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(54) **Method for the individual protection of the small staples in a flat cable**

(57) The invention relates to plastic covers whose function is that of covering the interconnection zone cop-

per-copper between two or more FFC cables, also called flat cables, formed with two insulating sheets between them are provided a plurality of flat copper, aluminium or similar electric leads, arranged longitudinally and parallel between them.

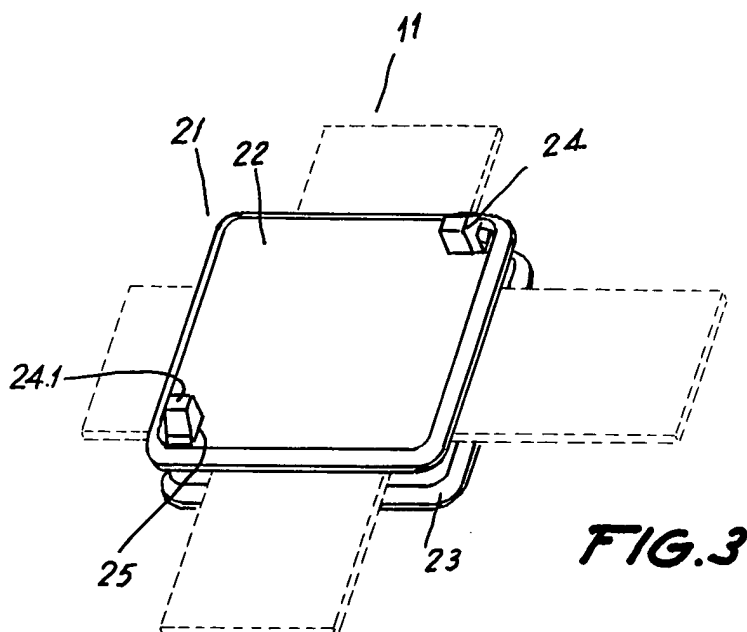


FIG. 3

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Description

[0001] The present application for a Patent of Invention consists, as indicated in its title, in a "METHOD FOR THE INDIVIDUAL PROTECTION OF THE SMALL STAPLES IN A FLAT CABLE", which novel characteristics of manufacturing, shaping and design fulfill the object for which had been specifically designed with a maximum of safety and efficiency.

[0002] More particularly, the invention relates to plastic covers whose function is that of covering the interconnection zone copper-copper between two or more FFC cables, also called flat cables, formed with two insulating sheets between them are provided a plurality of flat copper, aluminium or similar electric leads, arranged longitudinally and parallel between them.

[0003] One of the covers is provided with a catch at the end of a tongue in every vertex entering in its corresponding hole provided in the cover opposite, keeping both covers joined and allowing the passage of the copper lines interconnected through the intermediate zone of both covers.

[0004] A further object of the present invention is such that when because of the technical requirements its necessary that the protection must be watertight, the covers will incorporate silicone or HOT-MELT, thus the welding zones of the flat cables are protected at the 100% by heating.

[0005] There exist in the market and therefore can be considered the state of the art a plurality of flat cables which instead of having the traditional round shape are planes practically laminar and contain a plurality of copper, aluminium or similar leads, also flat, duly spaced with sheets of dielectric material welded in correspondence to said leads. At the ends of said leads are disposed the corresponding terminals, staples and similar elements, being of special application in the automotive sector and in grace to its special characteristics and as it is disclosed in the invention number 9 802 629 to same applicant, allow its multirectional interconnection in grace to a new welding method allowing to avoid the staples which served for keeping the contact between the several leads and its substitution for the method proposed in said patent, which basically allows the union between the conductive parts after having eliminated or peeled the connection points of the dielectric or insulating material covering same.

[0006] The present invention complementary to the above one of same applicant has the object, as it has been disclosed above, for a second pass in the installations using said type of cables, either if same are connected orthogonally with other of same nature, or if same are connected at any type of direction, protecting said union and avoiding that same may be a weak point of the general electric installation of the automobile, not so much because of the possibility of undesired actions, as the humidity presence, water vertical falling and other type of harmful effects, but also as an element serving

to reinforce the welding and avoiding that, at the moment of the assembly, and because of the strain of one of the cables integrating the net or on the welding, may provoke damages on same, which would be manifest once all the wiring of which said cables are a part would be fully assembled, which would cause the corresponding damages, not only because of the substitution of the defective material, but also because of the need to double the assembly times.

