

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
11 December 2008 (11.12.2008)

PCT

(10) International Publication Number
WO 2008/149200 A2

(51) International Patent Classification⁰ **Not classified**

(21) International Application Number:
PCT/IB2008/001420

(22) International Filing Date: 4 June 2008 (04.06.2008)

(25) Filing Language: Norwegian

(26) Publication Language: English

(30) Priority Data:
2007 2869 5 June 2007 (05.06.2007) NO

(71) Applicant (for all designated States except US): **M-I L.L.C.** [US/US]; 5950 North Course Drive, Houston, TX 77072 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **KJELL RUNE SELSVIK** [NO/NO]; Tveitehagen 9, N-5628 Herand (NO).

(74) Agent: **BRYN AARFLOT AS**; P.O.Box 449, Sentrum, N-0104 Oslo (NO).

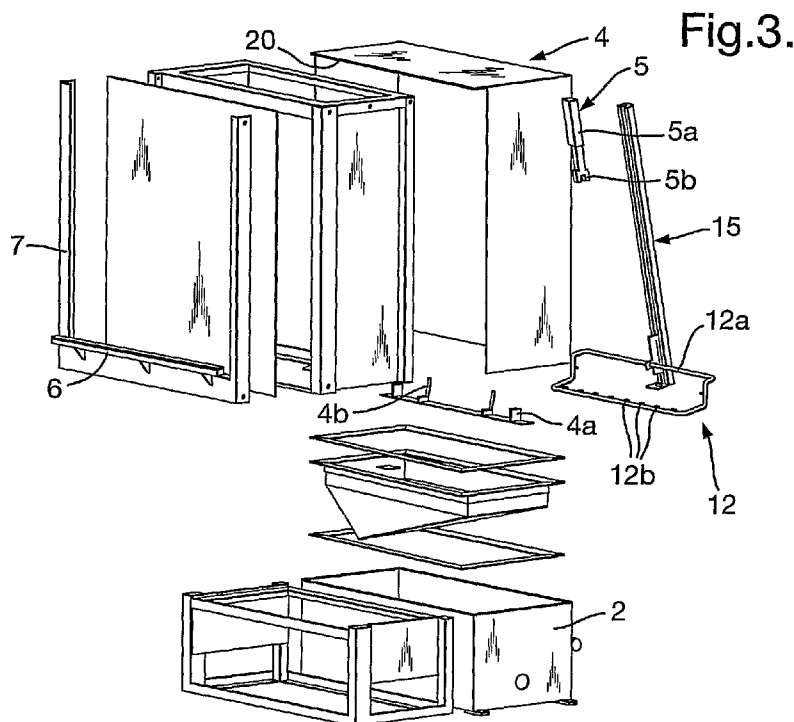
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished upon receipt of that report

(54) Title: SCREEN WASH MACHINE



(57) Abstract: Washing machine (1) for screen (S) comprising: a closed washing chamber (11) having internal nozzles (12a, 12b) for cleaning the screen (S). The nozzles (12a, 12b) are provided on a flushing frame (12) enclosing the screen (S), and the flushing frame (12) may be moved upwards and downwards within the chamber (11) whereby the screen (S) is flushed and cleaned. A method for cleaning the screen (S) in the washing machine (1) is also described.

"Screen Wash Machine"

The present invention concerns a washing machine for screen, comprising:
a closed washing chamber having internal nozzles for cleaning the screen.

5 The invention further concerns a method for cleaning a screen in a closed
washing machine comprising a closable inlet opening/door and a washing
chamber having internal nozzles for flushing the screen.

US 5,056,948 describes a flushing chamber having rotatable nozzles
flushing on both sides of an object to be cleaned.

10 US 5,860,361 concerns a flushing chamber having nozzles on both sides of
a vertical grid which can be moved vertically in the chamber during the process.

US 3,656,493 361 concerns a chamber where a nozzle during flushing of a
stencil grid can be moved upwards and downwards or horizontally.

15 US 3,760,824 concerns a plate washer where the plate is moved between a
two-sided nozzle system.

US 6,102,054 concerns a washing chamber having stationary pipe system
which cleans a stationary plate.

JP 10189528 deals with a chamber having two-sided flushing of a plate
shaped object which is moved vertically.

