Patent Examination Board

Final Diploma

FD3 Amendment of Specifications

Wednesday 18 October 2023

10:00 to 13:20 UK British Summer Time (GMT + 1 hour)

Examination time: 3 hours 20 minutes plus 10 minutes upload time

The 3 hours 20 minutes is allocated as follows:

10 minutes – Downloading and printing the question paper;
3 hours – Answering the questions;
10 minutes – Two screen breaks of 5 minutes each.

At 13.20 you MUST immediately stop answering the questions. You then have **10 minutes** in which to upload your Answer document to the PEBX system.

You MUST upload your Answer document to the PEBX system by 13.30. After 13.30 you will not be able to upload it and your examination will be void.

INSTRUCTIONS TO CANDIDATES

1. The whole assessment task is to be attempted.
2. The marks to be awarded are given at the end of the assessment task.
3. The total number of marks available for this paper is 100.
4. Start each part of your answer on a new sheet of paper.
5. You must use the Answer document for your answers.
6. Do not attempt to change the font style, font size, font colour, line spacing or any other pre-set formatting.
7. Start each part of your answer on a new page. Press the control key and the enter key simultaneously to begin a new page.
8. Do not state your name anywhere in the answers.
9. This question paper consists of **21 sheets**, including this sheet, and comprises:
   Assessment task (1 sheet)
   Client letter (1 sheet)
   Document A Examination Report (1 sheet)
   Document B Client application GB 2020202.0 (11 sheets including 3 sheets of drawings)
   Document C Prior art reference D1 – GB 2030405 (5 sheets including 2 sheets of drawings)
   A spare set of Claims (Document B) to use in your answer if you wish (1 sheet)

AT THE END OF THE EXAMINATION

10. Save your Answer document and any hand-annotated claims to your hard drive. Then follow the instructions for uploading your document onto the PEBX system.

Assessment task

You have received the letter and documents listed on the Instructions to Candidates sheet regarding United Kingdom patent application number GB 2020202.0, which has been filed at the UK Intellectual Property Office with no claim to priority, and was published in 2021.

Your task is to prepare:

1) **a letter to the UK Intellectual Property Office in response to the Examination Report;**

2) **a set of amended claims, if considered necessary;**

3) **notes on which you would base advice to your client in which you:**

   i) **explain the actions you have taken;**

   ii) **provide full reasoning for your actions;**

   iii) **outline future actions, if any, that your client could take to secure full protection of its commercial interests.**

Your advice should take into account that further information may be required.

Your notes should only relate to the invention(s) outlined in the client's correspondence to you.

Your notes should be directed to patent matters only.

Note the following:

a) You are NOT required to make any amendments to the description of the client's patent application.

b) You should accept the facts given to you and base your answer on those facts.

c) You should not make use of any other special knowledge that you may have of the subject matter concerned.

d) You should assume that the prior art referred to is complete.

e) You should identify clearly any amended claim set and/or divisional claim(s).

Allocation of Marks

Letter: 37 marks
Claims: 35 marks
Notes: 28 marks
Total: 100 marks

Client letter

Hadyort Ships Ltd

Lubber, Lee Patent Attorneys

Dear Mr Lubber

Thank you for sending the official report on our application. The design of oil tankers is somewhat specialised, and it is interesting to know that others have been working on the same problem of segregating ballast water from oil using collapsible containers. We thought that US 3,333,333 (D2), which you found when you were drafting the application and which is mentioned in the introduction, was a one-off. We work with shipbuilders, and there has certainly been a lot of interest in our product, so we would like to protect it as much as we can.

It does seem that Ship Ahoy's patent, D1, uses a similar concertina or bellows design to ours, with an expandable internal container or lining that expands and contracts vertically. One difference is that their flexible container is more reinforced than ours needs to be, because in their scheme the oil is not introduced simultaneously with the removal of seawater, nor *vice versa*. Also, their flexible container seems to be fixed in the bottom of the ship, so I can't see how they can easily clean it, though this doesn't need to be done very often.

However, I think maybe the most important difference is that the system described in the Ship Ahoy document fills the flexible container with seawater ballast from the bottom, whereas our container is filled with oil from the top and is surrounded by seawater. In our design it is also possible to empty the seawater ballast at the same time as filling with oil, in order to support the membrane. With modern control techniques this is easy to achieve.

A consequence of the above difference is that in the Ship Ahoy system there are times during their filling and emptying operations when their compartment 2 is only partly filled with oil, and there is gas in the remainder. Therefore, the Ship Ahoy system does not address the problem of volatile flammable gases at all. Our flexible container never has gas in it, and our method ensures that, even though the container is made of plastic, it doesn't get damaged. I hope this is enough information for you to prepare a draft with a chance of getting a patent.

Yours sincerely

John Silver
Technical Director

Intellectual
Property
Office

Your ref:		Examiner:	H. Nelson
Application no.	2020202.0	Tel:	01633 819191
Applicant	Hadyort Ships Ltd	Date of report:	26 July 2023
Latest date for reply:	26 November 2023	Page	1/1

Patents Act 1977

Examination report under Section 18(3)

Basis of the examination

1. The examination has been carried out on the basis of the application as filed on 20 October 2020.

Novelty

2. The invention as claimed in claim 1 is not new in view of D1 (GB 2030405 by Ship Ahoy! Ltd). See tank 2, collapsible container 10 in Fig. 1 of D1.

