PTO/SB/81A (12-08)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT - POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS

Patent Number	8,079,413 B2
Issue Date	December 20, 2011
First Named Inventor	W. Lynn Frazier
Title	Bottom Set Downhole Plug
Attorney Docket Number	

I hereby revoke all previous powers of attorney given in the above-identified patent.

☐ A Power of Attorney is submitted herewith.

OR

☐ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

OR

☒ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number
G. Turner Moller	22978

Please recognize or change the correspondence address for the above-identified patent to:

☐ The address associated with the above-mentioned Customer Number.

OR

☐ The address associated with Customer Number:

OR

☒ Firm or Individual Name	G. Turner Moller				
Address	711 N. Carancahua, Suite 720				
City	Corpus Christi	State	TX	Zip	78401
Country	US				
Telephone	361-883-7257	Email			

I am the:

☐ Inventor, having ownership of the patent.

OR

☒ Patent owner.

Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on _____

SIGNATURE of ~~Inventor~~ or Patent Owner

Signature	W. Lynn Frazier	Date	March 29, 2012
Name	W. Lynn Frazier	Telephone	361-299-6333
Title and Company	President and CEO, Magnum Oil Tools International, L.L.C.		

NOTE: Signatures of all the inventors or patent owners of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☒ *Total of 2 forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/SB/96 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Magnum Oil Tools International, L.L.C.

Application No./Patent No.: 8,079,413 B2 Filed/Issue Date: December 20, 2011

Titled: Bottom Set Downhole Plug

Magnum Oil Tools International, L.L.C. (Name of Assignee), a Texas Limited Liability Company (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. [X] the assignee of the entire right, title, and interest in;

2. [ ] an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is _____ %); or

3. [ ] the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. [ ] An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy therefore is attached.

OR

B. [ ] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

[ ] Additional documents in the chain of title are listed on a supplemental sheet(s).

[X] As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Signature — March 29, 2012 (Date)

W. Lynn Frazier (Printed or Typed Name) — President and CEO (Title)

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	12428710
Application Number:	13194871
International Application Number:	
Confirmation Number:	1776
Title of Invention:	BOTTOM SET DOWNHOLE PLUG
First Named Inventor/Applicant Name:	W. Lynn Frazier
Customer Number:	60935
Filer:	Jared E. Cmaidalka/Denise Barberis
Filer Authorized By:	Jared E. Cmaidalka
Attorney Docket Number:	MOTI-018P1
Receipt Date:	29-MAR-2012
Filing Date:	29-JUL-2011
Time Stamp:	18:20:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	MOTI_018P1_Transmittal_POA_and_373b.pdf	263132 7508056a617037850 6cb788114a64d0c13d11cc7	no	2

Warnings:	
Information:	

2		MOTI_018P1_POA_and_37cfr373b.pdf	289668 d0ac32e2cd00e50d653f65d4d569ba5191e00d91	yes	4

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Power of Attorney	1	2
Assignee showing of ownership per 37 CFR 3.73(b).	3	4

Warnings:	
Information:	
Total Files Size (in bytes):	552800

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc Code: TRAN.LET

Document Description: Transmittal Letter

PTO/SB/21 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	6

Application Number	13/194,871
Filing Date	July 29, 2011
First Named Inventor	W. Lynn Frazier
Art Unit	3676
Examiner Name	Robert E. Fuller
Attorney Docket Number	

ENCLOSURES (*Check all that apply*)

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☑ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☑ Other Enclosure(s) (please Identify below):

Statement Under 37 CFR 3.73(b)

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Edmonds & Nolte, P.C.		
Signature	/Robb D. Edmonds/		
Printed name	Robb D. Edmonds		
Date	March 29, 2012	Reg. No.	46,681

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature	/Denise A. Barberis/		
Typed or printed name	Denise A. Barberis	Date	03/29/2012 via EFS

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United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/194,871	12/20/2011	8079413	MOTI-018P1	1776

60935 7590 11/30/2011

Edmonds Nolte, PC
16815 ROYAL CREST DRIVE
SUITE 130
HOUSTON, TX 77058

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

W. Lynn Frazier, Corpus Christi, TX;

Examiner's Initials	US Document Number	Publication Date	Name of Patentee of Applicant of Cited Document
	2833354	2/15/1955	Sailers
	3013612 12/196	~~12/16/1964~~	Angel
	3054453	3/14/1955	Bonner
	3062296	12/1/1960	Brown
	3082824 03/1963	~~3/20/1959~~	Taylor et al.
	3160209 12/1964	~~10/19/1956~~	Bonner
	3163225 12/1964	~~2/15/1961~~	Perkins
	3273588	9/20/1966	Dollison
	3282342 11/1966	~~11/21/1963~~	Mott
	3291218 12/1966	~~2/17/1964~~	Lebourg
	3298440	1/17/1967	Current
	3308895 03/1967	~~12/16/1964~~	Oxford et al.
	3356140	12/5/1967	Young
	3393743 07/1968	~~11/12/1965~~	Stanescu
	3429375 02/1969	~~12/2/1966~~	Craig
	3517742	6/30/1970	Williams
	3554280	1/21/1971	Tucker
	3687202	8/29/1972	Young et al.
	3818987	6/25/1974	Ellis
	3851706	12/3/1974	Ellis
	3860066	1/14/1975	Pearce et al.
	3926253	12/16/1975	Duke
	4049015	9/20/1977	Brown
	4134455	1/16/1979	Read
	4185689	1/29/1980	Harris
	4391547	7/5/1983	Jackson
	4436151	3/13/1984	Callihan et al.
	4457376	7/3/1984	Carmody et al.
	4493374	1/15/1985	Magee, Jr.
	4532995	8/6/1985	Kaufman
	4554981	11/26/1985	Davies
	~~4556541~~ 4,566,541	1/28/1986	Moussy et al.
	4585067	4/29/1986	Blizzard et al.
	4595052	6/17/1986	Kristiansen
	4602654	1/29/1986	Stehling et al.
	4688641	8/25/1987	Knieriemen
Date Considered		**Examiner Signature**	

Change(s) applied to document, /N.W.S./ 11/16/2011

Change(s) applied to document, /N.W.S./ 11/17/2011

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /REF/

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	
				Filing Date	June 29, 2011
				First Named Inventor	W. Lynn Frazier
				Art Unit	
(Use as many sheets as necessary)				Examiner Name	
Sheet	1	of	6	Attorney Docket Number	MOTI-018

Examiner's Initials	US Document Number	Publication Date	Name of Patentee of Applicant of Cited Document
	20030024706	2/6/2003	Allamon
	20030188860	10/9/2003	Zimmerman et al.
	20070051521	3/8/2007	Fike et al.
	20070107908	5/17/2007	Vaidya et al.
	20080060821	3/13/2008	Smith et al.
	20080110635	5/15/2008	Loretz et al.
	20090211749	8/27/2009	Nguyen et al.
	20100084146	4/8/2010	Roberts
	20100132960	6/3/2010	Shkurti et al.
	20100155050	6/24/2010	Frazier
	20100252252	10/7/2010	Harris et al.
	20100263876	10/21/2010	Frazier
	20100276159	11/4/2010	Mailand et al.
	20100288503	11/18/2010	Cuiper et al.
	20110036564	2/17/2011	Williamson
	20110061856	3/17/2011	Kellner et al.
	20110088915	4/21/2011	Stanojcic et al.
	20110103915	5/5/2011	Tedeshi
	2040889	5/23/1933	Whinnen
	2223602	10/4/1938	Cox
	2286126	7/5/1940	Thornhill
	2376605	5/22/1945	Lawrence
	2593520	10/11/1945	Baker et al.
	2616502	3/15/1948	Lenz
	2640546	6/2/1953	Baker et al.
	2713910	7/26/1955	Baker et al.
	2737242	8/19/1952	Baker
	2756827	6/7/1948	Farrar
	2830666	7/12/1956	Rhodes
Date Considered		**Examiner Signature**	

Change(s) applied to document, /N.W.S./ 11/17/2011

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United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/194,871	07/29/2011	W. Lynn Frazier	MOTI-018P1

CONFIRMATION NO. 1776

60935
Edmonds Nolte, PC
16815 ROYAL CREST DRIVE
SUITE 130
HOUSTON, TX 77058

PUBLICATION NOTICE

Title:BOTTOM SET DOWNHOLE PLUG

Publication No.US-2011-0277987-A1
Publication Date:11/17/2011

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

60935 7590 11/04/2011

Edmonds Nolte, PC
16815 ROYAL CREST DRIVE
SUITE 130
HOUSTON, TX 77058

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Via EFS

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Stacy Lanier	(Depositor's name)
Stacy Lanier	(Signature)
11/10/2011	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/194,871	07/29/2011	W. Lynn Frazier	MOTI-018	1776

TITLE OF INVENTION: BOTTOM SET DOWNHOLE PLUG

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$870	$300	$0	$1170	02/06/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
FULLER, ROBERT EDWARD	3676	166-135000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Edmonds & Nolte, PC
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: W. Lynn Frazier

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Corpus Christi, TX

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☑ Issue Fee
☑ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
☑ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /Robb D. Edmonds/ Date 11/10/2011

Typed or printed name Robb D. Edmonds Registration No. 46681

Electronic Patent Application Fee Transmittal

Application Number:	13194871
Filing Date:	29-Jul-2011
Title of Invention:	BOTTOM SET DOWNHOLE PLUG
First Named Inventor/Applicant Name:	W. Lynn Frazier
Filer:	Robb D. Edmonds/Stacy Lanier
Attorney Docket Number:	MOTI-018P1

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	2501	1	870	870
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1170**

Electronic Acknowledgement Receipt

EFS ID:	11382743
Application Number:	13194871
International Application Number:	
Confirmation Number:	1776
Title of Invention:	BOTTOM SET DOWNHOLE PLUG
First Named Inventor/Applicant Name:	W. Lynn Frazier
Customer Number:	60935
Filer:	Robb D. Edmonds/Stacy Lanier
Filer Authorized By:	Robb D. Edmonds
Attorney Docket Number:	MOTI-018P1
Receipt Date:	10-NOV-2011
Filing Date:	29-JUL-2011
Time Stamp:	16:42:29
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1170
RAM confirmation Number	3807
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Issue Fee Payment (PTO-85B)	MOTI_018_IssueFeePymt_11102011.pdf	68351 e85d073b35081fe288b328bd2be48791f9140674	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	31753 de0aad4e4a0dc184c9a18e7d723c9ff749efc212	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	100104	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

60935 7590 11/04/2011

Edmonds Nolte, PC
16815 ROYAL CREST DRIVE
SUITE 130
HOUSTON, TX 77058

EXAMINER	
FULLER, ROBERT EDWARD	
ART UNIT	PAPER NUMBER
3676	

DATE MAILED: 11/04/2011

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/194,871	07/29/2011	W. Lynn Frazier	MOTI-018	1776

TITLE OF INVENTION: BOTTOM SET DOWNHOLE PLUG

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$870	$300	$0	$1170	02/06/2012

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

60935 7590 11/04/2011

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HOUSTON, TX 77058

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)

(Signature)

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/194,871	07/29/2011	W. Lynn Frazier	MOTI-018	1776

TITLE OF INVENTION: BOTTOM SET DOWNHOLE PLUG

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$870	$300	$0	$1170	02/06/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
FULLER, ROBERT EDWARD	3676	166-135000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☐ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

☐ A check is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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MEGCO Ex. 1002

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/194,871	07/29/2011	W. Lynn Frazier	MOTI-018	1776

60935 7590 11/04/2011

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SUITE 130
HOUSTON, TX 77058

EXAMINER	
FULLER, ROBERT EDWARD	
ART UNIT	PAPER NUMBER
3676	

DATE MAILED: 11/04/2011

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.

Notice of Allowability	Application No.	Applicant(s)	
	13/194,871	FRAZIER, W. LYNN	
	Examiner	Art Unit	
	ROBERT E. FULLER	3676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the Supplemental Amendment filed October 20, 2011*.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are *12-17 and 21-34*.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *20111024* .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

EXAMINER'S COMMENT

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-17, drawn to a plug, classified in class 166, subclass 135.

II. Claims 18-20, drawn to an insert, classified in class 166, subclass 242.6.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination does not require the threads on the outer surface of the insert body. The subcombination has separate utility such as a means to connect tubulars within a drilling assembly.

The examiner has required restriction between combination and subcombination inventions. Where applicant elects a subcombination, and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such

claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and/or examination burden if restriction were not required because at least the following reason(s) apply:

The inventions require different search scopes, as evidenced by their separate classification.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a invention to be examined even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected invention**.

The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record

showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

This application contains claims directed to the following patentably distinct species:

Species I – Plug having shearable threads disposed directly on the plug body (Fig. 2C).

Species II – Plug having shearable threads disposed on an insert threadably attached on an interior surface of the plug body (Figs. 2A, 2B, 3).

The species are independent or distinct because the claimed setting tool connections are mutually exclusive. In addition, these species are not obvious variants of each other based on the current record.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, or a single grouping of patentably indistinct species, for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claims are generic.

There is a search and/or examination burden for the patentably distinct species as set forth above because at least the following reason(s) apply:

The mutually exclusive features between the two species would require a different scope of search and unique search queries.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or a grouping of patentably indistinct species to be examined even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected species or grouping of patentably indistinct species**, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

The election may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the election of species requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected species or grouping of patentably indistinct species.

Should applicant traverse on the ground that the species, or groupings of patentably indistinct species from which election is required, are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing them to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the species unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other species.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141.

During a telephone conversation with Robb Edmonds on October 14, 2011 a provisional election was made without traverse to prosecute the invention of Group I, Species II, claims 12-17. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-11 and 18-20 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Per the supplemental amendment filed October 20, 2011, claims 1-11 and 18-20 have been cancelled. New claims 21-34 are all directed to group I, species II.

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance:

The closest prior art is that of Thompson (US 2,714,932) and Bonner (US 3,160,209).

Thompson discloses a plug having a body (10), a malleable element (30, 31), a slip (32), a conical element (33, 34), and an insert (15). The insert has "shearable" threads on an exterior surface (14) and on an interior surface (22), the interior threads engaging a setting tool (26). Note that Thompson does not explicitly state that the

threads shear, but examiner interprets any threaded connection to be *shearable* since the threads *could* shear if acted upon by a large enough force.

Thompson does not teach or suggest the insert having a passageway extending therethrough, nor does the removal of the setting tool (26) provide a flow passage through the insert and the body, as specifically called for in the claimed combination.

Bonner discloses a plug having a body (82), a malleable element (95), a slip (89, 90), a conical element (93, 94), and an insert (83) having a passage therethrough. Removal of a setting tool (84) provides a fluid passage through the body (82) and the insert (83). The insert does not have threads within its outer surface, but does have a shear pin (85) which connects with the setting tool. Though Bonner fails to disclose shearable threads, it would have been considered obvious to replace the shear pin of Bonner with shearable threads, as this would have amounted to simple substitution of well known equivalent shear release mechanisms.

Bonner does not teach or suggest the insert being screwed into or disposed within an *interior* surface of the body, as specifically called for in the claimed combination.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT E. FULLER whose telephone number is (571)272-6300. The examiner can normally be reached on Monday thru Friday from 9:00 AM - 6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shane Bomar can be reached on 571-272-7026. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SHANE BOMAR/
Supervisory Patent Examiner, Art Unit 3676

10/24/2011
/R.E.F./

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	13/194,871	FRAZIER, W. LYNN	
	Examiner	Art Unit	
	ROBERT E. FULLER	3676	

All participants (applicant, applicant's representative, PTO personnel):

(1) *ROBERT E. FULLER*. (3)_____.

(2) *Robb Edmonds (Attorney for Applicant)*. (4)_____.

Date of Interview: *20 October 2011*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☒102 ☒103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *12*.

Identification of prior art discussed: *Thompson (US 2,714,932) and Bonner (US 3,160,209)*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Language was agreed upon to overcome the closest prior art references, Thompson and Bonner. Applicant further agreed to cancel the withdrawn claims directed to a non-elected invention/species. See attached Reasons for Allowance. Applicant filed a supplemental amendment on October 20, 2011 containing the changes agreed upon in this interview.

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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	Application Number	
	Filing Date	
	First Named Inventor	W. Lynn Frazier
	Art Unit	
	Examiner Name	
	Attorney Docket Number	MOTI-018

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	2714932		1955-08-09	A. E. Thompson	
	2	4437516		1984-03-20	Darryl W. Cockrell	
	3	5224540		1993-07-06	Streich et al.	

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Filing Date	2011-07-29
First Named Inventor	W. Lynn Frazier
Art Unit	3676
Examiner Name	Thomas S. Bomar
Attorney Docket Number	MOTI-018

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7325617	B2	2008-02-05	Murray	
	2	5117915	A	1992-06-02	Mueller et al.	
	3	4848459		1989-07-18	Blackwell et al.	
	4	4432418		1984-02-21	Mayland	
	5	4405017		1983-09-20	Allen et al.	
	6	4314608		1982-02-09	Richardson	

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	1	20100101807		2010-04-29	Greenlee et al.		
	2	20090114401		2009-05-07	Purkis		

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	1	7798236	B2	2010-09-21	McKeachnie et al.	

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	Examiner Name	
	Attorney Docket Number	MOTI-018

	1	"Halliburton Services, Sales & Service Catalog No. 43," Halliburton Co., 1985 (202 pages)	☐
	2	"Alpha Oil Tools Catalog," Alpha Oil Tools, 1997 (136 pages)	☐

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				Filing Date	June 29, 2011
				First Named Inventor	W. Lynn Frazier
				Art Unit	
(Use as many sheets as necessary)				Examiner Name	
Sheet	1	of	6	Attorney Docket Number	MOTI-018

Examiner's Initials	US Document Number	Publication Date	Name of Patentee of Applicant of Cited Document
	20030024706	2/6/2003	Allamon
	20030188860	10/9/2003	Zimmerman et al.
	20070051521	3/8/2007	Fike et al.
	20070107908	5/17/2007	Vaidya et al.
	20080060821	3/13/2008	Smith et al.
	20080110635	5/15/2008	Loretz et al.
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	20100084146	4/8/2010	Roberts
	20100132960	1/3/2010	Shkurti et al.
	20100155050	1/24/2010	Frazier
	20100252252	10/7/2010	Harris et al.
	20100263876	10/21/2010	Frazier
	20100276159	11/4/2010	Mailand et al.
	20100288503	11/18/2010	Cuiper et al.
	20110036564	2/17/2011	Williamson
	20110061856	3/17/2011	Kellner et al.
	20110088915	4/21/2011	Stanojcic et al.
	20110103915	5/5/2011	Tedeshi
	2040889	5/23/1933	Whinnen
	2223602	10/4/1938	Cox
	2286126	7/5/1940	Thornhill
	2376605	5/22/1945	Lawrence
	2593520	10/11/1945	Baker et al.
	2616502	3/15/1948	Lenz
	2640546	6/2/1953	Baker et al.
	2713910	7/26/1955	Baker et al.
	2737242	8/19/1952	Baker
	2756827	6/7/1948	Farrar
	2830666	7/12/1956	Rhodes
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Examiner's Initials	US Document Number	Publication Date	Name of Patentee of Applicant of Cited Document
	2833354	2/15/1955	Sailers
	3013612	12/16/1964	Angel
	3054453	3/14/1955	Bonner
	3062296	12/1/1960	Brown
	3082824	3/20/1959	Taylor et al.
	3160209	10/19/1956	Bonner
	3163225	2/15/1961	Perkins
	3273588	9/20/1966	Dollison
	3282342	11/21/1963	Mott
	3291218	2/17/1964	Lebourg
	3298440	1/17/1967	Current
	3308895	12/16/1964	Oxford et al.
	3356140	12/5/1967	Young
	3393743	11/12/1965	Stanescu
	3429375	12/2/1966	Craig
	3517742	6/30/1970	Williams
	3554280	1/21/1971	Tucker
	3687202	8/29/1972	Young et al.
	3818987	6/25/1974	Ellis
	3851706	12/3/1974	Ellis
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	4436151	3/13/1984	Callihan et al.
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	4532995	8/6/1985	Kaufman
	4554981	11/26/1985	Davies
	4556541	1/28/1986	Moussy et al.
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	4595052	6/17/1986	Kristiansen
	4602654	1/29/1986	Stehling et al.
	4688641	8/25/1987	Knieriemen
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	4708163	11/24/1987	Deaton
	4708202	11/24/1987	Sukup et al.
	4776410	10/11/1988	Perkin et al.
	4784226	11/15/1988	Wyatt
	4792000	12/20/1988	Perkin et al.
	4830103	5/16/1989	Blackwell et al.
	4893678	1/16/1990	Stokley et al.
	5020590	6/4/1991	McLeod
	5095980	3/17/1992	Watson
	5113940	5/19/1992	Glaser
	5154228	10/13/1992	Gambertoglio et al.
	5183068	2/2/1993	Prosser
	5188182	2/23/1993	Echols, III et al
	5207274	5/4/1993	Streich et al.
	5209310	5/11/1993	Clydesdale
	5230390	7/27/1993	Zastresek et al.
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Date Considered		**Examiner Signature**	

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Date Considered		**Examiner Signature**	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /REF/

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	RE17217	2/19/1929	Burch
Examiner Initials	**Document Number**	**Publication Date**	**Foreign Patent Documents**
	GB914030	12/28/1962	KIGASS LIMITED
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Date Considered	10/24/2011	**Examiner Signature**	/Robert Fuller/

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /REF/

Issue Classification

Application/Control No.	Applicant(s)/Patent Under Reexamination
13194871	FRAZIER, W. LYNN
Examiner	**Art Unit**
ROBERT E FULLER	3676

ORIGINAL		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
166	124	E 2 1 B 33 / 129 (2006.0)	

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
166	133	135			

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1	6	17	19	33										
	2		18	20	34										
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2	13	15	29												
3	14	16	30												
4	15	17	31												
5	16	18	32												

/ROBERT E FULLER/ Examiner.Art Unit 3676 (Assistant Examiner)	10/24/2011 (Date)	**Total Claims Allowed:** 20
/SHANE BOMAR/ Supervisory Patent Examiner.Art Unit 3676 (Primary Examiner)	10/31/2011 (Date)	O.G. Print Claim(s): 1 O.G. Print Figure: 3A

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13194871	FRAZIER, W. LYNN
	Examiner	Art Unit
	ROBERT E FULLER	3676

SEARCHED			
Class	Subclass	Date	Examiner
166	123, 124, 135, 138, 193	10/13/2011	REF

SEARCH NOTES		
Search Notes	Date	Examiner
General text search; see EAST search history.	10/13/2011	REF
Inventor name search.	10/13/2011	REF
Backward/forward citations.	10/13/2011	REF

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
Text search; see EAST search history.		10/24/2011	REF

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BIB DATA SHEET

CONFIRMATION NO. 1776

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/194,871	07/29/2011	166	3676	MOTI-018

APPLICANTS
W. Lynn Frazier, Corpus Christi, TX;

**** CONTINUING DATA ***************************
This application is a CIP of 12/317,497 12/23/2008

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
08/08/2011

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☐ No Verified and Acknowledged /ROBERT EDWARD FULLER/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		TX	7	20	3

ADDRESS
Edmonds Nolte, PC
16815 ROYAL CREST DRIVE
SUITE 130
HOUSTON, TX 77058
UNITED STATES

TITLE
BOTTOM SET DOWNHOLE PLUG

FILING FEE RECEIVED		
462	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

OK TO ENTER: /REF/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: W. Lynn Frazier	§	Examiner:	Fuller, Robert E.
Serial No.: 13/194,871	§	Group Art Unit:	3676
Filed: July 29, 2011	§	Docket No:	MOTI/018
For: *Bottom Set Downhole Plug*	§	Confirmation No.:	1776
	§	Date:	October 20, 2011

MAIL STOP AMENDMENT
P.O. Box 1450
Alexandria, VA 22313-1450

APPLICANT'S AMENDMENT IN RESPONSE TO EXAMINER'S INTERVIEW

This amendment is submitted in response to the telephonic interview with the examiner on October 18, 2011. Applicant respectfully requests reconsideration of the application in light of the following amendments and remarks.

Amendments to the Specification: None.

Amendments to the Drawings: None.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks begin on page 6 of this paper.

OK TO ENTER: /REF/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: W. Lynn Frazier	§	Examiner:	Fuller, Robert E.
Serial No.: 13/194,871	§	Group Art Unit:	3676
Filed: July 29, 2011	§	Docket No:	MOTI/018
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Amendments to the Drawings: None.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks begin on page 6 of this paper.

Notice of References Cited	Application/Control No. 13/194,871	Applicant(s)/Patent Under Reexamination FRAZIER, W. LYNN	
	Examiner ROBERT E. FULLER	Art Unit 3676	Page 1 of 1

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	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13194871	FRAZIER, W. LYNN
	Examiner	Art Unit
	ROBERT E FULLER	3676

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	10/24/2011								
	1	-								
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17	31	=								
18	32	=								
19	33	=								
20	34	=								

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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/194,871	07/29/2011	W. Lynn Frazier	MOTI-018

CONFIRMATION NO. 1776

POA ACCEPTANCE LETTER

60935
Edmonds Nolte, PC
16815 ROYAL CREST DRIVE
SUITE 130
HOUSTON, TX 77058

OC000000050627404

Date Mailed: 10/28/2011

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/21/2011.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/ttkim/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	13/194,871	FRAZIER, W. LYNN	

Document Code - DISQ	Internal Document – DO NOT MAIL

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 10/21/11	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:

Felicia D. Roberts

12/317,497

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	11	(("4437516") or ("5224540") or ("2714932")).PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2011/08/23 09:17
S2	465	(166/135).CCLS.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2011/08/23 10:57
S3	466	(166/138).CCLS.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2011/08/23 11:04
S4	429	(plug packer) same (drillable adj material)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 11:14
S5	77	(plug packer) same (drillable adj material) same composite	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 11:14
S6	6	(plug packer) same ((dropp$3 drop) near3 ball) same (disappear$3 degradable degrad$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 11:16
S7	19	(plug packer) same (ball near3 (seat shoulder)) same (disappear$3 degradable degrad$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 11:17
S8	14	(bridge adj plug) and (ball near3 (seat shoulder)) same (disappear$3 degradable degrad$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 11:18
S9	45	(bridge adj plug) and (ball with (disappear$3 degradable degrad$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 11:18
S10	30	(bridge adj plug) and (ball near3 (disappear$3 degradable degrad$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 11:19

S11	18	(plug packer) same (ball near3 (disappear$3 degradable degrad$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 11:19
S12	4	(packer) same (ball near3 (disappear$3 degradable degrad$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 11:21
S13	4	(packer) same (ball near3 (disappear$3 degradable degrad$3 dissolv$3 dissolvable))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 11:22
S14	29	(packer plug) and ((drill $3 adj out) same (anti? rotat$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 11:23
S15	208	(frac adj plug)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 11:24
S16	106	(frac adj plug) and ball	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 11:24
S17	5	(frac adj plug).ti. and ball	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 11:25
S18	6	(frac adj (plug packer)).ti. and ball	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 11:25
S19	25	(frac adj (plug packer)).ti.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 11:25
S20	1636	(packer plug) and (slip wedge cam) and flapper	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 13:08
S21	240	((packer plug) near set) and (slip) and flapper	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 13:09
S22	197	(packer near set) and (slip wedge) and flapper	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 13:11

S23	25	(packer near set) same (slip wedge) same flapper	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 13:12
S24	64	(packer plug) and ((setting adj tool) same (thread with (shear$3 shearable frangible)))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 13:24
S25	7	(packer plug) and ((setting adj (tool rod mandrel)) same (thread near2 (shear$3 shearable frangible)))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 13:28
S26	12	(packer plug) and ((setting adj (tool rod mandrel)) same (thread near3 (shear$3 shearable frangible)))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 13:29
S27	3	(packer plug) and ((setting adj (tool rod mandrel)) with (thread near3 (shear$3 shearable frangible)))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 13:30
S28	12	(packer plug) and ((setting adj (tool rod mandrel)) same (thread near3 (shear$3 shearable frangible)))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/08/23 13:30
S29	5	("3602305").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2011/08/23 13:31
S30	169	(166/124).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2011/10/11 15:21
S31	18	("3633670" | "4060131" | "4153109" | "4305465" | "4363358" | "4391326" | "4513822" | "4646842" | "4655290" | "4660637" | "4726425" | "4862957" | "5074361" | "5207274"). PN. OR ("5343954"). URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/11 15:23
S32	29	("3223170" | "3519074" | "3631927" | "4176715" | "4248300" | "4281711" | "4562889" | "4572290"). PN. OR ("4690220"). URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/11 15:52

S33	21	("3189095" | "3288219" | "3659647" | "3976133" | "4216827"). PN. OR ("4437516"). URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/11 16:27
S34	8	("3061013").URPN.	USPAT	OR	ON	2011/10/11 17:11
S35	35	("20050021623" | "20060173729" | "6662194" | "7725405" | "4405017" | "4848459" | "20060178896" | "20080117928" | "20090307651" | "20110078717" | "20100101807" | "4437516" | "20060265266" | "20080065633" | "20100030743" | "7873533" | "4314608" | "5117915" | "20020046074" | "20080086366" | "20080201156" | "20080275717" | "6606601" | "7043443" | "20030144862" | "20060212338" | "7798236" | "4432418" | "7325617" | "5224540" | "2714932" | "20080103873" | "20090193083" | "7593946" | "20090114401").PN.	US-PGPUB; USPAT	OR	ON	2011/10/11 18:10
S36	4	("2714932").URPN.	USPAT	OR	ON	2011/10/11 18:17
S37	5	("3602305").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2011/10/12 11:28
S38	1387	shear$3 near2 thread	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/10/12 11:34
S39	54943	packer	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/10/12 11:34

S40	554323	slip	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/10/12 11:34
S41	35	S38 and S39 and S40	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/10/12 11:34
S42	11	(("4437516") or ("5224540") or ("2714932")).PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2011/10/12 11:39
S43	26	("1147108" | "2427330" | "2715441" | "2756827" | "3211233" | "4059150" | "4311196" | "4359090").PN. OR ("4440223").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/12 11:53
S44	75	("1648377" | "2043225" | "2084611" | "2155129" | "2205119" | "2331185" | "2589506" | "2778430" | "2806536" | "3055424" | "3529667" | "3710862" | "3910348" | "4067358" | "4151875" | "4300631" | "4393929" | "4440223" | "4520870" | "4708202" | "4784226" | "4834184" | "4858687" | "4977958" | "5086839" | "5131468" | "5224540" | "5271468" | "5390737").PN. OR ("6220349").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/12 11:53
S45	29	("3011558" | "3024843" | "3180419" | "3211227" | "3623551" | "3722588" | "3746093").PN. OR ("4059150").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/12 11:56
S46	581	composite and (bridge adj plug)	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/12 12:10
S47	848490	ball	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/12 12:10
S48	335	S46 and S47	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/12 12:10

S49	2	S38 and S48	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/12 12:10
S50	7038	setting adj (tool mandrel)	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/12 12:11
S51	155	S48 and S50	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/12 12:11
S52	57	("2751017" | "3054450" | "3298440" | "3507327" | "3623551" | "3678998" | "4146093" | "4153109" | "4289200" | "4345649" | "4573537" | "4708202" | "4784226" | "4898239" | "5044441" | "5332038" | "5636689" | "5678635" | "5775429" | "5810082" | "5819846").PN. OR ("6581681").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/12 13:45
S53	51	("2906346" | "3082824" | "3097697" | "3142338" | "3198254" | "3298437" | "3306362" | "3344861" | "3422897" | "3422899" | "3506067" | "3602305" | "3687196" | "4573537" | "4708202").PN. OR ("5819846").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/12 13:47
S54	73	("2205119" | "3433301" | "3695352" | "3861465" | "4151875" | "4153109" | "4296806" | "4441552"). PN. OR ("4708202"). URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/12 13:49
S55	1079	((166/123) or (166/124) or (166/135) or (166/138)).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2011/10/12 14:37
S56	169	(166/124).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2011/10/12 14:38
S57	910	S55 not S56	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/10/12 14:38
S58	182	(166/193).CCLS.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2011/10/12 14:53

S59	2393	((166/386) or (166/387)).CCLS.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2011/10/12 15:31
S60	2303	((166/386) or (166/387)).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2011/10/12 15:32
S61	28	("3244233" | "3507327" | "3584684" | "3722588" | "3749166" | "4044826" | "4078606" | "4427063" | "4518037" | "4526229" | "4545431").PN. OR ("4648446").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/12 16:22
S62	23	("3279542" | "3357489" | "3420306" | "3467184").PN. OR ("4018274").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/12 17:15
S63	3	("3422897").URPN.	USPAT	OR	ON	2011/10/12 17:59
S64	6	("3160209").URPN.	USPAT	OR	ON	2011/10/13 10:34
S66	60765	setting adj (tool mandrel device rod)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/10/13 10:52
S67	549457	shear$3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/10/13 10:52
S68	50665	(plug packer) and (slip)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/10/13 10:53
S69	1301036	ball	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/10/13 10:53
S70	473	S66 and S67 and S68 and S69	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/10/13 10:53
S71	81	S70 and drillable	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/10/13 10:53
S72	21	("3364997" | "3385366" | "3416608").PN. OR ("3631925").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/13 10:57

S73	46	(US-20100263876-$ or US-20110079383-$).did. or (US-5343954-$ or US-7591318-$ or US-7373973-$ or US-6116339-$ or US-4726425-$ or US-4660637-$ or US-4646842-$ or US-4153109-$ or US-4690220-$ or US-4898245-$ or US-4437516-$ or US-3924678-$ or US-3270819-$ or US-3061013-$ or US-3054450-$ or US-2331532-$ or US-2230447-$ or US-2714932-$ or US-3602305-$ or US-5224540-$ or US-4440223-$ or US-6220349-$ or US-4059150-$ or US-4044826-$ or US-7600572-$ or US-6581681-$).did. or (US-5819846-$ or US-4708202-$ or US-3082824-$ or US-7740079-$ or US-4805699-$ or US-4648446-$ or US-4572289-$ or US-4432418-$ or US-4018274-$ or US-3422897-$ or US-3163225-$ or US-3160209-$ or US-3055430-$ or US-3631925-$ or US-3024845-$ or US-2737242-$).did. or (US-3344861-$ or US-2551240-$).did.	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/13 11:56
S74	1388	shear$3 near2 thread	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/10/13 11:56
S75	4	S73 and S74	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/10/13 11:56

S76	26	("1147108" | "2427330" | "2715441" | "2756827" | "3211233" | "4059150" | "4311196" | "4359090").PN. OR ("4440223").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2011/10/13 11:57
S77	420	(166/123).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2011/10/13 13:46
S79	169	(166/124).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2011/10/13 13:47
S80	1079	((166/123) or (166/124) or (166/135) or (166/138)).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2011/10/13 13:47
S81	169	(166/124).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2011/10/13 13:47
S82	910	S80 not S81	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/10/13 13:47
S83	182	(166/193).CCLS.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2011/10/13 13:47
S84	0	S77 not (S79 S82 S83)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2011/10/13 13:47
S85	5	("3160209").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2011/10/17 14:45

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	0	(plug and insert and (passage passageway) and (threaded threadedly threadable) and (shear$3 shearable) and (setting adj tool)).clm.	US-PGPUB	OR	ON	2011/10/24 13:50
L3	0	(plug and insert and (passage passageway) and (thread threaded threadedly threadable) and (shear$3 shearable) and (setting adj tool)).clm.	US-PGPUB	OR	ON	2011/10/24 13:51

L4	1	(plug and insert and (passage passageway) and (thread threaded threadedly threadable) and (shear$3 shearable)).clm.	US-PGPUB	OR	ON	2011/10/24 13:51
L5	6	(plug and insert and (passage passageway) and (shear$3 shearable)).clm.	US-PGPUB	OR	ON	2011/10/24 13:51

10/24/2011 1:52:26 PM
C:\Documents and Settings\rfuller1\My Documents\EAST\Workspaces\13_194,871 - Bottom Set.wsp

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	13/194,871	FRAZIER, W. LYNN	

Document Code - DISQ	Internal Document – DO NOT MAIL

TERMINAL DISCLAIMER	☐ APPROVED	☒ DISAPPROVED
Date Filed : 10/20/11	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:

Felicia D. Roberts

The person who signed the terminal disclaimer does not have power of attorney, and thus, is not of record. (See FP 14.29.01.)

