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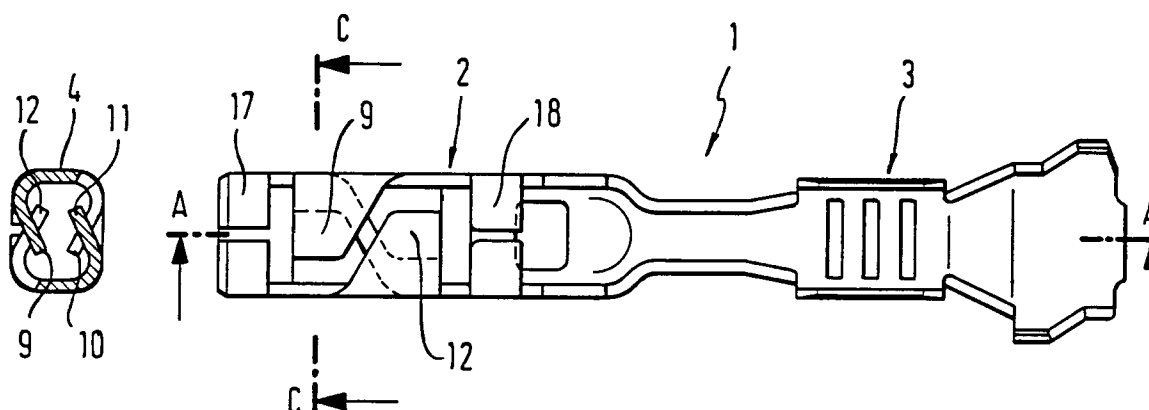
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(54) **Plug-in connector sleeve**

(57) Plug-in connector sleeve (1) having a plug-in region (2) and a conductor connection region (3), the plug-in region having a box-shaped housing (4) with two side walls (5, 6), a floor (7) and a roof (8), at least one contact segment (9 to 13) projecting into the housing in the roof region and in the floor region, in each case. In the direction of insertion, the plug-in connector sleeve firstly has on the first side wall (5) a contact segment (9) in the roof region, which projects inwards with its free

end (13), and a contact segment (11) in the floor region, which projects inwards with its free end (14) from the second wall (6), and as, further in the direction of insertion, on the first side wall (5) a contact segment (10) projecting inwards with its free end (15) in the floor region, and has a contact segment (12) in the roof region which projects inwards with its free end (16) from the second side wall (6).

Fig. 1a



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Description

[0001] The present invention relates to a plug-in connector sleeve according to the preamble of Patent Claim 1. Such a plug-in connector sleeve is disclosed in German Patent 21 48 805.

[0002] Such plug-in connector sleeves are applied, in particular, in automobiles, where they are exposed to adverse external circumstances such as vibrations and dirt. Conventional plug-in connector sleeves of this type permit the plug parts to vibrate relative to one another to an extent which can lead to fretting corrosion on the contact points, the result being an increase in the contact resistance. Micromovements caused by thermal expansion, or vibrations can expose a surface which in turn is oxidized and grows to form an insulating layer, entailing poorer contact.

[0003] It is the object of the present invention to improve a plug-in connector sleeve of the type mentioned at the beginning in such a way as to improve the static precision, hence reducing the possible degrees of freedom of the plug-in system and thus leading to enhanced resistance to fretting corrosion.

[0004] This object is achieved in accordance with the claim. Subclaims characterize preferred embodiments of the present invention. The measures according to the invention, in particular the fact that, in conjunction with a linear type of contact, the free ends of the contact segments are situated far apart from one another, lead to a higher static precision of the system, and thus to a higher resistance to fretting corrosion.

