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(54) **Transfer system for transferring goods from and/or to a ship, ship provided with such system and method therefor**

(57) The present invention relates to a transfer system (4) for transferring goods to and/or from a floating ship (2), a ship (2) provided with such transfer system and a method therefore.
The transfer system (4) according to the invention comprises:

- a housing (20) with a foundation element (28);
- a winch system (22) with at least one winch drive (24,26);
- a cable system connected to the winch system, the cable system (14) comprising a connecting element (16) for connecting to a destination for the goods, or a cable unit, and a tensioning unit.

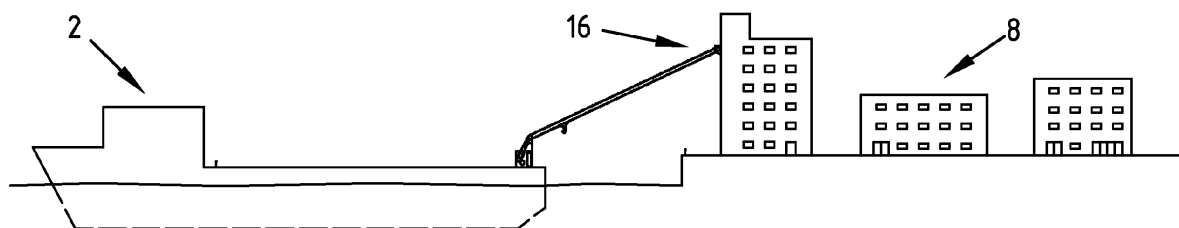
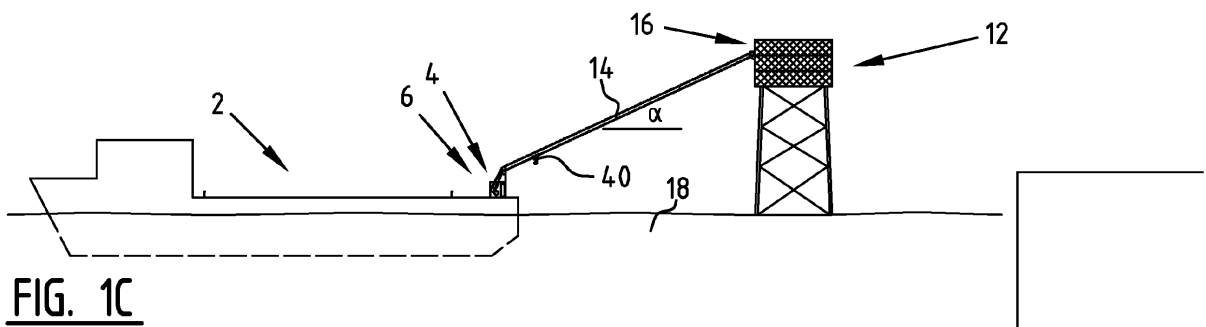
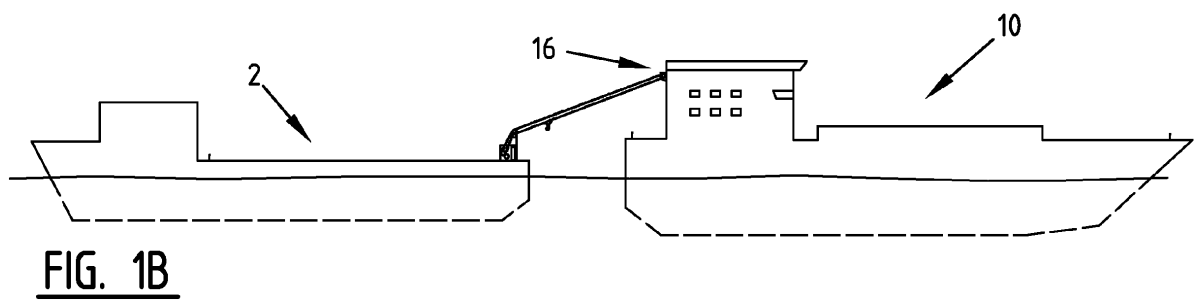


FIG. 1A



Description

[0001] The present invention relates to a transfer system for transferring goods from and/or to a floating ship. Goods can be transferred to a floating ship and a platform at shore or off-shore.