PTO/SB/81 (01-09)
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POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS

Application Number	13194871
Filing Date	July 29, 2011
First Named Inventor	W. Lynn Frazier
Title	BOTTOM SET DOWNHOLE PLUG
Art Unit	3676
Examiner Name	Robert Edward Fuller
Attorney Docket Number	MOTI-018

I hereby revoke all previous powers of attorney given in the above-identified application.

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith: **60935**

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I am the:

☒ Applicant/Inventor.

OR

☐ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on ______________.

SIGNATURE of Applicant or Assignee of Record

Signature	[signature]	Date	10/21/2011
Name	Lynn Frazier	Telephone	361-295-6373
Title and Company	President / Magnum Oil Tools International		

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of ________ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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TERMINAL DISCLAIMER TO OBVIATE A PROVISIONAL DOUBLE PATENTING REJECTION OVER A PENDING "REFERENCE" APPLICATION

Docket Number (Optional): MOTI-018

In re Application of: W. Lynn Frazier

Application No.: 13/194,871

Filed: July 29, 2011

For: Bottom Set Downhole Plug

The owner*, W. Lynn Frazier, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending **reference** Application Number 12/317,497, filed December 23, 2008, as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the **reference** application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said **reference** application, "as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application," in the event that: any such patent: granted on the pending **reference** application: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☑ The undersigned is an attorney or agent of record. Reg. No. 46681

/Robb D. Edmonds/ — Signature
October 21, 2011 — Date

Robb D. Edmonds — Typed or printed name

281-480-2700 — Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) is included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	13194871
Filing Date:	29-Jul-2011
Title of Invention:	BOTTOM SET DOWNHOLE PLUG
First Named Inventor/Applicant Name:	W. Lynn Frazier
Filer:	Robb D. Edmonds/Stacy Lanier
Attorney Docket Number:	MOTI-018

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Statutory or terminal disclaimer	1814	1	160	160
		Total in USD ($)		**160**

Electronic Acknowledgement Receipt

EFS ID:	11242374
Application Number:	13194871
International Application Number:	
Confirmation Number:	1776
Title of Invention:	BOTTOM SET DOWNHOLE PLUG
First Named Inventor/Applicant Name:	W. Lynn Frazier
Customer Number:	60935
Filer:	Robb D. Edmonds/Stacy Lanier
Filer Authorized By:	Robb D. Edmonds
Attorney Docket Number:	MOTI-018
Receipt Date:	21-OCT-2011
Filing Date:	29-JUL-2011
Time Stamp:	17:12:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$160
RAM confirmation Number	3838
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Power of Attorney	MOTI_018_Executed_Powerof Attorney.pdf	759672 1ff35e1ca4d11fb5f9e330142120a9b0baa5afa0	no	1
Warnings:					
Information:					
2	Statutory disclaimers per MPEP 1490.	MOTI_0018_sb0025_10212011.pdf	342118 fa0167da8ac3edd89e6147c48a99a6018b37a2e6	no	2
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30200 633781c0f8ba523dc56a8220c66ad5c42e1ccf5f	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1131990		

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: W. Lynn Frazier	§	Examiner:	Fuller, Robert E.
Serial No.: 13/194,871	§	Group Art Unit:	3676
Filed: July 29, 2011	§	Docket No:	MOTI/018
For: *Bottom Set Downhole Plug*	§	Confirmation No.:	1776
	§	Date:	October 20, 2011

MAIL STOP AMENDMENT
P.O. Box 1450
Alexandria, VA 22313-1450

APPLICANT'S AMENDMENT IN RESPONSE TO EXAMINER'S INTERVIEW

This amendment is submitted in response to the telephonic interview with the examiner on October 18, 2011. Applicant respectfully requests reconsideration of the application in light of the following amendments and remarks.

Amendments to the Specification: None.

Amendments to the Drawings: None.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks begin on page 6 of this paper.

AMENDMENTS TO THE CLAIMS

This Listing of Claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1-11 (Canceled).

12. (Currently Amended) A plug for isolating a wellbore, comprising:

a body having a first end and a second end~~, wherein the body is formed from one or more composite materials~~;

at least one malleable element disposed about the body;

at least one slip disposed about the body;

at least one conical member disposed about the body; and

an ~~a brass~~ insert screwed into an inner surface of the body proximate the second end of the body and adapted to receive a setting tool that enters the body through the first end thereof, wherein:

the insert comprises one or more shearable threads disposed on an inner surface thereof;

the insert has a passageway extending therethrough;

the one or more shearable threads are adapted to engage the setting tool; and

the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined axial force, thereby providing a flow passage through the insert and the body.

13. (Currently Amended) The plug of claim 12, wherein the outer surface of the ~~brass~~ insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the ~~brass~~ insert within the body.

14. (Original) The plug of claim 12, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween.

15. (Original) The plug of claim 12, wherein the body is adapted to receive a ball that restricts fluid flow in at least one direction through the body.

16. (Original) The plug of claim 12, wherein the predetermined axial force to release the setting tool is less than an axial force required to break the body.

17. (Original) The plug of claim 12, wherein the plug is a frac plug.

Claims 18-20 (Canceled).

21. (New) A plug for isolating a wellbore, comprising:

a body having a first end and a second end;

at least one sealing element disposed about the body;

at least one slip disposed about the body;

at least one conical member disposed about the body; and

an insert screwed into an inner surface of the body, proximate the second end of the body, the insert adapted to receive a setting tool that enters the body through the first end thereof, wherein:

the insert comprises one or more shearable threads disposed on an inner surface thereof and one or more threads on an outer surface thereof;

the insert has a passageway extending therethrough;

the one or more shearable threads are adapted to engage the setting tool;

the one or more threads on the outer surface of the insert are adapted to engage the inner surface of the body;

the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined axial force, thereby providing a flow passage through the insert and the body; and

the one or more threads on the outer surface of the insert are not deformable at the same predetermined axial force that deforms the shearable threads.

22. (New) The plug of claim 21, wherein the insert is formed or made from one or more metallic materials.

23. (New) The plug of claim 21, wherein the insert is formed or made from brass.

24. (New) The plug of claim 21, wherein the body is formed or made from one or more composite materials.

25. (New) The plug of claim 21, wherein the body is formed or made from aluminum.

26. (New) The plug of claim 21, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween.

27. (New) The plug of claim 21, wherein the plug is a frac plug.

28. (New) The plug of claim 21, wherein the passageway of the insert is adapted to receive an impediment that restricts fluid flow in at least one direction through the body.

29. (New) The plug of claim 28, wherein the impediment is decomposable at a predetermined temperature, pressure, pH, or a combination thereof.

30. (New) The plug of claim 28, wherein the impediment is a ball.

31. (New) A plug for isolating a wellbore, comprising:

a body having a first end and a second end, wherein the body is made or formed from one or more composite materials or aluminum or both;

at least one sealing element disposed about the body;

at least one slip disposed about the body;

at least one conical member disposed about the body; and

an insert disposed within an inner surface of the body, proximate the second end of the body, wherein:

the insert comprises one or more shearable threads disposed on an inner surface thereof;

the insert has a passageway extending therethrough;

the passageway of the insert is adapted to receive an impediment that restricts fluid flow in at least one direction through the body;

the one or more shearable threads are adapted to engage a setting tool;

the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined axial force, thereby providing a flow passage through the insert and the body; and

the first end of the body, the second end of the body, or both ends comprise an anti-rotation feature formed thereon, the anti-rotation feature selected from the group consisting of a taper, flat, slot, clutch, and one or more angled surfaces.

32. (New) The plug of claim 31, wherein the insert has one or more threads disposed on an outer surface thereof, and the insert is screwed into the inner surface of the body.

33. (New) The plug of claim 32, wherein the one or more threads on the outer surface of the insert are not deformable at the same predetermined axial force that deforms the shearable threads.

34. (New) The plug of claim 31, wherein the impediment is a ball made of a decomposable material that degrades or falls apart at a predetermined temperature, pressure, pH, or a combination thereof to allow bi-directional flow through the passageway of the insert.

REMARKS

Applicant respectfully submits that the foregoing claims are now in condition for allowance.

A terminal disclaimer in light of co-pending application 12/317,497 is being submitted concurrently herewith.

Allowance of the application is respectfully requested

Respectfully submitted,

October 20, 2011 /Robb D. Edmonds/

Date

Robb D. Edmonds
Attorney for Applicant
Registration No. 46,681

EDMONDS & NOLTE, P.C.
16815 Royal Crest Drive
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Houston, Texas 77058
Phone: 281-480-2700
Fax: 281-480-2701

Electronic Patent Application Fee Transmittal

Application Number:	13194871
Filing Date:	29-Jul-2011
Title of Invention:	BOTTOM SET DOWNHOLE PLUG
First Named Inventor/Applicant Name:	W. Lynn Frazier
Filer:	Robb D. Edmonds/Stacy Lanier
Attorney Docket Number:	MOTI-018

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Statutory or terminal disclaimer	1814	1	160	160
		Total in USD ($)		**160**

Electronic Acknowledgement Receipt

EFS ID:	11233278
Application Number:	13194871
International Application Number:	
Confirmation Number:	1776
Title of Invention:	BOTTOM SET DOWNHOLE PLUG
First Named Inventor/Applicant Name:	W. Lynn Frazier
Customer Number:	60935
Filer:	Robb D. Edmonds/Stacy Lanier
Filer Authorized By:	Robb D. Edmonds
Attorney Docket Number:	MOTI-018
Receipt Date:	20-OCT-2011
Filing Date:	29-JUL-2011
Time Stamp:	17:50:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$160
RAM confirmation Number	4389
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Statutory disclaimers per MPEP 1490.	MOTI_0018_sb0025_10202011.pdf	342173 09f794dfcc09116cd0bc6a46f917d4caeb6bb198	no	2
Warnings:					
Information:					
2	Supplemental Response or Supplemental Amendment	Response_to_Ex_Interview_10202011.pdf	120478 c9318ec31c570499952222a3b73427262edf638c	no	6
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30199 28e568f99faeb8a77e251aed8f933be29f91f9fa	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	492850	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/25 (08-11)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

TERMINAL DISCLAIMER TO OBVIATE A PROVISIONAL DOUBLE PATENTING REJECTION OVER A PENDING "REFERENCE" APPLICATION

Docket Number (Optional): MOTI-018

In re Application of: W. Lynn Frazier

Application No.: 13/194,871

Filed: July 29, 2011

For: Bottom Set Downhole Plug

The owner*, W. Lynn Frazier, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending **reference** Application Number 12/317,497, filed December 23, 2008, as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the **reference** application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said **reference** application, "as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application," in the event that: any such patent: granted on the pending **reference** application: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

Check either box 1 or 2 below, if appropriate.

1. ☐ For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☑ The undersigned is an attorney or agent of record. Reg. No. 46681

/Robb D. Edmonds/ — Signature
October 20, 2011 — Date

Robb D. Edmonds — Typed or printed name

281-480-2700 — Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) is included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this statement. See MPEP § 324.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
13/194,871	07/29/2011	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☒ RATE ($)	SMALL ENTITY ☒ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 10/20/2011	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X $30 =	0	OR	X $ =	
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $125 =	0	OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE	0	OR	TOTAL ADD'L FEE	

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/KIMBERLY WHITE/

UNITED STATES PATENT AND TRADEMARK OFFICE

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Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/194,871	07/29/2011	W. Lynn Frazier	MOTI-018	1776

60935 7590 09/30/2011

Edmonds Nolte, PC
16815 ROYAL CREST DRIVE
SUITE 130
HOUSTON, TX 77058

EXAMINER	
FULLER, ROBERT EDWARD	
ART UNIT	**PAPER NUMBER**
3676	

NOTIFICATION DATE	DELIVERY MODE
09/30/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@edmondsnolte.com

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

SEP 2 9 2011

Edmonds Nolte, PC
16815 Royal Crest Drive
Suite 130
Houston, TX 77058

In re application of : **DECISION ON PETITION**
Lynn W. Frazier : **TO MAKE SPECIAL FOR**
Application No. 13/194,871 : **NEW APPLICATION**
Filed: July 29, 2011 : **UNDER 37 CFR 1.102**
For: BOTTOM SET DOWNHOLE PLUG

This is a decision on the renewed petition filed on September 21, 2011, to make the above-identified application special for accelerated examination procedure under 37 C.F.R. § 1.102(d).

The renewed petition to make the application special is **GRANTED**.

The application is eligible for accelerated examination and the petition complies with the conditions for granting the application special status pursuant to the "Change to Practice for Petitions in Patent Applications to Make Special and for Accelerated Examination" published June 26, 2006, in the Federal Register. (71 Fed. Reg. 36323).

The prosecution of the instant application will be conducted expeditiously according to the following guidelines.

1. The application will be docketed to an examiner and taken up for action within two weeks of the date of this decision.

2. Restriction Practice:
If the examiner determines that the claims are not directed to a single invention, a telephone request to elect one single invention will be made pursuant to MPEP 812.01. As a prerequisite to the grant of this petition, the applicant has agreed to make an oral election, by telephone, without traverse. If the applicant refuses to make an election without traverse, or the examiner cannot reach the applicant after a reasonable effort, the examiner will treat the first claimed invention (invention defined by claim 1) as having being constructively elected without traverse for examination.

3. Office action:
If it is determined that, after appropriate consultation, there is a potential rejection or any other issue to be addressed, the examiner will telephone the applicant and arrange an interview to discuss and resolve the issue. An Office action, other than a Notice of Allowance and Fee(s) Due (Notice of Allowance), will not be issued unless either: 1) an interview was conducted but did not result in agreed to action that places the application in condition for allowance, or, 2) a determination is made that an interview would be unlikely to result in the application being placed in condition for allowance, and 3) an internal conference has been held to review any rejection of any claim.

4. Time for Reply:
An Office action other than a Notice of Allowance or a final Office action will set a shortened statutory period of one month or thirty days, whichever is longer, for reply with no extension of time available under 37 CFR 1.136(a). Failure to timely file a reply within this non-extendible period for reply will result in the abandonment of the application.

5. Reply by Applicant:
A timely reply to an Office action other than the Notice of Allowance must be submitted electronically via EFS or EFS-web and limited to addressing the rejections, objections and requirement made. Any amendment that attempts to: 1) add claims which would result in more than three pending independent claims or more than twenty pending total claims; 2) present claims not encompassed by the pre-examination search or an updated accelerated examination support document; or 3) present claims that are directed to a non-elected invention or an invention other than that previously claimed and examined in the application, will be treated as not fully responsive and will not be entered.

For any amendment to the claims (including any new claim) that is not encompassed by the accelerated examination support document, applicant must provide an updated accelerated examination support document that encompasses the amended or new claims at the time of filing of the amendment.

To proceed expeditiously with the examination, it is recommended that a reply with amendments made to any claim or with any new claim being added be accompanied by an updated accelerated examination support document or a statement explaining how the amended or new claim is supported by the original accelerated examination support document.

6. Information Disclosure Statement (IDS):
Any IDS filed during prosecution must be submitted electronically via EFS or EFS-web, accompanied by an updated accelerated examination support document, and be in compliance with 37 CFR 1.97 and 1.98.

7. Post-Allowance Processing:
To expedite processing of the allowed application into a patent, the applicant must: 1) pay the required fees within one month of the date of the Notice of

Allowance, and 2) not file any post allowance papers not required by the Office. In no event may the issue fee be paid and accepted later than three months from the date of the Notice of Allowance.

8. After-Final and Appeal Procedures:
To expedite prosecution, after receiving the final Office action, applicant must: 1) promptly file a notice of appeal, an appeal brief and appeal fees; and 2) not request a pre-appeal brief conference.

Any amendment, affidavit or other evidence filed after final Office action must comply with applicable rules and the requirements outlined in numbered paragraphs 5 and 6 above.

On appeal, the application will proceed according to normal appeal procedures. After appeal, the application will again be treated special.

9. Proceedings Outside the Normal Examination Process:
If the application becomes involved in a proceeding that is outside the normal examination process (e.g., a secrecy order, national security review, interference proceeding, petitions under 37 CFR 1.181, 182 or 183), the application will be treated special before and after such proceeding.

10. Final Disposition:
The twelve month goal of this accelerated examination procedure ends with a final disposition. The mailing of a final Office action, a Notice of Allowance, the filing of a Notice of Appeal, or the filing of a Request for Continued Examination (RCE) is the final disposition.

If, during prosecution, a paper is not filed electronically using EFS-web, a reply is filed but is not fully responsive, the application is involved in an appeal, or a proceeding outside normal examination process, the application will still be examined expeditiously, however, the final disposition may occur more than twelve months from the filing of the application.

Any inquiry regarding this decision should be directed to Quality Assurance Specialist Steven N. Meyers, at (571) 272-6611.

Steven N. Meyers,
Quality Assurance Specialist
Technology Center 3600

Sm/sm: 9/28/11

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant: W. Lynn Frazier	§	Conf. No.:	1776
	§		
Filed: July 29, 2011	§	Art Unit:	3676
	§		
Serial No.: 13/194,871	§	Examiner:	Thomas S. Bomar
	§		
For: *Bottom Set Downhole Plug*	§	Docket No.:	MOTI-018
	§		
	§	Customer No.:	60935

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ACCELERATED EXAMINATION SUPPORT DOCUMENT

Dear Examiner:

This accelerated examination support document is provided in support of the Amended Petition to Make the Application Special for Accelerated Examination filed herewith.

TABLE OF CONTENTS

I. Applicant's Pending Claims

There are 20 claims currently pending in the application. The pending claims read as follows:

1. A plug for isolating a wellbore, comprising:

a body having a first end and a second end, wherein the body is formed from one or more composite materials;

at least one malleable element disposed about the body;

at least one slip disposed about the body;

at least one conical member disposed about the body; and

one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof, wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof, and wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and adapted to release the setting tool when exposed to a predetermined axial force.

2. The plug of claim 1, wherein the shearable threads are composite and the predetermined axial force sufficient to deform the shearable threads to release the setting tool is less than an axial force sufficient to break the body.

3. The plug of claim 1, wherein the body is adapted to receive an impediment that restricts fluid flow in at least one direction through the body.

4. The plug of claim 3, wherein the impediment is a ball.

5. The plug of claim 3, wherein the impediment is a flapper valve disposed within the body, wherein the flapper valve is adapted to restrict fluid flow in at least one direction through the body.

6. The plug of claim 3, wherein the impediment is degradable at a predetermined temperature, pressure, pH, or a combination thereof.

7. The plug of claim 1, wherein the first end of the body comprises an anti-rotation feature formed thereon.

8. The plug of claim 1, wherein the second end of the body comprises an anti-rotation feature disposed thereon.

9. The plug of claim 1, wherein the first and second ends of the body each comprises an anti-rotation feature disposed thereon, and the anti-rotation features are adapted to engage each other when two tools are located in series, preventing relative rotation therebetween.

10. The plug of claim 1, wherein the plug is a frac plug.

11. The plug of claim 9, wherein each anti-rotation feature is individually selected from the group consisting of a taper, a mule shoe, a half-mule shoe, flat protrusions or flats, flats and slots, clutches, and one or more angled surfaces.

12. A plug for isolating a wellbore, comprising:

a body having a first end and a second end, wherein the body is formed from one or more composite materials;

at least one malleable element disposed about the body;

at least one slip disposed about the body;

at least one conical member disposed about the body; and

a brass insert screwed into the body proximate the second end of the body and adapted to receive a setting tool that enters the body through the first end thereof, wherein:

the insert comprises one or more shearable threads disposed on an inner surface thereof;

the one or more shearable threads are adapted to engage the setting tool; and

the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined axial force.

13. The plug of claim 12, wherein the outer surface of the brass insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the brass insert within the body.

14. The plug of claim 12, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween.

15. The plug of claim 12, wherein the body is adapted to receive a ball that restricts fluid flow in at least one direction through the body.

16. The plug of claim 12, wherein the predetermined axial force to release the setting tool is less than an axial force required to break the body.

17. The plug of claim 12, wherein the plug is a frac plug.

18. A shearable insert for a plug, comprising:

a body comprising brass, cast iron, or a combination thereof;

one or more threads disposed on an outer surface of the body, the one or more threads adapted to couple with one or more threads of the plug; and

one or more shearable threads disposed on an inner surface of the body, the shearable threads adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial force.

19. The insert of claim 18, wherein the outer surface of the body comprises a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the body within the plug.

20. The insert of claim 18, wherein the body is made of brass, and the plug is a frac plug.

II. 9(A) References Deemed Most Closely Related

An Information Disclosure Statement ("IDS") in compliance with 37 C.F.R. § 1.98 was filed on July 29, 2011, citing each of the following references deemed most closely related to the subject matter of the claims:

A.	U.S. Patent No. 4,437,516	Cockrell ("*Cockrell*")
B.	U.S. Patent No. 5,224,540	Streich et al. ("*Streich*")
C.	U.S. Patent No. 2,714,932	Thompson ("*Thompson*")

A First Supplemental Information Disclosure Statement ("SIDS") was also filed on July 29, 2011, citing references that are related to the subject matter of the claims, but not deemed most closely related to the subject matter of the claims.

A second SIDS is filed herewith, citing an additional reference deemed most closely related to the subject matter of the claims. The additional reference was discovered during a refined search based upon the examiner's recommendations in the dismissal of the petition.

D.	U.S. Patent No. 7,798,236	McKeachnie et al. ("*McKeachnie* ")

A third SIDS is also filed herewith, citing references that are related to the subject matter of the claims, but not deemed most closely related to the subject matter of the claims. The additional references were discovered during the refined search based upon the examiner's recommendations in the dismissal of the petition.

III. 9(B) Identification of Limitations Disclosed by the Cited References

A. *Cockrell* (U.S. Patent No. 4,437,516)

Pending Claim Limitation	**Reference to *Cockrell***
1. A plug for isolating a wellbore, comprising:	Col. 1, Lines 15 – 18
a body having a first end and a second end,	Col. 3, Lines 37 – 40
wherein the body is formed from one or more composite materials;	Not disclosed
at least one malleable element disposed about the body;	Not disclosed, *but see* Col. 3, Line 65 – Col. 4, Line 3
at least one slip disposed about the body;	Col. 4, Lines 4 – 24
at least one conical member disposed about the body; and	Col. 4, Lines 25 – 31
one or more shearable threads disposed on an inner surface of the body,	Not disclosed, *but see* Col. 5, Lines 40-60, Figure 1C
adjacent the second end thereof,	Not disclosed
wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof, and wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and	Not disclosed
adapted to release the setting tool when exposed to a predetermined axial force.	Not disclosed, *but see* Col. 5, Line 52 – Col. 6, Line 8
2. The plug of claim 1, wherein the	Not disclosed

shearable threads are composite	
and the predetermined axial force sufficient to deform the shearable threads to release the setting tool is less than an axial force sufficient to break the body.	Not disclosed, *but see* Col. 5, Line 52 – Col. 6, Line 16
3. The plug of claim 1, wherein the body is adapted to receive an impediment that restricts fluid flow in at least one direction through the body.	Not disclosed, *but see* Col. 7, lines 1-8
4. The plug of claim 3, wherein the impediment is a ball.	Not disclosed
5. The plug of claim 3, wherein the impediment is a flapper valve disposed within the body, wherein the flapper valve is adapted to restrict fluid flow in at least one direction through the body.	Not disclosed
6. The plug of claim 3, wherein the impediment is degradable at a predetermined temperature, pressure, pH, or a combination thereof.	Not disclosed
7. The plug of claim 1, wherein the first end of the body comprises an anti-rotation feature formed thereon.	Not disclosed
8. The plug of claim 1, wherein the second end of the body comprises an anti-rotation feature disposed thereon.	Not disclosed
9. The plug of claim 1, wherein the first and second ends of the body each comprises an anti-rotation feature disposed thereon, and the anti-rotation features are	Not disclosed

adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween.	
10. The plug of claim 1, wherein the plug is a frac plug.	Not disclosed
11. The plug of claim 9, wherein each anti-rotation feature is individually selected from the group consisting of a taper, a mule shoe, a half-mule shoe, flat protrusions or flats, flats and slots, clutches, and one or more angled surfaces.	Not disclosed
12. A plug for isolating a wellbore, comprising: a body having a first end and a second end,	Col. 1, Lines 15 – 18 Col. 3, Lines 37 – 40
wherein the body is formed from one or more composite materials;	Not disclosed
at least one malleable element disposed about the body;	Not disclosed, *but see* Col. 3, Line 65 – Col. 4, Line 3
at least one slip disposed about the body;	Col. 4, Lines 4 – 24
at least one conical member disposed about the body; and	Col. 4, Lines 25 – 31
a brass insert	Not disclosed, *but see* Col 5, lines 40-60, Figure 1C
screwed into the body proximate the second end of the body	Not disclosed, *but see* Col 5, lines 40-60, Figure 1C
and adapted to receive a setting tool	Not disclosed, *but see* Col. 5, Line 52 – Col. 6, Line 8
that enters the body through the first	Not disclosed

end thereof,	
wherein the insert comprises one or more shearable threads disposed on an inner surface thereof;	Not disclosed, *but see* Col 5, lines 40-60, Figure 1C
the one or more shearable threads are adapted to engage the setting tool; and	Not disclosed, *but see* Col. 5, Line 52 – Col. 6, Line 8
the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined axial force.	Not disclosed, *but see* Col. 5, Line 52 – Col. 6, Line 8
13. The plug of claim 12, wherein the outer surface of the brass insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the brass insert within the body.	Not disclosed
14. The plug of claim 12, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween.	Not disclosed
15. The plug of claim 12, wherein the body is adapted to receive a ball that restricts fluid flow in at least one direction through the body.	Not disclosed
16. The plug of claim 12, wherein the predetermined axial force to release the	Not disclosed, *but see* Col. 5, Line 52 – Col. 6, Line 8

setting tool is less than an axial force required to break the body.	
17. The plug of claim 12, wherein the plug is a frac plug.	Not disclosed
18. A shearable insert for a plug, comprising: a body comprising brass, cast iron, or a combination thereof;	Not disclosed, *but see* Col 5, lines 40-60, Figure 1C
one or more threads disposed on an outer surface of the body, the one or more threads adapted to couple with one or more threads of the plug; and	Not disclosed, *but see* Col 5, lines 40-60, Figure 1C
one or more shearable threads disposed on an inner surface of the body,	Not disclosed, *but see* Col 5, lines 40-60, Figure 1C
the shearable threads adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial force.	Not disclosed, *but see* Col. 5, Line 52 – Col. 6, Line 8
19. The insert of claim 18, wherein the outer surface of the body comprises a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the body within the plug.	Not disclosed
20. The insert of claim 18, wherein the body is made of brass, and the plug is a frac plug.	Not disclosed

B. *Streich* (U.S. Patent No. 5,224,540)

Pending Claim Limitation	**Reference to *Streich***
1. A plug for isolating a wellbore, comprising:	Col. 1, Lines 21 – 31
a body having a first end and a second end,	Col. 3, Lines 22 – 51
wherein the body is formed from one or more composite materials;	Not disclosed, *but see* Col. 7, Lines 25 – 37
at least one malleable element disposed about the body;	Col. 3, Lines 22 – 51
at least one slip disposed about the body;	Col. 3, Lines 22 – 51
at least one conical member disposed about the body; and	Col. 3, Lines 22 – 51
one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof,	Not disclosed
wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof, and wherein the one or more shearable threads are adapted to engage the setting tool	Not disclosed
when disposed through the body	Not disclosed
and adapted to release the setting tool when exposed to a predetermined axial force.	Not disclosed, *but see* Col. 15, Lines 1 – 3
2. The plug of claim 1, wherein the shearable threads are composite and the	Not disclosed

predetermined axial force sufficient to deform the shearable threads to release the setting tool is less than an axial force sufficient to break the body.	
3. The plug of claim 1, wherein the body is adapted to receive an impediment that restricts fluid flow in at least one direction through the body.	Col. 13, Lines 53-55, Figure 6B
4. The plug of claim 3, wherein the impediment is a ball.	Col. 13, Lines 53 – 55, Figure 6B
5. The plug of claim 3, wherein the impediment is a flapper valve disposed within the body, wherein the flapper valve is adapted to restrict fluid flow in at least one direction through the body.	Not disclosed
6. The plug of claim 3, wherein the impediment is degradable at a predetermined temperature, pressure, pH, or a combination thereof.	Not disclosed
7. The plug of claim 1, wherein the first end of the body comprises an anti-rotation feature formed thereon.	Not disclosed
8. The plug of claim 1, wherein the second end of the body comprises an anti-rotation feature disposed thereon.	Not disclosed
9. The plug of claim 1, wherein the first and second ends of the body each comprises an anti-rotation feature disposed thereon, and the anti-rotation features are adapted to engage each other when two tools	Not disclosed

are located in series, preventing relative rotation therebetween.	
10. The plug of claim 1, wherein the plug is a frac plug.	Not disclosed
11. The plug of claim 9, wherein each anti-rotation feature is individually selected from the group consisting of a taper, a mule shoe, a half-mule shoe, flat protrusions or flats, flats and slots, clutches, and one or more angled surfaces.	Not disclosed
12. A plug for isolating a wellbore, comprising: a body having a first end and a second end,	Col. 1, Lines 21 – 31
wherein the body is formed from one or more composite materials;	Col. 2, Lines 53 – 62 Col. 7, Lines 25 – 37
at least one malleable element disposed about the body;	Col. 3, Lines 22 – 51
at least one slip disposed about the body;	Col. 3, Lines 22 – 51
at least one conical member disposed about the body; and	Col. 3, Lines 22 – 51
a brass insert	Not disclosed
screwed into the body proximate the second end of the body	Not disclosed
and adapted to receive a setting tool that enters the body through the first end thereof,	Not disclosed, *but see* Col. 6, Lines 12 – 15
wherein the insert comprises one or more shearable threads disposed on	Not disclosed

an inner surface thereof;	
the one or more shearable threads are adapted to engage the setting tool; and	Not disclosed
the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined axial force.	Not disclosed
13. The plug of claim 12, wherein the outer surface of the brass insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the brass insert within the body.	Not disclosed
14. The plug of claim 12, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween.	Not disclosed
15. The plug of claim 12, wherein the body is adapted to receive a ball that restricts fluid flow in at least one direction through the body.	Col. 13, Lines 53 – 55 Figure 6B
16. The plug of claim 12, wherein the predetermined axial force to release the setting tool is less than an axial force required to break the body.	Not disclosed
17. The plug of claim 12, wherein the	Not disclosed

plug is a frac plug.	
18. A shearable insert for a plug, comprising: a body comprising brass, cast iron, or a combination thereof;	Not disclosed
one or more threads disposed on an outer surface of the body, the one or more threads adapted to couple with one or more threads of the plug; and	Not disclosed
one or more shearable threads disposed on an inner surface of the body,	Not disclosed
the shearable threads adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial force.	Not disclosed
19. The insert of claim 18, wherein the outer surface of the body comprises a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the body within the plug.	Not disclosed
20. The insert of claim 18, wherein the body is made of brass, and the plug is a frac plug.	Not disclosed

C. *Thompson* (U.S. Patent No. 2,714,932)

Pending Claim Limitation	**Reference to *Thompson***
1. A plug for isolating a wellbore, comprising:	Col. 1, Lines 17 – 20
a body having a first end and a second end,	Col. 2, Lines 30 – 37
wherein the body is formed from one or more composite materials;	Not disclosed
at least one malleable element disposed about the body;	Not disclosed, *but see* Col. 4, Lines 35 – 39
at least one slip disposed about the body;	Not disclosed, *but see* Col. 3, Lines 25 – 35
at least one conical member disposed about the body; and	Not disclosed, *but see* Col. 3, Lines 25 – 35
one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof,	Not disclosed
wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof,	Not disclosed, *but see* Figure 1
and wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and adapted to release the setting tool when exposed to a predetermined axial force.	Not disclosed
2. The plug of claim 1, wherein the shearable threads are composite and the predetermined axial force sufficient to	Not disclosed

deform the shearable threads to release the setting tool is less than an axial force sufficient to break the body.	
3. The plug of claim 1, wherein the body is adapted to receive an impediment that restricts fluid flow in at least one direction through the body.	Not disclosed
4. The plug of claim 3, wherein the impediment is a ball.	Not disclosed
5. The plug of claim 3, wherein the impediment is a flapper valve disposed within the body, wherein the flapper valve is adapted to restrict fluid flow in at least one direction through the body.	Not disclosed
6. The plug of claim 3, wherein the impediment is degradable at a predetermined temperature, pressure, pH, or a combination thereof.	Not disclosed
7. The plug of claim 1, wherein the first end of the body comprises an anti-rotation feature formed thereon.	Not disclosed
8. The plug of claim 1, wherein the second end of the body comprises an anti-rotation feature disposed thereon.	Col. 2, Line 42 Figures 1 and 2
9. The plug of claim 1, wherein the first and second ends of the body each comprises an anti-rotation feature disposed thereon, and the anti-rotation features are adapted to engage each other when two tools are located in series, preventing relative rotation	Not disclosed

therebetween.	
10. The plug of claim 1, wherein the plug is a frac plug.	Not disclosed
11. The plug of claim 9, wherein each anti-rotation feature is individually selected from the group consisting of a taper, a mule shoe, a half-mule shoe, flat protrusions or flats, flats and slots, clutches, and one or more angled surfaces.	Not disclosed, *but see* Figures 1 and 2
12. A plug for isolating a wellbore, comprising: a body having a first end and a second end,	Col. 1, Lines 17 – 20 Col. 2, Lines 30 – 37
wherein the body is formed from one or more composite materials;	Not disclosed
at least one malleable element disposed about the body;	Not disclosed, *but see* Col. 4, Lines 35 – 39
at least one slip disposed about the body;	Not disclosed, *but see* Col. 3, Lines 25 – 35
at least one conical member disposed about the body; and	Not disclosed, *but see* Col. 3, Lines 25 – 35
a brass insert	Not disclosed
screwed into the body proximate the second end of the body and adapted to receive a setting tool that enters the body through the first end thereof,	Not disclosed, *but see* Col. 2, Lines 52 – 56
wherein the insert comprises one or more shearable threads disposed on an inner surface thereof;	Not disclosed
the one or more shearable	Not disclosed

threads are adapted to engage the setting tool; and	
the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined axial force.	Not disclosed
13. The plug of claim 12, wherein the outer surface of the brass insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the brass insert within the body.	Not disclosed
14. The plug of claim 12, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween.	Not disclosed
15. The plug of claim 12, wherein the body is adapted to receive a ball that restricts fluid flow in at least one direction through the body.	Not disclosed
16. The plug of claim 12, wherein the predetermined axial force to release the setting tool is less than an axial force required to break the body.	Not disclosed
17. The plug of claim 12, wherein the plug is a frac plug.	Not disclosed
18. A shearable insert for a plug,	Not disclosed

comprising: a body comprising brass, cast iron, or a combination thereof;	
one or more threads disposed on an outer surface of the body, the one or more threads adapted to couple with one or more threads of the plug; and	Not disclosed, *but see* Col. 2, Lines 52 – 56
one or more shearable threads disposed on an inner surface of the body,	Not disclosed
the shearable threads adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial force.	Not disclosed, *but see* Col. 2, Lines 52 – 56
19. The insert of claim 18, wherein the outer surface of the body comprises a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the body within the plug.	Not disclosed
20. The insert of claim 18, wherein the body is made of brass, and the plug is a frac plug.	Not disclosed

