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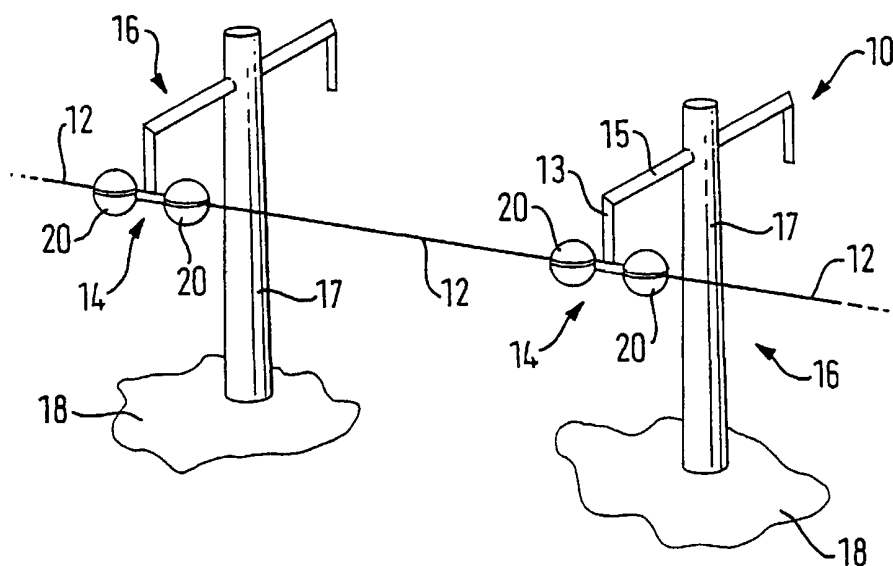
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(54) Title: AERIAL LINE INSTALLATION



(57) Abstract: An installation (10) comprises an aerial line (12), for example an ADSS cable, suspended from a plurality of suspension locations (14) provided on or by structures which extend from ground level (18). In order to bar access to the line to climbing animals such as rodents which may damage the line rotatable bodies (20) are provided on the structures and/or the line adjacent thereto.



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Aerial Line Installation

This invention relates to an installation comprising an aerial line extending between and suspended from a plurality of spaced apart aerial suspension locations provided by or on structures extending from said
5 locations to ground level.

A problem with such installations is that the structures (which are typically towers or poles) extending between ground level and the suspension locations provide paths to the line for animals, such as rodents, which may
10 damage the line for example by gnawing in the case of rodents.

An object of the invention is to prevent rodents and other animals from gaining access to the line.

To this end the invention provides an installation comprising an aerial line extending between and suspended by suspension devices from a plurality
15 of spaced apart aerial suspension locations provided by or on structures extending from said suspension locations to ground level, wherein rotatable bodies are provided on said structures and/or said line adjacent thereto at said suspension locations to provide barriers to rodents and other animals gaining access past said bodies to said line.

20 It will be understood that if an animal attempts to cross a rotatable body, the body will rotate causing the animal to fall.

At at least one suspension location the line may be provided with mechanical protection which is engaged by a said suspension device, said

mechanical protection extending between said suspension device and a said rotatable body provided on said line.

Advantageously, at at least one suspension location the line is provided with mechanical protection which is engaged by a said suspension
5 device, said mechanical protection extending between a respective said rotatable body provided on each side of said suspension device and said suspension device.

Preferably said mechanical protection is metallic and at earth potential and the or each rotatable body is fitted to said mechanical protection.

10 A friction reducing arrangement may be provided to assist rotation of at least one, and preferably each, of the rotatable bodies about the axis of rotation thereof of said body,.

At least one, and preferably each, of the rotatable bodies may comprise axially extending portions fitted together.

15 At least one, and preferably each, of the rotatable bodies may be hollow.

At least one, and preferably each, of the rotatable bodies may comprise a substantially spherical body.

