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(54) **Insulating container for a branch junction for electrical cables**

Isolierender Behälter für eine elektrische Kabelabzweigung

Réceptient isolant pour une jonction de dérivation de câbles électriques

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(56) References cited:
EP-A- 0 928 044 **FR-A- 2 775 129**

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Description

[0001] The present invention relates to electrical cables and particularly to branch junctions for electrical cables. Still more particularly it relates to a special insulating container used for making branch junctions for electrical cables.

[0002] As is known, there are many cases in which it is necessary to connect the phase conductors of a main cable with the phase conductors of a branch cable. A typical case is when it is necessary to carry electrical power to a building (or group of buildings) by tapping it off from a main cable.

[0003] Currently known solutions for making such branch junctions are complicated, dangerous, lengthy, inconvenient and unsafe from the point of view of protecting the environment. In practice it is necessary to interrupt the flow of electrical power in the main cable, remove the outer insulating sheath and manually strip a certain length of the cables (or phase conductors) from which the branches are to be taken. The stripped lengths are connected to the respective branches using clamp-type devices. The insulation of the main cable is renewed with insulating resin and/or tapes at the point where the insulating sheath has been removed.

[0004] Another problem with this known solution is the impossibility of checking the junction for efficiency once the insulating resin and/or tape has been applied. Indeed, if there is partial or total inefficiency of the junction the only option is to cut the length of main cable where the junction was made and make a new junction with a different device.

[0005] In light of the problems of the prior art, the main object of the present invention is to provide an insulating container for making a branch junction for electrical cables that is practical and safe, both for an operator preparing the junction by hand and for the environment.

[0006] Another object of the present invention is to provide an insulating container for making a branch junction for electrical cables that will enable such junctions to be made without interrupting the flow of electrical power in the main cable.

[0007] EP-A-0 928 044 relates to an insulating container comprising the features of the preamble of claim 1.

[0008] The objects of the present invention are achieved by means of an insulating container as specified in claim 1. Dependent claims 2 to 7 relate to preferred embodiments of the invention.

[0009] There now follows a detailed description of the invention, given purely by way of non-limiting example, which should be read with reference to the accompanying sheets of illustrative drawings, in which:

?? Fig. 1 shows an end view of a first embodiment of the insulating container according to the present invention;

?? Fig. 2 is similar to Fig. 1 but shows a branch cable inserted into the insulating container;

?? Fig. 3 is a view in longitudinal section through the container seen in Fig. 1;

?? Fig. 4 shows the contact means before they are bent into a "U"; and

?? Fig. 5 shows a second embodiment of the container of the invention in a fitted configuration.

[0010] With reference to the various figures, the container 10 of the invention comprises a longitudinally elongate body defining a cavity 12 that is essentially circular or in the shape of a tunnel, that is closed above by a curved vault-like surface. The elongate body preferably comprises two lower extremities or stabilizing edges 18 which may be of different shapes, such as for example the essentially circular shape seen in Fig. 5 or the straight shape seen in Figs. 1 and 2. The container of the invention is preferably made of a resilient, elastic material impervious to moisture, such as rubber. With this material the outer lower surface of the elongate body can adapt to the curvature of the phase conductors of the main cable, as will become clear in the course of the description.

[0011] The elongate body of the container 10 of the invention has a first end, or end of insertion of the branch, that is open; the other end 22 (second end) is however closed. As shown in Fig. 3, at the closed end 22 both the inside cross section of the elongate body and the outside cross section become smaller. The outside cross section of the end 22 is preferably essentially circular and does not have the lower extremities 18.

[0012] The container 10 of the invention also includes means 24 for making the electrical contact between a branch 36 and a phase conductor 32 of a main cable 30. In the preferred embodiment illustrated, the means 24 of electrical contact comprise a contact surface 14 and a pair of toothed plates 16 with a plurality of teeth 16'. The contact means 24 are preferably made from a single long metal plate. Before using the contact means 24 in the container 10, the toothed plates are bent through 90° with respect to the contact surface 14. The contact surface need not be continuous but could also comprise only surface portions (as in Fig. 4) in such a way as to connect the toothed plates 16 together. This solution has a number of advantages such as the use of less metallic material and the greater lightness and flexibility of the assembled container 10.

