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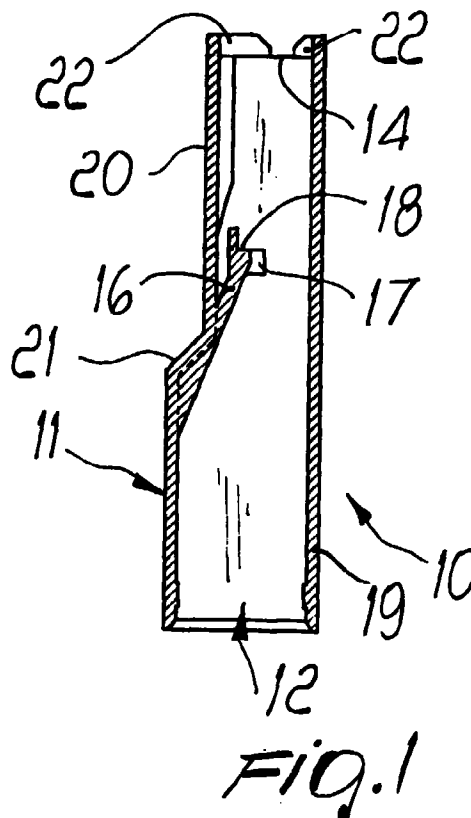
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(54) **Connector particularly for the guided insertion of electrical connection terminals**

(57) A connector particularly for the guided insertion of electrical connection terminals, comprising a longitudinally elongated hollow body (10) made of plastics which has, at one end, a first opening (12) for the insertion of a female terminal and, at the other end, a second opening (14) for the insertion of a male tab for electrical connection; the internal surface of the body is shaped so as to form at least one barrier (16) which determines unambiguous conditions for the insertion orientation of the female terminal.



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Description

[0001] The present invention relates to a connector which is particularly useful for the guided insertion of electrical connection terminals.

[0002] It is known that female terminals for extraction-resistant electrical connections are currently widely used; such terminals are substantially constituted by a longitudinally elongated metallic plate-like body formed by blanking and plastic deformation from a strip.

[0003] The plate-like body commonly has a first end which is shaped so as to form connection means for an electrical cable, while a second end thereof, arranged opposite the first one, is shaped by folding inwards part of the longitudinal edges so as to form a seat which, in association with the central region of the body, which is blanked so as to assume the shape of a cantilevered leaf spring and is provided with retention means, is adapted to accommodate a male tab which, once inserted, is locked by said retention means.

[0004] The connection between the female terminal and the tab is conveniently associated with a connector constituted by a hollow body made of plastics, which is adapted to protect and guide the electrical connection between the two parts.

[0005] Commercially available connectors currently have an internal surface which is substantially shaped so as to ensure the meeting and mating of the female terminal and the male tab.

[0006] However, the operator is usually unable to easily determine the insertion direction of the female terminal and this, especially in case of forcing, can lead to incorrect electrical connections which, in the worst cases in which the extraction-preventing means have been activated, entail replacing the female terminal and possibly the tab as well.

[0007] Damage to the female terminal or to the male tab is particularly troublesome, not because of their intrinsic value but because especially with partially or fully automated wiring it can stop production processes which instead require high production rates.

[0008] The aim of the present invention is to provide a connector which solves the above-mentioned problems of commercially available connectors, particularly ensuring that the operator has unambiguous conditions as regards the insertion orientation of the female terminal, in order to obtain an electrical connection which is correct every time, possibly preventing any error of the assembly operator from damaging the components of the wiring.

[0009] Within the scope of this aim, an object of the present invention is to provide a connector which has a structure that can be manufactured at low costs thus being competitive with respect to conventional connectors.

[0010] A further object of the present invention is to provide a connector which is also adapted to ensure the extraction-preventing characteristic of the female terminal

once it has been inserted correctly.

[0011] A further object of the present invention is to provide a connector which allows a quick and simple connection which can optionally be automated.

5 [0012] A further object of the present invention is to provide a connector which ensures high flexibility in application.

[0013] A further object of the present invention is to provide a connector which can be manufactured with conventional means and technologies.

10 [0014] This aim, these objects and others which will become apparent hereinafter are achieved by a connector particularly for the guided insertion of electrical connection terminals, comprising a longitudinally elongated hollow body made of plastics which has, at one end, a first opening for the insertion of a female terminal and, at the other end, a second opening for the insertion of a male tab for electrical connection, characterized in that the internal surface of said body is shaped so as to form at least one barrier which determines unambiguous conditions for the insertion orientation of said female terminal.

