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(72) Inventors; and
(71) Applicants : **DE ROVER, Cornelis, Daniel** [NL/NL]; Hoogstraat 74, NL-2965 AM Nieuwpoort (NL). **VAN DER PAS, Jan** [NL/NL]; Gentspolder 3, NL-4617 MN Bergen Op Zoom (NL).

(74) Agent: **ROELANDS, Olaf, Siegfried**; Sweelinckplein 1, NL-2517 GK Den Haag (NL).

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(54) Title: YACHT WITH A TOP DECK HAVING A VARIABLE SURFACE AREA

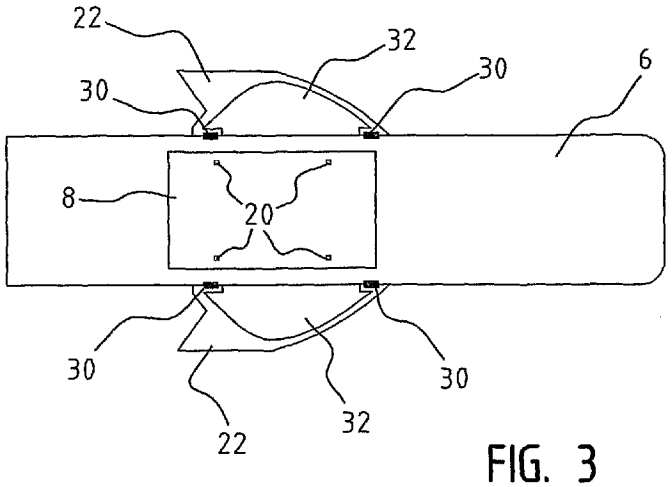

FIG. 3

(57) Abstract: The invention relates to a yacht with a hull and a superstructure protruding above the hull, wherein a top deck (6) which is open is provided on the upper side of the superstructure, and wherein the superstructure comprises one or more movable top deck panels (22) which can be connected to the surface of the top deck in order to enlarge the overall surface area, wherein the top deck panels are movable between an unused position and a position of use, wherein the top deck panels are provided at the sides of the top deck and can be connected in transverse direction of the yacht to the surface of the top deck, and wherein the top deck panels are movably coupled to the superstructure by means of a pivot connection (30).

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YACHT WITH A TOP DECK HAVING A VARIABLE SURFACE AREA

The invention relates to a yacht provided with a top deck of variable surface area.

In the yacht construction industry a structure of a yacht, in particular a motor yacht, is known wherein a superstructure consisting of one or more inner decks located one above another protrudes above the hull. An inner deck is for instance adapted for recreation and accommodation, and an inner deck for the steersman of the yacht. As additional outside space, an independent outer deck which is open can be provided on top of the superstructure. This outer deck is also referred to as sundeck or top deck. Such a top deck is also referred to as bridge fly-deck or flybridge.

In addition, a support construction on which navigation and other equipment is arranged is often present on the open top deck in motor yachts. This construction is referred to in the field as the mast. This mast consists of a vertical support carrying a horizontal mast board on which the navigation equipment is disposed. The mast board itself is often embodied such that it spans the width of the top deck and part of the length of the top deck. The mast board thus has a second function as sun awning. In a common design the mast is embodied on the basis of two upright panels on either side of the top tank on which the transverse mast board rests. This design is often referred to as a 'goal-port' mast. Such a design is particularly common for motor yachts with the length of 20 m or more.

For streamlining purposes and in order to manoeuvre the vessel, it is generally desirable when sailing with a yacht to limit the surface area of the top deck to the upper surface of the superstructure, so that the top deck does not protrude outside the contours of the superstructure. This is particularly desirable in situations where the space available for the vessel is limited, such as in berths, and at bridges or locks.

Conversely, the steersman may wish the top deck of the motor yacht to have a larger dimension at a berth with sufficient space or when travelling at lower speeds. In addition, it has been found that the upright panels of a goal port mast at the position of the top deck adversely affect the stability of the yacht because they catch a great deal of crosswind and, due to their weight at relative height, contribute toward an increase in the height of the centre of gravity of the yacht.

