

DESCRIPTION**Ship for long period station keeping at sea, in
particular drillship"**Field of application

5 [0001] The present invention relates to a ship for long period stationing at sea.

[0002] In particular the ship according to the present invention may be a drillship. Such drillship is destined to operate, in particular, in deep waters (over 450m) and
10 ultra deep waters (over 1,500m) for localising, exploring and exploiting deposits of hydrocarbons or other energy and mineral resources.

[0003] The ship which the present invention relates to may be made in particular as a pipe-laying ship, a cable-laying ship, a wind-farm ship, a oceanographic research
15 ship, a seismographic prospecting ship, an offshore production ship (FPSO), a floating industrial processing ship (for preparing and canning fish) or any other type of ship which must station in the same position at sea
20 for long periods to perform its operations.

State of the art

[0004] The term "ship for long period stationing at sea" is understood to mean a ship for which almost all the useful life is spent maintaining the same position in the sea,
25 with movements from one place to another limited to a

minimum.

[0005] A typical example is drillships. This is a class of offshore units specialised in drilling underwater oil wells at over 3000 m deep in the sea bed. These are
5 characterised by a derrick, normally installed halfway along the ship, which suspends the drill strings and manoeuvres them through an aperture in the hull known in the jargon as "moonpool". These units typically operate to locate and prepare oil wells for future use by other
10 offshore units specialised in the production of natural gas and crude oil. Consequently almost the entire life of these ships is spent maintaining the same vertical position over the well head and movements from one place to another are limited to a minimum.

15 [0006] The commercial value of a shipping unit for long period stationing at sea is established in particular by its seaworthiness since a naval unit subject to limited movements and accelerations makes it possible to reduce the number of days wasted due to swell, to a minimum.
20 This is particularly relevant to drillships.

[0007] To tackle and optimise the requirement to dampen ship movements, naval designers adopt a series of technical expedients, ranging from the shape of the hull with a symmetrical distribution of volumes at bow and
25 stern as far as stabiliser fins.

[0008] Generally, the hydrodynamic shapes of the ship hulls are typically directed at optimising propulsion to achieve the maximum speed at the lowest propulsion power.

[0009] Diversely, for ships designed to spend prolonged
5 periods stationary in the sea the most advantageous feature is that of maximising seaworthiness by minimising rolling, pitching and heaving motions while operating at a standstill in the midst of the sea.

[0010] The shapes of hull fulfilling such purpose differ
10 greatly from those optimised for speed performance, proving stockier and, in particular, symmetrical in the shape of the bow and stern as far as possible. Such symmetry permits a reduction of the vertical thrusts and a more even transit of the wave over the hull.

[0011] Moreover, the transversal cross-sections generally
15 have a V-cross-section so as to reduce to a minimum the risk of slamming, that is to say the violent slamming caused by the waves on the flat, sub-horizontal areas of the flared shape of the bow and flat stern bottom typical
20 of fast ships.

[0012] The degrees of freedom, movements of the ship, extend over 6 degrees of freedom: three are linear (translation, drift, heave) and three angular (yaw, roll, pitch). When designing the ship, ship designers focus on
25 all these movements with an eye to keeping them under

control and accentuating, with particular expedients, intervention on the movements which are particularly troublesome to the specific operations of the unit.

[0013] For example in drillships the positioning of the
5 bores at the center of buoyancy (through which the rotation axis which the pitching movement develops around passes) makes it possible to minimise the vertical component due to the pitching rotation.

[0014] Active or passive systems may be adopted to reduce
10 the rolling movement which are more or less effective and expensive.

[0015] For example some ships are provided with a ballast water tanks positioned on the side platings. The ballast water moves from one side plating to the other by means
15 of an active pump which synchronises the movement of the water in an asynchronous manner with that of the ship.

[0016] This dampening of the roll can also be achieved with the more costly retractable stabilizer fins fitted mainly on fast, commercially rich ships. Stabilizer fins exploit
20 the dynamic lift force caused by the pressure of the water incident on a fin suitably inclined in relation to the flow. When the ship is still they have practically no effect.

[0017] On drillships it is customary to dampen the roll
25 with stabiliser fins inasmuch as economical and passive.

Their efficacy is limited to dissipating energy by creating whirling while the ship is rolling.

[0018] All the aforementioned systems combine characteristics of efficiency with limitations of the results which can be achieved as a result of the physical constraints dictated by dimensions and costs of the expedient adopted. For example, in order to have acceptable dimensions, the retractable stabiliser fins do not work at speeds of less than approximately 15 knots.