20 JP 24230865 concerns a washing chamber having rotatable nozzles
flushing towards all sides of a stationary grid.

US 6,579,381 concerns a washing chamber where a vertically located "silk
screen" is one-sided flushed by nozzles located on a horizontal bar which can be
moved upwards and downwards.

25 Screens mounted on frames are used more and more in the drilling industry
and different forms and dimensions are found, but common for all of these is that
they often are replaced during drilling and that they are dirty and difficult to work
with. Today the screens are often put up on a wall or like and flushed by means of
the flushing lance of a high pressure washer. These frames have so many "nooks
30 and corners" that mud and cuttings are thrown in all directions during the cleaning,
resulting in that the one washing, in addition to the premises, are littered.

An object of the present invention is to provide a washing machine for
screen which can be used on all rigs offshore and onshore plants without in sub-
stantial degree have to revise any of the components of the machine.

Another object is that the machine shall be water tight, such that splash of water, water vapour (steam), cuttings and mud remain within the cabinet.

Another object is that the machine shall be ergonomical and easy to use and it shall satisfy existing safety requirements and authorisations.

5 A further object is that the washing machine shall clean the screen in an effective and economical way and simultaneously provide a good working environment.

The objects of the present invention are achieved by a washing machine as stated in the preamble of the description and which is characterized in that the
10 nozzles are provided on a flushing frame enclosing the screens and the flushing frame may be moved upwards and downwards within the chamber whereby the screen is flushed and cleaned.

Preferred embodiments of the washing machine are further stated in the claims 2 including 13.

15 Further, the objects of the invention is achieved by a method for cleaning a screen as stated in the preamble of the description and which further are characterized in that the screen is guided horizontally into the washing chamber over a scraping off pipe in the inlet opening, whereby mud and cuttings on the underside of the screen are scraped off, the screen is pushed into guides in the lower part of
20 the washing chamber and raised towards vertical position and suspended in the gripping devices in upper part of the washing chamber, the inlet opening is closed and the washing machine can be activated whereby a sealing gasket for the door is activated and water is transported from a ring pipe towards the inner walls of the chamber in addition to that high pressure- and low pressure water are flushed out
25 of the nozzles of the flushing frame and the flushing frame, which encloses the screen and which is provided on a movable cylinder, is moved upwards and downwards within the chamber whereby the screen is cleaned.

Below a washing machine for screen and method for cleaning the screen are explained with the reference to the figures, where

30 Figure 1 shows the washing machine having a closable inlet opening/door in open position;

Figure 2 shows the main parts of the machine in a separated condition;

Figure 3 is a further detailed depiction of the main parts of the washing machine according to figure 2; and

Figure 4 shows the complete washing machine in an operational condition where the inlet opening/door is closed.

5 First with reference to figures 1 and 4 an embodiment of a washing machine 1 according to the invention is shown. Figure 1 shows the washing machine 1 with inlet opening/door 8 in open position, i.e. the door 8 is pushed vertically downwards. Thus, an internal chamber 11 is shown with an approxi-
mately vertical provided screen S. Figure 4 shows the washing chamber 11 in
10 closed position i.e. the door 8 is moved downwards and the washing machine 1 is in a condition to carry out a washing operation.

With reference to figures 2 and 3 the main parts of the washing machine 1 are shown, and these are basically: a bottom box 2, a trough 3, a top box 4 and the door 8. The mentioned main parts in an assembled condition will form an inter-
15 nal washing chamber 11. The internal washing chamber 11 is further provided with a flushing frame 12 which can be moved upwards and downwards within the chamber 11. The flushing frame 12 is provided on a lifting- and lowering device 15 which in the shown embodiment is a cylinder without piston. The flushing frame 12 has a rectangular ring form and is provided with nozzles 12a, 12b for preferably
20 high- and low pressure water. In the shown embodiment the nozzles 12a for high pressure water are provided in the rear area of the flushing frame whereby the flushing nozzles are forwardly directed towards the door 8 of the chamber. The nozzles 12b for low pressure water are provided on the front area of the flushing frame and are directed towards the rear area of the chamber. Thus, the flushing
25 frame 12 is formed such that it will enclose the screen S, whereby the stationary screen S is flushed with high pressure water on the rear side and with low pressure water on the front side since the flushing frame 12 with continuous movement moves upwards and downwards within the chamber 11 and the enclosing screen S, respectively. The washing chamber 11 is in its lower part provided with
30 guides 4a, 4b for the screen S. Gripping devices 5 are further provided in the upper part of the washing chamber 11 such that the screen S is supported in vertical position and suspended in the gripping devices 5. The guides 4a, 4b and the gripping devices 5 are provided such that the screen S has an angle of inclination