The invention has for its object to meet the above outlined general requirement, and moreover provide a solution to the stated drawbacks of the known designs of goal port masts. At the same time the invention may not detract from the design of the top deck and of the yacht in general.

The above stated object of the invention is achieved with a yacht according to the appended claims.

According to the first aspect, the invention relates for this purpose to a yacht, comprising a hull and a superstructure protruding above the hull, wherein a top deck which is open is provided on the upper side of the superstructure, characterized in that the superstructure comprises one or more movable top deck panels which can be connected to the surface of the top deck in order to enlarge the overall surface area, wherein the top deck panels are movable between an unused position and a position of use, wherein the top deck panels are provided at the sides of the top deck and can be connected in transverse direction of the yacht to the surface of the top deck, and wherein the top deck panels are movably coupled to the superstructure by means of a pivot connection. In the position of use the panels are in a position to enlarge the overall surface area, and in unused position the top deck panels do not have this function. The option is thus provided of enlarging the surface area of the top deck as desired.

Since a top deck has dimensions which are usually relatively narrow and long, it is advantageous to obtain a surface area enlargement in transverse direction. It is recommended here to

provide a top deck panel on both sides, most preferably in a symmetrical design. A panorama terrace or sky terrace is thus formed by the top deck panels in the position of use.

Owing to the pivot connection the panels can be easily folded in and out to respectively an unused position and a position of use. It is simple using the pivot connection to place the panels such that they connect to the top deck, i.e. at the position of this pivot connection.

The invention thus provides the user of the yacht with the option of enlarging the surface area of the top deck in transverse direction. The invention achieves this in an elegant manner, wherein because of the pivot connection the top deck panels are incorporated in the general design of the yacht. The top deck panels are in other words integrated into the design, wherein in the position of use and in unused position they form one whole with the superstructure.

In the case of strong crosswind it has moreover been found advantageous to position the top deck panels in the position of use, since the lateral surface area of the yacht is thus reduced, whereby the crosswind has less impact on the position of the yacht. Furthermore, the centre of gravity of the yacht is simultaneously decreased, this further contributing toward a more stable position during crosswind.

The advantage of an integrated design applies particularly in the case of a yacht wherein in unused position the top deck panels stand upward, and in the position of use the top deck panels are positioned in the plane of the top deck. This is because in upward standing position the top deck panels form one whole with the upward lines of the superstructure, this contributing toward the integrated design of the yacht.

In the yacht according to the invention the top deck is preferably provided with a mast comprising a support construction having a horizontal mast board thereon, wherein the movable top deck panels form a continuous unit with the mast when the top deck panels are in the unused position. Such a design

contributes in even greater measure toward the integrated design of the yacht.

Such a design makes it possible to have the top deck panels in the unused position blend visually with the mast, wherein the panels are incorporated in the streamlining and the general design of the yacht. The top deck panels thus appear as a part of the support construction, as if they are the upright panels on which the mast board rests. The mast board advantageously rests on a support construction of individual uprights which take a slender form, i.e. have a relatively small lateral surface area at a given length. Compared to the top deck panels, such uprights have a negligible effect on the centre of gravity of the yacht, or on the sensitivity to crosswind.

It is especially recommended that the yacht according to the invention comprises top deck panels which are provided with fixed enclosures disposed along the outer edge of the top deck panels. The fixed enclosures have the function of a railing preventing passengers from falling overboard. Such a fixed enclosure is easy to incorporate in the top deck panel, and is preferred to a detachable enclosure, which is less practical (separate components are easily lost; stowage space is required). The placing thereof moreover involves the risk of a fall for those arranging the enclosure.

The yacht according to the invention preferably comprises a pivot connection comprising a hydraulically or pneumatically driven lever for moving the pivot connection. Using such a construction sufficient force is generated to move such a deck panel (which can for instance weigh 1000 kg). Such an arm can moreover produce sufficient load-bearing capacity to hold the panel stably in the position of use while the panel is loaded by passengers present thereon.