[0005] An exemplary embodiment of a plug-in contact sleeve is explained below in more detail with reference to the drawings, in which:

- Figure 1A shows a top view of a plug-in connector sleeve according to the invention;
- Figure 1B shows a side view of a plug-in connector sleeve according to the invention;
- Figure 1C shows a section through a plug-in connector sleeve according to the invention along the line A-A according to Figure 1a,
- Figure 2 shows a sheet-metal blank of the plug-in connector sleeve,
- Figure 3A shows the plug-in connector sleeve with a slip-on spring in top view,
- Figure 3B shows a side view of the plug-in connector sleeve shown in Figure 3a, with a slip-on spring, and
- Figure 3C shows a section along the centre line according to Figure 3a of the plug-in connector sleeve and the slip-on spring.

[0006] The plug-in connector sleeve 1 shown in Figure 1 has a plug-in region 2 and a conductor connection region 3. The plug-in region has the form of a housing 4 in the shape of a box and has two side walls 5, 6, a floor 7 and a roof 8.

[0007] Connected to the two side walls 5 and 6 and located at the front on the plug-in region 2 is a centring web 17 which, in conjunction with a slip-on spring 19 (see Figure 3), facilitates plugging a flat connector without any problem. A middle web 18 serves to stiffen the plug-in region 2 and to guide the slip-on spring 19 (see Figure 3).

[0008] Figure 2 shows a sheet-metal blank of the plug-in connector sleeve. The floor of the box-shaped housing is formed by the contact segment 11 with its free end 14 with the contact segment 10 with its free end 15. The two side walls 5 and 6 are bent upwards from the sheet-metal blank. The roof 8 of the housing is formed by the two contact segments 12 and 13. The four contact segments 9 to 12 are bent with their free ends 13 to 16 into the interior of the housing, so that they enclose an angle of less than 90° with the walls 5 and 6. The two upper contact segments 9 and 12 and the two lower contact segments 10 and 11 mutually overlap one another, as may be seen in Figure 1A in Section C-C. Owing to the overlapping of the segments 9 to 12, the free ends 13 to 16 have contact lines situated apart from one another, thus enhancing the static precision of the system. The result is improved protection against vibrations and a greater resistance to corrosion.

[0009] The front centring web 17 and the middle web 18 are fastened to the side walls 5 and 6, in order to reduce the spring action of the contact segments 9 to 12. The result of the special position of the contact segments 9 to 12 is that when a flat connector slides in the two spring-like contact segments 10 to 13 are firstly deflected, which facilitates insertion, and the two rear contact segments 10 and 12 are not deflected until later depths of insertion, with the result that the full contact force is then achieved. Following the middle web 18, the floor has a cutout 21 in which the slip-on spring of Figure 3 can be fastened.

[0010] In order to prevent excessive deformation of the contact segments 9 to 12, and to enhance the tightness of the seating of a plug-in contact in the sleeve, the latter is surrounded by a slip-on spring 19, as shown in Figure 3. The slip-on spring can be produced from a hard elastic material such as steel, for example. It has inwardly rounded edges in the front region, in order to facilitate plugging in a flat connector. The aim of the slip-on spring 19 is to prevent asymmetric insertion of a flat connector from bending outwards the lower contact segments 10, 11 and the upper contact segments 9, 12.

[0011] The plug-in connector sleeve according to the invention proves to be extremely compact and robust in shape, which renders it possible for the plug-in connection sleeve to be produced simply and in a way which can be automated. Furthermore, assembly rotated by 180° is possible because of the symmetrical design of the contact segments.

[0012] The preceding description of an exemplary embodiment is not to be understood as restrictive, but serves only to explain the present invention.