0° in relation to the vertical when it is fixed. The reason for this is that the water, mud and cuttings shall not be left on small stiffening ribs of the screen S. In order to prevent that mud residues etc. are fixed to the walls of the chamber or the trough 3 a low pressure ring pipe 20 is provided in the upper part of the top box 4. This ring pipe (conduit) 20 has the following functions: nozzles flush water onto the wall surfaces in the chamber in order to prevent accumulation of mud and cuttings, and shall also speed up the removal of the waste out of the washing machine 1. The latter is due to too small water flow from the high pressure flushing water. The chamber 11 is in its lower area for entering the screen S provided with a scraping off pipe 6. The screen S is introduced horizontally into the washing chamber 11 above the scraping off pipe 6 whereby mud and cuttings on the underside of the screen S are scraped off.

Guides 4a, 4b fix the screen S in the lower edge and gripping device 5b maintains the screen S in the upper edge. The gripping devices 5b are spring loaded and are provided with an adjustable hole device 5a which makes the washing machine 1 able to handle all types of screens S, i.e. screens with different height and width.

The washing machine 1 will preferably be delivered with three types of troughs 3 which are located in the bottom box 2. A first embodiment of the trough will be constructed symmetrical and may be located in both directions (waste flows out of a two-inch pipe to the right or to the left). Further, it will be an embodiment of the trough 3 where the waste flows out in the rear or straight down.

The washing machine 1 will preferably be provided with a control panel which can be located on both sides of the top box 4. I.e. connections are possible on both sides. The side which is not used is blinded. The control panel has start, stop switch and speed control for water and cylinder, located on the outside, in addition to possible connections for the interface components. The control panel will include pneumatic logic- and control valves which is the "brain" itself for the washing process.

Connection source will preferably be pressurised air (6-10 bar, the pressure which is available on the particular rig), fresh water (5-15 bar, the pressure which is available on the particular rig), high pressure flushing water (about 210 bar and 40 l/min, which is available on the particular rig), eventually electronic voltage (volt,

eumatic control components can be replaced by electrical components) and outlet, 2 inches "hose tail" (pipe which a hose is pressed on the outside and fixed with a hose clamp). When constructing the washing machine 1 the bottom box 2 will be the first unit to be installed. This will be fixed (screwed on) to the deck, bulk-
5 head or railing where after a gasket is placed on the top flange. Thereafter, the trough 3 is located in the bottom box 2 whereby a gasket is placed on the top flange. The top box 4 is placed on the bottom box 2 and the trough 3, and bolted together. The top box 4 again consists of several parts as the inlet opening/door 8 which travels in a Teflon rail 9 and which further consists of a plate and cassette
10 which is weight balanced by weight. A wire is fixed in the lower part of the door 8 and is routed above two sheaves and to a weight. The weight has its own travelling box and is protected from the "dirty environment" within the top box 4. In order to provide a water tight washing machine, and that water vapour from the high pressure nozzles, water, cuttings and mud do not escape from the washing
15 machine 1, an inflatable gasket 7 is used which seals against the door 8 from the inside.

The washing machine 1 functions in the following way:

- Open the door/hatch 8 manually by pushing downwards.

A pneumatic sensor valve will then be activated and the machine 1 is
20 *in emergency shut down mode.*

- Dirty screen S is introduced horizontally with the screen side up. By introducing it over the scraping off pipe 6 which scrapes off mud and cuttings from the underside of the screen S. The waste flows into the washing machine 1. The screen S is pushed into the guides 4a, 4b in the bottom and
25 erected towards vertical position. In order for the screen S to be fixed in the machine it must be pressed the last distance in order for the gripping device 5b to function.

- Shut the door/hatch 8 completely.

The pneumatic sensor valve activates the machine 1 to starting
30 mode.

- Press the starting switch.

The gasket 7 is inflated, and when the pressure is stabilised the pneumatic logic valve will open for the following valves.

Water starts to flow along walls from the ring pipe 20. High pressure- and low pressure water are flushed out of the pipe frame 12 which is connected to a lifting and a lowering device/cylinder 15.

