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(54) **ELECTRIC CONNECTOR**

ELEKTRISCHER VERBINDER

CONNECTEUR ELECTRIQUE

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Description

TECHNICAL FIELD

[0001] The present invention relates to an electric connector, in particular of the type comprising an insulating outer casing defining at least one axial cavity, and an electric terminal housed and retained inside the cavity by primary retaining means.

BACKGROUND ART

[0002] Known electric terminals of the aforementioned type comprise a secondary retaining device for ensuring correct insertion as well as further ensuring retention of the terminals inside the respective cavities.

[0003] The secondary retaining device normally comprises a movable element which snaps on to the casing, and which may either be hinged integral with the casing or consist of a separate element. In either case, snap-on connection of the movable element to the casing is only possible when the terminal is correctly inserted and retained inside the cavity by the primary retaining means which normally consist of an elastically deformable lance forming part of the casing. In the event the terminal is not properly or fully inserted, residual deformation of the primary retaining means prevents the movable element from being assembled, thus enabling the fault to be detected.

[0004] Known connectors of the type briefly described above present several drawbacks. In the event the terminal is not fully inserted inside the cavity, the movable element may be forced into the engaged position despite interference with the primary retaining means, e. g. by breaking or deforming the contacting parts, in which case, improper insertion of the terminal may go undetected due, for example, to the terminal being so positioned as to determine albeit a precarious electrical contact. In applications, however, in which the connector is subjected to vibration, as on a motor vehicle, it is only a question of time before the connection is cut off, with all the obvious consequences this entails.

[0005] DE-C-43 01 602 discloses an electric connector according to the preamble of claim 1.

DISCLOSURE OF INVENTION

[0006] It is an object of the present invention to provide an electric connector designed to overcome- the aforementioned drawbacks typically associated with known connectors.

[0007] According to the present invention, there is provided an electric connector comprising an insulating casing with at least one axial cavity; at least one electric terminal housed inside the cavity; primary retaining means for retaining the terminal inside the cavity; and secondary retaining means in turn comprising at least a first movable element connectable in a closed position to the casing and cooperating in said closed position with said primary retaining means, for ensuring correct engagement and preventing release of said terminal by said primary retaining means; characterized by comprising disabling means for preventing connection of said connector to a complementary connector; and de-activating means formed on said first movable element for de-activating said disabling means when said first movable element is in said closed position.

BRIEF DESCRIPTION OF DRAWINGS

[0008] A preferred, non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a vertical in-service section of an electric connector in accordance with the teachings of the present invention;
Figure 2 shows a vertical section of the Figure 1 connector assembled incorrectly;
Figure 3 shows a view in perspective, with parts removed for clarity, of the Figure 1 connector in the preassembly position;
Figure 4 shows a view in perspective of the casing of the connector in Figures 1 to 3;
Figure 5 shows a top view in perspective of a detail of the Figure 1 connector;
Figure 6 shows a bottom view in perspective of the Figure 5 detail;
Figure 7 shows a bottom view in perspective of the Figure 1 connector; and
Figure 8 shows a front view of an electric connecting unit including two connectors of Figure 1, joined to each other.

BEST MODE FOR CARRYING OUT THE INVENTION

[0009] Number 1 in Figures 1 and 2 indicates an electric connector.

[0010] Connector 1 substantially comprises an insulating casing 2 defining a number of longitudinal through cavities 3 (only one shown); and a number of male electric terminals 4 housed and retained inside respective cavities 3 by primary retaining means described in detail later on.

[0011] As shown in Figures 1 and 2, casing 2 comprises a substantially parallelepiped rear portion 2a in which cavities 3 of terminals 4 are formed; and a hollow front portion 2b defining a compartment 2c for receiving a correspondingly shaped portion of a complementary connector 1' (Figure 1), and communicating with each of cavities 3. Compartment 2c thus defines a connecting region for connectors 1 and 1'.

[0012] Each terminal 4 comprises an intermediate box-shaped portion 6; a blade contact portion 7 projecting frontwards from intermediate portion 6; and a rear portion 10 for connection to an electric cable 11.

[0013] Intermediate portion 6 presents a bottom wall 12, the rear edge 13 of which defines a stop for the primary retaining means; and a pair of lateral walls 14, each forming an integral coplanar tab 15 extending beyond bottom wall 12 and in turn forming a front stop edge 16 substantially perpendicular to the longitudinal direction of terminal 4, and the function of which is described later on.

[0014] Each terminal 4 is inserted inside respective cavity 3 through a rear opening 17 of the cavity, from which cable 11 extends in use, and contact portion 7 projects axially inside compartment 2c through a front opening 20 of cavity 3.

[0015] The primary retaining means comprise an elastic lance 18 narrower than the distance between tabs 15 of terminal 4, and which projects inside cavity 3 from the bottom wall 19 of the cavity, and extends substantially longitudinally towards front opening 20. The surface 21 of lance 18 facing inwards of cavity 3 presents a tooth 22 with a substantially serrated profile and presenting an inclined side 23 facing rear opening 17, and a side 24 substantially crosswise to the axis of cavity 3 and facing front opening 20.

[0016] Tooth 22 therefore permits insertion of terminal 4 which, as it slides along side 23, elastically deforms lance 18 towards wall 19; and, upon terminal 4 being inserted fully inside cavity 3 (Figure 1), lance 18 springs back to the undeformed position by tooth 22 snapping behind rear edge 13 of box portion 6 of terminal 4 which is prevented from being withdrawn by side 24 of tooth 22.

[0017] Connector 1 also presents a secondary retaining device for retaining terminals 4 and indicated as a whole by 25 (Figures 1 and 2).

[0018] With reference to Figures 4 and 5, device 25 comprises a movable plate 26 separate from casing 2 and which is insertable longitudinally inside compartment 2c of casing 2 so that it is positioned facing and adjacent to bottom wall 38 of portion 2b.

[0019] Plate 26 (Figures 5 and 6) presents a pair of inclined lateral edges 27 converging inwards of compartment 2c and slidable longitudinally inside respective guides 28, each of which is formed at the bottom of a lateral wall of compartment 2c of casing 2, and presents an inclined surface 30 cooperating in sliding manner with respective edge 27.

[0020] Plate 26 also presents a pair of lateral cam tabs 31 parallel to and projecting laterally above the rear portion of plate 26, and each integral with a respective enlarged portion 32 formed in one piece with the rear portion of a respective lateral edge 27 of plate 26.

[0021] As shown in Figures 5 and 6, cam tabs 31 are so formed as to interact with respective flexible blades 33 integral with and substantially hinged to walls 29 of compartment 2c so as to flex, by virtue of cam tabs 31, between a disabling position in which they project from walls 29 and interfere with the connecting region of connectors 1 and 1', and an enabling position in which they contact walls 29 and enable connection of connectors 1 and 1'.

[0022] More specifically, each tab 31 is defined by an outer lateral surface presenting, successively towards the free end of tab 31, an inclined wedge-shaped first surface 31a, a second surface 31b parallel to the longitudinal direction of connector 1, and an inclined wedge-shaped third surface 31c.

[0023] Each blade 33 comprises a top portion 33a projecting inwards of compartment 2c to interact with connector 1'; and a bottom portion 33b designed to interact with and substantially complementary to respective tab 31. More specifically, bottom portion 33b presents an inclined lead-in surface 52, an intermediate surface 53, and an inclined stop surface 54.

[0024] The bottom face 34 of plate 26 (Figure 6) presents two seats 35, 36 located successively along the center line of plate 26 and permitting one-way engagement by a tooth 37 extending from the bottom wall 38 of compartment 2c of casing 2.