3. Claim 1 is also arguably not even novel with respect to D2 (US 3,333,333) cited in the application itself: a collapsible container is formed by membrane 25 in tank 10, together with the tank walls (FIG. 2 of the Application, confirmed by the Examiner to correspond to what is shown in D2).

4. Claims 2–7 also appear not to be novel in view of D1.

Inventive Step

5. FIG. 1 of D1 shows the introduction of cargo into tank 2, which can be considered to have a collapsible container formed by the top plate 12 moving with respect to the deck 4, rendering claim 8 arguably not novel. In any event, it would be obvious to reverse the roles of the tank compartment 2 and the interior space of the container 10, so that they contain water and oil respectively. Claim 8 is therefore not inventive.

Client application

GB 2020202.0

Tanker and method of transporting liquid cargo

The invention relates to watercraft, in particular tanker ships for transporting large quantities of liquid products, such as crude oil and petroleum products, and to methods for transporting liquid cargo using such tankers. A typical tanker is shown in **Figure 1**, where it will be seen that the cargo space is divided by bulkheads (partitions) into separate tanks 10.

When the tanker is not loaded with oil, it is necessary to carry a suitable ballast in the compartments for proper weighting and stability of the tanker. For a long time, seawater was pumped into the same compartments as had been used for oil, to act as a ballast for the tanker. When the tanker is to be loaded at the refinery or other loading area, the seawater is discharged into the sea or river to make room for the cargo of crude oil or other products. Although theoretically oil and water do not mix, in practice the seawater pumped into an oil compartment will collect oil and contaminate the sea or river at the point of discharge, causing pollution.

Another problem is that there is a risk of explosion if the cargo containers are partially or completely empty, which presents a risk that the empty portion of the cargo container fills with potentially flammable vapour. Extensive research work has been carried out to reduce the risk to a minimum, but no fully satisfactory solution has yet been found.

One configuration that offers a partial solution to both these problems is shown in US 3,333,333, granted 20 January 2000. **Figure 2** is taken from this document and shows a ship’s ballasting system vertically separating the interior of a tank 10 into oil cargo and water ballast sections. The liquid cargo (oil) connection is shown at 23, communicating

with the oil cargo sections A and C of the tank, while a pipe 30 feeds ballast (seawater) into the ballast section B of the tank. A pair of flexible membranes 25 is securely fixed between the top 60 and the bottom 62 of the tank, thereby separating the oil tank 10 into the cargo sections A, C and the ballast section B. The entire tank is thus at all times full, namely of oil, ballast or both, thus ensuring stability and preventing sloshing of the liquids, and preventing gas or air build-up in the storage volume.

However, the membranes here are not supported, except in the centre by a perforated bulkhead 27, so it is difficult to control how they expand and contract as oil is pumped in and out and seawater is pumped out and in, so that unpredictable strains, and even damage, may occur in the membrane. Additionally, the membranes are somewhat inaccessible and hence difficult to clean.

According to the invention, a tanker ship is now proposed which is equipped with at least one collapsible container for receiving liquid cargo, such as oil. The container is preferably formed in a concertina fashion, located in a corresponding cylindrical tank against which the concertina is supported. Thus, pollution and explosions can be prevented, while no unpredictable stresses on the membrane will arise.

The container is initially in a substantially collapsed state, and when the cargo, e.g. crude oil, is fed in, the container expands to accommodate the cargo. Because the container is initially collapsed, there is no need to expel air from inside the container when introducing the cargo and therefore no volatile components of the cargo can mix with air, so that the risk of creating an explosive mixture is avoided. As the cargo is discharged from the container, the container collapses again, and no air is introduced into it.

The container can be formed in a wide variety of shapes, but preferably at least parts of its walls are flexible; they can

be made, for example, of reinforced rubber or plastic. While the container could be in the form of a fully flexible bag or sack, it preferably has at least one rigid wall, e.g. the top wall, to which the remaining walls are sealingly connected. Also, each tank in the tanker has rigid walls against which the flexible walls of the container can rest when the container is expanded. In such an arrangement, the walls of the container need not be strong enough to withstand all the forces exerted by the oil. For example, the container may be placed in an open-topped cargo bay or tank having rigid side walls and a rigid bottom. The container then preferably has a rigid top wall for closing the open top of the cylindrical tank, a bottom wall and collapsible side walls.

The container is preferably designed in such a way that it can be easily removed from the tanker. In this way it is possible to remove residues from the tanker and to dispose of them, and no cleaning work needs to be carried out on board the ship. Preferably the container is designed to be cleaned and reused, and, since it can be removed from the tanker, cleaning is easy.

In this way, not only is it possible to avoid contamination of the world's oceans, but also the risk of explosion is avoided or at least greatly reduced.

Water can be introduced into the cargo bay outside the collapsible container. It is thus possible to keep the hold filled at all times with liquid of some kind; that is, while the oil is being withdrawn from the collapsible container, water can be introduced into the space (i.e. the tank) surrounding it, and this introduction of water can be used to contribute to displacing the cargo from the container. Adding water compensates for the weight loss caused by the removal of cargo, so that the trim (balance) of the tanker remains essentially unchanged when the cargo is discharged. Similarly, water can be drawn off during the loading process while the load is being pumped in.

