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(54) **MULTI-HULL VESSEL COMPRISING A PLURALITY OF INFLATABLE ELEMENTS AND METHOD OF USING THE SAME**

SCHIFF MIT MEHREREN SCHWIMMKÖRPERN MIT MEHREREN AUFBLASBAREN ELEMENTEN
UND VERFAHREN ZU DESSEN GEBRAUCH

BATEAU MULTI-COQUE COMPRENANT UNE PLURALITÉ D'ÉLÉMENTS GONFLABLES ET
MÉTHODE DE SON UTILISATION

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Description

[0001] It takes a great deal of energy to move vessels such as hoist platforms. In addition, it is hardly possible to realise a satisfactory speed with such vessels. Both factors adversely affect the cost price of projects in which such vessels are used.

[0002] The object of the present invention is to obviate the above drawbacks of vessels provided with floats and to provide a multifunctional and cost price-friendly method and a corresponding vessel.

[0003] From the document US5921195 A1, which is considered to represent the closest prior art, a twin-hull water craft is known, which comprises a single controllably inflatable element arranged between the hulls and under the platform connecting these hulls.

[0004] The invention relates to a method in which at least two floats separated by one or more intermediate spaces form a vessel which is provided with inflatable elements which, in the inflated condition thereof, fill said at least one intermediate space at least partially.

[0005] The corresponding vessel comprises at least two floats separated by one or more intermediate spaces, and inflatable elements which, in the inflated condition thereof, fill said at least one intermediate space at least partially.

[0006] In the non-inflated condition of the inflatable elements, such a vessel has a typical, catamaran-like hull shape defined by the floats and the intermediate space present therebetween. According to the present method, the hull shape is deformed as a result of the inflatable elements being partially or completely inflated or deflated. The drag of a vessel having a catamaran-like hull shape in water is comparatively low, so that a rapid movement of the vessel can be realised in an advantageous manner.

[0007] Because it is precisely the extent to which water is being displaced that determines the lifting potential of a vessel, for example in the form of a hoist platform, a catamaran is unsuitable for use as a hoist platform.

[0008] However, since the invention makes it possible to convert a catamaran-like hull shape into that of a regular - non-catamaran - vessel, the amount of water displaced by the vessel strongly increases, resulting in an increased lifting capacity or deadweight capacity, thus realising desired advantages which render the vessel suitable for use as a support platform or a hoist platform. Both hull shapes, viz. a voluminous pontoon on the one hand and the more slender catamaran on the other hand are combined in a vessel, such as a hoist platform, which is provided with the invention.

[0009] In one possible embodiment, the vessel according to the invention comprises a number of inflatable cushions arranged between the floats of a catamaran, which cushions are retained between the floats after being inflated. Said retained position is in particular realised in such a manner that the cushions completely fill the intermediate space between the floats, thus supplying

the additional buoyancy that is required for supporting heavier loads.

[0010] In a simple embodiment, the movable parts enclose the cushions in such a manner that, once the cushions have been inflated, said movable parts are immovably retained in the intermediate space between the floats.

[0011] As a result, they cannot deform and are capable of providing the required stability. Advanced embodiments can be dynamically given a shape adapted to the load to be hoisted, for example, so that the buoyancy on the non-hoisting side of the hoist platform decreases rather than increases, thus making it possible to effect a horizontal position of the platform even during the hoisting operation. As a result, the invention is in particular also advantageously suitable for supporting spans exhibiting an irregular weight distribution, thus making it possible to dynamically remove any objectionable inclinations in longitudinal and transverse direction in a road surface.

[0012] In the case of operations in which support is quickly needed, also the shorter period, determined by the sailing time, within which the support vessel is available will constitute an important advantage. This applies for example in case of impending high cost resulting from action being taken too late or, for example, in case of the vessel according to the invention being needed to avert imminent danger. In the case of the above-mentioned activities, it will be speed and adaptability that will constitute the most obvious differences and advantages of the vessel according to the invention as described herein in relation to the conventional floating platforms.

[0013] Further embodiments and associated uses in addition to those described above are possible within the scope of the present invention. The embodiments and uses described herein are to be regarded as non-limitative, therefore.

