



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
15.10.2008 Bulletin 2008/42

(51) Int Cl.:
F42B 4/26 (2006.01) F42B 12/36 (2006.01)

(21) Application number: **07106156.8**

(22) Date of filing: **13.04.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

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(54) **Rocket-propelled emergency system**

(57) Emergency system, comprising a rocket (1), comprising means (8) which are arranged to transmit an RF signal after the rocket has been fired, e.g. including an RF transmitter (9), a code generator (10), an electric energy source (11) and a (e.g. shock) actuator (12), arranged such that the RF transmitter starts, activated by the actuator and energized by the electric energy source, broadcasting an emergency code provided by the code generator after the rocket has been fired. The code generator (10) is e.g. arranged to generate an identification code which is related to the user and/or the equipment in question and/or a position code which is related to the geographical position of the user and/or the equipment in question, e.g. based on GPS location information. The system may comprise a parachute (5,6) or balloon and their connection wire (6) may function as antenna.

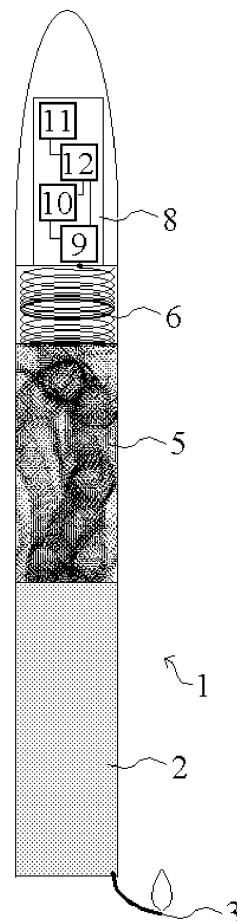


FIG. 1

Description

Field of the invention

Background of the invention

[0001] Smaller ships, e.g. for recreational use may, in case of emergency, launch a rocket which unfolds a parachute at e.g. a height of 300 meters and ignites a pyrotechnic signal flare. The pyrotechnic signal flare hangs about one minute in the air. The intention is that the pyrotechnic signal flare will visually be noticed in the surrounding area after which rescue operations may be started. However, the chance that the sign is noticed indeed is rather limited due to the small "reach" of this kind of signaling. The visibility reach of such an emergency rocket could be acceptable during the night, however, by day its visibility will be much less. Moreover, the location from which the rocket has been fired can rather hardly be determined on the basis of the location of the pyrotechnic signal flare, all the more since the pyrotechnic signal flare can be seen for only a restricted period, viz. about one minute.

[0002] Of course emergency signals could be broadcast in case of emergency, however, small ships often do not have radio apparatus aboard because of their costs and because it is room consuming.

Further existing systems are:

[0003] SART (Search and Rescue Radar Transponder) system in which a small transponder can receive navigation radar signals from (large) ships and can reflect those signals in a way that is specific for an emergency situation. The ship's radar system can calculate and display then the emergency location. The SART system has a range of about 15 km.

[0004] EPIRB (Emergency Position-Indicating Radio Beacon) and PLB (Personal Locator Beacons) are systems in which small beacons can transmit an emergency signal which is picked up by a satellite system which transfers the emergency signal to a ground station which calculates the position of the ship in question and sends an alarm message to an emergency centre. The EPIRB and PLB system can only be used in cooperation with the US Coastguard and is rather expensive.

Summary of the invention

[0005] One aim of the present invention is to provide an emergency alarm system which is small and cheap, which makes it useful for e.g. smaller ships, but also for e.g. backpackers, mountain climbers and that kind of sportsmen, and which has a far better reach and chance to be noted. Another aim is to provide means by which the emergency location can be determined considerably better.

[0006] To reach those aims an emergency system in-

tended for personal use is presented here, comprising a rocket, which e.g. may be fired in case of emergency, comprising means which are arranged to transmit an RF signal after the rocket has been fired. To that end the system may comprise an RF transmitter, a code generator, an electric energy source and an actuator, arranged such that the RF transmitter starts, activated by the actuator and energized by the electric energy source, broadcasting an emergency code provided by the code generator after the rocket has been fired.

