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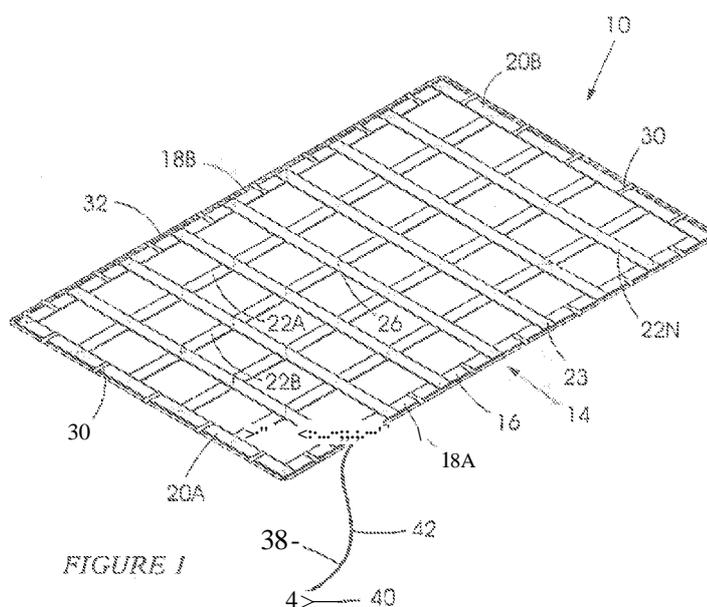
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(54) Title: ILLUMINATING SAFETY NET



(57) Abstract: The invention provides an illuminating safety net (10) which includes a net body (14) which has a quadrilateral perimeter (16) of elongate tensile members (18, 20) and a plurality of elongate tensile elements (22) attached to the perimeter (16) and extending within the perimeter (16) in at least two transverse directions; and an elongate flexible lighting strip (32) engaged to the net body (14) along at least a part of a perimeter edge of the perimeter (16).



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- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

## BACKGROUND OF THE INVENTION

[0001] The invention relates to an illuminating safety net.

[0002] Lighting is an issue in underground mine excavations. To provide adequate Sighting, particularly in the working areas or stopes of the mine, requires a complex electrical installation of bulbs, power lines, means to attach and suspend the bulbs and power lines and intermittent accessible electricity supply points.

[0003] In a typical lighting system, a string of bulbs is suspended from a wall of the excavation, interlinked by a power cable. The bulbs are interspersed on this cable at intervals that create an uneven lighting pattern.

[0004] The current invention at least partially solves the aforementioned problem.

## SUMMARY OF INVENTION

[0005] The invention provides an illuminating safety net which includes a net body which has a quadrilateral perimeter of elongate tensile members, and a plurality of elongate tensile elements attached to the perimeter and extending within the perimeter in at least two transverse directions; and an elongate flexible lighting strip engaged to the net body along at least part of a perimeter edge of the perimeter.

[0006] The flexible lighting strip may include at least one length of flexible plastic tubing, and a string of electrically Interlinked LEOs in the tubing and a connector terminal or power supply connector at one end of the string of LEOs.

[0007] Preferably, the lighting strip extends about the entire perimeter edge of the net

[0008] The safety net may include an attachment means for attaching the lighting strip to the net body.

[0009] The attachment means may be a plurality of attachment loops, each of which presents laterally of the perimeter. The lighting strip may be threaded through each of the loops in engagement of the lighting strip to the net body.

[0010] Alternatively, the lighting strip may be tied or fastened to the safety net by any suitable means, for example, by using a plurality of cable ties or the like,

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The invention is described with reference to the following drawings in which:

Figure 1 illustrates, in plan, an illuminating safety net in accordance with the invention; and

Figure 2 illustrates a length of lighting tube which is attached to the perimeter of a body of the safety net.

#### DESCRIPTION OF PREFERRED EMBODIMENTS

[0012] Figure 1 illustrates an illuminating safety net, in accordance with the invention, which is installed, with the aid of hooks (not shown) to preinsailed support (not shown), which is engaged to a hanging wall (not shown) of a mine excavation, to prevent rock fall from the hanging wall harming a mine worker beneath.

[0013] This particular net however, serves an additional function: that of illuminating the area beneath the safety net which, in the mine excavation, is an active work area.

[0014] This safety net 10 has a quadrilateral mesh body 14 defined by a perimeter 16 which is comprised of a pair of longitudinal members, respectively designated 18A and 18B and a pair of transverse members, respectively designated 20A and 20B.

