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Description

The invention relates to a device for the absorption of electrical noise on cables.

It is known that the propagation of electrical interference signals, also referred to as noise, on cables can be prevented by routing the cable through an either completely or almost completely closed ring, for example made from a ferromagnetic material. In order also to be able to do this subsequently in the case of existing cables, devices are known in which two ring halves made from a ferromagnetic material are accommodated inside a two-shelled housing. This housing is assembled around a cable, so that a closed magnetic ring or a ring with a small air gap is produced. The housings have a fixing means enabling the attachment of such devices to the cable. This fixing means grips the insulation of the cable. The housing with the ferromagnetic material must be prevented from sliding along the cable. It is known, for example, for teeth which engage in the cable to be formed in an opening, through which the cable is introduced. In a known device of this kind (EP 257179), a plurality of such teeth are formed in each opening.

It is also known (DE 19912917) to insert the cable into a slot between two edges and to clamp it securely in position there.

Also known, furthermore, is a device for the absorption of the electrical noise on cables which includes a housing in two parts, each having a ferrite element. Formed at the end surfaces of the housing on each half are a plurality of diagonally outward-oriented fingers, which bear against the cable with their ends with the housing closed and secure the housing in this way (US 5003278).

Devices of this kind are frequently secured to cables of different thicknesses. There is also the associated problem, however, that cables of the same thickness possess a varying degree of flexibility. This is the case, for example, if the cables have solid, thick wires. In this case, they are less flexible than cables with many thin strands.

The object of the invention is to make available a device for the absorption of electrical noise on cables, which device is capable of being attached securely to cables of the most varied kinds.

For the accomplishment of this object, the invention proposes a device having the characterizing features referred to in Claim 1. Further developments of the invention are the subject-matter of dependent claims.

The device thus comprises a housing, in which the ferromagnetic material is accommodated. The housing in question is a two-shelled housing similar to the kind that is familiar from the prior art. The deformation of the fixing means in the longitudinal direction of the cable makes it possible for the fixing means to deflect in the case of very rigid or also thick cables in order, through the deformation, to develop sufficient reaction force which is used for fixing. The more rigid a cable, the more space is also available at the end walls, since the cable can also not be kinked at that point.

In a further development of the invention, provision is made for the fixing means to be of deformable configuration in also the transverse direction of the cable. An additional possibility for compensating for different flexibilities and/or cable sizes can be provided in this case.

In a further development of the invention, provision is made for the fixing means to have two fixing edges forming a slot between them, between which edges the cable can be secured. This can take place either by the cable being pressed laterally into the slot and being secured there in this way. Because of the deformability in the longitudinal direction, however, it is also possible for the cable to be pushed through the fixing means from one side, which likewise results in the deformation of the fixing means.

In a further development of the invention, provision can be made for the fixing edges to be formed on stays, which are oriented more or less parallel to the end

surface of the housing. The stays can be flat, plate-like elements. These are attached at particular points to the end surfaces of the housing.

For example, provision can be made in a further development of the invention for the stays to be of L-shaped cross section, in which case one leg is oriented parallel to the end surface of the housing and exhibits the fixing edge.

The other leg is preferably attached integrally with the end surface of the housing.

In the case of a unilaterally open slot, provision can be made according to the invention for the outer ends of the fixing edges to diverge from one another in the direction towards the free end.

Provision can be made on a closed side of the slot for the fixing edges to be oriented parallel to one another in this area.

Provision can be made according to the invention for one fixing means, which is preferably of identical configuration to the other fixing means, to be present respectively on both opposing end surfaces of the housing.

Further characterizing features, details and advantages of the invention will be appreciated from the claims, the wording of which is arrived at with reference to the content of the description, the following description of preferred illustrative embodiments of the invention and on the basis of the drawing. In the drawing:

Figure 1 depicts a frontal view of an opened housing;

Figure 2 depicts a view of the opened housing from the closed side of the two housing shells;

Figure 3 depicts a view of the opened housing from above in Figure 1;

Figure 4 depicts a side view of the closed housing without a cable;

Figure 5 depicts schematically a top view of the housing attached to a thick cable.

Figure 1 depicts in a frontal view an opened housing of a device for the absorption of the electrical noise on cables. The housing comprises two part shells 1, which are of more or less trough-like configuration and exhibit a more or less semicircular groove 3 respectively at both of their end surfaces 2. The two half shells 1 are connected to one another via a film hinge 4, which is formed in the region of both longitudinal edges. On the external edge facing away from the film hinge 4, one half shell exhibits a projection 5 with teeth, the purpose of which is to lock the closed half shells 1 in the closed state.