[0025] When engaged by tooth 37, seat 35 defines a preassembly position of plate 26 inside front portion 2b of casing 2, wherein blades 33 are in the disabling position and are contacted by the inclined surfaces 31c of tabs 31; and seat 36 defines a fully assembled position of plate 26 inside portion 2b of casing 2, wherein blades 33 are set to the enabling position (Figure 1) by tabs 31.

[0026] At each cavity 3, plate 26 (Figures 5 and 6) presents a substantially fork-shaped front appendix 39 comprising two flexible arms 40 parallel to and facing each other and extending, parallel to the plane of plate 26, towards portion 2a of casing 2, and from a restraining portion 41 integral with plate 26. Arms 40 present respective tapered end portions 42 defined externally by respective converging surfaces 43 perpendicular to the plane of plate 26.

[0027] Arms 40 present an elongated cross section perpendicular to plate 26, so that they are substantially rigid perpendicular to, but flexible parallel to, plate 26; and the length of arms 40 is such that, when plate 26 is fully assembled inside portion 2b of casing 2, end portions 42 extend inside respective cavity 3, and cooperate with the underside surface 44, on the opposite side to surface 21, of elastic lance 18, so as to prevent lance 18 from being deformed elastically.

[0028] As shown in Figures 5 and 6, from restraining portion 41 of appendix 39, there projects a shaped appendix 45 extending first at an angle of 45° and then at an angle of 90° in the opposite direction to arms 40. When plate 26 is fully assembled inside portion 2b of casing 2, appendix 45 defines a front wall of cavity 3 defining opening 20, and provides for guiding contact portion 7 of terminal 4 towards opening 20 during insertion of the terminal.

[0029] For each cavity 3, device 25 also comprises a movable element 46 (Figures 1 and 2) extending frontwards and integrally from wall 19 to which it is connected by a flexible hinge blade 47, and which is interposed be-

tween plate 26 and terminal 4, for expelling the terminal from cavity 3 when plate 26 is assembled inside portion 2b of casing 2 and the terminal is not correctly engaged by elastic lance 18.

[0030] More specifically, movable element 46 comprises a pair of substantially triangular portions 48 projecting from blade 47, coplanar with tabs 15 of terminal 4, and facing each other at a distance substantially equal to that between tabs 15 and less than the minimum distance between surfaces 43 of arms 40 measured at the free end of arms 40.

[0031] Portions 48 each comprise a first side 49 extending substantially along an extension of blade 47 and towards appendix 39 of plate 26; an apex 50 opposite side 49 and located close to the free end of and on the opposite side of elastic lance 18 to the other apex 50; and a second side 51 extending between blade 47 and respective apex 50, and facing a respective tab 15 of terminal 4.

[0032] As best shown in Figure 7, a first and a second engaging member 64, 65, female and male respectively, integrally extend outwards from a side 60 of casing 2 defined by wall 38 and an adjacent external surface 61 of portion 2a.

[0033] More particularly, members 64, 65 extend parallel to each other along opposite longitudinal edges of side 60.

[0034] Female member 64 includes a pair of parallel longitudinal lips 68, defining a guide and delimiting a longitudinal seat 71 having a substantially T-shaped cross-section. Male member 65 is formed by a rectilinear rib having a corresponding substantially T-shaped cross-section.

[0035] Members 64, 65 present respective end bevels 72.

[0036] Wall 38 has a middle longitudinal slit 63 and further includes a pair of external teeth 76 of equal shape, presenting a substantially triangular profile; teeth 76 are adjacent to opposite longituginal edges of slit 63 and oriented longitudinally in opposite directions.

[0037] More particularly, each tooth 76 is delimited by a side 77 inclined with respect to wall 38 and by a side 78 substantially orthogonal to wall 38; sides 78 of teeth 76 lie on a common plane P, transversal to casing 2, and sides 77 face opposite ends of casing 2.

[0038] Tooth 76 of connector 1 are adapted to snap-couple with respective tooth 76 of another connector 1 of the same type (Figure 8), so that sides 78 of teeth 76 of one connector 1 abut, in use, with sides 78 of respective teeth 76 of the other connector 1 for preventing connectors 1 from sliding longitudinally with respect to each other and assuring a stable assembly, together with members 64, 65.

[0039] Wall 38 is less thick then the other walls of casing 2 and, also due to slit 63, has a given transversal flexibility.

[0040] Device 25 operates as follows.

[0041] When first inserted inside compartment 2c of casing 2, plate 26 is set to said preassembly position wherein surfaces 31c of tabs 31 are adjacent to lead-in surfaces 52 of bottom portions 33b of blades 33.

[0042] As plate 26 is inserted further as of the above position, tabs 31 slide along and exert such pressure on blades 33 as to move them from the disabling position projecting from walls 29 of compartment 2c, to the enabling position contacting walls 29, in the course of which passage from the disabling to the enabling position, surfaces 31a, 31b, 31c of tabs 31 are gradually brought into contact with the complementary surfaces 52, 53, 54 of blades 33.

[0043] At the same time, end portions 42 of arms 40 penetrate and are wedged by friction between portions 48 of movable element 46; as plate 26 is inserted further, it takes element 46 with it and rotates it about blade 47; and portions 48 slide along the lateral walls of cavity 3 until sides 51 of portions 48 are arrested against tabs 15 of terminal 4.

[0044] Two situations are therefore possible.

[0045] If terminal 4 is correctly engaged by lance 18 (Figures 1 and 7) which is therefore in the undeformed position, tabs 15 define fixed stops for portions 48 which, by also contacting the lateral walls of cavity 3, are prevented from flexing outwards.

[0046] As plate 26 is moved further along guides 28, surfaces 43 of arms 40 slide along the inside of portions 48; and the slope of surfaces 43 flexes arms 40 towards each other so that they penetrate further between portions 48 and are eventually positioned substantially contacting surface 44 of lance 18 which is thus prevented from flexing.

[0047] Plate 26 may thus be inserted fully: tabs 31 push blades 33 into the enabling position wherein surfaces 31c contact surfaces 54; at this point, tooth 37 on bottom wall 38 of compartment 2c penetrates inside seat 36 to lock plate 26 in position in relation to casing 2; and connector 1 may thus be connected to complementary connector 1'.

[0048] Conversely, in the event terminal 4 is not fully inserted inside respective cavity 3 (Figures 2 and 3), the thrust exerted by portions 48 on tabs 15 of the terminal is not counteracted by the restraining action exerted by tooth 22 on the terminal. Consequently, as plate 26 is inserted, no loss of adherence is incurred between surfaces 43 and portions 48, so that movable element 46 transmits the thrust to terminal 4 which is expelled from cavity 3.

[0049] Arms 40 contact lance 18, the residual deformation of which towards wall 19 prevents plate 26 from being inserted; and, as plate 26 cannot be inserted fully inside compartment 2c of casing 2, tabs 31 are prevented from moving blades 33 into the enabling position, so that blades 33 project from walls 29 of compartment 2c, thus preventing connection of connectors 1 and 1'.

[0050] Figure 8 shows an electric connecting unit 80 including two identical connectors 1 joined to each other. Assembly of unit 80 is performed by slidably coupling

female and male members 64, 65 with male and female members 65, 64, respectively, of the other connector 1. Connectors 1 snap-fit to each other by the relative engagement of respective teeth 76, which is aided by the flexibility of respective walls 38.

[0051] For uncoupling connectors 1, a flat tool (not shown) may be inserted between walls 38 so that walls 38 are slightly deformed inward and allow respective teeth 76 to disengage.

[0052] The advantages of connector 1, and particularly of device 25, according to the present invention will be clear from the foregoing description.