[0013] To assemble the contact means 24 with the elongate body, the contact means are first bent into an upside-down U, inserted into the cavity 12 and pressed down so that the teeth 16' penetrate through the bottom of the elongate body and protrude down to a certain length. There are preferably holes (not shown) for this purpose in the bottom of the elongate body in which to insert the teeth 16'. In order to attach the contact means 24 securely to the elongate body, at least one pair of teeth (16'a) can simply be bent around to secure it much like a staple. Preferably two (16'a, 16'b) or three pairs of teeth are bent around.

[0014] With reference to Figs. 2 and 5 the use of the

container 10 of the invention will now be described, i.e. the method of making a branch junction for electrical cables. A suitable length of sheath 34 is first removed from the main cable 30. This exposes the phase conductors 32 of the main cable 30. For each phase conductor 32 of the main cable 30 from which a branch is required, a completely assembled container 10 (with toothed plates inserted and protruding) is prepared. One end (with no insulating sheath) of each branch 36 is inserted into the cavity 12 of a corresponding container 10 as far as the closed end 22.

[0015] In order to establish the contact between the phase conductor 32 of the main cable 30 and the branch 36, the container 10 is simply pushed toward the phase conductor 32 so that the metal teeth 16 penetrate the sheath of the phase conductor 32 and come into contact with this phase conductor. The pressure can be applied by hand or by using a throttling strap or sleeve placed around the junction. In this way it is possible to make simultaneous contact between more than one branch and more than one corresponding phase conductor of the main cable.

[0016] A sealant (such as silicone) may conveniently be used to prevent the ingress of dust and/or moisture through the holes made by the teeth 16.

[0017] For secure attachment of the containers to the main cable, clasps should preferably be used. These clasps (not illustrated because not the subject of the present invention) attach to the main cable and enable the branch cable to be clasped at two points to keep it parallel to the main cable. The terminal end 22 of the elongate body of the container 10 which is of a slightly larger circular cross section to that of the branch is ideal for fitting the abovementioned clasps.

Claims

1. Insulating container (10) for a branch junction for electrical cables, comprising a longitudinally elongate body comprising:

- a longitudinal cavity (12),
- an open first end for insertion of a branch,

and means (24) for the electrical contact between said longitudinal cavity (12) and one phase conductor (32) of a main electrical cable (30), said contact means (24) comprising pressure members (16) for coming into electrical contact with the transmissive part of said phase conductor (32),

- a closed second end (22) at the opposite end from the open first end,

characterized in that the elongate body is made of a resilient elastic material such as rubber and has two longitudinally projecting edges (18) for stabiliz-

ing the elongate body on said phase conductor (32).

2. Insulating container (10) according to claim 1, **characterized in that** said pressure members (16) comprise teeth (16').
3. Insulating container (10) according to claim 2, **characterized in that** said teeth (16') comprise a first series of in-line teeth (16') and a second series of in-line teeth (16'), the two series of teeth being parallel.
4. Insulating container (10) according to anyone of claims 1 to 3, **characterized in that** said contact means (24) comprise an internal contact surface (14).
5. Insulating container (10) according to anyone of claims 1 to 4, **characterized in that** it comprises means (16'a, 16'b) for fixing said contact means (24) to the elongate body of the container (10).
6. Insulating container (10) according to claim 5, **characterized in that** the means (16'a, 16'b) for fixing said contact means (24) to the elongate body of the container (10) comprise at least one pair of teeth (16'a, 16'b) that can be bent over each other like a staple.
7. Insulating container (10) according to claim 6, **characterized in that** said closed second end (22) has a smaller external cross section than the elongate body.

