



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 0 839 708 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
01.12.1999 Bulletin 1999/48

(51) Int. Cl.⁶: **B63B 27/24**, B63B 13/00,
F04F 1/20
// E21B43/12

(43) Date of publication A2:
06.05.1998 Bulletin 1998/19

(21) Application number: **97203502.6**

(22) Date of filing: **02.11.1992**

(84) Designated Contracting States:
**AT BE CH DE DK ES FR GB GR IE IT LI LU MC NL
SE**

(30) Priority: **28.01.1992 NO 920380**

(62) Document number(s) of the earlier application(s) in
accordance with Art. 76 EPC:
93900466.9 / 0 623 084

(71) Applicant: **FRANK MOHN FUSA A/S**
N-5670 Fusa (NO)

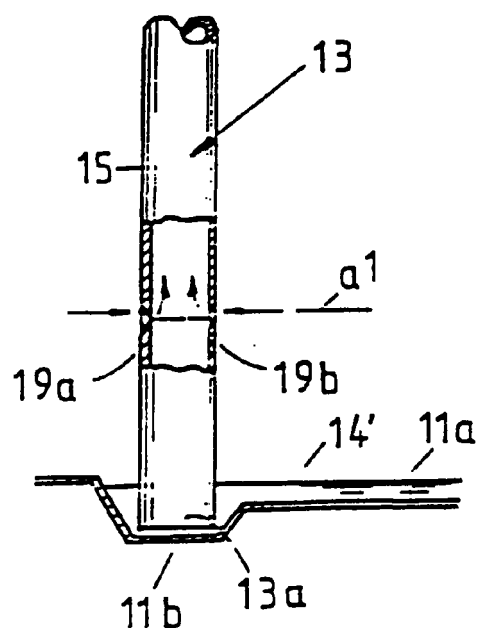
(72) Inventor: **Oyvind, Tveit**
5045 Skjoldtun (NO)

(74) Representative: **Wallin, Bo-Göran**
AWAPATENT AB,
Box 5117
200 71 Malmö (SE)

(54) **Process and arrangement for draining a liquid residue from the bottom of a tank**

(57) A liquid residue (14) is drained from the bottom (10a) of a tank (10) via a drain pipe (15) having its open bottom intake end (13a) near the tank bottom, using a pump or ejector (16) arranged at a level substantially above the upper level of the liquid residue (14). The pump (16) or ejector establishes an upwardly directed gas/liquid current in the drain pipe (15). At distinct levels (A1, A2) above the upper surface of the liquid residue, a gas medium is sucked into the drain pipe (15) through gas inlet openings (19a, 19b) in the drain pipe wall in order to mix this gas medium with the gas/liquid current passing through the drain pipe (15).

FIG. 2



EP 0 839 708 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 20 3502

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	NO 141 403 A (PATENTS AND DEVELOPMENTS A/S) 26 November 1979 (1979-11-26) * claim 1; figure 1 * ---	1-4	B63B27/24 B63B13/00 F04F1/20 //E21B43/12
Y	US 4 392 532 A (RAGGIO IVAN J) 12 July 1983 (1983-07-12) * abstract * * column 1, line 23 - column 2, line 25 * ---	1-4	
A	US 3 072 057 A (DA SILVA ROSA ESAU) 8 January 1963 (1963-01-08) * figures 1,2 * * column 1, line 10 - line 15 * * column 1, line 57 - line 70 * * column 2, line 52 - column 3, line 9 * ---	1-4	
A	GB 1 235 228 A (PATENTS AND DEVELOPMENTS A/S) 9 June 1971 (1971-06-09) * figure 1 * * page 2, line 109 - line 130 * & SE 369 698 B (PATENTS AND DEVELOPMENT AS) 16 September 1974 (1974-09-16) ---	1-4	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A	NO 123 115 B (PATENTS AND DEVELOPMENTS A/S) 27 September 1971 (1971-09-27) * figures 1-4 * * page 5, line 23 - line 28 * ---	1-4	B63B F04F E21B
A	WO 84 01138 A (THUNE EUREKA AS) 29 March 1984 (1984-03-29) -----		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 5 October 1999	Examiner Häusler, F.U.
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	

EPO FORM 1503 03/82 (P04C01)

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

EP 97 20 3502

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

05-10-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
NO 141403	A	NONE	
US 4392532	A	12-07-1983	NONE
US 3072057	A	08-01-1963	NONE
GB 1235228	A	09-06-1971	DE 1951405 A 30-04-1970 JP 51014800 B 12-05-1976 SE 369698 B 16-09-1974
NO 123115	B	NONE	
WO 8401138	A	29-03-1984	NONE