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(54) **Safety device for floatation and straightening of sailing boats**

(57) A safety device for floatation and uprighting sailing boats, whether single-hull or multi-hull ones, comprises: a sensor device (12, 12a, 12b) for indicating the inclination of a hull (11) with respect to a plane of flotation on the water; a means for supplying gas (13) designed to be activated by the sensor device (12, 12a,

12b); a pneumatic circuit (15); and at least one inflatable element (14), which is fixed to the hull (11), and/or to the equipment (18, 20) of the boat, in a position higher than the plane of flotation on the water and is connected to the means for supplying gas (13) through the circuit (15).

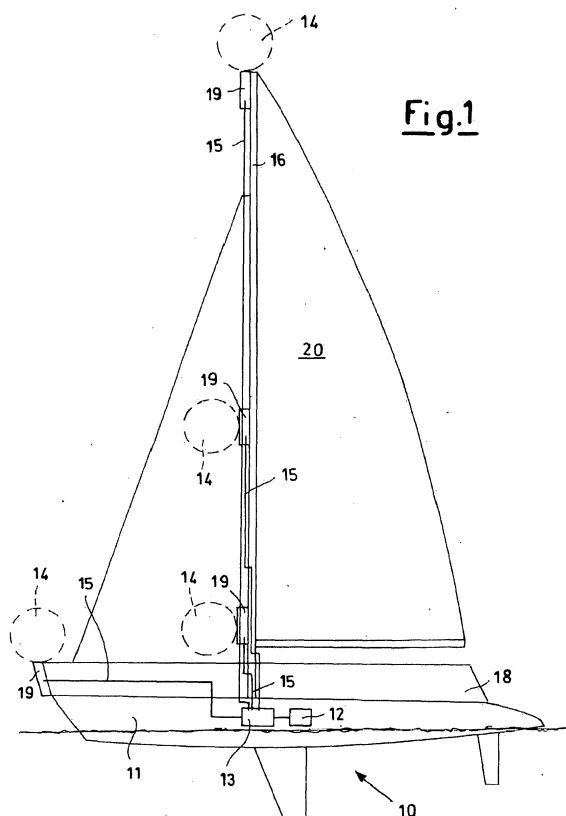


Fig. 1

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Description

[0001] The present invention relates to a safety device for flotation and uprighting (straightening) of sailing boats.

[0002] Up to the present day, safety devices and safety systems developed for sailing boats have been based, in general, on elements external to the boat itself. In particular, these are inflatable boats or dinghies or other rigid hulls, which, in the event of danger, enable safe transfer thereon of the occupants of the main hull. Solutions of this sort, albeit very effective in terms of safety of the occupants, do not, instead, solve the problem of safeguarding the boat in so far as they are not designed for said purpose. A purpose of the present invention is to provide a safety device for flotation and uprighting of sailing boats that will ensure protection of the boat as a whole by means of structural elements forming part of the boat itself.

[0003] Another purpose of the present invention is to provide a safety device for flotation and uprighting of sailing boats that will furnish a system capable of detecting the situation of danger of overturning and automatically proceed to guaranteeing flotation of the boat and so favour its uprighting.

[0004] Yet another purpose of the present invention is to provide a safety device for flotation and uprighting of sailing boats that will be particularly simple and functional, with contained costs.

[0005] The above purposes according to the present invention are achieved by providing a safety device for flotation and uprighting of sailing boats, as specified in Claim 1.

[0006] Further characteristics are described in the dependent claims.

[0007] The characteristics and advantages of a safety device for flotation and uprighting of sailing boats according to the present invention will emerge clearly from the following description, which is provided by way of nonlimiting example, with reference to the annexed schematic figures, in which:

- Figure 1 is a schematic view of a sailing boat provided with a safety device for flotation and uprighting of sailing boats;
- Figures 2a and 2b illustrate schematically the entry into action of the safety device forming the subject of the present invention following upon the dangerous inclination of a sailing boat, a single-hull and a multi-hull one, respectively;
- Figure 3 is a schematic illustration of an embodiment of a mechanical sensor belonging to the safety device that forms the subject of the present invention;
- Figure 4 is a block diagram of the operation of a digital embodiment of the sensor of the safety device forming the subject of the present invention; and

- Figure 5 is a cross-sectional view of a multilayered sail provided with inflatable elements belonging to the safety device of the invention.