10 The stabiliser fins give their maximum contribution if fitted at the maximum width of the ship (maximum arm) and their wet surface negatively influences the ship speed.

[0019] Up to today devices enabling a specific dampening of the pitching and heaving movements have not been proposed.

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Presentation of the invention

[0020] Consequently, the purpose of the present invention is to eliminate the drawbacks of the prior art mentioned above, by making available a ship for long period stationing at sea, which has an improved response in terms of dampening the pitching and heaving motions thus offering greater seaworthiness in the stationing phase.

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[0021] A further purpose of the present invention is to make available a ship for long period stationing at sea which has an improved response in terms of dampening the

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pitching and heaving motions thus offering greater seaworthiness in the stationing phase by means of economically not expensive devices.

[0022] A further purpose of the present invention is to
5 make available a ship for long period stationing at sea which overall is not more expensive to build than the current ship for long period stationing at sea.

Brief description of the drawings

[0023] The technical characteristics of the invention,
10 according to the aforesaid purposes, can be seen clearly from the contents of the following claims and the advantages of the same will be more clearly comprehensible from the detailed description below, made with reference to the attached drawings, showing one or
15 more embodiments by way of non-limiting examples, wherein:

[0024] - Figure 1 shows a perspective view from the bow of a particular embodiment of a ship according to the invention, used as a drillship;

20 [0025] - Figure 2 is a side view of the ship shown in Figure 1;

[0026] - Figure 3 shows the construction plan of the ship in figure 1, according to a side view of the fore area;

[0027] - Figure 4 shows the construction plan of the ship
25 in figure 1, according to a perspective view from the

bottom;

[0028] - Figure 5 shows the construction plan of the ship in figure 1, according to a bow frontal view;

[0029] - Figure 6 is a side view only of the hull of the ship in Figure 1;

[0030] - Figure 6 is a side view only of the hull of the ship in Figure 1;

[0031] - - Figure 7 is a side view only of the hull of the ship according to an alternative embodiment of the invention;

[0032] - Figure 8 shows the construction plan of the ship in figure 7, according to a side view;

[0033] - Figure 9 is a perspective schematic view from above of the hull in Figure 7; and

[0034] - Figure 10 shows a detailed transversal cross-section view of the inner structure of the hull of the fore area of a ship according to a particular embodiment of the present invention.

Detailed description

[0035] With reference to the appended drawings, reference numeral 1 globally denotes a ship for long period stationing at sea according to the invention.

[0036] In particular as shown in Figures 1 and 2, a ship 1 according to the invention may be used as a drillship and thus be provided, in particular, with a vertical derrick

100 and an opening in the hull 110 (in jargon "moonpool" made on the vertical of the derrick.

[0037] Here and henceforth in the description and the claims, reference will be made in addition to the ship 1
5 in conditions of use. References to an upper or lower position or horizontal or vertical direction should therefore be understood in this sense.

[0038] According to a general embodiment of the invention, the ship for long period stationing at sea 1 comprises a
10 hull 2 which extends along a longitudinal axis X between a bow 3 and a stern 4.

[0039] As may be observed in the appended drawings, the hull 2 comprises at least one protuberance 10 having a flattened shape which forms a shelf extending from the
15 hull in the direction of the width of the ship.

[0040] The protuberance 10 is positioned at the bow and extends in a longitudinal direction astride the bow of the ship 1 towards the midship, at least partially encompassing the fore part of the hull on both sides 5
20 and 6 with two separate branches 10a and 10b.

[0041] In particular as shown in the appended drawings, the protuberance 10 is positioned astride the stem 31.

[0042] As shown in particular in Figures 2, 6 and 7, the protuberance 10 is positioned in relation to the hull 2
25 so as to always be below the waterline B of the ship.

[0043] Functionally, the protuberance 10 poses a resistance to the movements in vertical direction of the ship 1 generated by the swell, in this case dampening the pitching and heaving motions.

5 [0044] The dynamic dampening effect is generally obtained in a fluid by making a body move in the viscous fluid and producing, by suitable shaping, as many vortexes as possible. The vortexes are the real cause of dissipation of the energy, transforming the kinetic energy of
10 movement in thermal energy exchangeable with the viscous fluid.

[0045] The movements of the ship in the 6 degrees of freedom are caused by the wave perturbation of the surface of the sea which transfers energy to the immersed
15 body in a dynamic manner and creates imbalances of hydrostatic thrust in relation to a perfectly even surface. The transfer of dynamic energy is due to the impact of the molecules of water which move along circular trajectories inside the wave profile.