5 Cylinder 15 moves upwards in vertical direction while washing the screen S. When the cylinder 15 reaches maximum stroke the pressure will stabilise and a logic valve turn the process such as it goes down again with the same speed.

10 On the outside of the control panel a speed regulator for adjusting the speed of the cylinder 15 is provided. This is desirable since screens S, which have stood still for a while before they are washed, are more difficult to clean. The speed of the cylinder may then be adjusted by experience depending on how dry the mud and cuttings are.

- 15 - The door/hatch 8 is opened and the screen S is inspected. If it is still dirty, the door/hatch is closed and the start button is pushed.
- If it is clean the screen S is removed.

PATENT CLAIMS

1. Washing machine (1) for screen (S), comprising:
5 a closed washing chamber (11) having internal nozzles (12a, 12b) for cleaning the screen (S),
characterized in that the nozzles (12a, 12b) are provided on a flushing frame (12) enclosing the screen (S), and the flushing frame (12) may be moved upwards and downwards within the chamber (11) whereby the screen (S) is
10 flushed and cleaned.
2. Washing machine (1) according to claim 1,
characterized in that the flushing frame (12) has a rectangular annular shape.
15
3. Washing machine (1) according to claim 1 or 2,
characterized in that the flushing frame (12) is provided on a lifting and lowering device (15) provided within the chamber (11).
- 20 4. Washing machine (1) according to claim 3,
characterized in that the lifting and lowering device (15) has an angle of inclination in relation to the vertical.
5. Washing machine (1) according to claim 4,
25 characterized in that the angle of inclination is 10°.
6. Washing machine (1) according to claim 3, 4 or 5,
characterized in that the lifting – and lowering device (15) is a cylinder without piston, whereby the flushing frame (12) is relocated in vertical direction.
30
7. Washing machine (1) according to claim 6,
characterized in that the flushing frame (12) is coupled to a pressure flushing system (16).

o. Washing machine (1) according to any one of the previous claims, characterized in that the flushing frame (12) is provided with nozzles (12a, 12b) for preferably high- and low pressure water.

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9. Washing machine (1) according any one of the previous claims, characterized in that the chamber (11) in its upper internal area is provided with a low pressure ring pipe (20) whereby water is flushed onto the chamber's internal wall faces.

10

10. Washing machine (1) according any one of the previous claims, characterized in that the chamber (11) in its lower area is provided with guides (4a, 4b) for the screen (S).

15

11. Washing machine (1) according any one of the previous claims, characterized in that the chamber (11) in its upper area is provided with gripping devices (5) for the screen (S).

12. Washing machine (1) according claims 10 and 11, characterized in that the guides (4a, 4b) and the gripping devices (5) for the screen (S) are provided such that the screen (S) is located with an angle of inclination in relation to the vertical of preferably 10°.

13. Washing machine (1) according any one of the previous claims, characterized in that the chamber (11) in its lower area for insertion of the screen (S) is provided with a scraping off pipe (6).

14. Method for cleaning a screen (S) in a closed washing machine (1) comprising a closable inlet opening/door (8) and a washing chamber (11) having internal nozzles (12a, 12b) for flushing the screen (S), characterized in that the screen (S) is guided horizontally into the washing chamber (11) over a scraping off pipe (6) in the inlet opening, whereby mud and cuttings on the underside of the screen (S) are scraped off,

30

the screen (S) is pushed into guides (4a, 4b) in the lower part of the washing chamber (11) and raised towards vertical position and suspended in the gripping devices (5) in upper part of the washing chamber (11),

the inlet opening (8) is closed and the washing machine (1) can be activated whereby a sealing gasket (7) for the door (8) is activated and water is transported from a ring pipe (20) towards the inner walls of the chamber in addition to that high pressure and low pressure water are flushed (17, 19) out of the nozzles (12a, 12b) of the flushing frame and the flushing frame (12), which encloses the screen (S) and which is provided on a movable cylinder (15), is moved upwards and downwards within the chamber (11) whereby the screen (S) is cleaned.

