



- (51) International Patent Classification:  
*E21B 49/00* (2006.01)    *E21B 49/08* (2006.01)
- (21) International Application Number:  
PCT/US2012/048010
- (22) International Filing Date:  
24 July 2012 (24.07.2012)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
61/511,441    25 July 2011 (25.07.2011)    US
- (71) Applicant (for all designated States except US): **HAL-LIBURTON ENERGY SERVICES, INC.** [US/US]; 10200 Bellaire Boulevard, Houston, TX 77072 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **PROETT, Mark** [US/US]; 3611 Covey Drive, Missouri City, TX 77459 (US). **CHEN, Dingding** [US/US]; 3201 Twist Trail, Plano, TX 75093 (US). **HADIBEIK, Abdolhamid** [IR/US]; 1 University Station, C0300, Room 5.146, Austin, TX 78712 (US). **EYUBOGLU, Sammi, Abbas** [US/US]; 70 N. Misty Canyon Place, Conroe, TX 77385 (US).
- (74) Agent: **HITCHCOCK, Thomas, S.**; Baker Botts LLP, 910 Louisiana Street, Houston, TX 77002 (US).
- (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, BN, BR, BW, BY, BZ, CA, CH, CL, 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, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

- (88) Date of publication of the international search report:  
28 March 2013

(54) Title: AUTOMATIC OPTIMIZING METHODS FOR RESERVOIR TESTING

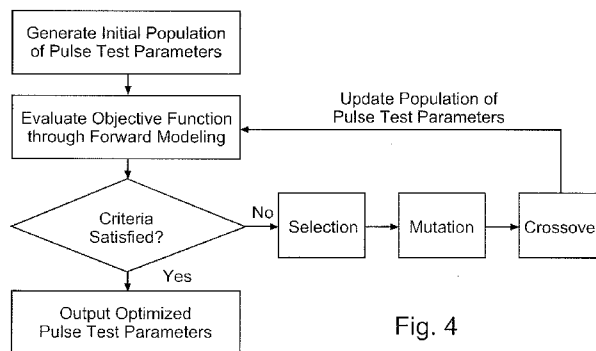
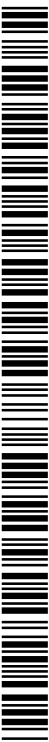


Fig. 4

(57) Abstract: A method of determining a reservoir parameter of a subterranean formation comprising: initiating an initial pressure pulse in the subterranean formation; initiating a series of subsequent pressure pulses in the subterranean formation until the reservoir parameter may be determined, wherein each subsequent pressure pulse is optimized utilizing analytical and/or numerical simulation models; and determining the reservoir parameter.



## INTERNATIONAL SEARCH REPORT

International application No

PCT/US2012/048010

A. CLASSIFICATION OF SUBJECT MATTER  
 INV. E21B49/00 E21B49/08  
 ADD.

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)  
 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 practicable, search terms used)

EPO-Internal, 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	MEISTER M, PRAGT J., BUYSCH A., WITTE J., DUE G.N., HOPE R.: "Pressure Gradient Testing With a New Formation Pressure Testing During Drilling Tool", SOCIETY OF PETROLEUM ENGINEERS, SPE, no. SPE90425, 26 September 2004 (2004-09-26), - 29 September 2004 (2004-09-29), pages 1-10, XP002690884, Houston, Tx page 3: "Description of the LWD Formation Pressure Tester" and "Optimized Test"; figure 5 ----- -/--	1-20

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 application or patent 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

24 January 2013

Date of mailing of the international search report

11/02/2013

Name and mailing address of the ISA/

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

Authorized officer

Schneiderbauer, K

## INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2012/048010

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>MEISTER M., LEE J., KRUEGER V., GEORGI D., CHEMALI R.: "Formation Pressure Testing During Drilling: Challenges and Benefits", SOCIETY OF PETROLEUM ENGINEERS, SPE, no. SPE 84088, 5 October 2003 (2003-10-05), - 8 October 2003 (2003-10-08), pages 1-8, XP002690885, Denver, Co page 2-3: "Intelligent Control System"; figure 1</p> <p style="text-align: center;">-----</p>	1-20
A	<p>LEE J., MICHAELS J.: "Enhanced Wireline Formation Tests in Low Permeability Formations: Quality Control Through Formation Rate Analysis", SOCIETY OF PETROLEUM ENGINEERS, SPE, no. SPE60293, 12 March 2000 (2000-03-12), - 15 March 2000 (2000-03-15), pages 1-7, XP002690886, Denver, Co page 2: "FRA technique"</p> <p style="text-align: center;">-----</p>	1-20
A	<p>US 2004/231841 A1 (NIEMEYER EICK [DE] ET AL) 25 November 2004 (2004-11-25) paragraphs [0026], [0045], [0046], [0047], [0053], [0056], [0063], [0065]</p> <p style="text-align: center;">-----</p>	1-20

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/048010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
US 2004231841	A1	25-11-2004	BR P10507858 A	17-07-2007
			CA 2556427 A1	01-09-2005
			DE 602005004383 T2	22-01-2009
			DK 1716314 T3	26-05-2008
			EP 1716314 A1	02-11-2006
			US 2004231841 A1	25-11-2004
			WO 2005080752 A1	01-09-2005
-----				