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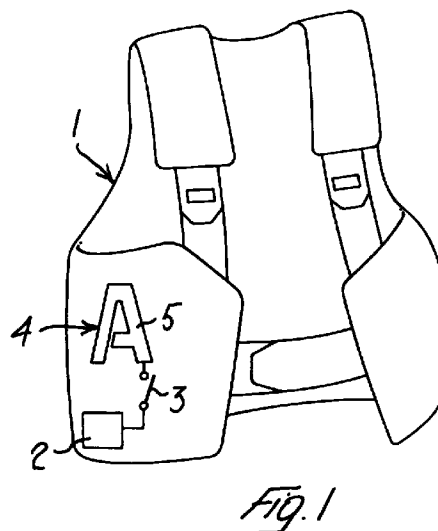
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**(54) Warning device and sighting light for scuba divers**

(57) Warning device and sighting light that may be applied on an underwater diver garment such as a scuba balancing jacket (1) or a diving suit (6). This device comprises: a battery (2) for supplying the electric current necessary for the circuit of said warning device and sighting light; a switch (3) for closing/opening said circuit; a filiform element (4) fastened or sewn to the underwater-diver garment (1) or (6), consisting of semi-conductor material which, in the case where it is traversed and thus excited by an electric current, emits light signals. The filiform element (4) is coated with a transparent plastic material which enables the light signals emitted by said filiform element (4) to be visible during diving; this filiform element (4) may assume any form of a symbol (5) or a number (7).



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## Description

[0001] The present invention relates to a warning device and sighting light that may be located on an underwater diving suit or on a balancing jacket (referred to also as "jacket"), so that the diver may be easy to detect and recognize during submersion by other divers.

[0002] The present invention thus envisages a warning device and warning light comprising basically a battery which supplies an electric current to a filiform semiconductor element (of the diameter of, for example, 1 or 2 mm) contained in a transparent plastic coating. The said filiform element consists of an electroluminescent semiconductor material, i.e., one that has the property of lighting up if it is traversed and thus excited by an electric current. This filiform element is then coated with a transparent plastic material so as to make the light signals emitted by this semiconductor visible.

[0003] The coated filiform element may be sewn or otherwise secured to a diving suit, or alternatively to a jacket, and is connected to a battery for supplying the current, for example a single storage cell. By putting on a switch provided in the warning device and sighting light, the scuba diver may send light signals in the case where he is in difficulty, or anyway wants to make himself visible to other divers who are in submersion. This warning light is also useful in the case where a scuba diver instructor wants to follow the squad of his pupils, recognizing them individually during diving. The coated filiform element fastened to the diving suit or jacket may in fact be given any form, such as a symbol (e.g., a letter) or a number, thus enabling recognition of the diver to whom the letter or number is associated.

[0004] The present invention will be better understood from the following description made with reference to the drawings attached, in which:

Figure 1 shows the warning device and sighting light applied to a scuba diver balancing jacket, also referred to herein as "jacket"; and

Figure 2 shows the warning device and sighting light applied to a diving suit.

[0005] With reference to Figure 1, according to a first embodiment exemplifying the present invention, the light warning device is fastened or sewn to a scuba diver balancing jacket, or simply jacket, 1. The said warning device and sighting light basically comprises a battery 2 for supplying the electric current, a switch 3 of the circuit of said warning light, and a filiform element 4 consisting of semiconductor material (having a diameter of, for example, 1 or 2 mm) coated with transparent plastic material. In the case where the diver is in difficulty or wishes to make himself visible to other divers in the water, he just needs to put on the switch 3 for supplying the circuit. In this way an electric current will be supplied to the coated filiform element 4, which, since it is made

of semiconductor material, has the property of lighting up if it is excited by an electric current. Since this filiform element 4 is moreover coated with transparent plastic material, it will be possible for the other divers to detect the light signal emitted by the filiform element 4. As may be noted from the figure, in this embodiment of the present invention the filiform element takes the form of, for instance, a symbol (letter) 5, which enables recognition of the scuba diver to whom it is associated.