[0015] Within the perimeter, the body 14 includes a grid of elongate tensile elements which extend in a first direction, parallel to the transverse members 20, and a second direction, parallel to the longitudinal members 18. These elements are designated, in no particular order, 22A, 22B ..... 22N. Each element intersects and engages with a member (18, 20) at an attachment location 23.

[0016] The elements 22 cross one another at overlap points 26. At the overlap points, the intersecting elements are stitched together or otherwise secured together by any other suitable means,

[0017] The elements (22, 24) and the members (18, 20) are straps of a suitable tensile fabric material.

[0018] In this particular example, the safety net 10 includes a plurality of attachment loops 30 extending transversely from the perimeter 16 and spaced at regular intervals along each member (18, 20).

**[0019]** The safety net 10 includes a lighting tube 32 which, in this example, runs along the entire perimeter 18 and which is attached thereto by being threaded through each loop 30.

**[0020]** In this example, the lighting tube 32 consists of a single length of flexible plastic tubing 34 and a plurality of LEDs 38 that are electrically interlinked by a power supply line 38. The LEDs can be connected in series or parallel. The power supply line terminates at one end, in a power source connector or plug 40. However it is anticipated, within the scope of this invention, that the lighting tube comprises a plurality of lengths, each length electrically connectable to a preceding or following length.

**[0021]** The plastic tubing 34 will be of a suitable plastic material that is protective to the LEDs contained therein, excluding the ingress of dirt and debris, whilst being flexible and sufficiently translucent or transparent so as not to absorb any of the light emanating from the LEDs.

**[0022]** The benefit of the illuminating safety net 10 is that it is a flexible structure, capable of being folded or rolled prior to installation, with the lighting tube hindering the folded or rolled configuration. When the net is required, it is unfolded or unrolled, elevated to the hanging wall and attached to preinstalled support as mentioned above. Then, to provide the secondary function of light, the plug 40, at a trailing end section 42 of the power line 38, is merely plugged into the nearest available power source portal.

**[0023]** Furthermore, below the installed net, the work area is more evenly and brightly lit.

CLAIMS

1. An illuminating safety net which includes a net body which has a quadrilateral perimeter of elongate tensile members, and a plurality of elongate tensile elements attached to the perimeter and extending within the perimeter in at least two transverse directions; and an elongate flexible lighting strip engaged to the net body along at least part of a perimeter edge of the perimeter.

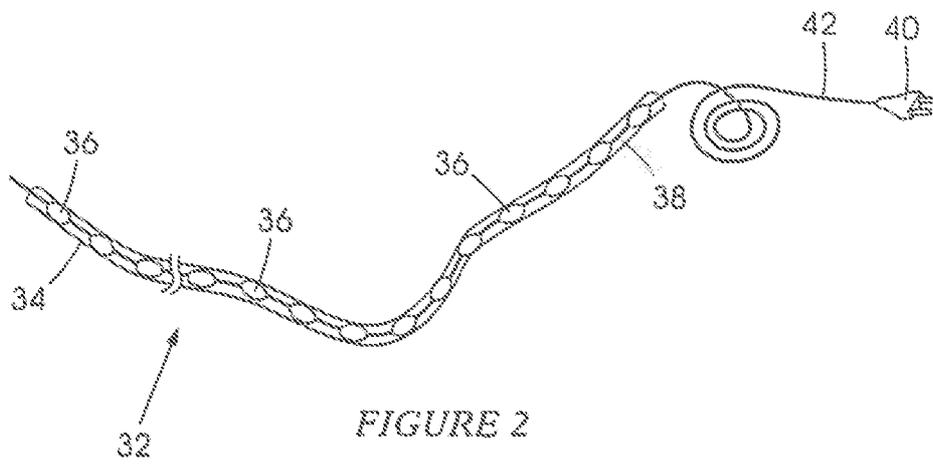
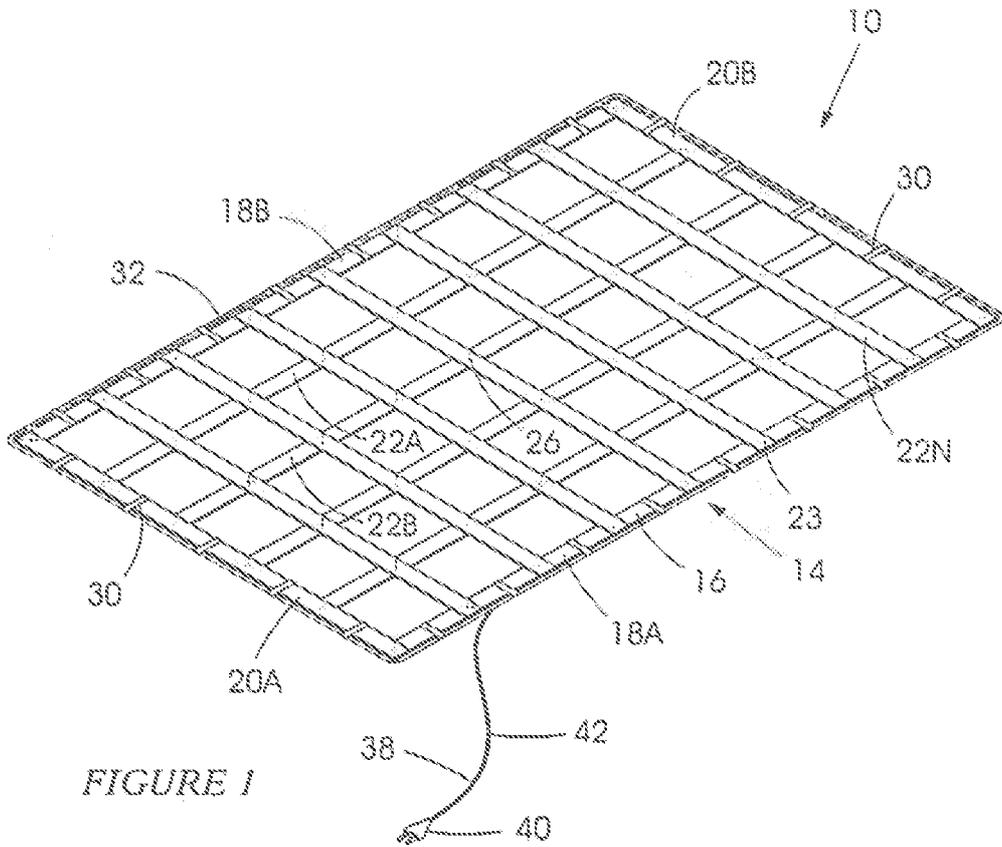
2. An illuminating safety net according to claim 1 wherein the flexible lighting strip includes at least one length of flexible plastic tubing, a string of electrically interlinked LEDs in the tubing and a connector terminal or power supply connector at one end of the string of LEDs,

