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GB-A- 2 000 474
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Description

The present invention relates to a tanker for carrying a bulk cargo, such as an oil.

Nowadays there is an increasing need to construct tankers in such a way that in case of wreck or other marine catastrophe leakage of cargo and thus environmental pollution is avoided or minimized.

For that purpose tankers have been built in the past with double bottoms and double sides, which brought about substantial increases in the prices of tankers. Further, double bottom constructions have the drawback that in case the bottom of a cargo tank is penetrated due to corrosion and/or erosion, oil may leak into the double bottom and generate a hazardous mixture of air and hydrocarbonaceous vapours, in case for instance oil is the cargo. Apart from the potential danger for explosion, there would be the requirement for gas detection and thorough ventilation of the double bottom before entry for routine structural inspections. Moreover, access to a double bottom also causes a problem. It must be either through a manhole in the bottom of the cargo tank which despite a bolted steel cover, introduces a source of leakage, or else through a vertical shaft which is led right up to the deck. Other concerns include the maintenance of the steel structure in double bottoms, in particular preservation of the anti-corrosive coatings which are required for the prevention of corrosion.

It is an object of the present invention is to provide a tanker of such a construction that environmental pollution is avoided or minimized in case of wreck or other marine catastrophe with a minimum increase of cost.

The present invention therefore provides a tanker for carrying a bulk cargo, which comprises at least a longitudinally extending centre cargo tank having a top wall, a bottom wall and double side walls, said double side walls each comprising an inner wall and an outer wall and defining closed inner spaces forming cargo or ballast tanks, located on either side of the centre cargo tank, wherein the said double side walls of the centre cargo tank(s) each extend below the bottom wall of the cargo tank(s) for a distance which is at least equal to $B/50$ wherein B represents the beam of the tanker, and wherein the cargo tank(s) is (are) of such a dimension that the H_1/H_2 ratio is at most 1 when the tank is filled with cargo, wherein H_1 represents the hydrostatic head on the bottom wall of the cargo tank due to the cargo in the tank and H_2 represents the hydrostatic head on the bottom wall of the cargo tank due to the outside water, and wherein the distance between the inner and outer wall of each double side wall is at most $B/5$, wherein B represents the beam of the tanker.

In this way in the event of the bottom wall of a cargo tank being ruptured, there will be an inflow of outside water to the cargo tank rather than an outflow of for instance oil into the outside water and environmental pollution can be avoided or minimized in case of wreck or other marine catastrophe.

Advantageously, the double side walls of the centre cargo tank(s) extend below the bottom wall of the cargo tank(s) for a distance which is at least equal to $B/15$, wherein B has the meaning as indicated hereinabove.

Suitably, the tanker comprises transitions, preferably curved transitions, between the bottom wall of the cargo tank and the inner walls of the double side walls extending below the bottom wall of the cargo tank.

Preferably, the hull comprises two or more double side walls whereby each inner space is closed at the front end and at the rear end.

Suitably, the inner walls of the double side walls are the side walls of the cargo tank.

The inner wall and outer wall of each double side wall may be arranged either parallel or at an angle to each other.

Advantageously, the inner and outer wall of each double side wall are arranged parallel with respect to each other.

Preferably, the double side walls of the tanker in accordance with the present invention may be arranged vertically or at an angle to the vertical, preferably they are arranged substantially vertical.

During transport of the bulk cargo the inner spaces defined by the double side walls may be empty, and after discharging the cargo from the tank(s) the inner spaces may be filled with water to function as ballast tanks. Suitably, the double side walls are located along the complete cargo tank. Thus the inner spaces defined by the double side walls may be used either for the carriage of cargo or for the carriage of water ballast or may be left void.

The inner spaces and cargo tank(s) may be subdivided to any required extent, both transversely and longitudinally.

It is remarked that US-A-3,832,966 and US-A-3,699,912 disclose various tanker hull designs for confining a bulk cargo within the hull of a ship in case of rupture as by a collision or grounding.

Further, GB-A-2,000,474 discloses a liquid cargo tank construction for tanker vessels wherein leakage in the event of hull rupture of a tank vessel is reduced and wherein the condition of ratio: hydrostatic heads of water and cargo is taken into account.

However, the specific pollution-resistant design of the present invention relating to a double sided tanker with a single bottom and having all the

benefits of the double hull design but none of the disadvantages of double bottoms, has not been disclosed.