Revendications

1. Récipient isolant (10) pour une jonction de dérivation de câbles électriques, comprenant un corps allongé longitudinalement comprenant :

- une cavité longitudinale (12),
- une première extrémité ouverte pour l'insertion d'une dérivation,

et des moyens (24) pour le contact électrique entre ladite cavité longitudinale (12) et un conducteur de phase (32) d'un câble électrique principal (30), lesdits moyens de contact (24) comprenant des éléments de pression (16) pour venir en contact électrique avec la partie transmissive dudit conducteur de phase (32),

- une seconde extrémité fermée (22) à l'extrémité opposée de la première extrémité ouverte,

caractérisé en ce que le corps allongé est constitué d'un matériau élastique résilient tel qu'un caoutchouc et a des bords se projetant longitudinalement

(18) pour stabiliser le corps allongé sur ledit conducteur de phase (32).

2. Récipient isolant (10) selon la revendication 1, **caractérisé en ce que** lesdits éléments de pression (16) comprennent des dents (16'). 5
3. Récipient isolant (10) selon la revendication 2, **caractérisé en ce que** lesdites dents (16') comprennent une première série de dents en ligne (16') et une seconde série de dents en ligne (16'), les deux séries de dents étant parallèles. 10
4. Récipient isolant (10) selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** lesdits moyens de contact (24) comprennent une surface de contact interne (14). 15
5. Récipient isolant (10) selon l'une quelconque des revendications 1 à 4, **caractérisé en ce qu'il** comprend des moyens (16'a, 16'b) pour fixer lesdits moyens de contact (24) au corps allongé du récipient (10). 20
6. Récipient isolant (10) selon la revendication 5, **caractérisé en ce que** les moyens (16'a, 16'b) pour fixer lesdits moyens de contact (24) au corps allongé du récipient (10) comprennent au moins une paire de dents (16'a, 16'b) qui peuvent être recourbées l'une au-dessus de l'autre comme une agrafe. 25 30
7. Récipient isolant (10) selon la revendication 6, **caractérisé en ce que** ladite seconde extrémité fermée (22) a une section transversale externe plus petite que le corps allongé. 35

Patentansprüche

1. Isolierender Behälter (10) für eine Kabelabzweigung für elektrische Leitungen, welcher einen längs gestreckten Gehäusekörper aufweist und umfasst: 40
 - einen längs verlaufenden Hohlraum (12),
 - ein offenes, erstes Ende für das Einführen einer Kabelabzweigung, 45
 - und Mittel (24) für den elektrischen Kontakt zwischen dem längs verlaufenden Hohlraum (12) und einem Phasenleiter (32) eines elektrischen Hauptleitungskabels (30), wobei die Kontaktmittel (24) Druckelemente (16) aufweisen, um mit dem übertragenden Teil des Phasenleiters (32) in elektrischen Kontakt kommen zu können;
 - ein geschlossenes, zweites Ende (22) an der gegenüberliegenden Seite in Bezug auf das offene, erste Ende; 55

dadurch gekennzeichnet, dass der längs ge-

streckte Gehäusekörper aus einem spannkraftigen, elastischen Material hergestellt ist, wie zum Beispiel aus Kautschuk, und der zwei der Länge nach vorspringende Abkantungen (18) aufweist, um den längs gestreckten Gehäusekörper auf dem Phasenleiter (32) stabilisieren zu können.

2. Isolierender Behälter (10) gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die Druckelemente (16) Zacken (16') aufweisen.
3. Isolierender Behälter (10) gemäß Anspruch 2, **dadurch gekennzeichnet, dass** die Zacken (16') eine erste Reihe mit linearen Zacken (16') und eine zweite Reihe mit linearen Zacken (16') aufweisen, wobei die zwei Zackenreihen parallel zueinander angeordnet sind.
4. Isolierender Behälter (10) gemäß einen der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** die Kontaktmittel (24) eine innere Kontaktfläche (14) aufweisen.
5. Isolierender Behälter (10) gemäß einen der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** dieser Mittel (16'a, 16'b) zum Fixieren der Kontaktmittel (24) in Bezug auf den längs gestreckten Gehäusekörper des Behälters (10) aufweist.
6. Isolierender Behälter (10) gemäß Anspruch 5, **dadurch gekennzeichnet, dass** die Mittel (16'a, 16'b) zum Fixieren der Kontaktmittel (24) in Bezug auf den längs gestreckten Gehäusekörper des Behälters (10) mindestens ein Paar Zacken (16'a, 16'b) aufweist, die übereinander wie eine Heftklammer umgebogen werden können.
7. Isolierender Behälter (10) gemäß Anspruch 6, **dadurch gekennzeichnet, dass** das geschlossene, zweite Ende (22) einen kleineren äußeren Querschnitt als der längs gestreckte Gehäusekörper besitzt.