[0008] With reference to the figures, a safety device is illustrated for flotation and uprighting of sailing boats, whether single-hull or multi-hull ones, as a whole designated by 10 and comprising: a sensor device 12 for detecting the inclination of a hull 11 with respect to a plane of flotation on the water (water level); a means for supplying gas 13, consisting, for example, of a compressor or a cylinder; and one or more inflatable elements 14.

[0009] The means for supplying gas 13 is connected to the inflatable elements 14 via a pneumatic circuit 15 comprising one or more tubes, for example made of rubber or of any other material suitable for the purpose of transferring the gas supplied by the compressor or by the cylinder 13 into the inflatable elements 14.

[0010] Figure 1 illustrates by way of example four inflatable elements 14 (shown outlined) connected in parallel to the means for supplying gas 13. Said inflatable elements 14, which can be of any number and could also be connected in series, are preferably fixedly constrained to the equipment of the boat, for example at the top of the mast 16, or else at various heights of the mast 16, or at the helm either at the bow 18 or at the stern, or else on the hull 11 preferably in a position that is high above the horizon represented by the water level.

[0011] In a first embodiment illustrated in Figure 1, the inflatable elements consist, for example, of balloons contained, when deflated, in a housing 19, from which they exit when they are inflated.

[0012] Alternatively, the inflatable elements 14 could also be directly housed in the mast.

[0013] The sensor device 12 has the function either of detecting the situation of danger deriving from an excessive inclination of the hull or else of indicating contact with the water, for example of the sail 20 itself or of any other element of the boat that indicates, on the basis of predetermined parameters, a situation of danger of capsizing or overturning. The sensor device 12 may, for example, be of a mechanical type 12a or of a digital type 12b, or of any other appropriate type for the purpose indicated above such as, again by way of example, devices for measuring pressure, humidity or other parameters.

[0014] An example of mechanical sensor 12a, illustrated in Figure 3, may be a so-called "level sensor", in which a liquid or a ball 21 is free to rotate within a bulb 22 and indicates the lateral inclination of the hull 11 with respect to the horizon represented by the level of the water surface.

[0015] Once a certain inclination is exceeded with respect to the plane of flotation on the water or of the horizon, as illustrated by way of example in Figures 2a and 2b, the sensor 12a indicates the situation to the compressor or to the cylinder for supplying the gas 13,

which, since it is activated automatically, will inflate the elements 14 through the connection tubes 15.

[0016] The digital sensor 12b, instead, of which a possible scheme of operation is illustrated in Figure 4, can receive information from a series of sensor elements 23 located in various parts of the boat, to transfer the information regarding the inclination of the hull 11 in real time to a control unit 24, for example a computer, which, through the continuous processing of the data, compared to pre-set numeric parameters, will establish automatically the moment in which the situation of danger is to be indicated by sending the electronic impulse for activation of the means for supplying gas 13.

[0017] The means for supplying gas 13, i.e., the compressor or the cylinder for supplying gas, may exploit a system similar to what is already in use in automobile air-bags, which are able to supply large amounts of gas in just a few instants, guaranteeing a fast and hence effective, in terms of safety, inflation of the elements 14. The supplying means must moreover keep at least one inflatable element 14 inflated.

[0018] The safety device 10 further comprises means for deflating the elements 14 after their entry into action so that it is possible to resume navigation in conditions of safety after the purpose of preventing overturning of the boat has been achieved.

[0019] Figure 5 illustrates a further embodiment of an inflatable element 14 consisting of an inflatable multilayered sail 20'. The third dimension of the sail 20', i.e., its capacity to inflate, is obtained by superimposing two faces or layers 25 and joining their perimeters using any one of the known techniques, for example by sewing, gluing, hot-sealing or some other technique. It will then be possible to insert between the two faces 25 of the sail 20' one or more bladders (i.e. gas chambers) 26, each equipped with an inflation valve 27, and then proceed to their inflation at the moment when the cylinder or the compressor 13 receives the impulse from the sensor device 12. In the case where the two layers 25 of the inflatable sail 20' are able by themselves to withhold the air within them, i.e., they are impermeable to the gas, it is possible to proceed directly to the inflation of the bladder formed by the two layers 25 of the sail, if necessary, divided into a number of compartments, each equipped with an inflation valve.

[0020] The safety device for flotation and uprighting of sailing boats forming the subject of the present invention has the advantage of combining the action of uprighting of the hull with flotation thereof.