The invention will now be described by way of example in more detail by reference to the accompanying drawing, in which fig. 1 represents schematically a cross-section of a tanker in accordance with the present invention.

The tanker as shown in Fig. 1 having a beam B comprises a centre cargo tank 1 extending longitudinally for any convenient distance and having a top wall 2 and a bottom wall 3, and double side walls each comprising an inner wall 4 and an outer wall 5 and defining an inner space 6.

Claims

1. A tanker for carrying a bulk cargo, which comprises at least a longitudinally extending centre cargo tank having a top wall, a bottom wall and double side walls, said double side walls each comprising an inner wall and an outer wall and defining closed inner spaces forming cargo or ballast tanks, located on either side of the centre cargo tank, wherein the said double side walls of the centre cargo tank(s) each extend below the bottom wall of the cargo tank(s) for a distance which is at least equal to $B/50$ wherein B represents the beam of the tanker, and wherein the cargo tank(s) is (are) of such a dimension that the H_1/H_2 ratio is at most 1 when the tank is filled with cargo, wherein H_1 represents the hydrostatic head on the bottom wall of the cargo tank due to the cargo in the tank and H_2 represents the hydrostatic head on the bottom wall of the cargo tank due to the outside water, and wherein the distance between the inner and outer wall of each double side wall is at most $B/5$, wherein B represents the beam of the tanker.
2. The tanker as claimed in claim 1, wherein the double side walls of the centre cargo tank(s) extend below the bottom wall of the cargo tank(s) for a distance which is at least equal to $B/15$, wherein B represents the beam of the tanker.
3. The tanker as claimed in claim 1 or 2, wherein the inner wall and outer wall of each double side wall are arranged parallel with respect to each other.
4. The tanker as claimed in any one of claims 1-3, wherein the double side walls are arranged substantially vertical.

Patentansprüche

1. Ein Tanker zum Befördern einer Bulkladung, der wenigstens einen sich in Längsrichtung erstreckenden mittleren Ladetank mit einer oberen Wand, einer Bodenwand und doppelten Seitenwänden aufweist, wobei die doppelten Seitenwände jeweils eine Innenwand und eine Außenwand aufweisen und geschlossene Innenräume definieren, die Lade- (Cargo-) oder Ballasttanks bilden, die an jeder Seite des mittleren Ladetanks angeordnet sind, wobei die doppelten Seitenwände des (der) mittleren Ladetanks sich jeweils unter die Bodenwand des (der) Ladetanks um einen Abstand erstrecken, welcher mindestens gleich $B/50$ ist, wobei B die Breite des Tankers darstellt, und wobei der (die) Cargotank(s) solche Ausmaße aufweist (aufweisen), daß das Verhältnis H_1/H_2 höchstens 1 ist, wenn der Tank mit Schiffsladung gefüllt ist, wobei H_1 die hydrostatische Höhe auf der Bodenwand des Ladetanks aufgrund der Ladung in dem Tank darstellt und H_2 die hydrostatische Höhe auf der Bodenwand des Ladetanks aufgrund des äußeren Wassers darstellt, und wobei der Abstand zwischen der Innen- und Außenwand jeder doppelten Seitenwand höchstens $B/5$ ist, wobei B die Breite des Tankers darstellt.
2. Der Tanker nach Anspruch 1, wobei die doppelten Seitenwände des (der) mittleren Cargotanks sich unter die Bodenwand des (der) Cargotanks um einen Abstand erstrecken, welcher mindestens gleich $B/15$ ist, wobei B die Breite des Tankers darstellt.
3. Der Tanker nach Anspruch 1 oder 2, wobei die Innenwand und die Außenwand jeder doppelten Seitenwand parallel zueinander angeordnet sind.
4. Der Tanker nach einem der Ansprüche 1 bis 3, wobei die doppelten Seitenwände im wesentlichen vertikal angeordnet sind.