[0053] In particular, in the event any one of terminals 4 is not correctly inserted inside the respective cavity and engaged by the primary retaining means, plate 26 is prevented from being inserted correctly inside compartment 2c of casing 2, so that blades 33 remain in the disabling position preventing connection of connector 1 to complementary connector 1'. Moreover, the poorly inserted terminal 4 is expelled from the cavity, thus enabling immediate detection of the fault and immediate identification the defective terminal which may then be inserted correctly inside the cavity.

[0054] Members 64, 65 allow connector 1 to be stably coupled to another connector, in order to form an electric modular connecting unit, as well as to a support body (not shown) provided with corresponding engaging members, e.g. for attachment to a vehicle.

[0055] Clearly, changes may be made to connector 1 as described and illustrated herein without, however, departing from the scope of the present invention.

[0056] In particular, connector 1 may comprise any number of terminals 4; and changes may be made to the design and location of cam tabs 31, respective blades 33, appendix 39 and element 46, or to the design and arrangement of the part of terminal 4 with which element 46 cooperates.

[0057] Expulsion of the poorly inserted terminal 4 by movable element 46 may be dispensed with, since the fault is anyway indicated by the impossibility of connecting connectors 1 and 1'.

[0058] Connector 1 may present a female as opposed to a male terminal, in which case, it would comprise a female casing connectable to a male casing on the complementary connector, and the connecting region would surround the female casing.

[0059] Finally, when terminal 4 is correctly engaged by lance 18, disconnection of plate 26 and terminal 4 may be effected by deforming an appropriately designed movable element 46 as opposed to appendix 39 of plate 26.

Claims

1. An electric connector (1) comprising an insulating casing (2) with at least one axial cavity (3); at least one electric terminal (4) housed inside the cavity (3); primary retaining means (18) for retaining the terminal (4) inside the cavity (3); and secondary retaining means (25) in turn comprising at least a first movable element (26) connectable in a closed position to the casing (2) and cooperating in said closed position with said primary retaining means (18), for ensuring correct engagement and preventing release of said terminal (4) by said primary retaining means (18); characterized by comprising disabling means (33) for preventing connection of said connector (I) to a complementary connector (1'); and de-activating means (31) formed on said first movable element (26) for de-activating said disabling means (33) when said first movable element (26) is in said closed position.

2. A connector as claimed in Claim 1, characterized in that said disabling means comprise at least one second element (33) interposed between said first element (26) and said casing (2) and movable between a disabling position wherein it interferes with the connecting region (2c) of said connector (1) to the complementary connector (1'), and an enabling position wherein it does not interfere with said region (2c); said de-activating means (31) cooperating with said second element (33) to move it into said enabling position when said first element (26) is in said closed position.

3. A connector as claimed in Claim 2, characterized in that said second element (33) is integral with said casing (2).

4. A connector as claimed in Claim 3, characterized in that said de-activating means comprise cam means (31) integral with said first element (26) and interacting with said second element (33) to move it from said disabling to said enabling position.

5. A connector as claimed in one of the foregoing Claims, characterized in that said first movable element is a plate (26) separate from said casing (2) and insertable inside a compartment (2c) of said casing (2), said compartment (2c) communicating with said cavity (3) and defining said connecting region of said connector (1) to said complementary connector (1').

6. A connector as claimed in Claim 5 dependent on Claim 4, characterized in that said cam means comprise at least one shaped tab (31) integral with a lateral edge (27) of said plate (26).

7. A connector as claimed in Claim 6, characterized in that said second movable element is a flexible blade (33) projecting from a wall (29) of said casing (2) in said compartment (2c); said blade (33) being movable by said shaped tab (31) from said disabling po-

sition wherein it projects from said wall (29) in said compartment (2c), to said enabling position wherein it substantially contacts said wall (29).

8. A connector as claimed in Claim 7, characterized in that it comprises two said shaped tabs (31) extending from respective lateral edges (27) of, and projecting laterally and axially in relation to, said plate (26); and two said blades (33), each extending from a lateral wall (29) of said compartment (2c).

9. A connector as claimed in one of the foregoing Claims, characterized in that said secondary retaining means (25) also comprise a third movable element (46) interposed between said first movable element (26) and said terminal (4), and which transmits to said terminal (4) the thrust exerted on said first element (26) when this is inserted inside said casing (2), so as to expel said terminal (4) from said cavity (3) in the event the terminal (4) is not correctly engaged by said primary retaining means (18); said first and third movable elements (26, 46) presenting respective engaging portions (39, 48) cooperating mutually by virtue of said thrust; and at least one (39) of said portions being elastically deformable by said thrust, to release said first element (26) from said terminal (4) in the event the terminal (4) is correctly engaged by said primary retaining means (18).

10. A connector as claimed in Claim 9, characterized in that said third movable element (46) is integral with and hinged to said casing (2).

11. A connector as claimed in one of the foregoing Claims, characterized in that said secondary retaining means (25) comprise means (35, 36, 37) for connecting said first element (26) to said casing (2) in a preassembly position and in said closed position.

12. A connector as claimed in one of the foregoing claims, characterized in that said casing (2) includes at least a first and a second engaging member (64, 65), female and male respectively, extending outwards from a common side (60) of said casing (2), having complementary shapes and adapted to be coupled in a stable manner with respective male and female engaging members (65, 64) carried by a matable body (1) to be joined to said connector (1).

13. A connector as claimed in claim 12, characterized in that said side (60) of said casing (2) includes snap coupling means (76) adapted to co-operate with respective snap coupling means (76) of said matable body (1).

14. A connector as claimed in claim 12 or 13, characterized in that said first and second engaging members (64, 65) are formed by a guide and a rib, respectively, extending parallel to each other along opposide longitudinal edges (66, 67) of said side (60).

15. A connector as claimed in claim 14, characterized in that side guide (64) includes a longitudinal seat (71) with a substantially T-shaped cross section, said rib (65) having a corresponding T-shaped cross-section.

Patentansprüche

1. Elektrischer Verbinder (1), mit einem isolierenden Gehäuse (2) mit wenigstens einem axialen Hohlraum (3); wenigstens einem elektrischen Anschluß (4), der im Hohlraum (3) angeordnet ist; einer primären Halteeinrichtung (18) zum Halten des Anschlusses (4) im Hohlraum (3); und einer sekundären Halteeinrichtung (25), die ihrerseits wenigstens ein erstes bewegliches Element (26) enthält, das in einer geschlossenen Position mit dem Gehäuse (2) verbindbar ist und in der geschlossenen Position mit der primären Halteeinrichtung (18) zusammenwirkt, um den korrekten Eingriff sicherzustellen und ein Lösen des Anschlusses (4) durch die primäre Halteeinrichtung (18) zu verhindern; gekennzeichnet durch eine Sperreinrichtung (33), die eine Verbindung des Verbinders (1) mit einem komplementären Verbinder (1') verhindert; und eine Deaktivierungseinrichtung (31), die am ersten beweglichen Element (26) ausgebildet ist, um die Sperreinrichtung (33) zu deaktivieren, wenn sich das erste bewegliche Element (26) in der geschlossenen Position befindet.

2. Verbinder nach Anspruch 1, dadurch gekennzeichnet, daß die Sperreinrichtung wenigstens ein zweites Element (33) enthält, das zwischen das erste Element (26) und das Gehäuse (2) eingesetzt ist und zwischen einer Sperrposition, in der sie in den Verbindungsbereich (2c) des Verbinders (1) mit dem komplementären Verbinder (1') eingreift, und einer Freigabeposition, in der es in den Bereich (2c) nicht eingreift, beweglich ist; wobei die Deaktivierungseinrichtung (31) mit dem zweiten Element (33) so zusammenwirkt, daß sie es in die Freigabeposition bewegt, wenn sich das erste Element (26) in der geschlossenen Position befindet.