The invention also envisages methods for transporting large quantities of liquid cargo in a tanker including a collapsible container in a rigid tank where the liquid cargo is introduced into the initially collapsed container, to cause the container to expand, or, where the liquid cargo is discharged after transport, causing the container to collapse, or both. Since the collapsible container is located in a tank in the tanker, water can be removed from the space between the tank and the outside of the container during loading of the cargo, and simultaneously introduced into the space between the tank and the outside of the container during unloading of the cargo. In this case, the rate of flow of the water is preferably equal to the rate of flow of the cargo, so that the overall volume of liquid in the tank remains constant. Since water is denser than oil, the water effectively supports the oil-containing membrane at all times, preventing any damage.

Reference is now made to the accompanying drawings, wherein:

Fig. 1 shows a tanker in a simplified perspective representation;

Fig. 2 shows a system of the Prior Art for segregating oil and water; and

Fig. 3 shows one of the tanks of the tanker in accordance with the invention, partly in a vertical section.

The tanker shown in Figure 1 is typical of those to which the invention can be applied. It carries its cargo in, typically, eight to twelve separate tanks 10, which in US 3,333,333 are each as shown in Figure 2.

With the invention, as shown in an embodiment in **Figure 3**, the tank 10 is open at the top and has a rigid base 11 and rigid side walls 12, which protrude somewhat above the deck 13; the upper rims of the side walls have outwardly flared flanges 14 in effect delimiting an open hatch which can be closed by a removable rigid lid or cover 15. The

cover 15 is releasably held in position by retaining members 16, which are connected by hinged bolts 17 to the flanges 14 and can be maintained in their holding position by screws 18 which are screwed into the cover 15. The tank 10 is generally circular-cylindrical in cross-section, though other tank shapes are possible, e.g. square.

The underside of the cover 15 forms the upper boundary of a container 19 which accommodates cargo and whose side walls and bottom are formed by a flexible bag-shaped membrane 20 depending from the cover 15 and thus secured in the upper region of the tank. This membrane is made of a plastic reinforced with a textile material and comprises a flexible lower wall or bottom 21 and collapsible side walls 22, the latter being preformed or provided with zigzag folds or corrugations, forming a bellows. The upper edges of the side walls 22 are folded outwards and clamped between a rectangular frame 24 and the underside of the cover 15. The container 19 could in principle be made entirely of flexible material and merely attached to a lid, so as to be held in the top region of the tank.

It can be seen that the flexible membrane 20 together with the rigid cover 15 form an independent and fully enclosed container 19 for the liquid load, with substantially the same shape and internal volume (≥ 90%) as the tank 10 when fully expanded. The load, e.g. crude oil or petroleum products, can be supplied to or removed from the collapsible container 19 from above via a feed pipe 26, which extends through and is firmly held by the rigid cover 15 and is permanently installed in the cover. As shown in Figure 3, the cover also carries an upwardly projecting vent tube 28 with a pressure- or temperature-sensitive vent valve 29, by means of which any residual gases in the container 19 are immediately vented to the atmosphere as necessary. However, as discussed below, the system functions in such a way that little or no gas remains in the collapsed container 19.

An inlet pipe 31 for supplying ballast water and a return pipe 32 for discharging ballast water are installed in the base 11 of the tank 10, and these pipes are connected to the fill side and the suction side of a pump 33, respectively.

The operation of the tanker will now be described. According to Figure 3, the collapsible cargo container 19 is essentially empty to start with, with the flexible membrane 20 collapsed upwards to the top cover 15 as shown, and the space between the bottom wall 21 of the membrane 20 and the base 11 of the tank 10 is filled with ballast water. The membrane may be collapsed to such an extent that the tank 10 is almost entirely filled with water, and the internal volume of the container 19 is essentially nil.

Oil is then pumped into the container 19 via the pipe 26 through the top cover 15, and at the same time water is sucked out of the tank 10 by the pump 33 adjacent to the base 11 and either supplied to a storage container or discharged from the tanker. As the oil is fed in from the top, the container 19 expands downwards, preferably supported at all times by the water, and the filling of the container can continue until the expanded container is full of oil and itself almost entirely fills the cylindrical volume of the tank, and all but a residual amount of water has been drained from the tank 10. A thin layer of water remains between the base 21 of the membrane and the base 11 of the tank 10, and also some water will have entered the spaces between the side walls 22 of the membrane 20 and the side walls 12 of the tank 10. This water acts as a lubricant and cushion between the membrane and the tank to minimise the risk of the membrane being damaged by chafing or wrinkling against the tank sides.

When the oil is to be unloaded, it is pumped up and out of the container 19 via the pipe 26. This causes the membrane 20 to collapse upwardly towards the cover 15 as the oil is removed, so that essentially no air- or gas-filled cavity is

formed within the membrane as it collapses towards the cover. Simultaneously, the pump 33 delivers water from the storage tank, if present, or fresh seawater, to the tank 10 from below to fill the space in the tank 10 previously occupied by the collapsible container 19 holding the oil. The oil load is therefore continuously supported by the water filling the tank 10 from the bottom, so that there is practically no pressure difference across the membrane. This can be achieved by a valve control system of known type, not shown.