[0002] At present, for regular maintenance of unmanned platforms, goods need to be delivered to and from the platform. These goods are currently hand carried by workers travelling to the platform with small boats. Boarding the platform from these small boats may lead to dangerous situations. This problem is increased even further in presence of waves and/or bad weather conditions.

[0003] The object of the present invention is to provide a transfer system for transferring goods to a ship and a platform ship or shore.

[0004] This object is achieved with a transfer system for transferring goods from and/or to a floating ship according to the invention. The system comprising:

- a housing with a foundation element;
- a winch system with at least one winch drive;
- a cable system connected to the winch system, the cable system comprising a connecting element for connecting to a destination for the goods, or a cable unit, and a tensioning unit.

[0005] The housing provides a foundation element to which, preferably, the winch system is attached. In use the cable system connects the winch system to the destination with a connecting element, for example a cable-sheave that is positioned at the destination by a person or apparatus. After installing the cable-sheave at the destination or desired location, a small cable may be passed and connected to the main cable. Alternatively, the main cable can be used directly. Next, the goods are transferred using the winch system and the cable system that is provided with a hook for carrying the goods, for example.

[0006] The goods to transfer include as examples canned fluids, spare parts and paint. Other goods are also possible to transfer with the system according to the invention. The destination may be a fixed (oil) platform, a ship, a stranded vessel, or the shore. In a presently preferred embodiment according to the invention the weight of the goods amounts about 250-500 kg, although other weights are possible with an accordingly designed system according to the invention.

[0007] Preferably, the transfer system according to the invention comprises a maximum of one ongoing cable. By using only one cable the total number of system parts for the transfer of goods is kept to a minimum. There is no need for a separate guiding cable, pulling cable, and retracting cable. Therefore, the system according to the invention results in an easy to fit system requiring minimal installation, as only one cable needs to be handled and put into place. Furthermore, the risk of damage to system

parts is minimised.

[0008] Preferably, the winch system of the transfer system according to the invention comprises a tensioning winch and a transfer winch. The transfer winch transfers the goods by displacing the cable with the hook for carrying the goods. The tensioning winch prevents the goods from dropping into the water, for example.

[0009] In a preferred embodiment according to the invention the foundation element comprises a foundation beam.

[0010] By providing a beam as foundation element an easy to handle system is achieved.

[0011] Preferably, the foundation element is retractable in the housing and/or rotatable relative to the housing. Providing a retractable foundation element a compact system is achieved. This limits storage space on a ship, for example. Furthermore, a retractable element enables the application of a modular system with the system being provided in a housing shaped as a box or container. This achieves a compact system, and preferably a portable system. Also, by providing a rotatable foundation element the flexibility of the system is improved. This renders positioning of a ship involved in the transfer of goods more easy.

[0012] In a preferred embodiment according to the invention the transfer system further comprises a tension controller for maintaining the cable tension within certain limits.

[0013] By maintaining the cable tension within certain limits the dropping of goods into the water is prevented. Such tension controller can be implemented as an electric and/or mechanic controller.

[0014] In a preferred embodiment according to the invention the transfer system further comprises a position controller for maintain a fixed position for the load relative to the destination in an approach mode.

[0015] By providing a two, or more, stage or mode transfer of goods a relatively fast transfer may be achieved between the pick-up and drop zones, while a slow transfer may be achieved for approaching the destination. A fixed position may be used when picking up and/or dropping the goods. Also, a fixed position may be used when switching between different modes.

[0016] Preferably, the controller of the transfer system according to the invention comprises an approach system for transferring the load in the approach mode. Providing a separate approach system achieves optimal control of the transfer operation, especially when delivering the goods at the destination.

[0017] In a preferred embodiment according to the invention the transfer system further comprises an emergency system for paying out the cable that is provided with an overload connection that releases the cable from the winch at a certain overload.

[0018] By providing the emergency system a safety measure is achieved. This is especially relevant considering the conditions of operation including bad weather conditions at open sea.

[0019] In a preferred embodiment according to the invention the transfer system further comprises a power supply.