As examples of alternatives the or each body may comprise a
20 substantially ellipsoidal body or a tubular sleeve.

The line may comprise a plastics sheath for an optical fibre unit comprising at least one optical fibre which unit is either sheathed by the

sheath during manufacture or inserted into the sheath, for example by blowing, after the sheath has been installed in the installation.

The line may comprise an all-dielectric self-supporting cable.

In order that the invention may be better understood some
5 embodiments thereof, which are given by way of example only, will now be described with reference to the accompanying drawings, in which:

Figure 1 schematically illustrates part of an aerial line installation comprising a line suspended from spaced apart poles;

Figure 2 is a schematic cross-section showing rotatable bodies
10 provided on the line at a suspension location thereof;

Figure 3 is a schematic view taken along the line III-III in Figure 2;

Referring first to Figure 1, there is shown part of an installation 10 comprising an aerial line 12 extending between and suspended by suspension devices 13 from spaced apart aerial suspension locations 14 provided by arms
15 15 of structures 16 comprising poles 17 which extend from the locations 14 to ground level which is indicated at 18.

As thus far disclosed the installation is known and has the disadvantage that climbing animals such as rodents can climb up the poles from ground level and gain access to and damage the line. In order to prevent
20 this access, in the illustrated embodiment rotatable bodies 20, are provided on the line 12 adjacent to the structures 16 at the suspension locations 14 to provide barriers to rodents and other climbing animals gaining access past the bodies 20 to the line 12 for damaging the same.

Referring now to Figure 2, there is shown to a larger scale than Figure 1 one of the suspension locations 14 of the installation shown in Figure 1 provided with alternative rotatable bodies 20 and 22. Body 20 is substantially spherical like a soccer ball whereas body 22 is substantially ellipsoidal like an American football or a Rugby ball. Ordinarily the two rotatable bodies at the suspension location would be identical and the two different bodies are illustrated merely to show possible variation in the shapes of these bodies. The rotatable bodies are rotatable about substantially horizontal axes 20A, 22A. The substantially spherical shape is presently preferred but shapes other than those illustrated in Figure 2 may be employed. For example the rotatable body may comprise a tubular sleeve fitted over the line adjacent the suspension location 14.

As shown in Figures 2 and 3, a layer of metallic mechanical protection 24 is provided on the line 12 at the suspension location. This layer is typically formed by metallic wires helically wound about the line 12 and is at earth potential. A clamp 26 of the suspension device 13 is clamped to the layer of mechanical protection. The rotatable bodies are provided on the layer of mechanical protection, one on each side of the clamp 26. Thus the rotatable bodies bar access for climbing animals to the unprotected line from the pole.

It will be understood that at the suspension location illustrated in Figure 2 the mechanical protection 24 extends between a respective rotatable body 20, 22 provided on each side of the suspension device 13 and the suspension device. In this way the line between the suspension device and the

rotatable bodies although accessible is protected against damage by the mechanical protection whereas the line between, or spanning, two suspension locations is unprotected, but inaccessible.

A friction reducing arrangement (not shown in Figure 2) is provided
5 between each of the bodies and the layer of mechanical protection to assist rotation of the bodies about their axes 20A, 22A of rotation. This arrangement may comprise PTFE tape 28 wound onto the layer of protection where the latter interfaces with the rotatable bodies. Alternatively respective mechanical bearings (not shown) may be provided at these positions.

10 To facilitate fitting of the rotatable bodies 20, 22 to the line the rotatable bodies each comprise two axially extending portions 20A, 20B and 22A, 22B which are fitted together. In other words, the rotatable bodies are axially split. After the two portions have been fitted together about the line on the mechanical protection thereof they are fastened together at abutting
15 flanges 30B, 30C and 32B, 32C for example by nuts and bolts indicated by chain dotted lines 34 in Figure 3. The bodies are prevented from moving axially along the line away from the suspension device 13 by stops 36 clamped to the line adjacent the bodies. In order to save weight the rotatable bodies are preferably made of plastics and are preferably hollow.

