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(54) Conductor rail.

(57) The invention relates to a conductor rail (10) comprising a supporting structure (13), an insulator (11) and a conductor or conductors (12) The supporting structure (13) and the insulator (11) of the conductor rail (19) are formed into one and the same uniform profile by means of a pultrusion method.

EP 0 428 055 A2

CONDUCTOR RAIL

The invention relates to a conductor rail comprising a supporting structure, an insulator and a conductor or conductors.

On display windows previously known, in dining rooms and other public premises as well as in homes, is used an electric or conductor rail, whereto electrical appliances, e.g. light fixtures can readily be connected at any point of the rail. Such known rail is manufactured in such a way that inside an aluminum profile runs a PVC-profile provided with copper conductors. In such known rail, the aluminum profile acts as a supporting structure, whereto an adapter can easily be fastened, and the PVC-profile acts an insulator.

A certain electric rail or a busbar known previously is described in the FI publication print 69730, in which the busbar is formed of a sectionally U-formed metallic profile and of two longitudinal electric conductors fastened thereto by means of a plastic retainer list.

Another conductor rail or busbar known previously is described in the FI publication print 49658, in which the busbar comprises a supporting rail acting as supporting structure, which busbar can be formed e.g. of an extruded aluminum rail, and to both side walls of the supporting rail are fastened longitudinal insulator lists, in whose grooves are embedded e.g. copper electric conductors.

A certain electric conductor-line solution previously known is described in the FI publication print 66706. In this known solution, the current-collecting rail is provided with two comb-shaped insulator profiles directed toward each other, in which profiles the electric conductor rails are kept in conformity with their form. In addition, an earthing conductor rail is installed in the profile of the busbar.

A certain rail solution previously known is described in the FI publication print 65874, in which the rail is formed of a channel groove, which is made e.g. of anodized aluminum by pressure casting and through which extends an insulator box, inside which are installed conductors.

The above solutions previously known for a conductor rail are comprised of several different parts, whereby the working phases of the production increase and thereby increase the production costs of the conductor rail.

The object of the present invention is to provide a conductor rail manufactured by using a pultrusion method.

The pultrusion refers to such a method, in which longitudinally continuous reinforced-plastic products are produced, e.g. by absorbing continuous reinforced fibers or reinforced-fibre bonds by means of a running resin hardening in heat and by drawing the fibers thus absorbed through a nozzle, wherein the forming and the hardening of the product occur.

A certain solution previously known, in which the pultrusion method is applied, is described in the US publication print 4,207,129. In this known solution, the pultrusion is adapted to the production of conducting or semiconducting elements.

Another known solution, in which the pultrusion method is applied, is described in the EP publication print 0274707, in which on the bases produced by the pultrusion method containing sensitive conducting metallic conductor elements or the like is electrostatically formed a coating.

The object of the invention is to provide a conductor rail, for the production of which is applied a pultrusion method and which conductor rail is formed in one working phase of the production.

For reaching the objects presented above and subsequently, the conductor rail according to the invention is mainly characterized in that the supporting structure and the insulator are formed into one and the same uniform profile by means of the protrusion method.

In addition to the advantages obtained in the production, by means of the conductor rail according to the invention, a coloration advantage is achieved in comparison e.g. with a previously known gray aluminum profile, which is an important fact from the point view of the appearance. In addition, the upper part of the profile of the conductor rail can be formed e.g. into a cable trough, whereby the operating possibilities of the conductor rail are diversified.

An advantage of the invention is also the fact that a product can readily be manufactured of a plastic-frame profile, in which product the parts under voltage, e.g. conductors, are protected behind blind angles in such a way that no electric shocks are possible.

The invention is next described with reference to the preferred application examples shown in the accompanying drawing, to which examples the invention in nevertheless in no way narrowly limited.

Fig. 1 shows schematically the inventive conductor rail structure, which is rectangular.

Fig. 2 shows schematically the inventive conductor rail structure, which is oval by cross-section.

Fig. 3 shows schematically the inventive conductor rail, which is circular by cross-section.

Fig. 4 shows schematically the inventive conductor rail, in which the conductors are on the

same level with the supporting structure.

Fig. 5 shows schematically the inventive conductor rail, in which the conductors are positioned in such a way that there is no risk of an electric shock.

Fig. 6 shows schematically the inventive conductor rail provided with a protecting cover.