[0014] The following are important aspects and advantages of the method and the vessel according to the invention:

a) The invention also relates to a possible adaptation of existing floating (hoist) platforms, by which the hull shape is changed, causing the buoyancy to increase or decrease and the drag to increase or decrease during movement;

b) The change of the hull shape or the deformation is a dynamic change, making it possible to maintain a horizontal position of the platform, even if it is loaded unevenly;

c) If desired, the platform vessel can be transported by road in separate parts to be coupled together, whilst it can furthermore be deployed over water as well as be adapted to the desired use thereof in a cheaper, quicker and more flexible manner;

d) The platform can be geared as regards its shape

and dimensions to the requirements of the most widely varying range of applications;

e) The platform vessel comprises possibilities to measure and adjust the air pressure in the various cushions by means of an air pressure adjusting system. Furthermore it is possible to adjust the required buoyancy distribution or the maximum load by means of said system. In the former case in order to compensate for an uneven weight distribution of the load for the purpose of maintaining the vessel in a horizontal position and in the latter case in order to prevent the vessel being overloaded.

f) The platform comprises possibilities to deliver information and programmable instructions to the user, via a display screen and a PC built into the platform, regarding the pressure distribution in the various cushions, so as to adapt the pressure in the individual cushions to the local requirements and maintain said pressure.

[0015] For a more detailed explanation, reference is finally made to the figures below, in which like parts are indicated by the same numerals. A wheel house 2 and an air inlet provided with a compressor 1 are placed on a vessel or platform vessel V, which is shown in every one of the appended figures 1-8. The figures indicated by increasing, odd numbers show respective front views of the hull shape, and in particular the change in the hull shape as the pressure in the initially empty air cushions 3 is gradually increased. Numeral 4 indicates the floats, which are coupled via a support platform D, whilst the intermediate space is indicated at T. The likewise increasing even numbers show respective longitudinal sectional views of the vessel V, and in particular the change in the position of the inflatable air cushion elements 3 as the pressure therein is gradually increased. In the illustrated embodiment, the inflatable cushions 3 are supported on the underside by an adjustable bottom B. The uppermost position of the adjustable bottom is indicated at 5, and the lowermost position of the bottom B is indicated at 6. In the position indicated at 7, the air cushions are completely filled.

Claims

1. A method in which at least two floats (4) separated by one or more intermediate spaces (T) form a vessel (V) which is provided with a number of inflatable elements (3, 7) which, in the inflated condition thereof, fill said at least one intermediate space (T) at least partially.
2. A method according to claim 1, **characterised in that** the inflatable elements (3) are empty when the vessel (V) is being moved, whilst the inflatable ele-

ments (3,7) are at least partially inflated when the vessel (V) is stationary.

3. A method according to claim 1 or 2, **characterised in that** the air pressure in the inflatable elements (3) is regulated in dependence on, for example, the required buoyancy of the vessel (V) or the distribution of the required buoyancy.
4. A method according to any one of claims 1-3, **characterised in that** the inflatable elements (3) are provided with individual cushions, in which an individual pressure and relative pressure distribution is adjusted.
5. A vessel (V) comprising at least two floats (4) separated by one or more intermediate spaces (T), as well as an inflatable element, **characterized in that** the vessel comprises a number of inflatable elements (3,7) which, in the inflated condition thereof, fill said at least one intermediate space (T) at least partially.
6. A vessel according to claim 5, **characterised in that** the inflatable elements (3) are provided under a support platform (D) by which the floats (4) are coupled together.
7. A vessel according to any one of claims 5 or 6, **characterised in that** the vessel (V) comprises an air pressure adjusting system (1) connected to the inflatable elements (3).
8. A vessel according to any one of claims 5-7, **characterised in that** the inflatable elements (3) are provided with individual cushions, which are each connected to a/the air pressure adjusting system (1) of the vessel (V).
9. Use of the vessel (V) according to any one of claims 5-8 as a pontoon or a platform, for example a floating support and/or hoist platform, wherein the inflatable elements (3) of the vessel (V) are filled with air when the vessel (V) is stationary, with the respective air pressures depending on the weight and/or the weight distribution of a load supported by the vessel (V).
10. Use according to claim 9, **characterised in that** the inflatable elements (3) are empty when the vessel (V) is being moved so as to influence the hull shape of the vessel (V) and minimise the drag of the vessel (V).

Patentansprüche

1. Verfahren, bei dem zumindest zwei Schwimmkörper (4), die durch einen oder mehr Zwischenräume (T)

getrennt sind, ein Wasserfahrzeug (V) ausbilden, das mit einer Anzahl von aufblasbaren Elementen (3, 7) versehen wird, welche im aufgeblasenen Zustand den zumindest einen Zwischenraum (T) zumindest teilweise füllen.

2. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** die aufblasbaren Elemente (3) leer sind, wenn das Wasserfahrzeug (V) bewegt wird, während die aufblasbaren Elemente (3, 7) zumindest teilweise aufgeblasen werden, wenn das Wasserfahrzeug (V) ortsfest ist.
3. Verfahren nach einem der Ansprüche 1 oder 2, **dadurch gekennzeichnet, dass** der Luftdruck in den aufblasbaren Elementen (3) abhängig von beispielsweise dem erforderlichen Auftrieb des Wasserfahrzeugs (V) oder der Verteilung des erforderlichen Auftriebs reguliert wird.
4. Verfahren nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** die aufblasbaren Elemente (3) mit individuellen Kissen versehen werden, in denen ein relativer Druck und eine relative Druckverteilung eingestellt werden.
5. Wasserfahrzeug (V), umfassend zumindest zwei Schwimmkörper (4), die durch einen oder mehr Zwischenräume (T) getrennt sind, sowie ein aufblasbares Element, **dadurch gekennzeichnet, dass** das Wasserfahrzeug eine Anzahl von aufblasbaren Elementen (3, 7) umfasst, welche im aufgeblasenen Zustand den zumindest einen Zwischenraum (T) zumindest teilweise füllen.
6. Wasserfahrzeug nach Anspruch 5, **dadurch gekennzeichnet, dass** die aufblasbaren Elemente (3) unter einer Trageplattform (D) vorgesehen sind, durch die die Schwimmkörper (4) zusammengekuppelt sind.
7. Wasserfahrzeug nach einem der Ansprüche 5 oder 6, **dadurch gekennzeichnet, dass** das Wasserfahrzeug (V) ein Luftdruckeinstellsystem (1) umfasst, das an die aufblasbaren Elemente (3) angeschlossen ist.
8. Wasserfahrzeug nach einem der Ansprüche 5 bis 7, **dadurch gekennzeichnet, dass** die aufblasbaren Elemente (3) mit individuellen Kissen versehen sind, die an ein/das Luftdruckeinstellsystem (1) des Wasserfahrzeugs (V) angeschlossen sind.
9. Benutzung des Wasserfahrzeugs (V) nach einem der Ansprüche 5 bis 8 als Ponton oder Plattform, beispielsweise eine schwimmende Trage- und/oder Hebeplattform, wobei die aufblasbaren Elemente (3) des Wasserfahrzeugs (V) mit Luft gefüllt sind, wenn

das Wasserfahrzeug (V) ortsfest ist, wobei die jeweiligen Luftdrücke vom Gewicht und/oder von der Gewichtsverteilung einer Last abhängen, die durch das Wasserfahrzeug (V) getragen ist.

10. Benutzung nach Anspruch 9, **dadurch gekennzeichnet, dass** die aufblasbaren Elemente (3) leer sind, wenn das Wasserfahrzeug (V) bewegt wird, um die Schiffskörperform des Wasserfahrzeugs (V) zu beeinflussen und den Strömungswiderstand des Wasserfahrzeugs (V) auf ein Mindestmaß zu verringern.

Revendications

1. Procédé dans lequel au moins deux flotteurs (4) séparés par un ou plusieurs espaces intermédiaires (T) forment un vaisseau (V) qui est équipé de plusieurs éléments gonflables (3, 7) qui, à l'état gonflé, remplissent ledit au moins espace intermédiaire (T) au moins partiellement.
2. Procédé selon la revendication 1, **caractérisé en ce que** les éléments gonflables (3) sont vides lorsque le vaisseau (V) est déplacé, tandis que les éléments gonflables (3, 7) sont au moins partiellement gonflés lorsque le vaisseau (V) est immobile.
3. Procédé selon la revendication 1 ou 2, **caractérisé en ce que** la pression d'air dans les éléments gonflables (3) est régulée en fonction, par exemple, de la flottabilité requise du vaisseau (V) ou de la répartition de la flottabilité requise.
4. Procédé selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** les éléments gonflables (3) sont équipés de coussins individuels dans lesquels une pression individuelle et une répartition de pression individuelle sont réglées.
5. Vaisseau (V) comprenant au moins deux flotteurs (4) séparés par un ou plusieurs espaces intermédiaires (T), ainsi qu'un élément gonflable, **caractérisé en ce que** le vaisseau comprend plusieurs éléments gonflables (3, 7) qui, à l'état gonflé, remplissent ledit au moins espace intermédiaire (T) au moins partiellement.
6. Vaisseau selon la revendication 5, **caractérisé en ce que** les éléments gonflables (3) sont disposés sous une plate-forme de support (D) au moyen de laquelle les flotteurs (4) sont raccordés.
7. Vaisseau selon l'une quelconque des revendications 5 ou 6, **caractérisé en ce que** le vaisseau (V) comprend un système de réglage de la pression d'air (1) raccordé aux éléments gonflables (3).