20 The size of the rotatable bodies will depend on the animals to be barred access to the line, but for example in the case of small rodents a spherical body of 600 mm diameter would be appropriate. It will be

understood that rotation of the body will occur when the rodent attempts to climb across a body causing the rodent to lose its grip and fall.

It will be appreciated that the rotatable bodies should be fitted in the installation such that there is no unprotected line accessible from ground level via the structures 16 providing the aerial suspension locations 14. In this regard, the positioning of the rotatable bodies on the layer of earthed metallic mechanical protection as described above is preferred. However, the rotatable bodies may be fitted to the structures particularly when the structures comprise towers rather than poles.

10 In the embodiment the line 12 comprises an all-dielectric self-supporting cable which is particularly vulnerable to damage by rodents.

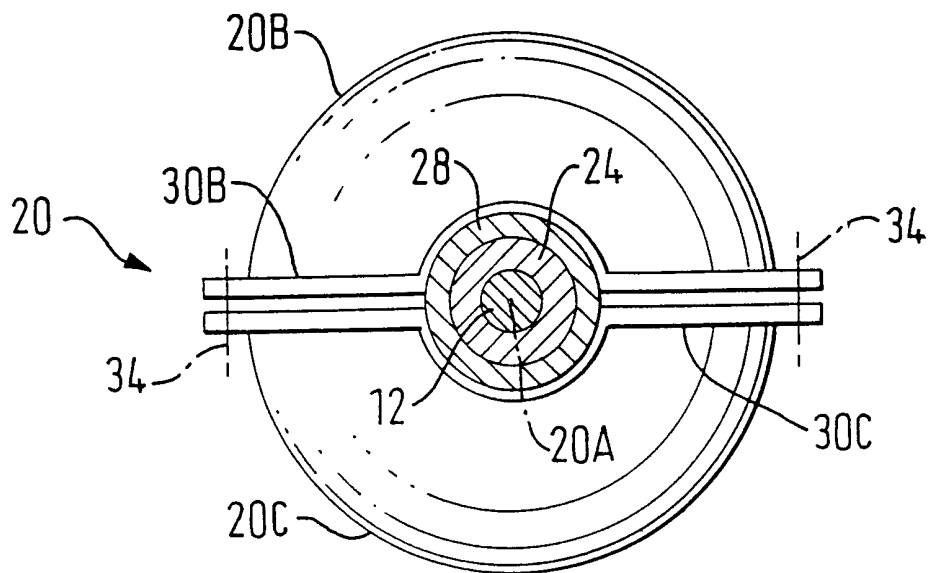
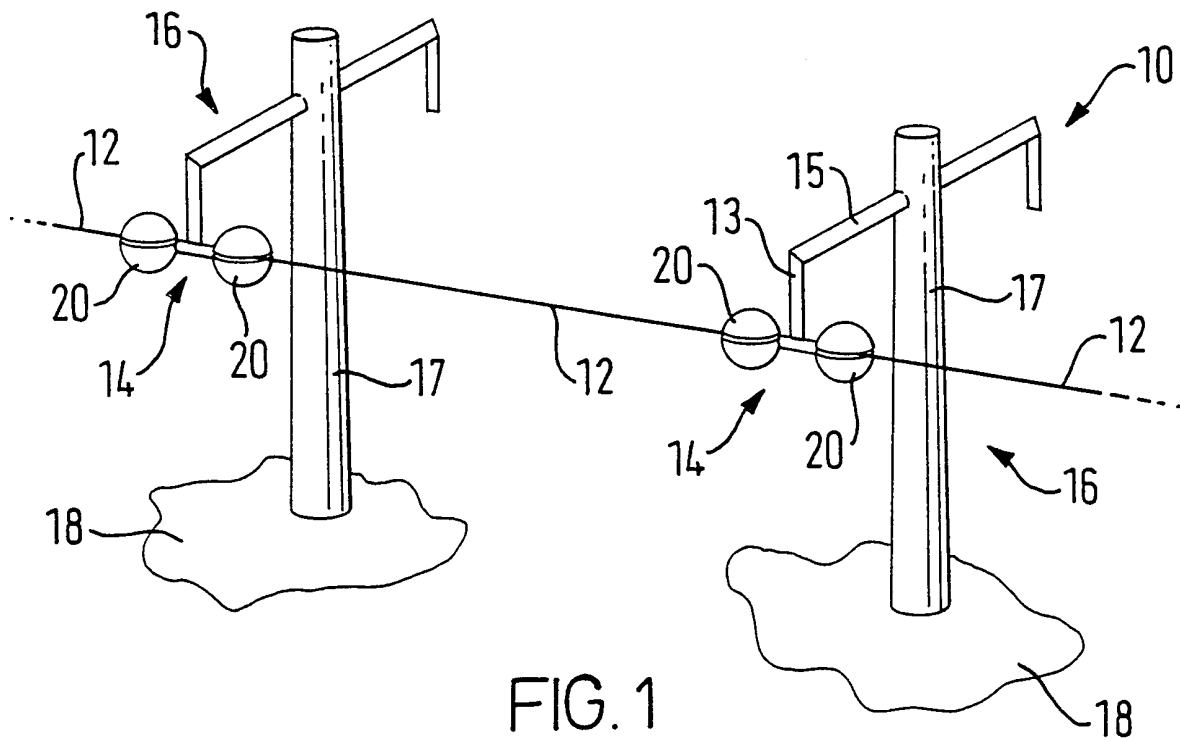
However, it is to be understood that the invention is applicable to any lines which are vulnerable to damage by rodents or other climbing animals. The more vulnerable of such lines are those with plastics outer surfaces. As indicated earlier, one particular application is that where the line comprises a plastics sheath defining a passage into which an optical fibre unit comprising at least one optical fibre is to be, or has been, installed for example by blowing.