[0020] Instead of using the power supply of the ship and/or shore or platform a separate power supply for the transfer system may be provided. This achieves a stand-alone system. Preferably, the power supply is integrated in the housing of the system thereby achieving a modular system.

[0021] The present invention also relates to a ship provided with the above transfer system.

[0022] Such ship provides the same effects and advantages as those related to the transfer system.

[0023] The invention further also relates to a method for transferring goods to and/or from a floating ship, comprising the steps of:

- bringing a messenger line from or to the ship;
- installing the above transfer system;
- maintaining a cable tension within certain limits; and
- transferring the goods.

[0024] Such method provides the same effects and advantages as those related to the system and the ship. For example, the ship approaches the platform and a messenger line is brought over from the ship to the platform. A sheave block is attached to the messenger line and is pulled to the platform to be attached to the platform. The tensioning winch will pay out the wire to reduce the pulling force required for the operator on the platform. The operator attaches the sheave block to the platform. The ship will move away from the platform while paying out the tensioning winch and maintaining a certain (small) tension in the cable.

[0025] Preferably, the transferring method comprises as a step the switching between a transfer mode wherein goods are transferred towards the destination, to an approach mode wherein a position controller maintaining a fixed position for the load relative to the destination. Preferably, in the approach mode an approach system adds a steering signal to the position controller signal to perform the final approach of the goods to the destination. As mentioned above, this achieves optimal control of the transfer operation, especially when delivering the goods at the destination.

[0026] Further advantages, features and details of the invention are elucidated on basis of preferred embodiments thereof, wherein reference is made to the accompanying drawings wherein:

- Figure 1 A-C shows a ship provided with a transfer system according to the invention; and
- Figure 2 A-C shows the transfer system of figure 1.

[0027] A ship or vessel 2 (figure 1 A-C) comprises a transfer system 4 on the aft deck 6. In the illustrated embodiment goods G are transferred using transfer system 4 from ship 2 to and/or from the shore 8, other ship 10,

and fixed platform 12. In use cable 14 runs from system 4 to connection or hook 16 on shore 8, ship 10 or platform 12. Endless cable 14 is provided with hook 40 for carrying goods G between ship 2 and shore 8, ship 10 or platform 12 over water 18.

[0028] System 4 (figure 2 A-C) consists of a standard container size box 20 provided with winch system 22. In the illustrated embodiment winch system 22 comprises two electrical, frequency controlled winches 24,26, a tensioning winch and a transfer winch. Frame 28 comprises two sheaves 30, 32 on top, a line or cable 14 running from the tensioning winch 24 through sheave block 30 to a hook 16. From hook 16 line 14 runs to winch 26. Box 20 further comprises an E-cabinet 30. Hinge 30 enables closing of modular box 20 from an opened position (figure 2A) via a closing position (figure 2B) to a closed position (figure 2C).

[0029] In the illustrated embodiment system 4 is capable of transferring goods G of 250 kg, with a minimal operational distance to platform 12 of 10 m., and a maximum operational distance to platform 12 of 50 m. The operational horizontal angle α is in the range of -30° to $+60^\circ$.

[0030] Transferring goods G starts by vessel 2 approaching platform 12. A messenger line is brought over from vessel 2 to platform 12. The sheave block 16 is attached to the messenger line and is pulled to platform 12 to be attached to the platform 12. The tensioning winch 26 will pay out the wire or cable 14 to reduce the pulling force required for the operator on platform 12. The operator attaches the sheave block 16 to platform 12. Next vessel 2 will move away from platform 2 while paying out the tensioning winch 26 and maintaining a certain (small) tension in cable 14.

[0031] When vessel 2 is a safe distance from platform 12, for example with a maximum of 50 m, the tensioning winch 26 will maintain a certain set tension in cable 14 using tensioning units 38. The tension in wire 14 is depending on the weight of the load G and the angle α of the line between vessel 2 and platform 12. Initially, the hook 40 for carrying goods G is close to vessel 2. A chain hoist or other sling is installed to the hook 40 and the load G hoisted. When the transfer winch 24 is paid out, the load will move towards platform 12. Tensioning winch 26 will automatically pay in wire 14, while maintaining the set tension in wire 14. This tension can be adjusted at any time during the transfer.

