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Description

The invention relates to a conductor rail comprising a supporting structure, an insulator structure including a groove in which a conductor is located, said conductor being disposed at a surface of the rail.

On display windows previously known, in dining rooms and other public premises as well as in homes, is used an electric or conductor rail, where to 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, where to an adapter can easily be fastened, and the PVC-profile acts as 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.

GB-A-2 149 230 discloses a rail, in which the support structure and the insulator structure are integrally formed.

The object of the present invention is to provide a method for such a conductor rail 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 rein-

forced 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 and a method for manufacturing it, whereby a pultrusion method is applied 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 integrally in a protrusion method, wherein the conductor is installed in the manufacturing phase of the conductor rail in the pultrusion 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 of 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 is 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 conduc-

tor 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 placed 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 into 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 se-

lect 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 invention only to these examples.

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 (10) are formed into one and the same uniform profile by means of a pultrusion method.

Claims

1. A method for manufacturing a conductor rail (10) comprising a supporting structure (13), an insulator structure (11) including a groove, in which a conductor (12) is located, said conductor being disposed at a surface of said conductor rail (10), wherein the support structure (13) and the insulator structure (11) are integrally formed, **characterized in that** said structure (13) and said insulator (11) are formed integrally in a pultrusion process, wherein the conductor (12) is installed in place in the manufacturing phase of the conductor rail (10) in the pultrusion process.
2. A conductor rail manufactured according to the method of claim 1, wherein the support structure (13) and the insulator (11) are made of a reinforced plastic material comprising a resin component and a reinforcing component.
3. A conductor rail according to claim 2, wherein said resin component is a thermoplastic.
4. A conductor rail according to claim 3, wherein said thermoplastic is polypropylene.

5. A conductor rail according to claim 2, wherein said resin component is a thermosetting plastic.
6. A conductor rail according to claim 5, wherein said thermosetting plastic is polyester.
7. A conductor rail according to claim 2, wherein said reinforcing component is a glass fiber.
8. A conductor rail according to any of the preceding claims 2-7, wherein the cross section of the conductor rail (10) is substantially rectangular.
9. A conductor rail according to any of the preceding claims 2-7, wherein the cross section of the conductor rail (10) is substantially oval.
10. A conductor rail according to any of the preceding claims 2-7, wherein the cross section of the conductor rail (10) is substantially circular.
11. A conductor rail according to any of the preceding claims 2-10, wherein the surface of the insulator (11) and that of the conductor (12) is on the same level.
12. A conductor rail according to any of the preceding claims 2-11, wherein said conductor (12) is disposed such that the insulator (11) forms a protective structure around said conductor (12).
13. A conductor rail according to any of the preceding claims 2-12, wherein said conductor rail (10) comprises a protecting cover (14).

Patentansprüche

1. Fertigungsverfahren einer Leiterschienen (10), mit einer tragenden Struktur (13), einer Isolatorstruktur (11) mit einer Rille, in der sich ein Leiter (12) befindet, wobei der Leiter an einer Fläche der Leiterschienen (10) angeordnet ist, wobei die Trägerstruktur (13) und die Isolatorstruktur (11) als eine Einheit geformt sind, dadurch gekennzeichnet, daß die Struktur (13) und der Isolator (11) in einem Pultrusionsverfahren als eine Einheit gebildet werden, wobei der Leiter (12) während der Fertigungsphase der Leiterschienen (10) im Pultrusionsverfahren eingebaut wird.
2. Leiterschienen, die nach dem Verfahren in Anspruch 1 gefertigt worden ist, wobei die Trägerstruktur (13) und der Isolator (11) aus einem, eine Harzkomponente und eine verstärkende Komponente aufweisenden verstärkten Kunststoffmaterial angefertigt worden ist.