[0021] The safety device forming the subject of the invention may moreover advantageously be activated automatically when a given situation of pre-set inclination is reached.

[0022] The safety device thus conceived may undergo numerous modifications and variations, all falling within the scope of the present invention. Furthermore, any of the items may be replaced by technically equivalent elements. In practice, the materials used, as well

as the dimensions, may be any whatsoever according to the technical requirements.

5 Claims

1. A safety device for flotation and uprighting of sailing boats, whether single-hull or multi-hull ones, **characterized in that** it comprises: a sensor device (12, 12a, 12b) for detecting the inclination of a hull (11) with respect to a plane of flotation on the water; a means for supplying gas (13), designed to be activated by said sensor device (12, 12a, 12b); a pneumatic circuit (15); and at least one inflatable element (14), which is fixed to said hull (11), and/or to the equipment (18, 20) of the boat, in a position higher than the plane of flotation on the water and is connected to said means for supplying gas (13) through the circuit (15).
2. The device according to Claim 1, **characterized in that** said sensor device (12) is a mechanical sensor (12a) comprising a liquid or a ball (21) that is free to rotate within a bulb (22), designed to indicate the lateral inclination of the hull (11) with respect to the plane of flotation on the water.
3. The device according to Claim 1, **characterized in that** said sensor device (12) is a digital sensor (12b) comprising a plurality of sensor elements (23) located in various parts of the boat, which are designed to transfer information regarding the inclination of the hull (11) to a control unit (24), designed to send an electronic impulse for activation of the means for supplying gas (13).
4. The device according to Claim 1, **characterized in that** said sensor device (12) is a sensor capable of measuring the pressure of a liquid or of the environment in which it is set for detecting a situation of danger of capsizing or overturning of the boat.
5. The device according to Claim 1, **characterized in that** said sensor device (12) is a sensor capable of measuring the humidity of the environment in which it is set for detecting a situation of danger of capsizing or overturning of the boat.
6. The device according to Claim 1, **characterized in that** said means for supplying gas (13) is a compressor or a cylinder capable of supplying large amounts of gas in a substantially instantaneous way and of keeping at least one inflatable element (14) inflated.
7. The device according to Claim 1, **characterized in that** it comprises means for deflating said inflatable elements (14) after their entry into action.

8. The device according to Claim 1, **characterized in that** said at least one inflatable element (14) is an inflatable balloon.
9. The device according to Claim 8, **characterized in that** said balloon (14) is contained, when deflated, in a housing (19), from which it comes out at the moment of inflation. 5
10. The device according to Claim 1, **characterized in that** said at least one inflatable element (14) is a multilayered sail (20') comprising two layers (25), between which there is set at least one bladder (26) equipped with an inflation valve (27). 10
11. The device according to Claim 1, **characterized in that** said at least one inflatable element (14) is a multilayered sail (20') comprising two layers (25), which are impermeable to air and are connected to said pneumatic circuit (15) for being inflated by said means for supplying gas (13). 15 20