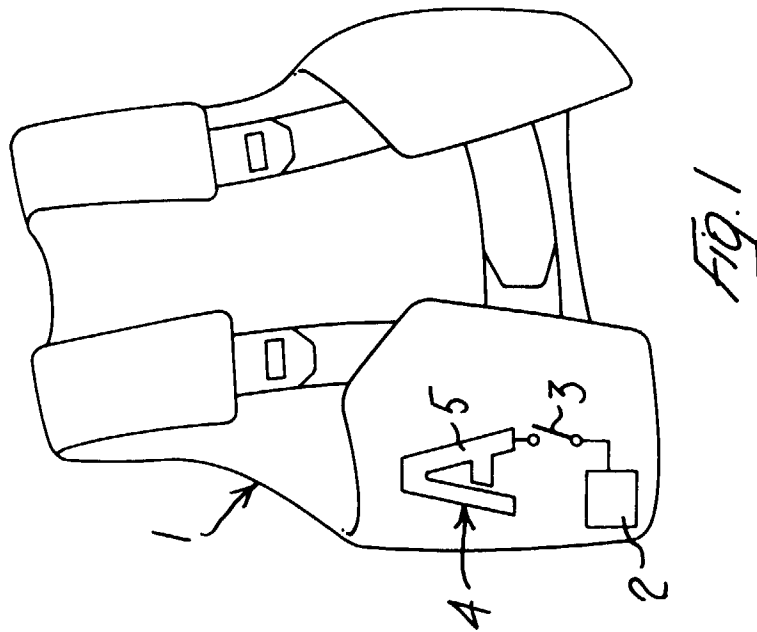
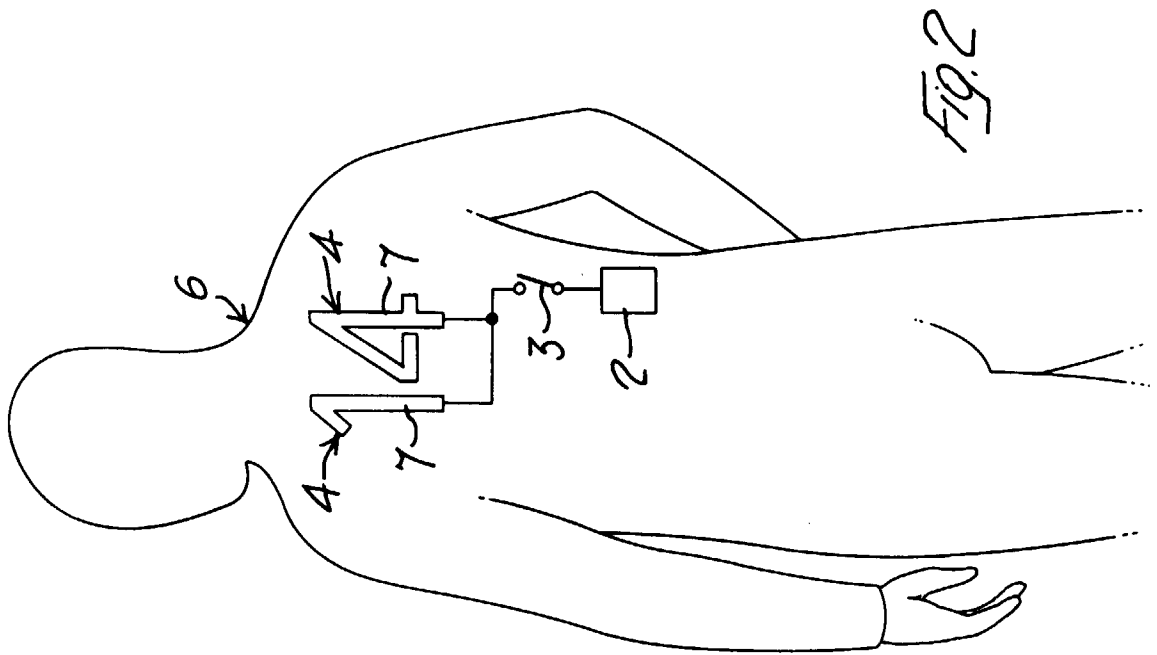
[0006] Figure 2 shows the warning device and sighting light according to another embodiment which presents a further example of the present invention, fastened or sewn directly to the diving suit 6 in the case, for example, of submersion without using breathing apparatus, whereby the balancing jacket is not used. As may be noted from the figure, the warning device and sighting light is made up of the same elements previously described for Figure 1, with the exception of the filiform element 4 consisting of semiconductor material coated with transparent plastic material, which takes the form, for example, of a number 7.

[0007] Even though in Figure 1 the light device according to the invention is represented as being applied to the front of a jacket 1, and in Figure 2 as being applied on the back of a diving suit 6, it remains understood that the said light device may be

[0008] applied in any suitable position. In addition, it is understood that the battery 2 and the switch 3, which are shown in the drawing in an altogether schematic way and purely for purposes of demonstration, may be housed in any suitable position.

