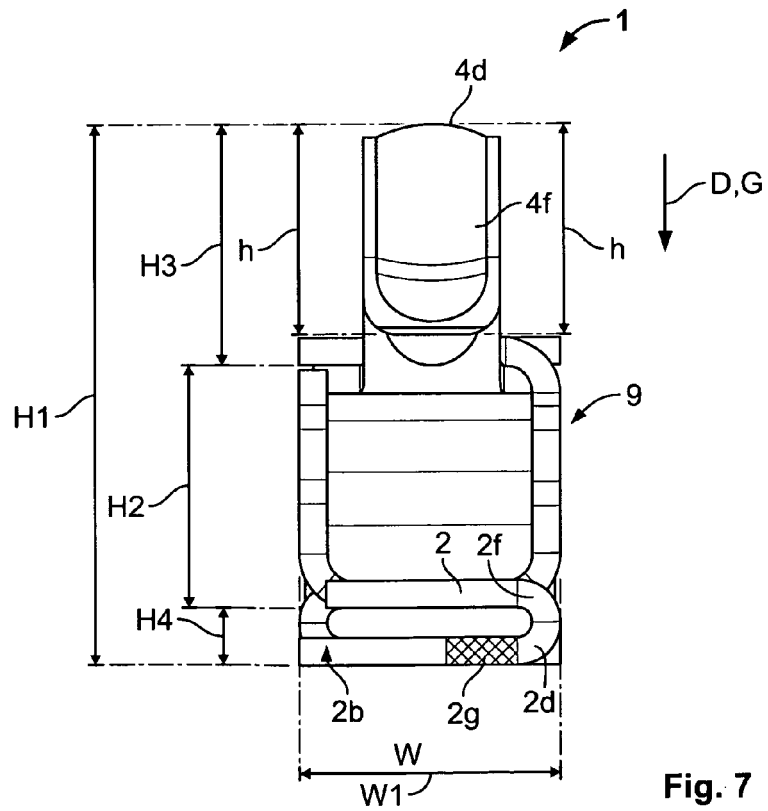


Fig. 7

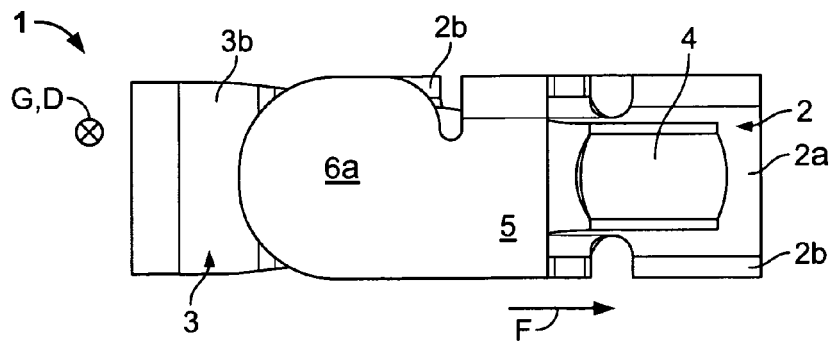


Fig. 8