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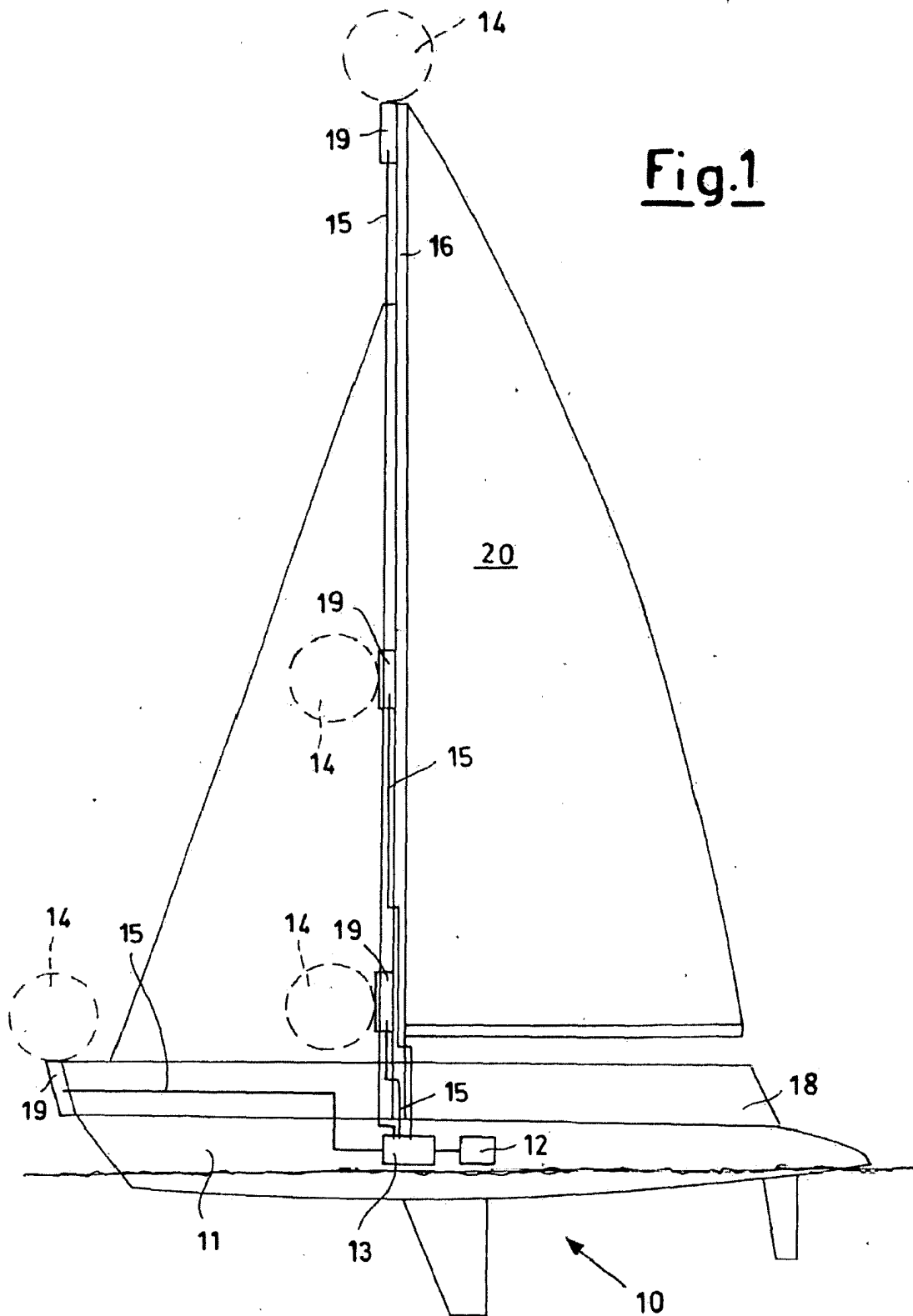