20 [0046] Since the circular trajectories of the molecules of water are characterised by decreasing diameters as the depth of immersion increases, the wave profile also proves progressively reduced with the increase in immersion until it is annulled at a certain distance from
25 the open surface of the sea.

[0047] The protuberance 10 must operate in this zone, at the maximum possible distance from the open surface of the sea, so as not to be subject to rotatory movements of great breadth on the surfaces (visually perceptible waves).

[0048] Preferably, the highest part of the protuberance 10 is at not less than 5 metres below the waterline B of the ship.

[0049] Operatively, while the ship is pushed to move by the surface perturbation acting on the portion of volume of the hull alternately wet or exposed to the air, the protuberance 10 dissipates energy in relatively still water, moving vertically.

[0050] From a functional point of view, the flattened protuberance 10 may thus be considered a passive expedient for dampening the pitching and heaving moitions.

[0051] Advantageously, in addition to the protuberance 10, the ship 1 may be provided with other expedients, passive or active, for dampening the ship motions, known in the state of the art. In particular, the ship 1 may be provided with stabiliser fins, as shown in Figure 1, where they are denoted by reference numeral 120. Such fins 120 are preferably positioned in the midship part of the hull, in particular in the section of cylindrical

body, if present.

[0052] It should be noted in this context that the flattened protuberance 10 according to the present invention has a conformation and hydrodynamic functioning
5 entirely different from the traditional hydrodynamic bulbs.

[0053] In brief, the traditional hydrodynamic bulb acts on the wave formation of a ship moving at a considerable speed reducing the resistance to advancement. For such
10 reason the traditional bulb has a shape which is profiled, with a very limited longitudinal extension and must lap the surface of the sea.

[0054] The resistance to advancement of a ship may be divided theoretically into two main components:

15 [0055] -A) the viscous component which takes into consideration the friction forces developed by the flowing of the fluid on the wet surface of the ship's bottom, and thus depends exclusively on the speed to the second power and on the effective extension of the wet
20 surface.

[0056] - B) the pressure component caused by the formation of waves on the surface separating the water and the atmosphere. Since the hydrostatic pressure of the atmosphere is constant, the wave ripples reflect the
25 pressure field surrounding the ship's bottom in its

forward movement; the field depends mainly on the speed and distribution of volumes of the ship's bottom.

[0057] Normally at low speeds in relation to the length of the ship, viscous resistance prevails, while as the speed
5 of advancement increases, despite the viscous resistance increasing quadratically, the pressure resistance due to the formation of waves, which grows exponentially to a cubic or even higher power, prevails.

[0058] The hydrodynamic bow bulb (introduced at a
10 widespread level in the mid - 1900 s) aims to contrast wave resistance. The functioning of a traditional hydrodynamic bulb is based on its capacity to create a wave perturbation in counter-phase with the wave created by the ship's bottom at the bow of the ship. For every
15 ship and every given speed there is an optimised bulb which is individually designed in a test tank acting on its shape characteristics such as length , profile, distribution of volumes in a longitudinal and vertical direction. A traditional hydrodynamic bulb must be
20 completely submerged, but diversely from the protuberance 10 must be able to lap the surface of the sea to create an efficacious wave perturbation.

[0059] Conversely, the protuberance 10 according to the present invention has a flattened shape and presents a
25 considerable extension in a longitudinal direction

astride the bow or stern end of the ship 1, encompassing at least partially the fore part of the hull on both sides 5 and 6. Moreover, as already said and as illustrated in particular in Figures 2, 6 and 7, the protuberance 10 is positioned in relation to the hull 2 so as to always be below the waterline B of the ship 1.

[0060] According to an embodiment not illustrated in the appended Figures, the protuberance 10 may be positioned at the stern rather than at the bow. In this case the 10 protuberance extends in a longitudinal direction astride the stern end of the ship, encompassing at least partially the aft part of the hull on both sides. This solution is not preferred inasmuch as requiring significant modifications in the positioning of the propulsion systems. This construction limit is not 15 however present in the embodiment which provides for the protuberance only in the fore part, as illustrated in the appended drawings.

[0061] According to the embodiment illustrated in Figures 20 7, 8 and 9, the ship may comprise a first protuberance 10' at the bow and a second protuberance 10'' at the stern. This may make it possible to further increase the seaworthiness of the ship 1 compared to the solutions with the protuberance at the bow or stern only.

