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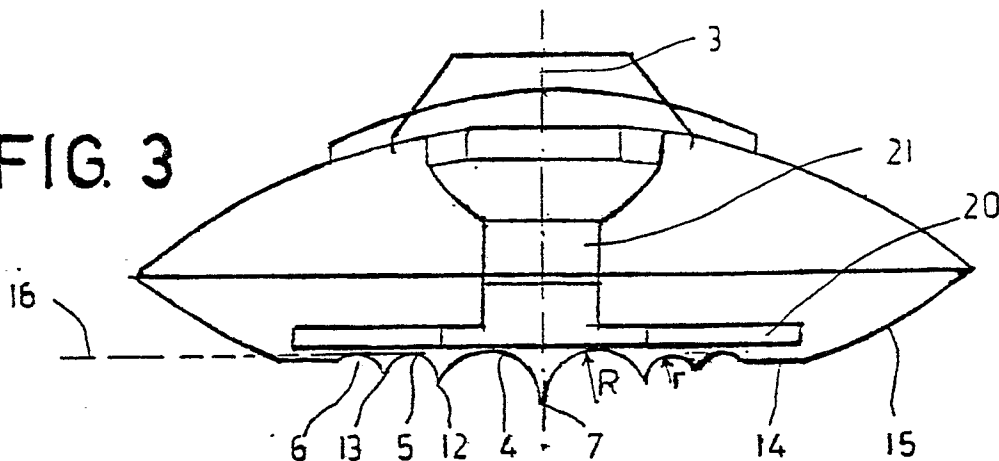
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AT BE CH DE ES FR GB GR IT LI LU NL SE(71) Applicant: **Wagstaff, Stephen Kenneth**
Roerdomp 36
NL-4872 PM Etten-Leur(NL)(72) Inventor: **Wagstaff, Stephen Kenneth**
Roerdomp 36
NL-4872 PM Etten-Leur(NL)(74) Representative: **Lips, Hendrik Jan George, Ir.**
et al
HAAGSCH OCTROOIBUREAU Breitnerlaan
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NL-2596 HG Den Haag(NL)(54) **Hull for a vessel.**

(57) Hull for a vessel, the lower face (2) of said hull (1), viewed in cross-section, being composed of at least four concave parts (4,5,6), located side by side and joining each other in substantially line-shaped keels (7,12,13), the highest positioned points of said concave parts (4,5,6) lying substantially in a horizontal plane (16) and the lowest positioned points of said keels (7,12,13) being positioned at a continuously decreasing distance of said horizontal plane (16) as seen from the lowest point of the hull (1) located in the central longitudinal plane (3) towards both sides of this.

FIG. 3



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Hull for a vessel.

The invention relates to a hull for a vessel, in case of the present invention in particular vessels are considered with relatively small dimensions such as for example speed boats and the like, but also surf boards, with which a considerable speed can be developed.

Now the object of the invention is to provide a hull with such a shape that the resistance of the hull in water is decreased in respect of the known hulls.

According to the invention this is achieved by that the lower face of the hull, viewed in cross section, is composed of at least four concave parts, located side by side and joining each other in substantially line-shaped vertical mutually connecting keels, the highest positioned points of said concave parts lying substantially in a horizontal plane, and the lowest positioned points of said keels present between said parts being positioned at a continuously decreasing distance of said horizontal plane as seen from the lowest point of the hull located in the central longitudinal plane towards both sides of this.

In this way it is achieved that air is enclosed in the concave parts by which as it were "air-lubrication" is obtained between the bottom of the hull and the water surface.

As the hull, viewed in cross section, has the shape of a flat V, the effect of the concave parts will be retained better than making a turn.

In particular it will be provided that the radius of curvature of both concave parts positioned at opposite sides of the central longitudinal plane, are mutually identical and that the radius of curvature of the adjacent parts is smaller. Simultaneously this will imply that, viewed in cross section, the two central concave parts are wider than the immediately adjacent concave parts.

According to a further elaboration of the invention the keel located in the central longitudinal plane between the two concave parts located at opposite sides of it, will forwardly extend into an upwardly curved part of the hull and the other concave parts will extend themselves mainly only over a substantially horizontal section of the hull.

