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(71) Applicant: **Zublezu Llona, Maria Iciar**
48113 Gamiz-Fika (Bizkaia) (ES)

(72) Inventor: **Zublezu Llona, Maria Iciar**
48113 Gamiz-Fika (Bizkaia) (ES)

(74) Representative: **Urizar Barandiaran, Miguel Angel**
Consultores Urizar y Cia, S.L.
Gordoniz 22 5°
48012 Bilbao Vizcaya (ES)

(54) **PROTECTIVE SHEATH FOR CABLES**

(57) A protective sheath for cables, particularly industrial cables of great dimensions and weight used in port and similar installations that is structured in an inner layer (1) that keeps the cables arranged together inside it and constitutes for them the first insulation; an inner sheath (2) that is of fireproof material and is attached to the inner layer (1) both forming a primary insulation. An armour (3) made of light and resistant material, that envelops the inner sheath and inner layer, resists high temperatures and provides it with a high degree of protection against fire and great rigidity to the assembled unit; an outer sheath (4) that constitutes a covering, also of fireproof material; so that in the joint performance of the four layers and sheaths the sheath is provided protection against fire for at least 20 minutes.

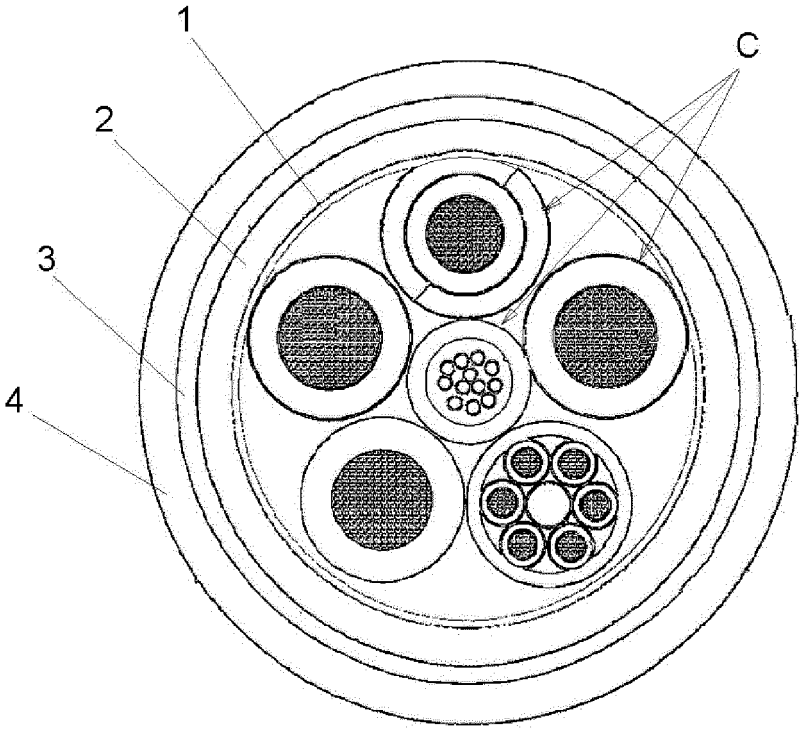

Fig. 1

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Description

Object of the invention

[0001] The object of the invention refers, in general, to a cable with protective outer sheath for cables. More specifically, the object of the invention refers to a cable with outer sheath for protection against fire for thick industrial cables that are used on winders and port facilities and similar environments.

Background of the invention

[0002] In the current state of the art cables with fire protection are already known. In, for example, and among others, documents EP0373669 and EP1045401 describe fireproof cables. In practice, these types of cable are handled grouped in hoses, using large winders.

Technical problem to be resolved

[0003] The known cables offer limited fire protection. To obtain effective fire protection, it is necessary for all the cables used (and housed inside the sheath) to be fireproof; and even in this case, the fire protection is different for each cable, depending on its own characteristics.

[0004] The fact that all the cables inside the sheath are fireproof results in multiplied costs and overdimensioning of the fire protection at the cost of driving up the price of the end product.

[0005] The object of the invention solves this problem, as it ensures that the outer sheath offers effective fire protection without increasing costs or offering overprotection.