[0007] The aim of these measures is to provide an emergency rocket which after launch broadcasts information which is relevant to start a rescue operation by any receiver of that information.

[0008] To start broadcasting of the emergency signal automatically and at the right moment the actuator may be, amongst others, a (e.g. piezoelectric) shock actuator, arranged to activate the RF transmitter and/or the electric energy source.

[0009] The code generator may be arranged to generate an identification code which is related to the user and/or the equipment in question. Instead or additionally, the code generator may be arranged to generate a position code which is related to the geographical position of the user and/or the equipment in question; the code generator may be arranged to use GPS location information.

[0010] The rocket may comprise a parachute - which is known as such - and an antenna - to cooperate with the transmitter and known as such too - wherein, however, the antenna is, at least partially integrated, with the parachute or is formed by a connection (wire) between the parachute and the transmitter.

[0011] It is noted that US3930448 discloses a portable, rocket-deployed signaling system for deploying a pinpoint location marker including a tractor rocket propulsion unit and attached payload container launched from a hand-held tube. The payload comprises an inflatable marker balloon, a gas generator for inflating the balloon and a tether line connecting the balloon to the launcher tube. A coupling pin, secured to the tether line at a predetermined length from the end attached to the launcher tube and removably supported on the payload container, is pulled subsequent to launch to permit the container to separate and deploy the balloon. A percussion igniter then actuates the gas generator to inflate the balloon with the generator separating after inflation.

[0012] Thus from US3930448 it is known to use as such a balloon in stead of a parachute to keep a marker of an alarm "in the air". The emergency system as proposed herein may comprise a balloon too, instead of a parachute, and the antenna may formed by a connection (wire) between the balloon and the transmitter.

[0013] The rocket may thus comprise an emergency transmitter which after launch of the rocket is activated to transmit (broadcast) an emergency signal which preferably comprises information which is necessary or at least useful for benefiting rescue operations. The rocket

may comprise an energy source, e.g. a battery, a GPS chip, a small transmitter and an antenna which may be coupled to the parachute or balloon. The rocket-transmitter combination is expected to have a range of at least 70 km. The price (at this moment) is esteemed to be less than 100 Euros.

[0014] The invention will be discussed more in detail with the help of a non-limiting exemplary embodiment of the invention.

Exemplary Embodiment

[0015] Figure 1 shows schematically an exemplary embodiment of a system according to the invention in a cross-sectional view; Figure 2 shows the embodiment of figure 1 in operation.

[0016] Figure 1 shows an emergency system comprising a rocket 1 which can be fired in case of emergency. The rocket comprises a propulsion chamber 2, filled with powder, which can be ignited by ignition means 3. Besides, the rocket includes a pyrotechnic load 4 and a parachute. The parachute 5 is, via parachute lines 6, connected with the pyrotechnic load 4.

[0017] The rocket further comprises a chamber which contains transmission means 8 which are arranged to transmit an RF signal after the rocket has been fired. The transmission means 8 is formed by an RF transmitter 9, a code generator 10, an electric energy source 11 and an actuator 12. The components are arranged such that the RF transmitter 9 starts, activated by the actuator 12 and energized by the electric energy source 11, broadcasting an emergency code provided by the code generator 10 after the rocket has been fired. All components and their mutual relationship can clearly be understood from the circuit diagram in figure 2 by any person skilled in the art. The actuator 12 is a shock actuator which is connected between the electric energy source 11 and the code generator 10 and the transmitter 9. When the rocket is launched, the actuator 12 connects the code generator 10 and the transmitter 9 with the electric energy source 11, thus activating them. As a result of this the transmitter 9 starts to broadcast the code signals as supplied by the code generator from the moment the rocket has been launched. It could be preferred to provide the actuator 12 with a delay which corresponds with the time which the rocket needs to reach its highest point. After that point the rocket will release its parachute and return slowly to the earth's surface, hanging on the parachute lines 6. It is preferred that at least one of those parachute lines and/or other parachute parts may be conductive and act as an antenna wire, connected to the transmitter 9.