CLAIMS:

1. An installation comprising an aerial line extending between and suspended by suspension devices from a plurality of spaced apart aerial suspension locations provided by or on structures extending from said suspension locations to ground level, wherein rotatable bodies are provided on said structures and/or said line adjacent thereto at said suspension locations to provide barriers to rodents and other animals gaining access past said bodies to said line.
2. An installation as claimed in claim 1, wherein at at least one suspension location the line is provided with mechanical protection which is engaged by a said suspension device, said mechanical protection extending between said suspension device and a said rotatable body provided on said line.
3. An installation as claimed in claim 1 wherein at at least one suspension location the line is provided with mechanical protection which is engaged by a said suspension device, said mechanical protection extending between a respective said rotatable body provided on each side of said suspension device and said suspension device.

4. An installation as claimed in claim 2 or 3, wherein said mechanical protection is metallic and at earth potential and the or each rotatable body is fitted to said mechanical protection.
- 5 5. An installation as claimed in any one of claims 1 to 4, wherein a friction reducing arrangement is provided to assist rotation of at least one of the rotatable bodies about an axis of rotation thereof.
6. An installation as claimed in any one of claims 1 to 5, wherein said at
10 least one rotatable body comprises axially extending portions fitted together.
7. An installation as claimed in any one of claims 1 to 6, wherein said at least one rotatable body is hollow.
- 15 8. An installation as claimed in any one of claims 1 to 7, wherein at least one of said rotatable bodies comprises a substantially spherical body.
9. An installation as claimed in any one of claims 1 to 7, wherein at least one of said rotatable bodies comprises a substantially ellipsoidal body.
- 20 10. An installation as claimed in any one of claims 1 to 7, wherein at least one of said rotatable bodies comprises a tubular sleeve.