[0006] With the use of the sheath that is the object of the invention, it is possible to use cables that of themselves do not offer fire protection (or with very limited fire protection) and place them inside the sheath, the assembled unit offering effective fire protection and complying with fire protection regulations which are mandatory in these types of installations.

Description of the invention

[0007] The object of the invention refers to a protective sheath for cables; specifically, a sheath for protection against fire for thick industrial cables that are used in port and similar facilities characterized in that it is structured in, at least one inner layer, which is a nonwoven band and comprises the first insulation that keeps the cables arranged together inside the sheath; an inner sheath which is of fireproof material and is attached outside of said inner layer, forming jointly with it a primary insulation; an armour made of light and resistant material, which resists high temperatures and provides a high degree of protection against fire, and simultaneously, great rigidity to the assembled unit; and an outer sheath that comprises an outer covering, also of fireproof material; so that, in the joint performance of outer sheath, armour, inner sheath and inner layer, the cable is provided with fire protection for at least 20 minutes (according to standard IEC60332-3).

[0008] Other configurations and advantages of the invention can be deduced from the following description, and from the subsidiary claims.

Description of the drawings

[0009] To better understand the object of the invention, a preferential form of embodiment, subject to accessory changes that do not essentially change it, is represented in the following figures. In this case:

Figure 1 represents a general section of the protective sheath for cables which is the object of the invention, inside of which several cables are arranged (C).

Detailed description of a preferential embodiment

[0010] An example of practical, non-limiting embodiment of this invention is described below. Other modes of embodiment, in which accessory changes that do not essentially change them are introduced, are in no way disregarded.

[0011] The object of the invention is a protective sheath for cables (C), in particular, industrial cables of great dimensions and weight, used in port and similar facilities.

[0012] The protective sheath which is the object of the invention can contain identical cables (C) (with the same functions and/or task) or different cables (C) (with different functions and/or task) without thereby essentially altering the invention.

[0013] In the example of embodiment represented, the sheath which is the object of the invention contains six cables (C): five peripheral cables distributed around a central one.

[0014] The number and distribution of cables (C) arranged inside the sheath do not matter for the purpose of the invention; likewise, it does not matter whether said cables (C) are identical to or different from each other.

[0015] According to the invention, and according to the embodiment represented, the protective sheath for cables is structured of at least:

- an inner layer (1), which keeps the cables (C) together arranged inside it and constitutes for them a first insulation;
- an inner sheath (2), which is attached to the mentioned inner layer (1) forming jointly with it a primary insulation of said cables (C);
- an armour (3), that envelops an inner sheath and inner layer, resists high temperatures and provides it with a high degree of protection against fire as well as great rigidity to the assembled unit; and

- an outer sheath (4) constitutes a covering that is also fire-resistant;

[0016] From this basic structure, any embodiments that do not essentially alter, change or modify the proposal are included in the object of the invention. In Particular:

- The mentioned inner layer (1) is a nonwoven band;
- The mentioned inner sheath (2) is of fireproof material. The fireproof material of the inner sheath (2) is an elastic isotropic material;
- The mentioned armour (3) is made of a light and resistant material. The light and resistant material of the armour (3) is a highly crystalline polymer with a melting temperature higher than 450°C; and
- The outer sheath (4) and the inner sheath (2) are of fireproof material and can both be made of the same material or of different materials.

[0017] The joint performance of outer sheath (4), armour (3), inner sheath (2) and inner layer (1) with its structure and specific particularities give the resulting covering a fire protection with a duration of at least 20 minutes after starting.

[0018] The materials, dimensions, proportions and, in general, those other accessory or secondary details that do not essentially alter, change or modify the proposal can be variable.

[0019] The terms in which this report is written are a true and faithful reflection of the object described and must be taken in their broadest sense and never in a limiting manner.

