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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 3: E02B 15/04	A1	(11) International Publication Number: WO 80/01580 (43) International Publication Date: 7 August 1980 (07.08.80)

(21) International Application Number: PCT/SE80/00033

(22) International Filing Date: 4 February 1980 (04.02.80)

(31) Priority Application Number: 7900974-2

(32) Priority Date: 5 February 1979 (05.02.79)

(33) Priority Country: SE

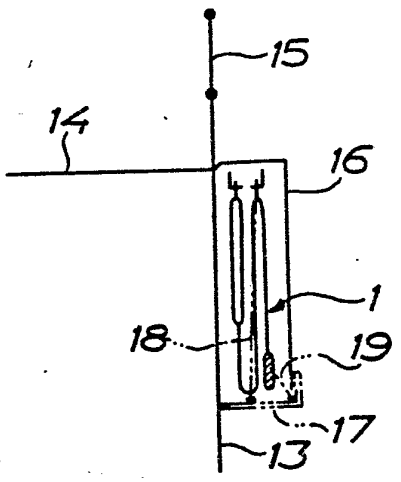
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(81) Designated States: DE, DE (Utility model), DE (European patent), DK, FR (European patent), GB, GB (European patent), JP, NL, NL (European patent), NO, US.

Published
With international search report

(54) Title: OIL LEAKAGE CONFINER FOR VESSELS, OFF-SHORE OIL WELL RIGS, ETC



(57) Abstract

The confiner (1) according to the invention is arranged in a stand-by condition along the sides (13) of the vessel or rig as an enclosed unit.

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OIL LEAKAGE CONFINER FOR VESSELS, OFF-SHORE OIL WELL RIGS,ETC

The present invention relates to an oil leakage confiner for vessels, off-shore oil well rigs, etc.

As already known oil leakage confiners are used to surround escaped oil which may occur in connection with grounding of vessels or oil-leaks from off-shore oil well rigs. The intention is to restrict the damage that may be caused by such an oil-spill. The confined oil is skimmed from the surface of the water or is taken care of in some other way. It is of great importance that the oil confiner can be launched at short notice to prevent the oil from escaping to a wider area by the influence of wind and currents.

The several measures available today for handling oil-spills imply that specially equipped vessels are used to surround and/or destroy the escaped oil. Thus, there is no effective way of surrounding the very source of the leakage. This means that neighbouring coasts may be damaged by the escaped oil.

A primary object of this invention is to provide an oil confiner which may be launched immediately when oil has escaped, in order to surround the very source of the leakage.

A further object of this invention is to provide an oil confiner which is easy to handle and which requires very little space when stored on a vessel or on an off-shore oil rig.

Another object of this invention is to provide an oil confiner which can be launched by a simple push-button operation.

A still further object of this invention is to provide an oil confiner the capacity of which is improved as compared with prior art oil confiners.

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To achieve the foregoing objects and in accordance with the purpose of the invention, as embodied and broadly described herein, the oil confiner according to the invention is arranged in a stand-by condition along the sides of the vessel or rig as an enclosed unit.

Preferably, the confiner includes several sections comprising inflatable hulls connected together.

The confiner can be suspended from the sides of the vessel or rig by means of disengageable couplings, the disengagement of which effects an automatic launching of the confiner.

Loops cooperating with the couplings are attached to the upper edge of the confiner adjacent to or along the inflatable hull which forms an integral part of the confiner.

The depth of the confiner or the space required for storing the confiner along the sides of the vessel or rig can be increased or decreased, respectively, by attaching loops between the hull and a sinker at the bottom of the confiner. These loops cooperate with the said couplings, which means that the confiner will be arranged double-folded in the stand-by position.

The capacity of the confiner can be increased by arranging the confiner in a serpentine-fashion along the sides of the vessel or rig and attaching it to the couplings there. This means that the total circumference of the confiner in the launching position will considerably exceed the circumference of the vessel or rig.