20 [0015] Further characteristics and advantages of the present invention will become apparent from the following detailed description of two embodiments thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a partially sectional orthographic projection view of a connector according to the invention in a first embodiment;

Figure 2 is another orthographic projection view of the connector of Figure 1;

Figure 3 is another orthographic projection view of the connector of Figure 1;

Figures 4 to 6 are different partially sectional orthographic projection views of connectors such as the one of Figure 1 during use;

Figure 7 is a view of a connector according to the invention in a second embodiment;

Figure 8 is another orthographic projection view of the connector of Figure 7;

Figure 9 is another orthographic projection view of the connector of Figure 7.

[0016] With reference to Figures 1 to 6, a connector particularly for the guided insertion of electrical connection terminals, according to the invention, is generally designated by the reference numeral 10 in a first embodiment.

50 [0017] The connector 10 comprises a hollow body 11, which in this case has a substantially rectangular cross-section, is made of plastics and is provided at one end with a first opening 12 for the insertion of a female terminal 13 which is substantially constituted by a conveniently shaped metallic laminar body.

[0018] The body 11 has, at its other end, a second opening 14 for the insertion of a metallic male tab 15 for

electrical connection to the terminal 13.

[0019] The connector 10, as described in greater detail hereinafter, has an internal surface which is shaped so as to form at least one barrier which determines unambiguous conditions for the insertion orientation of said female terminal 13.

[0020] In particular, a wing 16 protrudes from the internal surface of the body 11 and is shaped so as to form a polarization barrier which is constituted by a tooth 17 protruding from the cantilevered free end of said wing 16.

[0021] In particular, in this embodiment the wing 16 is formed substantially monolithically with respect to the body 11 and can flex elastically, so as to allow the passage of the female terminal 13 only when it is inserted with the correct orientation.

[0022] The wing 16 protrudes substantially at an angle with respect to the base surface in a direction which corresponds to the insertion direction of the female terminal 13 so as to define, at its free end, extraction-preventing abutment surfaces 18 for said female terminal 13.

[0023] In particular, the body 11 has, in this embodiment, a first portion 19 for the insertion of the female terminal 13 which has a larger cross-section than a second portion 20 which accommodates the connection between the latter and the male tab 15.

[0024] The wing 16 protrudes substantially at the region where connection between portions 19 and 20 occurs, and more precisely in the region of a recess 21 which actually forms the connection between said portions.

[0025] The body 11 is further shaped, at the second opening 14, so as to form folded edges 22 which are adapted to form stroke limits for the insertion of the female terminal 13.

[0026] With reference to Figures 7 to 9, a connector particularly for the guided insertion of electrical connection terminals, according to the invention is generally designated by the reference numeral 100 in a second embodiment.

[0027] The connector 100 is not substantially different from the connector 10 since it comprises a hollow body 101 provided with a first opening 102 and a second opening 103 which lies opposite the preceding one; a female terminal and a male tab, not shown in the figures, for electrical connection can be inserted respectively in said openings.

[0028] The connector 100 also is provided with a wing 104 from which there protrudes, at its free end, a tooth 105 which is adapted to determine the unambiguity of insertion orientation of the female terminal.

[0029] The connector 100 differs from the connector 10 substantially in that the wing 104 lies opposite the blending region, now designated by the reference numeral 106, between the first portion and the second portion, now designated by the reference numerals 107 and 108 respectively.

[0030] In practice it has been observed that the present invention fully achieves the intended aim and objects.

[0031] In particular, it should be noted that thanks to the connector according to the invention, if the operator makes a mistake in the insertion orientation of the terminal, he cannot in any case complete his action, thus avoiding any risk of damage to the connection.

[0032] The operator, realizing his error immediately because he cannot complete insertion, can in fact just as quickly correct said error by pulling out the terminal and inserting it again in the opposite orientation.

[0033] It should also be noted that the connector according to the invention, notwithstanding its structural simplicity, in addition to ensuring a safe insertion orientation of the female terminal, also ensures that the female terminal does not disengage once the electrical connection has been performed correctly.

[0034] Attention is also drawn to the constructive simplicity of the connector according to the invention, which can be mass-manufactured at low costs, thus being competitive with respect to conventional connectors.

[0035] It should also be noted that the structure of the connector according to the invention can also be advantageously used to prepare automated wiring.

[0036] The present invention is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept; accordingly, the technical details may be replaced with other technically equivalent elements.

[0037] The materials and the dimensions may be any according to requirements.

[0038] The disclosures in Italian Utility Model Application No. PD98U000041 from which this application claims priority are incorporated herein by reference.