Claims

1. Protective sheath for cables, specifically industrial cables of great dimensions and weight used in port and similar facilities; **characterized in that** it is structured of at least:

   a) one inner layer (1) that keeps the cables (C) arranged together inside it and constitutes for them a first insulation;
   b) an inner sheath (2) which is of fireproof material and is attached to the mentioned inner layer (1) forming jointly with it a primary insulation;
   c) an armour (3) made of light and resistant material, that envelops the inner sheath (2) and inner layer (1), resists high temperatures and provides it with a high degree of protection against fire along with great rigidity to the assembled unit;
   d) an outer sheath (4) that constitutes a covering, also of fireproof material; so that, in the joint performance of outer sheath (4), armour (3), inner sheath (2) and inner layer (1) the sheath is provided with protection against fire for at least 20 minutes after starting.

2. Sheath, according to claim 1, **characterized in that** the material of the inner layer (1) is a nonwoven band.

3. Sheath, according to claim 1, **characterized in that** the fireproof material of the mentioned inner sheath (2) is an elastic isotropic material.

4. Sheath, according to claim 1, **characterized in that** the light and resistant material of the mentioned armour (3) is a highly crystalline polymer with a melting temperature higher than 450°C.

5. Sheath, according to claim 1, **characterized in that** the outer sheath (4) and the inner sheath (2) are made of the same material.

6. Sheath, according to claim 1, **characterized in that** the outer sheath (4) and the inner sheath (2) are made of different materials.

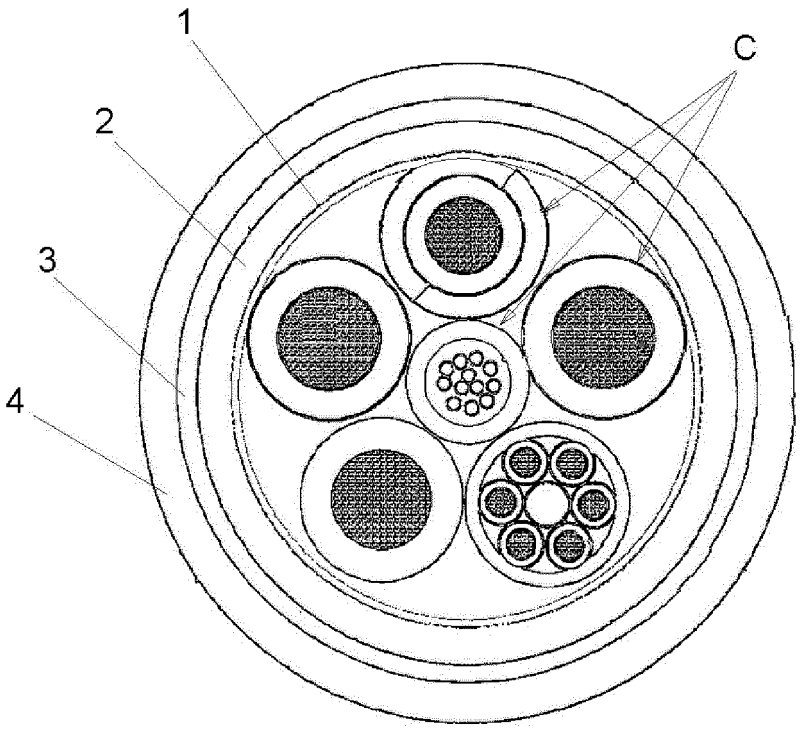

Fig. 1

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EUROPEAN SEARCH REPORT

Application Number
EP 18 38 2260

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2004/044927 A1 (DRAKA UK LTD [GB]; FROGGATT MARK [GB]; MASON STEPHEN [GB]) 27 May 2004 (2004-05-27) * abstract; figure 2 * * page 1, lines 2-5 * * page 2, lines 9-20 * * page 5, line 1 - page 6, line 4 * * page 9, line 13 - page 10, line 6 * * page 12, lines 3-5 * * page 15, line 5 - page 17, line 18 *	1-3,5,6	INV. H01B7/00 A61N1/04
A	WO 2008/142385 A1 (DRAKA U K LTD [GB]; GAUCHER MARK [GB]; JACKAMAN MARTIN [GB]; MANCHESTE) 27 November 2008 (2008-11-27) * the whole document *	1-6	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 October 2018	Molina Silvestre, A

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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L : document cited for other reasons

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 18 38 2260

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- EP 1045401 A **[0002]**