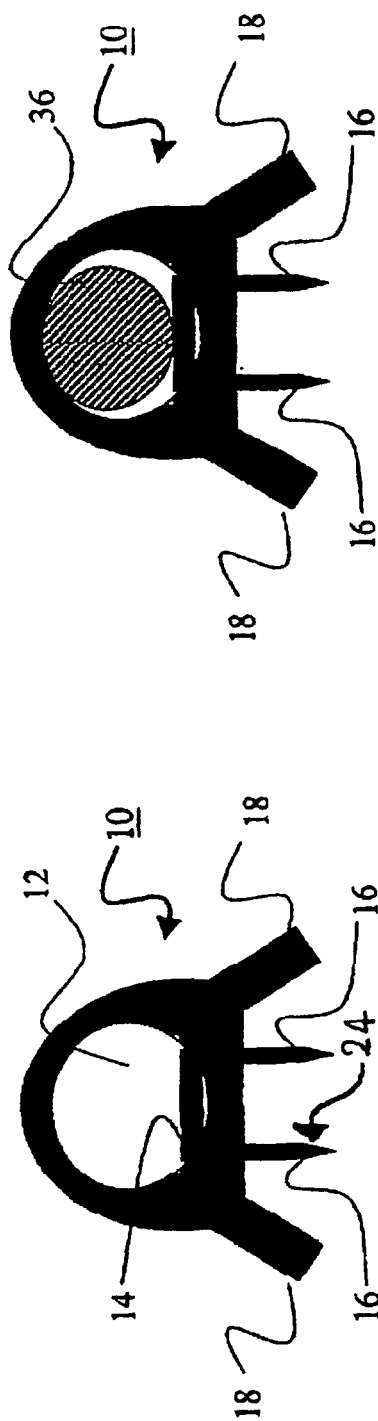


Fig. 1

Fig. 2

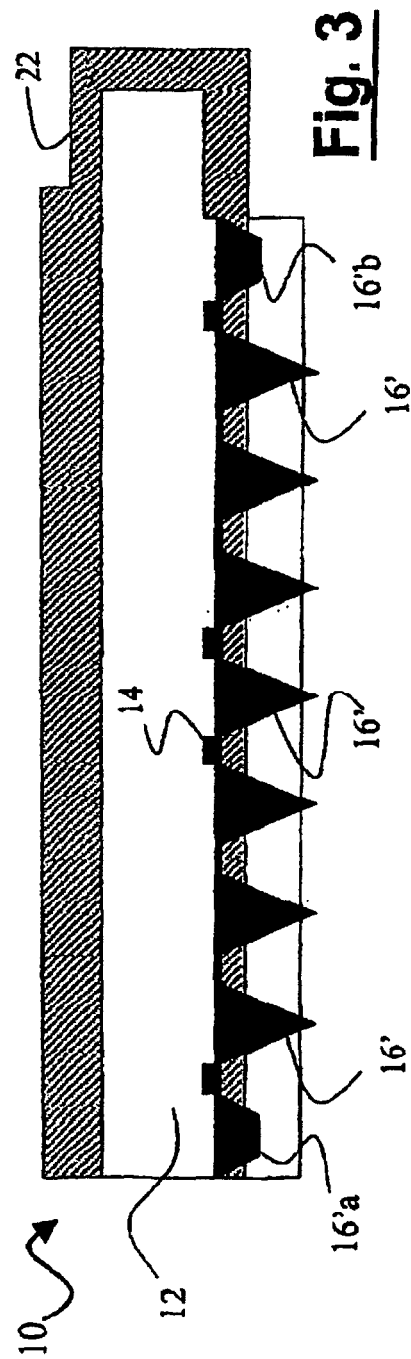