The yacht according to the invention more preferably comprises a pivot connection comprising a motor drive for moving the pivot connection, which drive preferably comprises a gear transmission such as a worm with a worm wheel. With such a

construction sufficient force is also generated to move such a deck panel and enable stable holding thereof in the position of use. It is particularly recommended to apply a worm with worm wheel because this meets the set requirements extent.

In a subsequent preferred embodiment of the yacht according to the invention the top deck panel is provided with a stop which in the position of use lies against the superstructure. In order to achieve the load-bearing capacity required for the panel in the position of use, it can be advantageous to make such an additional provision, whereby an extra supporting surface is created, in addition to the load-bearing capacity provided by the pivot connection itself.

In the yacht according to the invention the mast board is more preferably displaceable in the longitudinal direction of the yacht. The mast board which spans a part of the top deck in longitudinal direction can thus be moved forward. The shading effect of the mast board is therefore displaceable in accordance with the wishes of the user.

The surface area which is freely accessible from above is moreover enlarged at the rear of the top deck. The top deck can thus be made suitable as a landing site for a helicopter. Displacing of the mast board moreover has the advantage that in the displaced situation it protects the rest of the yacht from downwash generated by a helicopter.

The mast board can for instance be connected slidably or rotatably to the support construction using means known to the skilled person.

In the yacht according to the invention the support construction is preferably movable between a starting position and a translation position. The support construction consists for instance of a system of rods, wherein at the bottom the rods are connected pivotally to the top deck and at the top are connected pivotally to the mast board. In starting position the mast stands in the usual position and in translation position

the mast board is moved forward, wherein it can also take up a lower position.

It is recommended that the support construction brings about a displacement in longitudinal direction of the yacht as well as a height displacement. When lowered, the wind-turning effect of the mast board is increased, this also being advantageous during landing and take-off of a helicopter.

This construction moreover allows the mast to drop downward as a whole so that the height of the yacht is reduced. This is highly advantageous for instance when passing under low bridges.

The combination of outward folding top deck panels with a mast board adjustable in height and longitudinal direction is highly advantageous, particularly for the purpose of reducing the height of the yacht.

The invention is further elucidated with reference to the accompanying figures, which show different preferred embodiments of the invention, and in which

Figure 1 is a side view of a yacht according to the invention;

Figure 2 shows in perspective and in detail the top deck with top deck panels in unused position;

Figure 3 is a top view of the top deck with top deck panels in position of use;

Figure 4 shows in perspective the top deck of figure 2, wherein the mast board is displaceable;

Figure 5 shows a partially cut-away side view of an embodiment of a pivot connection between the superstructure and a top deck panel;

Figure 6 shows a partially cut-away side view of an embodiment of a pivot connection between the superstructure and a top deck panel;

Figures 7A and 7B show in cross-section two embodiments of a pivot connection between the superstructure and a top deck panel.

Figure 1 shows a yacht 1 with a superstructure 2 protruding above hull 4, wherein a top deck 6 is present on superstructure

2 and has thereabove a mast board 8 on which is arranged navigation equipment 10 such as radar and antennas.

Figure 2 shows top deck 6 of figure 1 with a support construction consisting of uprights 20 supporting mast board 8. In unused position top deck panels 22 are disposed at the sides of the top deck. Panels 22 connect at the top to the mast board and connect at the bottom to the outer edge 24 of top deck 6. In the unused position the top deck panels 22 thus form a visual whole with the yacht and the mast, as also shown in figure 1.

Figure 3 shows top deck panels 22 in folded-out position of use. Panels 22 are connected via pivot connections 30 to top deck 6. Uprights 20 support mast board 8. Panels 22 are provided with a wooden floor 32 similar to the floor of top deck 6. In accordance with the proportions in the figure, a doubling of the width of top deck 6 is obtained at the position of panels 22. This moreover makes the sensation of space on the top deck considerably greater since the top deck is no longer purely elongate.