The couplings may include several hooks, each of which carries a portion of the confiner and which can be adjusted to a position to disengage the loops attached to the confiner. By arranging the hooks on one or more rotatable shafts, the loops can be disengaged from the hooks simply by rotating such shafts.

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When using at least two shafts, the hooks can be arranged to disengage first the loops between the hull and the bottom of the confiner and then the loops attached to the upper edge along the inflatable hull.

In a preferred embodiment of the invention the hooks are arranged on two spaced parallel shafts operatively connected by at least two pairs of toothed segments, one segment of each pair being connected to an operating mechanism comprising a rotatable gearwheel.

The confiner suitably is arranged in a stand-by position behind a protective housing alongside, inside or above the outer sides of the vessel or rig.

The confiner may be attached to the vessel or rig by means of spacers when the confiner is in the launched position thereof.

The capacity of the confiner depends upon the length of the confiner, which must exceed the circumference of the vessel or rig when the confiner is in the launched position thereof. The necessary length of the confiner can be achieved by arranging the confiner in a serpentine-fashion along the sides of the vessel or rig as mentioned above. In this way the confiner may be given a circumference exceeding the circumference of the vessel or the rig up to three times.

Alternatively, the confiner may be folded in a zig-zag-fashion in the stand-by position and then laid in a serpentine-fashion thus forming an essentially compact endless body. Such a confiner may simply be suspended or even laid out directly on a collapsible support along the outside of the vessel or rig.

When the couplings are operated first to disengage the loops between the hull and the bottom of the confiner, the bottom of the confiner will fall down along the sides of the vessel or rig. Then, the couplings disengage the loops attached to the upper edge of the

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confiner to launch completely the confiner. The inflatable hull forming an integral part of the confiner will then be filled with gas in order to give the hull a sufficient buoyancy. The hull of the confiner may be inflated automatically when striking against the surface of the water by means of gas-cartridges attached to the hull or, via air pipes, from a central supply of compressed air on the vessel or rig.

Instead of using hooks as coupling means, such means may comprise cables passing through the loops attached to the confiner. The cables are withdrawn from the loops when the confiner is to be launched. This means that two cables have to be used to launch a double-folded confiner.

When used on a vessel, the confiner preferably is released initially at the stern of the vessel and then continuously forwards in parallel with the sides of the vessel.

The confiner of this invention may be used on already existing vessels or oil rigs, but the confiner will have a more protected storing place on the vessel or rig if constructed from the beginning to carry the confiner.

The sinker of the confiner of this invention may be used as part of the protective housing in which the confiner is stored in the stand-by position thereof. Said part of the housing may be released to fall freely towards the surface of the water a certain distance in such a way that the force of the falling sinker effects the unfolding of the double-folded confiner which is suspended along the sides of the vessel or rig. In this case the sinker may comprise a metal sheet connected to the bottom of the confiner.

When launched the confiner may still be connected to the vessel or rig by means of spacers which can be

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adjusted to provide different spacings between the confiner and the vessel or rig. Said spacings may vary around the circumference of the confiner.

The accompanying drawings which are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and, together with the description, serve to explain the principles of the invention.

In the drawings:

FIG 1 is a fragmentary perspective view of the double-folded confiner according to the present invention,

FIG 2 is a diagrammatic plan view of the confiner arranged in a serpentine-fashion in the stand-by position,

FIG 3 is a diagrammatic plan view showing the disengageable couplings in which the confiner is to be suspended along the sides of the vessel or rig,

FIG 4 is a sectional view of another embodiment of the disengageable couplings carrying the confiner at loops attached to the confiner,

FIG 5a-5c show different arrangements of the confiner along the sides of the vessel or rig, and

FIG 6 shows a confiner which has been folded in a zig-zag-fashion and then laid directly on a collapsible support forming part of a housing protecting the confiner.