Fig. 3

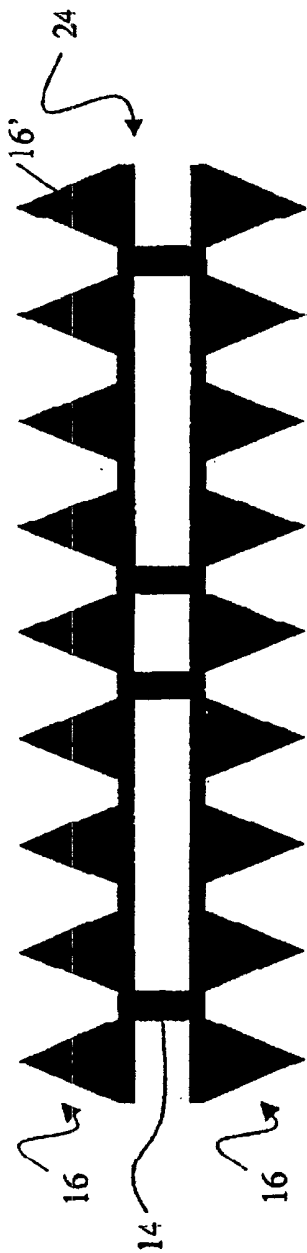


Fig. 4

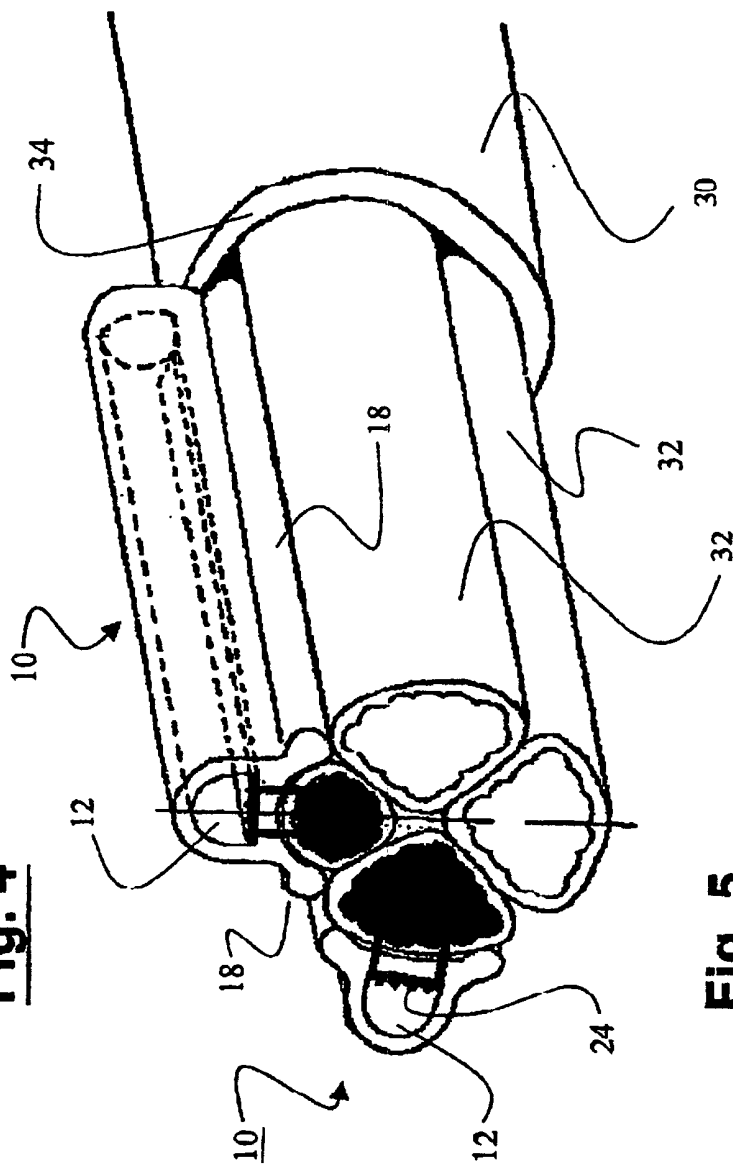


Fig. 5