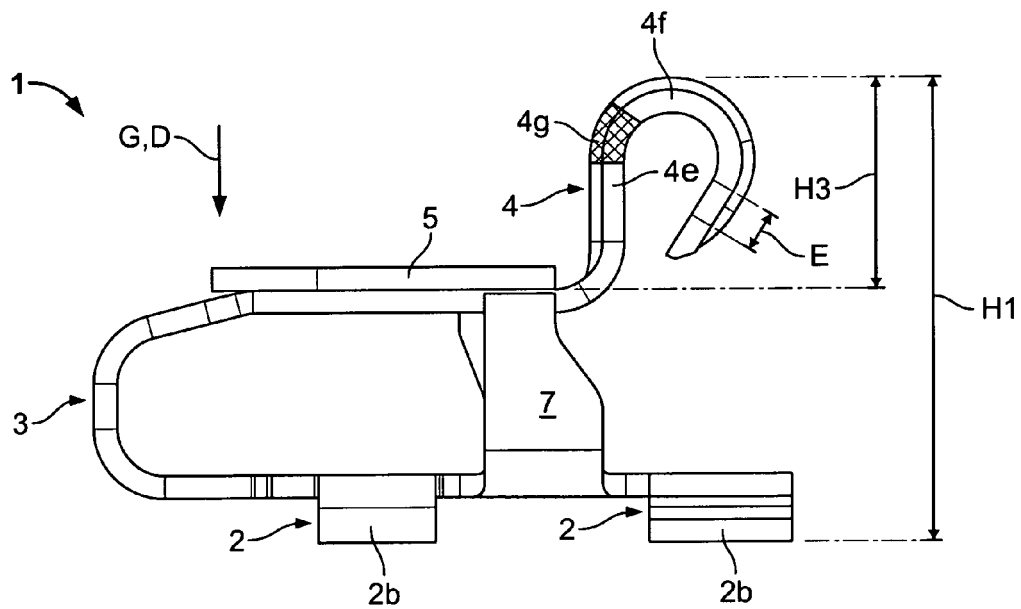


Fig. 9

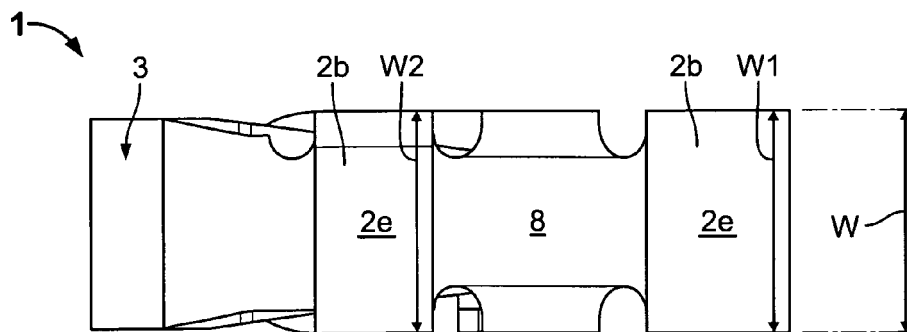


Fig. 10

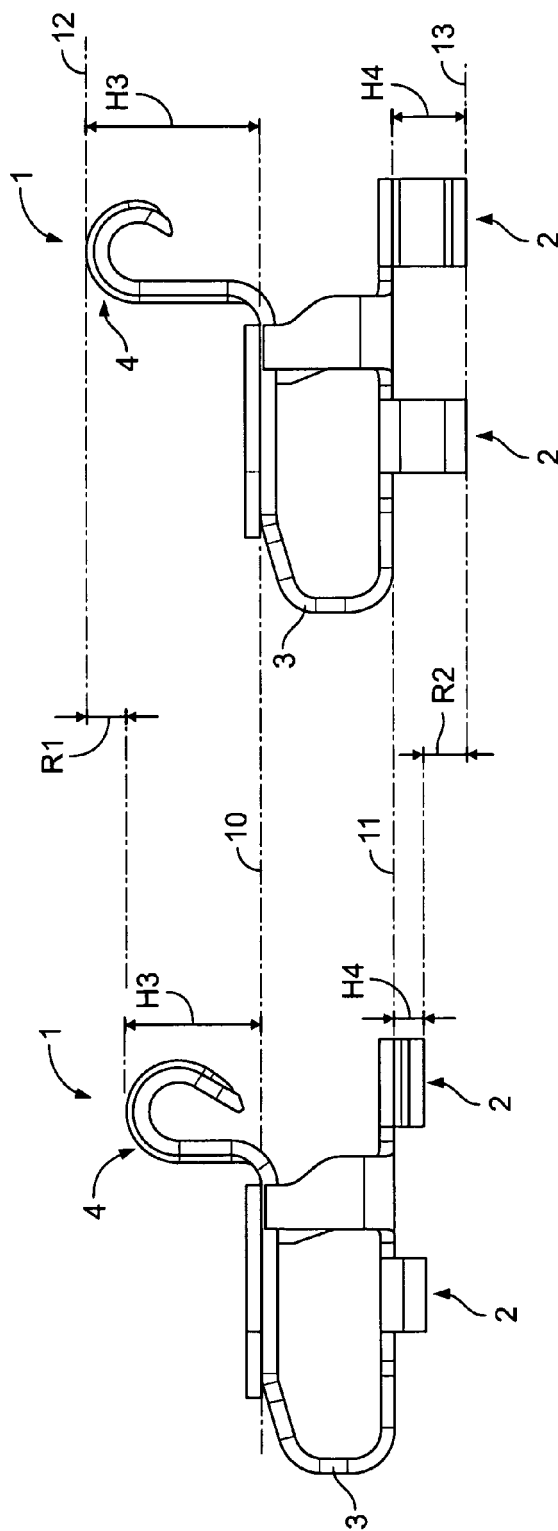