The oil residues that remain stay in the interior of the membrane, so that they do not come into contact with the walls of the tank 10. When these residues are to be removed, the locking parts 16 are loosened, whereupon the container 19 formed by the cover 15 and the membrane 20 is lifted out of the tanker as a whole with the aid of lifting eyes 50 and brought ashore, whereupon the cover is replaced with another cover to which a new or cleaned membrane has been attached. The used container is taken to an appropriate place where the residues can be disposed of. The membrane 20 may be removed from the cover 15 and either destroyed, along with the residue, or cleaned and reattached to the cover for reuse.

On some tankers it may be possible to arrange for water to be pumped into the tanks 10 under sufficient pressure to force faster emptying of the oil from the flexible container 19.

CLAIMS

1. A tanker, having at least one tank (10) in which is located a collapsible container (19) for liquid cargo.

2. A tanker according to claim 1, in which at least some (21, 22) of the walls of the container (19) are flexible.

3. A tanker according to claim 1 or 2, in which the container (19) has at least one rigid wall (15) to which the flexible wall or walls (21, 22) are connected and sealed, and towards which the flexible walls can collapse.

4. A tanker according to claim 2 or 3, in which the tank (10) has rigid walls (11, 12) on or against which the flexible walls (21, 22) of the container (19) can be supported.

5. A tanker according to claim 4, in which the tank (10) is open at the top and delimited by rigid side walls (12) and a rigid base (11), and the container (19) is arranged within it, the tank and container having matching horizontal cross-sections such that the container fits closely inside the tank.

6. A tanker according to claim 5, including a means (26) for supplying liquid cargo into, and withdrawing cargo from, the collapsible container (19).

7. A tanker according to claim 5 or 6, further including means (31, 32, 33) for transferring liquid ballast into, and draining ballast from, the space between the tank (10) and the outside of the collapsible container (19).

8. A method for transporting liquid cargo in a tanker, in which the cargo is introduced into an initially collapsed collapsible container in a rigid tank in the tanker, thereby causing the container to expand, and the cargo is then transported within the collapsible container in the tanker; and when the cargo is drained off, causing or allowing the container to collapse, the resulting space is at least partially filled with ballast.