Formed in the region of the end surface 2 of the left-hand housing shell that can be seen in Figure 1 is a fixing means 6, which is injected jointly in particular in a single piece from the plastic of the housing. The fixing means 6 comprises two stays 7, which exhibit a level front side oriented parallel to the end surface 2 of the corresponding housing half shell 1. The two stays exhibit a mutual distance from one another, such that a slot 8 is formed at that point. The inner sides of the stays 8 facing towards the slot form fixing edges 9. In the lower region depicted in Figure 1, that is to say where the end of the slot 8 is present in the end surface 2 of the housing as a result of the contour of the semicircular groove 3, the fixing edges 9 are oriented parallel to one another. In the end region, that is to say where the slot 8 is open, the fixing edges diverge so as to form a feed-in channel.

The identical fixing means 6 is arranged on the opposite side on the second housing half shell 1, shown on the right in Figure 1. Depicted here is the rear side 10 of the stays 7, which form a step, since they exhibit a distance from the end surface 2 of the housing half shell 1.

Figure 2 depicts a view of the housing half shells from below in Figure 1. It can be appreciated that two film hinges 4 executed at a distance apart are present. It can likewise be appreciated that the stays 7 exhibit an L-shaped form in their cross section and in the view from below, one leg of the stay 7 being oriented parallel to the end surface 2. The second leg serves the purpose of connecting the first leg integrally to the end surface 2. It can also be appreciated from Figure 2 that, in the presence of a loading in the longitudinal direction, that is to say from bottom to top in Figure 2, the fixing edges 9 are capable of being displaced upwards as the stays are 7 deformed.

Now to Figure 3. This depicts the arrangement in Figure 1 viewed from above in Figure 1. It can be appreciated here that the stays 7 with their rear sides 10 exhibit a distance from the surface of the end surface 2, and that there are present between the stays and the end surface 2 notches or indentations 11, which permit the stays 7 to be deformed in the longitudinal direction of the present cable.

Figure 4 depicts a side view of the closed housing without the inserted cable. An indentation 12 is also present in this view between the stays 7 and the end surface 2 of the housing half shell 1, so that the height of the leg connecting the stay 7 with the housing is reduced. This also contributes to the arrangement of the stay 7 that is configured as a plate-like element in such a way that it can itself be deformed by the deformation of the connecting element, to be precise in a manner such that the fixing edges 9 are capable of being displaced in the axial direction. The expression axial direction is understood to denote the direction which connects together the two half-round notches 3 in a housing shell.

The result of the installation of such a housing on a cable 13 is illustrated in Figure 5. It is assumed that the cable in question is a relatively thick cable, the diameter of which is significantly greater than the distance of the two fixing edges 9 from one another in their parallel region. As a result, the stays 7 pivot away from the end surface 2 of the housing shell and in so doing make the slot 8 wider. At the same time, this produces the effect that the corners of the fixing

edges 9 form a sharp edge, which engages in the material of the insulation of the cable 13. It can be appreciated from Figure 5 that thick and rigid cables 13 can also be secured by this type of deformation, whereas thinner or more flexible cables lead to a smaller deformation of the stays 7.

Patentkrav

1. Apparat til absorbering af elektrisk støj på kabler (13) med

1.1 et hus, som indeholder to delskaller (1), og som
1.2 i lukket tilstand i begge forreste endeflader (2) har en åbning (3) til et kabel (13), der skal føres igennem, samt med
1.3 mindst et fikseringsmiddel (6) til fastlægning af huset på kablet (13), hvorved
1.4 fikseringsmidlet (6) inden for området af åbningen (3) påvirker kablet (13) på mindst en forreste endeflade (2) på huset og
1.5 er deformerbart tildannet i kablets (13) længderetning og tværretning,

kendetegnet ved, at

1.6 et fikseringsmiddel (6) er anbragt på den forreste endeflade på blot en delskal (1) og ved forekomsten af et andet fikseringsmiddel (6) det andet fikseringsmiddel (6) er anbragt på husets over for beliggende forreste endeflade, og
1.7 fikseringsmidlet (6) omfatter to fikseringskanter (9), som danner en spalte (8) imellem sig, og hvorimellem kablet (13) er fastlæggeligt.

2. Apparat ifølge krav 1, ved hvilket fikseringskanterne (9) er tildannet på flige (7), som strækker sig omtrent parallelt med husets forreste endeflade (2).

3. Apparat ifølge krav 2, ved hvilket fligene (7), set i tværsnit, er L-formede, hvorved et ben på fligen (7) forløber parallelt med husets forreste endeflade (2) og omfatter fikseringskanterne (9).

4. Apparat ifølge krav 3, ved hvilket det andet ben er forbundet ud i ét med husets forreste endeflade (2).

5. Apparat ifølge et af de foregående krav, ved hvilket de ydre ender af fikseringskanterne (9) fjerner sig fra hinanden.

6. Apparat ifølge et af de foregående krav, ved hvilket fikseringskanterne (9) i spaltens (8) endeområde strækker sig parallelt med hinanden.

7. Apparat ifølge et af de foregående krav, ved hvilket et fikseringsmiddel (6) er tildannet på husets to frontsider (2).

