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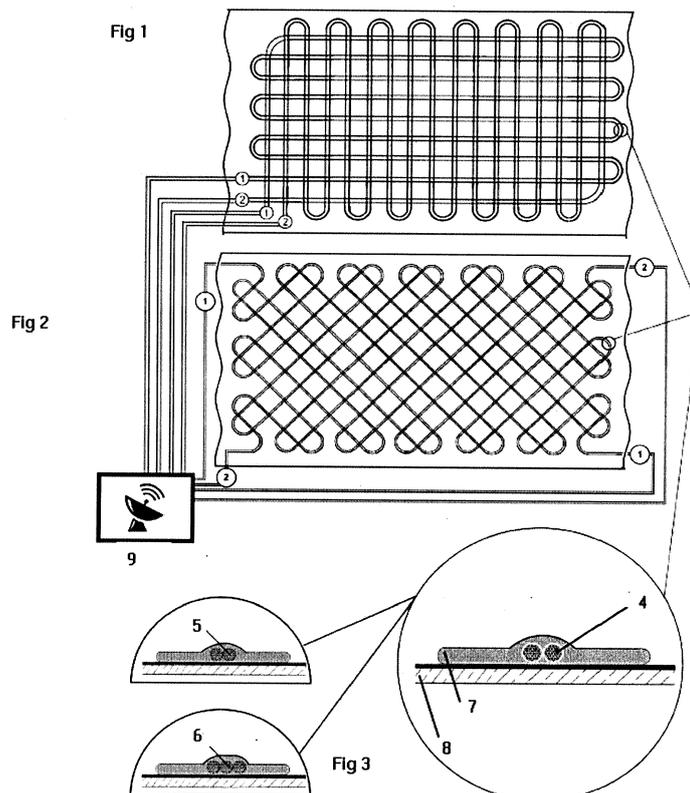
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(54) **REINFORCED FABRIC WITH DAMAGE SIGNALLING**

(57) Reinforced fabric with damage signalling is characterised by the fact that has a permanent manner of attaching to the fabric surface (8) sets of metal conduits (1) and (2), placed next to each other on the surface (8),

which beginnings and ends meet in the place (9) in which they are connected with the monitoring system, wherein at least two conduits run next to each other, create a grid due to the fact that their routes are frequently changed.



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Description

[0001] The invention regards a new and original reinforced fabric with damage signalling as means of protection against theft and vandalism, which may be used to produce, e.g. tarpaulins, safety covers, tents, sacks.

[0002] The content for protection is a reinforced fabric with metal conduits, which protects against vandalism in the form of cutting through the fabric with a sharp tool, and has an alarm system triggered when damage is done to the fabric.

[0003] There are known variety of materials which are structurally enhanced by external reinforcements.

[0004] From the description of the invention no. P 408280 there is known a manner of securing areas which involves installing a permanently radiating cable. Its electric signal is transmitted to a monitoring sensor, which then identifies the place of the intrusion.

[0005] From the description of the invention no. P 344320 there is known a way of securing cargo transported via land or sea by means of radio and satellite communication as well as vehicle traffic monitoring systems. After loading the vehicle, it is secured by surrounding the cargo with a closed-circuit optic ring and establishing a connection with a monitoring station. The position of the vehicle and status of the optic ring are observed; if the circuit is cut, procedures prepared for handling such incidents are triggered immediately.

[0006] From the description of the German patent no. DE2441054 there is known a solution with cables interwoven in a tarpaulin so as to create a continuous grid with straight angle intersections. Both cables are connected with a circuit including a transmitter and a power source - when it is cut, the alarm is triggered. This patent uses only electric cables, the damage to which results in sending an alarm signal. There are no steel cords applied, which would make cutting with a sharp tool impossible.

[0007] From the description Of the invention no. EP 1236820 there is known a solution where steel cords run along the warp, but do not follow the turn at the end of the grid. Fabrics known to apply this solution may be cut along the without disrupting the steel cord.