D. *McKeachnie* (U.S. Patent No. 7,789,236)

Pending Claim Limitation	**Reference to *McKeachnie***
1. A plug for isolating a wellbore, comprising:	Col. 1, Lines 15-46
a body having a first end and a second end,	Col. 4, Lines 60-65; Figure 2
wherein the body is formed from one or more composite materials;	Col. 8, Lines 35-42
at least one malleable element disposed about the body;	Col. 4, Line 60 – Col. 5, Line 14 Figure 2
at least one slip disposed about the body;	Col. 4, Line 60 – Col. 5, Line 14 Figure 2
at least one conical member disposed about the body; and	Col. 4, Line 60 – Col. 5, Line 14 Figure 2
one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof,	Not disclosed
wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof,	Not disclosed
and wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and adapted to release the setting tool when exposed to a predetermined axial force.	Not disclosed
2. The plug of claim 1, wherein the shearable threads are composite and the predetermined axial force sufficient to	Not disclosed

deform the shearable threads to release the setting tool is less than an axial force sufficient to break the body.	
3. The plug of claim 1, wherein the body is adapted to receive an impediment that restricts fluid flow in at least one direction through the body.	Col. 4, Lines 51-59; Col. 5, Lines 26-44 Figure 2
4. The plug of claim 3, wherein the impediment is a ball.	Col. 4, Lines 51-59; Col. 5, Lines 26-44 Figure 2
5. The plug of claim 3, wherein the impediment is a flapper valve disposed within the body, wherein the flapper valve is adapted to restrict fluid flow in at least one direction through the body.	Not disclosed
6. The plug of claim 3, wherein the impediment is degradable at a predetermined temperature, pressure, pH, or a combination thereof.	Col. 6, Lines 4-22
7. The plug of claim 1, wherein the first end of the body comprises an anti-rotation feature formed thereon.	Not disclosed
8. The plug of claim 1, wherein the second end of the body comprises an anti-rotation feature disposed thereon.	Not disclosed
9. The plug of claim 1, wherein the first and second ends of the body each comprises an anti-rotation feature disposed thereon, and the anti-rotation features are adapted to engage each other when two tools are located in series, preventing relative rotation	Not disclosed

therebetween.	
10. The plug of claim 1, wherein the plug is a frac plug.	Col. 4, Lines 35-59
11. The plug of claim 9, wherein each anti-rotation feature is individually selected from the group consisting of a taper, a mule shoe, a half-mule shoe, flat protrusions or flats, flats and slots, clutches, and one or more angled surfaces.	Not disclosed
12. A plug for isolating a wellbore, comprising: a body having a first end and a second end,	Col. 1, Lines 15-46; Col. 4, Lines 60-65; Figure 2
wherein the body is formed from one or more composite materials;	Col. 8, Lines 35-42
at least one malleable element disposed about the body;	Col. 4, 60 – Col. 5, Line 14 Figure 2
at least one slip disposed about the body;	Col. 4, Line 60 – Col. 5, Line 14 Figure 2
at least one conical member disposed about the body; and	Col. 4, Line 60 – Col. 5, Line 14 Figure 2
a brass insert	Not disclosed
screwed into the body proximate the second end of the body and adapted to receive a setting tool that enters the body through the first end thereof,	Not disclosed
wherein the insert comprises one or more shearable threads disposed on an inner surface thereof;	Not disclosed
the one or more shearable	Not disclosed

threads are adapted to engage the setting tool; and	
the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined axial force.	Not disclosed
13. The plug of claim 12, wherein the outer surface of the brass insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the brass insert within the body.	Not disclosed
14. The plug of claim 12, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween.	Not disclosed
15. The plug of claim 12, wherein the body is adapted to receive a ball that restricts fluid flow in at least one direction through the body.	Col. 4, Lines 51-59; Col. 5, Lines 26-44 Figure 2
16. The plug of claim 12, wherein the predetermined axial force to release the setting tool is less than an axial force required to break the body.	Not disclosed
17. The plug of claim 12, wherein the plug is a frac plug.	Col. 4, Lines 35-59
18. A shearable insert for a plug,	Not disclosed

comprising: a body comprising brass, cast iron, or a combination thereof;	
one or more threads disposed on an outer surface of the body, the one or more threads adapted to couple with one or more threads of the plug; and	Not disclosed
one or more shearable threads disposed on an inner surface of the body,	Not disclosed
the shearable threads adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial force.	Not disclosed
19. The insert of claim 18, wherein the outer surface of the body comprises a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the body within the plug.	Not disclosed
20. The insert of claim 18, wherein the body is made of brass, and the plug is a frac plug.	Not disclosed

IV. 9(C) Detailed Explanation of Patentability

All pending claims are patentable over the prior art references cited above for at least the following reasons:

Claim 1: At the very least, the combination of *Cockrell*, *Streich*, *Thompson*, and *McKeachnie* does not teach, show, or suggest one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof, wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof, and

wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and adapted to release the setting tool when exposed to a predetermined axial force, as required in claim 1.

Cockrell discloses a combination shear and rotational release mechanism for a downhole packer. *See, e.g.*, Abstract; Col. 1, Lines 15 – 18; Col. 3, Lines 37 – Col. 4, Line 31. The release mechanism 136 is fabricated from a suitable frangible material such as mild steel having a known shear strength…, [wherein] it is possible to determine the axial force necessary to effect shearing of the threads 140 to permit relative upward movement of the mandrel 12 with respect to the [nut] member 126 when the latter is engaged with the head 56 through the resilient collar 116." Col. 5, Lines 52 – 60. The cylindrical sleeve/frangible member 136 has internal shearable threads 140 screwed onto non-shearable threads on the outer diameter of the body/mandrel 12 (col. 6, lines 3-8) and non-shearable external threads 138 engaging an external nut member 126 that is surrounded by the housing 54. *See, e.g.*, Col. 5, Line 40 to Col. 6, Line 60. The body/mandrel 12 is lifted or rotated to disengage the shearable threads 140 on the release member 146 to release the packer from its set position. *See, e.g.* Abstract. *Cockrell* makes no mention or suggestion of one or more shearable threads disposed on an inner surface of the body itself, as required in claim 1. *Cockrell* also makes no mention or suggestion that its shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof, and wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and adapted to release the setting tool when exposed to a predetermined axial force, as required in claim 1.

Streich discloses a plug comprising a metallic body/mandrel 22, 102 having a first end and a second end, wherein the plug is adapted to release the setting tool when exposed to a predetermined axial force. *See, e.g.*, Col. 1, Lines 21 – 31; Col. 2, Lines 12 – 15, 53 – 62; Col. 3, Lines 22 – 51; Col. 7, Lines 25 – 37, Col. 15, Lines 1 – 3; Figure 2. *Streich* further discloses a tension sleeve 62, 174 that has a threaded portion adapted for connection "to a standard setting tool of a kind known in the art." *See, e.g.*, Figure 3A; Col. 10, Lines 45 – 48. The tension sleeve is designed to shear or break, releasing the setting tool. *Streich* does not mention or suggest shearable threads as required in claim 1, and thus, does not cure the deficiencies of *Cockrell*.

Thompson discloses a metallic plug for isolating a wellbore, comprising a body 10 having a first end and a second end adapted to receive a setting tool through the first end thereof. *See,*

e.g., Col. 1, Lines 17 – 20; Col. 2, Lines 30 – 37, 47 – 56; Col. 3, Lines 25 – 35; Col. 4, Lines 35 – 39; Figure 1. *Thompson* further discloses that the plug engages a setting tool when disposed through the body via an actuating stud 23. *See*, *e.g.*, Col. 2, Lines 43-66. The stud 23 has upper threads 24 that engage a central actuating rod 26 of a setting tool, and lower threads 25 to engage a shank 15. *Id*. at lines 52-56. A shear groove 27 is located between the threads 24, 25 on the stud 23. *Id*. at line 58. The stud 23 fractures or fails at the groove 27 at a predetermined maximum tension, thereby freeing the actuating rod 26 from the shank 15 and permitting withdrawal of the setting tool and the upper portion of the stud after the plug is set. *Id*. at lines 60-66. Accordingly, *Thompson* does not mention or suggest shearable threads as required in claim 1 and does not cure the deficiencies of *Streich* and *Cockrell*.

McKeachnie discloses a frac plug 200 having a composite mandrel 201 with a bore formed therethrough. *See*, *e.g.*, Col. 4, Lines 35-59. *McKeachnie* further discloses one or more slips 203A,B, one or more cones 204A,B, and a packing element 202. *See*, *e.g.*, Paragraph [0057]. *McKeachnie*, however, does not mention or suggest shearable threads as required in claim 1 and does not cure the deficiencies of *Streich*, *Cockrell*, and *Thompson*.

Therefore, at the very least, a combination of *Cockrell*, *Streich*, *Thompson*, and *McKeachnie* does not teach, show, or suggest one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof, wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof, and wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and adapted to release the setting tool when exposed to a predetermined axial force, as required in claim 1.

Claim 2: As noted above, none of the references, namely *Cockrell*, *Streich*, *Thompson*, and *McKeachnie,* teach, show, or suggest shearable threads on the body of the plug, much less shearable threads that are composite. Therefore, a combination of *Cockrell*, *Streich*, *Thompson*, and *McKeachnie* cannot anticipate or make obvious the further limitations of claim 2.

Claim 3: Claim 3 is not separately patentable if claim 1 is found to be unpatentable.

Claim 4: Claim 4 is not separately patentable if claim 1 is found to be unpatentable.

Claim 5: Claim 5 is not separately patentable if claim 1 is found to be unpatentable.

Claim 6: Claim 6 is not separately patentable if claim 1 is found to be unpatentable.

Claim 7: None of the references, namely *Cockrell*, *Streich*, *Thompson*, and *McKeachnie,* teach, show, or suggest wherein the first end of the body comprises an anti-rotation feature formed thereon. Therefore, a combination of *Cockrell*, *Streich*, *Thompson*, and *McKeachnie* cannot anticipate or make obvious the further limitations of claim 7.

Claim 8: Claim 8 is not separately patentable if claim 1 is found to be unpatentable.

Claim 9: None of the references, namely *Cockrell*, *Streich*, *Thompson*, and *McKeachnie,* teach, show, or suggest wherein the first and second ends of the body each comprises an anti-rotation feature disposed thereon. *Thompson* discloses an anti-rotation feature 19 but on only one end of the plug, not both. *See, e.g.*, Figs 1-2 and col. 2, ll. 37-42. Therefore, a combination of *Cockrell*, *Streich*, *Thompson*, and *McKeachnie* cannot anticipate or make obvious the further limitations of claim 9.

Claim 10: Claim 10 is not separately patentable if claim 1 is found to be unpatentable.

Claim 11: Claim 11 is not separately patentable if claim 9 is found to be unpatentable.

Claim 12: At the very least, a combination of *Cockrell*, *Streich*, *Thompson*, and *McKeachnie* does not teach, show, or suggest a brass insert screwed into the body proximate the second end of the body and adapted to receive a setting tool that enters the body through the first end thereof, wherein the insert comprises one or more shearable threads disposed on an inner surface thereof; the one or more shearable threads are adapted to engage the setting tool; and the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined axial force, as required in claim 12.

Cockrell discloses a combination shear and rotational release mechanism for a downhole packer. *See*, *e.g.*, Abstract; Col. 1, Lines 15 – 18; Col. 3, Lines 37 – Col. 4, Line 31. The release mechanism 136 is fabricated from a suitable frangible material such as mild steel having a known shear strength…, [wherein] it is possible to determine the axial force necessary to effect shearing of the threads 140 to permit relative upward movement of the mandrel 12 with respect to the [nut] member 126 when the latter is engaged with the head 56 through the resilient collar 116." Col. 5, Lines 52 – 60. The cylindrical sleeve/frangible member 136 has internal shearable threads 140 screwed onto non-shearable threads on the outer diameter of the body/mandrel 12 (col. 6, lines 3-8) and non-shearable external threads 138 engaging an external nut member 126 that is surrounded by the housing 54. *See*, *e.g.*, Col. 5, Line 40 to Col. 6, Line 60. The body/mandrel 12 is lifted or rotated to disengage the shearable threads 140 on the release

member 146 to release the packer from its set position. *See, e.g.* Abstract. *Cockrell* makes no mention or suggestion of a brass insert screwed into the body proximate the second end of the body, as required in claim 12. *Cockrell* also makes no mention or suggestion that the insert includes one or more shearable threads disposed on an inner surface thereof, that the one or more shearable threads are adapted to engage the setting tool, and that the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined force, as required in claim 12.

Streich discloses a plug comprising a metallic body/mandrel 22, 102 having a first end and a second end, wherein the plug is adapted to release the setting tool when exposed to a predetermined axial force. *See, e.g.*, Col. 1, Lines 21 – 31; Col. 2, Lines 12 – 15, 53 – 62; Col. 3, Lines 22 – 51; Col. 7, Lines 25 – 37, Col. 15, Lines 1 – 3; Figure 2. *Streich* further discloses a tension sleeve 62, 174 that has a threaded portion adapted for connection "to a standard setting tool of a kind known in the art." *See, e.g.*, Figure 3A; Col. 10, Lines 45 – 48. The tension sleeve is designed to shear or break, releasing the setting tool. *Streich* does not mention or suggest a brass insert having one or more shearable threads as required in claim 12, and thus, does not cure the deficiencies of *Cockrell*.

Thompson discloses a metallic plug for isolating a wellbore, comprising a body 10 having a first end and a second end adapted to receive a setting tool through the first end thereof. *See, e.g.*, Col. 1, Lines 17 – 20; Col. 2, Lines 30 – 37, 47 – 56; Col. 3, Lines 25 – 35; Col. 4, Lines 35 – 39; Figure 1. *Thompson* further discloses that the plug engages a setting tool when disposed through the body via an actuating stud 23. *See, e.g.*, Col. 2, Lines 43-66. The stud 23 has upper threads 24 that engage a central actuating rod 26 of a setting tool, and lower threads 25 to engage a shank 15. *Id.* at lines 52-56. A shear groove 27 is located between the threads 24, 25 on the stud 23. *Id.* at line 58. The stud 23 fractures or fails at the groove 27 at a predetermined maximum tension, thereby freeing the actuating rod 26 from the shank 15 and permitting withdrawal of the setting tool and the upper portion of the stud after the plug is set. *Id.* at lines 60-66. Accordingly, *Thompson* does not mention or suggest a brass insert having one or more shearable threads as required in claim 12 and does not cure the deficiencies of *Streich* and *Cockrell*.

McKeachnie discloses a frac plug 200 having a composite mandrel 201 with a bore formed therethrough. *See, e.g.*, Col. 4, Lines 35-59. *McKeachnie* further discloses one or more

slips 203A,B, one or more cones 204A,B, and a packing element 202. *See*, *e.g.*, Paragraph [0057]. *McKeachnie*, however, does not mention or suggest a brass insert having one or more shearable threads as required in claim 12 and does not cure the deficiencies of *Streich*, *Cockrell*, and *Thompson*.

Therefore, at the very least, a combination of *Cockrell*, *Streich*, *Thompson*, and *McKeachnie* does not teach, show, or suggest a brass insert screwed into the body proximate the second end of the body and adapted to receive a setting tool that enters the body through the first end thereof, wherein the insert comprises one or more shearable threads disposed on an inner surface thereof; the one or more shearable threads are adapted to engage the setting tool; and the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined axial force, as required in claim 12.

Claim 13: None of the references, namely *Cockrell*, *Streich*, *Thompson*, and *McKeachnie,* teach, show, or suggest wherein the outer surface of the brass insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the brass insert within the body, as required in claim 13. Therefore, a combination of *Cockrell*, *Streich*, *Thompson*, and *McKeachnie* cannot anticipate or make obvious the further limitations of claim 13.

Claim 14: None of the references, namely *Cockrell*, *Streich*, *Thompson*, and *McKeachnie,* teach, show, or suggest wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween, as required in claim 14. Therefore, a combination of *Cockrell*, *Streich*, *Thompson*, and *McKeachnie* cannot anticipate or make obvious the further limitations of claim 14.

Claim 15: Claim 15 is not separately patentable if claim 12 is found to be unpatentable.

Claim 16: None of the references, namely *Cockrell*, *Streich*, *Thompson*, and *McKeachnie,* teach, show, or suggest wherein the predetermined axial force to release the setting tool is less than an axial force required to break the body, as required in claim 16. Therefore, a combination of *Cockrell*, *Streich*, *Thompson*, and *McKeachnie* cannot anticipate or make obvious the further limitations of claim 16.

Claim 17: Claim 17 is not separately patentable if claim 12 is found to be unpatentable.

Claim 18: At the very least, a combination of *Cockrell*, *Streich*, *Thompson*, and *McKeachnie* does not teach, show, or suggest a body comprising brass, cast iron, or a combination thereof; one or more threads disposed on an outer surface of the body, the one or more threads adapted to couple with one or more threads of the plug; and one or more shearable threads disposed on an inner surface of the body, the shearable threads adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial force, as required in claim 18.

Cockrell discloses a release mechanism 136 fabricated from a suitable frangible material such as mild steel having a known shear strength…, [wherein] it is possible to determine the axial force necessary to effect shearing of the threads 140 to permit relative upward movement of the mandrel 12 with respect to the [nut] member 126 when the latter is engaged with the head 56 through the resilient collar 116." Col. 5, Lines 52 – 60. The cylindrical sleeve/frangible member 136 has internal shearable threads 140 screwed onto non-shearable threads on the outer diameter of the body/mandrel 12 (col. 6, lines 3-8) and non-shearable external threads 138 engaging an external nut member 126 that is surrounded by the housing 54. *See*, *e.g.*, Col. 5, Line 40 to Col. 6, Line 60. The body/mandrel 12 is lifted or rotated to disengage the shearable threads 140 on the release member 146 to release the packer from its set position. *See, e.g.* Abstract. *Cockrell* makes no mention or suggestion of a body having one or more shearable threads disposed on an inner surface, wherein the shearable threads are adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial force, as required in claim 18.

Streich discloses a plug adapted to release the setting tool when exposed to a predetermined axial force. *See, e.g.*, Col. 1, Lines 21 – 31; Col. 2, Lines 12 – 15, 53 – 62; Col. 3, Lines 22 – 51; Col. 7, Lines 25 – 37, Col. 15, Lines 1 – 3; Figure 2. *Streich* further discloses a tension sleeve 62, 174 that has a threaded portion adapted for connection "to a standard setting tool of a kind known in the art." *See, e.g.*, Figure 3A; Col. 10, Lines 45 – 48. The tension sleeve is designed to shear or break, releasing the setting tool. *Streich* does not mention or suggest a body having one or more shearable threads disposed on an inner surface, wherein the shearable threads are adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial for as required in claim 18, and thus, does not cure the deficiencies of *Cockrell*.

Thompson discloses a metallic plug that engages a setting tool via an actuating stud 23. *See*, *e.g.*, Col. 2, Lines 43-66. The stud 23 has upper threads 24 that engage a central actuating rod 26 of a setting tool, and lower threads 25 to engage a shank 15. *Id*. at lines 52-56. A shear groove 27 is located between the threads 24, 25 on the stud 23. *Id*. at line 58. The stud 23 fractures or fails at the groove 27 at a predetermined maximum tension, thereby freeing the actuating rod 26 from the shank 15 and permitting withdrawal of the setting tool and the upper portion of the stud after the plug is set. *Id*. at lines 60-66. Accordingly, *Thompson* does not mention or suggest a body having one or more shearable threads disposed on an inner surface, wherein the shearable threads are adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial for as required in claim 18 and does not cure the deficiencies of *Streich* and *Cockrell*.

McKeachnie discloses a frac plug 200 having a composite mandrel 201 with a bore formed therethrough. *See*, *e.g.*, Col. 4, Lines 35-59. *McKeachnie*, however, does not mention or suggest a body having one or more shearable threads disposed on an inner surface, wherein the shearable threads are adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial for as required in claim 18 and does not cure the deficiencies of *Streich*, *Cockrell*, and *Thompson*.

Therefore, at the very least, a combination of *Cockrell*, *Streich*, *Thompson*, and *McKeachnie* does not teach, show, or suggest a body comprising brass, cast iron, or a combination thereof; one or more threads disposed on an outer surface of the body, the one or more threads adapted to couple with one or more threads of the plug; and one or more shearable threads disposed on an inner surface of the body, the shearable threads adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial force, as required in claim 18.

Claim 19: None of the references, namely *Cockrell*, *Streich*, *Thompson*, and *McKeachnie,* teach, show, or suggest wherein the outer surface of the body comprises a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the body within the plug, as required in claim 19. Therefore, a combination of *Cockrell*, *Streich*, *Thompson*, and *McKeachnie* cannot anticipate or make obvious the further limitations of claim 19.

Claim 20: None of the references, namely *Cockrell*, *Streich*, *Thompson*, and *McKeachnie,* teach, show, or suggest wherein the body is made of brass, as required in claim 20. Therefore, a

combination of *Cockrell*, *Streich*, *Thompson*, and *McKeachnie* cannot anticipate or make obvious the further limitations of claim 20.

V. 9(D) Concise Statement of Utility

The claimed invention, relates to a plug for isolating a wellbore. The plug includes a low set shear mechanism that is shearable to release a setting tool when exposed to a predetermined axial force.

VI. 9(E) Showing of Support under 35 USC § 112, ¶ 1

A. Showing of support under **35 USC § 112, ¶ 1** of the pending application 13/194,871

Pending Claim Limitation	**Support from specification**
1. A plug for isolating a wellbore, comprising: a body having a first end and a second end, wherein the body is formed from one or more composite materials	At least the Abstract Paragraphs [0034], [0035], [0056], [0069], [0070], [0071] and [0073] Figures 2A, 2B, 2C, 3A, 3B, 3C and 3D
at least one malleable element disposed about the body;	At least the Abstract Paragraphs [0037], [0040], [0041], and [0054] Figures 2A, 2B, 2C, 3A, 3B, 3C, 3D and 4
at least one slip disposed about the body;	At least the Abstract Paragraphs [0037], [0038], and [0039] Figures 2A, 2B, 2C, 3A, 3B, 3C, 3D and 4
at least one conical member disposed about the body; and	At least the Abstract Paragraph [0037] Figures 2A, 2B, 2C, 3A, 3B, 3C, 3D and 4
one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof, wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof,	At least the Abstract Paragraphs [0026], [0027], [0028], [0030], [0032], [0035], [0048], [0049], [0050], [0051], [0055], and [0056] Figure 2C

and wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and adapted to release the setting tool when exposed to a predetermined axial force.	
2. The plug of claim 1, wherein the shearable threads are composite and the predetermined axial force sufficient to deform the shearable threads to release the setting tool is less than an axial force sufficient to break the body.	At least Paragraphs [0048] and [0055]
3. The plug of claim 1, wherein the body is adapted to receive an impediment that restricts fluid flow in at least one direction through the body.	At least the Abstract Paragraphs [0025], [0034], [0036], and [0046] Figures 2A, 2B, 2C, 3A, 3B, 3C and 3D
4. The plug of claim 3, wherein the impediment is a ball.	At least Abstract Paragraphs [0025] and [0034] Figures 1B and 3C
5. The plug of claim 3, wherein the impediment is a flapper valve disposed within the body, wherein the flapper valve is adapted to restrict fluid flow in at least one direction through the body.	At least Paragraphs [0036] and [0046] Figures 2B, 3B, and 3D
6. The plug of claim 3, wherein the impediment is degradable at a predetermined temperature, pressure, pH, or a combination thereof.	At least the Abstract Paragraphs [0058], [0059], and [0060]
7. The plug of claim 1, wherein the first end of the body comprises an anti-rotation feature formed thereon.	At least Paragraphs [0043], [0044], [0062], [0063], and [0066] Figures 2A, 2B, 2C, 3A, 3B, 3C and 3D

8. The plug of claim 1, wherein the second end of the body comprises an anti-rotation feature disposed thereon.	At least Paragraphs [0043], [0062], and [0066] Figures 2A, 2B, 2C, 3A, 3B, 3C and 3D
9. The plug of claim 1, wherein the first and second ends of the body each comprises an anti-rotation feature disposed thereon, and the anti-rotation features are complementary and adapted to engage each other when two tools are located in series, preventing relative rotation therebetween.	At least Paragraphs [0043], [0044], [0062], [0063], and [0066] Figures 2A, 2B, 2C, 3A, 3B, 3C and 3D
10. The plug of claim 1, wherein the plug is a frac plug.	At least Paragraphs [0003], and [0023]
11. The plug of claim 9, wherein each anti-rotation feature is individually selected from the group consisting of a taper, a mule shoe, a half-mule shoe, flat protrusions or flats, flats and slots, clutches, and one or more angled surfaces.	At least Paragraphs [0043], [0063], and [0068] Figures 2A, 2B, 2C, 3A, 3B, 3C, 3D, 5, 6, 7 and 8
12. A plug for isolating a wellbore, comprising: a body having a first end and a second end, wherein the body is formed from one or more composite materials;	At least the Abstract Paragraphs [0034], [0035], [0056], [0069], [0070], [0071] and [0073] Figures 2A, 2B, 2C, 3A, 3B, 3C and 3D
at least one malleable element disposed about the body;	At least the Abstract Paragraphs [0037], [0040], [0041], and [0054] Figures 2A, 2B, 2C, 3A, 3B, 3C, 3D and 4
at least one slip disposed about the body;	At least the Abstract Paragraphs [0037], [0038], and [0039] Figures 2A, 2B, 2C, 3A, 3B, 3C, 3D and 4
at least one conical member disposed	At least the Abstract

about the body; and	Paragraph [0037] Figures 2A, 2B, 2C, 3A, 3B, 3C, 3D and 4
a brass insert screwed into the body proximate the second end of the body and adapted to receive a setting tool that enters the body through the first end thereof, wherein: the insert comprises one or more shearable threads disposed on an inner surface thereof;	At least Paragraphs [0024], [0025], [0026], [0028], [0030], [0032], [0033], [0035], and [0055] Figures 1A, 1B, 2A, 2B, 3A, 3B, 3C and 3D
the one or more shearable threads are adapted to engage the setting tool; and	At least Paragraphs [0024], [0026], and [0027] Figures 1A, 1B, 2A, 2B, 3A, 3B, 3C and 3D
the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined axial force.	At least Paragraphs [0024], [0028], and [0055] Figures 1A, 1B, 2A, 2B, 3A, 3B, 3C and 3D
13. The plug of claim 12, wherein the outer surface of the brass insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the brass insert within the body.	At least Paragraph [0031] Figures 1A, 1B, 2A, 2B, 3A, 3B, 3C and 3D
14. The plug of claim 12, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween.	At least Paragraphs [0043], [0044], [0062], [0063], and [0066] Figures 2A, 2B, 2C, 3A, 3B, 3C and 3D

15. The plug of claim 12, wherein the body is adapted to receive a ball that restricts fluid flow in at least one direction through the body.	At least the Abstract Paragraphs [0025], [0034], [0036], [0057], [0058], and [0059] Figures 1B, 2A, 2B, 2C, 3A, 3B, 3C and 3D
16. The plug of claim 12, wherein the predetermined axial force to release the setting tool is less than an axial force required to break the body.	At least Paragraph [0055]
17. The plug of claim 12, wherein the plug is a frac plug.	At least Paragraphs [0003], and [0023]
18. A shearable insert for a plug, comprising: a body comprising brass, cast iron, or a combination thereof;	At least Paragraphs [0024], [0032], and [0033] Figures 1, 1B, 2A, 2B, 3A, 3B, 3C and 3D
one or more threads disposed on an outer surface of the body, the threads adapted to couple with one or more threads of the plug; and	At least Paragraphs [0024], [0034] and [0035] Figures 1A, 1B, 2A, 2B, 3A, 3B, 3C and 3D
one or more shearable threads disposed on an inner surface of the body, the shearable threads adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial force, releasing the tool.	At least Paragraphs [0026], [0027], [0028], and [0035] Figures 1A, 1B, 2A, 2B, 3A, 3B, 3C and 3D
19. The insert of claim 18, wherein the outer surface of the body comprises a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the body within the plug.	At least Paragraph [0031] Figures 1A, 1B, 2A, 2B, 3A, 3B, 3C and 3D
20. The insert of claim 18, wherein the	At least Paragraphs [0003], 0023], [0032],

body is made of brass, and the plug is a frac plug.	and [0033]

B. Showing of support under 35 USC § 112, ¶ 1 of the priority ("parent") application 12/317,497

Pending Claim Limitation	**Support from parent, 12/317,497**
1. A plug for isolating a wellbore, comprising: a body having a first end and a second end, wherein the body is formed from one or more composite materials	At least at paragraphs [0006], [0007], [0019], [0020], [0034], [0035] Figures 1, 3, 4, and 5
at least one malleable element disposed about the body;	At least at paragraphs [0006], [0007], [0019], [0020], [0021], [0023], [0034], [0038] Figures 1, 3, 4, and 5
at least one slip disposed about the body;	At least at paragraphs [0006], [0007], [0019], [0020], [0021], [0023], [0029], [0034], [0038] Figures 1, 3, 4, and 5
at least one conical member disposed about the body; and	At least at paragraph [0021] Figures 1, 3, 4, and 5
one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof, wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof, and wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and adapted to release the setting tool when exposed to a	At least at paragraphs [0022], [0023], [0029], [0034] Figures 1-5

predetermined axial force.	
2. The plug of claim 1, wherein the shearable threads are composite and the predetermined axial force sufficient to deform the shearable threads to release the setting tool is less than an axial force sufficient to break the body.	At least at paragraphs [0022], [0023], [0029], [0034] Figures 1-5
3. The plug of claim 1, wherein the body is adapted to receive an impediment that restricts fluid flow in at least one direction through the body.	At least at paragraphs [0020], [0024], [0025], [0026], [0027], [0028], [0030], [0031], [0033] Figures 3, 4, 5, and 6
4. The plug of claim 3, wherein the impediment is a ball.	At least at paragraphs [0020], [0024], [0025], [0026], [0028], [0030], [0031], [0033] Figures 3, 4, 5, and 6
5. The plug of claim 3, wherein the impediment is a flapper valve disposed within the body, wherein the flapper valve is adapted to restrict fluid flow in at least one direction through the body.	N/A
6. The plug of claim 3, wherein the impediment is degradable at a predetermined temperature, pressure, pH, or a combination thereof.	At least at paragraphs [0005], [0006], [0028]
7. The plug of claim 1, wherein the first end of the body comprises an anti-rotation feature formed thereon.	At least at paragraphs [0006], [0007], [0019], [0020], [0024], [0033] Figures 1 and 3-6
8. The plug of claim 1, wherein the second end of the body comprises an anti-rotation feature disposed thereon.	At least at paragraphs [0006], [0007], [0019], [0020], [0024], [0033] Figures 1 and 3-6
9. The plug of claim 1, wherein the first	At least at paragraphs [0006], [0007], [0019],

and second ends of the body each comprises an anti-rotation feature disposed thereon, and the anti-rotation features are complementary and adapted to engage each other when two tools are located in series, preventing relative rotation therebetween.	[0020], [0024], [0033] Figures 1 and 3-6
10. The plug of claim 1, wherein the plug is a frac plug.	At least at paragraphs [0025], [0026]
11. The plug of claim 9, wherein each anti-rotation feature is individually selected from the group consisting of a taper, a mule shoe, a half-mule shoe, flat protrusions or flats, flats and slots, clutches, and one or more angled surfaces.	At least at paragraphs [0006], [0007], [0019], [0020], [0024], [0033] Figures 1 and 3-6
12. A plug for isolating a wellbore, comprising: a body having a first end and a second end, wherein the body is formed from one or more composite materials;	At least at paragraphs [0006], [0007], [0019], [0020], [0034], [0035] Figures 1, 3, 4, and 5
at least one malleable element disposed about the body;	At least at paragraphs [0006], [0007], [0019], [0020], [0021], [0023], [0034], [0038] Figures 1, 3, 4, and 5
at least one slip disposed about the body;	At least at paragraphs [0006], [0007], [0019], [0020], [0021], [0023], [0029], [0034], [0038] Figures 1, 3, 4, and 5
at least one conical member disposed about the body; and	At least at paragraph [0021] Figures 1, 3, 4, and 5
a brass insert screwed into the body proximate the second end of the body and adapted to receive a setting tool that enters	At least at paragraphs [0022], [0023], [0029], [0034] Figures 1-5

the body through the first end thereof, wherein: the insert comprises one or more shearable threads disposed on an inner surface thereof;	
the one or more shearable threads are adapted to engage the setting tool; and	At least at paragraphs [0022], [0023], [0029], [0034] Figures 1-5
the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined axial force.	At least at paragraphs [0022], [0023], [0029], [0034] Figures 1-5
13. The plug of claim 12, wherein the outer surface of the brass insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the brass insert within the body.	At least at paragraph [0072] Figures1-5
14. The plug of claim 12, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween.	At least at paragraphs [0006], [0007], [0019], [0020], [0024], [0033] Figures 1 and 3-6
15. The plug of claim 12, wherein the body is adapted to receive a ball that restricts fluid flow in at least one direction through the body.	At least at paragraphs [0020], [0024], [0025], [0026], [0028], [0030], [0031], [0033] Figures 3, 4, 5, and 6
16. The plug of claim 12, wherein the	At least at paragraphs [0022], [0023], [0029],

predetermined axial force to release the setting tool is less than an axial force required to break the body.	[0034] Figures 1-5
17. The plug of claim 12, wherein the plug is a frac plug.	At least at paragraphs [0025], [0026]
18. A shearable insert for a plug, comprising: a body comprising brass, cast iron, or a combination thereof;	At least at paragraphs [0022], [0023], [0029], [0034] Figures 1-5
one or more threads disposed on an outer surface of the body, the threads adapted to couple with one or more threads of the plug; and	At least at paragraphs [0022], [0023], [0029], [0034] Figures 1-5
one or more shearable threads disposed on an inner surface of the body, the shearable threads adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial force, releasing the tool.	At least at paragraphs [0022], [0023], [0029], [0034] Figures 1-5
19. The insert of claim 18, wherein the outer surface of the body comprises a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the body within the plug.	At least at paragraphs [0022], [0023], [0029], [0034] Figures 1-5
20. The insert of claim 18, wherein the body is made of brass, and the plug is a frac plug.	At least at paragraphs [0022], [0023], [0025], [0026], [0029], [0034] Figures 1-5

VII. 9(F) Showing of Support under 35 USC § 112, ¶ 6

None of the pending claim elements contain any means-plus (or step-plus) function claim elements. Thus, consideration under 35 U.S.C. § 112, ¶ 6 is not invoked.

VIII. 9(G) References Disqualified as Prior Art under 35 U.S.C. § 103(c)

None of the cited references are disqualified as prior art under 35 U.S.C. § 103(c).