In the Figures 7A-7D are shown schematically different possibilities as a connection between an insulator and a conductor in the conductor rail according to the invention.

In accordance with Fig. 1, a conductor rail 10 comprises a supporting structure 13 and an insulator structure 11. Conductors 12 are place in position in the manufacturing phase of the conductor rail 10. According to Fig. 1, the conductors 12 are located in the grooves of the insulator structure 11.

The conductor rail 10 shown in Fig. 2 is oval by cross-section, and the conductors 12 are located in the grooves of the insulator part 11 of the supporting structure 13.

In Fig. 3 is shown the conductor rail 10, the cross-sectional form of whose supporting structure 13 is circular. The insulator structure 11 forms grooves, wherein are located the conductors 12.

The conductor rail 10 shown in Fig. 4 is formed in such a way that the surface of the insulator structure 11 corresponds to the surface of the supporting structure 13. In such a case, the current collector (not shown in the figure) to be positioned inside the supporting structure 13 of the conductor rail can more freely move in the conductor rail 10.

In Fig. 5, the conductor rail 10 is formed by cross-section in such a way that the insulator structure 11 in a way forms a protective structure in the form of a blind angle and that the electric parts or conductors 12 are positioned on the rear side of the supporting structure.

The conductor rail 10 according to Fig. 6 corresponds by construction to the conductor rail 10 shown in Fig. 1, but it is provided with a protecting cover 14.

In the Figures 7A-7D are shown schematically different possibilities as connections between the insulator structure 11 of the supporting structure 13 of the conductor rail 10 and the conductor 12.

In the case shown in Fig 7A, the insulator structure forms a lap protecting the conductors 12. This insulator structure is flexible in order to enter the current collector inside the insulator structure 11.

In the invention, the pultrusion method is utilized in such a way that the supporting structure 13 and the insulator 11 is produced int one and the same profile.

When producing pultrusion products, either cold-set plastics or thermosetting plastics can be used as the raw material. The most suitable raw material among the thermosetting plastics for the conductor rail according to the invention is polypropylene, since it is price-wise economical. Also e.g. polyamides and polybutylftalate can be used as a raw material for the conductor rail. Among the cold-set plastics, the most suitable raw material for the conductor rail according to the invention is polyester. It is also possible to select from the cold-set plastics epoxy plastics or vinyl esters. Another main raw material in the conductor rail according to the invention is fiber and most preferably glass fiber.

Owing to the raw material and the manufacturing method, the conductor rail according to the invention can be advantageously manufactured into the desired form, as shown in Fig. 1-6. Although the cross-sections shown in the figures are mainly symmetric, the conductor rail can also be manufactured cross-sectionally asymmetric e.g. in such a way that one shank of the rail is stronger than the other. The conductor rail in accordance with the invention can thus be easily manufactured also according to safety regulations.

In addition, the guards or protecting covers can be, when manufactured of plastic, easily formed and the plastic is also automatically an insulator providing additional safety.

The invention has been described with reference to its certain application examples only. However, the intention is not to limit the inven tion only to these examples, but many changes and modifications are possible within the inventive idea defined in the following patent claims.

The invention relates to a conductor rail (10) comprising a supporting structure (13), an insulator (11) and a conductor or conductors (12) The supporting structure (13) and the insulator (11) of the conductor rail (19) are formed into one and the same uniform profile by means of a pultrusion method.

Claims

1. A conductor rail (10) comprising a supporting structure (13), an insulator (11) and a conductor or conductors (12), characterized in that the supporting structure (13) and the insulator (11) are formed into one and the same uniform profile by means of a pultrusion method.

2. A conductor rail according to Claim 1, characterized in that the conductor or conductors (12) are installed in place in connection with the pultrusion.

3. A conductor rail according to Claim 1 or 2, characterized in that said profile is formed of reinforced plastic.

4. A conductor rail according to Claim 3, characterized in that the resin component of said reinforced

plastic is a thermoplast.

5. A conductor rail according to Claim 4, characterized in that the thermoplast is polypropylene.

6. A conductor rail according to Claim 3, characterized in that the resin component of said reinforced plastic is a thermosetting plastic.

7. A conductor rail according to Claim 6, characterized in that the thermosetting plastic is polyester.

8. A conductor rail according to Claim 3, characterized in that reinforcing component of the reinforced plastic is a glass fiber.

