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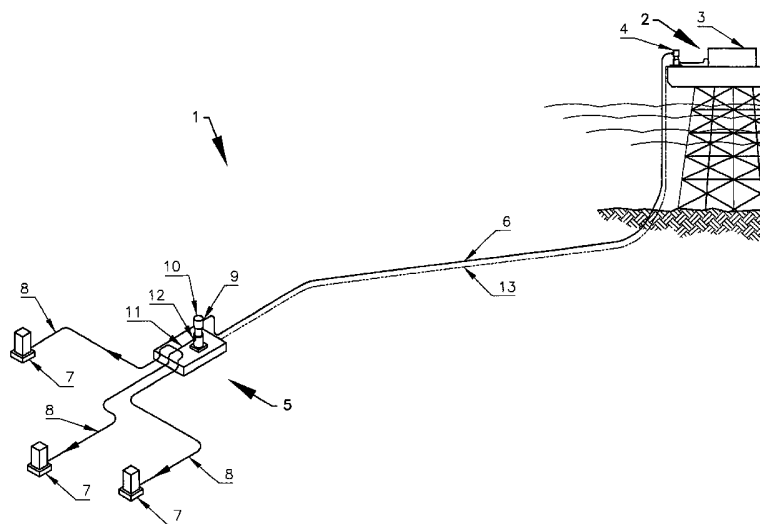
- (51) International Patent Classification⁷: **E21B 43/18**, 43/12, 43/40, 43/017
- (74) Agents: **JOHNSTONE, Douglas, Ian** et al.; Baron & Warren, 19 South End, Kensington, London W8 5BU (GB).
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- (71) Applicant (*for all designated States except US*): **ALPHA THAMES LIMITED** [GB/GB]; Essex House, Station Road, Upminster, Essex RM14 2SU (GB).
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): **APPLEFORD, David, Eric** [GB/GB]; 5 Greenview Cottages, Theydon Bois, Epping, Essex CM16 7JD (GB). **LANE, Brian, William** [GB/GB]; 41 Rattwick Drive, Canvey Island, Essex SS8 8NF (GB). **ANDREWS, Nicholas, John, Abbott** [GB/GB]; 15 Aspen Way, Brandon Groves, South Ockendon, Essex RM15 6TX (GB).

Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG,

[Continued on next page]

(54) Title: A SYSTEM AND METHOD FOR INJECTING GAS INTO A HYDROCARBON RESERVOIR



(57) Abstract: Gas is supplied from a host facility (2) to an underwater gas compressor (10) via a connecting pipeline (6) and the gas compressor is connected to a plurality of gas injection wells (7) for a hydrocarbon reservoir via well supply flowlines (8). The gas compressor (10) compresses the supplied gas to a higher pressure, and drives the gas into the reservoir via the flowlines (8) and gas injection wells (7) at a pressure at least as high as the pressure of the production fluid in the reservoir. This raises the overall pressure in the reservoir to drive production fluid there to the host facility (2). The compressed gas may alternatively be injected into production fluid in a production well to provide a gas lift effect.



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- KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)
- of inventorship (Rule 4.17(iv)) for US only

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 02/04635

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 E21B43/18 E21B43/12 E21B43/40 E21B43/017

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 7 E21B

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)

EPO-Internal, TULSA

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 98 15712 A (BAKER HUGHES) 16 April 1998 (1998-04-16) page 14, paragraph 2 ---	1,12
A	US 5 460 227 A (SIDRIM) 24 October 1995 (1995-10-24) abstract ---	1,12
A	WO 01 71158 A (KVAERNER OILFIELD PRODUCTS AS) 27 September 2001 (2001-09-27) page 25, paragraph 3 ---	1,12
A	GB 2 167 467 A (PARK) 29 May 1986 (1986-05-29) page 2, line 40 - line 98 ---	1,12
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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

20 February 2003

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

RAMPELMANN, K

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 02/04635

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>KUO J C ET AL: "WORLD'S LARGEST N2-GENERATION PLANT STARTS UP FOR CANTARELL RESERVOIR PRESSURE MAINTENANCE" OIL AND GAS JOURNAL, PENNWELL PUBLISHING CO. TULSA, US, vol. 99, no. 11, 12 March 2001 (2001-03-12), pages 41-47, XP001005735 ISSN: 0030-1388 page 45, paragraph "Economics; production specification"</p> <p style="text-align: center;">---</p>	1,12
A	<p>GB 2 327 695 A (BAKER HUGHES) 3 February 1999 (1999-02-03) page 35 -page 36</p> <p style="text-align: center;">-----</p>	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 02/04635

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:

see additional sheet

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.:

1-18

Remark on Protest

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

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-18

System and method for injecting gas into a reservoir

2. Claim : 19

Fluid handling method including separation and re-injection of gas

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/GB 02/04635

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