IX. Conclusion

In view of this Accelerated Examination Support Document, Applicant respectfully requests that the examiner grant the Petition to Make the Application Special for Accelerated Examination for the above-captioned patent application. Applicant respectfully submits that the pending claims of the above-captioned patent application are in condition for allowance, and respectfully requests allowance of the above-captioned patent application to issue in a U.S. patent.

Respectfully submitted,

Dated: September 21, 2011

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PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13194871
Filing Date	2011-07-29
First Named Inventor	W. Lynn Frazier
Art Unit	3676
Examiner Name	Thomas S. Bomar
Attorney Docket Number	MOTI-018

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13194871
	Filing Date	2011-07-29
	First Named Inventor	W. Lynn Frazier
	Art Unit	3676
	Examiner Name	Thomas S. Bomar
	Attorney Docket Number	MOTI-018

	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13194871
Filing Date	2011-07-29
First Named Inventor	W. Lynn Frazier
Art Unit	3676
Examiner Name	Thomas S. Bomar
Attorney Docket Number	MOTI-018

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Robb D. Edmonds/	Date (YYYY-MM-DD)	2011-09-21
Name/Print	Robb D. Edmonds	Registration Number	46681

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13194871
Filing Date	2011-07-29
First Named Inventor	W. Lynn Frazier
Art Unit	3676
Examiner Name	Thomas S. Bomar
Attorney Docket Number	MOTI-018

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7325617	B2	2008-02-05	Murray	
	2	5117915	A	1992-06-02	Mueller et al.	
	3	4848459		1989-07-18	Blackwell et al.	
	4	4432418		1984-02-21	Mayland	
	5	4405017		1983-09-20	Allen et al.	
	6	4314608		1982-02-09	Richardson	

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U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13194871
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	Art Unit	3676
	Examiner Name	Thomas S. Bomar
	Attorney Docket Number	MOTI-018

	1	20100101807		2010-04-29	Greenlee et al.	
	2	20090114401		2009-05-07	Purkis	

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FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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Signature	/Robb D. Edmonds/	Date (YYYY-MM-DD)	2011-09-21
Name/Print	Robb D. Edmonds	Registration Number	46681

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Electronic Acknowledgement Receipt

EFS ID:	10999295
Application Number:	13194871
International Application Number:	
Confirmation Number:	1776
Title of Invention:	BOTTOM SET DOWNHOLE PLUG
First Named Inventor/Applicant Name:	W. Lynn Frazier
Customer Number:	60935
Filer:	Robb D. Edmonds/Stacy Lanier
Filer Authorized By:	Robb D. Edmonds
Attorney Docket Number:	MOTI-018
Receipt Date:	21-SEP-2011
Filing Date:	29-JUL-2011
Time Stamp:	12:57:14
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Accelerated Exam - Transmittal amendment/reply	MOTI_018_AESD_09212011.pdf	342274 981aeb7d5870354310bfae4bc3fcf99caa7a744e	no	46

Warnings:	
Information:	

2	Accelerated Exam - Transmittal amendment/reply	MOTI_018_Search_Doc_09212011.pdf	140444 d0d9e591c3acf1348c55a95230fafcaf229c58dd	no	8
Warnings:					
Information:					
3	Transmittal Letter	MOTI_018_Supp_IDS_2_09212011.pdf	133211 ad821f873f5509f69438bb10f45dda94f2c8abea	no	2
Warnings:					
Information:					
4	Transmittal Letter	MOTI_018_Supp_IDS_3_09192011.pdf	133170 5689277362c92e42fa244d7b809180e78a72f632	no	2
Warnings:					
Information:					
5	Information Disclosure Statement (IDS) Form (SB08)	MOTI_018_SuppIDS_2_09212011.pdf	612142 3a94760b0f5350fea970429d48373964686 17d6c	no	4
Warnings:					
Information:					
6	Information Disclosure Statement (IDS) Form (SB08)	MOTI_018_SuppIDS_3_09212011.pdf	612434 4e4aae8219e298fc5c12f9eb2888fcf74658cf99	no	4
Warnings:					
Information:					
		Total Files Size (in bytes):	1973675		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant: W. Lynn Frazier	§	Conf. No.:	1776
	§		
Filed: July 29, 2011	§	Art Unit:	3676
	§		
Serial No.: 13/194,871	§	Examiner:	Thomas S. Bomar
	§		
For: *Bottom Set Downhole Plug*	§	Docket No.:	MOTI-018
	§		
	§	Customer No.:	60935

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRE-EXAMINATION SEARCH STATEMENT

Dear Examiner:

This pre-examination search statement is provided in support of the Petition to Make Special for Accelerated Examination filed on July 29, 2011.

I. 8 (A) Pre-examination Search

A pre-examination search was conducted involving U.S. patents and patent application publications, foreign patent documents, and non-patent literature as indicated below.

A. Fields of Search

1. U.S. Class(es)/Subclass(es) Searched

137/15.24, 15.26, 15.18, 508

166/85.3, 97.1, 102 123, 124, 125, 135, 138, 181, 182, 188, 192, 193, 194, 239, 242.6, 285, 316, 317, 318, 327, 328, 332.3, 332.5, 332.8, 376, 377, 378, 381, 382, 376, 386, 387;

175/218, 234, 237, 243, 317, 318

2. IPC Class(es)/Subclass(es) Searched

E21B 33/04, 12, 16, 129;
E21B 25/00

B. Date of Searches:

May 15-17, 2011

Updated: September 13, 2011

C. Databases Searched and Search Logic:

1. Database Service: LexisNexis TotalPatent

Files Searched

Full Text: US, EP, WO, JP, DE, FR, GB, AT, AU, BE, BR, CA, CH, CN, DD, DK, ES, FI, IE, IT, LU, MC, NL, PT, RU, SE, SU

Bibliographic Only: AP, AR, BA, BG, BN, BO, CL, CO, CR, CS, CU, CY, CZ, DO, DZ, EA, EC, EE, EG, GC, GR, GT, HK, HN, HR, HU, ID, IL, IN, KE, KR, LB, LT, LV, MA, MD, MN, MT, MW, MX, MY, NI, NO, NZ, OA, PA, PE, PH, PL, PY, RO, SG, SI, SK, SV, TH, TJ, TR, TT, TW, UA, UY, UZ, VE, VN, YU, ZA, ZM, ZW

Search Logic

L1 TITLE-ABST-CLAIM(((insert! or body!) w/8 thread! and (groov! or recess! or indent! or line or thread!) w/10 (shear! or break! or detach! or frang!) and (zinc or zn) and (copper or cu)))

L2 TITLE-ABST-CLAIM(((insert! or body!) w/8 thread! and (groov! or recess! or indent! or line or thread!) w/10 (shear! or break! or detach! or frang!)))

L3 TITLE-ABST-CLAIM((brass w/10 (insert! or body! or mandrel) w/8 thread! and (groov! or recess! or indent! or line or thread!) w/10 (shear! or break! or detach! or frang!)))

L4 (brass w/10 (insert! or body! or mandrel or bore!) w/12 thread! and (groov! or recess! or indent! or line or thread!) w/10 (shear! or break! or detach! or frang!)) and US-MAIN(166#! or 175#!)

L5 ((zinc or zn or copper or cu or brass) and (insert! or body!) w/8 thread! and (groov! or recess! or indent! or line or thread!) w/10 (shear! or break! or detach! or frang!)) and US-MAIN(166#188 or 166#373 or 166#142 or 166#151 or 166#192 or 166#325 or 166#332#1 or 166#332#3 or 166#179 or 166#380 or 166#387 or 166#381 or 166#386 or 166#316 or 166#192 or 166#193 or 166#332.1 or 166#332.3 or 166#332.5 or 166#332.8 or 166#239 or 166#102 or 175#218 or 175#234 or 175# 237 or 175#243 or 175#317 or 175#318))

L6 (brass and (insert! or body! or mandrel or bore!) w/12 thread! and (groov! or recess! or indent! or line or thread! or ring) w/10 (shear! or break! or detach! or frang!)) and US-MAIN(166#! or 175#!)

L7 TITLE-ABST-CLAIM(((insert! or body! or mandrel or bore!) w/12 thread! w/10 (shear! or break! or detach! or frang!) and brass))

L8 (downhole or "down hole" or wellbore or "well bore" or borehole or "bore hole" or wellhole or "well hole" or "bore well" or borewell) and thread! w/10 insert and (tool or body or mandrel or string) w/10 (element or cone or slip or ring or shoe) and thread! w/10 (shear! or break! or detach! or frang!)

L9 (downhole or "down hole" or wellbore or "well bore" or borehole or "bore hole" or wellhole or "well hole" or "bore well" or borewell) and (tool or body or mandrel or string) w/10 (element or cone or slip or ring or shoe) and ((insert or plug) w/8 thread!) w/10 (shear! or break! or frang!)

L10 ((tool or body or mandrel or string) w/10 (element or cone or slip or ring or shoe) and ((insert or plug) w/6 thread!) w/10 (shear! or break! or frang!)) and US-MAIN(166#! or 175#!)

L11 (((insert or plug) w/6 thread!) w/10 (shear! or break! or frang!) and flap! and ball) and US-MAIN(166#! or 175#!)

L12 ((plug! or stop!) w/6 thread! and flap!) and US-MAIN((166#193 or 166#239 or 166#318 or 175#237))

L13 (plug w/6 thread! and flap! and ball) and US-MAIN(166#! or 175#!)

L14 ((plug w/6 thread!) and flap!) and US-MAIN(166#328)

L15 ((plug w/6 thread!) w/12 (bottom! or end or second!) and flap! and ball)

L16 ((plug w/6 thread!) w/12 (bottom! or end or second!) and flap! w/8 valve and ball w/8 seat)

L17 (ring or detent! or thread!) w/10 (shear! or break! or frang! or releas! or deform!) and US-MAIN(166#! or 175#!)

L18 (thread! w/10 (shear! or break! or frang!)) w/12 (body or insert! or string!) and US-MAIN(166#! Or 175#!)

L19 ((plug w/6 thread!) w/12 (shear! or break! or frang!)) and US-MAIN(166#! or 175#!)

L20 ((bottom or end or tip) w/10 (plug w/6 thread!) w/12 (shear! or break! or frang! or releas! or deform!)) and US-MAIN(166#! or 175#!)

L21 ((bottom or end or tip) w/10 (plug w/6 thread!) w/12 (shear! or break! or frang! or releas! or deform!)) and US-MAIN(166#123 or 166#124 or 166#125 or 166#181 or 166#182 or 166#242.6 or 166#377 or 166#387)

L22 ((plug or insert) w/6 thread!) w/12 (shear! or break! or frang! or releas! or deform!)) and US-MAIN(166#123 or 166#124 or 166#125 or 166#181 or 166#182 or 166#242.6 or 166#377 or 166#387)

L23 (ring or detent! or thread!) w/10 (shear! or break! or frang! or releas! or deform!) and US-MAIN(166#123 or 166#124 or 166#125 or 166#181 or 166#182 or 166#242.6 or 166#377 or 166#387)

L24(plug and (downhole or borehole or wellbore) and (malleabl! or ductil! or deform!) and slip and shear! w/3 thread! and setting! w/3 tool and (axial! or long! or shear) w/5 forc!)

L25US-CL(166/135 or 166/138) and (deform! or shear! or break! or frang! or shear!) w/3 thread!

L26 US-CL(166/135 or 166/138) and (deform! or shear! or break! or frang! or shear!) w/3 thread! and (ball! or flap! or check!) w/10 valv!

L27 US-CL(166#386 or 166#387) and (deform! or shear! or break! or frang! or shear!) w/3 thread! and (ball! or flap! or check!) w/10 valv!

L28 US-CL(166/386 or 166/387 or 166/135 or 166/138 or 166/192 or 166/193 or 166/194) and (dissolv! or degrad!) w/5 (temp! or therm! or pressur! or "pH")

L29 US-CL(166/386 or 166/387 or 166/135 or 166/138 or 166/192 or 166/193 or 166/194) and (dissolv! or degrad!) w/5 (temp! or therm! or

pressur! or "pH") w/10 (valv! or obstruct! or restrict! or imped! or block! or plug!)

L30(deform! or shear! or break! or frang! or shear!) w/3 thread! and (dissolv! or degrad!) w/5 (temp! or therm! or pressur! or "pH") w/10 (valv! or obstruct! or restrict! or imped! or block! or plug!) and (downhole or wellbore or borehole)

L31 US-CL(166/386 or 166/387 or 166/135 or 166/138 or 166/192 or 166/193 or 166/194) and (deform! or shear! or break! or frang! or shear!) w/3 thread! and (antirota! or anti-rota! or (rotat! w/7 (prevent! or lock!)))

L32 US-CL(166/386 or 166/387 or 166/135 or 166/138 or 166/192 or 166/193 or 166/194) and (deform! or shear! or break! or frang! or shear!) w/3 set! and (antirota! or anti-rota! or (rotat! w/7 (prevent! or lock!)))

L33US-CL(166/386 or 166/387 or 166/135 or 166/138 or 166/192 or 166/193 or 166/194) and (deform! or shear! or break! or frang! or shear!) w/3 set! and (antirota! or anti-rota! or (rotat! w/7 (prevent! or lock!))) and (dissolv! or degrad! or erod! or solu! or eros!) w/10 (valv! or obstruct! or restrict! or imped! or block! or plug!)

L34frac! w/3 plug! and (deform! or shear! or break! or frang! or shear!) w/3 (thread! or set!) and (antirota! or anti-rota! or (rotat! w/7 (prevent! or lock!))) and (dissolv! or degrad! or erod! or solu! or eros!) w/10 (valv! or obstruct! or restrict! or imped! or block! or plug!)

Date Updated: September 13, 2011.

2. Database Service: Dialog

Files Searched

Ei Compendex+Fluid Power Net+FLUIDEX (Fluid Engineering Abstracts)+Gale Group New Product Announcements/Plus (NPA/Plus)+Gale Group PROMT+Gale Group Trade & Industry DatabaseTM+ICONDA - International Construction Database+JICST-EPlus - Japanese Science & Technology+NTIS: National Technical Information Service+PASCAL+TEME - Technology and Management+Wilson Applied Science & Technology Abstracts+CA SEARCH: Chemical Abstracts+CAOLD (Pre-1967 Chemical Abstracts File)+CAplus+GeoArchive+GEOBASETM+GeoRef+IBM Technical Disclosure Bulletin+Knovel+Oil & Gas Journal+TULSATM (PETROLEUM ABSTRACTS)

Search Logic

D1 (downhole or "down hole" or wellbore or "well bore" or borehole or "bore hole" or wellhole or "well hole" or "bore well" or borewell) AND (ball or plug? or stop? or flap?) 6w thread? AND (groov? or recess? or indent? or line) 10W (shear? or break? or detach? or frang?)

D2 (downhole or "down hole" or wellbore or "well bore" or borehole or "bore hole" or wellhole or "well hole" or "bore well" or borewell) AND ball AND flap? AND (plug? or stop?) 6w thread? and (shear? or break? or detach? or frang?)

D3 (downhole or "down hole" or wellbore or "well bore" or borehole or "bore hole" or wellhole or "well hole" or "bore well" or borewell) AND (bottom? or lower or second?) 8w (plug? or stop?) 8w (thread?)

3. Database Service: Google

File Searched

Google Scholar (Non Patent Literature)

Search Logic

G1 (downhole OR "down hole" OR wellbore OR "well bore" OR borehole OR "bore hole" OR wellhole OR "well hole" OR "bore well" OR borewell) (insert OR sleeve OR string OR subassembly OR "sub-assembly")

G2 allintitle: (downhole OR "down hole" OR wellbore OR "well bore" OR borehole OR "bore hole" OR wellhole OR "well hole" OR "bore well" OR borewell)(valve OR valves)

G3 (downhole OR "down hole" OR wellbore OR "well bore" OR borehole OR "bore hole" OR wellhole OR "well hole" OR "bore well" OR borewell)(valve OR valves)

G4 allintitle: (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string" OR bore)(valve OR valves OR valving OR ball OR flap OR flapper)

G5 (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string" OR bore)(valve OR valves OR valving OR ball OR flap OR flapper)

G6 (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string" OR bore)(valve OR valves OR valving OR ball OR seal)

G7 allintitle: (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string" OR bore)(valve OR valves OR valving OR ball OR seal)

G8 allintitle: (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string")(valve OR valves OR valving OR ball OR seal OR flap)

G9 allintitle: (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string" OR bore)(flap OR ball)

G10 (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string" OR bore)(flap OR flapper)(ball OR "ball valve")

G11 (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string" OR bore)(plug OR stopper)(bottom OR secondary OR lower)

G12 allintitle: (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string" OR bore)(plug OR stopper)(bottom OR secondary OR lower)

II. 8(B) Search Directed to the Invention

The pre-examination search was directed to the claimed invention, encompassing all the features of the independent claims, giving the claims their broadest reasonable interpretation.

III. 8(C) Search Directed to the Disclosure

The pre-examination search encompasses the disclosed features that may be claimed. No disclosed features that are unclaimed at this time are currently seen as features that may be claimed later.

IV. 8(D) Search Report from a Foreign Patent Office

No search report from a foreign patent office is provided here as the pre-examination search.

V. 8(E) Statement of Good Faith

All statements above in support of the petition to make special are based on a good faith belief that the search was conducted in compliance with the requirements of this rule.

Respectfully submitted,

Dated: September 21, 2011

/Robb D. Edmonds/

Robb D. Edmonds
Attorney for Applicant
Registration No. 46,681

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant: W. Lynn Frazier	§	Conf. No.:	1776
	§		
Filed: July 29, 2011	§	Art Unit:	3676
	§		
Serial No.: 13/194,871	§	Examiner:	Thomas S. Bomar
	§		
For: *Bottom Set Downhole Plug*	§	Docket No.:	MOTI-018
	§		
	§	Customer No.:	60935

Commissioner for Patents
Mail Stop Amendment
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Dear Examiner:

Applicant submits herewith a second Supplemental Information Disclosure Statement ("SIDS") for the above-referenced patent application for accelerated examination. The second SIDS includes U.S. Patent No. 7,798,236 that Applicant deems most closely related to the subject matter of the claims. Accordingly, U.S. Patent No. 7,798,236 has been added to the Accelerated Examination Support Document ("AESD").

Conclusion

Applicant respectfully requests the examiner to accept and consider the second SIDS during the accelerated examination of the application. Further, Applicant submits that the application is in condition for allowance, and respectfully requests that the examiner allow the claims of the application to issue in a U.S. patent.

Respectfully submitted,

/Robb D. Edmonds/

Robb D. Edmonds
Registration No. 46,681

Dated: September 21, 2011

EDMONDS & NOLTE, PC
16815 Westheimer Road
Suite 130
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Office: 281-480-2700
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant: W. Lynn Frazier	§	Conf. No.:	1776
	§		
Filed: July 29, 2011	§	Art Unit:	3676
	§		
Serial No.: 13/194,871	§	Examiner:	Thomas S. Bomar
	§		
For: *Bottom Set Downhole Plug*	§	Docket No.:	MOTI-018
	§		
	§	Customer No.:	60935

Commissioner for Patents
Mail Stop Amendment
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Dear Examiner:

Applicant submits herewith a third Supplemental Information Disclosure Statement ("SIDS") for the above-referenced patent application for accelerated examination. The third SIDS includes references that are related to the subject matter of the claims but not deemed most closely related to the subject matter of the claims. The references in the third SIDS are made of record only in the interest of complete and full disclosure.

Conclusion

Applicant respectfully requests the examiner to accept and consider the third SIDS during the accelerated examination of the application. Further, Applicant submits that the application is in condition for allowance, and respectfully requests that the examiner allow the claims of the application to issue in a U.S. patent.

Respectfully submitted,

/Robb D. Edmonds/

Robb D. Edmonds
Registration No. 46,681

Dated: September 21, 2011

EDMONDS & NOLTE, PC
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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/194,871	07/29/2011	W. Lynn Frazier	MOTI-018	1776

60935 7590 08/25/2011

Edmonds Nolte, PC
16815 ROYAL CREST DRIVE
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HOUSTON, TX 77058

EXAMINER	
BOMAR, THOMAS S	
ART UNIT	**PAPER NUMBER**
3676	

NOTIFICATION DATE	DELIVERY MODE
08/25/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@edmondsnolte.com

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

AUG 24 2011

Edmonds Nolte, PC
16815 Royal Crest Drive
Suite 130
Houston, TX 77058

In re application of : **DECISION ON PETITION**
Lynn W. Frazier : **TO MAKE SPECIAL FOR**
Application No. 13/194,871 : **NEW APPLICATION**
Filed: July 29, 2011 : **UNDER 37 CFR 1.102**
For: BOTTOM SET DOWNHOLE PLUG

This is a decision on the petition filed on July 29, 2011 to make the above-identified application special for accelerated examination procedure under 37 C.F.R. § 1.102(d).

The petition to make the application special is **DISMISSED**.

REGULATION AND PRACTICE

A grantable petition to make special under 37 C.F.R. § 1.102(d) and pursuant to the "Change to Practice for Petitions in Patent Applications to Make Special and for Accelerated Examination" published in the Federal Register on June 26, 2006 (71 Fed. Reg. 36323), must satisfy the following conditions:

I. Conditions Regarding the Application:

1. the application must be a non-reissue utility or design application filed under 37 CFR 1.111(a);

2. the application, the petition and the required fees must be filed electronically using the USPTO's electronic filing system (EFS), or EFS-web; if not filed electronically, a statement asserting that EFS and EFS-web were not available during the normal business hours.

3. at the time of filing, the application must be complete under 37 CFR 1.51 and in condition for examination;

4. the application must contain three or fewer independent claims and twenty or fewer total claims and the claims must be directed to a single invention.

II. Conditions Regarding the Petition:

The petition must:

1. be filed with the application;

2. include a statement that applicant agrees not to separately argue the patentability of any independent claim during any appeal in the application;

3. include a statement that applicant agrees to make an election without traverse in a telephone interview.

4. include a statement that applicant agrees to conduct such an interview when requested by the examiner.

5. include a statement, made based on a good faith belief, that a preexamination search in compliance with the following requirements, was conducted, including an identification of the field of search by United States class and subclass, where applicable, and for database searches, the search logic or chemical structure or sequence used as a query, the name of the file(s) searched and the database service, and the date of the search. The preexamination search must:

5.1 involve U.S. patents and patent application publications, foreign patent documents, and non-patent literature, unless the applicant can justify with reasonable certainty that no references more pertinent than those already identified are likely to be found in the eliminated sources and includes such a justification with this statement;

5.2. be directed to the claimed invention and encompass all of the features of the claims, giving the claims the broadest reasonable expectation;

5.3. encompass the disclosed features that may be claimed.

6. must provide in support of the petition an accelerated examination support document.

An accelerated examination support document must include:

6.1. an information disclosure statement (IDS) in compliance with 37 CFR 1.98 citing each reference deemed most closely related to the subject matter of each of the claims;

6.2. an identification of all the limitations in the claims that are disclosed by the reference specifying where the limitation is disclosed in the cited reference;

6.3. a detailed explanation of how each of the claims are patentable over the references cited with particularity required by 37 CFR 1.111(b) and (c);

6.4. a concise statement of the utility of the invention as defined in each of the independent claims (unless the application is a design application);

6.5. a showing of where each limitation of the claims finds support under 35 USC 112, first paragraph, in the written description of the specification. If applicable, the showing must also identify: (1) each means- (or step) plus-function claim element that invokes consideration under 35 UDC 112, sixth paragraph; and (2) the

structure, material, or acts in the specification that corresponds to each means- (or step) plus-function claim element that invokes consideration under 35 UDC 112, sixth paragraph; if the application claims the benefit of one or more applications under title 35, United States Code, the showing must also include where each limitation of the claims finds support under 35 USC 112, first paragraph, in each such application in which such supports exists;
6.6. an identification of any cited references that may be disqualified under 35 USC 103(c).

REVIEW OF FACTS

The petition in this case fails to comply with conditions II.5.2, II.6.3, and II.6.5.

As to condition II.5.2, the petition lacks an indication of a preexamination search that encompasses all of the features of the claims. Specifically, there does not appear to be an adequate classification search. A proper classification search for this invention needs to additionally include a search of 166/135 (where the case is classified) and 166/138. Furthermore, it does not appear that an adequate text search has been completed. The search appears to be misdirected and lacks some claimed elements. Search logic encompassing the "broadest reasonable interpretation" of the claimed invention is required. The USPTO website has an example of the proper manner of performing and documenting a preexamination search for Accelerated Examination petitions at: http://www.uspto.gov/web/patents/accelerated/. Additionally, an example of sample search logic is provided below:

(plug packer) same (drillable adj material) same composite
(packer) same (ball near3 (disappear$3 degradable degrad$3))
(packer near set) same (slip wedge) same flapper
(packer plug) and ((drill$3 adj out) same (anti?rotat$3))
(frac adj (plug packer)).ti.

The sample search logic is not meant to be the sole search logic that can or should be employed in this application, but is meant solely as an example for applicant's assistance. The same examples shown above for the text search can also be used in the search of foreign databases and any NPL search.

Many of the more common limitations present in the claims are apparently not found in any of the cited references. Some of the claims or portions thereof, for example, but not limited to, the third limitation in claim 1, the second limitation in claim 12, claims 3-8, 10, 14, 15, 17 and 20, appear to contain limitations that are quite common and it strains credulity to assert that nowhere in the prior art are located these additional claimed limitations. The lack of finding art on what appears to be limitations quite common in the art is an indication that a search of the 'broadest reasonable interpretation" of the invention has not been properly completed. While a reference containing a specific

limitation of any one claim may not result in a rejection of the claim, not finding the structure at all calls into question the sufficiency of the search. It appears that the search may have been completed on the concept of the disclosed invention of the independent claims rather than the specifics of the "claimed invention" as is required.

The general requirement is that applicant is required to submit an accelerated examination support document (AESD) that includes an IDS in compliance with 37 CFR 1.98 citing each reference deemed most closely related to the subject matter of each of the claims (whether in independent or dependent form). Specifically:

> **(1)** Applicant **is not** required to cite the references that are only relevant to the general subject matter of the claims because there are references that are more closely related to the subject matter of the claims. Applicant is also not required to cite a reference that is cumulative to any other reference cited in the IDS.
> **(2)** Applicant **is** required to cite any reference that establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim (see 37 CFR 1.56(b)) in the IDS of the AESD.
> **(3)** Applicant **is** required to cite the reference that discloses the most limitations in the independent claim.
> **(4)** Applicant **is** required to cite any reference that discloses a limitation of an independent claim that is not shown in the other references.
> **(5)** Applicant **is** required to cite any reference that discloses a limitation of a dependent claim that is not shown in the other references.

As to item II.6.3, there is not a satisfactory detailed explanation of claim patentability over each of the references. The explanation needs to specify how each of the claims are patentable over each of the cited references, which includes the need to specify whether each of the dependent claims are separately patentable beyond the limitations contained in the independent claims, and if so how, or a statement made that the dependent claims are not separately patentable. This is certainly not clear for dependent claims 3-4, 8, 11, 15 and 16 because these claims are indicated as being allowable because of the claims upon which they are dependent and silent on whether they are separately allowable over the cited art for what they are claiming. This needs to be made clear. In addition, any indication of patentability over the prior art references needs to take in to account any distinctions seen as being obvious over any single or a combination of cited references.

As to condition to II.6.5, the showing of where each limitation of each of the claims finds support under 35 USC 112 in the written description of the application is sufficient. However, similar support (if any) for the claimed invention must additionally be shown in the parent application upon which priority is claimed under 35 USC 120. Specifically, for parent application 12/317,497, a listing of where the limitations of the claims find support is necessary.

The petition fails to meet the required conditions to be accorded special status under the accelerated examination procedure.

DECISION

For the above stated reasons, the petition is **DISMISSED**. The application will therefore be taken up by the examiner for action in its regular turn.

Petitioner is given a single opportunity to perfect the petition. Any request for reconsideration of this decision must be submitted within one (1) month or thirty (30) days, whichever is longer, from the date of this decision. No extensions of time will be granted under 37 CFR 1.136(a) if the request is to be considered timely. Any request for reconsideration must address the deficiencies indicated above.

Petitioner is reminded that, upon granting of the special status of the application on request for reconsideration, the application will be processed expeditiously. However, due to the dismissal of the instant petition, examination may not be completed within twelve months of the filing date of the application.

Any inquiry regarding this decision should be directed to Steven N. Meyers at (571) 272-6611.

Steven N. Meyers
Quality Assurance Specialist
Technology Center 3600

Snm: 8/24/11

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/194,871

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	82		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	270		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	110		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	*	x 26 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 110 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $270 ($135 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	462		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/194,871	07/29/2011	3672	462	MOTI-018	20	3

CONFIRMATION NO. 1776

60935
Edmonds Nolte, PC
16815 ROYAL CREST DRIVE
SUITE 130
HOUSTON, TX 77058

FILING RECEIPT

Date Mailed: 08/10/2011

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

W. Lynn Frazier, Corpus Christi, TX;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CIP of 12/317,497 12/23/2008

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)

If Required, Foreign Filing License Granted: 08/08/2011

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/194,871**

Projected Publication Date: 11/17/2011

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****

Title

BOTTOM SET DOWNHOLE PLUG

Preliminary Class

166

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as

set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

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PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13194871
Filing Date	2011-07-29
First Named Inventor	W. Lynn Frazier
Art Unit	
Examiner Name	
Attorney Docket Number	MOTI-018

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13194871
	Filing Date	2011-07-29
	First Named Inventor	W. Lynn Frazier
	Art Unit	
	Examiner Name	
	Attorney Docket Number	MOTI-018

	1	"Halliburton Services, Sales & Service Catalog No. 43," Halliburton Co., 1985 (202 pages)	☐
	2	"Alpha Oil Tools Catalog," Alpha Oil Tools, 1997 (136 pages)	☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13194871
	Filing Date	2011-07-29
	First Named Inventor	W. Lynn Frazier
	Art Unit	
	Examiner Name	
	Attorney Docket Number	MOTI-018

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Robb D. Edmonds/	Date (YYYY-MM-DD)	2011-08-01
Name/Print	Robb D. Edmonds	Registration Number	46681

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	10641757
Application Number:	13194871
International Application Number:	
Confirmation Number:	1776
Title of Invention:	BOTTOM SET DOWNHOLE PLUG
First Named Inventor/Applicant Name:	W. Lynn Frazier
Customer Number:	60935
Filer:	Robb D. Edmonds/Stacy Lanier
Filer Authorized By:	Robb D. Edmonds
Attorney Docket Number:	MOTI-018
Receipt Date:	01-AUG-2011
Filing Date:	
Time Stamp:	17:23:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	MOTI_018_2nd_Supp_IDS.pdf	114802 a9edef6ff0cb1e6c992575a62d1aa8c87107caf8	no	2

Warnings:	
Information:	

2	Information Disclosure Statement (IDS) Form (SB08)	MOTI_018_PTO_1449_08012011.pdf	612234 f75b6fbaca980b2e24285c6f31a63e393065aa91	no	4
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Information:					
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Warnings:					
Information:					
6	Non Patent Literature	913996v1_Halliburton_43_pt3.pdf	6881557 74be809a8c5f57806e1c64093bbcec732db1f304	no	50
Warnings:					
Information:					
7	Non Patent Literature	913996v1_Halliburton_43_pt4.pdf	6753280 50e840825dd08c1f645864263e0126172c03a88f	no	52
Warnings:					
Information:					
			Total Files Size (in bytes):	41747705	

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant: W. Lynn Frazier	§	Conf. No.:	1776
	§		
Filed: July 29, 2011	§	Art Unit:	Not Yet Assigned
	§		
Serial No.: 13/194,871	§	Examiner:	Not Yet Assigned
	§		
For: Bottom Set Downhole Plug	§	Docket No.:	MOTI-018
	§		
	§	Customer No.:	60935

Commissioner for Patents
Mail Stop Amendment
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF SECOND SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Dear Examiner:

Applicant submits herewith a Second Supplemental Information Disclosure Statement ("SIDS") for the above-referenced patent application for accelerated examination. The SIDS includes references that are related to the subject matter of the claims but not deemed most closely related to the subject matter of the claims. The references in the SIDS are made of record only in the interest of complete and full disclosure.

Conclusion

Applicant respectfully requests the examiner to accept and consider the SIDS during the accelerated examination of the application. Further, Applicant submits that the application is in condition for allowance, and respectfully requests that the examiner allow the claims of the application to issue in a U.S. patent.

Respectfully submitted,

/Robb D. Edmonds/

Robb D. Edmonds
Registration No. 46,681

Dated: August 1, 2011

EDMONDS & NOLTE, PC
16815 Westheimer Road
Suite 130
Houston, Texas 77058
Office: 281-480-2700
Fax: 281-480-2701

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant: W. Lynn Frazier	§	Conf. No.:	Not Yet Assigned
	§		
Filed: Concurrently Herewith	§	Art Unit:	Not Yet Assigned
	§		
Serial No.: Not Yet Assigned	§	Examiner:	Not Yet Assigned
	§		
For: Bottom Set Downhole Plug	§	Docket No.:	MOTI-018
	§		
	§	Customer No.:	60935

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ACCELERATED EXAMINATION SUPPORT DOCUMENT

Dear Examiner:

This accelerated examination support document is provided in support of the Petition to Make the Application Special for Accelerated Examination filed herewith.

TABLE OF CONTENTS

I. Applicant's Pending Claims

There are 20 claims currently pending in the application. The pending claims read as follows:

1. A plug for isolating a wellbore, comprising:

a body having a first end and a second end, wherein the body is formed from one or more composite materials;

at least one malleable element disposed about the body;

at least one slip disposed about the body;

at least one conical member disposed about the body; and

one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof, wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof, and wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and adapted to release the setting tool when exposed to a predetermined stress.

2. The plug of claim 1, wherein the shearable threads are composite and the predetermined stress sufficient to deform the shearable threads to release the setting tool is less than a stress sufficient to break the body.

3. The plug of claim 1, wherein the body is adapted to receive an impediment that restricts fluid flow in at least one direction through the body.

4. The plug of claim 3, wherein the impediment is a ball.

5. The plug of claim 3, wherein the impediment is a flapper valve disposed within the body, wherein the flapper valve is adapted to restrict fluid flow in at least one direction through the body.

6. The plug of claim 3, wherein the impediment is degradable at a predetermined temperature, pressure, pH, or a combination thereof.

7. The plug of claim 1, wherein the first end of the body comprises an anti-rotation feature formed thereon.

8. The plug of claim 1, wherein the second end of the body comprises an anti-rotation feature disposed thereon.

9. The plug of claim 1, wherein the first and second ends of the body each comprises an anti-rotation feature disposed thereon, and the anti-rotation features are adapted to engage each other when two tools are located in series, preventing relative rotation therebetween.

10. The plug of claim 1, wherein the plug is a frac plug.

11. The plug of claim 10, wherein each anti-rotation feature is individually selected from the group consisting of a taper, a mule shoe, a half-mule shoe, flat protrusions or flats, flats and slots, clutches, and one or more angled surfaces.

12. A plug for isolating a wellbore, comprising:

a body having a first end and a second end, wherein the body is formed from one or more composite materials;

at least one malleable element disposed about the body;

at least one slip disposed about the body;

at least one conical member disposed about the body; and

a brass insert screwed into the body proximate the second end of the body and adapted to receive a setting tool that enters the body through the first end thereof, wherein:

the insert comprises one or more shearable threads disposed on an inner surface thereof;

the one or more shearable threads are adapted to engage the setting tool; and

the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined stress.