[0018] It is noted that the construction of the rocket and its parachute are not disclosed here in detail because all that is of general knowledge, e.g. disclosed in US5661257 (1938) and in other disclosures, and not important for the present invention as such. The same applies for the optional construction in which the system

comprises a balloon as disclosed in US3930448.

[0019] It is preferred that the code generator 10 is arranged to generate an identification code which is related to the user and/or the equipment in question. At the moment of purchase or activation a user identification code may be set via an IR or short distance RF (e.g. Bluetooth®) link.

[0020] The code generator 10 preferably is arranged to generate a position code which is related to the geographical position of the user and/or the equipment in question. To that end the code generator 10 may comprise an added GPS receiver chip (not shown).

Claims

1. Emergency system, comprising a rocket (1), comprising means (8) which are arranged to transmit an RF signal after the rocket has been fired.
2. Emergency system according to claim 1, comprising an RF transmitter (9), a code generator (10), an electric energy source (11) and an actuator (12), arranged such that the RF transmitter starts, activated by the actuator and energized by the electric energy source, broadcasting an emergency code provided by the code generator after the rocket has been fired.
3. Emergency system according to claim 2, wherein the actuator (12) is arranged to activate the RF transmitter (9) and/or the electric energy source (11).
4. Emergency system according to claim 2, wherein the code generator (10) is arranged to generate an identification code which is related to the user and/or the equipment in question.
5. Emergency system according to claim 2 or 4, wherein the code generator (10) is arranged to generate a position code which is related to the geographical position of the user and/or the equipment in question.
6. Emergency system according to claim 5, wherein the code generator (10) is arranged to use GPS location information.
7. Emergency system according any of claims 2- 9, comprising a parachute (5,6) and an antenna (6), wherein the antenna is at least partially integrated with the parachute or is comprised by a connection between the parachute and the transmitter.
8. Emergency system according any of claims 2 - 9, comprising a balloon and an antenna (6), wherein the antenna is comprised by a connection between the balloon and the transmitter.