11. An installation as claimed in any one of claims 1 to 10, wherein said line comprises a plastics sheath for an optical fibre unit comprising at least one optical fibre.
- 5 12. An installation as claimed in any one of claims 1 to 10, wherein said line comprises an all-dielectric self-supporting cable.



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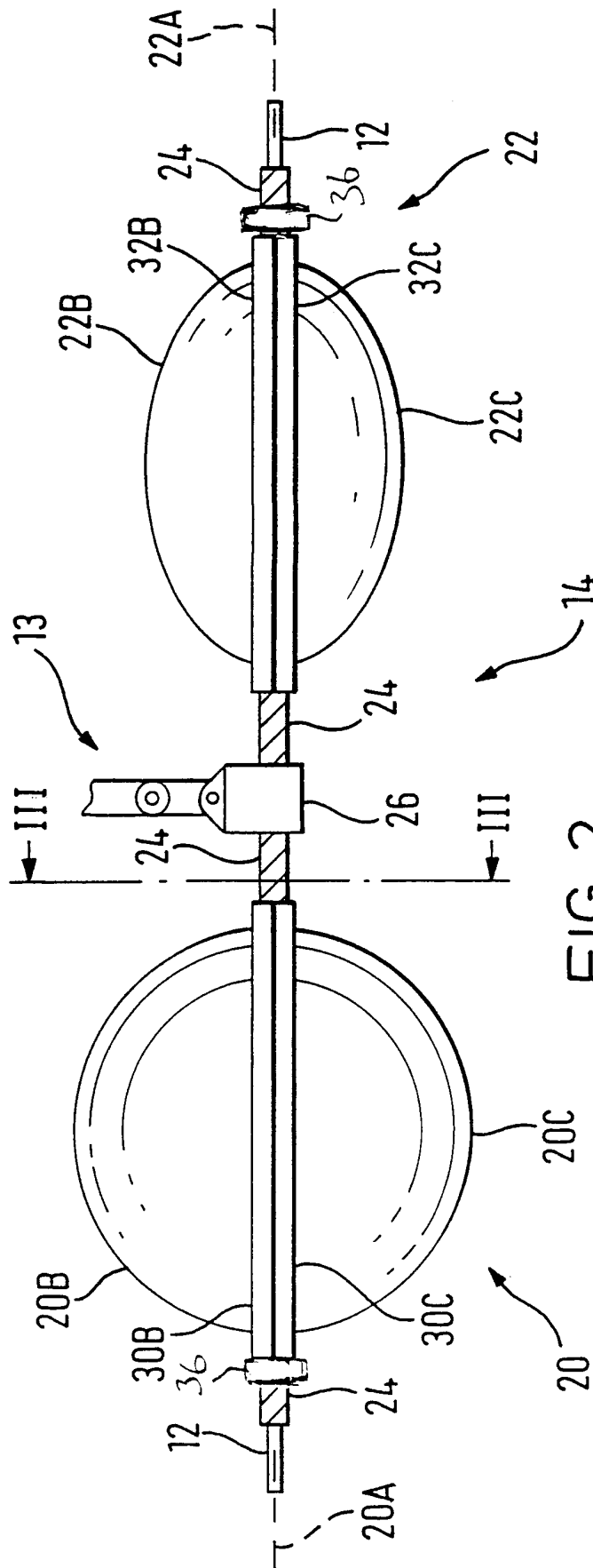


FIG. 2

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/04799

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H02G7/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H02G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 262 169 A (LANTON JR RALPH H) 14 April 1981 (1981-04-14) the whole document ---	1, 6, 10, 12
X	US 5 293 721 A (RICHARD JAMES T ET AL) 15 March 1994 (1994-03-15) the whole document ---	1, 6, 10, 12
X	US 5 570 652 A (FERLAND BRET) 5 November 1996 (1996-11-05) the whole document ---	1
X	GB 2 209 456 A (MACKERETH PETER EDWARD) 17 May 1989 (1989-05-17) the whole document ---	1
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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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- * & * document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/04799

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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