[0032] When hook 40 approaches platform 12, system 4 is switched from a transfer mode to an approach mode. The two winches 24,26 will operate at the same speed to maintain a fixed position with respect to the platform. This is relevant considering the conditions of transfer involving weather conditions and open sea operation. In the illustrated embodiment this mode can be overruled for the final approach of the load to the platform, for example with a joystick.

[0033] After completion of the transfer the preset tension in wire or cable 14 is reduced and vessel 2 will be

positioned close to platform 12. The sheave block 16 at platform 12 is disconnected and lowered with the messenger line. The tensioning winch 26 will maintain a (small) tension in cable 14 while paying in wire 14. The operator on platform 12 will slowly let go the messenger line.

[0034] In the illustrated embodiment an emergency break out is provided that is of relevance in case of an emergency, such as loss of position control of the vessel or other, and system 4 will pay out wire 14. If the emergency situation is not solved before wire 14 runs out, the wire connection with the winch drum will release wire 14 with a certain overload.

[0035] System 4 can be controlled with a remote wireless radio controlled box (not shown). In the illustrated embodiment this box has the following functions of: On/Off switch, proportional joystick for control of the winches, selector for constant tension setting, mode selection switch (transfer/approach), Manual winch selection switch (transfer winch/tensioning winch/both), display for wire payout and tensioning information/status, emergency switch, and master/slave selector (only applicable with optional second control box).

[0036] In the illustrated embodiment the interfaces with vessel 2 are limited to the mechanical interface and the electrical interface. Preferably, container 20 is connected to vessel 2 by means of (container) lashings or welding. The electrical interface is the power feeding to container 20. Preferably, a waste energy resistor is included in the system, so no energy is returned to the vessel's circuit. Furthermore, in the illustrated embodiment the interface with platform 12 is limited to a (removable) pad eye for mounting of the sheave block 16.

[0037] In the illustrated embodiment system 4 is electrically powered from vessel 2. A power connection is mounted at the side of container 20. Required power input is 440V, 3ph, 60 Hz, or other upon request. Alternatively, a diesel electrical generator (e.g. 35 kW) is provided in container 20 for powering of the system independent from the vessel's circuit.

[0038] The present invention is by no means limited to the above described preferred embodiments thereof. The rights sought are defined by the following claims on the scope of which many modifications can be envisaged.

Claims

1. Transfer system for transferring goods from and/or to a floating ship, comprising:

- a housing with a foundation element;
- a winch system with at least one winch drive;
- a cable system connected to the winch system, the cable system comprising a connecting element for connecting to a destination for the goods, or a cable unit, and a tensioning unit.

2. Transfer system according to claim 1, wherein the cable system comprises a maximum of one ongoing cable.

3. Transfer system according to claim 1 or 2, wherein the winch system comprises a tensioning winch and a transfer winch.

4. Transfer system according to claim 1, 2 or 3, wherein the foundation element comprises a foundation beam.

5. Transfer system according to any of the claims 1-4, wherein the foundation element is retractable in the housing and/or rotatable relative to the housing.

6. Transfer system according to any of the claims 1-5, further comprising a tension controller for maintaining the cable tension within certain limits.

7. Transfer system according to any of the claims 1-6, further comprising a position controller for maintain a fixed position for the load relative to the destination in an approach mode.

8. Transfer system according to claim 7, wherein the controller comprises an approach system for transferring the load in the approach mode.

9. Transfer system according to any of the claims 1-8, further comprising an emergency system for paying out the cable that is provided with an overload connection that releases the cable from the winch at a certain overload.

10. Transfer system according to any of the claims 1-9, further comprising a power supply.

11. Ship provided with a transfer system of any of the claims 1-10.

12. Method for transferring of goods from and/or to a floating ship, comprising the steps of:

- bringing a messenger line from or to the ship;
- installing the transfer system of any of claims 1-10;
- maintaining a cable tension with certain limits; and
- transferring the goods.

13. Method according to claim 12, further comprising the switching between a transfer mode, wherein goods are transferred towards the destination, to an approach mode, wherein a position controller maintaining a fixed position for the load relative to the destination.