13. The plug of claim 12, wherein the outer surface of the brass insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the brass insert within the body.

14. The plug of claim 12, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween.

15. The plug of claim 12, wherein the body is adapted to receive a ball that restricts fluid flow in at least one direction through the body.

16. The plug of claim 12, wherein the predetermined stress to release the setting tool is less than a stress required to break the body.

17. The plug of claim 12, wherein the plug is a frac plug.

18. A shearable insert for a plug, comprising:

a body comprising brass, cast iron, or a combination thereof;

one or more threads disposed on an outer surface of the body, the one or more threads adapted to couple with one or more threads of the plug; and

one or more shearable threads disposed on an inner surface of the body, the shearable threads adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined stress.

19. The insert of claim 18, wherein the outer surface of the body comprises a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the body within the plug.

20. The insert of claim 18, wherein the body is made of brass, and the plug is a frac plug.

II. 9(A) References Deemed Most Closely Related

An Information Disclosure Statement ("IDS") in compliance with 37 C.F.R. § 1.98 is being filed herewith citing each of the following references deemed most closely related to the subject matter of the claims:

A.	U.S. Patent No. 4,437,516	Cockrell ("*Cockrell*")
B.	U.S. Patent No. 5,224,540	Streich et al. ("*Streich*")
C.	U.S. Patent No. 2,714,932	Thompson ("*Thompson*")

A Supplemental Information Disclosure Statement ("SIDS") is also being filed herewith citing references that are related to the subject matter of the claims, but not deemed most closely related to the subject matter of the claims.

III. 9(B) Identification of Limitations Disclosed by the Cited References

A. *Cockrell* (U.S. Patent No. 4,437,516)

Pending Claim Limitation	**Reference to *Cockrell***
1. A plug for isolating a wellbore, comprising:	Col. 1, Lines 15 – 18
a body having a first end and a second end,	Col. 3, Lines 37 – 40
wherein the body is formed from one or more composite materials;	Not disclosed
at least one malleable element disposed about the body;	Not disclosed, *but see* Col. 3, Line 65 – Col. 4, Line 3
at least one slip disposed about the body;	Not disclosed, *but see* Col. 4, Lines 4 – 24
at least one conical member disposed about the body; and	Not disclosed, *but see* Col. 4, Lines 25 – 31
one or more shearable threads disposed on an inner surface of the body,	Not disclosed, *but see* Col. 5, Lines 52 – 58
adjacent the second end thereof,	Not disclosed
wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof, and wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and	Not disclosed
adapted to release the setting tool when exposed to a predetermined stress.	Not disclosed, *but see* Col. 5, Line 52 – Col. 6, Line 8
2. The plug of claim 1, wherein the shearable threads are composite	Not disclosed

and the predetermined stress sufficient to deform the shearable threads to release the setting tool is less than a stress sufficient to break the body.	Not disclosed, *but see* Col. 5, Line 52 – Col. 6, Line 16
3. The plug of claim 1, wherein the body is adapted to receive an impediment that restricts fluid flow in at least one direction through the body.	Not disclosed
4. The plug of claim 3, wherein the impediment is a ball.	Not disclosed
5. The plug of claim 3, wherein the impediment is a flapper valve disposed within the body, wherein the flapper valve is adapted to restrict fluid flow in at least one direction through the body.	Not disclosed
6. The plug of claim 3, wherein the impediment is degradable at a predetermined temperature, pressure, pH, or a combination thereof.	Not disclosed
7. The plug of claim 1, wherein the first end of the body comprises an anti-rotation feature formed thereon.	Not disclosed
8. The plug of claim 1, wherein the second end of the body comprises an anti-rotation feature disposed thereon.	Not disclosed
9. The plug of claim 1, wherein the first and second ends of the body each comprises an anti-rotation feature disposed thereon, and the anti-rotation features are adapted to engage each other when two	Not disclosed

plugs are located in series, preventing relative rotation therebetween.	
10. The plug of claim 1, wherein the plug is a frac plug.	Not disclosed
11. The plug of claim 10, wherein each anti-rotation feature is individually selected from the group consisting of a taper, a mule shoe, a half-mule shoe, flat protrusions or flats, flats and slots, clutches, and one or more angled surfaces.	Not disclosed
12. A plug for isolating a wellbore, comprising: a body having a first end and a second end,	Col. 1, Lines 15 – 18 Col. 3, Lines 37 – 40
wherein the body is formed from one or more composite materials;	Not disclosed
at least one malleable element disposed about the body;	Not disclosed, *but see* Col. 3, Line 65 – Col. 4, Line 3
at least one slip disposed about the body;	Not disclosed, *but see* Col. 4, Lines 4 – 24
at least one conical member disposed about the body; and	Not disclosed, *but see* Col. 4, Lines 25 – 31
a brass insert	Not disclosed
screwed into the body proximate the second end of the body	Not disclosed
and adapted to receive a setting tool	Not disclosed, *but see* Col. 5, Line 52 – Col. 6, Line 8
that enters the body through the first end thereof,	Not disclosed

wherein the insert comprises one or more shearable threads disposed on an inner surface thereof;	Not disclosed, *but see* Col. 5, Lines 52 – 58
the one or more shearable threads are adapted to engage the setting tool; and	Not disclosed, *but see* Col. 5, Line 52 – Col. 6, Line 8
the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined stress.	Not disclosed, *but see* Col. 5, Line 52 – Col. 6, Line 8
13. The plug of claim 12, wherein the outer surface of the brass insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the brass insert within the body.	Not disclosed
14. The plug of claim 12, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween.	Not disclosed
15. The plug of claim 12, wherein the body is adapted to receive a ball that restricts fluid flow in at least one direction through the body.	Not disclosed

16. The plug of claim 12, wherein the predetermined stress to release the setting tool is less than a stress required to break the body.	Not disclosed, *but see* Col. 5, Line 52 – Col. 6, Line 8
17. The plug of claim 12, wherein the plug is a frac plug.	Not disclosed
18. A shearable insert for a plug, comprising: a body comprising brass, cast iron, or a combination thereof;	Not disclosed
one or more threads disposed on an outer surface of the body, the one or more threads adapted to couple with one or more threads of the plug; and	Not disclosed, *but see* Col. 5, Lines 40 – 51
one or more shearable threads disposed on an inner surface of the body,	Not disclosed, *but see* Col. 5, Lines 52 – 58
the shearable threads adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined stress.	Not disclosed, *but see* Col. 5, Line 52 – Col. 6, Line 8
19. The insert of claim 18, wherein the outer surface of the body comprises a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the body within the plug.	Not disclosed
20. The insert of claim 18, wherein the body is made of brass, and the plug is a frac plug.	Not disclosed

B. *Streich* (U.S. Patent No. 5,224,540)

Pending Claim Limitation	**Reference to *Streich***
1. A plug for isolating a wellbore, comprising:	Col. 1, Lines 21 – 31
a body having a first end and a second end,	Col. 3, Lines 22 – 51
wherein the body is formed from one or more composite materials;	Not disclosed, *but see* Col. 7, Lines 25 – 37
at least one malleable element disposed about the body;	Col. 3, Lines 22 – 51
at least one slip disposed about the body;	Col. 3, Lines 22 – 51
at least one conical member disposed about the body; and	Col. 3, Lines 22 – 51
one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof,	Not disclosed
wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof, and wherein the one or more shearable threads are adapted to engage the setting tool	Not disclosed
when disposed through the body	Not disclosed
and adapted to release the setting tool when exposed to a predetermined stress.	Not disclosed, *but see* Col. 15, Lines 1 – 3

2. The plug of claim 1, wherein the shearable threads are composite and the predetermined stress sufficient to deform the shearable threads to release the setting tool is less than a stress sufficient to break the body.	Not disclosed
3. The plug of claim 1, wherein the body is adapted to receive an impediment that restricts fluid flow in at least one direction through the body.	Not disclosed, *but see* Figure 6B
4. The plug of claim 3, wherein the impediment is a ball.	Not disclosed, *but see* Col. 13, Lines 53 – 55 Figure 6B
5. The plug of claim 3, wherein the impediment is a flapper valve disposed within the body, wherein the flapper valve is adapted to restrict fluid flow in at least one direction through the body.	Not disclosed
6. The plug of claim 3, wherein the impediment is degradable at a predetermined temperature, pressure, pH, or a combination thereof.	Not disclosed
7. The plug of claim 1, wherein the first end of the body comprises an anti-rotation feature formed thereon.	Not disclosed
8. The plug of claim 1, wherein the second end of the body comprises an anti-rotation feature disposed thereon.	Not disclosed

9. The plug of claim 1, wherein the first and second ends of the body each comprises an anti-rotation feature disposed thereon, and the anti-rotation features are adapted to engage each other when two tools are located in series, preventing relative rotation therebetween.	Not disclosed
10. The plug of claim 1, wherein the plug is a frac plug.	Not disclosed
11. The plug of claim 10, wherein each anti-rotation feature is individually selected from the group consisting of a taper, a mule shoe, a half-mule shoe, flat protrusions or flats, flats and slots, clutches, and one or more angled surfaces.	Not disclosed
12. A plug for isolating a wellbore, comprising: a body having a first end and a second end,	Col. 1, Lines 21 – 31
wherein the body is formed from one or more composite materials;	Col. 2, Lines 53 – 62 Col. 7, Lines 25 – 37
at least one malleable element disposed about the body;	Col. 3, Lines 22 – 51
at least one slip disposed about the body;	Col. 3, Lines 22 – 51
at least one conical member disposed about the body; and	Col. 3, Lines 22 – 51
a brass insert	Not disclosed
screwed into the body proximate the second end of the body	Not disclosed

and adapted to receive a setting tool that enters the body through the first end thereof,	Not disclosed, *but see* Col. 6, Lines 12 – 15
wherein the insert comprises one or more shearable threads disposed on an inner surface thereof;	Not disclosed
the one or more shearable threads are adapted to engage the setting tool; and	Not disclosed
the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined stress.	Not disclosed
13. The plug of claim 12, wherein the outer surface of the brass insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the brass insert within the body.	Not disclosed
14. The plug of claim 12, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween.	Not disclosed
15. The plug of claim 12, wherein the body is adapted to receive a ball that restricts fluid flow in at least one direction through the body.	Not disclosed, *but see* Col. 13, Lines 53 – 55 Figure 6B

16. The plug of claim 12, wherein the predetermined stress to release the setting tool is less than a stress required to break the body.	Not disclosed
17. The plug of claim 12, wherein the plug is a frac plug.	Not disclosed
18. A shearable insert for a plug, comprising: a body comprising brass, cast iron, or a combination thereof;	Not disclosed
one or more threads disposed on an outer surface of the body, the one or more threads adapted to couple with one or more threads of the plug; and	Not disclosed
one or more shearable threads disposed on an inner surface of the body,	Not disclosed
the shearable threads adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined stress.	Not disclosed
19. The insert of claim 18, wherein the outer surface of the body comprises a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the body within the plug.	Not disclosed
20. The insert of claim 18, wherein the body is made of brass, and the plug is a frac plug.	Not disclosed

C. *Thompson* (U.S. Patent No. 2,714,932)

Pending Claim Limitation	**Reference to *Thompson***
1. A plug for isolating a wellbore, comprising:	Col. 1, Lines 17 – 20
a body having a first end and a second end,	Col. 2, Lines 30 – 37
wherein the body is formed from one or more composite materials;	Not disclosed
at least one malleable element disposed about the body;	Not disclosed, *but see* Col. 4, Lines 35 – 39
at least one slip disposed about the body;	Not disclosed, *but see* Col. 3, Lines 25 – 35
at least one conical member disposed about the body; and	Not disclosed, *but see* Col. 3, Lines 25 – 35
one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof,	Not disclosed
wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof,	Not disclosed, *but see* Figure 1
and wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and adapted to release the setting tool when exposed to a predetermined stress.	Not disclosed

2. The plug of claim 1, wherein the shearable threads are composite and the predetermined stress sufficient to deform the shearable threads to release the setting tool is less than a stress sufficient to break the body.	Not disclosed
3. The plug of claim 1, wherein the body is adapted to receive an impediment that restricts fluid flow in at least one direction through the body.	Not disclosed
4. The plug of claim 3, wherein the impediment is a ball.	Not disclosed
5. The plug of claim 3, wherein the impediment is a flapper valve disposed within the body, wherein the flapper valve is adapted to restrict fluid flow in at least one direction through the body.	Not disclosed
6. The plug of claim 3, wherein the impediment is degradable at a predetermined temperature, pressure, pH, or a combination thereof.	Not disclosed
7. The plug of claim 1, wherein the first end of the body comprises an anti-rotation feature formed thereon.	Not disclosed
8. The plug of claim 1, wherein the second end of the body comprises an anti-rotation feature disposed thereon.	Not disclosed, *but see* Figures 1 and 2

9. The plug of claim 1, wherein the first and second ends of the body each comprises an anti-rotation feature disposed thereon, and the anti-rotation features are adapted to engage each other when two tools are located in series, preventing relative rotation therebetween.	Not disclosed
10. The plug of claim 1, wherein the plug is a frac plug.	Not disclosed
11. The plug of claim 10, wherein each anti-rotation feature is individually selected from the group consisting of a taper, a mule shoe, a half-mule shoe, flat protrusions or flats, flats and slots, clutches, and one or more angled surfaces.	Not disclosed, *but see* Figures 1 and 2
12. A plug for isolating a wellbore, comprising: a body having a first end and a second end,	Col. 1, Lines 17 – 20 Col. 2, Lines 30 – 37
wherein the body is formed from one or more composite materials;	Not disclosed
at least one malleable element disposed about the body;	Not disclosed, *but see* Col. 4, Lines 35 – 39
at least one slip disposed about the body;	Not disclosed, *but see* Col. 3, Lines 25 – 35
at least one conical member disposed about the body; and	Not disclosed, *but see* Col. 3, Lines 25 – 35
a brass insert	Not disclosed

screwed into the body proximate the second end of the body and adapted to receive a setting tool that enters the body through the first end thereof,	Not disclosed, *but see* Col. 2, Lines 52 – 56
wherein the insert comprises one or more shearable threads disposed on an inner surface thereof;	Not disclosed
the one or more shearable threads are adapted to engage the setting tool; and	Not disclosed
the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined stress.	Not disclosed
13. The plug of claim 12, wherein the outer surface of the brass insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the brass insert within the body.	Not disclosed
14. The plug of claim 12, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween.	Not disclosed

15. The plug of claim 12, wherein the body is adapted to receive a ball that restricts fluid flow in at least one direction through the body.	Not disclosed
16. The plug of claim 12, wherein the predetermined stress to release the setting tool is less than a stress required to break the body.	Not disclosed
17. The plug of claim 12, wherein the plug is a frac plug.	Not disclosed
18. A shearable insert for a plug, comprising: a body comprising brass, cast iron, or a combination thereof;	Not disclosed
one or more threads disposed on an outer surface of the body, the one or more threads adapted to couple with one or more threads of the plug; and	Not disclosed, *but see* Col. 2, Lines 52 – 56
one or more shearable threads disposed on an inner surface of the body,	Not disclosed
the shearable threads adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined stress.	Not disclosed, *but see* Col. 2, Lines 52 – 56
19. The insert of claim 18, wherein the outer surface of the body comprises a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the body within the plug.	Not disclosed

20. The insert of claim 18, wherein the body is made of brass, and the plug is a frac plug.	Not disclosed

IV. 9(C) Detailed Explanation of Patentability

All pending claims are patentable over the prior art references cited above for at least the following reasons:

A. Claims 1 – 11 in view of *Cockrell*

At the very least, Cockrell (U.S. Patent No. 4,437,516; herein "*Cockrell*") fails to disclose or make obvious a plug comprising a body "formed from one or more composite materials" and "one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof, wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof, and wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and adapted to release the setting tool when exposed to a predetermined stress," as required by claims 1-11. A more detailed analysis of claims 1-11 follows.

1. Independent Claim 1

Cockrell discloses a releasable packer comprising a body/mandrel 12 having a first end and a second end, at least one malleable element 28 disposed about the body, at least one slip 40 disposed about the body, and at least one conical member 36, 44 disposed about the body. Col. 1, Lines 15 – 18; Col. 3, Lines 37 – Col. 4, Line 31. A cylindrical sleeve/frangible member 146 that has internal shearable threads 140 is screwed onto the outer diameter of the body/mandrel 12. Col. 5, Line 40 to Col. 5, Line 60. The body/mandrel 12 is lifted or rotated to disengage the shearable threads on the release member 146 to release the packer from its set position. *See, e.g.* Abstract. Furthermore, the "[r]elease member 136 is fabricated from a suitable frangible material such as mild steel having a known shear strength…, [wherein] it is possible to determine the axial force necessary to effect shearing of the threads 140 to permit relative upward

movement of the mandrel 12 with respect to the [nut] member 126 when the latter is engaged with the head 56 through the resilient collar 116." Col. 5, Lines 52 – 60.

Cockrell does not, however, teach, show, or suggest a plug comprising a body "formed from one or more composite materials, as required in every claim. *Cockrell* does not, however, teach, show, or suggest a plug comprising one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof, wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof, and wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and adapted to release the setting tool when exposed to a predetermined stress, as required by claim 1. Therefore, *Cockrell* fails to disclose or make obvious each and every element recited in claim 1.

2. Dependent Claim 2

Dependent claim 2 includes all of the limitations of claim 1, and is allowable for at least the same reasons. Furthermore, *Cockrell*, at the very least, does not disclose or make obvious "wherein the shearable threads are composite," as recited in dependent claim 2.

3. Dependent Claim 3

Dependent claim 3 includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Cockrell* also does not disclose or make obvious "the plug of claim 1, wherein the body is adapted to receive an impediment that restricts fluid flow in at least one direction through the body," as recited in dependent claim 3.

4. Dependent Claim 4

Dependent claim 4 includes all of the limitations of claim 3, which includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Cockrell* also does not disclose or make obvious "the plug of claim 3, wherein the impediment is a ball," as recited in dependent claim 4.

5. Dependent Claim 5

Dependent claim 5 includes all of the limitations of claim 3, which includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Cockrell* also does not

disclose or make obvious "the plug of claim 3, wherein the impediment is a flapper valve disposed within the body, wherein the flapper valve is adapted to restrict fluid flow in at least one direction through the body," as recited in dependent claim 5.

6. Dependent Claim 6

Dependent claim 6 includes all of the limitations of claim 3, which includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Cockrell* also does not disclose or make obvious "the plug of claim 3, wherein the impediment is degradable at a predetermined temperature, pressure, pH, or a combination thereof," as recited in dependent claim 6.

7. Dependent Claim 7

Dependent claim 7 includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Cockrell* also does not disclose or make obvious "the plug of claim 1, wherein the first end of the body comprises an anti-rotation feature formed thereon," as recited in dependent claim 7.

8. Dependent Claim 8

Dependent claim 8 includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Cockrell* also does not disclose or make obvious "the plug of claim 1, wherein the second end of the body comprises an anti-rotation feature disposed thereon," as recited in dependent claim 8.

9. Dependent Claim 9

Dependent claim 9 includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Cockrell* also does not disclose or make obvious "the plug of claim 1, wherein the first and second ends of the body each comprises an anti-rotation feature disposed thereon, and the anti-rotation features are adapted to engage each other when two tools are located in series, preventing relative rotation therebetween," as recited in dependent claim 9.

10. Dependent Claim 10

Dependent claim 10 includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Cockrell* also does not disclose or make obvious "the plug of claim 1, wherein the plug is a frac plug," as recited in dependent claim 10.

11. Dependent Claim 11

Dependent claim 11 includes all of the limitations of claim 10, which include all of the limitations of claim 1, and is allowable for at least the same reasons. *Cockrell* also does not disclose or make obvious "the plug of claim 10, wherein each anti-rotation feature is individually selected from the group consisting of a taper, a mule shoe, a half-mule shoe, flat protrusions or flats, flats and slots, clutches, and one or more angled surfaces," as recited in dependent claim 11.

B. Claims 12 – 17 in view of *Cockrell*

At the very least, *Cockrell* fails to disclose or make obvious a plug comprising a body formed from one or more composite materials and a brass insert screwed into the body proximate the second end of the body and adapted to receive a setting tool that enters the body through the first end thereof, as required by claims 12-17. A more detailed analysis of claims 12-17 follows.

12. Independent Claim 12

Cockrell discloses a releasable packer comprising a body/mandrel 12 having a first end and a second end, at least one malleable element 28 disposed about the body, at least one slip 40 disposed about the body, and at least one conical member 36, 44 disposed about the body. Col. 1, Lines 15 – 18; Col. 3, Lines 37 – Col. 4, Line 31. A cylindrical sleeve/frangible member 146 that has internal shearable threads 140 is screwed onto the outer diameter of the body/mandrel 12. Col. 5, Line 40 to Col. 5, Line 60. The body/mandrel 12 is lifted or rotated to disengage the shearable threads on the release member 146 to release the packer from its set position. *See, e.g.* Abstract. Furthermore, the "[r]elease member 136 is fabricated from a suitable frangible material such as mild steel having a known shear strength…, [wherein] it is possible to determine the axial force necessary to effect shearing of the threads 140 to permit relative upward

movement of the mandrel 12 with respect to the [nut] member 126 when the latter is engaged with the head 56 through the resilient collar 116." Col. 5, Lines 52 – 60.

Cockrell does not, however, teach, show, or suggest a body formed from one or more composite materials. *Cockrell* also does not, however, teach, show, or suggest a brass insert screwed into the body proximate the second end of the body and adapted to receive a setting tool that enters the body through the first end thereof, as required by claim 12. *Cockrell* further does not, however, teach, show, or suggest shearable threads that are adapted to engage the setting tool. Therefore, *Cockrell* fails to disclose or make obvious each and every element recited in independent claim 12.

13. Dependent Claim 13

Dependent claim 13 includes all of the limitations of claim 12, and is allowable for at least the same reasons. *Cockrell* also does not disclose or make obvious "the plug of claim 12, wherein the outer surface of the brass insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the brass insert within the body," as recited in dependent claim 13.

14. Dependent Claim 14

Dependent claim 14 includes all of the limitations of claim 12, and is allowable for at least the same reasons. *Cockrell* also does not disclose or make obvious "the plug of claim 12, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween," as recited in dependent claim 14.

15. Dependent Claim 15

Dependent claim 15 includes all of the limitations of claim 12, and is allowable for at least the same reasons. *Cockrell* also does not disclose or make obvious "the plug of claim 12, wherein the body is adapted to receive a ball that restricts fluid flow in at least one direction through the body," as recited in dependent claim 15.

16. Dependent Claim 16

Dependent claim 16 includes all of the limitations of claim 12, and is allowable for at least the same reasons.

17. Dependent Claim 17

Dependent claim 17 includes all of the limitations of claim 12 and is allowable for at least the same reasons. *Cockrell* also does not disclose or make obvious "the plug of claim 12, wherein the plug is a frac plug," as recited in dependent claim 17.

C. Claims 18 – 20 in view of *Cockrell*

At the very least, *Cockrell* fails to disclose or make obvious a shearable insert for a plug, comprising a body comprising brass, cast iron, or a combination thereof, as required in claims 18-20. A more detailed analysis of claims 18-20 follows.

18. Independent Claim 18

Cockrell discloses a cylindrical sleeve/frangible member 146 that has internal shearable threads 140 screwed onto the outer diameter of the body/mandrel 12. Col. 5, Line 40 to Col. 5, Line 60. The body/mandrel 12 is lifted or rotated to disengage the shearable threads on the release member 146 to release the packer from its set position. *See, e.g.* Abstract. Furthermore, the "[r]elease member 136 is fabricated from a suitable frangible material such as mild steel having a known shear strength…, [wherein] it is possible to determine the axial force necessary to effect shearing of the threads 140 to permit relative upward movement of the mandrel 12 with respect to the [nut] member 126 when the latter is engaged with the head 56 through the resilient collar 116." Col. 5, Lines 52 – 60.

Cockrell does not, however, teach, show, or suggest a shearable insert for a plug comprising a body comprising brass, cast iron, or a combination thereof. *Cockrell* does not, however, teach, show, or suggest shearable threads [on an inner surface of the body] adapted to couple with one or more threads of a setting tool. Therefore, *Cockrell* fails to disclose or make obvious each and every element recited in independent claim 18.

19. Dependent Claim 19

Dependent claim 19 includes all of the limitations of claim 18, and is allowable for at least the same reasons. *Cockrell* also does not disclose or make obvious "the insert of claim 18, wherein the outer surface of the body comprises a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the body within the plug," as recited in dependent claim 19.

20. Dependent Claim 20

Dependent claim 20 includes all of the limitations of claim 18, and is allowable for at least the same reasons. *Cockrell* also does not disclose or make obvious "the insert of claim 18, wherein the body is made of brass, and the plug is a frac plug," as recited in dependent claim 20.

D. Claims 1 – 11 in view of *Streich*

At the very least, Streich et al. (U.S. Patent No. 5,224,540; hereafter "*Streich*") fails to disclose or make obvious a plug comprising a body that is formed from one or more composite materials, and one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof, wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool engage the setting tool when disposed through the body, as required by claim 1 and those dependent therefrom. A more detailed analysis of claims 1-11 follows.

1. Independent Claim 1

Streich discloses a plug comprising a metallic body/mandrel 22, 102 having a first end and a second end, at least one malleable element 40, 42 disposed about the body, at least one slip disposed about the body 28, 54, and at least one conical member disposed about the body 32, 46, wherein the plug is adapted to release the setting tool when exposed to a predetermined axial force. *See, e.g.* Figure 2; Col. 1, Lines 21 – 31; Col. 2, Lines 12 – 15, 53 – 62; Col. 3, Lines 22 – 51; Col. 7, Lines 25 – 37, Col. 15, Lines 1 – 3. *Streich* further discloses a tension sleeve 62, 174 that has a threaded portion adapted for connection "to a standard setting tool of a kind known in the art." *See, e.g.* Figure 3A; Col. 10, Lines 45 – 48. The tension sleeve is designed to shear or break, releasing the setting tool.

Therefore, *Streich* fails to disclose or make obvious a plug comprising a body that is formed from one or more composite materials, and one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof, wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool engage the setting tool when disposed through the body, as required by claim 1 and those dependent therefrom.

2. Dependent Claim 2

Dependent claim 2 includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Streich* also does not disclose or make obvious "the plug of claim 1, wherein the shearable threads are composite and the predetermined stress sufficient to deform the shearable threads to release the setting tool is less than a stress sufficient to break the body," as recited in dependent claim 2.

3. Dependent Claim 3

Dependent claim 3 includes all of the limitations of claim 1, and is allowable for at least the same reasons.

4. Dependent Claim 4

Dependent claim 4 includes all of the limitations of claim 3, which includes all the limitations of claim 1, and is allowable for at least the same reasons.

5. Dependent Claim 5

Dependent claim 5 includes all of the limitations of claim 3, which includes all the limitations of claim 1, and is allowable for at least the same reasons. *Streich* also does not disclose or make obvious "the plug of claim 3, wherein the impediment is a flapper valve disposed within the body, wherein the flapper valve is adapted to restrict fluid flow in at least one direction through the body," as recited in dependent claim 5.

6. Dependent Claim 6

Dependent claim 6 includes all of the limitations of claim 3, which includes all the limitations of claim 1, and is allowable for at least the same reasons. *Streich* also does not disclose or make obvious "the plug of claim 3, wherein the impediment is degradable at a

predetermined temperature, pressure, pH, or a combination thereof," as recited in dependent claim 6.

7. Dependent Claim 7

Dependent claim 7 includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Streich* also does not disclose or make obvious "the plug of claim 1, wherein the first end of the body comprises an anti-rotation feature formed thereon," as recited in dependent claim 7.

8. Dependent Claim 8

Dependent claim 8 includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Streich* also does not disclose or make obvious "the plug of claim 1, wherein the second end of the body comprises an anti-rotation feature disposed thereon," as recited in dependent claim 8.

9. Dependent Claim 9

Dependent claim 9 includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Streich* also does not disclose or make obvious "the plug of claim 1, wherein the first and second ends of the body each comprises an anti-rotation feature disposed thereon, and the anti-rotation features are adapted to engage each other when two tools are located in series, preventing relative rotation therebetween," as recited in dependent claim 9.

10. Dependent Claim 10

Dependent claim 10 includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Streich* also does not disclose or make obvious "the plug of claim 1, wherein the plug is a frac plug," as recited in dependent claim 10.

11. Dependent Claim 11

Dependent claim 11 includes all of the limitations of claim 10, which includes all the limitations of claim 1, and is allowable for at least the same reasons. *Streich* also does not disclose or make obvious "the plug of claim 10, wherein each anti-rotation feature is individually selected from the group consisting of a taper, a mule shoe, a half-mule shoe, flat protrusions or

flats, flats and slots, clutches, and one or more angled surfaces," as recited in dependent claim 11.

E. Claims 12 – 17 in view of *Streich*

At the very least, *Streich* fails to disclose or make obvious a body comprising a brass insert screwed into the body proximate the second end of the body, wherein the insert comprises one or more shearable threads disposed on an inner surface thereof that are adapted to engage the setting tool, and deform to release the setting tool when exposed to a predetermined axial force, as required by claim 12 and those dependent therefrom. A more detailed analysis of claims 12-17 follows.

12. Independent Claim 12

Streich discloses a plug comprising a metallic body/mandrel 22, 102 having a first end and a second end, at least one malleable element 40, 42 disposed about the body, at least one slip disposed about the body 28, 54, and at least one conical member disposed about the body 32, 46, wherein the plug is adapted to release the setting tool when exposed to a predetermined axial force. *See, e.g.* Figure 2; Col. 1, Lines 21 – 31; Col. 2, Lines 12 – 15, 53 – 62; Col. 3, Lines 22 – 51; Col. 7, Lines 25 – 37, Col. 15, Lines 1 – 3. *Streich* further discloses a tension sleeve 62, 174 that has a threaded portion adapted for connection "to a standard setting tool of a kind known in the art." *See, e.g.* Figure 3A; Col. 10, Lines 45 – 48. The tension sleeve is designed to shear or break, releasing the setting tool.

Therefore, *Streich* fails to disclose or make obvious a body comprising a brass insert screwed into the body proximate the second end of the body, wherein the insert comprises one or more shearable threads disposed on an inner surface thereof that are adapted to engage the setting tool, and deform to release the setting tool when exposed to a predetermined axial force, as required by claim 12 and those dependent therefrom.

13. Dependent Claim 13

Dependent claim 13 includes all of the limitations of claim 12, and is allowable for at least the same reasons. *Streich* also does not disclose or make obvious "the plug of claim 12,

wherein the outer surface of the brass insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the brass insert within the body," as recited in dependent claim 13.

14. Dependent Claim 14

Dependent claim 14 includes all of the limitations of claim 12, and is allowable for at least the same reasons. *Streich* also does not disclose or make obvious "the plug of claim 12, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween," as recited in dependent claim 14.

15. Dependent Claim 15

Dependent claim 15 includes all of the limitations of claim 12, and is allowable for at least the same reasons.

16. Dependent Claim 16

Dependent claim 16 includes all of the limitations of claim 12, and is allowable for at least the same reasons. *Streich* also does not disclose or make obvious "the plug of claim 12, wherein the predetermined stress to release the setting tool is less than a stress required to break the body," as recited in dependent claim 16.

17. Dependent Claim 17

Dependent claim 17 includes all of the limitations of claim 12 and is allowable for at least the same reasons. *Streich* also does not disclose or make obvious "the plug of claim 12, wherein the plug is a frac plug," as recited in dependent claim 17.

F. Claims 18 – 20 in view of *Streich*

At the very least, *Streich* fails to disclose or make obvious a shearable insert for a plug comprising a body comprising brass, cast iron, or a combination thereof, one or more threads disposed on an outer surface of the body that are adapted to couple with one or more threads of the plug, and one or more shearable threads disposed on an inner surface of the body that are adapted to couple with one or more threads of a setting tool and release the setting tool when

exposed to a predetermined axial force, as required by claim 18 and those dependent therefrom. A more detailed analysis of claims 18-20 follows.

18. Independent Claim 18

Streich discloses none of the limitations of independent claim 18. As noted previously, *Streich* discloses a plug comprising a metallic body/mandrel 22, 102 having a first end and a second end, at least one malleable element 40, 42 disposed about the body, at least one slip disposed about the body 28, 54, and at least one conical member disposed about the body 32, 46, wherein the plug is adapted to release the setting tool when exposed to a predetermined axial force. *See, e.g.* Figure 2; Col. 1, Lines 21 – 31; Col. 2, Lines 12 – 15, 53 – 62; Col. 3, Lines 22 – 51; Col. 7, Lines 25 – 37, Col. 15, Lines 1 – 3. *Streich* further discloses a tension sleeve 62, 174 that has a threaded portion adapted for connection "to a standard setting tool of a kind known in the art." *See, e.g.* Figure 3A; Col. 10, Lines 45 – 48. The tension sleeve is designed to shear or break, releasing the setting tool.

Streich fails to disclose or make obvious, however, a shearable insert for a plug. *Streich* also fails to disclose or make obvious a shearable insert having a body comprising brass, cast iron, or a combination thereof. *Streich* also fails to disclose or make obvious a shearable insert with one or more threads disposed on an outer surface of the body that are adapted to couple with one or more threads of the plug, and one or more shearable threads disposed on an inner surface of the body that are adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial force, as required by claim 18.

19. Dependent Claim 19

Dependent claim 19 includes all of the limitations of claim 18, and is allowable for at least the same reasons. *Streich* also does not disclose or make obvious "the insert of claim 18, wherein the outer surface of the body comprises a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the body within the plug," as recited in dependent claim 19.

20. Dependent Claim 20

Dependent claim 20 includes all of the limitations of claim 18, and is allowable for at least the same reasons. *Streich* also does not disclose or make obvious "the insert of claim 18, wherein the body is made of brass, and the plug is a frac plug," as recited in dependent claim 20.

G. Claims 1 – 11 in view of *Thompson*

At the very least, Thompson (U.S. Patent No. 2,714,932; hereafter "*Thompson*") fails to disclose or make obvious a body formed from one or more composite materials, and one or more shearable threads disposed on an inner surface of the body, wherein the one or more shearable threads are adapted to release the setting tool when exposed to a predetermined stress, as required by claim 1 and those dependent therefrom. A more detailed analysis of claims 1-11 follows.

1. Independent Claim 1

Thompson discloses a metallic plug for isolating a wellbore, comprising a body 10 having a first end and a second end adapted to receive a setting tool through the first end thereof, comprising at least one malleable element 30 disposed about the body, at least one slip 32 disposed about the body, and at least one conical member 33 disposed about the body 10. *See, e.g.* Fig. 1; Col. 1, Lines 17 – 20; Col. 2, Lines 30 – 37, 47 – 56; Col. 3, Lines 25 – 35; Col. 4, Lines 35 – 39. *Thompson* further discloses that the plug engages a setting tool when disposed through the body via an actuating stud 23. Col. 2, Lines 43-66. The stud 23 has upper threads 24 that engage a central actuating rod 26 of a setting tool, and lower threads 25 to engage a shank 15. *Id.* at lines 52-56. A shear groove 27 is located between the threads 24, 25 on the stud 23. *Id.* at line 58. The stud 23 fractures or fails at the groove 27 at a predetermined maximum tension, thereby freeing the actuating rod 26 from the shank 15 and permitting withdrawal of the setting tool and the upper portion of the stud after the plug is set. *Id.* at lines 60-66.