8. Vaisseau selon l'une quelconque des revendications 5 à 7, **caractérisé en ce que** les éléments gonflables (3) sont équipés de coussins individuels, qui sont chacun raccordés à un/au système de réglage de la pression d'air (1) du vaisseau (V). 5
9. Utilisation du vaisseau (V) selon l'une quelconque des revendications 5 à 8 en tant que ponton ou plate-forme, par exemple un support flottant et/ou une plate-forme de treuillage, dans laquelle les éléments gonflables (3) du vaisseau (V) sont remplis d'air lorsque le vaisseau (V) est immobile, les pressions d'air respectives dépendant du poids et/ou de la répartition du poids d'une charge supportée par le vaisseau (V). 10
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10. Utilisation selon la revendication 9, **caractérisée en ce que** les éléments gonflables (3) sont vides lorsque le vaisseau (V) est déplacé de façon à influencer la forme de la coque du vaisseau (V) et réduire au maximum la traînée du vaisseau (V). 20

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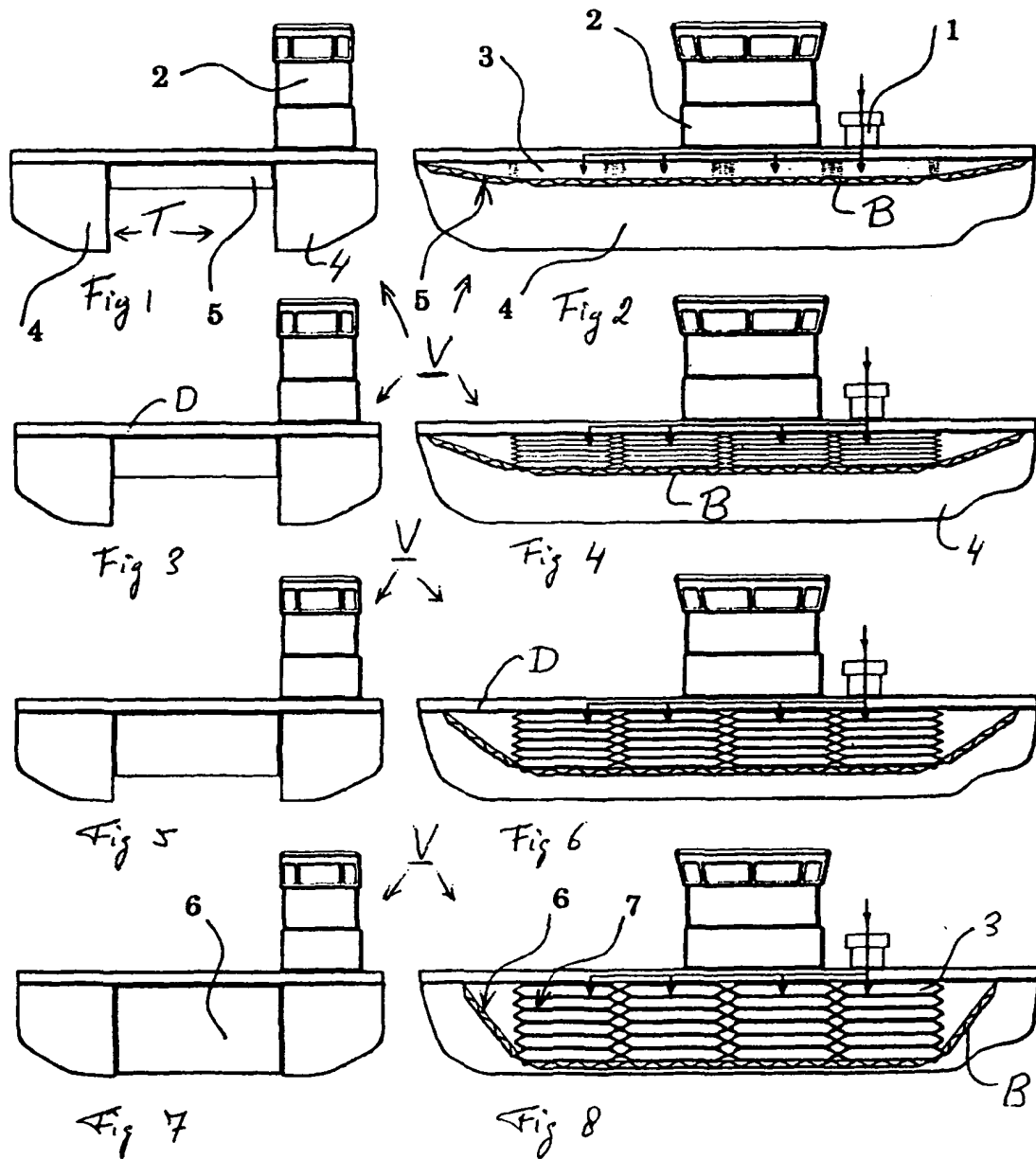
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REFERENCES CITED IN THE DESCRIPTION

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