Figure 4 shows a top deck 6 wherein mast board 8 is displaced forward by making use of movable uprights 20 connected with a pivot construction 40 to the top deck. Uprights 20 are connected to mast board 8 with a pivot construction 42. A helicopter 46 is shown at the rear of top deck 6 in order to illustrate that the top deck is suitable as landing place. In the figure the top deck panels stand upright, but can if desired also be folded out as according to figure 3. This further increases the space for a helicopter. The mast board 8 situated in the foremost position in figure 4 is clearly lowered in height relative to the original position. This lowering has the consequence of enhancing the function as wind-break for the top deck.

Figure 5 shows a top deck panel 22 which is arranged on the outer side of superstructure 2 and which protrudes partially above the outer edge or railing 24 of the top deck. On either side of panel 22 a motor 50 driving a rotation shaft 52 is built into and fixed in superstructure 2. The rotation shaft is built into panel 22 and connected fixedly thereto. Motor 50 is thus

able to move panel 22 between the shown unused position and the position of use (shown in figure 3).

Figure 6 shows an alternative pivot connection relative to figure 5. The pivot connection is constructed from a hydraulic cylinder 60 connected movably to a lever 62 which is connected movably to a rotation shaft 64. Cylinder 60 is fixedly connected to superstructure 2 and the rotation shaft is fixedly connected to panel 22. Panel 22 can thus be moved between the shown unused position and the position of use (shown in figure 3).

Figure 7A shows in cross-section an embodiment of a pivot connection according to figure 6, with like numbered components. As addition to figure 6, there is provided as component of panel 22 a stop 70 which, when tilted to the right to a folded-out horizontal position, enters cavity 72 in superstructure 2. In the folded-out end position the stop lies against superstructure 2, against the upper side 75 of cavity 72. Also shown is an upright edge 74 which bounds the outer edge of panel 22.

Figure 7B shows a cross-section similar to figure 7A, wherein the stop and corresponding cavity are omitted. Sufficient load-bearing capacity is provided here by the pivot connection itself and the end surface 76 of the panel, which in the folded-out position supports against the superstructure.

Claims

1. Yacht, comprising a hull and a superstructure protruding above the hull, wherein a top deck which is open is provided on the upper side of the superstructure, characterized in that the superstructure comprises one or more movable top deck panels which can be connected to the surface of the top deck in order to enlarge the overall surface area, wherein the top deck panels are movable between an unused position and a position of use, wherein the top deck panels are provided at the sides of the top deck and can be connected in transverse direction of the yacht to the surface of the top deck, and wherein the top deck panels are movably coupled to the superstructure by means of a pivot connection.

2. Yacht as claimed in claim 1, wherein in unused position the top deck panels stand upward, and in the position of use the top deck panels are positioned in the plane of the top deck.

3. Yacht as claimed in any of the foregoing claims, wherein the top deck is provided with a mast comprising a support construction having a horizontal mast board thereon, wherein the movable top deck panels form a continuous unit with the mast when the top deck panels are in the unused position.

4. Yacht as claimed in any of the foregoing claims, wherein the top deck panels are provided with fixed enclosures disposed along the outer edge of the top deck panels.

5. Yacht as claimed in any of the foregoing claims, wherein the pivot connection comprises a hydraulically or pneumatically driven lever for moving the pivot connection.

6. Yacht as claimed in any of the foregoing claims, wherein the pivot connection comprises a motor drive for moving the pivot

connection, which drive preferably comprises a gear transmission such as a worm with a worm wheel.

7. Yacht as claimed in any of the foregoing claims, wherein the top deck panel is provided with a stop which in the position of use lies against the superstructure.

8. Yacht as claimed in any of the claims 3-7, wherein the mast board is displaceable in the longitudinal direction of the yacht.

9. Yacht as claimed in claim 8, wherein the support construction is movable between a starting position and a translation position.