[0008] The essence of the solution consists in the fact that the reinforced fabric with damage signalling has a permanent manner of attaching to the fabric surface sets of metal conduits, placed next to each other on the surface, which beginnings and ends meet in the place in which they are connected with the monitoring system, wherein at least two conduits run next to each other, create a grid due to the fact that their routes are frequently changed.

[0009] The solutions applying in this invention regards an efficiently metal grid created by intersecting routes of at least two metal conduits, along with efficient steel cords, all arranged on the entire surface of the material in a continuous manner (conduits have independent beginnings and ends, equal in number to the cords). The

conduits are inseparably attached to the fabric in a permanent manner. This leads to an unexpected effect in the form of a double protection of, e.g. a tarpaulin: mechanical - against vandalism seen as an attempt to cut through it with a sharp tool - and electronic - monitoring. The latter involves solutions known to contemporary technology - e.g. an alarm system triggered during an attempt to cut the cords or actually cutting the cords. The signal from the system may be transmitted to a monitoring company, units responsible for safety, such as police, as well as mobile or email of the tarpaulin owner.

[0010] According to the invention, the inner surface of the material holds permanently and inseparably interwoven (efficiently, by means of a plastic strap, e.g. PVC) one, two or more conduits and sufficiently steel cords placed next to each other. Such an arrangement forms a grid or a truss as they frequently change their routes without being cut, in a continuous manner. The fabric may involve one or more steel cords covered by a welded strap on a secured surface. Said invention of a fabric reinforced with sufficiently metal cords is protected against vandalism (cutting with a sharp tool) and theft by additional stationary and satellite signalling triggered in the event of cutting a cord - it creates a short-circuit sending a signal to the monitoring system. Metal cords are attached to the material by covering them with a welded plastic strap. They are arranged in a continuous manner, with beneficial small-surface turns at the end of the secured fabric area.

[0011] Reinforced fabric with damage signalling is presented on attached figures 1-5, where:

Fig. 1 - presents the reinforced fabric with a system of conduits and cords arranged in a truss,

Fig. 2 - presents the reinforced fabric with a system of conduits and cords arranged diagonally,

Fig. 3 - presents a cross-section of the conduits within the fabric (a few kinds),

Fig. 4 - presents the reinforced fabric with a system of conduits and cords bending in a non-systematic manner,

Fig. 5 - presents a cross-section of the conduits within the fabric (a few kinds).

[0012] This solution strengthens mechanical security systems of tarpaulins, covers, reinforced fabrics. It makes it easier to secure and monitor, e.g. tarpaulin halls in cases of theft, damage, intrusion.

[0013] Reinforced fabric with damage signalling is characterised by sets of metal conduits (1) and (2), permanently interwoven in the fabric surface (8) and distributed in a continuous manner. The cords may be insulated (4) or not (5), (6). The beginning and end of each conduit meet in a place (9) where all of them are connected to

the monitoring system. Connecting the sets of conduits (1) and (2) to it makes it possible to send an alarm signal to the headquarters in case of a short-circuit or cutting the circuit.

[0014] Each conduit set (1) and (2) is accompanied by at least one other set (4), (5), (6), creating a grid or truss resulting from frequent changes of route direction for conduit sets (1) and (2). Conduit sets (1) and (2) are securely placed on the fabric (8) by means of a strap (7) made of a sufficiently plastic material (e.g. PCV)..The strap is attached to the material (8) in a permanent and inseparable manner.

[0015] Conduit sets (1) and (2) arranged on the fabric surface (8) may be divided into subsets (1a), (1b) and (2a), (2b), so that cords (1) and (2) may be distributed on the fabric (8) and bent as needed. Within one plastic strap, some cords may be insulated (4), some may not (5). Cords (1a), (1b), (2a) and (2b) are continuously arranged within the fabric so as to create a regular or irregular net by frequent changes in the route of said conduit sets (1a), (1b), (2a) and (2b). The beginning and the end of conduit sets (1a), (1b) and (2a), (2b) respectively may join in one place, but may also stay separated.

[0016] The solutions applied in the invention is presented in the examples below.