3. Verbinder nach Anspruch 2, dadurch gekennzeichnet, daß das zweite Element (33) mit dem Gehäuse (2) einteilig ausgebildet ist.

4. Verbinder nach Anspruch 3, dadurch gekennzeich-

net, daß die Deaktivierungseinrichtung eine Nokkeneinrichtung (31) enthält, die einteilig mit dem ersten Element (26) ausgebildet ist und mit dem zweiten Element (33) in der Weise in Wechselwirkung steht, daß sie es aus der Sperrposition in die Freigabeposition bewegt.

5. Verbinder nach irgendeinem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß das erste bewegliche Element eine vom Gehäuse (2) getrennte Platte (2) ist, die in ein Fach (2c) des Gehäuses (2) einschiebbar ist, wobei das Fach (2c) mit dem Hohlraum (3) in Verbindung steht und den Verbindungsbereich des Verbinders (1) mit dem komplementären Verbinder (1') definiert.

6. Verbinder nach Anspruch 5 in Verbindung mit Anspruch 4, dadurch gekennzeichnet, daß die Nokkeneinrichtung wenigstens einen geformten Ansatz (31) enthält, der einteilig mit einer Seitenkante (27) der Platte (26) ausgebildet ist.

7. Verbinder nach Anspruch 6, dadurch gekennzeichnet, daß das zweite bewegliche Element ein flexibles Blatt (33) ist, das von einer Wand (29) des Gehäuses (2) im Fach (2c) vorsteht; wobei das Blatt (33) durch den geformten Ansatz (31) aus der Sperrposition, in der es von der Wand (29) im Fach (2c) vorsteht, in die Freigabeposition, in der es mit der Wand (29) in wesentlichem Kontakt ist, beweglich ist.

8. Verbinder nach Anspruch 7, dadurch gekennzeichnet, daß er zwei der geformten Ansätze (31) enthält, die sich von jeweiligen Seitenkanten (27) der Platte (26) erstrecken und seitlich und axial in bezug auf das Blatt (26) vorstehen; und zwei der Blätter (33) enthält, die sich jeweils von einer Seitenwand (29) des Fachs (2c) erstrecken.

9. Verbinder nach irgendeinem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß die sekundäre Halteeinrichtung (25) außerdem ein drittes bewegliches Element (46) enthält, das zwischen das erste bewegliche Element (26) und den Anschluß (4) eingefügt ist und an den Anschluß (4) den Schub überträgt, der auf das erste Element (26) ausgeübt wird, wenn dieses in das Gehäuse (2) eingeschoben ist, so daß der Anschluß (4) aus dem Hohlraum (3) herausgetrieben wird, falls der Anschluß (4) durch die erste Halteeinrichtung (18) nicht in korrektem Eingriff ist; wobei das erste und das dritte bewegliche Element (26, 46) jeweilige Eingriffabschnitte (39, 48) aufweisen, die kraft des Schubs gegenseitig zusammenwirken; wobei wenigstens einer (39) der Abschnitte durch den Schub elastisch verformbar ist, um das erste Element (26) vom Anschluß (4) freizugeben, falls der Anschluß (4) durch die primäre Halteeinrichtung (18) in korrektem Eingriff ist.

10. Verbinder nach Anspruch 9, dadurch gekennzeichnet, daß das dritte bewegliche Element (46) einteilig mit dem Gehäuse (2) ausgebildet und an diesem angelenkt ist.

11. Verbinder nach irgendeinem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß die sekundäre Halteeinrichtung (25) eine Einrichtung (35, 36, 37) zum Verbinden des ersten Elements (26) mit dem Gehäuse (2) in einer Vormontageposition und in der geschlossenen Position enthält.

12. Verbinder nach irgendeinem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß das Gehäuse (2) wenigstens ein erstes und ein zweites Eingriffelement (64, 65), d. h. ein Buchsenelement bzw. ein Steckerelement, enthält, die sich von einer gemeinsamen Seite (60) des Gehäuses (2) auswärts erstrecken, komplementäre Formen besitzen und so beschaffen sind, daß sie stabil mit entsprechenden Stecker- und Buchsen-Eingriffelementen (65, 64) gekoppelt werden können, die von einem zu paarenden Körper (1) getragen werden, der mit dem Verbinder (1) verbunden werden soll.

13. Verbinder nach Anspruch 12, dadurch gekennzeichnet, daß die Seite (60) des Gehäuses (2) eine Einrastkopplungseinrichtung (76) enthält, die so beschaffen ist, daß sie mit einer entsprechenden Einrastkopplungseinrichtung (76) des zu paarenden Körpers (1) zusammenwirkt.

14. Verbinder nach Anspruch 12 oder 13, dadurch gekennzeichnet, daß das erste und das zweite Eingriffelement (64, 65) durch eine Führung bzw. eine Rippe gebildet sind, die sich parallel zueinander längs gegenüberliegender longitudinaler Kanten (66, 67) der Seite (60) erstrecken.

15. Verbinder nach Anspruch 14, dadurch gekennzeichnet, daß die Seitenführung (64) einen longitudinalen Sitz (71) mit einem im wesentlichen T-förmigen Querschnitt besitzt, wobei die Rippe (65) einen entsprechenden T-förmigen Querschnitt besitzt.

Revendications

1. Connecteur électrique (1) comprenant un boîtier isolant (2) avec au moins une cavité axiale (3); au moins une borne électrique (4) logée à l'intérieur de la cavité (3), un moyen de retenue principal (18) destiné à retenir la borne (4) à l'intérieur de la cavité (3); un moyen de retenue secondaire (25) compre-

nant lui-même au moins un premier élément mobile (26) pouvant être raccordé en position fermée sur le boîtier (2) et coopérant dans ladite position fermée avec ledit moyen de retenue principal (18), afin d'assurer un assemblage correct et d'empêcher la libération de ladite borne (4) par ledit moyen de retenue principal (18); caractérisé par le fait qu'il comprend un moyen de condamnation (33) destiné à empêcher la connexion dudit connecteur (1) sur un connecteur complémentaire (1'); et un moyen de désactivation (31) formé sur ledit premier élément mobile (26) destiné à désactiver ledit moyen de condamnation (33) lorsque ledit premier élément mobile (26) est dans ladite position fermée.

2. Connecteur selon la revendication 1, caractérisé en ce que ledit moyen de condamnation comprend au moins un deuxième élément (33) interposé entre ledit premier élément (26) et ledit boîtier (2) et qui peut se déplacer entre une position de condamnation dans laquelle il interfère avec la zone de connexion (2c) dudit connecteur (1) avec le connecteur complémentaire (1'), et une position libre dans laquelle il n'interfère pas avec ladite zone (2c); ledit moyen de désactivation (31) coopérant avec ledit deuxième élément (33) pour le déplacer dans ladite position libre lorsque ledit premier élément (26) est dans ladite position fermée.

3. Connecteur selon la revendication 2, caractérisé en ce que ledit deuxième élément (33) fait partie intégrante dudit boîtier (2).

4. Connecteur selon la revendication 3, caractérisé en ce que ledit moyen de désactivation comprend un moyen à came (31) faisant partie intégrante dudit premier élément (26) et coopérant avec ledit deuxième élément (33) pour le déplacer de ladite position de condamnation vers ladite position libre.