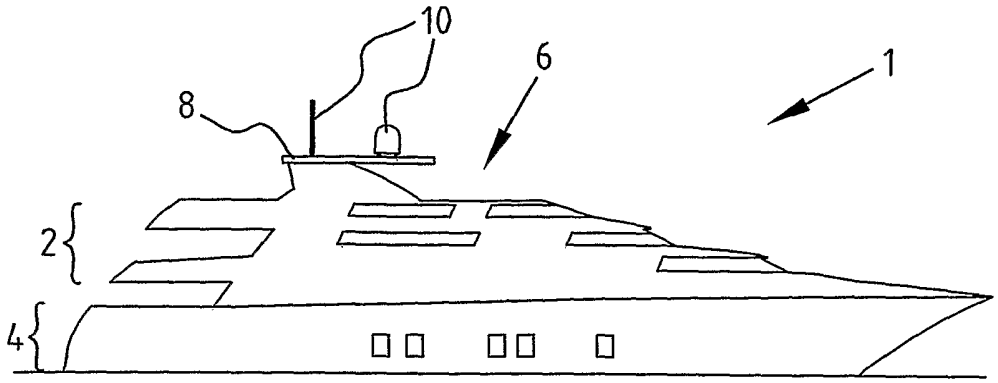

FIG. 1

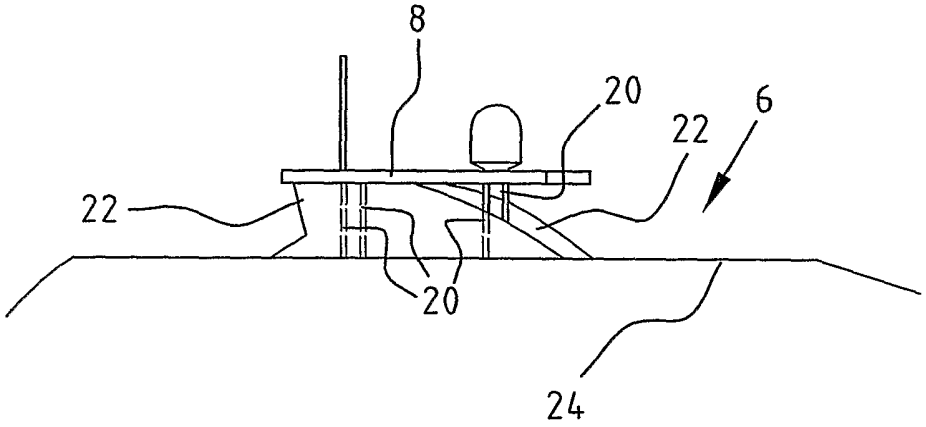

FIG. 2

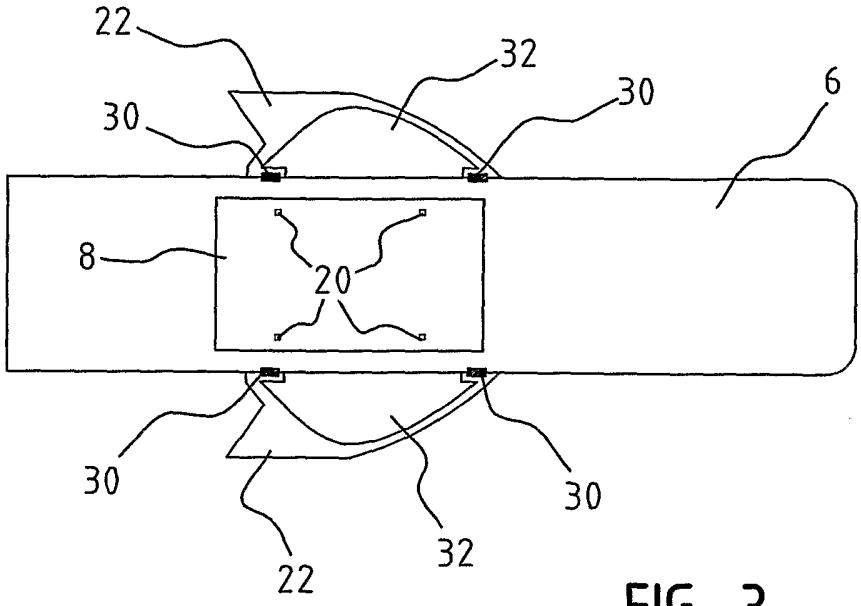

FIG. 3

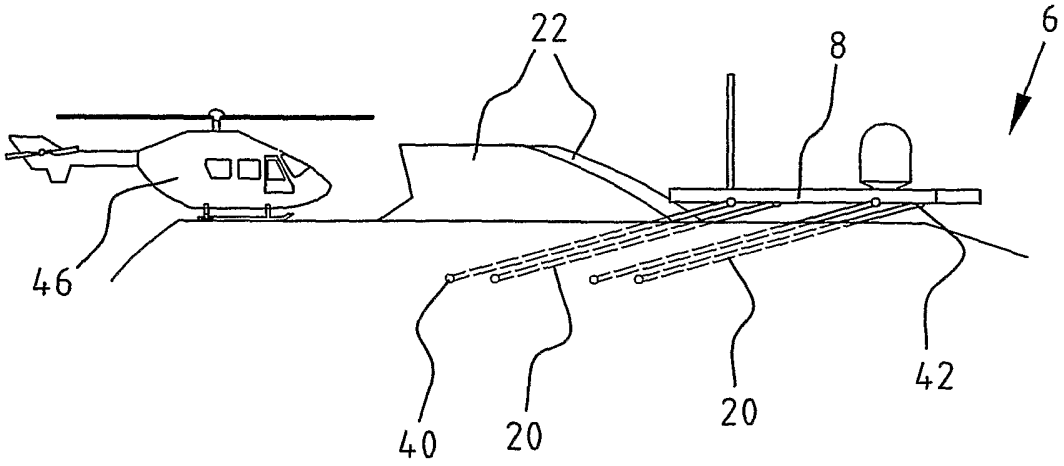

FIG. 4

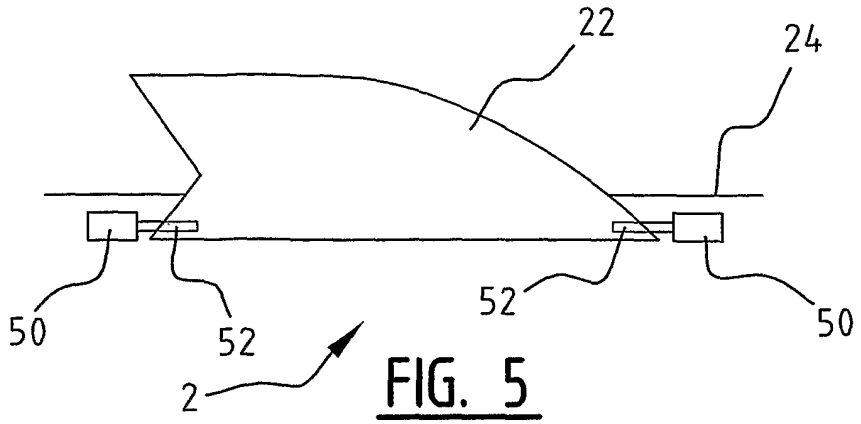

FIG. 5

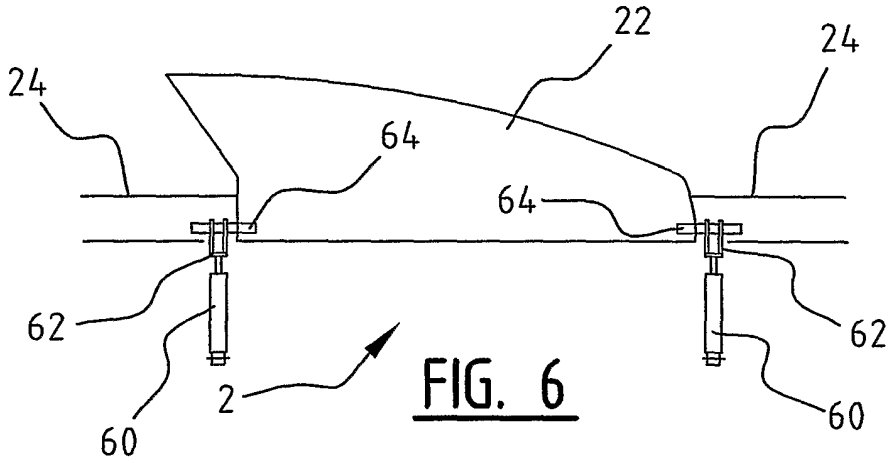

FIG. 6

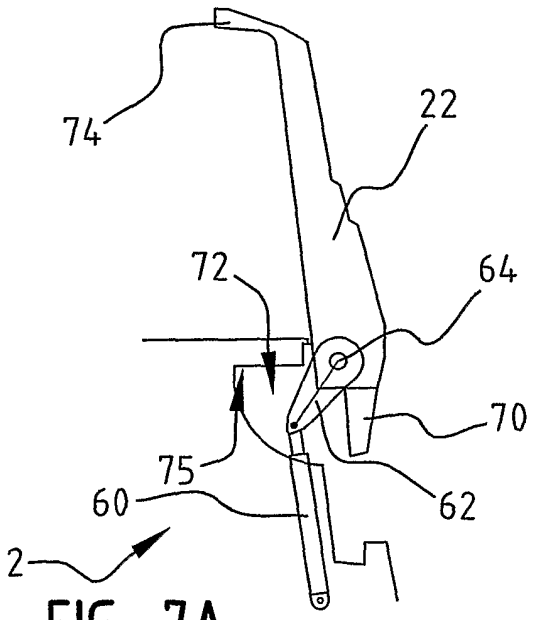

FIG. 7A

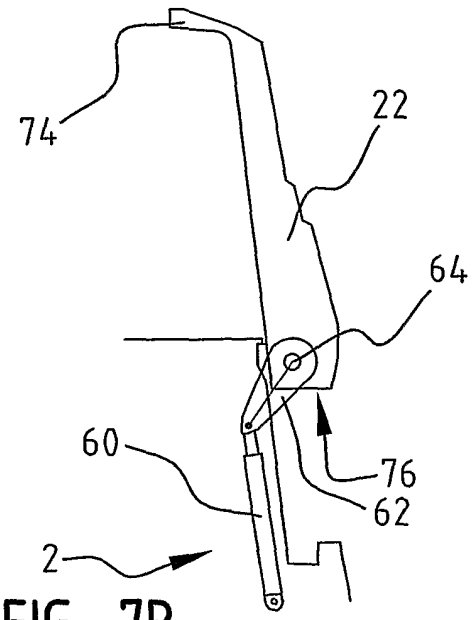

FIG. 7B

INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2010/000145

A. CLASSIFICATION OF SUBJECT MATTER
INV. B63B3/48
ADD.

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)
B63B

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 practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 3 662 412 A (HAWKINS ROBERT D) 16 May 1972 (1972-05-16) the whole document	1-9
Y	FR 2 629 785 A1 (RAISIN FRANCIS [FR]; GOUHIER EDOUARD [FR]) 13 October 1989 (1989-10-13) the whole document	1-9
A	US 3 325 836 A (LANKFORD JR EUGENE) 20 June 1967 (1967-06-20) the whole document	1-9
A	US 3 475 773 A (CODMAN DANIEL S JR) 4 November 1969 (1969-11-04) the whole document	1

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[X] Further documents are listed in the continuation of Box C.

[X] 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

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"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

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
24 January 2011	31/01/2011

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	De Sena Hernandorena

INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2010/000145

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 4 803 940 A (EBELING JAAKKO [FI] ET AL) 14 February 1989 (1989-02-14) the whole document	1
A	US 2009/178605 A1 (TUFTE BRIAN N [US]) 16 July 2009 (2009-07-16) paragraph [0119]; figures 7a-7c paragraph [0131]	1,3
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A	US 4 085 473 A (FRANKLIN DWAINE R) 25 April 1978 (1978-04-25) the whole document	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/NL2010/000145

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☒ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-6

   A yatch with a superstructure and a laterally extendable deck.

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2. claims: 7-10

   A yatch with a supporting deck that can be shifted in the longitudinal direction within the outside perimeter of the superstructure.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/NL2010/000145

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