Claims

1. Plug-in connector sleeve (1) having a plug-in region (2) and a conductor connection region (3), the plug-in region having a box-shaped housing (4) with two side walls (5, 6), a floor (7) and a roof (8), at least one contact segment (9, 10, 11, 12) projecting into the housing in the roof region and in the floor region, in each case, characterized in that, seen in the direction of insertion of the plug-in contact, firstly a contact segment (9) is bent inwards in the roof region with its free end (13) from the first side wall (5), and a contact segment (11) is bent inwards in the floor region with its free end (14) from the second wall (6), and in that, seen further in the direction of insertion of the plug-in contact, a contact segment (10) of the floor region is bent inwards with its free end (15) from the first side wall (5) and a contact segment (12) is bent inwards in the roof region with its free end (16) from the second side wall (6). 5 10 15 20
2. Plug-in connector sleeve according to Claim 1, characterized in that at the front the plug-in region has a centring web (17) which is connected to the two side walls (5, 6). 25
3. Plug-in connector sleeve according to one of the preceding claims, characterized in that the plug-in region has a middle web (18) which is connected to the two side walls (5, 6). 30
4. Plug-in connector sleeve according to one of the preceding claims, characterized in that the contact segments (10, 11, 12, 13) enclose an angle of less than 90° with the respective side walls (5, 6). 35
5. Plug-in connector sleeve according to Claim 1-4, characterized in that the free ends (13-16) are situated away from the central axes of the floor or roof. 40
6. Plug-in connector sleeve according to Claim 5, characterized in that the contact segments extend outwards from the corresponding side wall beyond the central axis of the floor or roof. 45
7. Plug-in connector sleeve according to Claim 5, characterized in that the contact elements (10-13) of the floor or of the roof overlap at the side. 50
8. Plug-in connector sleeve according to Claims 1-7, characterized in that the plug-in connection sleeve has a slip-on spring (19) with caulking lugs (20), which surrounds the plug-in zone in the shape of a box. 55
9. Plug-in connector sleeve according to one of the preceding claims, characterized in that the plug-in connection sleeve has a cutout for fastening the slip-on spring (19).
10. Plug-in connector sleeve according to one of the preceding claims, characterized in that the contact regions between the contact segments and the counter pieces are linear.
11. Plug-in connector sleeve according to one of the preceding claims, characterized in that two contact segments each which each start from the same side wall are arranged offset relative to one another seen in the plug-in direction, and taper towards their free ends, and are arranged in a complementary fashion with a small lateral spacing from one another with the contact segments which start from the other side wall, the respective front and rear edges of the contact segments being situated perpendicular to the plug-in direction, and the respective middle, mutually opposite edges of the contact segments being situated at a slope relative to the plug-in direction.
12. Plug-in connector sleeve according to Claim 8, characterized in that with its side opposite the plug-in end, the slip-on spring forms a defined peripheral shoulder for bearing a secondary lock.

