



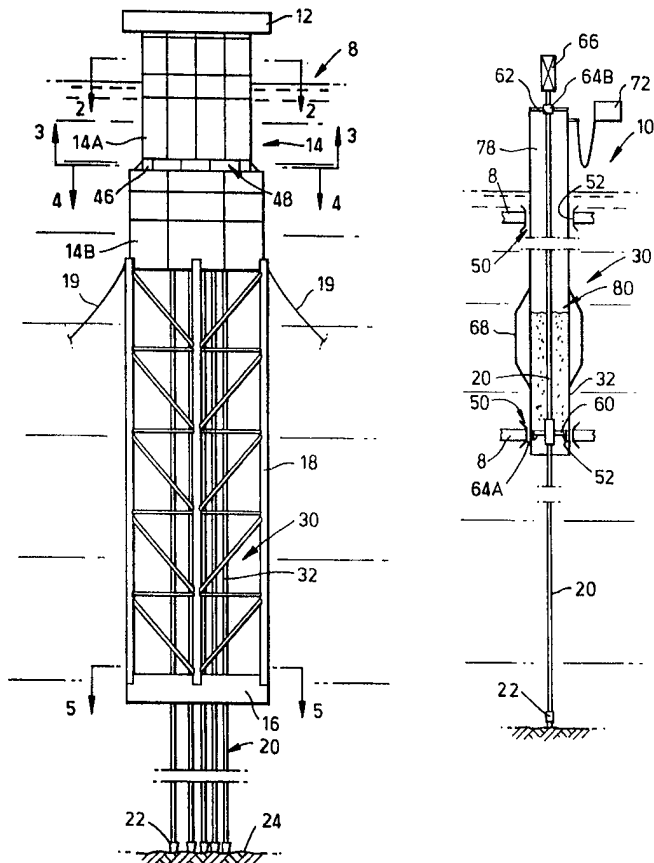
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/EP97/07342 (22) International Filing Date: 30 December 1997 (30.12.97) (30) Priority Data: 60/034,465 31 December 1996 (31.12.96) US (71) Applicant: SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ B.V. [NL/NL]; Carel van Bylandtlaan 30, NL-2596 HR The Hague (NL). (72) Inventors: BALINT, Stephen, William; 14107 Edinburgh Court, Houston, TX 77077 (US). COX, Bobby, Eugene; 924 Tavel Drive, Kenner, LA 70065 (US). EKVALL, Anders, Gustaf, Conny; 8126 Brighton Place Court, Houston, TX 77095 (US).</p>		<p>(81) Designated States: BR, GB, ID, MX, NO, OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). <b>Published</b> <i>With international search report.</i> (88) Date of publication of the international search report: 8 October 1998 (08.10.98)</p>

(54) Title: DEEPWATER RISER SYSTEM

(57) Abstract

A deepwater riser assembly (10) for application at an offshore platform comprising: a riser (20) connecting subsea equipment to a surface wellhead; a buoyancy can assembly (30), comprising: an open-ended buoyancy can tube (32) surrounding the upper part end of the riser; a seal (62) arranged in an upper part of the buoyancy can tube so as to effectively close the annulus between the riser and the buoyancy can tube; and a load transfer connection (64B) between the buoyancy can tube and the riser; a pressure charging system (72) communicating with said annulus between the riser and the buoyancy can tube at a location below the seal.



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# INTERNATIONAL SEARCH REPORT

International Application No <b>PCT/EP 97/07342</b>
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**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC 6 E21B17/01

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
 IPC 6 E21B B63B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 017 934 A (RHODES) 23 January 1962 see column 5, line 57 - line 66 ---	1,3,6-12
X	US 3 981 357 A (WALKER) 21 September 1976  see column 2, line 52 - line 62 see column 3, line 18 - line 24 see column 3, line 44 - line 55 see column 3, line 1 - line 2 ---	1,3,6, 10-12
X	US 3 858 401 A (WATKNS) 7 January 1975  see column 4, line 1 - line 12 ---	1,3,6, 10-12
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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Date of the actual completion of the international search

8 May 1998

Date of mailing of the international search report

03.08.98

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SOGNO M.G.

# INTERNATIONAL SEARCH REPORT

Inter. Patent Application No PCT/EP 97/07342
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 952 526 A (WATKINS) 27 April 1976	1,3,6, 10-12
A	see column 3, line 22 - line 25 see column 5, line 66 - column 10; figures 4,5 see column 6, line 47 - line 68 ---	7,8
A	US 3 426 858 A (BAUER) 11 February 1969 see column 5, line 1-5 see column 5, line 42-50 see column 5, line 58-63 -----	1,2,6-8

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP 97/ 07342

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. Claims: 1-3,6-8,10-12
2. Claims: 4,5
3. Claim : 9

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-3, 6-8, 10-12

### Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter. .ional Application No

PCT/EP 97/07342

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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