Application drawings

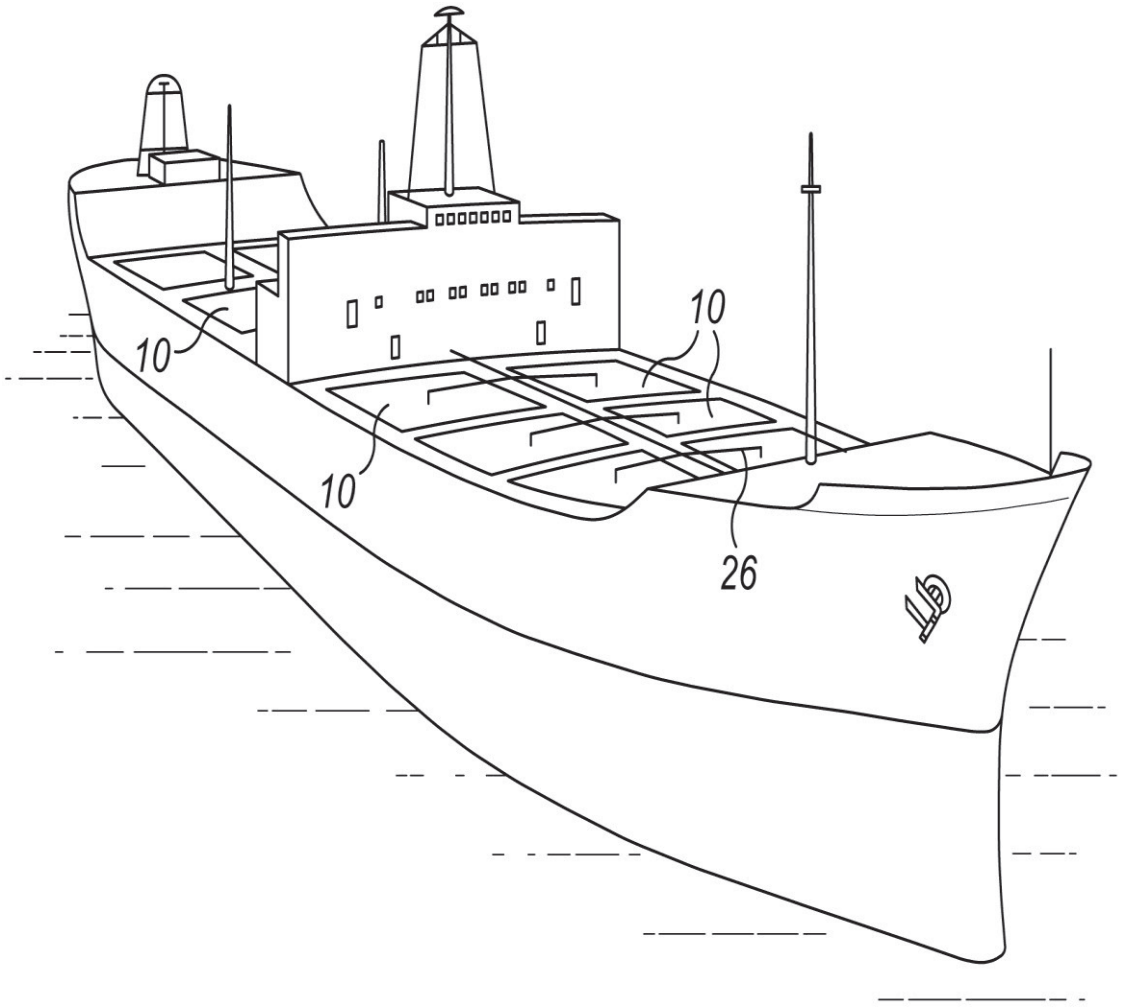

FIG. 1

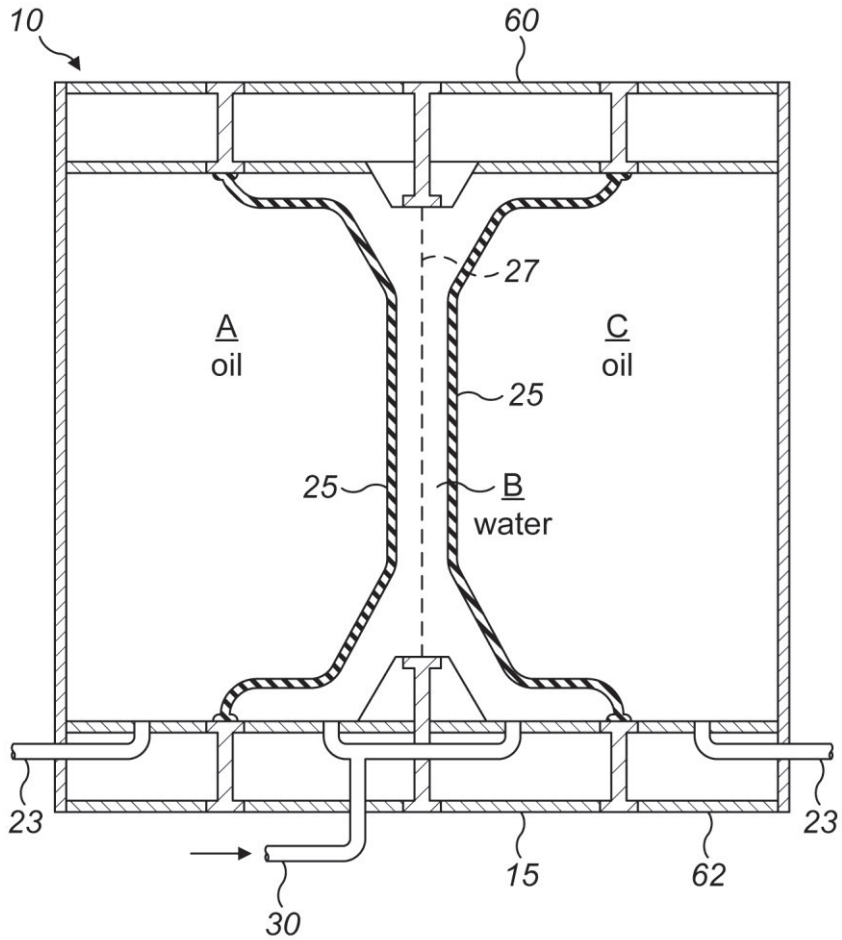

FIG. 2
Prior Art

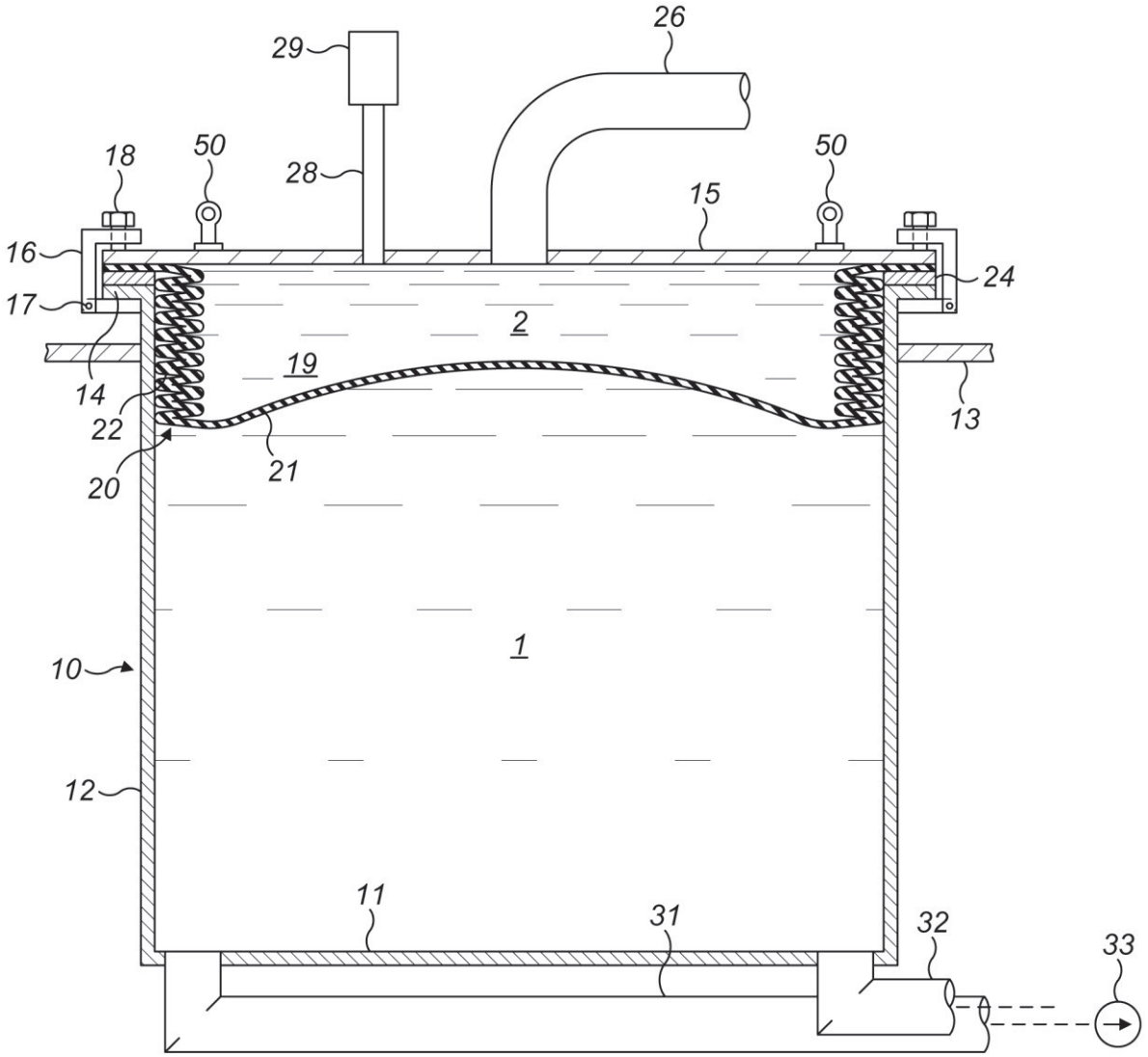

FIG. 3

Document C

Prior art reference D1

GB 2030405

Granted 24 September 1996

Ship Ahoy! Ltd

This invention relates to improvements in Anti-Pollution Ballast Containers for tankers for transporting crude oil or other liquid material.

The tanker is generally provided with compartments which are adapted for receiving crude oil for transportation. When the tanker is not loaded with oil, it is necessary to carry a suitable ballast in the compartments for proper weighting of the tanker for transportation when empty of oil. To avoid contamination of the oil by the seawater and the water by the oil, segregated flexible containers have been proposed.

One object of the invention is to improve the construction of containers for liquid ballast in a tanker to provide for the introduction and discharge of ballast liquids, such as seawater, without contamination or pollution of the area adjacent to the point of discharge.

The ballast container should be filled with ballast liquid, such as seawater, and emptied again when loading, whereupon the ballast container will collapse, releasing substantially the full capacity of the compartment. In order to enable collapse of the ballast container, its side walls are arranged to fold like a bellows or concertina, and are guided in this folding action to ensure proper collapse in a minimum of space within the compartment.

According to the invention, a container is located within a compartment of a tanker, such as an oil tanker. The container is constructed with a flexible surrounding wall having contracting rings secured at intervals therearound so as to cause collapsing of the container in folds that are guided by rings secured to the wall of the container between the folds. The container is then collapsed, and will expand again under pressure when ballast liquid is pumped into the container to provide the appropriate quantity of ballast weight within the compartment. The ballast can later be discharged from the tanker without it being contaminated with the oil. The container is collapsed when it is time to fill the compartment with oil or other cargo.

The present invention may more readily be understood by reference to the accompanying drawings, in which:

FIG. 1 is a vertical section through a tanker compartment, showing the container in place therein; and