By this it is achieved that a good distribution of the flow over the width of the hull is obtained and consequently a good stability of the vessel in particular during the acceleration of the vessel.

This effect can be further improved by providing that the front edge of the upwardly curved portion of the keel located in the central longitudinal plane, is rounded off and the width of the keel increases from the highest point till near the horizontal plane in which the highest points of the

concave parts are located, after which the width of the keel decreases again towards the rear.

In order to make the adhesion between the hull and the water surface as small as possible, it will be provided that the concave parts end in an upwardly and rearwardly inclined plane. At the upper edge of this upwardly and rearwardly inclined plane a mainly horizontally directed bottom plane may connect which rearwardly extends in an upwardly curved plane.

In particular two substantially horizontally directed planing faces may connect to the upper edge of the upwardly and rearwardly inclined plane, said planing faces being located at opposite sides of the two central concave parts.

By this stability of the vessel is increased in particular when the hull of it rises more from the water with increasing speed.

The planing faces may be connected to the vessel in a detachable manner. This does not have only the advantage that the planing faces can be easily replaced for example after having been damaged, but the vessel may also be made suitable for other purposes by mounting various types of planing faces and for example may be adjusted to the condition of the water.

The planing faces may be provided with fins, controlable or not. These may contribute for example to a better directional stability.

The invention is now explained by means of an embodiment, shown in the drawing, in which:

Fig. 1 schematically shows a side view of a vessel provided with a hull according to the present invention;

Fig. 2 shows a bottom view of the vessel of Fig. 1; and

Fig. 3 shows a rear view of the vessel.

The vessel illustrated in the drawing comprises a hull 1, the bottom face 2 of which is formed by successive concave parts 4, 5 and 6 on opposite sides of the central longitudinal plane 3. The concave parts 4 together are forming the keel 7 which forwardly ends in the part 8 connecting to the upwardly curved part 9 of the bottom 2. The portion 8 of the keel is rounded off at its forward end 10 and widens till the point 11 while narrowing again beyond said point. Each concave part 4 is connected to a concave part 5 by means of the keel 12 and the concave part 5 is connected with the concave part 6 by means of the keel 13, said concave part 6 ending in a horizontal bottom part 14 extending into an upwardly curved inclined part 15.

The highest points of the concave parts 4, 5 and 6 are substantially positioned in a horizontal

plane 16 and the lowest points of the keels 7, 12 and 13 are positioned at a substantially decreasing distance from the horizontal plane 16. The radius R of curvature of the concave parts 4 is larger than the radius r of curvature of the concave parts 5.

The concave parts 4, 5 and 6 end into an upwardly and rearwardly inclined plane 17 connecting to a substantially horizontal part 18 of the bottom face 2 extending in the upwardly inclined part 19.

Two planing faces 20 join to the horizontal part 18 and may be connected by means of a support 21 which can be detachably secured to the hull 1 of the vessel. Fins 22 can be mounted to the lower face of the planing faces 20, said fins being deleted in Fig. 3 for the sake of clarity.

In Fig. 1 it is schematically shown that a motor 23 is positioned in the hull 1 serving for driving the propeller 24.

The vessel shown in the drawing is not provided with a rudder because steering of the vessel can take place in that the steersman displaces his weight. Obviously also the other occupants may contribute to the steering or the vessel can be provided with a rudder.

It will be obvious that only a possible embodiment of the invention is shown in the drawing and described above and that many modifications can be made without leaving the inventive concept.

Claims

1. Hull (1) for a vessel, characterized in that the lower face (2) of the hull (1), viewed in cross section, is composed of at least four concave parts (4,5,6), located side by side and joining each other in substantially line-shaped vertical mutually connecting keels (7,12,13), the highest positioned points of said concave parts lying substantially in a horizontal plane (16) and the lowest positioned points of said keels (7,12,13) present between said parts (4,5,6) being positioned at a continuously decreasing distance of said horizontal plane (16) as seen from the lowest point of the hull (1) located in the central longitudinal plane (3) towards both sides of this.

2. Hull for a vessel according to claim 1, characterized in that the radius of curvature (R) of both concave parts (4) positioned at opposite sides of the central longitudinal plane (3), are mutually identical and that the radius of curvature (r) of the adjacent parts (5) is smaller.