5. Connecteur selon l'une quelconque des revendications précédentes, caractérisé en ce que ledit premier élément mobile est une plaque (26) distincte dudit boîtier (2) et qui peut être insérée à l'intérieur d'un compartiment (2c) dudit boîtier (2), ledit compartiment (2c) communiquant avec ladite cavité (3) et définissant ladite zone de connexion dudit connecteur (1) avec ledit connecteur complémentaire (1').

6. Connecteur selon la revendication 5, lorsqu'elle dépend de la revendication 4, caractérisé en ce que ledit moyen à came comprend au moins une patte profilée (31) faisant partie intégrante du rebord latéral (27) de ladite plaque (26).

7. Connecteur selon la revendication 6, caractérisé en ce que ledit second élément mobile est une lame souple (33) en saillie par rapport à une paroi (29) dudit boîtier (2) dans ledit compartiment (2c); ladite lame (33) pouvant être déplacée sous l'action de ladite patte profilée (31) depuis ladite position de condamnation dans laquelle elle est en saillie par rapport à ladite paroi (29) dans ledit compartiment (2c), vers ladite position libre dans laquelle elle est sensiblement en contact avec ladite paroi (29).

8. Connecteur selon la revendication 7, caractérisé en ce qu'il comprend deux desdites pattes profilées (31) s'étendant à partir des rebords latéraux respectifs (27) de ladite plaque (26) et étant latéralement et axialement en saillie par rapport à celle-ci; et deux desdites lames (33), chacune s'étendant à partir d'une paroi latérale (29) dudit compartiment (2c).

9. Connecteur selon l'une quelconque des revendications précédentes, caractérisé en ce que ledit moyen de retenue secondaire (25) comprend aussi un troisième élément mobile (46) interposé entre ledit premier élément mobile (26) et ladite borne (4), et qui transmet à ladite borne (4) la poussée exercée sur ledit premier élément (26) lorsque celui-ci est inséré à l'intérieur dudit boîtier (2), de manière à expulser ladite borne (4) de ladite cavité (3) dans le cas où la borne (4) n'est pas correctement retenue par rapport audit élément de retenue principal (18); lesdits premier et troisième éléments mobiles (26, 46) présentant des parties de retenue respectives (39, 48) coopérant mutuellement sous l'action de ladite poussée; et au moins l'une (39) desdites parties pouvant être déformée de manière élastique par ladite poussée, afin de libérer ledit premier élément (26) de ladite borne (4) dans le cas où la borne (4) est correctement retenue par ledit moyen de retenue principal (18).

10. Connecteur selon la revendication 9, caractérisé en ce que ledit troisième élément mobile (46) fait partie intégrante dudit boîtier (2) et est articulé par rapport à celui-ci.

11. Connecteur selon l'une quelconque des revendications précédentes, caractérisé en ce que ledit moyen de retenue secondaire (25) comprend des moyens (35, 36, 37) destinés à raccorder ledit premier élément (26) sur ledit boîtier (2) dans une position préalable à l'assemblage et dans ladite position fermée.

12. Connecteur selon l'une quelconque des revendications précédentes, caractérisé en ce que ledit boîtier (2) comprend au moins un premier et un second éléments d'assemblage (64, 65), respectivement femelle et mâle, s'étendant vers l'extérieur à partir d'une face commune (60) dudit boîtier (2), présen-

tant des formes complémentaires et adaptées pour être couplés d'une manière stable à des éléments d'assemblage mâle et femelle respectifs (64, 65) supportés par un corps pouvant s'imbriquer (1) de manière à être relié audit connecteur (1).

13. Connecteur selon la revendication 12, caractérisé en ce que ladite face (60) dudit boîtier (2) comprend un moyen de couplage par encliquetage (76) conçu de manière à coopérer avec des moyens de couplage par encliquetage respectif (76) dudit corps pouvant s'imbriquer (1).

14. Connecteur selon la revendication 12 ou 13, caractérisé en ce que lesdits premier et second éléments d'assemblage (64, 65) sont formés respectivement par un guide et une nervure s'étendant en parallèle l'un par rapport à l'autre le long des rebords longitudinaux opposés (66, 67) de ladite face (60).

15. Connecteur selon la revendication 14, caractérisé en ce que le guide latéral (64) comprend un siège longitudinal (71) présentant une section transversale sensiblement en forme de T, ladite nervure (65) présentant une section transversale correspondante en forme de T.