Fig.2a

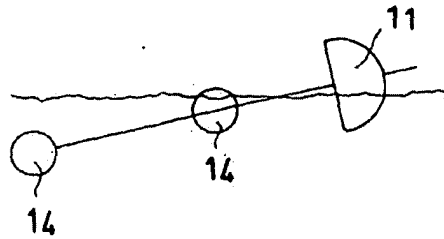


Fig.2b

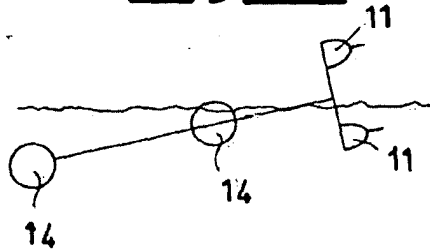


Fig.3

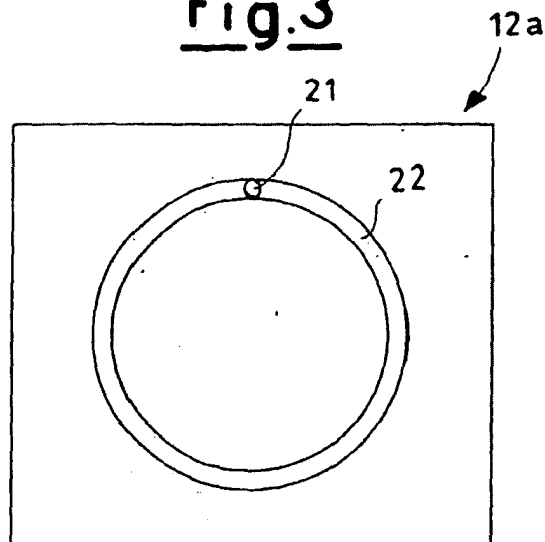


Fig.4

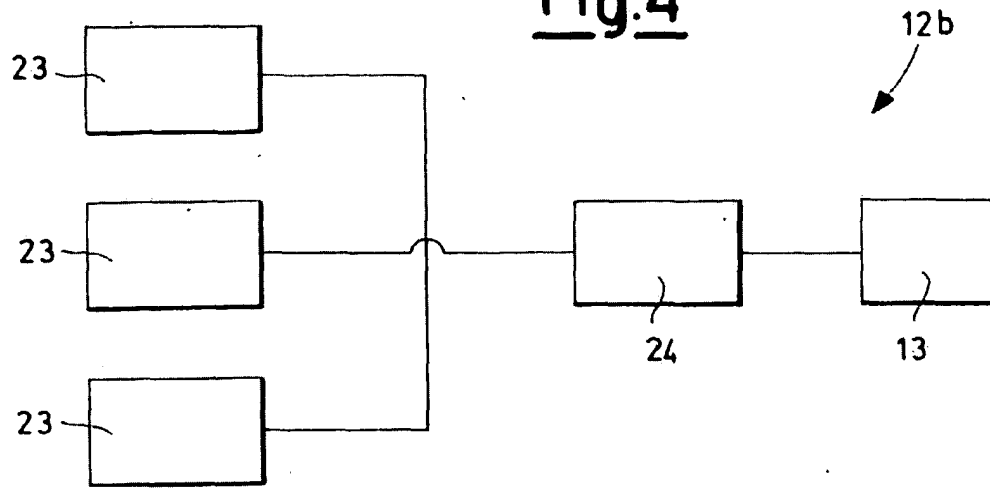
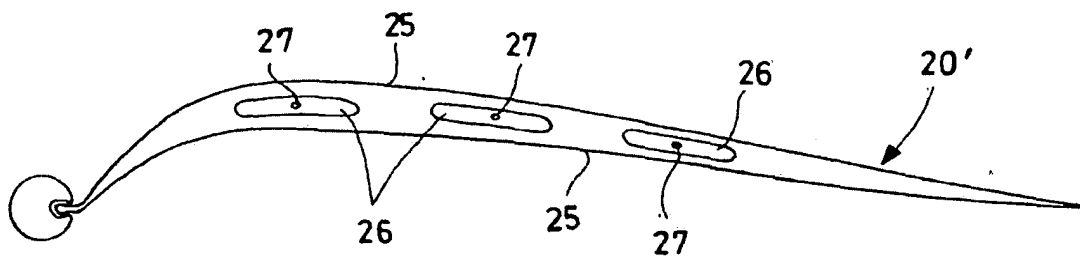


Fig.5





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EUROPEAN SEARCH REPORT

Application Number
EP 04 01 3336

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.7)
X	FR 2 741 588 A (DARDENNE BERNARD) 30 May 1997 (1997-05-30)	1,3-9	B63B43/00 B63B43/02 B63B43/10
Y	* page 4, line 5 - page 7, line 23; figures *	10,11	

X	FR 2 765 184 A (DISSOUBRAY PATRICK) 31 December 1998 (1998-12-31)	1,3-9	
Y	* the whole document *	10,11	

X	GB 933 360 A (BILL O BRIEN LTD) 8 August 1963 (1963-08-08)	1,2,6,7, 9	
	* claims 1-3; figures *		

X	US 3 016 860 A (JOHNSON ROBERT F) 16 January 1962 (1962-01-16)	1,3-7, 10,11	
	* column 2, line 55 - column 4, line 20; figures *		

X	US 5 255 624 A (LEGARE DAVID J) 26 October 1993 (1993-10-26)	1-3,6-8	
Y	* column 1, line 59 - column 2, line 51; figures *	10,11	TECHNICAL FIELDS SEARCHED (Int.Cl.7)

Y	US 4 753 186 A (PARAS RICARDO S) 28 June 1988 (1988-06-28)	10,11	B63B
	* the whole document *		

The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 4 August 2004	Examiner Moya, E
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
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 01 3336

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04-08-2004

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
FR 2741588	A	30-05-1997	FR	2741588 A1	30-05-1997
FR 2765184	A	31-12-1998	FR	2765184 A1	31-12-1998
GB 933360	A	08-08-1963	NONE		
US 3016860	A	16-01-1962	NONE		
US 5255624	A	26-10-1993	NONE		
US 4753186	A	28-06-1988	AU	603627 B2	22-11-1990
			AU	8220587 A	23-06-1988
			GB	2198699 A	22-06-1988

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