14. Method according to claim 12 or 13, wherein in the approach mode an approach system adds a steering signal to the position controller signal to perform the final approach of the goods to the destination.

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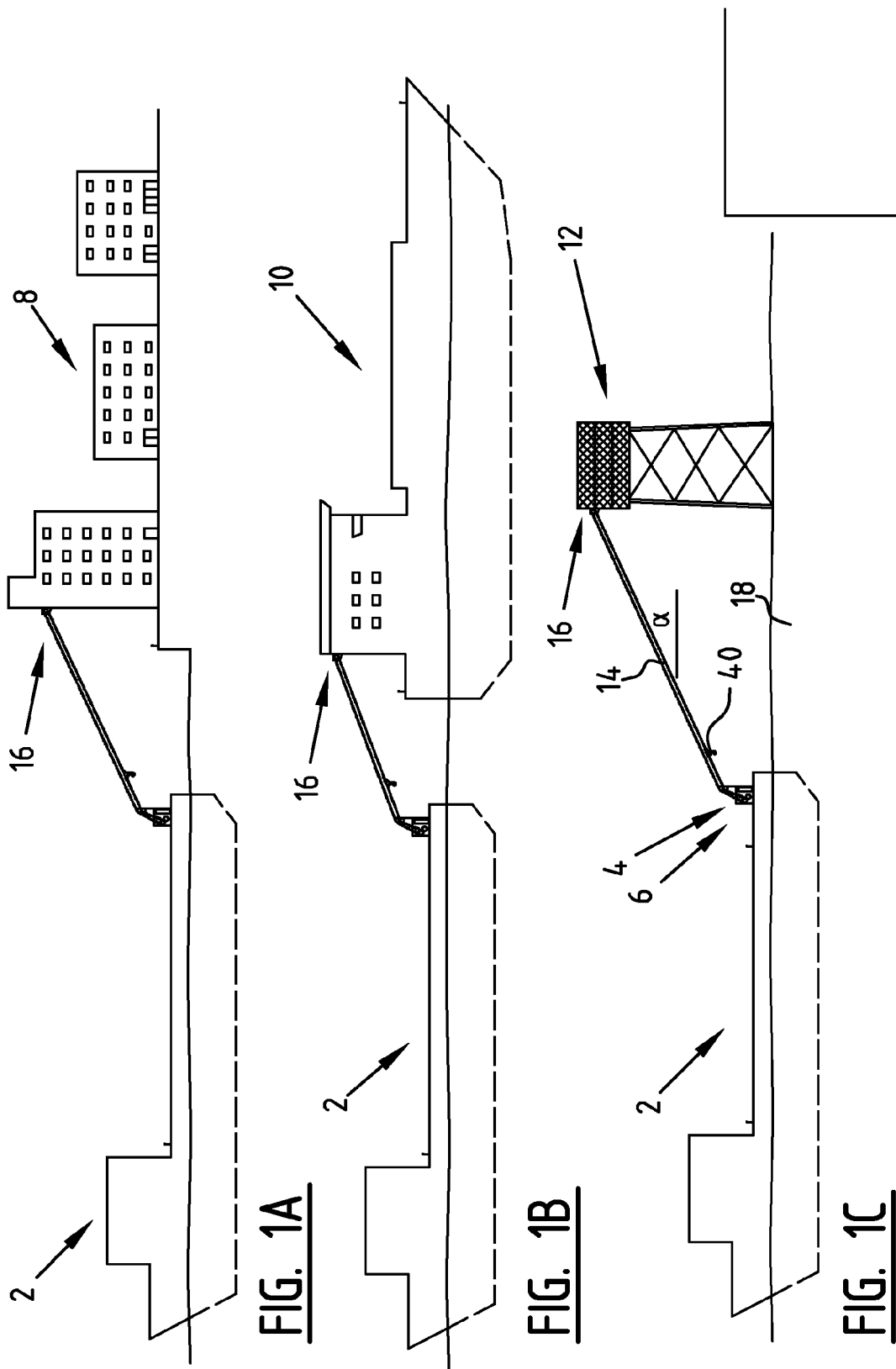
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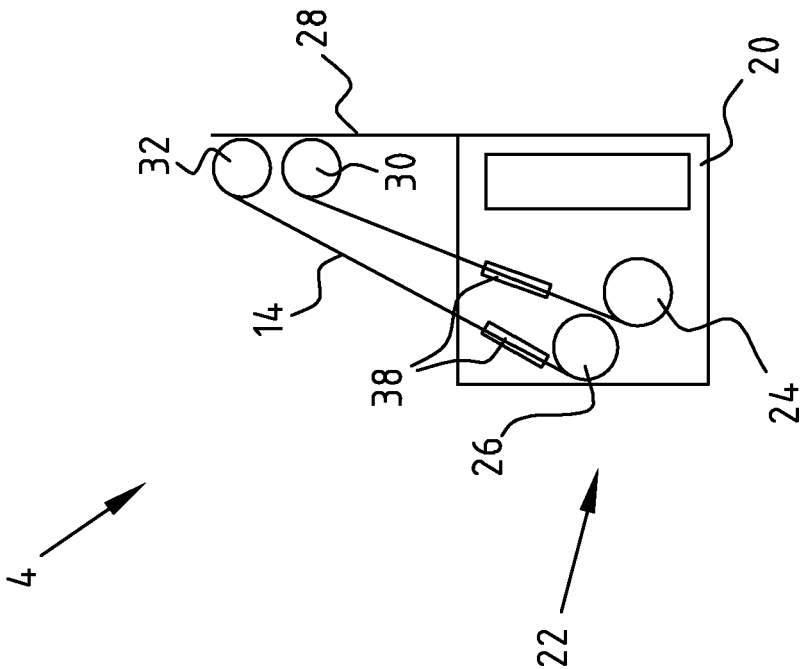