25 [0062] Preferably, as shown in Figures 7, 8 and 9, the

first 10' and the second protuberance 10'' are identical. Even more preferably the ship 1 has a hull with a ship's bottom shapes having a symmetrical distribution of volumes at bow and stern

5 [0063] According to the embodiments illustrated in the appended Figures, the protuberance 10 defines a top surface 11, which is substantially facing upwards, in other words in conditions of use faces towards the surface of the sea. In particular, such top surface 11
10 may be at least partially flat.

[0064] According to the embodiments illustrated in the appended Figures, the protuberance 10 defines a bottom surface 12, which is substantially facing downwards, in other words in conditions of use faces towards the sea
15 bed. In particular, such bottom surface 12 may be at least partially flat.

[0065] Functionally, such two surfaces, top 11 and bottom 12 oppose the movements in a vertical direction of the ship 1 generated by the swell, in this case dampening the
20 pitching and heaving movements.

[0066] Preferably, as shown in particular in Figure 3, the protuberance 10 has a rounded surface 13 which connects the top surface 11 to the bottom surface 12.

[0067] In particular the bottom surface 12 of the
25 protuberance 10 connects to the bottom 8 of the ship.

[0068] Preferably, the bottom 8 of the ship 1 is flat, as shown in Figures 2, 4, 5, 7 and 8. In this case, preferably, the bottom surface 12 of the protuberance 10 connects to the bottom 8 of the ship.

5 [0069] In particular, each branch of the protuberance 10 has a predefined height H comprised between the top surface 11 and the bottom surface 12.

[0070] The height H of the protuberance 10 at both branches 10a and 10b may vary along the longitudinal extension of
10 the protuberance. In particular, the height H of the protuberance 10 increases as it moves towards the bow or stern end as shown in Figure 3.

[0071] In particular each branch 10a and 10b of the protuberance 10 has a predefined width W in the direction
15 of the width of the ship 1. By width of the individual branch (or of the shelf) the distance between the outermost rim of the protuberance in the width direction of the ship and the point where it connects to the hull is meant, as shown in Figure 5.

20 [0072] Such width W may vary along the longitudinal extension of each branch of the protuberance. In particular, the width W increases as it moves towards the bow or stern end.

[0073] Functionally, the greater the extension of the top
25 surface 11 and of the corresponding bottom surface 12 of

the protuberance 10, that is of the surface which mainly contributes to opposing vertical movements, the greater the dampening effect of the vertical movements. In this sense, it is preferable that the protuberance 10 in the two branches 10a and 10b is particularly extensive both in a longitudinal and transversal direction.

[0074] Preferably, the protuberance 10 extends symmetrically in relation to the longitudinal axis X of the ship 1. The two branches of the protuberance are therefore symmetrical to the longitudinal extension axis X of the ship 1. In particular, the two branches thus have the same shape, the same thicknesses S and the same widths in relation to the transversal cross-section planes, orthogonal to such longitudinal axis X.

[0075] As shown in Figures 1, 4 and 5, the two branches 10a and 10b of the protuberance 10 connects to each other at the centreline M of the ship 1 at the bow or stern.

[0076] Preferably, as shown in particular in Figures 2, 3, 7 and 8, the two branches 10a and 10b of the protuberance 10 project at least in relation to the base of the stem or of the stern-post. This way the shelf formed by the protuberance 10 not only extends along the sides, but frontally and rearwards of the ship, increasing the dampening effect of the vertical movements.

[0077] The profile of the bow or stern may start from the

top surface 11 of the protuberance with inclinations which can be varied depending on the various needs dictated by the specific application. In particular the stem may have various conformations and patterns. The
5 stem may even be vertical and in particular pass through the bow end of the protuberance, where the two branches connect to each other. In this case the shelf formed by the protuberance is divided into two separate parts and the protuberance does not project in relation to the
10 stem, with reduction of the surfaces opposing the vertical movements. An analogous situation may also occur at stern, if a protuberance 10 is provided there.

[0078] Advantageously, the protuberance 10 has a maximum longitudinal extension which does not exceed the point of
15 maximum length of the ship at bow or at stern to prevent dangerous protrusions beyond the ship's main dimensions.

[0079] In particular as shown in Figures 6 and 8, the hull 2 comprises centrally a section of cylindrical body 9, at which the ship 1 has its maximum extension in width.
20 Preferably, the two branches 10a and 10b of the single protuberance 10 extend in a longitudinal direction towards midship at least as far as such section of cylindrical body 9.