FIG. 2 shows a perspective view of the concertina-shaped container.

DETAILED DESCRIPTION

An oil tanker is constructed in the usual manner, with a series of compartments, one of which is shown at 2 in Figure 1. Several such compartments are spaced throughout the major portion of the hull of the tanker. One side wall of the hull is shown generally at 3 in Figure 1 as enclosing one of the compartments 2. The compartment extends vertically from the deck 4 to the base 5 of the compartment 2 and is spaced above the ship bottom plate 6 by bottom beams 7 in the hull. The tanker is provided with the usual means, not shown, for pumping oil into and out of the respective compartments 2 in the hull, e.g. through a pipe extending through the deck 4.

Mounted within each of the compartments 2 is an upstanding cylinder, indicated at 8, which preferably extends from the deck 4 to the bottom 5 of the compartment and is secured thereto. The cylinder 8 is provided with perforations 9 in its wall substantially throughout its height so as to allow open communication through the wall of this cylinder between the interior and exterior. Thus, the cylinder will be filled with oil or other cargo liquid when the compartment 2 is filled and likewise will be emptied when the oil is pumped out of the compartment 2.

Mounted within the cylinder 8 is a container 10 whose body is constructed of elastic material substantially throughout its height, although it has a bottom metal plate 11 that is firmly secured to the base 5 of the compartment 2. The cylinder 8 walls and base support the elastic container 10 when it is expanded.

The container bottom metal plate 11 is sealed to the edge of the side wall of the container 10 around the circumference. A container top plate 12, also of metal, covers the volume within the perforated cylinder 8 over the upper end of the container 10. The top plate 12 of the container 10 can be sealed either by extending the elastic material to cover the top plate 12 or by sealing the edges of the surrounding elastic wall to the edges of the plate 12.

The surrounding wall of the container 10 is constructed with contracting rings 13 secured to the elastic wall and spaced there along axially so as to pull the wall into concertina folds or sections indicated at 14. The contracting rings 13 may be in the form of heavy rubber bands extending around the inner circumference of the concertina folds or sections 14 and which are employed to pull the inner folds of the container inwardly when the container is to be collapsed.