## Claims

1. Sighting light that may be applied on an underwater diving garment such as a diving suit (6) or a scuba balancing jacket (1), characterized in that it comprises: a battery (2) for supplying the electric current necessary for the circuit of said warning device and sighting light; a switch (3) for closing/opening said circuit; a filiform element (4) which, whenever traversed and thus excited by an electric current, emits light signals, the said filiform element (4) being coated with a transparent plastic material which enables the light signals emitted by said filiform element (4) to be visible during submersion.
2. Device according to Claim 1, characterized in that the filiform element (4) may assume any form, such as a symbol (5) or a number (7).
3. Device according to Claim 1, characterized in that the said filiform element (4) consists of semiconductor material coated with a transparent plastic material which can be fastened or sewn directly to the underwater diving garment (1) or (6).





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# EUROPEAN SEARCH REPORT

Application Number  
EP 98 11 8416

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X,P	GB 2 319 164 A (MINIFLAME LIMITED) 20 May 1998 * abstract; claims 1,9; figures 1-5 * * page 5, line 5 - line 16 * * page 6, line 6 - line 16 * * page 7, line 10 - line 21 * ---	1,3	B63C11/26 G09F13/22 //B63C9/20, G08B5/00
Y	US 5 370 566 A (K.C. MITCHELL, JR. ET AL.) 6 December 1994 * abstract; figures 1-5 * * column 3, line 53 - column 4, line 40 * ---	1	
A	---	3	
Y	DE 29 41 245 A (MIDLAND-ROSS CORP.) 24 April 1980 * claims 1-3; figures 1,2 * * page 8, line 14 - page 9, line 6 * * page 16, line 4 - page 17, line 8 * * page 19, line 31 - page 20, line 8 * * page 26, line 14 - line 21 * ---	1	
A	---	2,3	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A	DE 15 16 648 A (H. GEILING) 25 September 1969 * the whole document * ---	1	B63C G09F G08B H05B
A	FR 2 626 547 A (P. FONTANILLE) 4 August 1989 * figures 1,2,5 * * page 1, line 6 - page 1, line 37 * ---	1	
A	WO 86 02613 A (W.L. COURTNEY) 9 May 1986 * figures 5,6 * * page 14, line 17 - line 25 * ---	1,3	
		-/--	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 21 December 1998	Examiner Häusler, F.U.
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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# EUROPEAN SEARCH REPORT

Application Number  
EP 98 11 8416

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	DE 296 00 047 U (A. MÜLLER-RETTSTATT ET AL.) 4 April 1996 * claim 1; figures 1-4 * * page 8, line 7 - line 19 * * page 12, line 14 - line 30 * ---	1,3	
A	DE 93 07 469 U (P. KLETT) 28 October 1993 * claims 1,3; figure 1 * * page 3, line 1 - page 4, line 4 * ---	1-3	
A	US 5 622 422 A (N.A. RODGERS) 22 April 1997 * claim 1 * * column 1, line 7 - line 34 * * column 2, line 28 - line 34 * ---	1,3	
A	US 5 613 756 A (M.E. ALLEN) 25 March 1997 * abstract; figures 6-8 * * column 6, line 34 - line 58 * ---	1,3	
A	EP 0 648 436 A (W. BROSCHE, MAG.) 19 April 1995 * claim 1; figure 1 * ---	1,3	
A	US 3 148 299 A (J.C. DEVOL ET AL.) 8 September 1964 * column 1, line 59 - column 2, line 22 * -----	1,3	
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>21 December 1998</b>	Examiner <b>Häusler, F.U.</b>
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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 ----- &amp; : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

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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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21-12-1998

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
GB 2319164	A	20-05-1998	NONE		
US 5370566	A	06-12-1994	NONE		
DE 2941245	A	24-04-1980	FR	2438952 A	09-05-1980
DE 1516648	A	25-09-1969	US	3469231 A	23-09-1969
FR 2626547	A	04-08-1989	NONE		
WO 8602613	A	09-05-1986	US	4645465 A	24-02-1987
			US	4681552 A	21-07-1987
			US	4779554 A	25-10-1988
			AU	5063685 A	15-05-1986
			EP	0198066 A	22-10-1986
DE 29600047	U	04-04-1996	NONE		
DE 9307469	U	28-10-1993	NONE		
US 5622422	A	22-04-1997	US	5461815 A	31-10-1995
			US	5330282 A	19-07-1994
			US	5697182 A	16-12-1995
US 5613756	A	25-03-1997	CA	2162839 A	22-02-1997
EP 0648436	A	19-04-1995	AT	207593 A	15-01-1997
US 3148299	A	08-09-1964	NONE		