[0039] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A connector particularly for the guided insertion of electrical connection terminals, comprising a longitudinally elongated hollow body made of plastics which has, at one end, a first opening for the insertion of a female terminal and, at the other end, a second opening for the insertion of a male tab for electrical connection, characterized in that the internal surface of said body is shaped so as to form at least one barrier which determines unambiguous conditions for the insertion orientation of said female terminal.
2. The connector according to claim 1, characterized

in that a wing shaped so as to form said at least one barrier protrudes from the internal surface of said body.

3. The connector according to claim 2, characterized in that said barrier is constituted by a tooth protruding from a free cantilevered end of said wing. 5
4. The connector according to claim 2, characterized in that said wing is elastically flexible so as to allow the passage of said female terminal only when it is inserted with the correct orientation. 10
5. The connector according to claim 2, characterized in that said wing protrudes at an angle with respect to a base surface of said internal surface of the body and in the same direction in which said female terminal is inserted, so as to define, at its free end, extraction-preventing abutment surfaces for said female terminal. 15 20
6. The connector according to claim 2, characterized in that said body comprises a first portion for the insertion of the female terminal which has a larger cross-section than a second portion which accommodates the connection between said female terminal and the male tab, said wing protruding substantially in the region where said portions blend together. 25 30
7. The connector according to claim 1, characterized in that it has, at said second opening, stroke limiting folds for the insertion of said female terminal.
8. The connector according to claim 2, characterized in that said body comprises a first portion for the insertion of the female terminal which has a larger cross-section than a second portion which accommodates the connection between said female terminal and the male tab, said wing protruding opposite the region where said two portions blend together. 35 40

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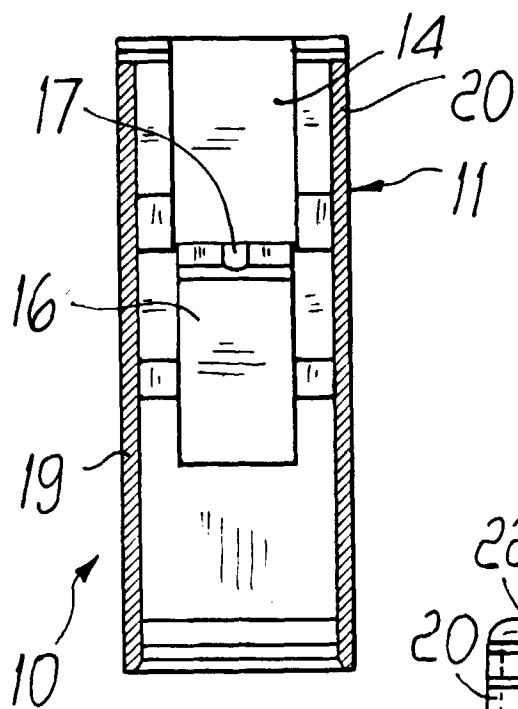


