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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, the collapsible container comprising a flexible membrane depending from a cover of the tank at an upper region of the tank, the collapsible container configured to receive a liquid cargo via the upper region of the tank and configured to expand downwardly within the tank in use, the remaining portion of the tank configured to store a ballast liquid which surrounds the collapsible container and supports the flexible membrane of the collapsible container in use.
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).

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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, the collapsible container comprising a flexible membrane depending from a cover of the tank at an upper region of the tank, the collapsible container receiving the cargo via the upper region of the tank 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 and delivering ballast liquid to surround the collapsible container and fill the remaining space in the tank in order to support the collapsible container, ~~the resulting space is at least partially filled with ballast.~~ 8

Claims

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[Instruction to Candidate: Save your Answer document to your computer as a Word document. Convert the Answer document to a PDF. Check and then Upload the PDF-ed Answer document to the PEBX system.]

Letter to UKIPO

Dear Examiner,

We write in response to the examination report dated 26 July 2023 with a replacement set of claims.

Amendments

Claim 1 has been amended to recite:

“the collapsible container comprising a flexible membrane depending from a cover of the tank at an upper region of the tank, the collapsible container configured to receive a liquid cargo via the upper region of the tank and configured to expand downwardly within the tank in use, the remaining portion of the tank configured to store a ballast liquid which surrounds the collapsible container and supports the flexible membrane of the collapsible container in use”,

finding basis in the description at:

- Page 5, lines 18 and 19, *“for receiving liquid cargo”,*
- Page 8, lines 9 to 11, *“membrane 20 depending from the cover 15 and thus secured in the upper region of the tank”*. It is understood from this paragraph that the membrane may be held between the cover and the flared flanges of the tank, or may be attached to the cover itself (see page 8, lines 17 to 20). The description considers different ways in which the

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membrane may be supported with respect to the cover, and thus it is submitted that the amendment is supported.

- Page 6, line 28, "*water can be introduced into the space (i.e. the tank) surrounding it*". The support liquid, water, is introduced around the collapsible container in order to support it.
- Page 8, lines 25 to 27 "*the load... can be supplied to or removed from the collapsible container from above*". It is submitted that the specific features of a feed pipe are not essential to the working of the invention, but rather that the load is received from above to cause the collapsible container to expand downward. The term upper region has been used in place of 'above' for improved clarity, and to relate to features defined in claim 1.
- Page 9, lines 19 and 20 "*container 19 expands downwards, preferably supported at all times by the water*". It is submitted that the term downwards, while relative, is provided in the context of an upper portion of the tank, and is clear. While the term water is used in the above basis, the function of the water is provided in the claim i.e., that water acts as a ballast to support the membrane.

Claim 8 has been amended in line with claim 1 above, with respect to the flexible membrane configuration and receiving the cargo, and has also been amended to recite:

- "*and when the cargo is drained off, causing or allowing the container to collapse and delivering ballast liquid to surround the collapsible container and fill the remaining*

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space in the tank in order to support the collapsible container”,

finding basis in the description as above, and at:

- Page 10, lines 2 to 7, “*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*”, and at page 6 as described above.

It is understood that water is delivered into the tank in order to fill the remaining space of the tank such that the ballast supports the membrane as the collapsible container contracts back upwards towards the top of the tank as load is pumped out of the container. Similar terminology is used in claim 8 as that used in claim 1, as described above.

Support 6

Novelty

Documents D1 and D2 were published/known to the public before the priority date (which is the filing date of the present application) and are citable for the purposes of both novelty and inventive step.

Claim 1 has been amended to recite the above features.

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D1, while having a collapsible container 10, does not disclose “*a collapsible container comprising a flexible membrane depending from a cover of the tank at an upper region of the tank*”. As is clearly shown in D1 Figure 1, the collapsible container is attached to the bottom plate of the tank via bottom plate 11, and is located within what is considered the lower portion of the tank.

Further, the collapsible container 10 is not configured to “*receive a liquid cargo via the upper region of the tank*”. Instead, the collapsible container is configured to receive water (equivalent to a ballast liquid) via the bottom of the tank, via supply 17.

Even further, the remaining portion of the tank is not configured to “*store a ballast liquid which surrounds the collapsible container and supports the flexible membrane of the collapsible container in use*”. The cylinder 8 is used in order to support the elastic container 10 rather than the ballast liquid itself. Further, the cylinder 8 and top plate 12 prevent the ballast liquid from surrounding and supporting the flexible membrane.

Considering now D2, shown in Figure 2 of the present application, D2 does not describe “*the collapsible container configured to receive a liquid cargo via the upper portion of the tank and configured to expand downwardly within the tank in use*”. As is clear from the description of D2, and Figure 2 itself, the membranes 25 are configured to move left and right in use with a connection to oil 23 provided at the bottom of the tank.

Further, the ballast liquid located within the central portion B in Figure 2, does not support the flexible membrane of the collapsible container in use. Rather, a

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perforated bulkhead 27 is provided between the membranes 25 in order to provide support.

Nov. (Claim 1) 4

Claim 8 has been amended to recite features and steps corresponding to those recited in claim 1, and to specifically to require that ballast liquid fills the remaining space in the tank in order to support the membrane of the collapsible container.

It is noted that claim 8, by receiving the cargo from an upper region of the tank, is novel for the same reasons as claim 1.