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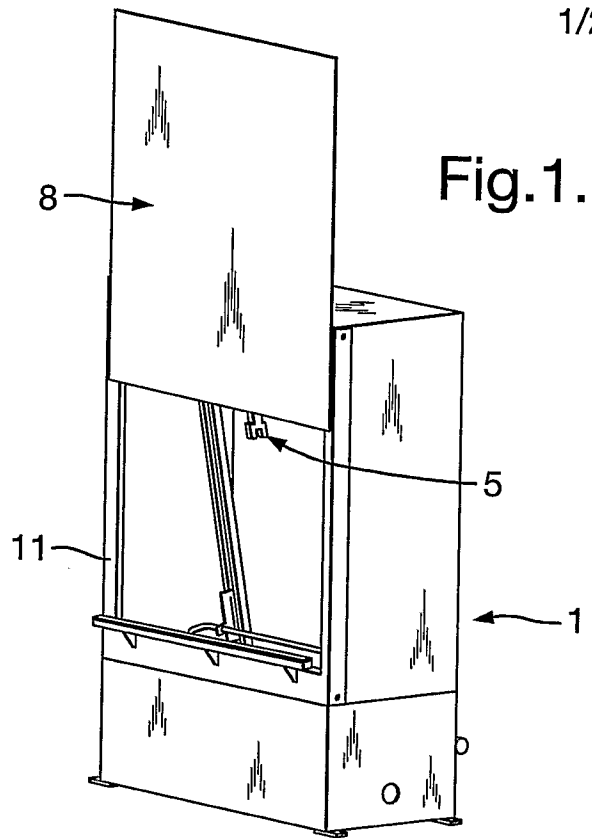
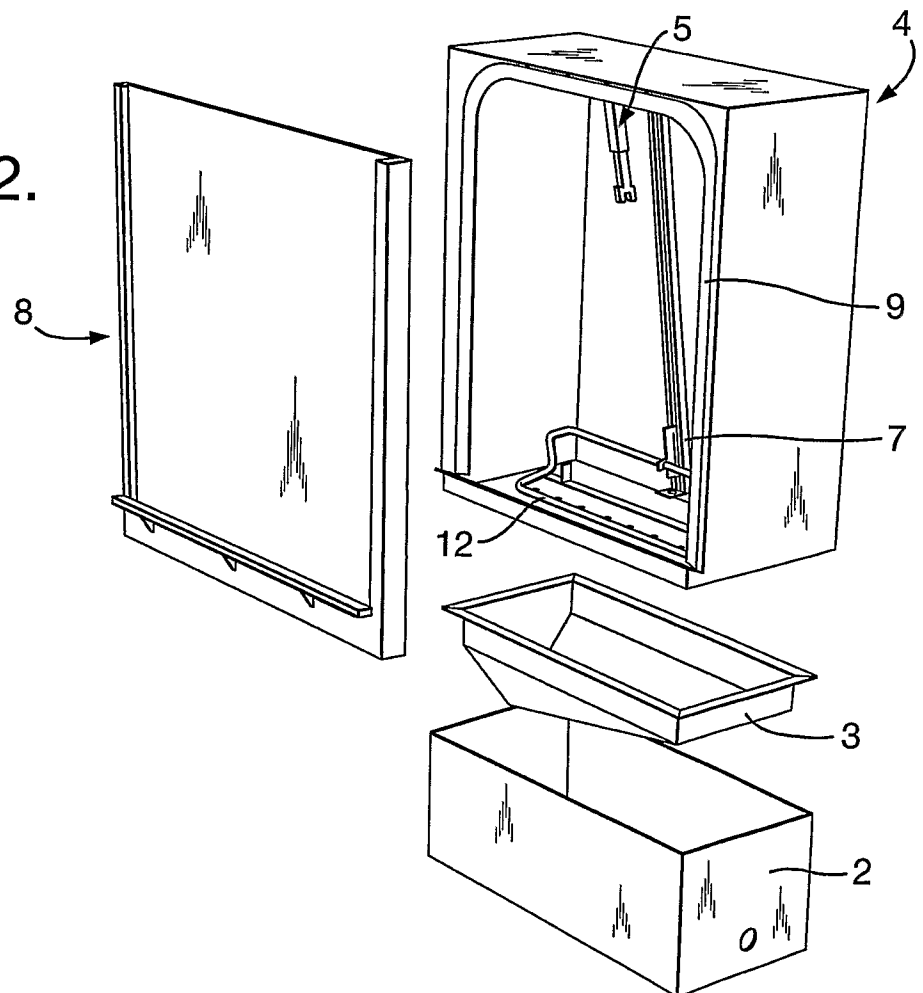


Fig.2.



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