Fig. 2

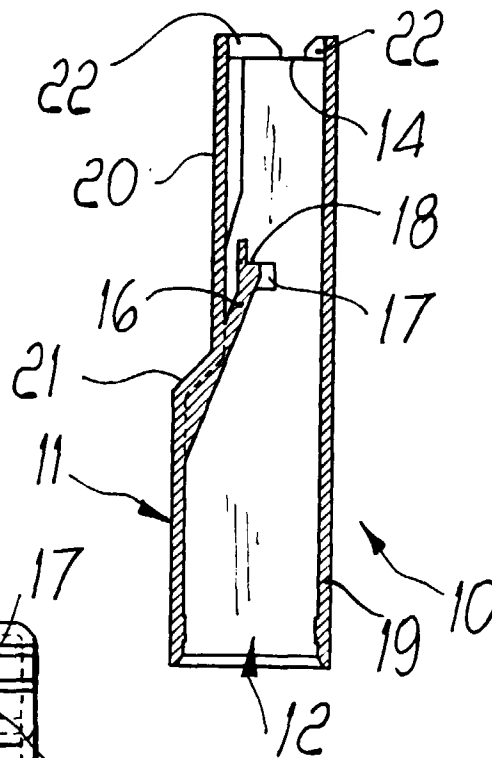


Fig. 1

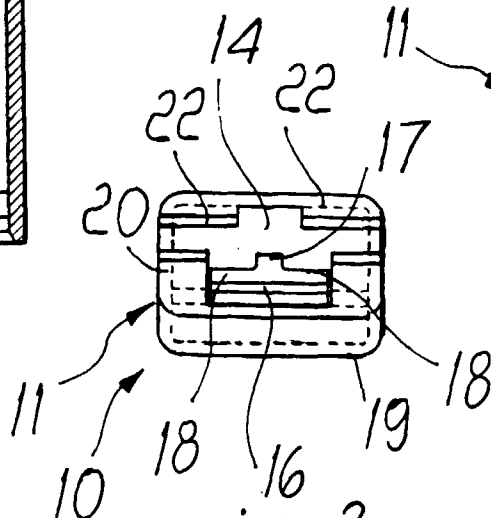


Fig. 3

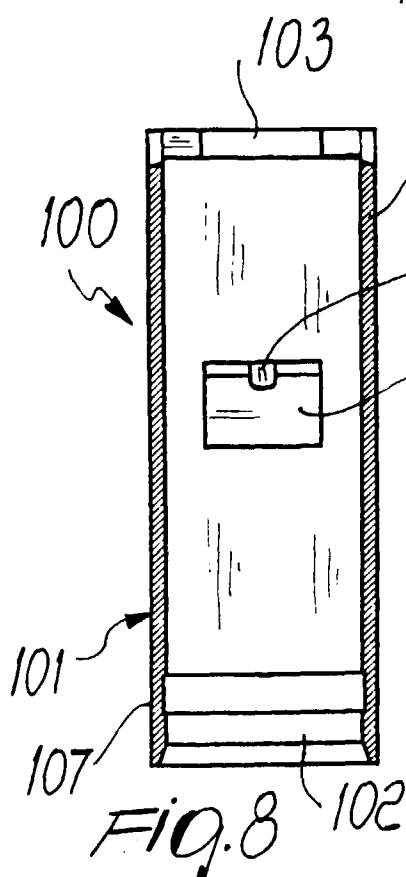


Fig. 8

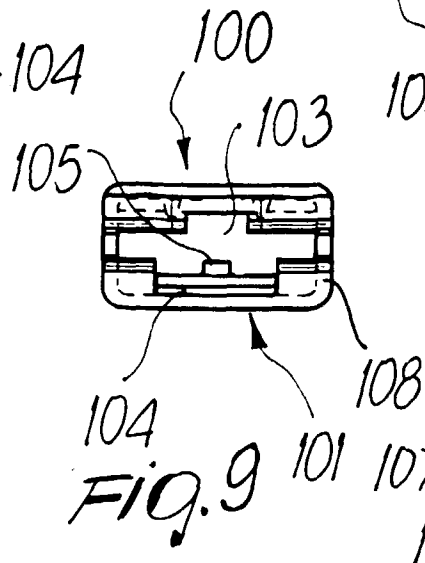