Thompson does not, however, teach, show, or suggest a body formed from one or more composite materials. *Thompson* also does not teach, show, or suggest one or more shearable threads disposed on an inner surface of the body that are adapted to engage a setting tool and adapted to release the setting tool when exposed to a predetermined stress, as required by claim

1. Therefore, *Thompson* fails to disclose or make obvious each and every element recited in independent claim 1.

2. Dependent Claim 2

Dependent claim 2 includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Thompson* also does not disclose or make obvious "the plug of claim 1, wherein the shearable threads are composite and the predetermined stress sufficient to deform the shearable threads to release the setting tool is less than a stress sufficient to break the body," as recited in dependent claim 2.

3. Dependent Claim 3

Dependent claim 3 includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Thompson* also does not disclose or make obvious "the plug of claim 1, wherein the body is adapted to receive an impediment that restricts fluid flow in at least one direction through the body," as recited in dependent claim 3.

4. Dependent Claim 4

Dependent claim 4 includes all of the limitations of claim 3, which includes all the limitations of claim 1, and is allowable for at least the same reasons. *Thompson* also does not disclose or make obvious "the plug of claim 3, wherein the impediment is a ball," as recited in dependent claim 4.

5. Dependent Claim 5

Dependent claim 5 includes all of the limitations of claim 3, which includes all the limitations of claim 1, and is allowable for at least the same reasons. *Thompson* also does not disclose or make obvious "the plug of claim 3, wherein the impediment is a flapper valve disposed within the body, wherein the flapper valve is adapted to restrict fluid flow in at least one direction through the body," as recited in dependent claim 5.

6. Dependent Claim 6

Dependent claim 6 includes all of the limitations of claim 3, which includes all the limitations of claim 1, and is allowable for at least the same reasons. *Thompson* also does not disclose or make obvious "the plug of claim 3, wherein the impediment is degradable at a

predetermined temperature, pressure, pH, or a combination thereof," as recited in dependent claim 6.

7. Dependent Claim 7

Dependent claim 7 includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Thompson* also does not disclose or make obvious "the plug of claim 1, wherein the first end of the body comprises an anti-rotation feature formed thereon," as recited in dependent claim 7.

8. Dependent Claim 8

Dependent claim 8 includes all of the limitations of claim 1, and is allowable for at least the same reasons.

9. Dependent Claim 9

Dependent claim 9 includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Thompson* also does not disclose or make obvious "the plug of claim 1, wherein the first and second ends of the body each comprises an anti-rotation feature disposed thereon, and the anti-rotation features are adapted to engage each other when two tools are located in series, preventing relative rotation therebetween," as recited in dependent claim 9.

10. Dependent Claim 10

Dependent claim 10 includes all of the limitations of claim 1, and is allowable for at least the same reasons. *Thompson* also does not disclose or make obvious "the plug of claim 1, wherein the plug is a frac plug," as recited in dependent claim 10.

11. Dependent Claim 11

Dependent claim 11 includes all of the limitations of claim 10, and is allowable for at least the same reasons.

H. Claims 12 – 17 in view of *Thompson*

At the very least, *Thompson* fails to disclose or make obvious a body formed from one or more composite materials and a brass insert adapted to receive a setting tool that enters the body

through the first end thereof, wherein the insert comprises one or more shearable threads disposed on an inner surface thereof that are adapted to engage the setting tool, and deform to release the setting tool when exposed to a predetermined axial force, as required by claim 12 and those dependent therefrom. A more detailed analysis of claims 12-17 follows.

12. Independent Claim 12

Thompson discloses a metallic plug for isolating a wellbore, comprising a body 10 having a first end and a second end adapted to receive a setting tool through the first end thereof, comprising at least one malleable element 30 disposed about the body, at least one slip 32 disposed about the body, and at least one conical member 33 disposed about the body 10. *See, e.g.* Fig. 1; Col. 1, Lines 17 – 20; Col. 2, Lines 30 – 37, 47 – 56; Col. 3, Lines 25 – 35; Col. 4, Lines 35 – 39. *Thompson* further discloses that the plug engages a setting tool when disposed through the body via an actuating stud 23. Col. 2, Lines 43-66. The stud 23 has upper threads 24 that engage a central actuating rod 26 of a setting tool, and lower threads 25 to engage a shank 15. *Id.* at lines 52-56. A shear groove 27 is located between the threads 24, 25 on the stud 23. *Id.* at line 58. The stud 23 fractures or fails at the groove 27 at a predetermined maximum tension, thereby freeing the actuating rod 26 from the shank 15 and permitting withdrawal of the setting tool and the upper portion of the stud after the plug is set. *Id.* at lines 60-66.

Thompson, however, does not teach, show, or suggest a body formed from one or more composite materials. *Thompson* also does not teach, show, or suggest a brass insert adapted to receive a setting tool that enters the body through the first end thereof. *Thompson* also does not teach, show, or suggest a brass insert that comprises one or more shearable threads disposed on an inner surface thereof that are adapted to engage the setting tool, and deform to release the setting tool when exposed to a predetermined axial force, as required by claim 12.

13. Dependent Claim 13

Dependent claim 13 includes all of the limitations of claim 12, and is allowable for at least the same reasons. *Thompson* also does not disclose or make obvious "the plug of claim 12, wherein the outer surface of the brass insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the brass insert within the body," as recited in dependent claim 13.

14. Dependent Claim 14

Dependent claim 14 includes all of the limitations of claim 12, and is allowable for at least the same reasons. *Thompson* also does not disclose or make obvious "the plug of claim 12, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween," as recited in dependent claim 14.

15. Dependent Claim 15

Dependent claim 15 includes all of the limitations of claim 12, and is allowable for at least the same reasons. *Thompson* also does not disclose or make obvious "the plug of claim 12, wherein the body is adapted to receive a ball that restricts fluid flow in at least one direction through the body," as recited in dependent claim 15.

16. Dependent Claim 16

Dependent claim 16 includes all of the limitations of claim 12, and is allowable for at least the same reasons. *Thompson* also does not disclose or make obvious "the plug of claim 12, wherein the predetermined stress to release the setting tool is less than a stress required to break the body," as recited in dependent claim 16.

17. Dependent Claim 17

Dependent claim 17 includes all of the limitations of claim 12, and is allowable for at least the same reasons. *Thompson* also does not disclose or make obvious "the plug of claim 12, wherein the plug is a frac plug," as recited in dependent claim 17.

I. Claims 18 – 20 in view of *Thompson*

At the very least, *Thompson* fails to disclose or make obvious a shearable insert for a plug that has a body comprising brass, cast iron, or a combination thereof, and one or more shearable threads disposed on an inner surface of the body that are adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial force, as required by claim 18 and those dependent therefrom. A more detailed analysis of claims 18-20 follows.

18. Independent Claim 18

Thompson discloses a metallic plug for isolating a wellbore, comprising a body 10 having a first end and a second end adapted to receive a setting tool through the first end thereof, comprising at least one malleable element 30 disposed about the body, at least one slip 32 disposed about the body, and at least one conical member 33 disposed about the body 10. *See, e.g.* Fig. 1; Col. 1, Lines 17 – 20; Col. 2, Lines 30 – 37, 47 – 56; Col. 3, Lines 25 – 35; Col. 4, Lines 35 – 39. *Thompson* further discloses that the plug engages a setting tool when disposed through the body via an actuating stud 23. Col. 2, Lines 43-66. The stud 23 has upper threads 24 that engage a central actuating rod 26 of a setting tool, and lower threads 25 to engage a shank 15. *Id.* at lines 52-56. A shear groove 27 is located between the threads 24, 25 on the stud 23. *Id.* at line 58. The stud 23 fractures or fails at the groove 27 at a predetermined maximum tension, thereby freeing the actuating rod 26 from the shank 15 and permitting withdrawal of the setting tool and the upper portion of the stud after the plug is set. *Id.* at lines 60-66.

Thompson, however, does not teach, show, or suggest a shearable insert for a plug. *Thompson* also does not teach, show, or suggest a shearable insert that has a body comprising brass, cast iron, or a combination thereof. *Thompson* also does not teach, show, or suggest one or more shearable threads disposed on an inner surface of the body of an insert, wherein the shearable threads are adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial force, as required by claim 18 and those dependent therefrom.

19. Dependent Claim 19

Dependent claim 19 includes all of the limitations of claim 18, and is allowable for at least the same reasons. *Thompson* also does not disclose or make obvious "the insert of claim 18, wherein the outer surface of the body comprises a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the body within the plug," as recited in dependent claim 19.

20. Dependent Claim 20

Dependent claim 20 includes all of the limitations of claim 18, and is allowable for at least the same reasons. *Thompson* also does not disclose or make obvious "the insert of claim

18, wherein the body is made of brass, and the plug is a frac plug," as recited in dependent claim 20.

V. 9(D) Concise Statement of Utility

The claimed invention, relates to a plug for isolating a wellbore. The plug includes a low set shear mechanism that is shearable to release a setting tool when exposed to a predetermined stress.

VI. 9(E) Showing of Support under 35 USC § 112, ¶ 1

The application filed herewith is a continuation-in-part of U.S. Patent Application 2010/0155050 having Serial No. 12/317,497, filed December 23, 2008. The paragraph numbers below correspond to the patent application filed herewith.

Pending Claim Limitation	**Support under 35 USC § 112, ¶ 1**
1. A plug for isolating a wellbore, comprising: a body having a first end and a second end, wherein the body is formed from one or more composite materials	At least the Abstract Paragraphs [0034], [0035], [0056], [0069], [0070], [0071] and [0073] Figures 2A, 2B, 2C, 3A, 3B, 3C and 3D
at least one malleable element disposed about the body;	At least the Abstract Paragraphs [0037], [0040], [0041], and [0054] Figures 2A, 2B, 2C, 3A, 3B, 3C, 3D and 4
at least one slip disposed about the body;	At least the Abstract Paragraphs [0037], [0038], and [0039] Figures 2A, 2B, 2C, 3A, 3B, 3C, 3D and 4
at least one conical member disposed about the body; and	At least the Abstract Paragraph [0037] Figures 2A, 2B, 2C, 3A, 3B, 3C, 3D and 4

one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof, wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and adapted to release the setting tool when exposed to a predetermined axial force.	At least the Abstract Paragraphs [0026], [0027], [0028], [0030], [0032], [0035], [0048], [0049], [0050], [0051], [0055], and [0056] Figure 2C
2. The plug of claim 1, wherein the shearable threads are composite and the predetermined axial force sufficient to deform the shearable threads to release the setting tool is less than an axial force sufficient to break the body.	At least Paragraphs [0048] and [0055]
3. The plug of claim 1, wherein the body is adapted to receive an impediment that restricts fluid flow in at least one direction through the body.	At least the Abstract Paragraphs [0025], [0034], [0036], and [0046] Figures 2A, 2B, 2C, 3A, 3B, 3C and 3D
4. The plug of claim 3, wherein the impediment is a ball.	At least Abstract Paragraphs [0025] and [0034] Figures 1B and 3C
5. The plug of claim 3, wherein the impediment is a flapper valve disposed within the body, wherein the flapper valve is adapted to restrict fluid flow in at least one direction through the body.	At least Paragraphs [0036] and [0046] Figures 2B, 3B, and 3D
6. The plug of claim 3, wherein the impediment is degradable at a predetermined temperature, pressure, pH, or a combination	At least the Abstract Paragraphs [0058], [0059], and [0060]

thereof.	
7. The plug of claim 1, wherein the first end of the body comprises an anti-rotation feature formed thereon.	At least Paragraphs [0043], [0044], [0062], [0063], and [0066] Figures 2A, 2B, 2C, 3A, 3B, 3C and 3D
8. The plug of claim 1, wherein the second end of the body comprises an anti-rotation feature disposed thereon.	At least Paragraphs [0043], [0062], and [0066] Figures 2A, 2B, 2C, 3A, 3B, 3C and 3D
9. The plug of claim 1, wherein the first and second ends of the body each comprises an anti-rotation feature disposed thereon, and the anti-rotation features are complementary and adapted to engage each other when two tools are located in series, preventing relative rotation therebetween.	At least Paragraphs [0043], [0044], [0062], [0063], and [0066] Figures 2A, 2B, 2C, 3A, 3B, 3C and 3D
10. The plug of claim 1, wherein the plug is a frac plug.	At least Paragraphs [0003], and [0023]
11. The plug of claim 10, wherein each anti-rotation feature is individually selected from the group consisting of a taper, a mule shoe, a half-mule shoe, flat protrusions or flats, flats and slots, clutches, and one or more angled surfaces.	At least Paragraphs [0043], [0063], and [0068] Figures 2A, 2B, 2C, 3A, 3B, 3C, 3D, 5, 6, 7 and 8
12. A plug for isolating a wellbore, comprising: a body having a first end and a second end, wherein the body is formed from one or more composite materials;	At least the Abstract Paragraphs [0034], [0035], [0056], [0069], [0070], [0071] and [0073] Figures 2A, 2B, 2C, 3A, 3B, 3C and 3D
at least one malleable element disposed about the body;	At least the Abstract Paragraphs [0037], [0040], [0041], and [0054] Figures 2A, 2B, 2C, 3A, 3B, 3C, 3D and 4

at least one slip disposed about the body;	At least the Abstract Paragraphs [0037], [0038], and [0039] Figures 2A, 2B, 2C, 3A, 3B, 3C, 3D and 4
at least one conical member disposed about the body; and	At least the Abstract Paragraph [0037] Figures 2A, 2B, 2C, 3A, 3B, 3C, 3D and 4
a brass insert screwed into the body proximate the second end of the body and adapted to receive a setting tool that enters the body through the first end thereof, wherein: the insert comprises one or more shearable threads disposed on an inner surface thereof;	At least Paragraphs [0024], [0025], [0026], [0028], [0030], [0032], [0033], [0035], and [0055] Figures 1A, 1B, 2A, 2B, 3A, 3B, 3C and 3D
the one or more shearable threads are adapted to engage the setting tool; and	At least Paragraphs [0024], [0026], and [0027] Figures 1A, 1B, 2A, 2B, 3A, 3B, 3C and 3D
the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined axial force.	At least Paragraphs [0024], [0028], and [0055] Figures 1A, 1B, 2A, 2B, 3A, 3B, 3C and 3D
13. The plug of claim 12, wherein the outer surface of the brass insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the brass insert within the body.	At least Paragraph [0031] Figures 1A, 1B, 2A, 2B, 3A, 3B, 3C and 3D
14. The plug of claim 12, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second	At least Paragraphs [0043], [0044], [0062], [0063], and [0066] Figures 2A, 2B, 2C, 3A, 3B, 3C and 3D

ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween.	
15. The plug of claim 12, wherein the body is adapted to receive a ball that restricts fluid flow in at least one direction through the body.	At least the Abstract Paragraphs [0025], [0034], [0036], [0057], [0058], and [0059] Figures 1B, 2A, 2B, 2C, 3A, 3B, 3C and 3D
16. The plug of claim 12, wherein the predetermined axial force to release the setting tool is less than an axial force required to break the body.	At least Paragraph [0055]
17. The plug of claim 12, wherein the plug is a frac plug.	At least Paragraphs [0003], and [0023]
18. A shearable insert for a plug, comprising: a body comprising brass, cast iron, or a combination thereof;	At least Paragraphs [0024], [0032], and [0033] Figures 1, 1B, 2A, 2B, 3A, 3B, 3C and 3D
one or more threads disposed on an outer surface of the body, the threads adapted to couple with one or more threads of the plug; and	At least Paragraphs [0024], [0034] and [0035] Figures 1A, 1B, 2A, 2B, 3A, 3B, 3C and 3D
one or more shearable threads disposed on an inner surface of the body, the shearable threads adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial force, releasing the tool.	At least Paragraphs [0026], [0027], [0028], and [0035] Figures 1A, 1B, 2A, 2B, 3A, 3B, 3C and 3D
19. The insert of claim 18, wherein the outer surface of the body comprises a larger	At least Paragraph [0031] Figures 1A, 1B, 2A, 2B, 3A, 3B, 3C and 3D

diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the body within the plug.	
20. The insert of claim 18, wherein the body is made of brass, and the plug is a frac plug.	At least Paragraphs [0003], 0023], [0032], and [0033]

VII. 9(F) Showing of Support under 35 USC § 112, ¶ 6

None of the pending claim elements contain any means-plus (or step-plus) function claim elements. Thus, consideration under 35 U.S.C. § 112, ¶ 6 is not invoked.

VIII. 9(G) References Disqualified as Prior Art under 35 U.S.C. § 103(c)

None of the cited references are disqualified as prior art under 35 U.S.C. § 103(c).

IX. Conclusion

In view of this Accelerated Examination Support Document, Applicant respectfully requests that the examiner grant the Petition to Make the Application Special for Accelerated Examination for the above-captioned patent application. Applicant respectfully submits that the pending claims of the above-captioned patent application are in condition for allowance, and respectfully requests allowance of the above-captioned patent application to issue in a U.S. patent.

Respectfully submitted,

Dated: July 29, 2011

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PTO/SB/28 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U. S. DEPARTMENT OF COMMERCE

PETITION TO MAKE SPECIAL UNDER ACCELERATED EXAMINATION PROGRAM

Attorney Docket Number	MOTI-018	First Named Inventor	W. Lynn Frazier
Application Number (if Known)			
Title of Invention	BOTTOM SET DOWNHOLE PLUG		

APPLICANT HEREBY PETITIONS TO MAKE THE ABOVE-IDENTIFIED APPLICATION SPECIAL UNDER THE REVISED ACCELERATED EXAMINATION PROGRAM. See Instruction sheet on page 3.

1. **Claims of the application:**
   a. The application must contain three (3) or fewer independent claims and twenty (20) or fewer total claims. The application may not contain any multiple dependent claims.

   b. **Applicant hereby agrees not to separately argue the patentability of any dependent claim during any appeal** in the application. Specifically, the applicant agrees that the dependent claims will be grouped together with and not argued separately from the independent claim from which they depend in any appeal brief filed in the application (37 CFR 41.37(c)(1)(vii)).

   c. The claims must be directed to **a single invention**.

2. **Interviews:**
   Applicant hereby agrees to have (if requested by examiner):
   a. An interview (including an interview before a first Office action) to discuss the prior art and any potential rejections or objections with the intention of clarifying and possibly resolving all issues with respect to patentability at that time, and

   b. A telephonic interview to make an election without traverse if the Office determines that the claims are not obviously directed to a single invention.

3. **Preexamination Search Statement and Accelerated Examination Support Document:**
   With this petition, applicant is providing: a **preexamination search statement**, in compliance with the requirements set forth in item 8 of the instruction sheet, and an **"accelerated examination support document"** that includes:
   a. An **information disclosure statement** in compliance with 37 CFR 1.98 citing each reference deemed most closely related to the subject matter of each of the claims;

   b. For each reference cited, **an identification of all the limitations of the claims** that are disclosed by the reference specifying where the limitation is disclosed in the cited reference;

   c. A **detailed explanation of how each of the claims are patentable** over the references cited with the particularity required by 37 CFR 1.111(b) and (c);

   d. A concise **statement of the utility** of the invention as defined in each of the independent claims (unless the application is a design application);

   e. An identification of any cited references that may be disqualified as prior art under 35 U.S.C. 103(c) as amended by the CREATE act; and

   f. **A showing of where each limitation of the claims finds support under the first paragraph of 35 U.S.C. 112** in the written description of the specification. If applicable, the showing must also identify: (1) each means- (or step-) plus-function claim element that invokes consideration under 35 U.S.C. 112, ¶6; and (2) the structure, material, or acts that correspond to any means- (or step-) plus-function claim element that invokes consideration under 35 U.S.C. 112, ¶6. If the application claims the benefit of one or more applications under title 35, United St ates Code, the showing must also include where each limitation of the claims finds support under the first paragraph of 35 U.S.C. 112 in each such application in which such support exists.

PTO/SB/28 (07-09)
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U.S. Patent and Trademark Office; U. S. DEPARTMENT OF COMMERCE

PETITION TO MAKE SPECIAL UNDER ACCELERATED EXAMINATION PROGRAM (Continued)

Attorney Docket Number	MOTI-018	First Named Inventor	W. Lynn Frazier

Attachments:

a.		Accelerated Examination Support Document (see item 3 above).
b.		A statement, in compliance with the requirements set forth in item 8 of the instruction sheet, detailing the preexamination search which was conducted.
c.		Information Disclosure Statement.
d.	☒	Other (*e.g.*, a statement that the claimed subject matter is directed to environmental quality, energy, or countering terrorism (37 CFR 1.102(c)(2)). Supplemental Information Disclosure Statement

Fees: The following fees must be filed electronically via EFS or EFS-Web:

a.	The basic filing fee, search fee, examination fee, and application size fee (if required) under 37 CFR 1.16.
b.	Petition fee under 37 CFR 1.17(h) - unless the petition is filed with a showing under 37 CFR 1.102(c)(2).

Signature:

Click Remove if you wish to remove this signatory — Remove

Signature	/Robb D. Edmonds/	Date	2011-07-29
Name (Print/Typed)	Robb D. Edmonds	Registration Number	46681

Click Add if you wish to add additional signatory — Add

Note: *Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.*

PTO/SB/28 (07-09)
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U.S. Patent and Trademark Office; U. S. DEPARTMENT OF COMMERCE

Instruction Sheet Petition to Make Special Under the Accelerated Examination

A grantable petition must meet the following conditions:

1. The petition to make special under the accelerated examination program must be filed with the application and accompanied by the fee set forth in 37 CFR 1.17(h) or a statement that the claimed subject matter is directed to environmental quality, energy, or countering terrorism.

2. The application must be a non-reissue utility or design application filed under 35 U.S.C. 111(a).

3. The application must be **filed electronically** using the Office electronic filing system (EFS) or EFS-Web.

4. The application must be complete under 37 CFR 1.51 and in condition for examination on filing. For example, the application must be filed together with the basic filing fee, search fee, examination fee, and application size fee (if applicable), and an oath or declaration under 37 CFR 1.63.

5. The application must contain three (3) or fewer independent claims and twenty (20) or fewer total claims. The application may not contain any multiple dependent claims. The petition must include a statement that **applicant will agree not to separately argue the patentability of any dependent claim during any appeal** in the application. Specifically, the applicant is agreeing that the dependent claims will be grouped together with and not argued separately from the independent claim from which they depend in any appeal brief filed in the application (37 CFR 41.37(c)(1)(vii)).

6. The claims must be directed to a **single invention**. The petition must include a statement that applicant will agree to have a telephonic interview to make an election without traverse in a telephonic interview if the Office determines that all the claims are not directed to a single invention.

7. The petition must include a statement that **applicant will agree** to have an interview (including an interview before a first Office action) to discuss the prior art and any potential rejections or objections with the intention of clarifying and possibly resolving all issues with respect to patentability at that time.

8. At the time of filing, applicant must provide a statement that a **preexamination search was conducted**, including an identification of the field of search by United States class and subclass and the date of the search, where applicable, and, for database searches, the search logic or chemical structure or sequence used as a query, the name of the file or files searched and the database service, and the date of the search.
   a. This preexamination search must involve U.S. patents and patent application publications, foreign patent documents, and nonpatent literature, unless the applicant can justify with reasonable certainty that no references more pertinent than those already identified are likely to be found in the eliminated source and includes such a justification with this statement.
   b. This preexamination search must be directed to the claimed invention and encompass all of the features of the independent claims, giving the claims the broadest reasonable interpretation.
   c. The preexamination search must also encompass the disclosed features that may be claimed, in that an amendment to the claims (including any new claim) that is not encompassed by the preexamination search will be treated as non-responsive and will not be entered.
   d. A search report from a foreign patent office will not be accepted unless the search report satisfies the requirements set forth above.
   e. Any statement in support of a petition to make special must be based on a good faith belief that the preexamination search was conducted in compliance with these requirement. See 37 CFR 1.56 and 10.18.

9. At the time of filing, applicant must provide in support of the petition an **accelerated examination support document that includes:**
   a. An **information disclosure statement** in compliance with 37 CFR 1.98 citing each reference deemed most closely related to the subject matter of each of the claims;
   b. For each reference cited, **an identification of all the limitations of the claims** that are disclosed by the reference specifying where the limitation is disclosed in the cited reference;
   c. A **detailed explanation of how each of the claims are patentable** over the references cited with the particularity required by 37 CFR 1.111(b) and (c);
   d. A concise **statement of the utility** of the invention as defined in each of the independent claims (unless the application is a design application);
   e. An identification of any cited references that may be disqualified as prior art under 35 U.S.C. 103(c) as am ende d by the CREATE act; and
   f. A **showing of where each limitation of the claims finds support under the first paragraph of 35 U.S.C. 112** in the written description of the specification. If applicable, the showing must also identify: (1) each means- (or step-) plus-function claim element that invokes consideration under 35 U.S.C. 112, ¶6; and (2) the structure, material, or acts that correspond to any means- (or step-) plus-function claim element that invokes consideration under 35 U.S.C. 112, ¶6. If the application claims the benefit of one or more applications under title 35, United States Code, the showing must also include where each limitation of the claims finds support under the first paragraph of 35 U.S.C. 112 in each such application in which such support exists.
   For more information, see notice "Changes to Practice for Petitions in Patent Applications to Make Special and for Accelerated Examination" available on the USPTO web site at http://www.uspto.gov/web/office s/pac/dapp/ogsheet.html

MEGCO Ex. 1002

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Fr eedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about indivi duals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant: W. Lynn Frazier	§	Conf. No.:	Not Yet Assigned
	§		
Filed:	§	Art Unit:	Not Yet Assigned
	§		
Serial No.: Not Yet Assigned	§	Examiner:	Not Yet Assigned
	§		
For: Bottom Set Downhole Plug	§	Docket No.:	MOTI-018
	§		
	§	Customer No.:	60935

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRE-EXAMINATION SEARCH STATEMENT

Dear Examiner:

This pre-examination search statement is provided in support of the Petition to Make Special for Accelerated Examination filed herewith.

I. 8 (A) Pre-examination Search

A pre-examination search was conducted involving U.S. patents and patent application publications, foreign patent documents, and non-patent literature as indicated below.

A. Fields of Search

1. U.S. Class(es)/Subclass(es) Searched

137/15.24, 15.26, 15.18, 508

166/85.3, 97.1, 102 123, 124, 125, 181, 182, 188, 192, 193, 194, 239, 242.6, 316, 317, 318, 327, 328, 332.3, 332.5, 332.8, 376, 377, 378, 386, 387;

175/218, 234, 237, 243, 317, 318

2. IPC Class(es)/Subclass(es) Searched

E21B 33/04, 12, 16, 129;
E21B 25/00

B. Date of Searches:

May 15-17, 2011

C. Databases Searched and Search Logic:

1. Database Service: LexisNexis TotalPatent

Files Searched

Full Text: US, EP, WO, JP, DE, FR, GB, AT, AU, BE, BR, CA, CH, CN, DD, DK, ES, FI, IE, IT, LU, MC, NL, PT, RU, SE, SU

Bibliographic Only: AP, AR, BA, BG, BN, BO, CL, CO, CR, CS, CU, CY, CZ, DO, DZ, EA, EC, EE, EG, GC, GR, GT, HK, HN, HR, HU, ID, IL, IN, KE, KR, LB, LT, LV, MA, MD, MN, MT, MW, MX, MY, NI, NO, NZ, OA, PA, PE, PH, PL, PY, RO, SG, SI, SK, SV, TH, TJ, TR, TT, TW, UA, UY, UZ, VE, VN, YU, ZA, ZM, ZW

Search Logic

L1 TITLE-ABST-CLAIM(((insert! or body!) w/8 thread! and (groov! or recess! or indent! or line or thread!) w/10 (shear! or break! or detach! or frang!) and (zinc or zn) and (copper or cu)))

L2 TITLE-ABST-CLAIM(((insert! or body!) w/8 thread! and (groov! or recess! or indent! or line or thread!) w/10 (shear! or break! or detach! or frang!)))

L3 TITLE-ABST-CLAIM((brass w/10 (insert! or body! or mandrel) w/8 thread! and (groov! or recess! or indent! or line or thread!) w/10 (shear! or break! or detach! or frang!)))

L4 (brass w/10 (insert! or body! or mandrel or bore!) w/12 thread! and (groov! or recess! or indent! or line or thread!) w/10 (shear! or break! or detach! or frang!)) and US-MAIN(166#! or 175#!)

L5 ((zinc or zn or copper or cu or brass) and (insert! or body!) w/8 thread! and (groov! or recess! or indent! or line or thread!) w/10 (shear! or break! or detach! or frang!)) and US-MAIN(166#188 or 166#373 or 166#142 or 166#151 or 166#192 or 166#325 or 166#332#1 or 166#332#3 or 166#179 or 166#380 or 166#387 or 166#381 or 166#386 or 166#316 or 166#192 or 166#193 or 166#332.1 or 166#332.3 or 166#332.5 or 166#332.8 or 166#239 or 166#102 or 175#218 or 175#234 or 175# 237 or 175#243 or 175#317 or 175#318))

L6 (brass and (insert! or body! or mandrel or bore!) w/12 thread! and (groov! or recess! or indent! or line or thread! or ring) w/10 (shear! or break! or detach! or frang!)) and US-MAIN(166#! or 175#!)

L7 TITLE-ABST-CLAIM(((insert! or body! or mandrel or bore!) w/12 thread! w/10 (shear! or break! or detach! or frang!) and brass))

L8 (downhole or "down hole" or wellbore or "well bore" or borehole or "bore hole" or wellhole or "well hole" or "bore well" or borewell) and thread! w/10 insert and (tool or body or mandrel or string) w/10 (element or cone or slip or ring or shoe) and thread! w/10 (shear! or break! or detach! or frang!)

L9 (downhole or "down hole" or wellbore or "well bore" or borehole or "bore hole" or wellhole or "well hole" or "bore well" or borewell) and (tool or body or mandrel or string) w/10 (element or cone or slip or ring or shoe) and ((insert or plug) w/8 thread!) w/10 (shear! or break! or frang!)

L10 ((tool or body or mandrel or string) w/10 (element or cone or slip or ring or shoe) and ((insert or plug) w/6 thread!) w/10 (shear! or break! or frang!)) and US-MAIN(166#! or 175#!)

L11 (((insert or plug) w/6 thread!) w/10 (shear! or break! or frang!) and flap! and ball) and US-MAIN(166#! or 175#!)

L12 ((plug! or stop!) w/6 thread! and flap!) and US-MAIN((166#193 or 166#239 or 166#318 or 175#237))

L13 (plug w/6 thread! and flap! and ball) and US-MAIN(166#! or 175#!)

L14 ((plug w/6 thread!) and flap!) and US-MAIN(166#328)

L15 ((plug w/6 thread!) w/12 (bottom! or end or second!) and flap! and ball)

L16 ((plug w/6 thread!) w/12 (bottom! or end or second!) and flap! w/8 valve and ball w/8 seat)

L17 (ring or detent! or thread!) w/10 (shear! or break! or frang! or releas! or deform!) and US-MAIN(166#! or 175#!)

L18 (thread! w/10 (shear! or break! or frang!)) w/12 (body or insert! or string!) and US-MAIN(166#! Or 175#!)

L19 ((plug w/6 thread!) w/12 (shear! or break! or frang!)) and US-MAIN(166#! or 175#!)

L20 ((bottom or end or tip) w/10 (plug w/6 thread!) w/12 (shear! or break! or frang! or releas! or deform!)) and US-MAIN(166#! or 175#!)

L21 ((bottom or end or tip) w/10 (plug w/6 thread!) w/12 (shear! or break! or frang! or releas! or deform!)) and US-MAIN(166#123 or 166#124 or 166#125 or 166#181 or 166#182 or 166#242.6 or 166#377 or 166#387)

L22 ((plug or insert) w/6 thread!) w/12 (shear! or break! or frang! or releas! or deform!)) and US-MAIN(166#123 or 166#124 or 166#125 or 166#181 or 166#182 or 166#242.6 or 166#377 or 166#387)

L23 (ring or detent! or thread!) w/10 (shear! or break! or frang! or releas! or deform!) and US-MAIN(166#123 or 166#124 or 166#125 or 166#181 or 166#182 or 166#242.6 or 166#377 or 166#387)

2. Database Service: Dialog

Files Searched

Ei Compendex+Fluid Power Net+FLUIDEX (Fluid Engineering Abstracts)+Gale Group New Product Announcements/Plus (NPA/Plus)+Gale Group PROMT+Gale Group Trade & Industry DatabaseTM+ICONDA - International Construction Database+JICST-EPlus - Japanese Science & Technology+NTIS: National Technical Information Service+PASCAL+TEME - Technology and Management+Wilson Applied Science & Technology Abstracts+CA SEARCH: Chemical Abstracts+CAOLD (Pre-1967 Chemical Abstracts File)+CAplus+GeoArchive+GEOBASETM+GeoRef+IBM Technical Disclosure Bulletin+Knovel+Oil & Gas Journal+TULSATM (PETROLEUM ABSTRACTS)

Search Logic

D1 (downhole or "down hole" or wellbore or "well bore" or borehole or "bore hole" or wellhole or "well hole" or "bore well" or borewell) AND (ball or plug? or stop? or flap?) 6w thread? AND (groov? or recess? or indent? or line) 10W (shear? or break? or detach? or frang?)

D2 (downhole or "down hole" or wellbore or "well bore" or borehole or "bore hole" or wellhole or "well hole" or "bore well" or borewell) AND ball AND flap? AND (plug? or stop?) 6w thread? and (shear? or break? or detach? or frang?)

D3 (downhole or "down hole" or wellbore or "well bore" or borehole or "bore hole" or wellhole or "well hole" or "bore well" or borewell) AND (bottom? or lower or second?) 8w (plug? or stop?) 8w (thread?)

3. Database Service: Google

File Searched

Google Scholar (Non Patent Literature)

Search Logic

G1 (downhole OR "down hole" OR wellbore OR "well bore" OR borehole OR "bore hole" OR wellhole OR "well hole" OR "bore well" OR borewell) (insert OR sleeve OR string OR subassembly OR "sub-assembly")

G2 allintitle: (downhole OR "down hole" OR wellbore OR "well bore" OR borehole OR "bore hole" OR wellhole OR "well hole" OR "bore well" OR borewell)(valve OR valves)

G3 (downhole OR "down hole" OR wellbore OR "well bore" OR borehole OR "bore hole" OR wellhole OR "well hole" OR "bore well" OR borewell)(valve OR valves)

G4 allintitle: (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string" OR bore)(valve OR valves OR valving OR ball OR flap OR flapper)

G5 (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string" OR bore)(valve OR valves OR valving OR ball OR flap OR flapper)

G6 (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string" OR bore)(valve OR valves OR valving OR ball OR seal)

G7 allintitle: (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string" OR bore)(valve OR valves OR valving OR ball OR seal)

G8 allintitle: (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string")(valve OR valves OR valving OR ball OR seal OR flap)

G9 allintitle: (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string" OR bore)(flap OR ball)

G10 (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string" OR bore)(flap OR flapper)(ball OR "ball valve")

G11 (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string" OR bore)(plug OR stopper)(bottom OR secondary OR lower)

G12 allintitle: (wellbore OR "well bore" OR borehole OR "bore hole" OR "bore well" OR borewell OR "drill string" OR bore)(plug OR stopper)(bottom OR secondary OR lower)

II. 8(B) Search Directed to the Invention

The pre-examination search was directed to the claimed invention, encompassing all the features of the independent claims, giving the claims their broadest reasonable interpretation.

