CLAIMS

1. An electric connector including

a first connector part (10) and a second connector part (20) being couplable to each other and comprising a first contact element (11) and a second contact element (21), respectively, for closing an electric contact with one another when first and second connector part are coupled to each other, and

a first support (1b) and a second support (3a) which support the first and the second connector part, respectively, and are mountable to one another by means of bayonet or screw fitting for obtaining the coupling between first and second connector part,

wherein said first connector part comprises a resilient support structure (13) whose proximal end (13a) is fixed to the first support, and whose distal end (13b) supports the first contact element, and

wherein said second connector part comprises an abutment ring (23) adapted to be slidingly engaged by the first contact element during the fitting between first and second support, said abutment ring housing the second contact element,

characterized in that said second contact element is positioned in a limited circumferential arc of the abutment ring, stop means (30) being provided for stopping the first contact element at the second contact element for realizing the coupling between first and second connector part, wherein in coupled condition the resilient support structure of the first connector part biases the first contact element in axial direction against the abutment ring, and in circumferential direction against said stop means.

2. A connector according to claim 1, wherein said resilient support structure comprises a coil spring extending coaxially with the fitting axis (y) of the connector, and whose body has a hollow cross-section for housing an end part of an electric cable (C1') electrically connected to the first contact element (11).

3. A connector according to claim 2, wherein said resilient support structure is tube-like shaped and further comprises an envelope (13c) made of elastomeric material which is arranged in such a way as to fill the gaps between coils of the coil spring.

4. A connector according to any of claims 1 to 3, wherein a box-like body (17) open in distal direction is fixed to the distal end (13b) of the resilient support structure (13), the first contact element (11) being housed within the box-like body.

5. A connector according to claim 4, wherein said stop means comprise a projecting formation (31) formed on the abutment ring (23), which formation protrudes axially with respect to the distal ring surface (23a) of the abutment ring (23), said projecting formation being adapted to be engaged by the box-like body (17) of the first connector part (10) when said first and second connector part are in coupled condition.

6. A connector according to claim 5, wherein said box-like body has a notch (17a) formed correspondingly to said projecting formation of the abutment ring (13).

7. A connector according to claim 6, wherein said projecting formation of the abutment ring (23) and said notch of the box-like body (17) have respective undercut surfaces (31b, 17b) by means of which they are intended to engage each other.

8. A connector according to any of claims 4 to 7, wherein an intermediate housing (19) is slidingly inserted within said box-like body, said first contact element being slidingly inserted inside said intermediate housing, and wherein resilient means (19a, 19b) are housed within the box-like body (17) for biasing said first contact element and said housing in distal direction, independently from each other.

9. A connector according to claim 8, wherein said resilient means comprise first resilient means (19b) associated to the first contact element (11) and second resilient means (19a) associated to the intermediate housing (19), said first and second resilient means being disposed coaxially with respect to each other.

10. A connector according to any of the preceding claims, wherein said first and second support are end elements (1b, 3a) of respective components (1, 3) of a drill string, particularly drill pipes.

11. An electric connection device adapted to be coupled to a complementary device, comprising

a support (1b) adapted to be mounted by means of screw or bayonet fitting to a corresponding support (3a) of the complementary device,

a contact element (11) for closing an electric contact with a corresponding contact element (21) of the complementary device, and

a resilient support structure (13) whose proximal end (13a) is fixed to the support, and whose distal end (13b) supports the contact element of the electric connection device,

characterized in that said resilient support structure comprises a coil spring extending coaxially with the fitting axis (y) of the electric connection device, and whose body has a hollow cross section for housing an end part of an electric cable (C1') electrically connected to the contact element (11) of the electric connection device.

12. A device according to claim 11, wherein said resilient support structure is tube-like shaped and further comprises an envelope (13c) made of elastomeric material which is arranged in such a way as to fill the gaps between coils of the coil spring.

13. A device according to claim 11 or 12, wherein a box-like body (17) open in distal direction is fixed to the distal end (13b) of the resilient support structure (13), wherein an intermediate housing (19) is slidingly inserted within the box-like body, the contact element of the electric connection device being slidingly inserted inside the intermediate housing, and wherein resilient means (19a, 19b) are housed within the box-like body (17) for biasing said contact element and said housing in distal direction, independently from each other.