Fig. 9

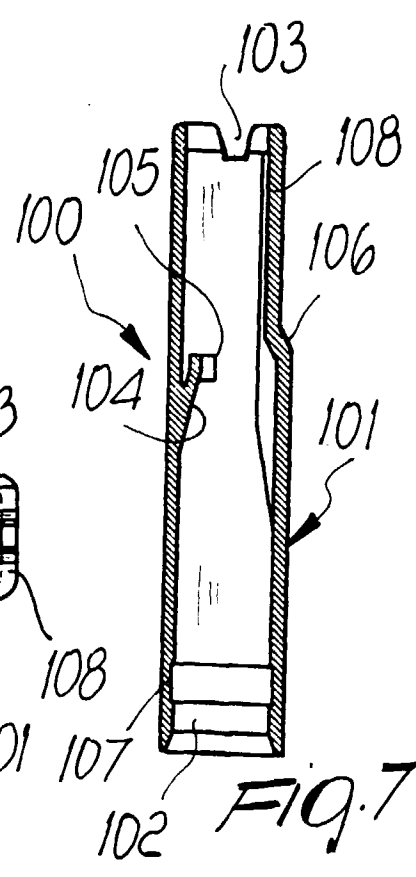


Fig. 7

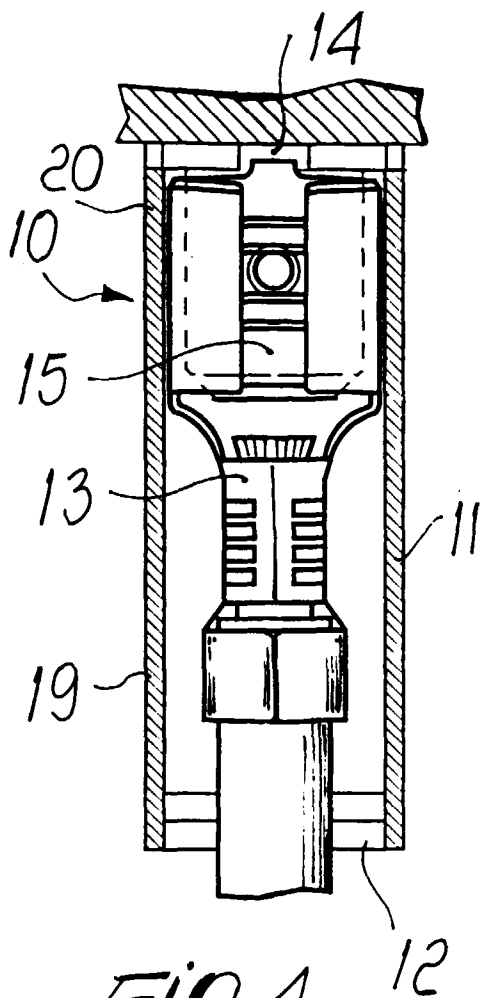


FIG. 4

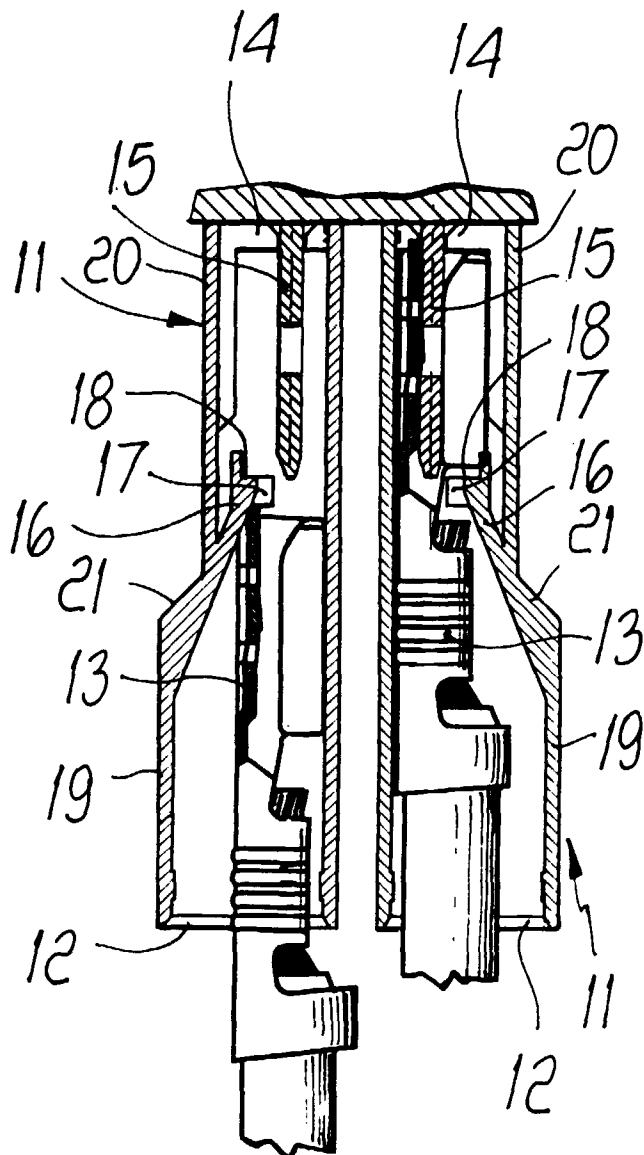


FIG. 5

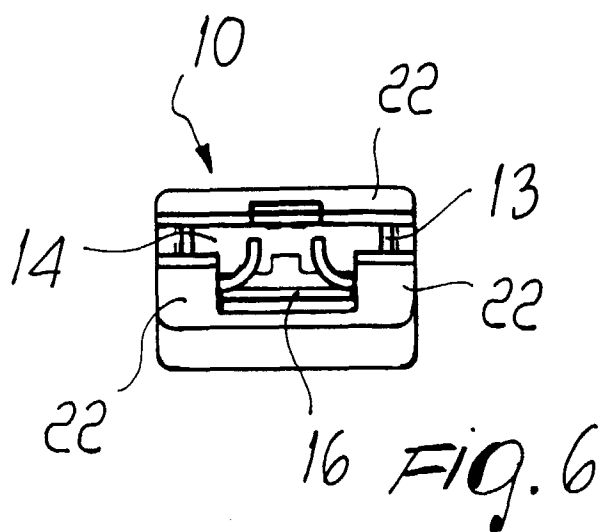


FIG. 6