3. An illuminating safety net according to claim 1 or 2 wherein the lighting strip extends about the entire perimeter edge of the net.

4. An illuminating safety net according to any one of claims 1 to 3 wherein the safety net includes an attachment means for attaching the lighting strip to the net body,

5. An illuminating safety net according to claim 4 wherein the attachment means is a plurality of attachment loops, each of which presents laterally of the perimeter.

8. An illuminating safety net according to any one of claims 1 to 3 wherein the lighting strip is tied or fastened to the safety net,



INTERNATIONAL SEARCH REPORT

International application No  
PCT/ZA2017/000012

A. CLASSIFICATION OF SUBJECT MATTER				
INV.	F21V33/00	F21S4/26	E01F7/04	E02D17/20
ADD.	F21W131/402	F21Y115/10	F21Y103/10	F21Y103/20
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)							
F21V	F21W	F21S	F21Y	E01F	E02D	E21D	E04G

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 practicable, search terms used)  
EPO-Internal , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 205 145 431 U (TAIZHOU HONGDA MINING SAFETY COMPONENTS CO LTD) 13 April 2016 (2016-04-13) the whole document -----	1,3-6
X	US 6 969 185 B1 (ADAIR DARRYL [US] ) 29 November 2005 (2005-11-29) column 3, line 30 - column 4, line 56 figures 2,6, 10, 15-17 -----	1,2,4,6
X	CN 204 899 430 U (STATE GRID CORP CHINA; LIAOCHENG POWER SUPPLY CO OF STATE GRID SHANDON) 23 December 2015 (2015-12-23) the whole document -----	1
A	US 2010/286910 A1 (HUDSON JACK F [US] ) 11 November 2010 (2010-11-11) the whole document -----	1-6
-/- .		

Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance	"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
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"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search	Date of mailing of the international search report
7 March 2018	16/03/2018

Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  Soto Salvador, Jesus
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# INTERNATIONAL SEARCH REPORT

International application No  
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2008/002389 A1 (KUFFERATH-KASSNER INGO [DE] ET AL) 3 January 2008 (2008-01-03) the whole document -----	1-6

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No <b>PCT/ZA2017/000012</b>
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 205145431	U	13-04-2016	NONE
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US 6969185	B1	29-11-2005	NONE
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CN 204899430	U	23-12-2015	NONE
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US 2010286910	A1	11-11-2010	US 2010286910 A1 11-11-2010
			WO 2010127251 A1 04-11-2010
-----			
US 2008002389	A1	03-01-2008	NONE
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