Further, such support is not provided by D1 due to the cylinder 8, as described above. Further D2, describes no requirement that ballast liquid is delivered to the tank in order to fill the remaining space in the tank. It appears impossible from D2 that the ballast liquid could fill the remaining space, given the ballast liquid itself is contained within the collapsible container.

While D2 considers that both portions A and B of the tank are full at all times, it does teach that the ballast liquid is inserted to provide support to the collapsible container or surround it.

Novelty (Claim 8) 3

Inventive Step

Inventive step will be assessed using the Pozzoli approach. ✓

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The person skilled in the art (PSA) is understood to be cargo transport engineer, with a common general knowledge of existing cargo transport solutions such as tankers, properties of the cargo being transported and their drawbacks (including risks of explosion etc.) and the concept of using ballast while not carrying cargo. Such knowledge is described in the application between lines 2 and 26 on page 4.

The inventive concept of the features of claim 1 is to provide support to the collapsible container using the ballast liquid provided in the remaining part of the tank, and avoiding unpredictable stresses on portions of the collapsible container. 2

The state of the art is taken to be the embodiment described in document D1, since this embodiment resembles the present invention most closely in terms of the structure of the collapsible container.

The differences between the present invention and D1 are described above in the novelty section, and include:

- *“a collapsible container comprising a flexible membrane depending from a cover of the tank at an upper region of the tank”;*
- *“configured to receive a liquid cargo via the upper region of the tank”;* and
- *“configured to store a ballast liquid which supports the flexible membrane of the collapsible container in use”.*

It is submitted that the PSA would not consider these differences to be obvious, even when combined with the CGK for a number of reasons.

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Firstly, in order for the collapsible container to receive a liquid cargo from an upper region of the tank, substantial redesign of the embodiment shown in Figure 2 would need to occur, given that currently the collapsible container is not connected or positioned near the upper region of the tank. Tubes or infeed pipes would need to extend from the upper portion down through the tank to the collapsible portion, passing through space in the tank for storing load (reducing its capacity) while an existing bottom feeding solution is already provided.

Second, it is clear from claim 1 that remaining portion of the tank is used to support the flexible membrane in use. The cylinder 8 of D1 is used to provide support to the flexible membrane when expanded (see page 16, line 20), and thus a solution for the support of the flexible membrane is already provided and the PSA would have no reason to consider an alternative.

Even when starting from D2, the PSA would not find the differences obvious since arriving at the features of claim 1 would require substantial reconfiguration of the membranes and liquid loading mechanisms already provided. Rather, the support offered by the remaining part of the tank provides exactly the benefit over systems such as that shown in D2, where unpredictable stresses can occur against the membrane as the ballast and load are inserted and removed from the tank.

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The loading of the liquid cargo from the top is also completely missing from D2, and thus the associated advantage of preventing gas build up within the tank cannot be achieved. I.S. (Claim 1) 4

With regards to claim 8, even if the interpretation taken by the Examiner was considered, the PSA would not find the differences obvious due to modifications necessary to the system as described in relation to claim 1.

I.S (Claim 8) 0

Best regards,

Mr Lubber

Letter

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Client Memo

Thank you for your letter.

I enclose a draft response to the pending examination report for your review. The deadline for a response is 26 November 2023, which has not yet passed. If you require additional time to review the response, we can request a 2-month extension as of right at any time until the 26 January 2024. If additional time is needed, we can request a discretionary extension for further time, preferably before the 26 January 2024 deadline.

The Examiners comments assert that the product claims 1 to 7 as filed lack novelty over both D1 and D2, and that the method claim could lack novelty over D1, but in any event lacks an inventive step.

As you will see, we have amended claim 1 to focus on the feature you deemed to be most important in your letter, namely that the collapsible container is filled from the top and supported by seawater at the bottom. We understand that the benefits of this are described as preventing unpredictable forces on the membrane. We also added features to better discern from the membranes currently used in D1 and D2, by specifying that it depends from an upper region of the tank. Such a distinction helps with novelty over D1, since the collapsible container is clearly shown in a bottom region. While the membrane 25 of D2 could be said to depend from an upper region of the tank, and may thus not be

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novel in itself, the upper region terminology helps define other terminology in the claim.

The main argument is that neither document provides the support to the flexible membrane as per the present invention, since the D1 collapsible container is separated from the other liquid via a cylindrical barrier 8, and since the ballast liquid of D2 is positioned laterally adjacent the stored load liquid in section A, providing the unpredictable forces described in the specification.

While we considered the other benefits mentioned in your letter regarding the reinforcement of the collapsible container. However, we feel that further specification of the collapsible container in terms of features that are missing from the collapsible container would be difficult. Also, the benefit of being able to remove the container from the tank for cleaning appeared secondary to the important difference, and since the systems of D1 and D2 could be removed in order to clean the tanks, albeit with these cleaning procedures taking more time and effort.

With regards to potential infringement of the claims, I note that the subject matter relates to technology for use on ships. The UK patents act provides certain exemptions to products and methods used on ships temporarily or accidentally in the UK, where these ships are registered at another country/territory.

Infringement would occur on ships registered in the UK.

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I would recommend filing a divisional application in order to pursue claims to the collapsible container, or flexible membrane in particular, alone (separate from the tanker).

At the moment, the claims relate to the entire tanker (which while if infringed would provide a large remuneration for damages) could avoid being direct infringement by selling of parts or even an entire tank system separately. These acts may fall under secondary infringement, however this would then require territorial requirements which could be circumvented if both parties are not located in the UK.

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Notes

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