Fig.2

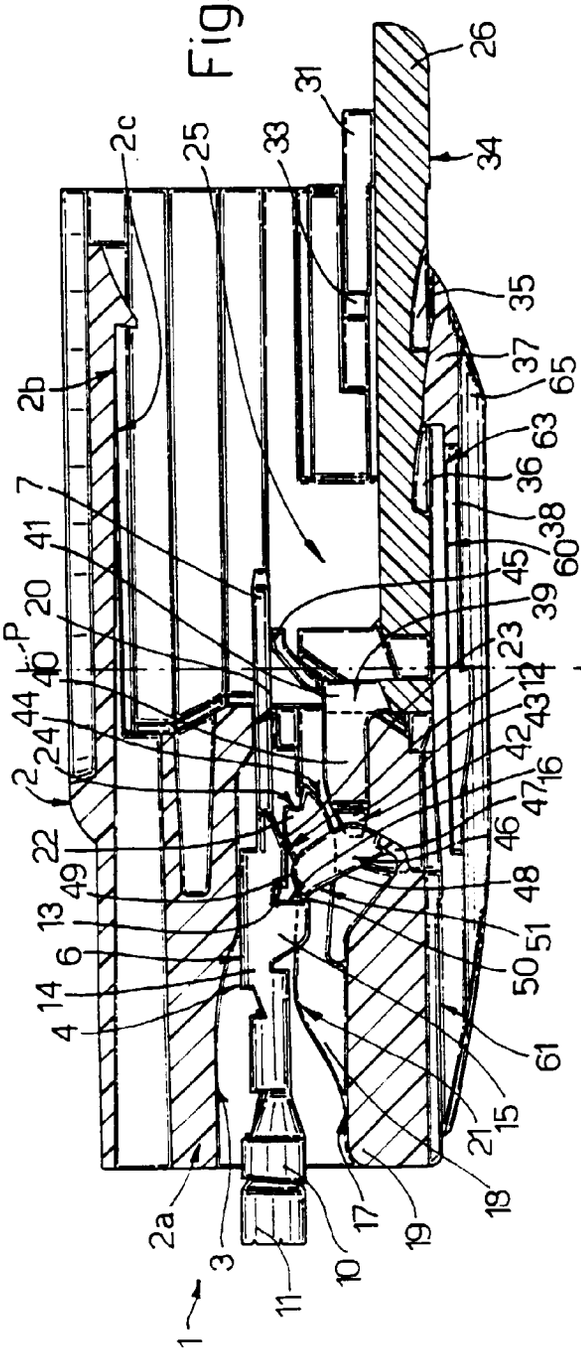
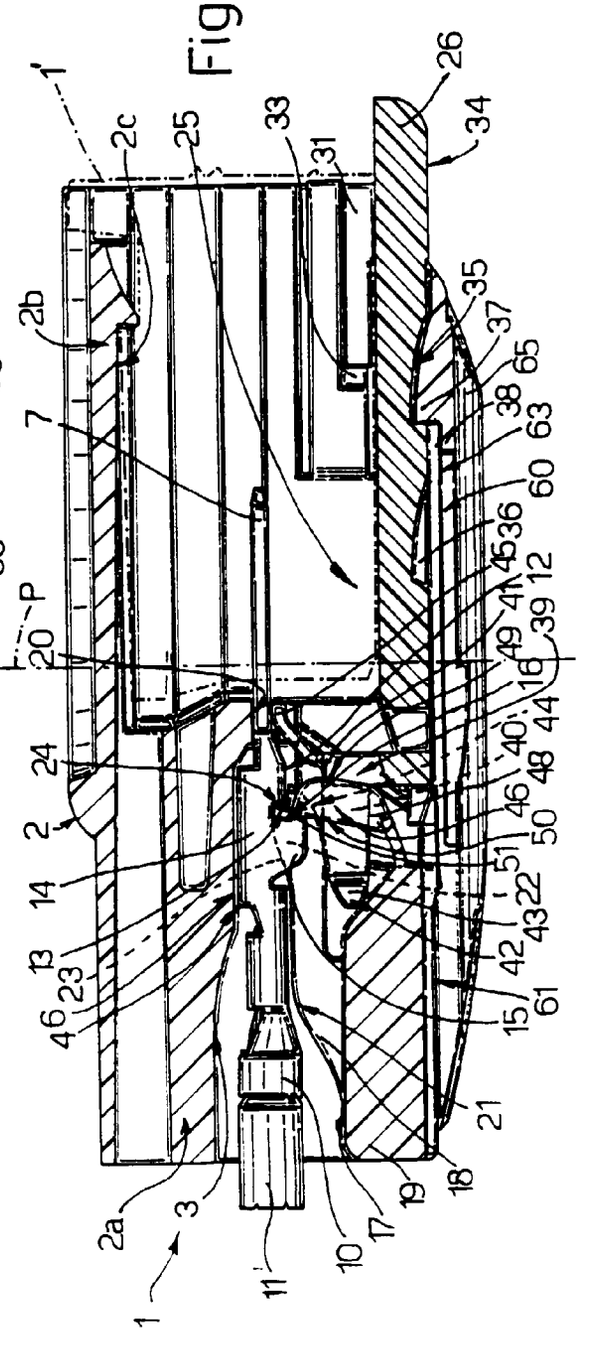
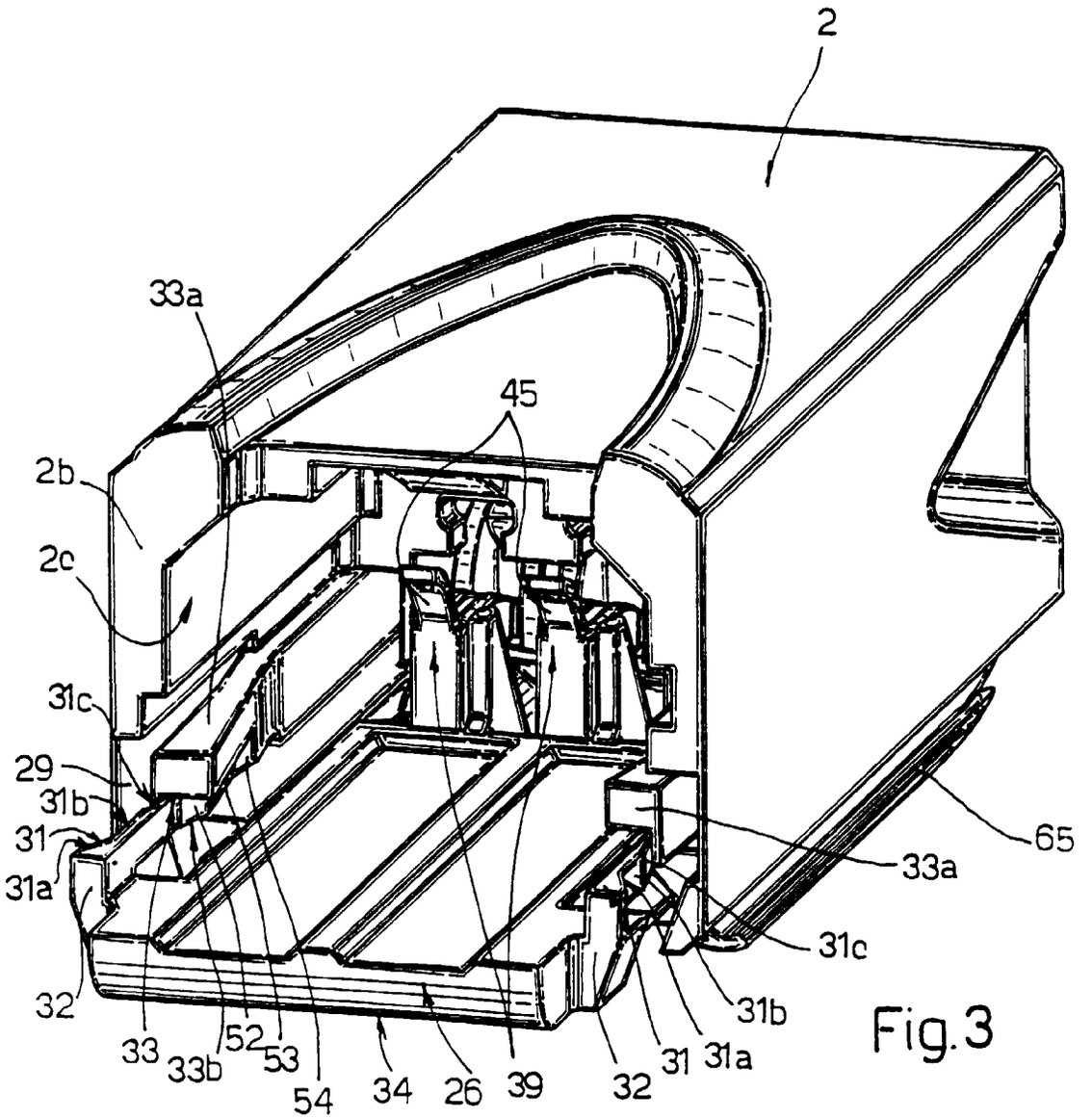


Fig.1

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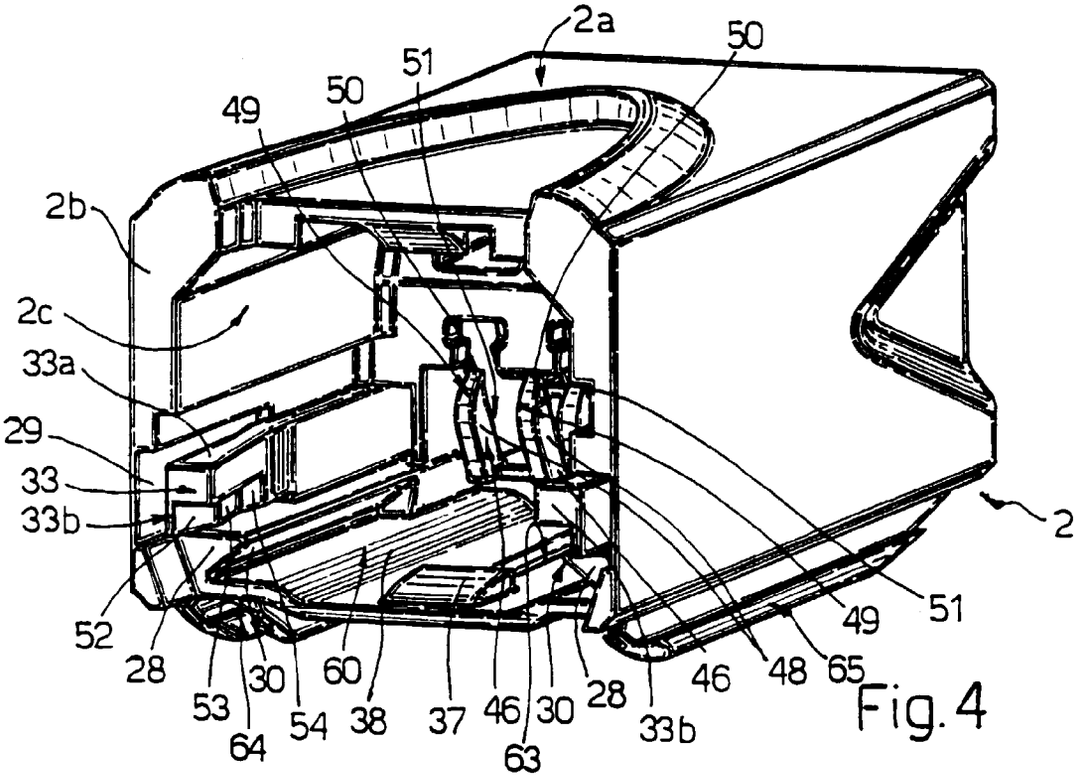
31a
31b
31c
33a
65