[0007] Other details and characteristics of the present application for a Patent of Invention will be manifest through the reading of the description given herebelow, in which reference is made to the figures attached to this description where the above details are depicted in a rather schematic way. These details are given as an example, referring to a case of a possible practical embodiment, but is not limited to the details outlined; therefore this description must be considered from an illustrative point of view and with no limitations whatsoever.

[0008] There follows a detailed report of the several elements named in the present application: (10) cable union, (11) flat cable, (12) flat cable, (13) flat leads, (14) flat leads, (15) insulating sheet, (16) insulating sheet, (17-18-19-20) welding zone, (21) protector, (22) cover, (23) cover, (24) tongue, (24.1) catch, (25) holes.

[0009] Figure 1 is a perspective view of a crossing of flat cables (11 and 12) which had been joined by the corresponding welding zones (17-18-19-20).

[0010] Figure 2 is a perspective view of the union of cables (10) protected by its protector (21) formed by the covers (21 and 22).

[0011] Figure 3 is a perspective view of the protector (21), covering the union zone of the flat cables (11 and 12).

[0012] In one of the preferred embodiments of what is the object of the present application for a Patent of Invention and as can be seen in Figure 1, the flat cables (11 and 12) are formed with protecting sheets (16) of a dielectric material covering with insulation the copper, aluminium or similar material leads (13 and 14) parallel between them and longitudinally arranged. When same must interconnect, and by the method disclosed in the Patent of Invention No. 9 802 629, it is carried out the connection of same, remaining electrically joined by the welding zones (17-18-19-20).

[0013] When the union of cables above described, which can be seen in Figure No. 1, needs a standard protection, it is covered with what is the object of the present Model of Utility: the protector (21) formed with two covers of a noticeably quadrangular section, provided with the corresponding holes (25) in the neighbourhood of their vertices, by which there are introduced tongues (24) provided in the other cover, entering through said holes and immobilizing said covers (22 and 23) of the protector (21) in grace to being provided in the ends of said tongues of catches or spurs (24.1), therefore remaining said welding zones duly protected, see Figures No. 2 and 3.

[0014] Additionally, a further object of the present invention is obtaining a full watertightness of the union and welding zones, by the incorporation of silicone or HOT-MELT and a further heating.

[0015] In this way, the welding zones (17-18-19-20) remain duly protected. 5

[0016] Enough disclosed what the present application for a Patent of Invention is in agreement with the attached figures, it is understood that can be introduced in same any detail modifications regarded as convenient, always provided that any the modifications entered do not depart from the essence of the present Patent of Invention as summarized in the following claims. 10

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Claims

1. "METHOD FOR THE INDIVIDUAL PROTECTION OF THE SMALL STAPLES IN A FLAT CABLE" of those formed with a series of flat conductive electric leads (13 and 14) of aluminium, copper or other conductive material, arranged longitudinally parallel between them and covered with sheets of insulating material (15 and 16), crossing two or more of same in any direction, being established the electrical connection between same at welding zones (17-18-19-20) which connect electrically and in a selective way the leads (13 and 14), in grace to being previously obtained such welding zones by the removal or peeling of the sheets in said zones, proceeding afterwards to the welding of the exposed conductive zones (13 and 14) by the application of an ultrasonic or similar welding method, characterized in that said welding zones (17-18-19-20) are covered with a protector (21) formed by covers (22), in the neighbourhood of whose corners or vertexs are provided holes (25) whilst in the opposed ones are provided tongues (24), at which ends are designed catches (24.1). 20 25 30 35 40
2. "METHOD FOR THE INDIVIDUAL PROTECTION OF THE SMALL STAPLES IN A FLAT CABLE" as per Claim 1 characterized in that the covers (22 and 23) forming the protector (21) may be of a cuadrangular, rectangular or any other similar figure perimeter, according with the welding zones (17-18-19-20). 45
3. "METHOD FOR THE INDIVIDUAL PROTECTION OF THE SMALL STAPLES IN A FLAT CABLE" as per the above Claims characterized in that every cover (22) may be provided with two or more tongues (24) and catches (24.1), as well as two or more holes (25). 50 55
4. "METHOD FOR THE INDIVIDUAL PROTECTION OF THE SMALL STAPLES IN A FLAT CABLE" as per Claim 1 characterized in that when the protec-

tion must be watertight against the vertical falling of water will be incorporated in the interior part of the covers (22) silicone or hot-melt.