Revendications

1. Pétrolier pour le transport d'une cargaison de vrac, comportant au moins une citerne centrale à cargaison qui s'étend longitudinalement et comprend une paroi supérieure, une paroi de fond et des parois latérales doubles, lesdites parois latérales doubles comprenant chacune une paroi intérieure et une paroi extérieure et définissant des espaces intérieurs clos formant citernes à cargaison ou à ballast, situés d'un côté et de l'autre de la citerne centrale à

cargaison, pétrolier dans lequel lesdites parois latérales doubles de la citerne centrale à cargaison, ou des citernes centrales à cargaison, s'étendent chacune en dessous de la paroi de fond de la citerne à cargaison, ou des citernes à cargaison, sur une distance qui est au moins égale à $B/50$, B représentant la largeur du pétrolier, et dans lequel la citerne à cargaison, ou les citernes a cargaison, est, ou sont, d'une dimension telle que le rapport H_1/H_2 vaut au plus 1 lorsque la citerne est chargée de la cargaison, H_1 représentant la pression hydrostatique sur la paroi de fond de la citerne à cargaison due à la cargaison dans la citerne et H_2 représentant la pression hydrostatique sur la paroi de fond de la citerne à cargaison due à l'eau extérieure, et dans lequel la distance entre la paroi intérieure et la paroi extérieure de chaque paroi latérale double est au plus $B/5$, B représentant la largeur du pétrolier.

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2. Pétrolier selon la revendication 1, dans lequel les parois latérales doubles de la citerne centrale à cargaison, ou des citernes centrales à cargaison, s'étendent en dessous de la paroi de fond de la citerne à cargaison, ou des citernes a cargaison, sur une distance qui est au moins égale à $B/15$, B représentant la largeur du pétrolier.
3. Pétrolier selon la revendication 1 ou 2, dans lequel la paroi intérieure et la paroi extérieure de chaque paroi latérale double sont disposées parallèlement l'une à l'autre.
4. Pétrolier selon l'une quelconque des revendications 1-3, dans lequel les parois latérales doubles sont disposées sensiblement verticalement.

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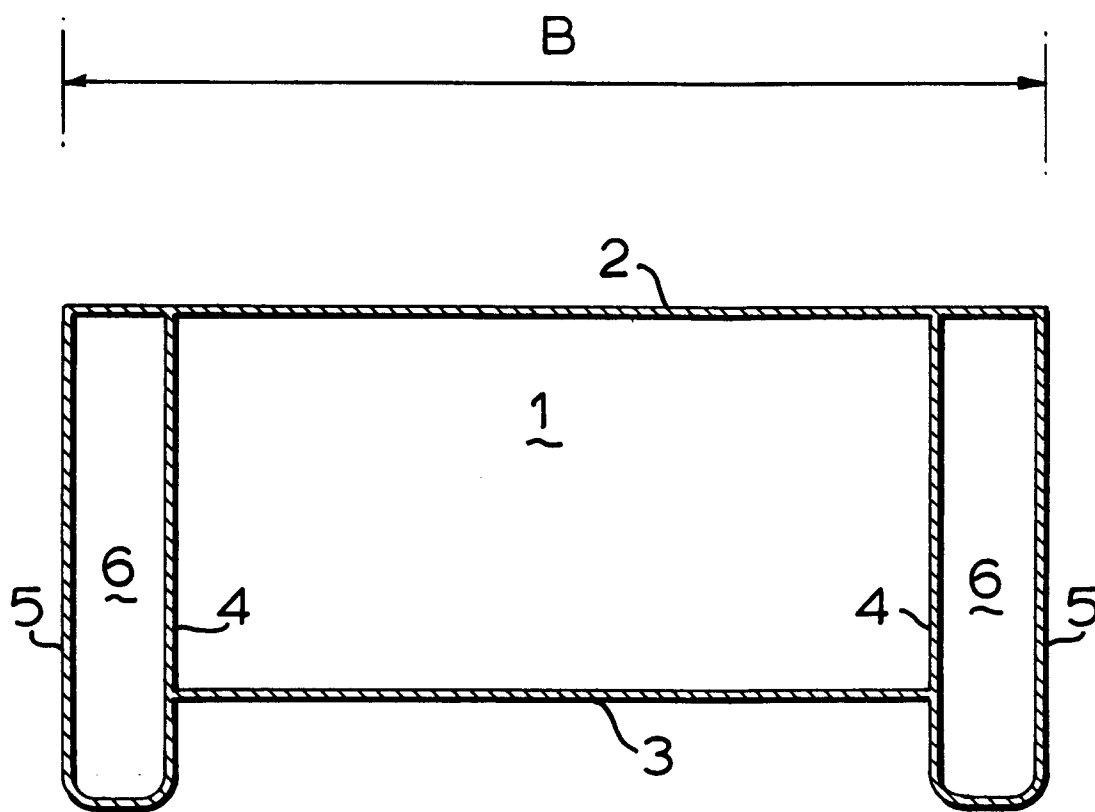


FIG. 1