Fig.3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33b
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Fig. 4

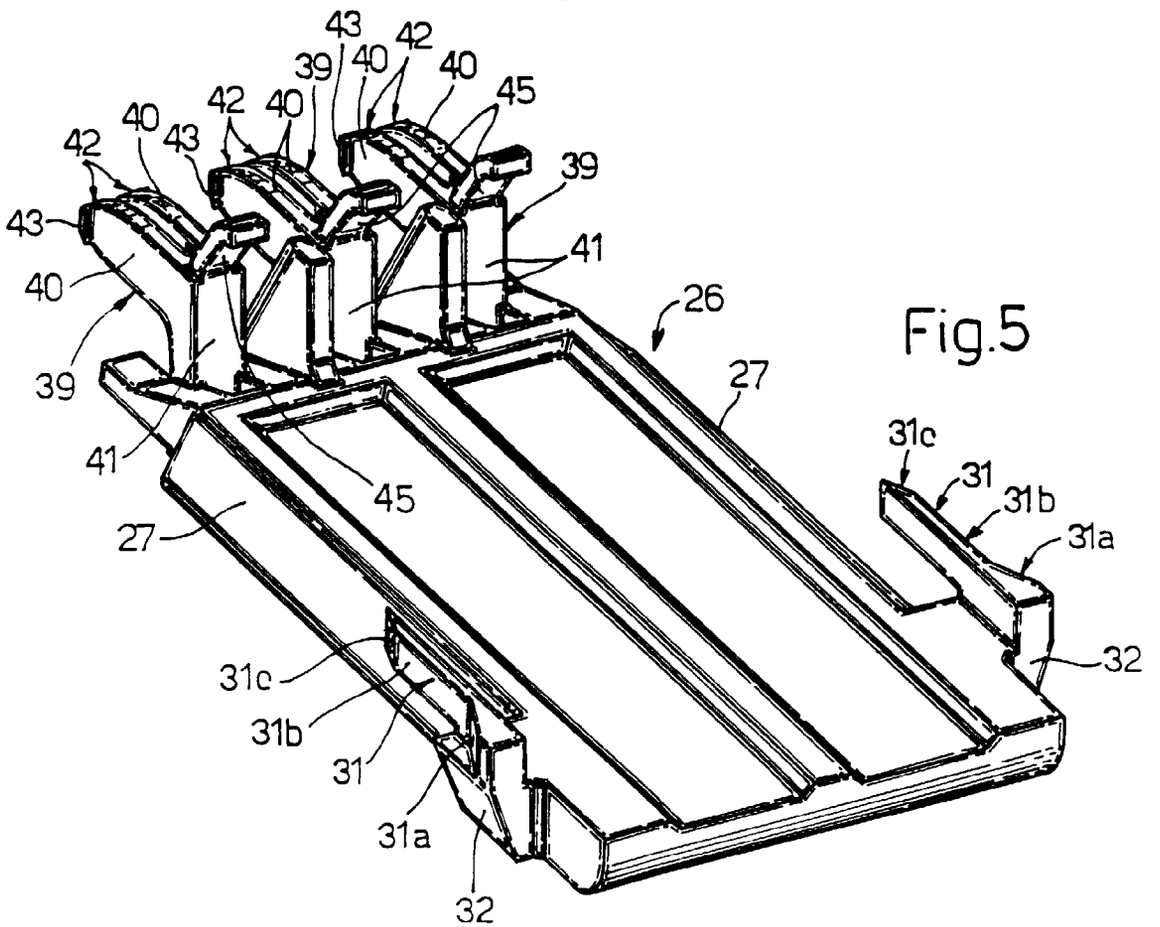
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Fig. 5