3. Hull for a vessel according to claim 1 or 2, characterized in that the keel (7) located in the central longitudinal

plane (3) between the two concave parts (4) located at opposite sides of it, extends forwardly into an upwardly curved part of the hull (1) and that the other concave parts (5,6) extend themselves mainly over a substantially horizontal bottom section (14) of the hull (1).

4. Hull for a vessel according to claim 3, characterized in

that the front edge (10) of the upwardly curved portion (8 of the keel (7) located in the central longitudinal plane (3), is rounded off and the width of the keel (7) increases from the highest point till near the horizontal plane (16) in which the highest points of the concave parts (4,5,6) are located, after which the width of the keel (7) decreases again towards the rear.

5. Hull for a vessel according to one of the preceding claims, characterized in

that the concave parts (4,5,6) end in an upwardly and rearwardly inclined plane (17).

6. Hull for a vessel according to claim 5, characterized in

that at the upper edge of the upwardly and rearwardly inclined plane (17) a mainly horizontally directed bottom plane (18) connects which rearwardly extends in an upwardly curved plane (19).

7. Hull for a vessel according to claim 5 or 6, characterized in

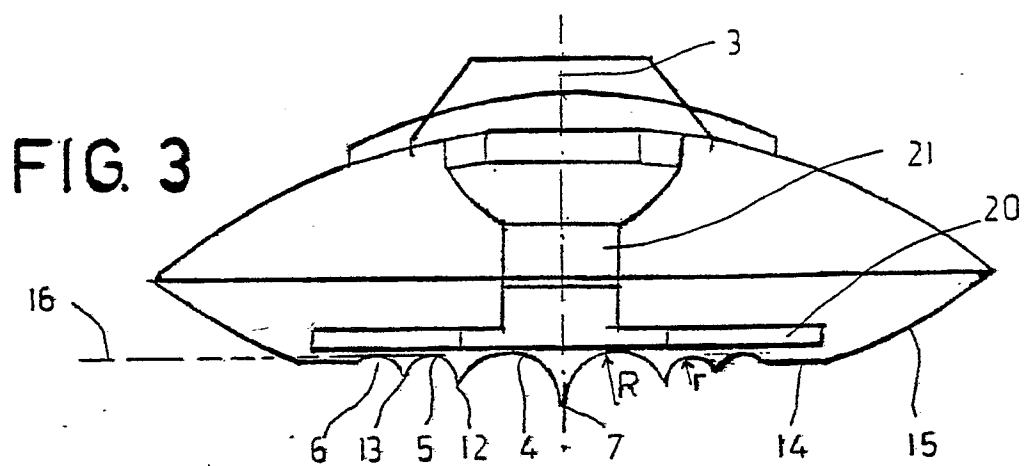
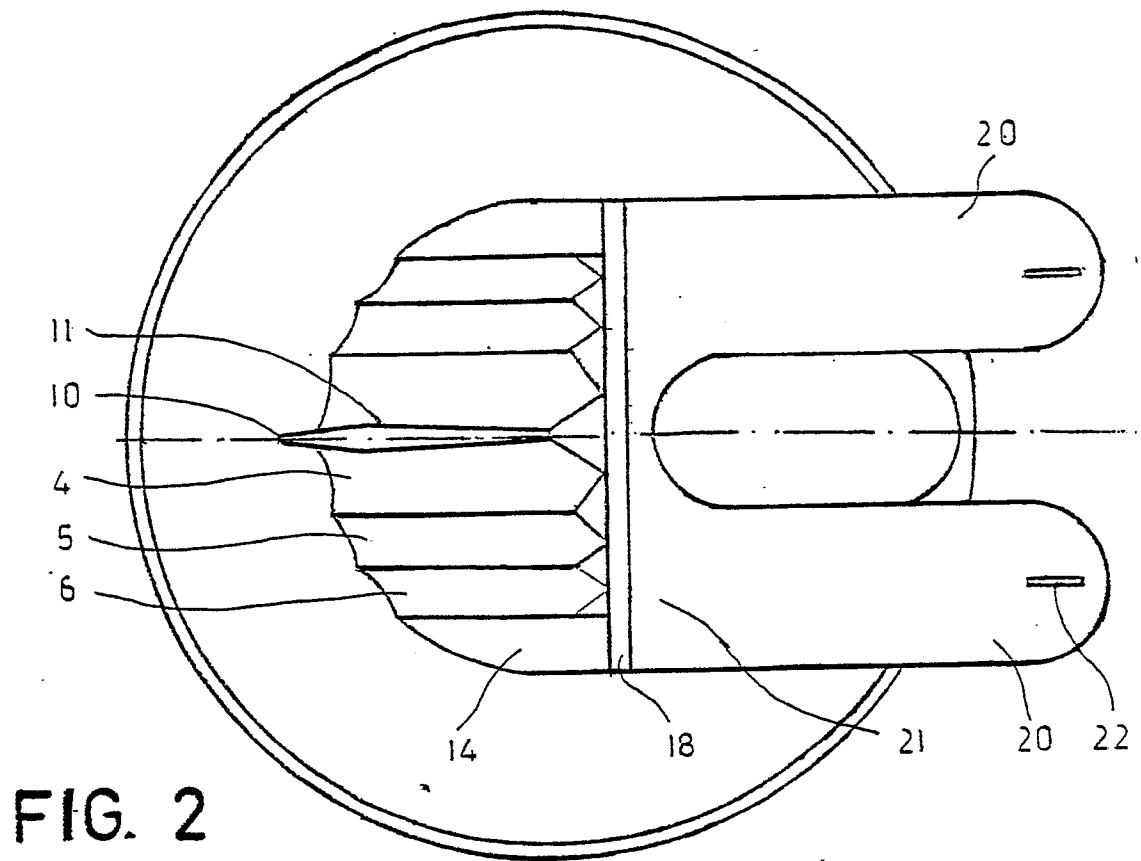
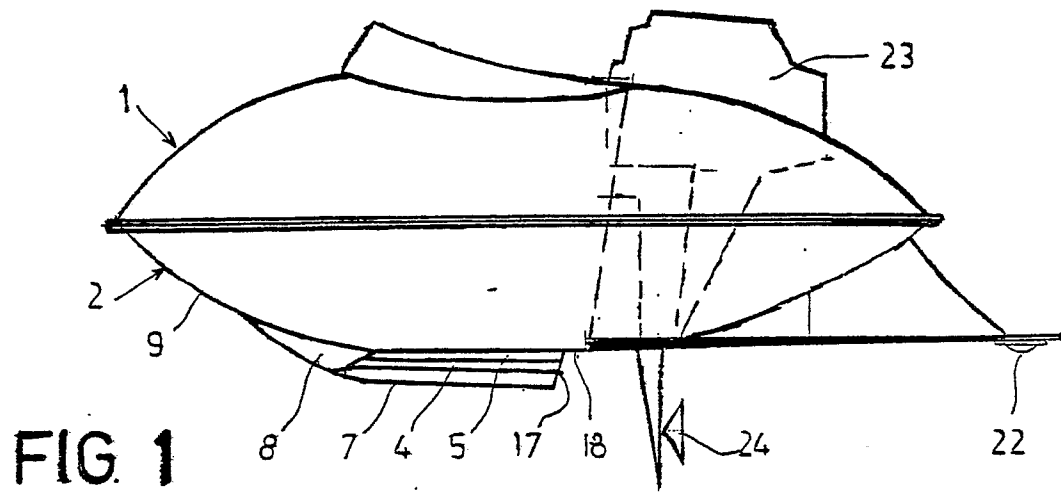
that two substantially horizontally directed planing faces (20) connect to the upper edge of the upwardly and rearwardly inclined plane (17), said planing faces being located at opposite sides of the two central concave parts (4).

8. Hull for a vessel according to claim 7, characterized in

that the planing faces (20) are connected to the vessel in a detachable manner.

9. Hull for a vessel according to claim 7 or 8, characterized in

that the planing faces (20) are provided with fins (22), controllable or not.





DOCUMENTS CONSIDERED TO BE RELEVANT			EP 88202135.5
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	<u>US - A - 3 077 172</u> (DORNAK) * Totality *	1,2	B 63 B 1/18
Y	--	7,9	
Y	<u>US - A - 4 730 572</u> (HOLLINGSWORTH) * Totality *	7,9	
A	-- <u>US - A - 3 216 389</u> (THORSEN) * Totality * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			B 63 B
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 14-11-1989	Examiner SCHMICKL
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	