Heavy metal guide rings 16 are internally secured to the container 10 between the folds 14 in order to maintain the folds at all times in contact with the perforated cylinder 8 at their peripheries.

A water supply pipe 17 extends through and is attached to the fixed bottom plate 11 of the container 10 from a main supply pipe 18 having suitable pumping means, not shown. A control valve is shown at 20 which may be opened and closed by a reach rod 21 extending to a suitable point above the top deck 4, as shown in the Figure.

When the compartment 2 is filled with oil or other liquid cargo for transportation, the container 10 will be completely collapsed in the bottom of the cylinder 8 in the compartment 2. When it is so collapsed, all of the folds 14 will lie flat upon each other and upon the metal guide rings 16 that are interposed therebetween in the bottom of the cylinder 8. The contraction rings also will lie directly one upon another over the inner edges of the guide rings 16. Thus, almost the entire volume of the compartment 2 above the collapsed container 10 can be filled with liquid cargo.

When the tanker is to have its cargo unloaded, it is desirable to fill each of the containers 10 with a suitable ballast liquid. Seawater is often used for this purpose and may be pumped directly into the container 10 through the pipes 18 and 17 at the base of the container 10 after removal of the cargo liquid from the compartment 2. The seawater will cause the elastic container 10 to expand upwards as the clean ballast water is pumped into the container, flattening the elastic wall against the inner face of the perforated cylinder 8, as illustrated in the lower portion of the Figure. This will continue until the desired quantity of clean ballast water is provided in the container 10 within the compartment 2 or until all of the folds of the container 10 have thus been expanded. The clean ballast water is thus confined in an elastic container out of communication with the oil space in the compartment 2 so as not to be contaminated with the oil.

When it is desired to take on a load of cargo, the clean ballast water from within the collapsible container 10 can be pumped out directly into the sea or river adjacent to the point of loading without polluting the area at the loading point. As the clean ballast water is thus pumped out, the container will advantageously automatically collapse under gravity into the bottom of the perforated cylinder 8 in the manner described above, and oil can then be pumped into the top of the compartment 2 and fill the cylinder 8 through the perforations.