In FIG 1 the confiner comprising an inflatable hull 2 and a sinker 3 is shown in a double-folded fashion. In this condition the confiner will be placed in a serpentine-fashion along the sides of the vessel or rig in order to obtain a circumference of the confiner exceeding the circumference of the vessel or rig when the confiner is in the launched position thereof. The confiner is releasably suspended at loops 4. The coupling shown in

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FIG 3 is used to store the confiner in a stand-by position and comprises two parallel rotatable shafts 9, 10 mutually spaced, on which couplings 11, 12 are attached. The loops 4 attached to the confiner are releasably engaged by said couplings.

The shafts 9, 10 are operatively interconnected by toothed segments 6, 7 which are rotatable together with the shafts 9, 10 to a position wherein the couplings 11, 12 disengage the loops 4 of the confiner. The shafts 9, 10 are operated to the disengaged position by actuating one segment of each pair of segments 6, 7 over a mechanism including a manually operated crank 8 and a right-angle gearing 8a operatively connected to the shaft 10 for operating the segment 7 which in turn engages and actuates the segment 6 attached to the shaft 9.

The coupling arrangement 5 shown in FIG 3 and 4 allows the confiner 1 to be unfolded in stages in such a way that the bottom part of the confiner is first released by disengaging the couplings from the loops 4, which means that the weight of the confiner 1 and the sinker 3 forces the folded section of the confiner to spread out vertically. The confiner will remain in this position along the sides of the vessel or rig, until the second couplings 12 have been disengaged from the loops 4 attached to the inflatable hull 2 of the confiner.

In the embodiment of the coupling arrangement according to FIG 4, the couplings 11', 12' are each integral with one segment of each pair of segments 6 and 7 which are rotated in a way similar to that mentioned with reference to FIG 3. Couplings 11' are formed as straight hooks while couplings 12' are formed as curved hooks. Thus, when the shafts 9, 10 carrying the segments 6, 7 and the couplings 11', 12' are rotated

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the couplings 11' will first disengage the loops 4' attached to the lower portion of the confiner and then, at continued rotation of the shafts, couplings 12' will disengage the loops 4 attached to the hull. When arranged as shown in FIG 4 the hook 11' abuts the hook 12' in the engaged position so as to prevent unintentional disengagement of the loops from the hooks.

FIG 5a shows an embodiment of the invention, wherein the confiner is stored within a housing 16 arranged along the outside 13 of the vessel or rig. The deck and the gunwale of the vessel or rig are indicated at 14 and 15, respectively. Preferably, the embodiment according to FIG 5a is used when the confiner of this invention shall be attached to an already existing construction.

In FIG 5a a lid 17 is shown. The lid is kept in closed position by means of holders 18 attached between the lid and one of the couplings. Alternatively, or additionally the lid may be connected to the sinker of the confiner by connection means 19 or may be connected to the bottom of the confiner by such means to be used as a sinker, provided that the weight of the lid 17 is sufficient for unfolding the confiner when released.

In the embodiment according to FIG 5b, which can be used on existing constructions as well as planned constructions, a protected storing place has been provided for the confiner 1 inside the outline of the vessel or rig.

In FIG 5c another arrangement is shown, wherein the confiner has been built in under the deck 14 and inside the outline of the vessel or rig.

A simplified, but yet reliable launching of the confiner may be achieved by the arrangement shown in FIG 6. The confiner 1 is folded in a zig-zag-fashion and stored in a serpentine-fashion inside the housing

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16. The launching of such a confiner can be accomplished in several different ways. The housing 16 in FIG 6 is shown with a bottom forming a collapsible support or releasable bottom 17, on which the confiner may be supported directly. The support or bottom 17 is attached to the housing through releasing means not shown in the drawing. By actuating these releasing means the support or bottom 17 may be dropped to launch the packed confiner. The launching of the confiner can be accomplished by inflating the hull of the confiner with compressed air to expand the confiner towards the support or bottom 17 and thus providing a force sufficient to release the support or bottom. It is possible to suspend the packed confiner in separate coupling means within the housing, which coupling means have to be disengaged in order to launch the confiner.