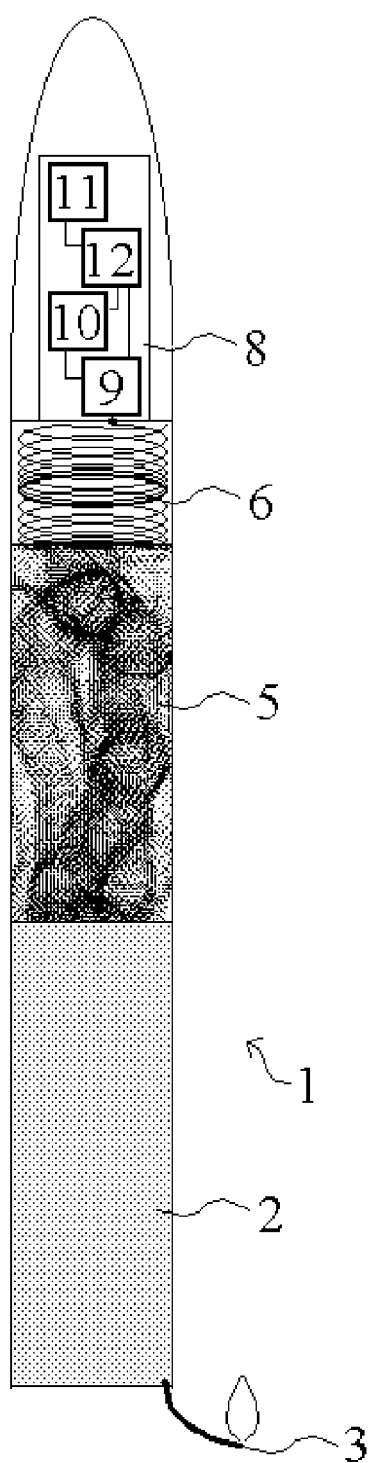


FIG. 1

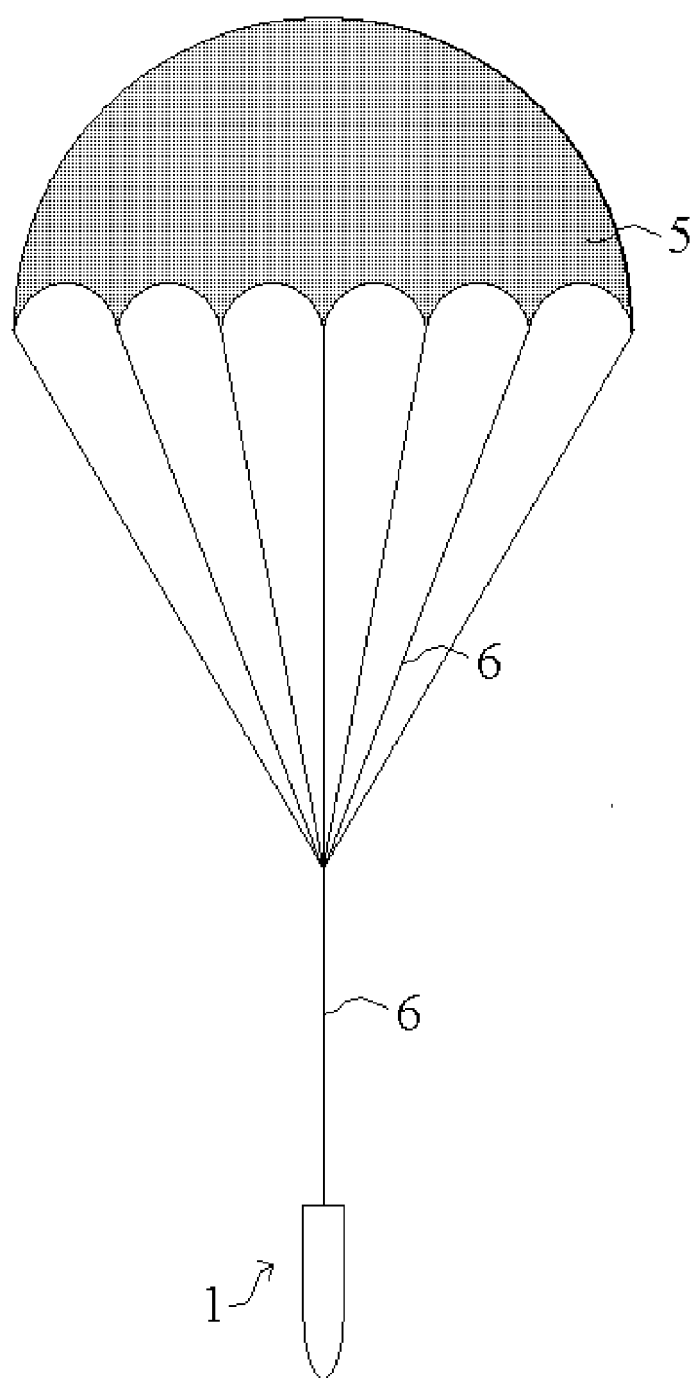


FIG. 2



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	FR 2 843 848 A1 (I S L INST FRANCO ALLEMAND DE [FR]) 27 February 2004 (2004-02-27) * abstract * * column 3, line 6 - column 4, line 24 * * figures *	1	INV. F42B4/26 F42B12/36
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A	----- EP 1 617 166 A (ROKE MANOR RESEARCH [GB]) 18 January 2006 (2006-01-18) * paragraph [0018] - paragraph [0024] * * figures *	5,6	
D,A	----- US 3 930 448 A (BARBER WILLIAM H ET AL) 6 January 1976 (1976-01-06) * abstract * * figures *	7	
	-----		TECHNICAL FIELDS SEARCHED (IPC) F42B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26 September 2007	Examiner Vermander, Wim
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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EPO FORM 1503 03.82 (P04C01)

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

EP 07 10 6156

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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26-09-2007

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REFERENCES CITED IN THE DESCRIPTION

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- US 3930448 A [0011] [0012] [0018]
- US 56612571938 A [0018]