(*Claims omitted*)`

D1 drawings

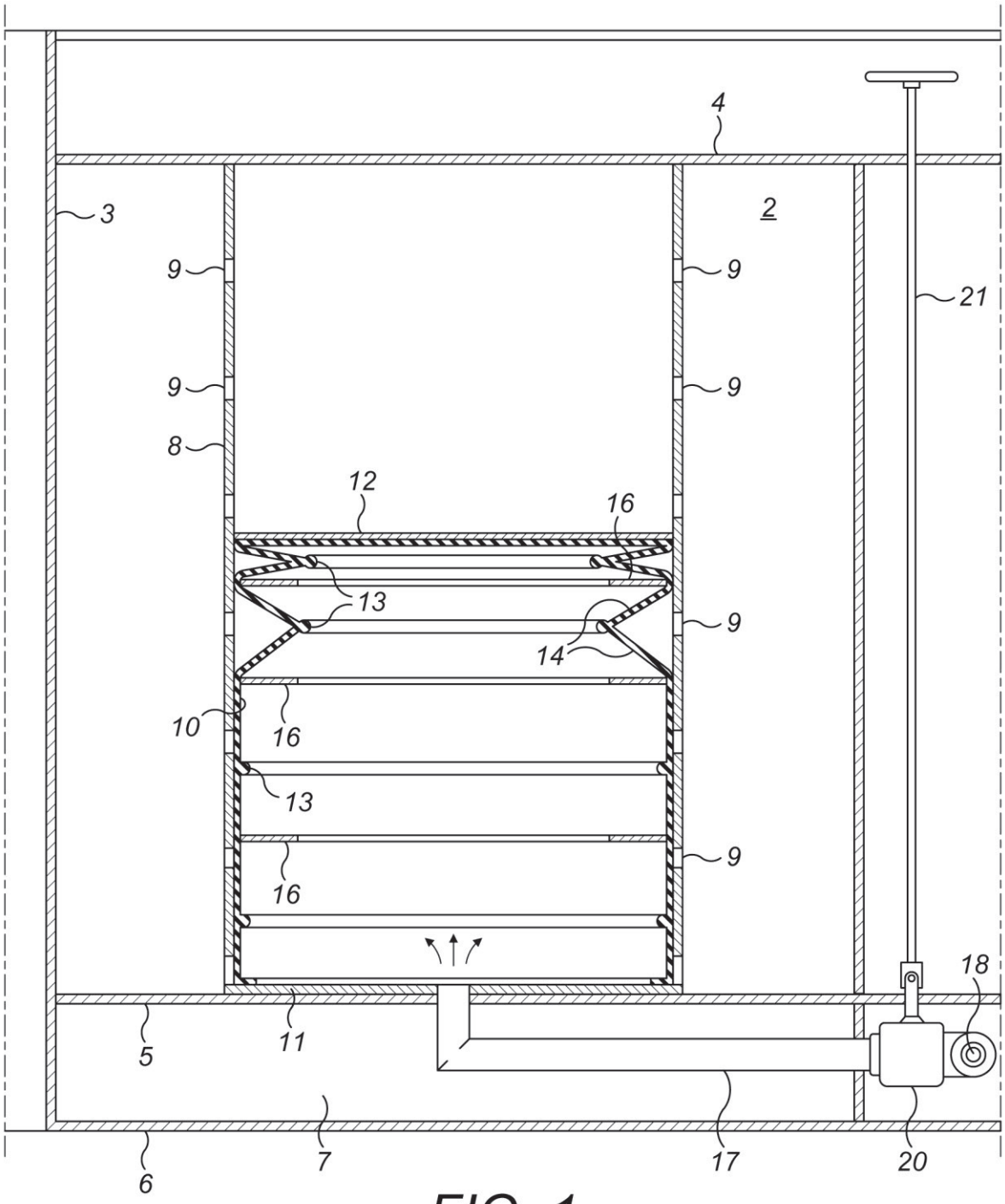

FIG. 1

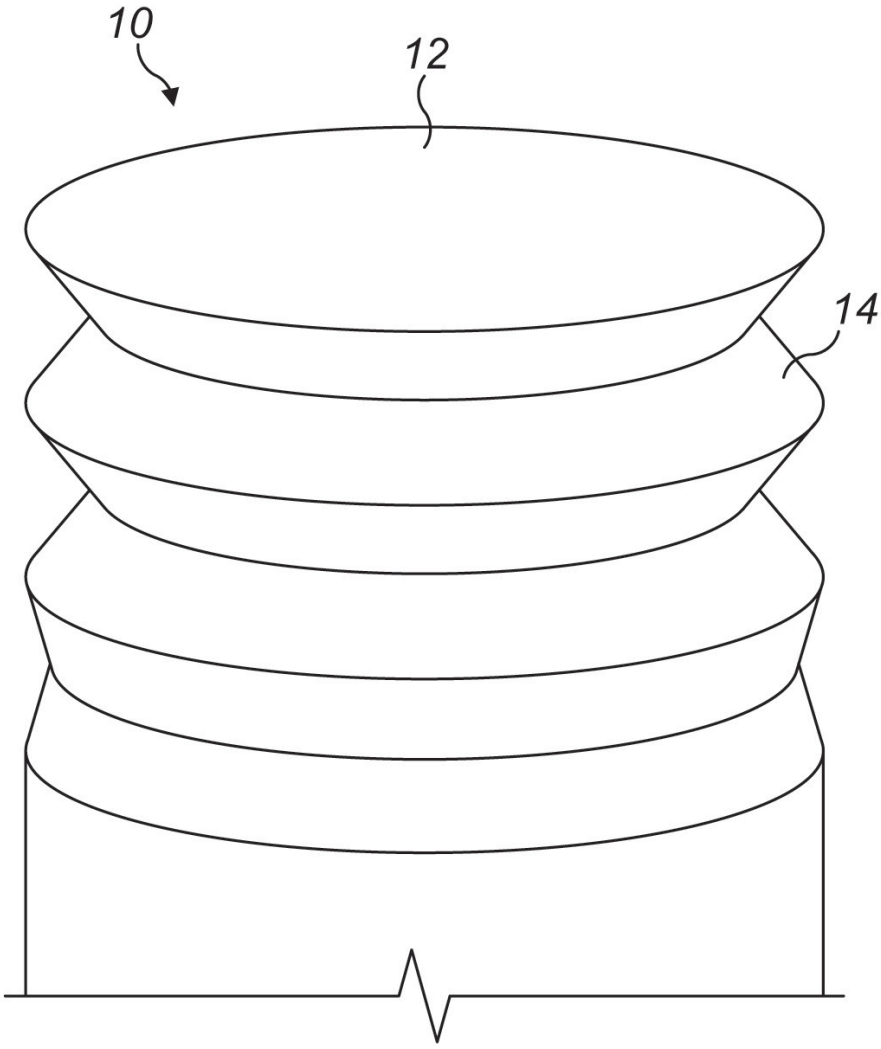

FIG. 2

Spare set of Claims

CLAIMS

1. A tanker, having at least one tank (10) in which is located a collapsible container (19) for liquid cargo.

2. A tanker according to claim 1, in which at least some (21, 22) of the walls of the container (19) are flexible.

3. A tanker according to claim 1 or 2, in which the container (19) has at least one rigid wall (15) to which the flexible wall or walls (21, 22) are connected and sealed, and towards which the flexible walls can collapse.

4. A tanker according to claim 2 or 3, in which the tank (10) has rigid walls (11, 12) on or against which the flexible walls (21, 22) of the container (19) can be supported.

5. A tanker according to claim 4, in which the tank (10) is open at the top and delimited by rigid side walls (12) and a rigid base (11), and the container (19) is arranged within it, the tank and container having matching horizontal cross-sections such that the container fits closely inside the tank.

6. A tanker according to claim 5, including a means (26) for supplying liquid cargo into, and withdrawing cargo from, the collapsible container (19).

7. A tanker according to claim 5 or 6, further including means (31, 32, 33) for transferring liquid ballast into, and draining ballast from, the space between the tank (10) and the outside of the collapsible container (19).

8. A method for transporting liquid cargo in a tanker, in which the cargo is introduced into an initially collapsed collapsible container in a rigid tank in the tanker, thereby causing the container to expand, and the cargo is then transported within the collapsible container in the tanker; and when the cargo is drained off, causing or allowing the container to collapse, the resulting space is at least partially filled with ballast.