3. Leiterschienen nach Anspruch 2, wobei die Harzkomponente ein Thermoplast ist.
4. Leiterschienen nach Anspruch 3, wobei das Thermoplast Polypropylen ist.
5. Leiterschienen nach Anspruch 2, wobei die Harzkomponente ein wärmehärtender Kunststoff ist.
6. Leiterschienen nach Anspruch 5, wobei der wärmehärtende Kunststoff Polyester ist.
7. Leiterschienen nach Anspruch 2, wobei die verstärkende Komponente ein Glasfaserstoff ist.
8. Leiterschienen nach einem beliebigen der vorstehenden Ansprüche 2 bis 7, wobei der Querschnitt der Leiterschienen (10) im wesentlichen rechtwinklig ist.
9. Leiterschienen nach einem beliebigen der vorstehenden Ansprüche 2 bis 7, wobei der Querschnitt der Leiterschienen (10) im wesentlichen oval ist.
10. Leiterschienen nach einem beliebigen der vorstehenden Ansprüche 2 bis 7, wobei der Querschnitt der Leiterschienen (10) im wesentlichen kreisförmig ist.
11. Leiterschienen nach einem beliebigen der vorstehenden Ansprüche 2 bis 10, wobei die Oberflächen des Isolators (11) und des Leiters (12) auf gleicher Höhe sind.
12. Leiterschienen nach einem beliebigen der vorstehenden Ansprüche 2 bis 11, wobei der Leiter (12) derart angeordnet ist, daß der Isolator (11) eine schützende Struktur um den Leiter (12) bildet.
13. Leiterschienen nach einem beliebigen der vorstehenden Ansprüche 2 bis 12, wobei die Leiterschienen (10) eine Schutzabdeckung (14) hat.

Revendications

1. Procédé de fabrication d'un rail conducteur (10) comprenant une structure porteuse (13), une structure isolante (11) comportant une rainure dans laquelle est situé un conducteur (12), ledit conducteur étant disposé à une surface dudit rail conducteur (10), grâce auquel la structure porteuse (13) et la structure isolante (11) sont formées solidairement l'une de l'autre, caractérisé en ce que ladite structure (13) et ledit isolant (11) sont formés solidairement l'un de l'autre selon un procédé d'extrusion par étirage grâce auquel le conducteur (12) est mis en place pendant la pha-

se de fabrication du rail conducteur (10) dans le procédé d'extrusion par étirage.

tecteur (14).

2. Rail conducteur fabriqué selon le procédé de la revendication 1, caractérisé en ce que la structure porteuse (13) et l'isolant (11) sont réalisés en une matière plastique comprenant un composant résineux et un composant de renforcement. 5
3. Rail conducteur selon la revendication 2, caractérisé en ce que ledit composant résineux est un thermoplastique. 10
4. Rail conducteur selon la revendication 3, caractérisé en ce que ledit thermoplastique est le polypropylène. 15
5. Rail conducteur selon la revendication 2, caractérisé en ce que ledit composant résineux est une résine thermodurcissable. 20
6. Rail conducteur selon la revendication 5, caractérisé en ce que ladite résine thermodurcissable est le polyester. 25
7. Rail conducteur selon la revendication 2, caractérisé en ce que ledit composant de renforcement est un fibre de verre.
8. Rail conducteur selon l'une quelconque des revendications 2 à 7, caractérisé en ce que la section du rail conducteur (10) est sensiblement rectangulaire. 30
9. Rail conducteur selon l'une quelconque des revendications 2 à 7, caractérisé en ce que la section du rail conducteur (10) est sensiblement ovale. 35
10. Rail conducteur selon l'une quelconque des revendications 2 à 7, caractérisé en ce que la section du rail conducteur (10) est sensiblement circulaire. 40
11. Rail conducteur selon l'une quelconque des revendications 2 à 10, caractérisé en ce que la surface de l'isolant (11) et celle du conducteur (12) sont situées au même niveau. 45
12. Rail conducteur selon l'une quelconque des revendications 2 à 11, caractérisé en ce que ledit conducteur (12) est disposé de telle sorte que l'isolant (11) forme une structure de protection autour dudit conducteur (12). 50
13. Rail conducteur selon l'une quelconque des revendications 2 à 12, caractérisé en ce que ledit rail conducteur (10) comporte un couvercle pro- 55