III. 8(C) Search Directed to the Disclosure

The pre-examination search encompasses the disclosed features that may be claimed. No disclosed features that are unclaimed at this time are currently seen as features that may be claimed later.

IV. 8(D) Search Report from a Foreign Patent Office

No search report from a foreign patent office is provided here as the pre-examination search.

V. 8(E) Statement of Good Faith

All statements above in support of the petition to make special are based on a good faith belief that the search was conducted in compliance with the requirements of this rule.

Respectfully submitted,

Dated: July 29, 2011

/Robb D. Edmonds/

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Attorney for Applicant
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PATENT SPECIFICATION

DRAWINGS ATTACHED

Inventor: CHARLES TERRY WARDMAN

914,030

Date of filing Complete Specification Jan. 9, 1959.

Application Date Oct. 9, 1957. *No. 31519/57.*

Complete Specification Published Dec. 28, 1962.

Index at acceptance:—Classes 7(5), B2F5C2B; and 7(3), B2G(1A2:1G), B2J(1B7:15R2:15B1).

International Classification:—F02d. F02f.

COMPLETE SPECIFICATION

Improvements in or relating to Fuel Atomisers for Internal Combustion Engines

We, KIGASS LIMITED, a British Company, of 31, Regent Grove, Leamington Spa, Warwickshire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention has reference to atomisers of the kind adapted to be fitted in the induction manifolds of internal combustion engines so that atomised liquid fuel may be directed into the said manifolds to facilitate the starting of the engines from cold.

Whilst the atomisers are emminently satisfactory insofar as their intended useful purpose is concerned, the fitting of same gives rise to the disadvantage that, since the interior of the manifold of an internal combustion engine is at less than atmospheric pressure when the engine is running, and particularly when the engine is running at low speed with the fuel control throttle nearly closed, there is a tendency for the liquid fuel to be drawn through any atomiser fitted to the manifold, into the interior of the said manifold. To obviate this disadvantage, it has been proposed to provide some form of cut-off valve in the fuel supply system to the atomiser: thus, for example, it has been proposed to instal a non-return valve in the priming pump whereby the liquid fuel is adapted to be withdrawn from a tank or other source of supply and then fed to the atomiser under pressure, or alternatively, and when the said pump is of the manually-reciprocable plunger type, to make provision for screwing down the plunger in the pump cylinder after the engine has started, so as positively to close the fuel discharge outlet of the said pump. Again, such proposals have had eminently satisfactory results in that they have enabled the above-mentioned disadvantage to be overcome; on the other hand, the necessity to provide such means external to the atomisers for preventing liquid fuel being drawn through the atomisers by the creation of low pressure conditions, has increased initial installation costs and/or has complicated the construction and increased the costs of manufacturing, the priming pumps.

The principal object of the present invention is to provide an improved atomiser which enables the above-mentioned disadvantages to be overcome in a simple and economical manner and, at the same time, disposes of the necessity of installing a special valve in the priming pump or elsewhere in the supply pipe between a source of liquid fuel supply and an atomiser.

In accordance with the present invention, an atomiser of the kind referred to comprises an axially bored and substantially cylindrical body of which one end has a concentric fuel-atmosing discharge orifice and is threaded externally so that it is adapted to be screw connected into a tapped hole in a wall of the induction manifold of an internal combustion engine whereas, at the opposite end of the body, the bore is tapped so that a fuel supply pipe is adapted to be screw-connected therein and, between the said body ends, an axially bored seat of a non-return ball valve is secured within the body bore, the ball of the valve being urged on to the periphery of the seat bore by a partially compressed spring of which the opposite ends impinge respectively upon the ball of the valve and upon means secured within the body bore adjacent to the discharge orifice for imparting a swirling movement to liquid fuel pumped into the tapped end of the body bore and, after raising the ball from the valve seat against the action

of the spring, flowing through the said seat, swirling means and discharge orifice.

In order that the invention may be more readily understood and carried into practice, reference will now be made to the accompanying drawing in which Figures 1—3 are, respectively, sectional elevations of three alternative atomiser constructions.

The atomiser shown in Figure 1 comprises a body 1 which is substantially cylindrical in external configuration, is formed externally thereof and at a predetermined position along its length, with a hexagonal or equivalent shoulder 2, and is screw threaded from the shoulder to the fuel discharge end 3 so that, by engaging the shoulder with a spanner or equivalent tool, the said end may be screw connected into a tapped hole in the wall of the induction manifold of an internal combustion engine into which atomised liquid fuel is to be sprayed.

To enable the opposite and inlet end 4 of the body to be screw connected to the threaded end of a supply pipe (not shown) through which the liquid fuel is adapted to be fed under pressure from a pump, the body has a blind axial bore 5 which opens to the said inlet end and is tapped from the vicinity of the said end to, or to the vicinity of, the shoulder 2.

At the discharge end 3 of the body, the bore 5 tapers inwardly to the periphery of an atomising discharge orifice 6 formed in and concentrically of the said end.

A cylindrical valve seat 7 which is a press fit within the untapped portion of the said body bore, extends from the base of the tapered end of the said bore into overlapping relationship with the tapped bore portion; the seat has an axial bore comprising three contiguous portions 8, 9 and 10 which are of successively greater diameters from the supply to the discharge end of the body. An inverted cup 11 is accommodated and makes a pressure fit within the largest portion 10 of the seat bore, the external surface of the crown of the cup being located flush with the rim of the seat end adjacent the orifice 6, and the external periphery of the said cup having formed therein, a spiral duct 12 which extends from the crown to the mouth of the cup.

One end coil of a partially compressed coil spring 13 impinges upon the internal surface of the crown of the cup, whereas the opposite end coil of the said spring impinges upon a ball 14 which is accommodated freely within the intermediate portion 9 of the seat bore and is urged by the spring into closing abutment with the periphery of the adjacent and flared end 15 of the smallest diameter portion 8 of the said bore.

Hence, when liquid fuel is fed to the atomiser from the pump through the supply pipe connected into the inlet end of the atomiser body, the ball is forced away from the flared bore-portion end 15 against the action of the spring, whereupon the liquid flows to and along the spiral groove 12 so that a swirling movement is imparted thereto, and is then discharged from the atomiser through the orifice 6. Immediately the pump ceases to feed the liquid, the spring returns the ball onto the said flared bore-portion end so that, even if the external pressure at the discharge orifice is reduced below atomspheric pressure, the seated ball prevents further liquid from being drawn from the supply pipe, to and through the said orifice.

Alternatively and if so desired, the bore of the body 1 may consist of three contiguous portions 16, 17 and 18 (see Figures 2 and 3) which are of successively smaller diameters from the inlet end 4 to the discharge end 3, and the seat may consist of a plug 19 having an axial bore 20 of which the end adjacent the said discharging end of the body is flared outwardly at 21, the said plug being accommodated within the intermediate body bore portion 17 and the flared end of the plug bore being closed (except when liquid fuel is being pumped through the supply pipe) by the spring-loaded ball 14.

As shown in Figure 2, the plug may be a pressure fit within the body bore portion 17 and a portion of the plug bore adjacent the liquid inlet end of the body may be tapped so that, if and when desired, the plug may be withdrawn from the body by engaging a threaded extractor with the said tapped plug bore portion. Alternatively and as shown in Figure 3, the intermediate portion 17 of the body bore may be tapped, the plug may be threaded and screw-engaged with the said tapped bore portion, and the end of the plug adjacent the liquid inlet end of the body may have a diametrical slot 22 adapted to be engaged by the blade of a screwdriver to enable the plug to be assembled in and dismantled from the body.

Instead of forming the body with a blind axial bore and an atomising discharge orifice and providing a peripherally-grooved cup in the said bore, as shown in Figure 1, the body bore may open both to the liquid inlet and discharge ends of the body and a separate assembly adapted to impart a swirling movement to, and then to atomise the fuel, may be mounted within the discharge end of the bore. For example, as shown in Figures 2 and 3, an assembly comprising a disc 23 which is formed with a central fuel-atomising discharge orifice 24 and spans the mouth of a swirl chamber 25 in another and centrally dished disc 26 having one or more inlet ducts 27 which open tangentially or substantially tangentially into the said chamber and establish communication between the swirl chamber and the body bore, may be

mounted within the liquid discharge end of the body.

The said separate assembly may be fixed permanently (see Figure 2) in and across the discharge end of the body bore, by seating the periphery of the dished disc 26 upon an internal annular shoulder 28 in the bore and peening the rim of the body on to the external marginal zone of the outer surface of the orifice disc 23. Alternatively, and as shown in Figure 3, the peripheries of the orifice and dished discs may be trapped between an internal peripheral shoulder 30 in the discharge end of the bore and one end of a lining sleeve 20 which is trapped between the dished disc and the plug 19, so that, after the plug has been removed from the body, the said assembly may also be removed for servicing or replacement.

WHAT WE CLAIM IS:—

1. An atomiser of the kind referred to, comprising an axially bored and substantially cylindrical body of which one end has a concentric fuel-atomising discharge nozzle and is threaded externally so that it is adapted to be screw connected into a tapped hole in a wall of the induction manifold of an internal combustion engine whereas, at the opposite end of the body, the bore is tapped so that a fuel supply pipe is adapted to be screw-connected therein, and between the said ends, an axially bored seat of a non-return ball valve is secured within the body bore, the ball of the valve being urged on to the periphery of the seat bore by a partially compressed coil spring of which the opposite ends impinge respectively upon the ball of the valve and upon means for imparting a swirling movement to liquid fuel pumped into the tapped end of the body bore and, after raising the ball from the valve seat, flowing through the said seat, swirling means and discharge orifice.

2. An atomiser as claimed in Claim 1, wherein the seat of the ball valve is removeable from the body bore.

3. An atomiser as claimed in Claim 2, wherein the swirling means is also removeable from the body bore subsequently to the removal of the valve seat.

4. An atomiser as claimed in Claim 1, wherein the valve seat is a pressure fit within the body bore.

5. An atomiser as claimed in Claim 2 wherein the valve seat is screw threaded and makes screw engagement with a tapped portion of the body bore.

6. An atomiser as claimed in Claim 4, wherein the valve seat bore is tapped so that it is engageable by a threaded extractor whereby the said seat may be removed from the body.

7. An atomiser substantially as herein described with reference to Figure 1 or Figure 2 or Figure 3 of the accompanying drawing.

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Chartered Patent Agents,
Ocean Chambers, 44, Waterloo Street,
Birmingham, 2,
Agents for the Applicants.

Leamington Spa: Printed for Her Majesty's Stationery Office by the Courier Press.—1962.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained.

914030 COMPLETE SPECIFICATION

1 SHEET *This drawing is a reproduction of the Original on a reduced scale*

FIG.1.

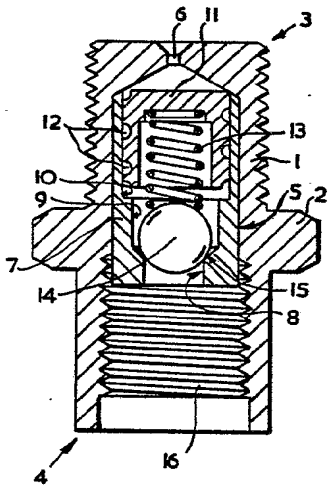


FIG.2.

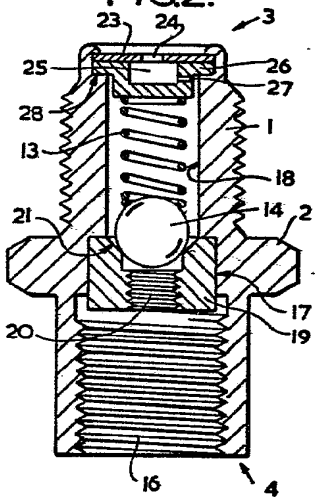
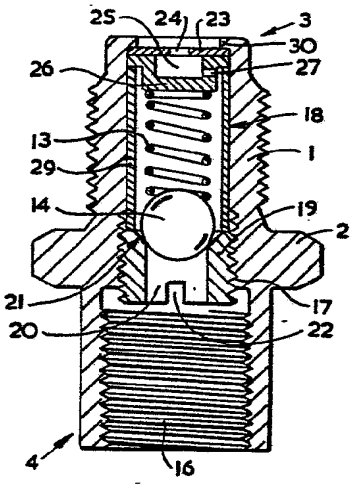


FIG.3.



(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
11 November 2010 (11.11.2010)

PCT

(10) International Publication Number
WO 2010/127457 A1

(51) International Patent Classification:
E21B 33/124 (2006.01) *E21B 34/14* (2006.01)

(21) International Application Number:
PCT/CA2010/000727

(22) International Filing Date:
7 May 2010 (07.05.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/176,334 7 May 2009 (07.05.2009) US
61/326,776 22 April 2010 (22.04.2010) US

(71) Applicant *(for all designated States except US)*: **PACKERS PLUS ENERGY SERVICES INC.** [CA/CA]; 900, 407 - 2nd Street SW, Calgary, Alberta T2P 2Y3 (CA).

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(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, 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, RO, RS, RU, 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.

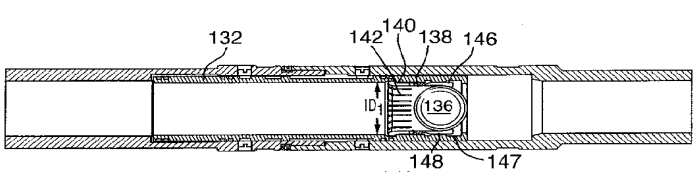
(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, 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))*

(54) Title: SLIDING SLEEVE SUB AND METHOD AND APPARATUS FOR WELLBORE FLUID TREATMENT

FIG. 2A



(57) Abstract: A tubing string assembly is disclosed for fluid treatment of a wellbore The tubing string can be used for staged wellbore fluid treatment where a selected segment of the wellbore is treated, while other segments are sealed off The tubing string can also be used where a ported tubing string is required to be run-m in a pressure tight condition and later is needed to be in an open-port condition A sliding sleeve in a tubular has a driver selected to be acted upon by an inner bore conveyed actuating device, the driver drives the generation of a ball stop on the sleeve.

WO 2010/127457 A1

Sliding Sleeve Sub and Method and Apparatus for Wellbore Fluid Treatment

Priority Application

This application claims priority to US provisional application serial number 61/176,334, filed May 7, 2009.

Field of the Invention

The invention relates to a method and apparatus for wellbore fluid treatment and, in particular, to a method and apparatus for selective communication to a wellbore for fluid treatment.

Background of the Invention

Recently, as described in US Patents 6,907,936 and 7,108,067 to Packers Plus Energy Services Inc., the assignee of the present application, wellbore treatment apparatus have been developed that include a wellbore treatment string for staged well treatment. The wellbore treatment string is useful to create a plurality of isolated zones within a well and includes an openable port system that allows selected access to each such isolated zone. The treatment string includes a tubular string carrying a plurality of packers that can be set in the hole to create isolated zones therebetween about the annulus of the tubing string. Between at least various of the packers, openable ports through the tubing string

are positioned. The ports are selectively openable and include a sleeve thereover with a sealable seat formed in the inner diameter of the sleeve. By launching a ball, the ball can seal against the seat and pressure can be increased behind the ball to drive the sleeve through the tubing string, such driving acting to open the port in one zone. The seat in each sleeve can be formed to accept a ball of a selected diameter but to allow balls of lower diameters to pass.

Unfortunately, limitations with respect to the inner diameter of wellbore tubulars, due to the inner diameter of the well itself, such wellbore treatment system may tend to be limited in the number of zones that may be accessed. For example, if the well diameter dictates that the largest sleeve in a well can at most accept a 3¾" ball, then the well treatment string will generally be limited to approximately 11 sleeves and therefore can treat in only 11 stages.

Summary of the Invention

In one embodiment, there is provided a sliding sleeve sub for installation in a wellbore tubular string, the sliding sleeve sub comprising: a tubular including an inner bore defined by an inner wall; and a sleeve installed in the tubular inner bore and axially slidable therein at least from a first position to a second position, the sleeve including an inner diameter, an outer diameter facing the tubular inner wall, a driver for the sleeve selected to be acted upon by an inner bore conveyed actuating device passing adjacent thereto to drive the generation on the sleeve of a ball stop, the ball stop being formed to retain and hold an inner bore conveyed ball passing along the inner bore and position the inner bore conveyed ball to form a seal against fluid flow therepast.

In one embodiment, there is provided a sliding sleeve sub for installation in a wellbore tubular string, the sliding sleeve sub comprising: a tubular including an inner bore defined by an inner wall; and a sleeve installed in the tubular inner bore and axially slidable therein at least from a first position to a second position, the sleeve including an inner diameter, an outer diameter facing the tubular inner wall, a driver for the sleeve

selected to be acted upon by an inner bore conveyed actuating device passing adjacent thereto to drive the generation of a ball stop on the sleeve, the driver being selected to be acted upon to remain in a passive condition until being actuated to move into an active, ball stop-generating position.

In one embodiment, there is provided a wellbore tubing string apparatus, the apparatus comprising: a tubing string having a long axis and an inner bore; a first sleeve in the tubing string inner bore, the first sleeve being moveable along the inner bore from a first position to a second position; and an actuating device moveable through the inner bore for actuating the first sleeve, as it passes thereby, to form a ball stop on the first sleeve.

In one embodiment, there is provided a wellbore tubing string apparatus, the apparatus comprising: a tubing string having a long axis and an inner bore; a first sleeve in the tubing string inner bore, the first sleeve being moveable along the inner bore from a first position to a second position; a second sleeve, the second sleeve offset from the first sleeve along the long axis of the tubing string, the second sleeve being moveable along the inner bore from a third position to a fourth position; and a sleeve shifting ball for both (i) actuating the first sleeve, as it passes thereby, to form a ball stop on the first sleeve and (ii) for landing in and creating a seal against the second sleeve to permit the second sleeve to be driven by fluid pressure from the third position to the fourth position.

In one embodiment, there is provided a wellbore fluid treatment apparatus, the apparatus comprising a tubing string having a long axis, a first port opened through the wall of the tubing string, a second port opened through the wall of the tubing string, the second port offset from the first port along the long axis of the tubing string, a first packer operable to seal about the tubing string and mounted on the tubing string to act in a position offset from the first port along the long axis of the tubing string, a second packer operable to seal about the tubing string and mounted on the tubing string to act in a position between the first port and the second port along the long axis of the tubing string; a third packer operable to seal about the tubing string and mounted on the tubing string to act in a position offset from the second port along the long axis of the tubing string and on a side

of the second port opposite the second packer; a first sleeve positioned relative to the first port, the first sleeve being moveable relative to the first port between a closed port position and a position permitting fluid flow through the first port from the tubing string inner bore; a second sleeve positioned relative to the second port, the second sleeve being moveable relative to the second port between a closed port position and a position permitting fluid flow through the second port from the tubing string inner bore; and a sleeve shifting device for both (i) actuating the first sleeve, as it passes thereby, to form a ball stop on the first sleeve and (ii) for landing in and creating a seal against the second sleeve to permit the second sleeve to be driven from the closed port position to the position permitting fluid flow.

In view of the foregoing there is provided a method for fluid treatment of a borehole, the method comprising: providing a wellbore tubing string apparatus according to one of the various embodiments of the invention; running the tubing string into a wellbore and to a desired position in the wellbore; conveying an actuating device to actuate the first sleeve and generate thereon a ball stop; conveying a sleeve shifting ball to land on the ball stop and create a fluid seal between the sleeve and the sleeve shifting ball; and increasing fluid pressure in the tubing string above the sleeve shifting ball to move the first sleeve to open a port through which borehole treatment fluid can be introduced to the borehole.

It is to be understood that other aspects of the present invention will become readily apparent to those skilled in the art from the following detailed description, wherein various embodiments of the invention are shown and described by way of illustration. As will be realized, the invention is capable for other and different embodiments and its several details are capable of modification in various other respects, all without departing from the spirit and scope of the present invention. Accordingly the drawings and detailed description are to be regarded as illustrative in nature and not as restrictive.

Brief Description of the Drawings

A further, detailed, description of the invention, briefly described above, will follow by reference to the following drawings of specific embodiments of the invention. These drawings depict only typical embodiments of the invention and are therefore not to be considered limiting of its scope. In the drawings:

Figure 1A is a sectional view through a wellbore having positioned therein a prior art fluid treatment assembly;

Figure 1B is an enlarged view of a portion of the wellbore of Figure 1a with the fluid treatment assembly also shown in section;

Figures 2A to 2D are sequential sectional views through a sleeve valve sub according to an aspect of the present invention;

Figures 2E and 2F are a sectional views through a sleeve valve sub according to an aspect of the present invention;

Figure 3 is a sectional view through another sleeve according to an aspect of the invention;

Figures 3A to 3D are sequential sectional views through another sleeve valve sub according to an aspect of the present invention;

Figure 3E is a plan view of a J keyway slot useful in the invention;

Figure 3F is an isometric view of a sleeve useful in the invention;

Figure 4 is a sectional view through a sleeve valve sub according to an aspect of the present invention;

Figures 5A to 5D are sequential sectional views through another sleeve valve sub according to an aspect of the present invention;

Figure 5 is a sectional view through another sleeve according to an aspect of the invention;

Figure 6A is a sectional view through another sleeve according to an aspect of the invention;

Figure 6B is an isometric view of a split ring assembly useful in the present invention;

Figure 6C is an isometric view of a spring biased detent pin useful in the present invention;

Figure 6D is a sectional view through another sleeve according to an aspect of the invention;

Figure 6E is a sectional view through another sleeve according to an aspect of the invention;

Figure 7 is a sectional view through a wellbore having positioned therein a fluid treatment assembly and showing a method according to the present invention; and

Figures 8A to 8F are a series of schematic sectional views through a wellbore having positioned therein a fluid treatment assembly showing a method according to the present invention.

Detailed Description of Various Embodiments

The description that follows and the embodiments described therein, are provided by way of illustration of an example, or examples, of particular embodiments of the principles of various aspects of the present invention. These examples are provided for the purposes of explanation, and not of limitation, of those principles and of the invention in its various aspects. In the description, similar parts are marked throughout the specification and the drawings with the same respective reference numerals. The drawings are not necessarily

to scale and in some instances proportions may have been exaggerated in order more clearly to depict certain features.

A wellbore sliding sleeve has been invented that is modified by the passage therethrough of a device that configures the sleeve to be driven by a sleeve shifting device while it was not previously configured, such that during the subsequent passage of a sleeve shifting device, the sleeve may be actuated by the sleeve shifting device. The sliding sleeve sub may be employed in a wellbore tubular string. In addition, a method and apparatus has been invented which provides for selective communication to a wellbore for fluid treatment using such a wellbore sliding sleeve. In one aspect of the invention the method and apparatus provide for staged injection of treatment fluids wherein fluid is injected into selected intervals of the wellbore, while other intervals are closed. In another aspect, the method and apparatus provide for the running in of a fluid treatment string, the fluid treatment string having ports substantially closed against the passage of fluid therethrough, but which are each openable by operation of a sliding sleeve when desired to permit fluid flow into the wellbore. The apparatus and methods of the present invention can be used in various borehole conditions including open holes, cased holes, vertical holes, horizontal holes, straight holes or deviated holes.

Referring to Figures 1a and 1b, an example prior art wellbore fluid treatment assembly is shown, which includes sliding sleeves. While other string configurations are available using sliding sleeves in staged arrangements, in the assembly illustrated the sleeves are used to control flow through the string and the string can be used to effect fluid treatment of a formation 10 through a wellbore 12. The wellbore assembly includes a tubing string 14 having a lower end 14a and an upper end extending to surface (not shown). Tubing string 14 includes a plurality of spaced apart ported intervals 16a to 16e each including a plurality of ports 17 opened through the tubing string wall to permit access between the tubing string inner bore 18 and the wellbore. Any number of ports can be used in each interval. Ports can be grouped in one area of an interval or can be spaced apart along the length of the interval.

A packer 20a is mounted between the upper-most ported interval 16a and the surface and further packers 20b to 20e are mounted between each pair of adjacent ported intervals. In the illustrated embodiment, a packer 20f is also mounted below the lower most ported interval 16e and lower end 14a of the tubing string. The packers are disposed about the tubing string and selected to seal the annulus between the tubing string and the wellbore wall, when the assembly is disposed in the wellbore. The packers divide the wellbore into isolated segments wherein fluid can be applied to one segment of the well, but is prevented from passing through the annulus into adjacent segments. As will be appreciated the packers can be spaced in any way relative to the ported intervals to achieve a desired interval length or number of ported intervals per segment. In addition, packer 20f need not be present in some applications.

The packers may take various forms. Those shown are of the solid body-type with at least one extrudable packing element, for example, formed of rubber. Solid body packers including multiple, spaced apart packing elements 21a, 21b on a single packer are particularly useful especially, for example, in open hole (unlined wellbore) operations. In another embodiment, a plurality of packers is positioned in side by side relation on the tubing string, rather than using one packer between each ported interval.

Sliding sleeves 22c to 22e are disposed in the tubing string to control the opening of the ports. In this embodiment, a sliding sleeve is mounted over each ported interval to close them against fluid flow therethrough, but can be moved away from their positions covering the ports to open the ports and allow fluid flow therethrough. In particular, the sliding sleeves are disposed to control the opening of the ported intervals through the tubing string and are each moveable from a closed port position, wherein the sleeve covers its associated ported interval (as shown by sleeves 22c and 22d) to a position away from the ports wherein fluid flow of, for example, stimulation fluid is permitted through ports 17 of the ported interval (as shown by sleeve 22e). In other embodiments, the ports can be closed by other means such as caps or second sleeves and can be opened by the

action of the sliding sleeves 22c to 22e to break open or remove the caps or move the second sleeves.

The assembly is run in and positioned downhole with the sliding sleeves each in their closed port position. The sleeves are moved to their open position when the tubing string is ready for use in fluid treatment of the wellbore. The sleeves for each isolated interval between adjacent packers may be opened individually to permit fluid flow to one wellbore segment at a time, in a staged, concentrated treatment process.

In one embodiment, the sliding sleeves are each moveable remotely from their closed port position to their position permitting through-port fluid flow, for example, without having to run in a line or string for manipulation thereof. In one embodiment, the sliding sleeves are each actuated by a device, such as a ball 24e (as shown), which includes a ball, a dart or other plugging device, which can be conveyed by gravity or fluid flow through the tubing string. The device engages against the sleeve. For example, in this case ball 24e engages against sleeve 22e, and, when pressure is applied through the tubing string inner bore 18 from surface, ball 24e stops in the sleeve and creates a pressure differential above and below the sleeve which drives the sleeve toward the lower pressure side.

In the illustrated embodiment, the inner surface of each sleeve which is open to the inner bore of the tubing string defines a seat 26e onto which an associated plug such as a ball 24e, when launched from surface, can land and seal thereagainst. When the ball seals against the sleeve seat and pressure is applied or increased from surface and a pressure differential is set up which causes the sliding sleeve on which the ball has landed to slide to a port-open position. When the ports of the ported interval 16e are opened, fluid can flow therethrough to the annulus between the tubing string and the wellbore and thereafter into contact with formation 10.

Each of the plurality of sliding sleeves has a different diameter seat and therefore each accept different sized balls. In particular, the lower-most sliding sleeve 22e has the

smallest diameter D1 seat and accepts the smallest sized ball 24e and each sleeve that is progressively closer to surface has a larger seat. For example, as shown in Figure 1b, the sleeve 22c includes a seat 26c having a diameter D3, sleeve 22d includes a seat 26d having a diameter D2, which is less than D3 and sleeve 22e includes a seat 26e having a diameter D1, which is less than D2. This provides that the lowest sleeve can be actuated to open first by first launching the smallest ball 24e, which can pass through all of the seats of the sleeves closer to surface but which will land in and seal against seat 26e of sleeve 22e. Likewise, penultimate sleeve 22d can be actuated to move away from ported interval 16d by launching a ball 24d which is sized to pass through all of the seats closer to surface, including seat 26c, but which will land in and seal against seat 26d.

Lower end 14a of the tubing string can be open, closed or fitted in various ways, depending on the operational characteristics of the tubing string that are desired. In the illustrated embodiment, end 14a includes a pump out plug assembly 28. Pump out plug assembly acts to close off end 14a during run in of the tubing string, to maintain the inner bore of the tubing string relatively clear. However, by application of fluid pressure, for example at a pressure of about 3000 psi, the plug can be blown out to permit actuation of the lower most sleeve 22e by generation of a pressure differential. As will be appreciated, an opening adjacent end 14a is only needed where pressure, as opposed to gravity, is needed to convey the first ball to land in the lower-most sleeve. Alternately, the lower most sleeve can be hydraulically actuated, including a fluid actuated piston secured by shear pins, so that the sleeve can be opened remotely without the need to land a ball or plug therein.

In other embodiments, not shown, end 14a can be left open or can be closed for example by installation of a welded or threaded plug.

Centralizer 29 and/or other standard tubing string attachments can be used, as desired.

In use, the wellbore fluid treatment apparatus, as described with respect to Figures 1A and 1B, can be used in the fluid treatment of a wellbore. For selectively treating

formation 10 through wellbore 12, the above-described assembly is run into the borehole and the packers are set to seal the annulus at each location creating a plurality of isolated annulus zones. Fluids can then pumped down the tubing string and into a selected zone of the annulus, such as by increasing the pressure to pump out plug assembly 28. Alternately, a plurality of open ports or an open end can be provided or lower most sleeve can be hydraulically openable. Once that selected zone is treated, as desired, ball 24e or another sealing plug is launched from surface and conveyed by gravity or fluid pressure to seal against seat 26e of the lower most sliding sleeve 22e, this seals off the tubing string below sleeve 22e and opens ported interval 16e to allow the next annulus zone, the zone between packer 20e and 20f to be treated with fluid. The treating fluids will be diverted through the ports of interval 16e exposed by moving the sliding sleeve and be directed to a specific area of the formation. Ball 24e is sized to pass through all of the seats, including seats 26c, 26d closer to surface without sealing thereagainst. When the fluid treatment through ports 16e is complete, a ball 24d is launched, which is sized to pass through all of the seats, including seat 26c closer to surface, and to seat in and move sleeve 22d. This opens ported interval 16d and permits fluid treatment of the annulus between packers 20d and 20e. This process of launching progressively larger balls or plugs is repeated until all of the zones are treated. The balls can be launched without stopping the flow of treating fluids. After treatment, fluids can be shut in or flowed back immediately. Once fluid pressure is reduced from surface, any balls seated in sleeve 2 seats 26c - e can be unseated by pressure from below to permit fluid flow upwardly therethrough.

The apparatus is particularly useful for stimulation of a formation, using stimulation fluids, such as for example, acid, gelled acid, gelled water, gelled oil, CO_2, nitrogen and/or proppant laden fluids. The apparatus may also be useful to open the tubing string to production fluids.

While the illustrated tubing string includes five ported intervals controlled by sleeves, it is to be understood that the number of ported intervals in these prior art assemblies can be

varied. In a fluid treatment assembly useful for staged fluid treatment, for example, at least two openable ports from the tubing string inner bore to the wellbore must be provided such as at least two ported intervals or an openable end and one ported interval. As the staged sleeve systems become more developed, there is a desire to use greater numbers of sleeves. It has been found, however, that size limitations do tend to limit the number of sleeves that can be installed in any tubular string. For example, in one example ID tubular, using sleeves with a ¼" seat size graduation, balls from 1¼" to 3¾" are reasonable and each size ball can only be used once. This limits the number of sleeves in any tubular for this tubular size to eleven and has a lower region of the tubing string being reduced in ID to form a seat capable of catching a 1¼" ball.

A sleeve according to the present invention may be useful to allow an increased number of sleeves in any tubular string, while maintaining a substantially open inner diameter along a considerable length of the tubing string. For example, using sleeves according to the present invention more than one sleeve can be provided with a similar diameter ball stop. The sleeves however, may be installed in a condition where the ball stop, which may further act as a valve seat, is not exposed but the sleeve can be configurable downhole to have a valve seat formed thereon which is sized to catch and retain sealing devices. Referring to Figures 2A to 2D, a sleeve system is shown including a sliding sleeve 132 that is actuable to be reconfigured from a form not including a sleeve shifting ball stop (Figure 2A) to a form defining a sleeve shifting ball stop 126, which in the illustrated embodiment also acts as a ball seat providing the sealing area against which the ball can act (Figure 2B). In the condition of Figure 2A, prior to a ball stop being formed, a ball, which is to be understood to include sleeve shifting devices such as balls, darts, plugs, etc., may pass therethrough. However, after being actuated to form a ball stop 126, the ball that previously passed through would be caught in the ball stop and create a fluid seal in the sleeve such that a pressure differential can be established thereabout.

The sleeve may be actuated to reconfigure by various means such as by moving an actuator device 136 through the inner bore of the sleeve. The sleeve system may include a mechanical driver driven by the actuator device engaging on the mechanical driver and acting upon it to drive the formation of a valve seat. In another embodiment, the sleeve system may include a non-mechanical driver such as a sensor that is actuated by means other than physical engagement to drive the formation of a valve seat. A sensor may respond to an actuator device such as one emitting radio signals, magnetic forces, etc. Such an actuator device signals the sensor to form a ball stop on the sleeve, as it communicates with the sensor the sleeve. The actuator device may be operated from surface or may be passes through the tubing string to communicate with the sensor.

In one embodiment, for example such as that shown in Figures 2, sleeve 132 may be installed in a tubing section 150 and positioned to be moveable between a position (Figures 2A – 2D) covering and therefore blocking flow through ports 116 through the section wall and a position away from ports such that they are open for fluid flow therethrough (Figure 2D).

Sleeve 132 may include a mechanical driver such as including a collet 138 slidably mounted on sleeve 132 and operating relative to a section 140 of tapering inner diameter of the sleeve. As such collet 138, including fingers 142 can be originally mounted in the sleeve with the fingers having an inner diameter between them of ID_1. However, the relative position of the fingers can be reconfigured by moving the collet along a tapering portion of tapered section 140 to drive collet fingers 142 together and radially inwardly to define an opening through the collet fingers having a second inner diameter ID_2 smaller than the original inner diameter ID_1. When constricted, fingers 142 together form seat 126 defining the inner diameter ID_2.

In such an embodiment, a ball or other sealing device can be used as an actuator to drive the collet, along tapered section 140. For example, the mechanical driver can include a catcher to catch an actuator temporarily to drive movement of the collet. In the illustrated embodiment, actuator ball 136 can be passed through the sleeve and is sized to land in a

catcher 146 (Figure 2A) connected to the collet in order to engage, at least temporarily in the catcher and move the collet. Catcher 146 can include a valve seat sized to catch ball 136 or other sealing device to allow the collet to be moved axially along by, for example, increasing pressure behind the ball while the ball is held in the catcher. Catcher 146 in the illustrated embodiment includes a plurality of collet fingers that are biased and retained inwardly to create the valve seat. The catcher can also act against a tapered or stepped portion such that while the catcher, and in particular the fingers thereof, are initially held against radial expansion by being located in a smaller diameter region 148 in the sleeve (Figure 2A), catcher 146 can expand once the ball moves the catcher fingers over a larger diameter section 147 (Figures 2B and 2C). When in the position where catcher fingers can expand to release the ball (arrow A), the collet fingers have been driven onto tapered section 140 to form seat 126. Collet 138 can be locked in this position so that it cannot advance further nor return to the run in position. For example, collet 138 can include a lock protrusion 149a that lands in a recess 149b in sleeve 132. As such, any force applied to collet 138 can be transmitted to sleeve 132.