9. A conductor rail according to any of the preceding Claims 1-8, characterized in that the cross-section of the conductor rail (10) is essentially rectangular.

10. A conductor-rail according to any of the preceding Claims 1-8, characterized in that the cross-section of the conductor rail (10) is essentially oval.

11. A conductor rail according to any of the preceding Claims 1-8, characterized in that the cross-section of the conductor rail (10) is essentially circular.

12. A conductor rail according to any of the preceding Claims 1-11, characterized in that the conductors (12) are located in grooves formed by the insulator structure (11).

13. A conductor rail according to any of the preceding Claims 1-11, characterized in that the surface of the insulator structure (11) and the conductors (12) is on the same level.

14. A conductor rail according to any of the preceding Claims 1-13, characterized in that the conductors (12) are positioned in such a way that the insulator structure (11) forms for them a protective structure.

15. A conductor rail according to any of the preceding Claims 1-13, characterized in that the conductor rail (10) is provided with a protecting cover (14).

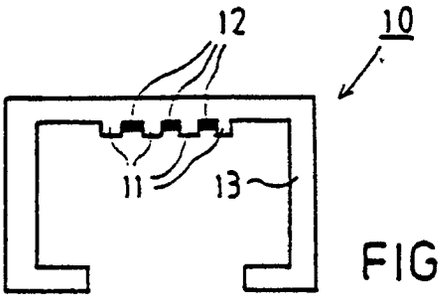

FIG.1

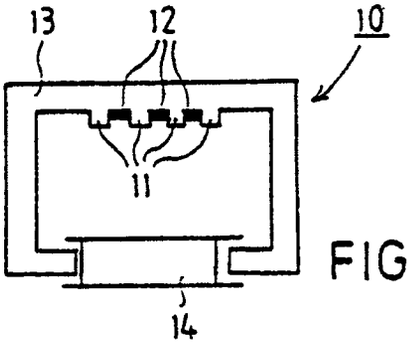

FIG.6

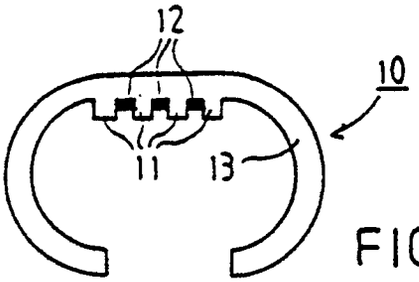

FIG.2

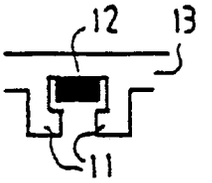

FIG.7A

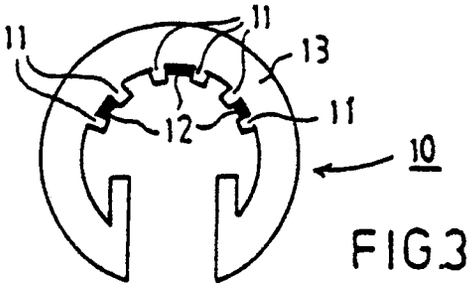

FIG.3

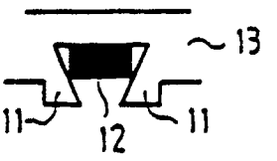

FIG.7B

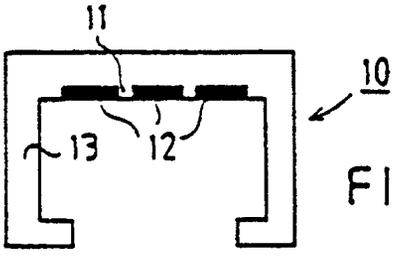

FIG.4

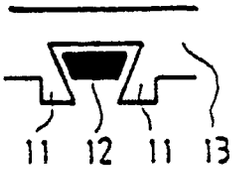

FIG.7C

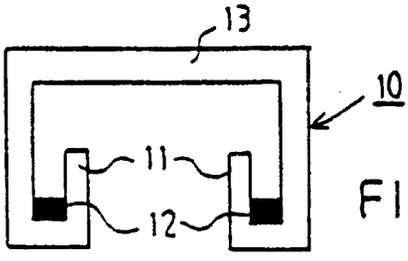

FIG.5

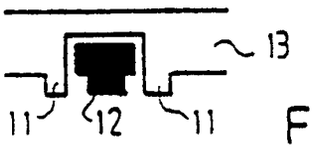

FIG.7D