Instead of using a rigid support or bottom 17 at the housing 16 it is possible to use some kind of canvas as well. Preferably, the canvas is sealingly attached to the sides of the vessel or rig or to one upper edge of the housing and is releasably attached to the other upper edge of the housing to enclose the confiner therein. Accordingly, the confiner is stored within the canvas in the stand-by position. To prevent the confiner from being frozen and rigid, the confiner can be packed together with common salt or another antifreeze agent. Sealing means may be provided at the canvas material adjacent the releasable edge thereof.

It will be apparent to those skilled in the art that various other modifications and variations in addition to those mentioned above could be made in the confiner of the invention without departing from the scope and spirit of the invention.

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CLAIMS

1. An oil leakage confiner for vessels, off-shore oil rigs, etc, c h a r a c t e r i z e d in that the confiner (1) is arranged in a stand-by condition along the sides (13) of the vessel or rig as an enclosed unit.

2. A confiner according to claim 1, c h a r a c t e r i z e d in that the confiner (1) includes several sections comprising inflatable hulls (2) connected together.

3. A confiner according to claim 1, c h a r a c t e r i z e d in that the confiner (1) is suspended from the sides (13) of the vessel or rig by means of disengageable couplings (11, 12), the disengagement of which effects an automatic launching of the confiner.

4. A confiner according to claim 3, c h a r a c t e r i z e d in that loops (4) cooperating with the couplings (11, 12) are attached to the upper edge of the confiner (1) adjacent to or along the inflatable hull (2) which forms an integral part of the confiner.

5. A confiner according to claim 4, c h a r a c t e r i z e d in that the loops (4; 4') are attached between the hulls (2) and a sinker (3) at the bottom of the confiner, these loops (4; 4') cooperating with said couplings (11; 11') so that the confiner will be arranged double-folded in the stand-by position.

6. A confiner according to claims 3-5, c h a r a c t e r i z e d in that the confiner is arranged in a serpentine-fashion along the sides of the vessel or rig.

7. A confiner according to claim 3, c h a r a c t e r i z e d in that the couplings (11, 12; 11', 12') include several hooks, each of which carries a portion of the confiner, and which can be adjusted to a position to disengage the loops attached to the confiner.

8. A confiner according to claim 7, c h a r a c t e r i z e d in that the couplings (11, 12; 11', 12')

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are arranged on one or more rotatable shafts (9, 10) the rotation of which disengages the loops (4; 4') from the couplings.

9. A confiner according to claims 4 and 8, c h a r a c t e r i z e d in that the couplings (11'; 12') are arranged to disengage first the loops (4') between the hull (2) and the bottom of the confiner and then the loops (4) attached to the upper edge along the inflatable hull (2).

10. A confiner according to claims 8 and 9, c h a r a c t e r i z e d in that the couplings (11', 12') are arranged on two spaced parallel shafts (9, 10) operatively connected by at least two pairs of toothed segments (6, 7), one segment of each pair being connected to an operating mechanism (8) comprising a rotatable gearwheel (8a).

11. A confiner according to one or more of the preceding claims, c h a r a c t e r i z e d in that the confiner is arranged in a stand-by position behind a protective housing (16) alongside, inside or above the outer sides (13) of the vessel or rig.

12. A confiner according to one or more of the preceding claims, c h a r a c t e r i z e d in that spacers are connected between the confiner and the vessel or rig to provide different spacings between the confiner and the vessel or rig.

13. A confiner according to claim 4, c h a r a c t e r i z e d in that the couplings comprise one or more cables passing through the loops attached to the confiner.