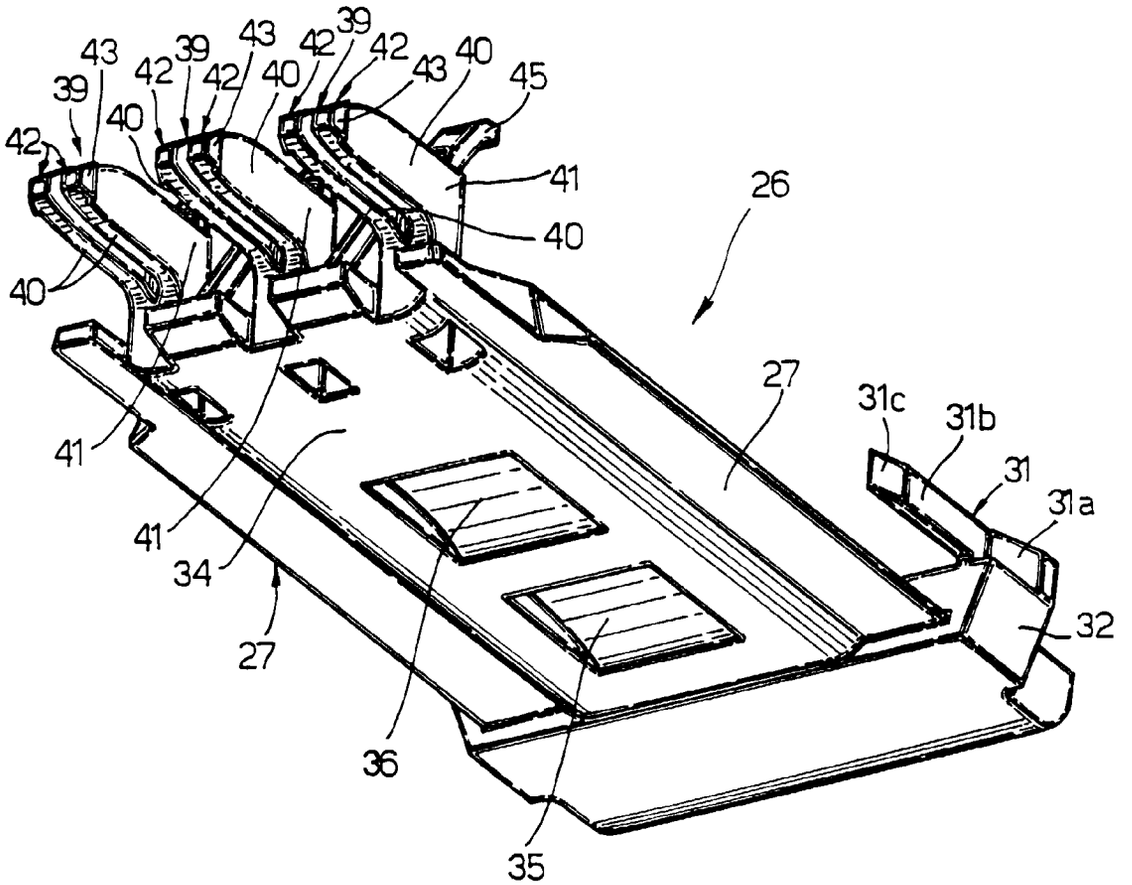
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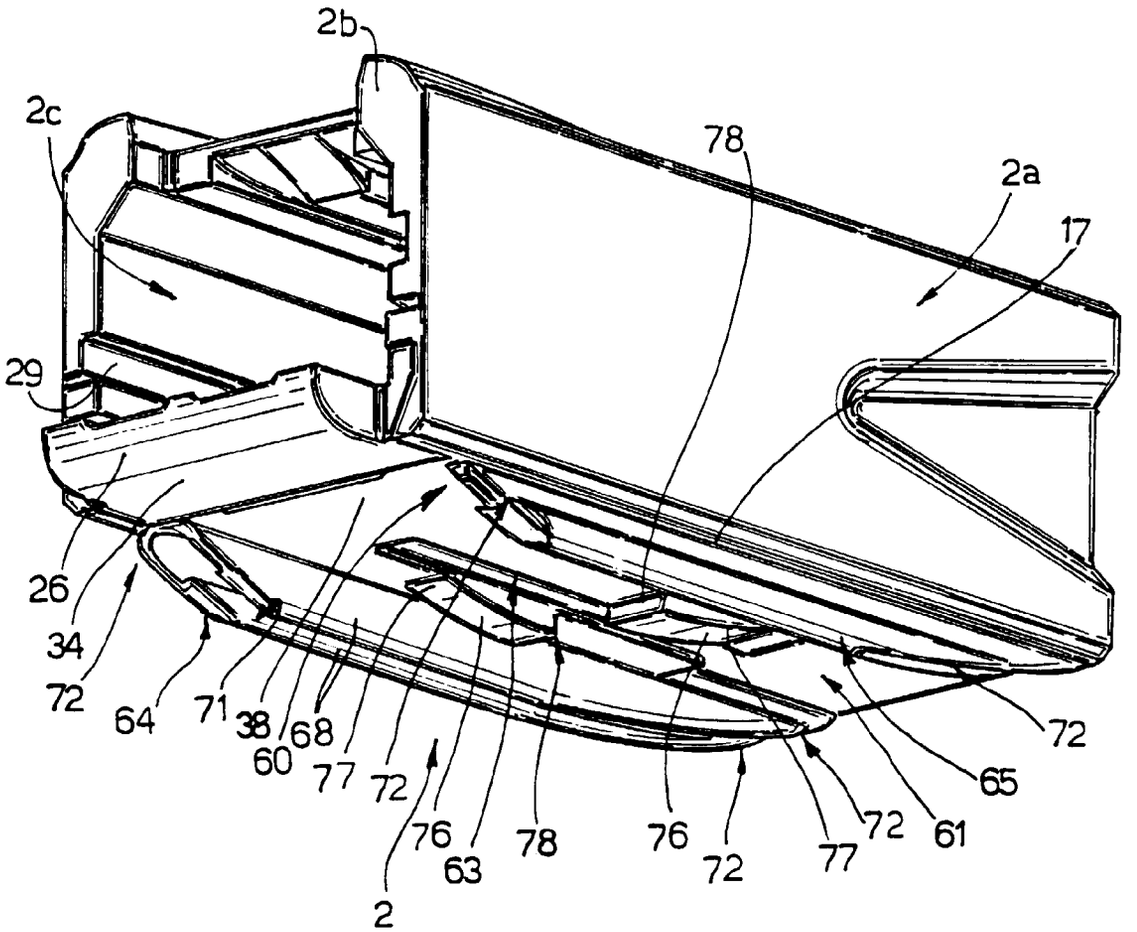
Fig.6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65
72

Fig.7

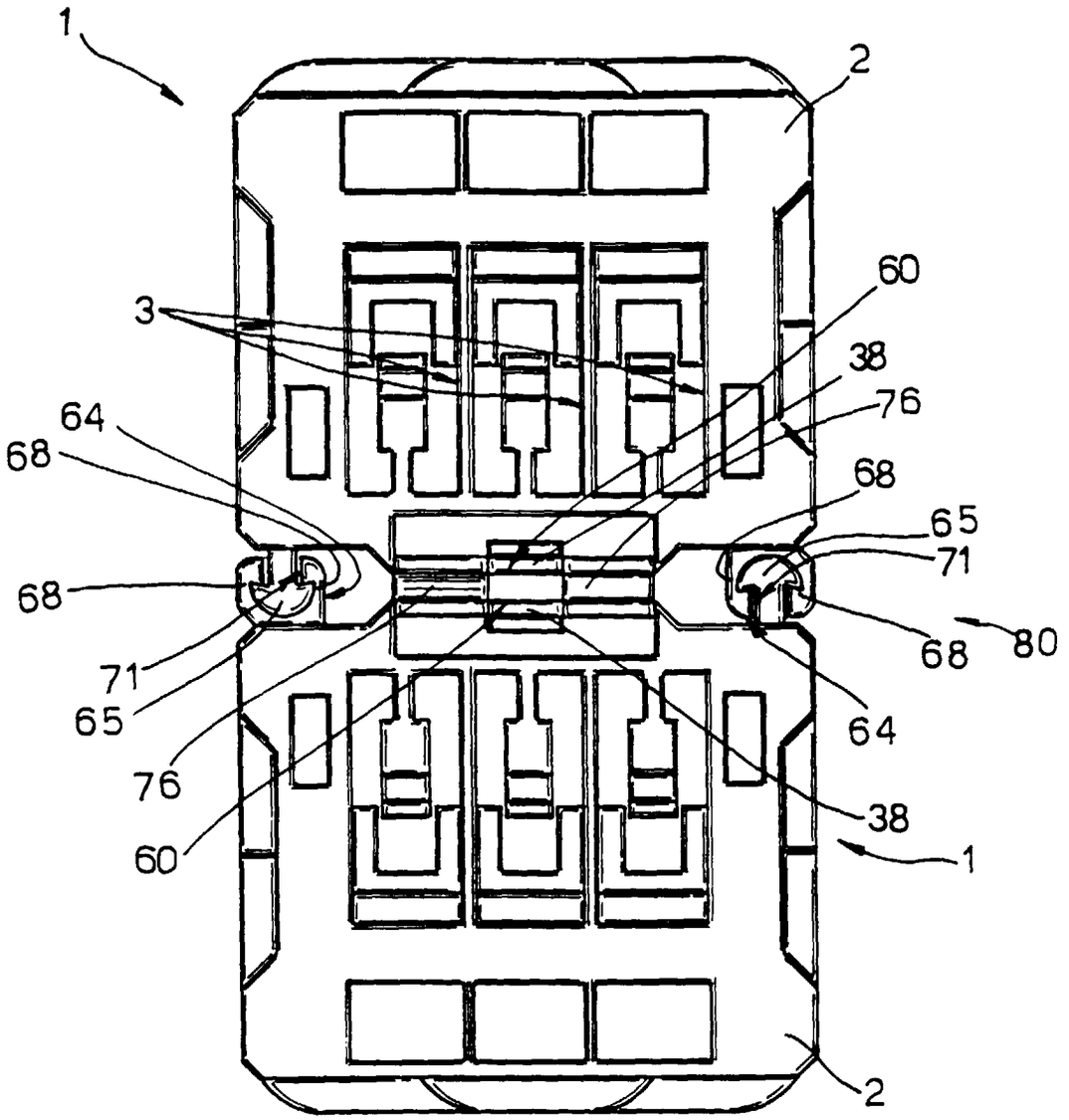

Fig.8