

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
11 May 2006 (11.05.2006)

PCT

(10) International Publication Number
WO 2006/048596 A3

(51) International Patent Classification:
G01V 11/00 (2006.01)

(21) International Application Number:
PCT/GB2005/003847

(22) International Filing Date: 6 October 2005 (06.10.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/980,049 3 November 2004 (03.11.2004) US

(71) Applicant (for all designated States except US): **HAL-LIBURTON ENERGY SERVICES, INC.** [US/US]; P.O. Box 1431, Duncan, OK 73533 (US).

(71) Applicant (for MW only): **WAIN, Christopher, Paul** [GB/GB]; A.A. Thornton & Co., 235 High Holborn, London WC1V 7LE (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **SHELLEY, Robert, F.** [US/US]; 2131 White Eagle Lane, Katy, TX 77450 (US). **FAM, Maged** [US/US]; 1315 Irish Mist Ct, Katy, TX 77450 (US). **SORENSEN, Federico** [AR/AR]; 1453 Rio Trocoman, Neuquen (AR). **PETTINATO, Miguel, H.** [AR/AR]; Borwn 492-Piso 9A, Chubut (AR).

(74) Agents: **WAIN, Christopher, Paul** et al.; A A Thornton & Co, 235 High Holbon, London WC1V 7LE (GB).

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

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
24 August 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD AND SYSTEM FOR PREDICTING PRODUCTION OF A WELL

(57) Abstract: Production of a well is predicted by associating log profiles for wells in a reservoir to production indicators for wells in the reservoir. A log for the well is matched to a corresponding log profile. The log profiles may each be generated by clustering logs for wells in the reservoir. The log profiles and logs may include magnetic resonance imaging (MRI) and/or other suitable data.



WO 2006/048596 A3

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB2005/003847

A. CLASSIFICATION OF SUBJECT MATTER

INV. G01V11/00

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)

G01V

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, COMPENDEX, INSPEC, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99/28767 A (SCHLUMBERGER LIMITED; SCHLUMBERGER CANADA LIMITED; SCHLUMBERGER TECHNO) 10 June 1999 (1999-06-10) page 6, line 19 - line 22 page 10, line 25 - page 11, line 7 page 12, line 14 - line 21 page 13, line 4 - line 11 page 14, line 6 - line 21 page 16, line 1 - line 10	1-75
X	BHUSHAN VIKAS ET AL: "A Novel Approach to Identify Reservoir Analogues" PROC EUR PET CONF; PROCEEDINGS OF THE EUROPEAN PETROLEUM CONFERENCE 2002, 2002, pages 1-6, XP002374613 the whole document ----- -/--	1-75

☒ Further documents are listed in the continuation of Box C.

☒ See patent family 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

5 April 2006

Date of mailing of the international search report

10. 07. 2006

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

Lorne, B

INTERNATIONAL SEARCH REPORT

Internati Application No
PCT/GB2005/003847

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ALIMONTI C ET AL: "Knowledge Discovery in Databases and Multiphase Flow Metering: The Integration of Statistics, Data Mining, Neural Networks, Fuzzy Logic, and Ad Hoc Flow Measurements Towards Well Monitoring and Diagnosis" PROC SPE ANNU TECH CONF EXHIB; PROCEEDINGS - SPE ANNUAL TECHNICAL CONFERENCE AND EXHIBITION 2002, 2002, pages 1-11, XP002374614 page 4 - page 5 -----	1-75

INTERNATIONAL SEARCH REPORT

Intern I application No.
PCT/GB2005/003847

Box II Observations where certain claims were found unsearchable (Continuation of item 2 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 III Observations where unity of invention is lacking (Continuation of item 3 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.:

see annex

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

International Application No. PCT/ GB2005/ 003847

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-5,12-15,19-22,25-27,30,31,34-36,39,42-46,55-57,61,73

A method for predicting production wherein the log profiles comprise clustered log profiles.

2. claims: 6-11,23,24,28,29,32,33,37,38,47-50,58,59,74,75

A method for predicting production wherein the log comprise magnetic resonance imaging.

3. claims: 16-18,40,41,60

A method for predicting production with validation indicators.

4. claims: 51-54

A computer model for predicting production of a well comprising a production profile associated with each log profile.

5. claims: 62-67

A computer system comprising a correlation engine.

6. claims: 68-72

A system for predicting production for a well comprising a production predictor.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/GB2005/003847

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9928767	A	10-06-1999	CA 2312381 A1
			DE 69829072 D1
			EP 1036341 A1
			RU 2223521 C2
			10-06-1999
			24-03-2005
			20-09-2000
			10-02-2004