[0080] In particular as shown in Figure 5, each branch 10a
25 and 10b of the protuberance 10 connects to the section of

cylindrical body 9. In this case, the width W of each branch progressively decreases in a longitudinal direction from bow/stern to midship, as the width of the ship increases in the fore/aft area, as far as
5 disappearing at the point of the section of cylindrical body 9.

[0081] According to embodiments not illustrated, the protuberance 10 may not necessarily connect to the section of cylindrical body and thus also project in
10 relation thereto, therefore beyond the maximum width of the ship.

[0082] In particular as shown in Figure 10, (where the baseline of the ship is indicated as B.L.) the ship 1 may comprise a double bottom 14. Preferably, the protuberance
15 10 is structurally connected and integrated with the double bottom 14 as shown for example in Figure 10.

[0083] By way of example, a description of a particular embodiment of the protuberance with reference to the hull of a ship according to the invention will now be
20 provided, having the following dimensions: maximum length approximately 210 m, maximum width approximately 40 m, maximum immersion approximately 11 m. the protuberance 10 is positioned in relation to the hull in such a way that the highest part of said protuberance (i.e. the top
25 surface) is at 7-8 m below the waterline B.

[0084] The total length of the ship, from bow to stern, is divided into 20 equal parts numbered from 0 (stern end) to 20 (bow end). Considering the overall dimensions in width from one branch to the other (along a transversal cross-section plane), the protuberance 10 has the following overall relative extension values in width, indicated as WT in relation to the width of the ship: at division 13 (fore end of the cylindrical body) at full ship width, at division 15 the WT width is approximately 90%, at division 17 approximately 75%, at division 19 approximately 40%, at division 19 approximately 30%, and at 20 it becomes 0% coinciding with the ship's centreline.

[0085] Continuing with the example given above the protuberance has a height H also varying along its longitudinal extension: starting from the stern, at division 13, at the same height as the double bottom (protuberance/hull intersection line) and increasing towards the bow in a practically linear manner as far reaching about one and a half times the starting height at division 20.

[0086] If one considers the transversal cross-section, the protuberance has a flat bottom area from which a curved line starts at zero ceiling and which extends in a parabolic shape to be incident at the top on the surface

of the hull with a sub-horizontal ceiling, as shown in Figure 5.

[0087] Still remaining in the specific example give above, in absolute values the protuberance 10 has in particular
5 the following dimensions:

[0088] - longitudinal extension of the single branch approximately 70 m;

[0089] - extension in height H of the single branch: starting from a minimum height of 2 m at division 13 to
10 reach the maximum height of 3 m at division 20;

[0090] - extension in width W of the single branch (width of the shelf or of the single branch is taken to mean the distance between the outermost rim of the protuberance in the width direction of the ship and the point where it
15 connects to the hull): at division 13 (fore end of the cylindrical body) at full ship width, it is 0 metres since it does not exceed the maximum ship width; at division 15 it is approximately 0.8 m; at division 17 it is approximately 1.7 m; at division 19 it is
20 approximately 4 m; at division 19 it is approximately 5 m; at division 20 it is approximately 0 m, coinciding with the ship centreline.

[0091] Remaining in the specific example described above, considering the overall dimensions in width from one
25 branch to the other (along a transversal cross-section

plane), the protuberance has the following overall extension in width, indicated as WT in Figure 5: at division 13 (fore end of the cylindrical body) at full ship width, about 40 m; at division 15 approximately 36
5 m; at division 17 approximately 30 m; at division 19 approximately 16 m; at division 19 approximately 12 m; at 20, 0 m, coinciding with the ship centreline.

[0092] The invention permits many advantages to be obtained, some of which already pointed out above.

10 [0093] The ship for long period stationing at sea according to the invention has an improved dynamic response in terms of dampening the pitching and heaving movements thus offering greater seaworthiness in the stationing phase. This is essentially related to the fact that it is
15 provided with an expedient for dampening the ship movements specifically designed for dampening the pitching and heaving motions.

[0094] The pitching and heaving dampening device, (i.e. the protuberance 10) which the ship 1 is fitted with, is
20 economically inexpensive in that it does not require particular and complex construction expedients. The fact that this is a passive dampening expedient is to be emphasised in that it does not require adjustment and control devices. The ship for long period stationing at
25 sea according to the invention thus offers an improved

dynamic response in terms of dampening the pitching and heaving motions with economically inexpensive or constructionally simple devices.

[0095] The ship 1 according to the invention offers an improved dynamic response in terms of dampening the pitching and heaving movements without being constructionally more expensive than the current ships for long period stationing at sea.