Example 1:

[0017] On the surface of the fabric (8) made of synthetic thread covered with plastic, there are sets of steel cords (1) and (2), two cords in one set (4) protected by dielectric insulation, which are placed next to each other and connected to the fabric (8) in a permanent manner. The cords are distributed over the entire fabric (8) and attached by means of a PVC welded strap (7) so as to create a fabric-reinforcing grid. Cord sets (1) and (2) are continuously distributed on the fabric so that they create a grid or truss as a result of frequent changes of the route of said cords (1) and (2). The beginning and the end of conduit sets (1) and (2) meet in one place (9), where they are connected with the monitoring system.

Example 2:

[0018] Conduit sets (1) and (2) (three in each set) without insulation (6) are placed next to each other on the fabric surface (8) and connected with said surface (8) in a permanent manner. The conduits are distributed all over the fabric (8) and attached by means of a welded strap (7) so as to create a fabric-reinforcing grid. Conduit sets (1) and (2) arranged within the fabric in a continuous manner undulate due to frequent changes in the route of said conduit sets (1) and (2). The beginning and the end of conduit sets (1) and (2) meet in one place (9), where they are connected with the monitoring system.

Example 3:

[0019] On the surface of the fabric (8) made of synthetic thread covered with plastic, there are sets of steel cords - heated double tracks with cords (1a), (1b) and (2a), (2b) - placed next to each other and permanently connected to the fabric (8). Some cords are insulated (4), some are not (5). Cords are distributed on the entire surface (8) and attached by means of a welded PVC strap (7) so as to create a fabric-reinforcing grid. Cords (1a), (1b), (2a), (2b) are arranged in the fabric (8) as irregularly bending cords. Since they are distributed in a continuous manner, they create a non-systematic grid as a result of frequent changes in the track of said conduit sets (1a), (1b), (2a) and (2b). The beginning and end of sets (1a), (1b) and (2a), (2b) respectively meet in one place.

Claims

1. Reinforced fabric with damage signalling with said reinforcement on its surface connected to an alarm system is **characterised by** the fact that has a permanent manner of attaching to the fabric surface (8) sets of metal conduits (1) and (2), placed next to each other on the surface (8), which beginnings and ends meet in the place (9) in which they are connected with the monitoring system, wherein at least two conduits run next to each other, create a grid due to the fact that their routes are frequently changed.

Amended claims in accordance with Rule 137(2) EPC.

1. Reinforced fabric with damage signalling with said reinforcement on its surface connected to an alarm system is **characterised by** the fact that sets of metal conduits (1) and (2) are arranged continuously on the surface of the material (8), which beginnings and ends meet in the place (9) in which they are connected with the monitoring system, wherein the conduits create a grid due to the fact that their routes are frequently changed.