Fig. 11

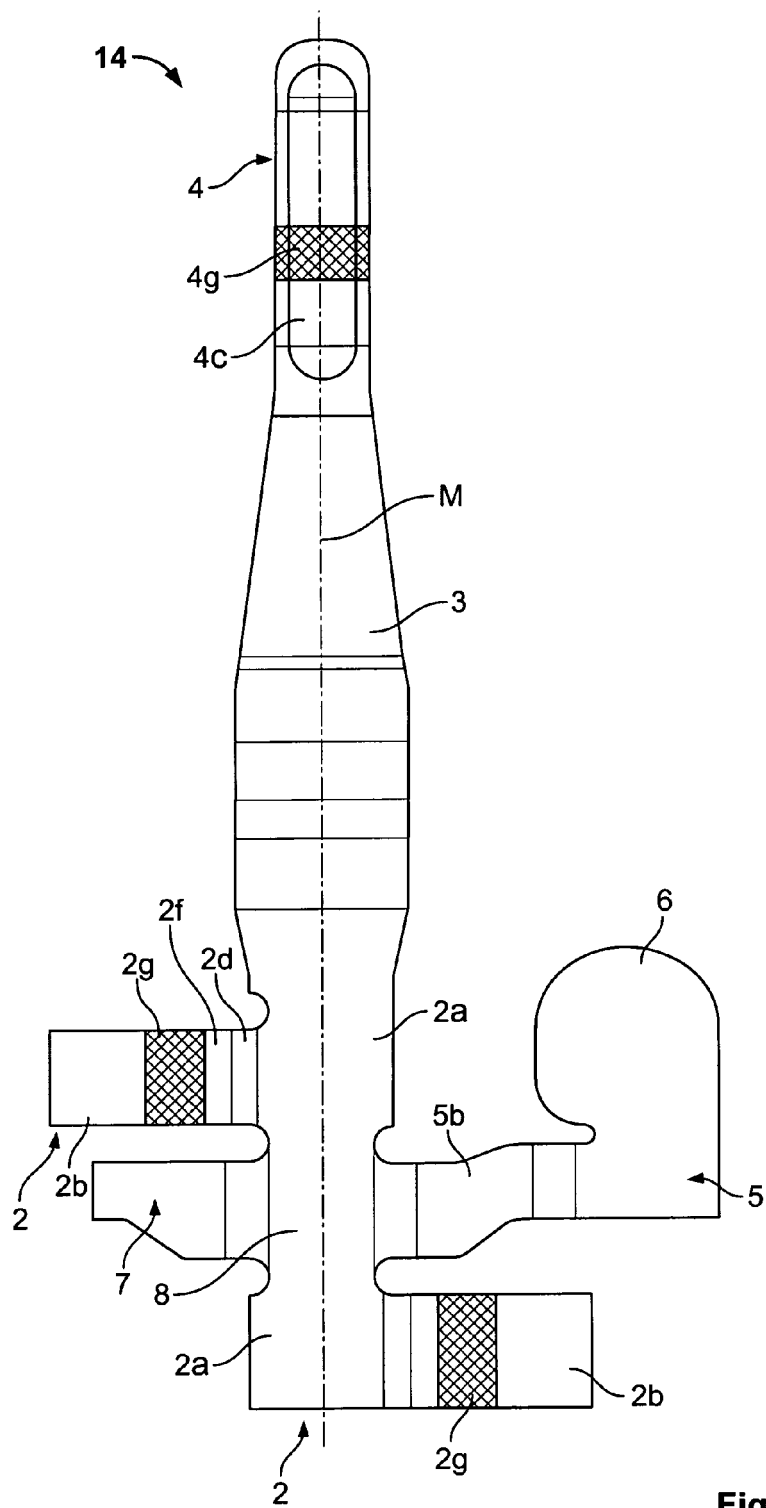


Fig. 12



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