FIG. 2A

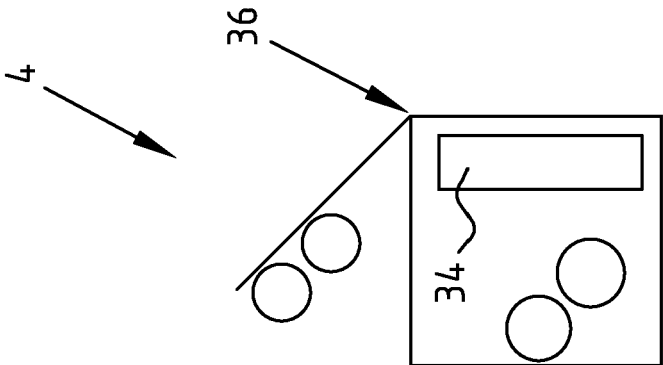


FIG. 2B

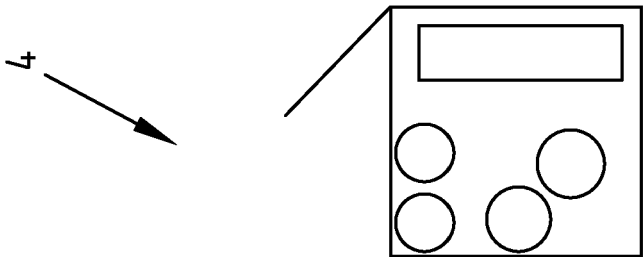


FIG. 2C



EUROPEAN SEARCH REPORT

Application Number
EP 10 18 7250

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 4 295 636 A (LANGFORD FREDERIC E) 20 October 1981 (1981-10-20) * column 8, line 14 - line 31 * * figure 1 *	1-14	INV. B63B27/18
A	US 3 361 080 A (BORN ELLIS H ET AL) 2 January 1968 (1968-01-02) * column 2, line 34 - line 51 * * column 3, line 1 - line 26 * * figures 3,4 *	1,7,8, 11-14	
A	US 3 614 066 A (DAY VEARL) 19 October 1971 (1971-10-19) * figures *	1,11,12	
			TECHNICAL FIELDS SEARCHED (IPC)
			B63B B66D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 28 April 2011	Examiner Gardel, Antony
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 18 7250

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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28-04-2011

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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US 3361080	A	02-01-1968	NONE	
US 3614066	A	19-10-1971	NONE	