Fig 1

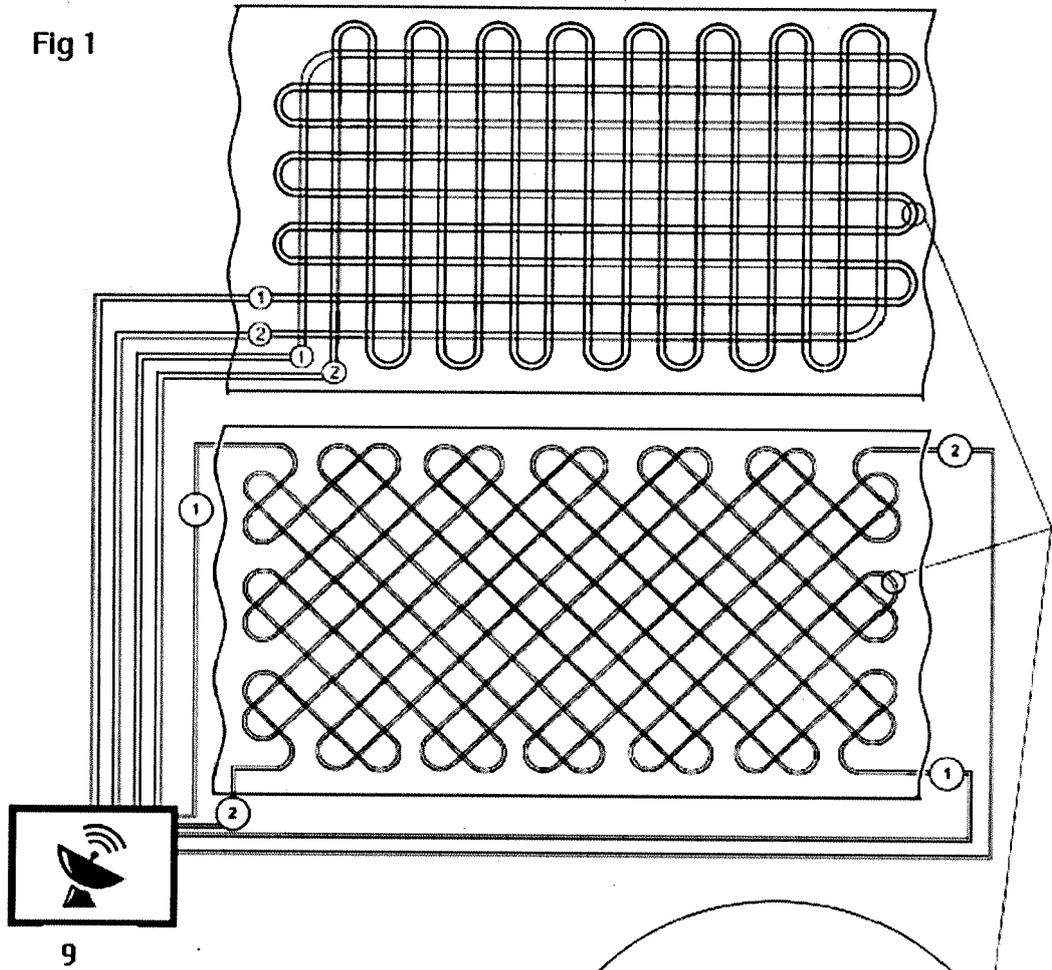


Fig 2

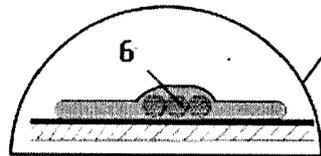
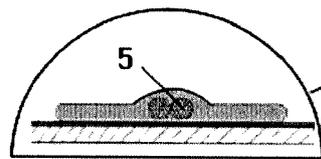