14. A device according to claim 13, wherein said resilient means comprise first resilient means (19b) associated to the contact element (11) of the electric connection device and second resilient means (19a) associated to the intermediate housing (19), said first and second resilient means being disposed coaxially with respect to one another.

15. A device according to claim 13 or 14, wherein said box-like body has a notch (17a) for engaging a corresponding part (31) of the complementary device.

16. A device according to claim 15, wherein said notch of the box-like body (17) has an undercut surface (17b) for engaging a corresponding surface (31b) of the complementary device.

17. An electric connection device adapted to be coupled to a complementary device, comprising

a support (3a) adapted to be mounted by means of screw or bayonet fitting to a corresponding support (1b) of the complementary device,

a contact element (21) for closing an electric contact with a corresponding contact element (11) of the complementary device, and

an abutment ring (23) adapted to be slidingly engaged by the contact element of the complementary device during the fitting between connection device and complementary device, said abutment ring housing the contact element of the electric connection device,

characterized in that said contact element is positioned in a limited circumferential arc of the abutment ring, a projecting formation (31) being formed on the abutment ring (23) protruding axially with respect to the distal ring surface (23a) of the abutment ring (23), said projecting formation being adapted to engage a corresponding part (17) of the complementary device for establishing alignment between contact elements.

18. A device according to claim 17, wherein said projecting formation has an undercut surface (31b) for engaging a corresponding surface (17b) of the complementary device.

Claims

1. An electric connector including
a first connector part (10) and a second connector part (20) being couplable to each other and comprising a first contact element (11) and a second contact element (21), respectively, for closing an electric contact with one another when first and second connector part are coupled to each other, and

a first support (1b) and a second support (3a) which support the first and the second connector part, respectively, and are mountable to one another by means of bayonet or screw fitting for obtaining the coupling between first and second connector part,
wherein said first connector part comprises a resilient support structure (13) whose proximal end (13a) is fixed to the first support, and whose distal end (13b) supports the first contact element, and
wherein said second connector part comprises an abutment ring (23) adapted to be slidingly engaged by the first contact element during the fitting between first and second support, said abutment ring housing the second contact element,
characterized in that said second contact element is positioned in a limited circumferential arc of the abutment ring, stop means (30) being provided for stopping the first contact element at the second contact element for realizing the coupling between first and second connector part, wherein in coupled condition the resilient support structure of the first connector part biases the first contact element in axial direction against the abutment ring, and in circumferential direction against said stop means.

2. A connector according to claim 1, wherein said resilient support structure comprises a coil spring extending coaxially with the fitting axis (y) of the connector, and whose body has a hollow cross-section for housing an end part of an electric cable (C1') electrically connected to the first contact element (11).

3. A connector according to claim 2, wherein said resilient support structure is tube-like shaped and further comprises an envelope (13c) made of elastomeric material which is arranged in such a way as to fill the gaps between coils of the coil spring.

4. A connector according to any of claims 1 to 3, wherein a box-like body (17) open in distal direction is fixed to the distal end (13b) of the resilient support structure (13), the first contact element (11) being housed within the box-like body.

5. A connector according to claim 4, wherein said stop means comprise a projecting formation (31) formed on the abutment ring (23), which formation protrudes axially with respect to the distal ring surface (23a) of the abutment ring (23), said projecting formation being adapted to be engaged by the box-like body (17) of the first connector part (10) when said first and second connector part are in coupled condition.

6. A connector according to claim 5, wherein said box-like body has a notch (17a) formed correspondingly to said projecting formation of the abutment ring (13).

7. A connector according to claim 6, wherein said projecting formation of the abutment ring (23) and said notch of the box-like body (17) have respective undercut surfaces (31b, 17b) by means of which they are intended to engage each other.

8. A connector according to any of claims 4 to 7, wherein an intermediate housing (19) is slidingly inserted within said box-like body, said first contact element being slidingly inserted inside said intermediate housing, and wherein resilient means (19a, 19b) are housed within the box-like body (17) for biasing said first contact element and said housing in distal direction, independently from each other.

9. A connector according to claim 8, wherein said resilient means comprise first resilient means (19b) associated to the first contact element (11) and second resilient means (19a) associated to the intermediate housing (19), said first and second resilient means being disposed coaxially with respect to each other.

10. A connector according to any of the preceding claims, wherein said first and second support are end elements (1b, 3a) of respective components (1, 3) of a drill string, particularly drill pipes.