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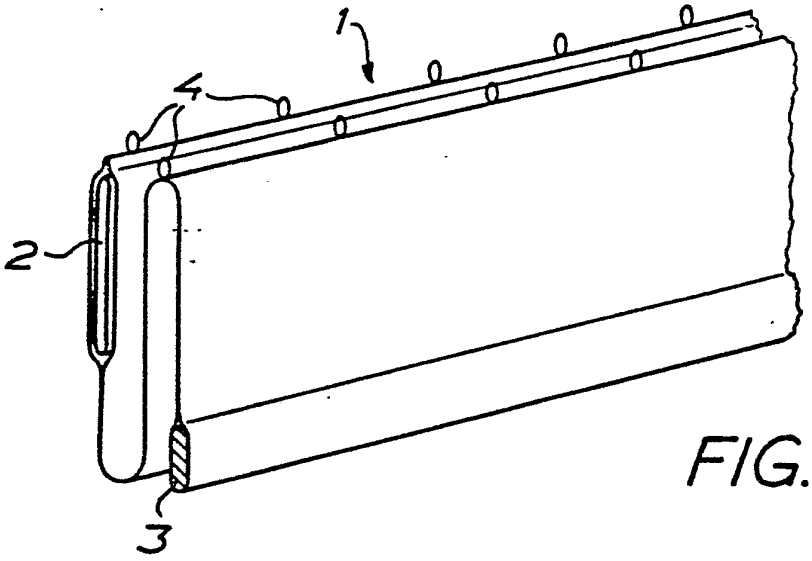