Fig. 1a

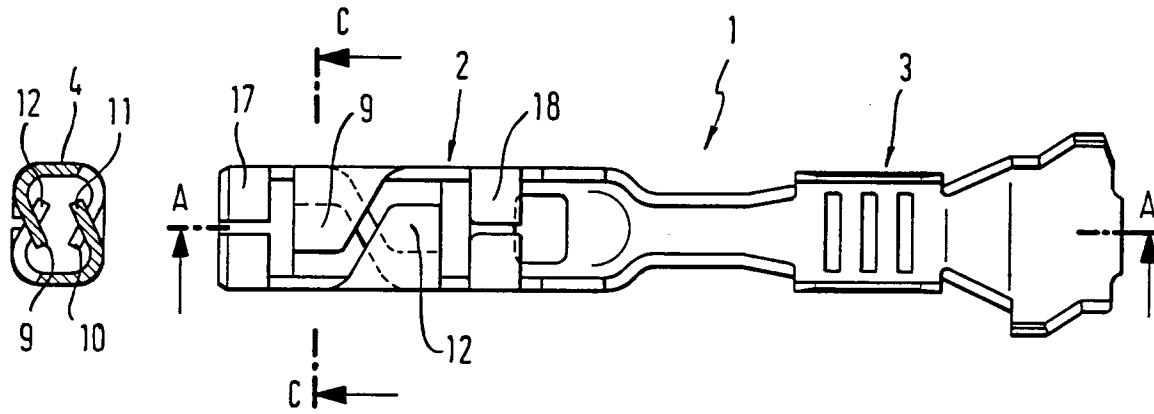


Fig. 1b

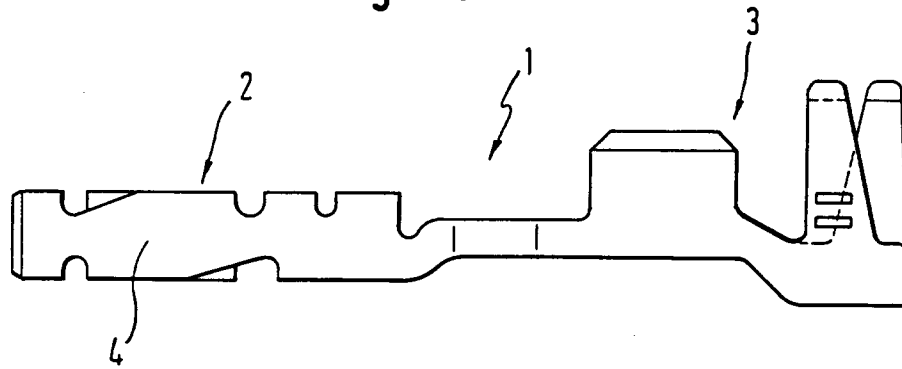


Fig. 1c

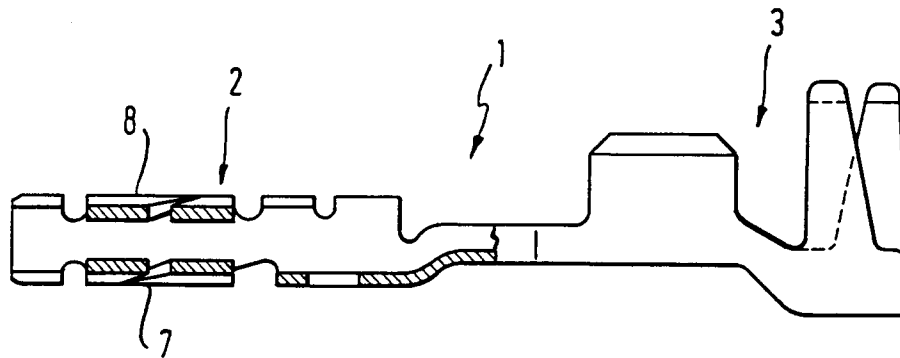