[0096] The invention thus conceived thereby achieves the intended objectives.

[0097] Obviously, its practical embodiments may assume forms and configurations different from those described while remaining within the sphere of protection of the invention.

[0098] Furthermore, all the parts may be replaced with technically equivalent parts and the dimensions, shapes and materials used may be varied as required.

claims

1. Ship for long period stationing at sea, comprising a hull (2) which extends along a longitudinal axis (X) between a bow (3) and a stern (4), characterised by the
5 fact that the hull (2) comprises at least one protuberance (10) having a flattened shape which forms a shelf extending from the hull in the direction of the width of the ship, said protuberance being positioned at the bow or at the stern and extending in a longitudinal
10 direction astride the bow or stern of the ship (1) towards the midship, at least partially encompassing the fore or aft part of the hull on both sides (5 , 6) with two separate branches (10a, 10b), said protuberance (10) being positioned in relation to the hull (2) so as to
15 always be below the waterline (B) of the ship and posing resistance to the movements in vertical direction of the ship (1) at sea generated by the swell, thus dampening the pitching and heaving movements, wherein said ship comprises a first protuberance (10') at the bow and a
20 second protuberance (10'') at the stern.

2. Ship according to claim 1, wherein the highest part of the protuberance (10) is at not less than 5 metres below the waterline (B) of the ship.

3. Ship according to claim 1 or 2, wherein said
25 protuberance (10) defines a top surface (11), which is

substantially facing upwards.

4. Ship according to claim 1, 2 or 3, wherein said protuberance (10) defines a bottom surface (12), which is substantially facing downwards.

5 5. Ship according to claims 3 and 4, the protuberance (10) has a rounded surface (13) which connects the top surface (11) to the bottom surface (12).

6. Ship according to claim 4 or 5, the bottom surface (12) of the protuberance 10 connects to the bottom (8) of
10 the ship.

7. Ship according to one or more of the previous claims, wherein the bottom (8) of the ship (1) is flat.

8. Ship according to claims 6 and 7, wherein the bottom surface (12) of the protuberance (10) connects to the
15 flat bottom (8) of the ship without steps.

9. Ship according to claims 3 and 4, wherein the protuberance (10) has a predefined height (H) comprised between the top surface (11) and the bottom surface (12).

10. Ship according to claim 9, wherein the height (H) of
20 the protuberance (10) may vary along the longitudinal extension of the protuberance.

11. Ship according to claim 9 or 10, wherein the height (H) of the protuberance (10) increases as it moves towards the bow or stern end.

25 12. Ship according to one or more of the previous

claims, wherein the protuberance (10) is positioned astride the stem.

13. Ship according to one or more of the previous claims, wherein each branch (10a, 10b) of the
5 protuberance (10) has a predefined width (W) in the direction of the width of the ship (1).

14. Ship according to claim 13, wherein said width (W) may vary along the longitudinal extension of each branch of the protuberance.

10 15. Ship according to claim 13 or 14, wherein said width (W) increases as it moves towards the bow or stern end.

16. Ship according to one or more of the previous claims, wherein the two branches (10a, 10b) of the protuberance (10) connect to each other at bow or stern
15 at the centreline of the ship (1).

17. Ship according to claim 16, wherein the two branches (10a, 10b) of the protuberance (10) project at least in relation to the base of the stem or of the stern-post.

18. Ship according to one or more of the previous
20 claims, wherein the protuberance (10) has a maximum longitudinal extension which does not exceed the point of maximum length of the ship at bow or at stern.

19. Ship according to one or more of the previous claims, wherein the hull (2) comprises centrally a
25 section of cylindrical body (9), at which the ship (1)

has its maximum extension in width.

20. Ship according to claim 19, wherein the two branches (10a, 10b) of the protuberance (10) extend in a longitudinal direction as far as said section of
5 cylindrical body (9).

21. Ship according to claim 20, each branch (10a,10b) of the protuberance (10) connects to the cylindrical cross-section body (9).

22. Ship according to one or more of the previous
10 claims, comprising a double bottom (14), the protuberance (10) being connected to said double bottom (14).

23. Ship according to one or more of the previous claims, wherein the protuberance (10) extends symmetrically in relation to the longitudinal axis (X) of
15 the ship (1).

24. Ship according to one or more of the previous claims, wherein said first (10') and said second protuberance (10'') are identical.

25. Ship according to one or more of the previous
20 claims, characterised by the fact of being a drillship, a pipe-laying ship or an offshore production ship.