Fig 3

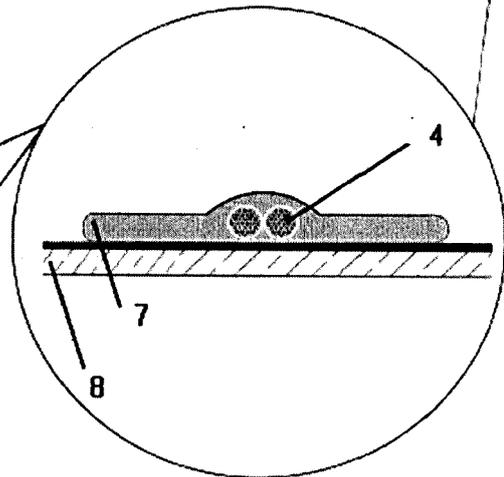


Fig 4

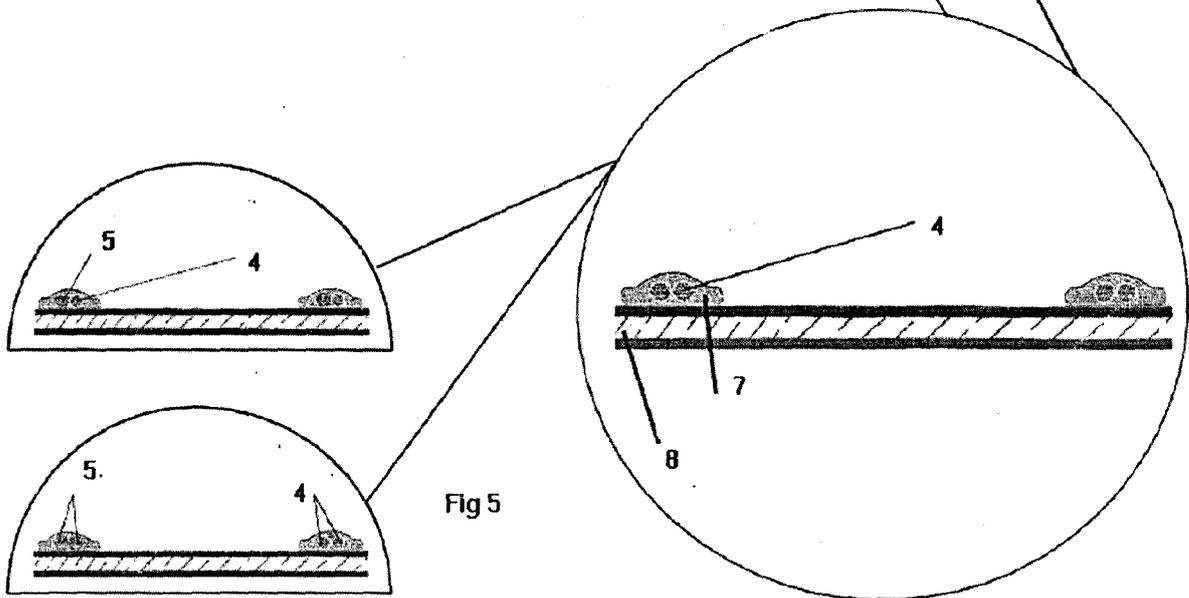
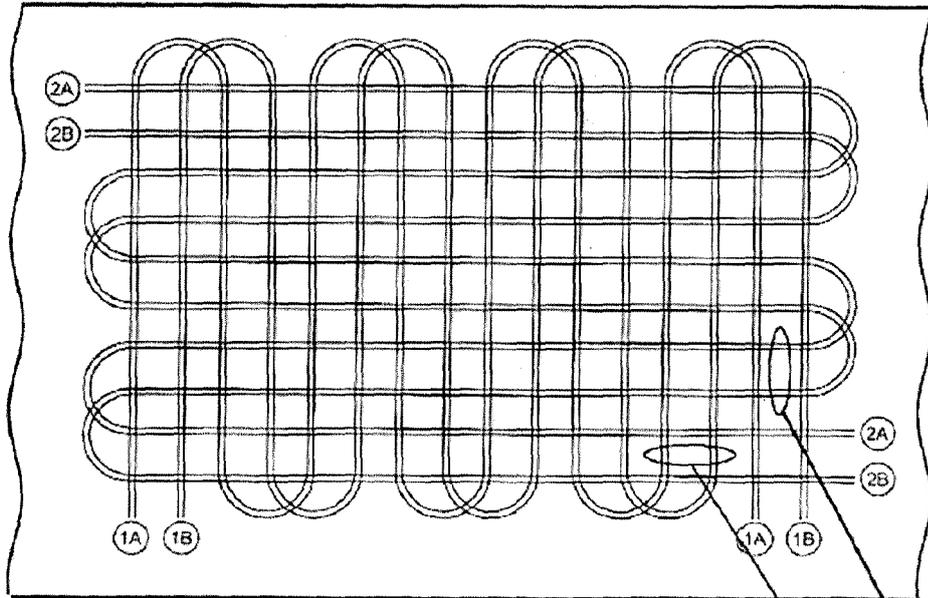


Fig 5



EUROPEAN SEARCH REPORT

Application Number
EP 16 46 0084

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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 88/08594 A1 (WOLF ADRIAN FRANCIS [GB]) 3 November 1988 (1988-11-03) * page 4, line 4 - page 5, line 6 * * page 5, line 12 - page 6, line 24 * * figures 1,2 *	1	INV. G08B13/12
A	----- US 5 813 360 A (DICKEY JR STEVEN R [US]) 29 September 1998 (1998-09-29) * the whole document * -----	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			G08B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 7 July 2017	Examiner Meister, Mark
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 16 46 0084

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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07-07-2017

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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