Fig. 2

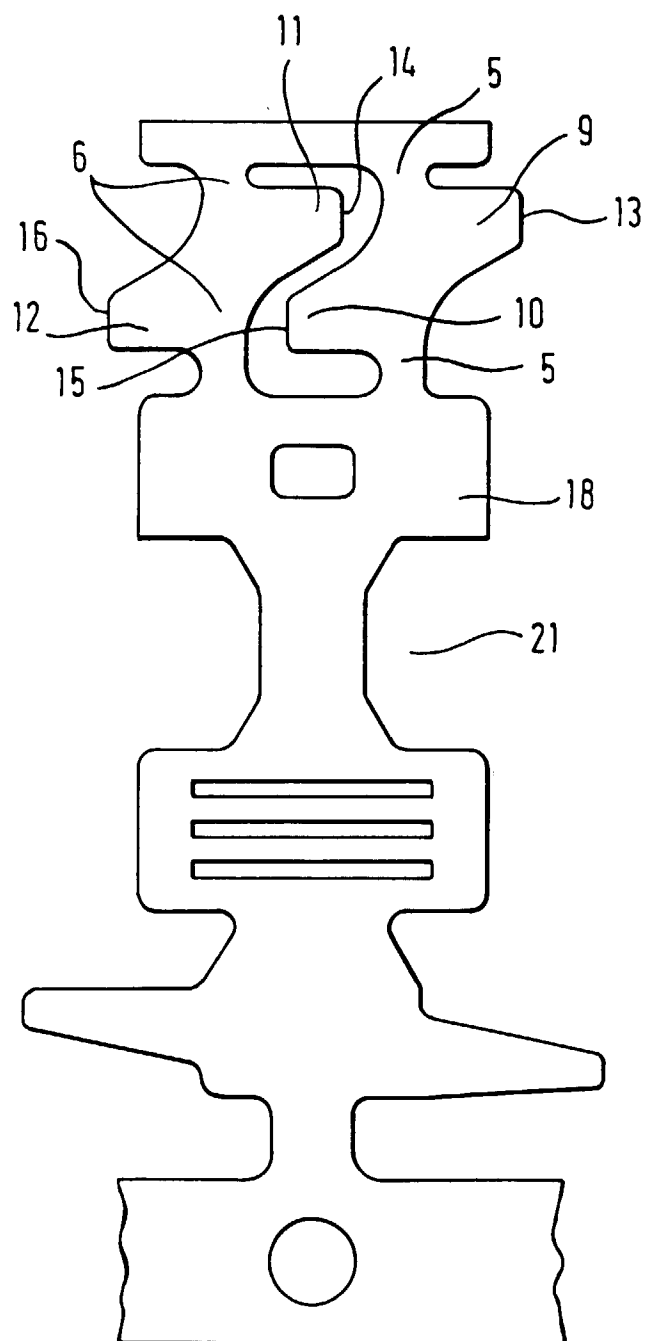


Fig. 3a

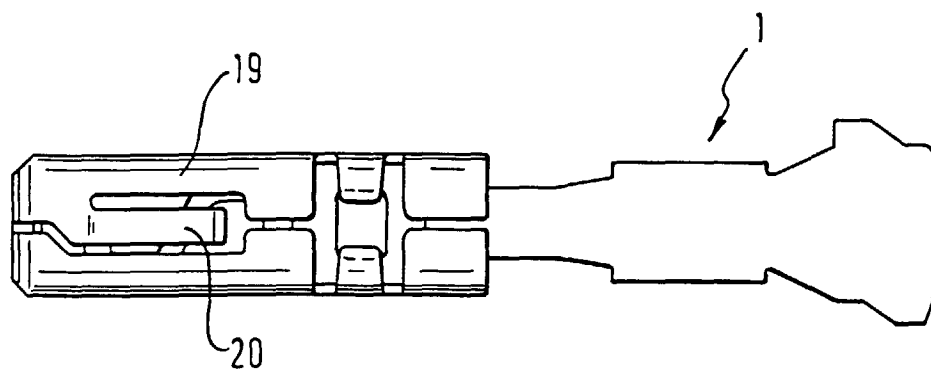


Fig. 3b

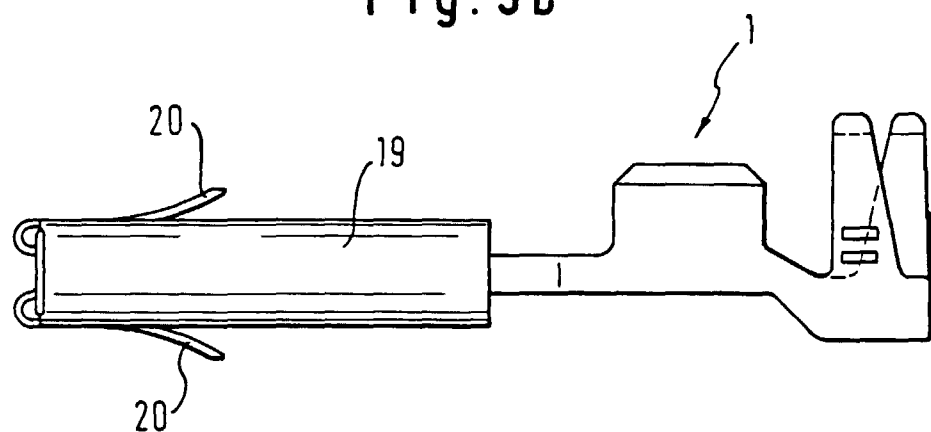


Fig. 3c