FIG. 1

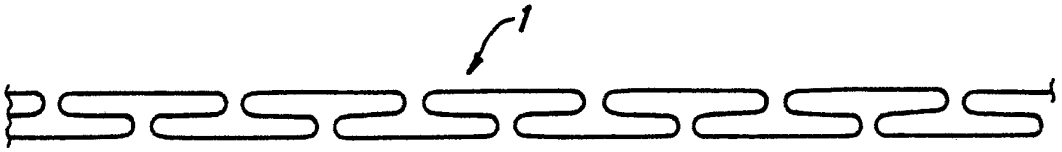


FIG. 2

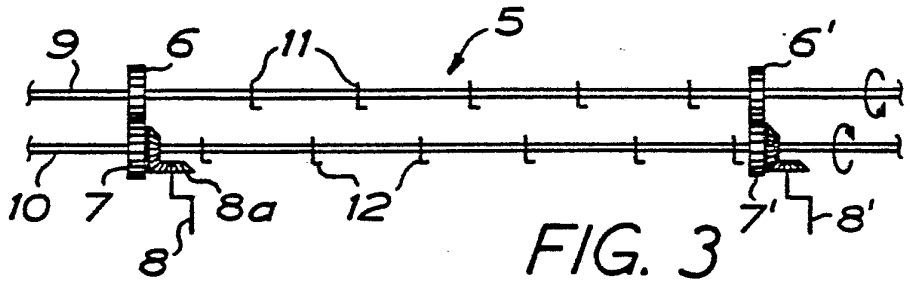


FIG. 3

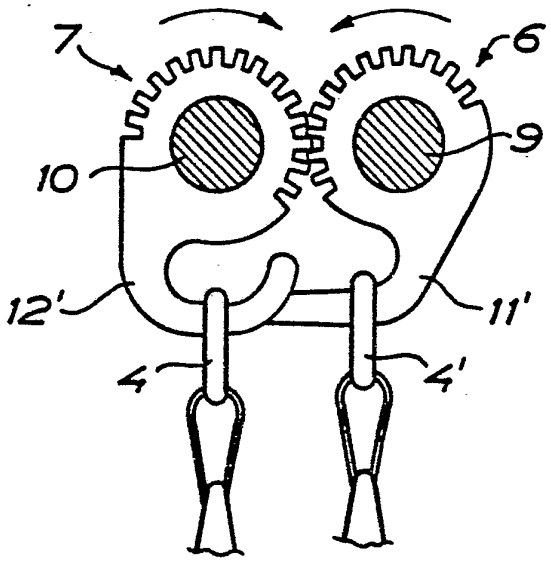


FIG. 4

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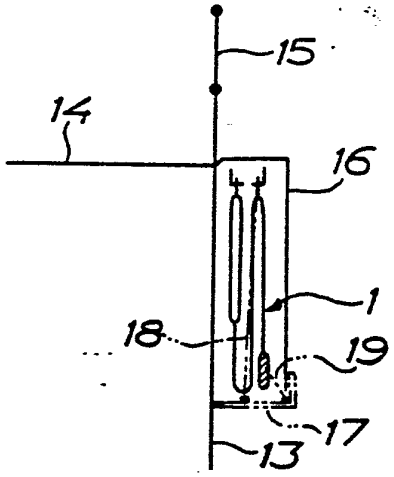


FIG. 5a

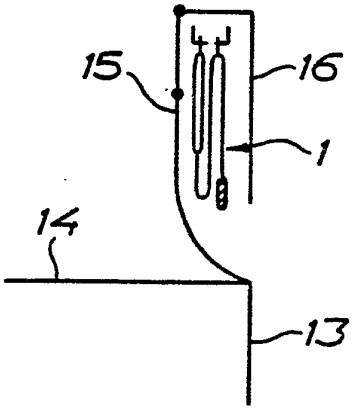


FIG. 5b

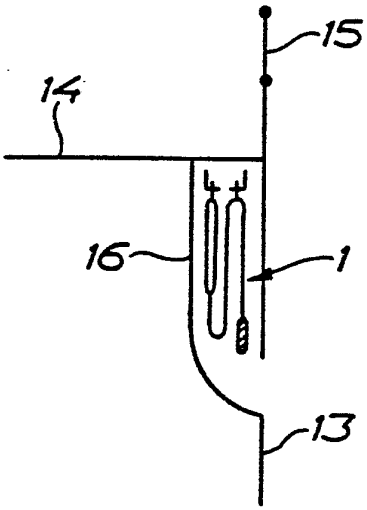


FIG. 5c

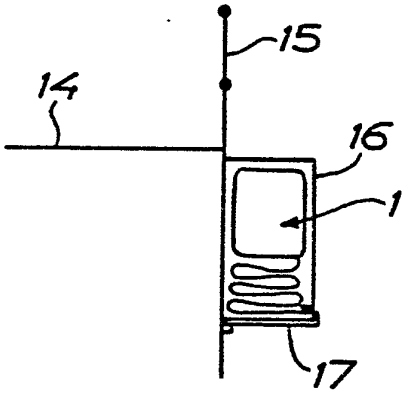


FIG. 6

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INTERNATIONAL SEARCH REPORT

International Application No PCT/SE80/00033

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC 3

E 02 B 15/04

II. FIELDS SEARCHED

Minimum Documentation Searched [4]

Classification System	Classification Symbols
IPC 3	E 02 B 15/04; B 63 B 35/32
US Cl	61:1; 210:242; 292:22, 24-31, 51, 56, 98, 108, 116-120

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [5]

SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

Category *	Citation of Document, [16] with indication, where appropriate, of the relevant passages [17]	Relevant to Claim No. [18]
A	DE, A1, 1 484 368 published 1969, October 16, Neirad Industries Inc.	1, 2, 10
A	SE, B, 394 124 published 1977, June 6, Sanera Projecting AB	
A	NO, B, 115 244 published 1968, September 2, Porsgrund Metalverk A/S	
A	US, A, 3 839 870 published 1974, October 8, Margaret M Ryan	2, 3
A	DE, A1, 2 726 789 published 1977, December 22, Hosöy Öyvind	

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"X" document of particular relevance

IV. CERTIFICATION

Date of the Actual Completion of the International Search [2]	Date of Mailing of this International Search Report [2]
1980-04-22	1980-04-28
International Searching Authority [1]	**Signature of Authorized Officer [20]**
Swedish Patent Office	Åke Olofsson