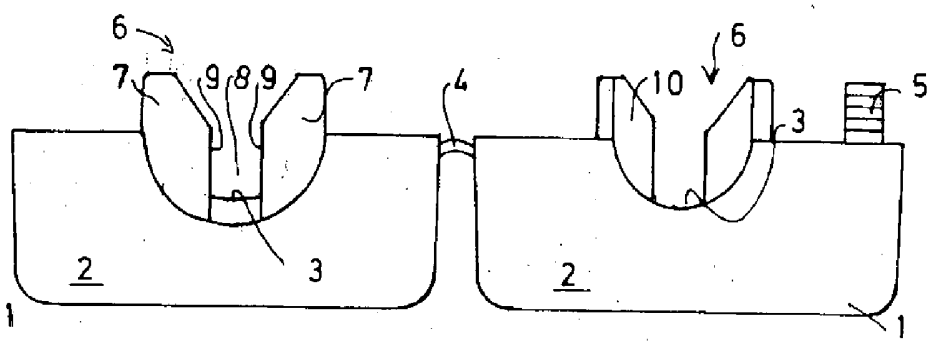

FIG. 1

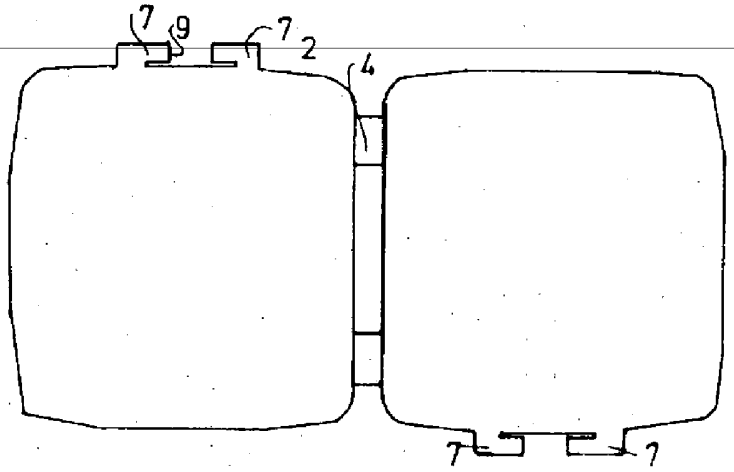

FIG. 2

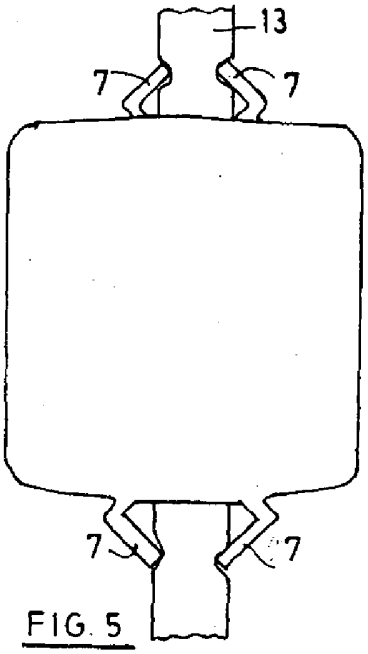

FIG. 5

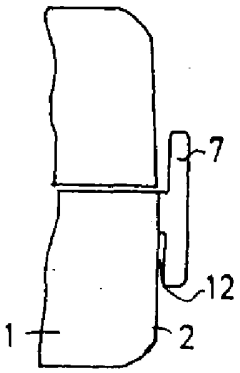

FIG. 4

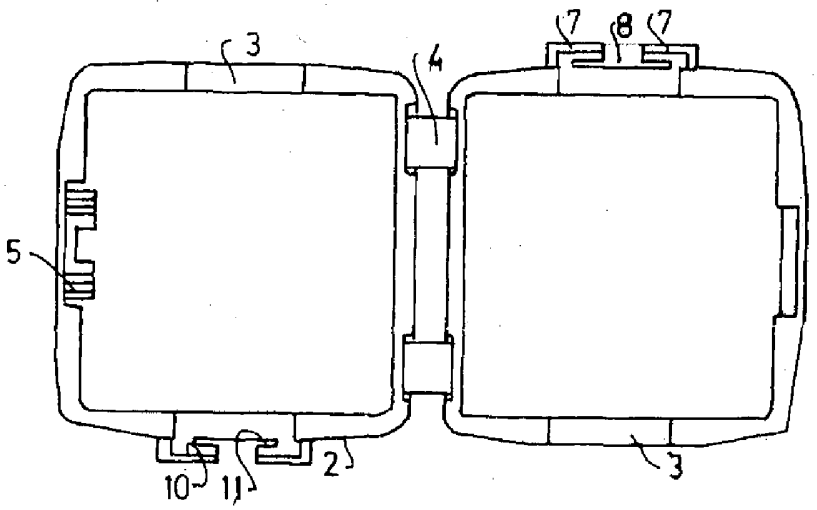

FIG. 3