Collet 138 can be mounted in sleeve 132 such that when driven into the second configuration, the collet 138 cannot move further such that in this way any further forces against collet are transferred to sleeve 132. For example, collet 138 can include a lock protrusion 159a that lands in a recess 159b in sleeve 132. As such, any force applied to collet 138 can be transmitted to sleeve 132.

After the collet is moved to constrict fingers 142 to form an opening of ID_2, a second ball 154 or plug having a diameter greater than ID_2 can be launched from surface and can land and seal against seat 126 formed at the constricted opening between collet fingers 142. The collet can then be driven along with the sleeve by increasing fluid pressure behind the ball to drive the ball to act against the seat. It will be appreciated that prior to the formation of the opening of ID_2, that same ball would have passed through the sleeve without catching on fingers 142.

The relative ease of movement between collet 138 and sliding sleeve 132 can be selected such that the collet moves preferentially over the movement of the sliding sleeve. For example, shear screws 149 or frictional selections can be used between the sleeve and the tubular 150 in which the sleeve is positioned to ensure that movement of the sleeve is restricted until certain selected pressures are reached.

Movement of sleeve 132 exposes ports 116 such that fluid can be forced out of the tubular above ball 154.

Of course, other types of ball stops and catchers can be employed as desired. For example, in another embodiment as shown in Figures 2E and 2F, another form of catcher is employed in the driver. The catcher in this illustrated embodiment includes a shear out actuation ring 146a secured to collet 138a. The shear out actuation ring is secured to the collet with an interlock suitable to catch an actuator ball 136a (Figure 2E) and move the collet in response to a pressure differential about the ball, but when the collet shoulders against return 147a on sleeve 132a, the interlock will be overcome and actuation ring 146a will be sheared from the collet and expand into a recess 148a to let ball 136a pass and open the bore through the sleeve.

When shear out actuation ring 146a is sheared from the collet and expanded into recess 148a, the collet fingers 126a have been driven onto tapered section 140a to form the sleeve shifting seat into which a sleeve shifting ball 154a can land and seal (Figure 2F). Collet 138a being shouldered against return 147a, directs any force applied thereagainst by ball 154a and fluid pressure to sleeve 132a, which can slide to expose ports 116a.

In one embodiment, the driver may include a device to only drive the formation of a valve seat after a plurality of actuations. For example, in one embodiment, the driver may include a walking J-type controller that is advanced through a plurality of stages prior to actually finally driving configuration of the valve seat. As shown in Figure 3, for example, a sleeve 232 may include a walking J keyway 240 in which the driver 238 is installed by a key 241. Actuators, such as a plurality of balls may be passed by the driver

to each advance it one position through the various positions in keyway 240 before finally allowing the driver to move into a position to form a valve seat. For example, after passing out of the final stage of the keyway, the driver can be allowed to move along a frustoconical interval 250 to constrict into a valve seat that retains a plug of a selected size to create a back pressure to push the sleeve through the tubing string and expose ports 216. In one embodiment, for example as shown, the driver may include a radially compressible and resilient C ring 251 that can be compressed when being forced axially along a tapering diameter of frustoconical surface 250 to form a valve seat, which is ring 251 compressed to reduce its inner diameter. It is noted in this illustrated embodiment that the same structure as a catcher of the driver and as the eventual valve seat, depending on the stage of operation.

In another embodiment, as shown in Figures 3A to 3F, the driver can be secured or formed integral with the sleeve valve 232a such that movement of the sleeve causes formation of the ball stop, which here is embodied as a single valve seat 226. In particular in this illustrated embodiment, sleeve valve 232a includes a walking J keyway 240a on its outer surface in which rides a key 241a that is secured to the sub housing 251a. Actuators, such as a plurality of balls 236 may be passed by the driver to each advance it one position from a first, run in position 1 through the various positions 2, 3 in keyway 240a (Figures 3B and 3C), as assisted by spring 240c, before finally allowing the driver to move into a position 4 to form a valve seat 226 (Figure 3D). For example, when passing into the final position 4 in the keyway, the sleeve is driven to move a compressible seat 226 along a frustoconical interval 250 that compresses the valve seat such that it has a reduced diameter and can retain a sleeve shifting plug 254 of a selected size when it is introduced to the sleeve. When landed in and sealed against seat 226, plug 254 creates a back pressure to push the sleeve through the tubing string and expose ports 216a.

In one embodiment, for example as shown, the driver may include a first deformable ball seat 251 that holds a ball 236 temporarily and for enough time to move the sleeve against

the bias in spring 240c such that the sleeve moves over key 241a from position 2 (Figure 3B) to position 3 (Figure 3C). However, the seat 251 deforms elastically when a certain pressure differential is reached to allow the ball to pass and spring 240c can act again on the sleeve to bias it to the next position 2, until finally it moves into position 4. The number of ball driven positions 3 in keyway slot 240a determine the number of cycles that sleeve moves through before moving into final position 4, when valve seat 226 is formed.

In embodiments where cycling is of interest, indexing keyways may be employed or, alternately, timers or staged locks, such as latches, stepped regions, c-rings, etc., may be used to allow the sleeve to cycle through a number of passive positions before arriving at an active position, wherein a seat forms. Of course, the indexing keyway such as that shown in Figure 3A provides a reliable yet simple solution where the sleeve must pass through a larger number (more than two or three) cycles before arriving at the active state.

The drivers for the seat can be actuated by actuating devices, passing the sleeve either on the way down through the tubular, toward bottom hole, or when the actuating device is being reversed out of the well. Figure 4 shows another possible embodiment that includes a driver that is actuated by an actuating device passing up hole therepast, as when the actuating device is being reversed out of the well. As shown, for example, a sliding sleeve 332 may include a driver that is mechanically driven and includes a plurality of dogs 354 that are initially positioned to allow passage of an actuating device as it passes downhole through the inner diameter 362 of a sub in which the sleeve is installed. However, the dogs are configured such that same device operates to drive the dogs to a second position, forming a valve seat of a selected size when that actuating device is reversed out of the tubular string and moves upwardly past the sleeve. For example, the dogs may be pivotally connected by pins 356 to the sleeve and may be normally capable of pivoting to allow a ball to pass in one direction but may be driven to pivot to, and remain in, a second position when that ball passes upwardly therepast, the

second position forming a valve seat for retaining a second ball when it is launched from surface. The second ball sized to land in and seal against the formed valve seat such that it a pressure differential can be established above and below the second ball to drive the sleeve along its recess 366 in the sub 360 until it lands against wall 364 and in this position exposes ports 316 previously covered by the sleeve.

In another embodiment, rather than being mechanically driven to reconfigure, such as those embodiments described hereinbefore, the driver may be non-mechanically driven as by electric or magnetic signaling to drive formation of a ball stop, such as a valve seat. For example, a device emitting a magnetic force may be dropped or conveyed through the tubing string to actuate the drivers to configure a ball stop on the sleeve or sleeves of interest.

In some embodiments, such as is shown in Figure 3A – 3D, movement of the sleeve valve drives formation of the ball stop. In other embodiments, such as in Figures 2 and 4, the movement of components to form the ball stop may be separate from movement of the sliding sleeve such that the sleeve seals do not have to unseat during formation of the ball stop. Another such embodiment is shown in Figures 5, which shows a multi-acting hydraulic drive system.

The illustrated multi-acting hydraulic drive system of Figures 5A to 5D utilizes a driver that allows a staged formation of a collet ball seat 426 to drive movement of a sleeve 432 to open ports 416. The multi-acting hydraulic drive system is run in initially in the un-shifted position (Figure 5A) with the fracturing port openings 416 in the outer housing 450 of the tubing string segment isolated from the inner bore of the tubing string segment by a wall section of sleeve 432. O-rings 433 are positioned to seal the interface between sleeve 432 and housing 450 on each side of the openings. The inner sleeve is held within the outer housing by shear pins 449 that thread through the external housing and engage a slot 449a machined into the outer surface of the sleeve. The range of travel of the inner sleeve along housing 450 is restricted by torque pins 451.

A driver formed as a second sleeve 438 is held within and pinned to the inner sleeve by shearable pins 459. The second sleeve carries a collet ball seat 426 that is initially has a larger diameter IDL and, downstream thereof, a yieldable ball seat 446 that is a smaller diameter IDS. This configuration allows selection of a ball 436 that can be introduced and pass through the collet ball seat, but land in and be stopped by the yieldable ball seat. When landed (Figure 5B), the ball isolates the upstream tubing pressure from the downstream tubing pressure across seat 446 and if the upstream pressure is increased by surface pumping, the pressure differential across the yieldable seat develops a force that exceeds the resistive shear force of the pins 459 holding the second sleeve within inner sleeve 432. As the second sleeve moves, collet ball seat 426 then travels a short distance within the inner sleeve and moves into an area of reduced diameter 440 resulting in a decrease in diameter to IDS1, which is less than IDL, across the collet ball seat. With a further increase in pressure, the differential force developed will be sufficient to push ball 436 through the yieldable ball seat and the ball will travel (arrows B, Figure 5C) down to seat in and actuate a sliding sleeve-valve (not shown) below. The yieldable seat can be formed as a constriction in the material of the secondary sleeve and be formed to be yieldable, as by plastic deformation at a particular pressure rating. In one embodiment, the yieldable seat is a constriction in the sleeve material with a hollow backside such that the material of the sleeve protrudes inwardly at the point of the constriction and is v-shaped in section, but the material thinning caused by hollowing out the back side causes the seat to be relatively more yieldable than the sleeve material would otherwise be.

Movement of the secondary sleeve is stopped by a return 458 on the inner sleeve forming a stop wall. The stop wall causes any further downward force on sleeve 438 to be transmitted to inner sleeve 432.

When it is desired to open ports 416 of the multi-acting hydraulic drive system, a ball 454 is pumped down to the now formed collet ball seat 426 (Figure 5D). Ball 454 is selected to be larger than IDS1 such that it seals off the upstream pressure from the downstream pressure. Ball 454 may be the same size as ball 436. Increasing the upstream pressure P

creates a pressure differential across ball 454 and seat 426 that acts on the inner sleeve and results in a force that is resisted by the shear pins 449 holding the inner sleeve in place. When this force on the inner sleeve exceeds the resistive force of the shear pins 449, the pins shear off and the inner sleeve slides down, as permitted by torque pins 451. Port openings 416 are then open allowing the frac string fluid to exit the tubing string and communicate with the annulus. The inner sleeve may prevented from closing again by a C-ring arrangement.

Since the string may include balls, such as ball 436 large enough to be stopped by seat 426, there may be a concern that employing such a multi-acting system may cause the tubing sting inner bore to be blocked when the lower balls return uphole with productions. As such, a ball stopper 460 may be attached below sleeve 432 that is operable to stop balls from flowing back through the multi-acting hydraulic drive system. A ball stopper may be operated in various ways. A ball stopper should not prevent balls from proceeding down the tubing string but stop balls from flowing back. The present ball stopper 460 is operated by movement of sleeve 432. When the sleeve is moved to open ports 416, it is useful to activate the ball stopper, as it is known that no further balls will be introduced therepast.

In the illustrated embodiment, ball stopper 460 is compressed to close a set of fingers 462 to protrude into the inner bore and prevent balls of at least a size to lodge in seats 426 and 446 from moving therepast. The fingers are fixed at a first end 462a such that they cannot move along housing 450 and are free to move at an opposite end 462b adjacent to sleeve 432. The fingers are further biased, as by selected folding at a mid point 462c, to collapse inwardly when the inner sleeve moves against the free ends thereof. As best seen in Figure 5E, the fingers 462 at least at their free ends can be connected by a ring 463 that urges the fingers to act as a unitary member and prevents the fingers from individually catching on structures, such as balls moving down therepast. Fingers 462 of the ball stopper prevent the original first leg balls from flowing back therepast, while allowing fluid flow. The ball stopper will generally be compressed into position before

any back flow in the well. As such, then ball stopper tends to act first to prevent the balls below from reaching the seats of the secondary sleeve.

If there is concern that the ball stopper or fracs of the multi-acting hydraulic drive system of Figures 5A will restrict production, the string housing 450 can be configured such that ports 416 also allow production from the lower stages to be produced through the upper sliding sleeve-valved fracturing port and into the annulus to bypass any flow constrictions such as balls that are trapped by the ball stopper.

In one embodiment, a ball seat guard 464 can be provided to protect the collet seat 426. For example, as shown, ball seat guard 464 can be positioned on the uphole side of collet seat 426 and include a flange 466 that extends over at least a portion of the upper surface of the collet seat. The guard can be formed frustoconically, tapering downwardly, to substantially follow the frustoconical curvature of the collet seat. Depending on the position of the guard, it may be formed as a part of the inner sleeve or another component, as desired. The guard may serve to protect the collet fingers from erosive forces and from accumulating debris therein. In one embodiment, the collet fingers may be urged up below the guard to force the fingers apart to some degree. After the collet moves to form the active seat (Figure 5B), it may be separated from guard 464. In this position, guard tends to funnel fluids and ball 454 toward the center of collet seat 426 such that the figures of the collet continue to be protected to some degree.

As an example, a multi-acting hydraulic drive system as shown in Figures 5A to 5D, when run in may drift at 2.62" (IDS = 2.62") and IDL is greater than that, for example about 2.75". A 2.75" ball 436 can pass seat 426, but land in yieldable seat 446 to shift collet seat 426 over the tapered area to create a new seat of diameter IDS2, which may be for example 2.62".

After ball 436 lands and shifts the second sleeve to form seat of diameter IDS2, seat 426 will yield and the ball will continue downhole. The second sleeve may shift to form the new seat at a pressure, for example, of 10 MPa, while the seat yields at 17 MPa. In this

process, the multi-acting hydraulic drive system sleeve 432 does not move, the seals remain seated and unaffected and port openings 416 do not open. That ball 436 can thereafter land in a lower 2.62" seat below the repeater port and open the sleeve actuated by the seat to frac at that stage.

When it is desired to frac through openings 416, a second ball 454 is pumped down that is sized to land in and seal against seat 426. Such a ball may be, for example, 2.75", the same size as ball 436. Ball 454 will shift the sleeve 432 to open openings 416 and then fluids can be passed through openings 416. Sleeve may shift at a pressure greater than that used to yield seat 446, for example, 24 MPa. Ball stopper 450 has fingers sized to prevent passage of any balls, such as ball 436 which might block seats 426 or 446.

The multi-acting hydraulic drive system of Figure 5A can be modified in several ways. For example, in one embodiment, as shown in Figure 5E, the yieldable seat can be modified. For example, as shown in Figure 5E, the yieldable seat can be formed as a sub sleeve 468, the yielding effect being restricted by a rear support 470 in the run in position. The multi-acting hydraulic drive system shift sleeve contains a collet ball seat 426a that is initially in a passive condition with a larger diameter IDLa and a further downstream the yieldable ball seat with sub sleeve 468 that is a smaller diameter IDSa. This configuration allows a ball 436a to pass through the collet ball seat and land in the yieldable ball seat and isolate the upstream tubing pressure from the downstream tubing pressure. The upstream pressure is increased by surface pumping and the pressure differential across the yieldable seat develops a force that exceeds the resistive shear force of pins 459a holding the second sleeve 438a within the inner sleeve 432a. As the second sleeve moves, collet ball seat 426a is moved with the sleeve a short distance along a tapering region 440a of the inner sleeve 432 resulting in the fingers of the collet to be compressed and a resulting decrease in diameter across the fingers forming the collet seat 426a. With further pressure differential the force developed will be sufficient to shear further pins 472 holding the sub sleeve to move the yieldable seat off the rear support 470 and the material of the sub sleeve can then expand and yield to allow the ball 436a to

pass. The yieldable seat can be formed as a constriction in the material of the sub sleeve and be formed to be yieldable, as by plastic deformation at a particular pressure rating. In one embodiment, the yieldable seat is a thin sleeve material. In another embodiment, the yieldable seat is a plurality of collet fingers with inwardly turned tips forming the constriction.

As noted previously, the ball stops and sealing areas of the driver and shifting sleeve can be formed in various ways. In some embodiments, the ball stops and sealing areas are combined as seats. In another embodiment, as shown in Figures 6, the ball stop can be provided separately, but positioned adjacent.

With reference to Figure 6A, for example, a seat effect to drive a sleeve may be formed by a ball stop 580 and an adjacent sealing area 582. The ball stop creates a region of constricted diameter along a inner bore 583 that can retain and hold a ball 584 in a position in the inner diameter, for example of a sleeve 586. The sealing area is positioned adjacent the ball stop and formed to create a seal with the ball when it is retained on the ball stop such that pressure differential can be established across the sealing area when a ball is positioned therein.

The sealing area may be non-deformable or deformable. Because the sealing area is more susceptible to damage that creates failure, however, sealing area may be made non-deformable if it is not desired to introduce breaks or yieldability in the surface thereof. The ball stop may be non-deformable or deformable as desired, such that it can be used in the driver or in a formable seat. Deformable options may include expandable split rings (Figures 6B and 6E) including a number of ring segments 588 arranged in an annular arrangement, annularly installed ball bearing type detent pins 590 (Figure 6C), a collet 592 (Figure 6D) etc.

This arrangement of ball stop and adjacent sealing area may be employed, for example, in a sleeve configured to allow shifting to move through several passive stages and then move to active stage to be operable to actually shift the sleeve. For example, as shown in

Figure 6D, a sleeve valve 532 is shown mounted in and positioned to cover ports 516a through a tubular housing 550. Sleeve 532 carries a collet 592 positioned adjacent a sealing area 582a. Collet 592 rides in a keyway that permits the collet, as driven by force applied by sealing of balls 536, to move between ball stop positions and expanded, yieldable positions. The movement through keyway is driven by spring 540. The keyway leads the collet to a final active stage, where it becomes locked in position on sleeve 532 adjacent to sealing surface 582a. In the active position, the collet holds a final ball against sealing area 582a to create a pressure differential to move sleeve 532 away from ports 516.

Figure 6E shows a ball stop formed of split ring segments 588 positioned adjacent a sealing area 582b. The split ring forms a yieldable seat in a driver sleeve 589. In this illustrated embodiment, the split ring is secured in a gland 591 of the driver sleeve with edges 588a retained behind returns 591a of gland. Gland 591 is open such that ring segments ride along a portion of a sliding sleeve valve 532b between a supporting area 594 and a recess 595. When positioned over the supporting area, the segments 588 protrude into the inner bore to hold a ball 536b against the sealing area. Segments 588 cannot retract, as they are held at their backside by supporting area 594. As such, a pressure differential can be built up across the ball and sealing area 582b to create a hydraulic force to move sleeve 589 down against a stop wall 596. Movement of sleeve 589 moves segments over recess where they are able to expand and release ball 536b. The backside of segments are rounded to permit ease of movement along supporting area 594. Movement of sleeve 589 also draws a collet 526 attached thereto over a constricting surface 540 to form a ball seat. Thereafter, a ball can be dropped to land and seal in collet 526 to shift sleeve 532b.

Knowing the diameter of the ball to be used in the ball stop, the ball stop can be sized to stop the ball from moving therepast and the sealing area can have an inner diameter selected to fit closely against the ball. As such, the ball stop holds the ball in the sealing section. Once the ball stop prevents the ball from moving through the tool, the ball will

be positioned adjacent the sealing area and the resulting seal can allow pressure to be built up behind the ball and apply force, depending on the intended use of the ball stop, to move the driver on which it is installed or to cause the sliding sleeve valve to shift from the closed to the open position. As such, the ball stop itself needs only retain the ball, but not actually create a seal with the ball. This allows greater flexibility with the formation of the stop without also having to consider its sealing properties both initially and after use downhole.

Other mechanical devices can be used to move valves to an active position and then a ball can be pumped down the tubing or casing to shift the sleeve to the open position.

It will be appreciated that although components may be shown as single parts, they are typically formed of a plurality of connected parts to facilitate manufacture. Components described herein are intended for downhole use and may be formed of materials and by processes to withstand the rigors of such downhole use.

The sleeves may be installed in a tubular for connection into a tubular string, such as in the form of a sub. With reference to Figure 4 for example, sleeve 332 may be installed in a sub. The sub includes a tubular body 360 including an inner bore defined by an inner wall 362 and sleeve 332 is installed in the tubular inner bore and is axially slidable therein at least from a first position to a second position. As will be appreciated, the second position is generally defined by a shoulder 364 on the tubular inner wall against which the sleeve may be stopped. Generally, the sliding sleeve is mounted in a recessed area 366 formed in the inner bore of the tubular body such that the sleeve can move in the recess until it stops against shoulder 364 formed by the lower stepped edge of that recess. The tubular upper and lower ends 368a, 368b may be formed, such as by forming as threaded boxes and/or pins, to accept connection into a wellbore tubular string.

In use, one or more of the reconfigurable sleeves may be positioned in a tubing string. Because of their usefulness to increase the possible numbers of sleeves in any tubing string, the reconfigurable sleeves may often be installed above one or more sleeves

having a set valve seat. For example, with reference to Figure 7, a wellbore tubing string apparatus may include a tubing string 614 having a long axis and an inner bore 618, a first sleeve 632 in the tubing string inner bore, the first sleeve being moveable along the inner bore from a first position to a second position; a second sleeve 622a in the tubing string inner bore, the second sleeve offset from the first sleeve along the long axis of the tubing string, the second sleeve being moveable along the inner bore from a third position to a fourth position; and a third sleeve 622b offset from the second sleeve and moveable along the tubular string from a fifth position to a sixth position. The first sleeve may be reconfigurable, such as by one of the embodiments noted in Figures 2 to 5 above or otherwise, having a driver 638 therein to form a valve seat (not yet formed) upon actuation thereof. The second and third sleeves may be reconfigurable or, as shown, standard sleeves, with set valve seats 626a, 626b therein. An actuator device, such as ball 636 may be provided for actuating the first sleeve, as it passes thereby, to form a valve seat on the first sleeve. The actuator device may be a device, as shown, for acting with driver 638 to actuate the formation of a valve seat on the first sleeve and also serves the purpose of landing in and creating a seal against the second sleeve seat 626a to permit the second sleeve to be driven by fluid pressure from the third position to the fourth position. Alternately, the actuator device may have the primary purpose of acting on driver 638 without also acting to seal a lower sleeve.

In the illustrated embodiment, for example, the sleeve furthest downhole, sleeve 622b, includes a valve seat with a diameter D1 and the sleeve thereabove has a valve seat with a diameter D2. Diameter D1 is smaller than D2 and so sleeve 622b requires the smaller ball 623 to seal thereagainst, which can easily pass through the seat of sleeve 622a. This provides that the lowest sleeve 622b can be actuated to open first by launching ball 623 which can pass without effect through all of the sleeves 622a, 632 thereabove but will land in and seal against seat 626b. Second sleeve 622a can likewise be actuated to move along tubing string 612 by ball 636 which is sized to pass through all of the sleeves thereabove to land and seal in seat 626a, so that pressure can be built up thereabove. However, in the illustrated embodiment, although ball 636 can pass through the sleeves

thereabove, it may actuate those sleeves, for example sleeve 632, to generate valve seats thereon. For example, driver 638 on sleeve 632 includes a catcher portion 646 with a diameter D2 that is formed to catch and retain ball 636 such that pressure can be increased to move the driver along sleeve 632 to open the catcher but create a valve seat in another area, for example portion 642 of the driver. Catcher 646, being opened, releases ball 636 so it can continue to seat 626a.

Of course, where the first sleeve, with the configurable valve seat, is positioned above other sleeves with valve seats formable or fixed thereon, the formation of the valve seat on the first seat should be timed or selected to avoid interference with access to the valve seats therebelow. As such, for example, the inner diameter of any valve seat formed on the first sleeve should be sized to allow passage thereby of actuation devices or plugging balls for the valves therebelow. Alternately, and likely more practical, the timing of the actuation of the first sleeve to form a valve seat is delayed until access to all larger diameter valve seats therebelow is no longer necessary, for example all such larger diameter valve seats have been actuated or plugged.

In one embodiment as shown, the wellbore tubing string apparatus may be useful for wellbore fluid treatment and may include ports 617 over or past which sleeves 622a, 622b, 632 act.

In an embodiment where sleeves 622a, 622b, 632 are positioned to control the condition of ports 617, note that, as shown, in the closed port position, the sleeves can be positioned over their ports to close the ports against fluid flow therethrough. In another embodiment, the ports for one or both sleeves may have mounted thereon a cap extending into the tubing string inner bore and in the position permitting fluid flow, their sleeve has engaged against and opened the cap. The cap can be opened, for example, by action of the sleeve shearing the cap from its position over the port. Each sleeve may control the condition of one or more ports, grouped together or spaced axially apart along a path of travel for that sleeve along the tubing string. In yet another embodiment, the ports may have mounted thereover a sliding sleeve and in the position permitting fluid flow, the first

sleeve has engaged and moved the sliding sleeve away from the first port. For example, secondary sliding sleeves can include, for example, a groove and the main sleeves (622a, 632) may include a locking dog biased outwardly therefrom and selected to lock into the groove on the sub sleeve. These and other options for fluid treatment tubulars are more fully described in applicants US Patents noted hereinbefore.

The tubing string apparatus may also include outer annular packers 620 to permit isolation of wellbore segments. The packers can be of any desired type to seal between the wellbore and the tubing string. In one embodiment, at least one of the first, second and third packer is a solid body packer including multiple packing elements. In such a packer, it is desirable that the multiple packing elements are spaced apart. Again the details and operation of the packers are discussed in greater detail in applicants earlier US Patents.

In use, a wellbore tubing string apparatus, such as that shown in Figure 7 including reconfigurable sleeves, for example according to one of the various embodiments described herein or otherwise may be run into a wellbore and installed as desired. Thereafter the sleeves may be shifted to allow fluid treatment or production through the string. Generally, the lower most sleeves are shifted first since access to them may be complicated by the process of shifting the sleeves thereabove. In one embodiment, for example, the sleeve shifting device, such as a plugging ball may be conveyed to seal against the seat of a sleeve and fluid pressure may be increased to act against the plugging ball and its seat to move the sleeve. At some point, any configurable sleeves are actuated to form their valve seats. As will be appreciated from the foregoing description, an actuating device for such purpose may take various forms. In one embodiment, as shown in Figure 7, the actuating device is a device launched to also plug a lower sleeve or the actuating device may act apart from the plugging ball for lower sleeves. For example, the actuating device may include a magnetic rod, etc. that actuates a valve seat to be formed on a reconfigurable sleeve as it passes thereby. In another embodiment, a plugging ball for a lower sleeve may actuate the formation of a valve seat on the first

sleeve as it passes thereby and after which may land and seal against the valve seat of sleeve with a set valve seat. As another alternate method, a device from below a configurable sleeve can actuate the sleeve as it passes upwardly through the well. For example, in one embodiment, a plugging ball, when it is reversed by reverse flow of fluids, can move past the first sleeve and actuate the first sleeve to form a valve seat thereon.

The method can be useful for fluid treatment in a well, wherein the sleeves operate to open or close fluid ports through the tubular. The fluid treatment may be a process for borehole stimulation using stimulation fluids such as one or more of acid, gelled acid, gelled water, gelled oil, CO_2, nitrogen and any of these fluids containing proppants, such as for example, sand or bauxite. The method can be conducted in an open hole or in a cased hole. In a cased hole, the casing may have to be perforated prior to running the tubing string into the wellbore, in order to provide access to the formation. In an open hole, the packers may be of the type known as solid body packers including a solid, extrudable packing element and, in some embodiments, solid body packers include a plurality of extrudable packing elements. The methods may therefore, include setting packers about the tubular string and introducing fluids through the tubular string.

Figures 8A to 8F show a method and system to allow several sliding sleeve valves to be run in a well, and to be selectively activated. The system and method employs a tool such as, for example, that shown in Figures 3 that will shift through several "passive" shifting cycles (positions 2-3). Once the valves pass through all the passive cycles, they can each move to an "active" state (position 4, Fig. 3D). Once it shifts to the active state, the valve can be shifted from closed to open position, and thereby allow fluid placement through the open parts from the tubing to the annulus.

Figure 8A shows a tubing string 714 in a wellbore 712. A plurality of packers 720 a-f can be expanded about the tubing string to segment the wellbore into a plurality of zones where the wellbore wall is the exposed formation along the length between packers. The string may be considered to have a plurality of intervals 1-5 between each adjacent pair

of packers. Each interval includes at least one port and a sliding sleeve valve thereover (within the string), which together are designated 716 a-e. Sliding sleeve valve 716a includes a ball stop, called a seat that permits a ball-driver movement of the sleeve. Sliding sleeve valves 716b to 716e includes seats formable therein when actuated to do so, such as for example a seat 226 that is compressible to a ball retaining diameter, as shown in Figures 3A-D.

Initially, as shown in Figure 8A, all ports are in the closed position, wherein they are closed by their respective sliding sleeve valves.

As shown in Figure 8B a ball 736 may be pumped onto a seat in the sleeve 716a to open its port in Interval 1. When the ball passes through the sleeves 716c-e in Intervals 5, 4, and 3, they make a passive shift. When the ball passes through Interval 2, it generates a ball stop on that sleeve 716b such that it can be shifted to the open position when desired.

Next, as shown in Figure 8C, a ball 736a is pumped onto the activated seat in sleeve 716b to open the port in Interval 2. When it passes through the sleeves in Intervals 5, and 4, they make a passive shift. When the ball passes through Interval 3, it moves sleeve 716c from passive to active so that it can be shifted to the open position when desired.

Thereafter, as shown in Figure 8D, a ball 736b is pumped onto the activated seat in sleeve 716c to open the port in Interval 3. When it passes through the sleeve 716e in Interval 5, that sleeve makes a passive shift. When the ball passes through Interval 4, it moves sleeve 716d from passive to active so that it can be shifted to the open position when desired.

Thereafter, as shown in Figure 8E, a ball 736c is pumped onto the activated seat of sleeve 716d to open the port in Interval 4. When ball 736c passes through Interval 5, it moves sleeve 716e from passive to active so that it can be shifted to the open position when desired.

Thereafter, as shown in Figure 8F, a ball 736d is pumped onto the activated seat of sleeve 716e to open the port in Interval 5 completing opening of all ports. Note that more than five ports can be run in a string.

When the ports are each opened, the formation accessed therethrough can be stimulated as by fracturing. It is noted, therefore, that the formation can be treated in a focused, staged manner. It is also noted that balls 736 - 736d may all be the same size. The intervals need not be directly adjacent as shown but can be spaced.

This system and tool of Figures 8 provides a substantially unrestricted internal diameter along the string and allows a single sized ball or plug to function numerous valves. By eliminating reduction in internal diameter to seat balls, the system may improve the ability to pump at high rates without causing abrasion to port tools. The system may be activated using an indexing j-slot system as noted. The system may be activated using a series of collet, c-rings or deformable seats. The system can be used in combination with solid ball seats. The system allows for installations of fluid placement liners of very long length forming large numbers of separately accessible wellbore zones.

The previous description of the disclosed embodiments is provided to enable any person skilled in the art to make or use the present invention. Various modifications to those embodiments will be readily apparent to those skilled in the art, and the generic principles defined herein may be applied to other embodiments without departing from the spirit or scope of the invention. Thus, the present invention is not intended to be limited to the embodiments shown herein, but is to be accorded the full scope consistent with the claims, wherein reference to an element in the singular, such as by use of the article "a" or "an" is not intended to mean "one and only one" unless specifically so stated, but rather "one or more". All structural and functional equivalents to the elements of the various embodiments described throughout the disclosure that are know or later come to be known to those of ordinary skill in the art are intended to be encompassed by the elements of the claims. Moreover, nothing disclosed herein is intended to be dedicated to the public regardless of whether such disclosure is explicitly recited in the claims. No claim element is to be construed under the provisions of 35 USC 112, sixth paragraph, unless the element is expressly recited using the phrase "means for" or "step for".

Claims:

1. A sliding sleeve sub for installation in a wellbore tubular string, the sliding sleeve sub comprising: a tubular including an inner bore defined by an inner wall; and a sleeve installed in the tubular inner bore and axially slidable therein at least from a first position to a second position, the sleeve including an inner diameter, an outer diameter facing the tubular inner wall, a driver for the sleeve selected to be acted upon by an inner bore conveyed actuating device passing adjacent thereto to drive the generation on the sleeve of a ball stop, the ball stop being formed to retain and hold an inner bore conveyed device passing along the inner bore and position the inner bore conveyed device to form a seal against fluid flow therepast, the driver being driveable to create the ball stop apart from axial sliding of the sleeve.

2. The sliding sleeve sub of claim 1 wherein the driver is a moveable second sleeve installed within the sleeve.

3. The sliding sleeve sub of claim 2 wherein the moveable second sleeve includes a yieldable seat and a collet constrictable to form the ball stop.

4. The sliding sleeve sub of claim 1 further comprising a ball stopper below the ball stop, the ball stopper formed to retain a ball from flowing back and blocking against the ball stop.

5. The sliding sleeve sub of claim 1 wherein the driver is configured to be driven through a plurality of passive cycles prior to creating the ball stop.

6. A sliding sleeve sub for installation in a wellbore tubular string, the sliding sleeve sub comprising: a tubular including an inner bore defined by an inner wall; and a sleeve installed in the tubular inner bore and axially slidable therein at least from a first position to a second position, the sleeve including an inner diameter, an outer diameter facing the tubular inner wall, a driver for the sleeve selected to be acted upon by an inner bore conveyed actuating device passing adjacent thereto to drive the generation of a ball stop

on the sleeve, the driver being selected to be acted upon to remain in a passive condition until being actuated to move into an active, ball stop generating position.

7. The sliding sleeve sub of claim 6 wherein the driver employes a walking J type key/keyway assembly to guide the driver through at least one passive condition and into the active, ball stop generating position.

8. A wellbore tubing string apparatus, the apparatus comprising: a tubing string having a long axis and an inner bore; a first sleeve in the tubing string inner bore, the first sleeve being moveable along the inner bore from a first position to a second position; and an actuating device moveable through the inner bore for actuating the first sleeve, as it passes thereby, to form a ball stop on the first sleeve without moving the first sleeve out of its first position.

9. The sliding sleeve sub of claim 8 wherein the actuating device acts on a moveable second sleeve installed within the sleeve.

10. The sliding sleeve sub of claim 9 wherein the moveable second sleeve includes a yieldable seat and a collet constrictable to form the ball stop.

11. A wellbore tubing string apparatus, the apparatus comprising: a tubing string having a long axis and an inner bore; a first sleeve in the tubing string inner bore, the first sleeve being moveable along the inner bore from a first position to a second position; a second sleeve offset from the first sleeve along the long axis of the tubing string, the second sleeve being moveable along the inner bore from a third position to a fourth position; and a sleeve shifting device for both (i) actuating the first sleeve, as it passes thereby, to form a ball stop on the first sleeve and (ii) for landing in and creating a seal against the second sleeve to permit the second sleeve to be driven by fluid pressure from the third position to the fourth position.

12. The wellbore tubing string apparatus of claim 11 wherein the sleeve shifting device is a ball.

13. The wellbore tubing string apparatus of claim 11 further comprising a ball stopper below the ball stop, the ball stopper formed to retain the sleeve shifting device from flowing back and blocking against the ball stop.

14. A wellbore fluid treatment apparatus, the apparatus comprising a tubing string having a long axis, a first port opened through the wall of the tubing string, a second port opened through the wall of the tubing string, the second port offset from the first port along the long axis of the tubing string, a first packer operable to seal about the tubing string and mounted on the tubing string to act in a position offset from the first port along the long axis of the tubing string, a second packer operable to seal about the tubing string and mounted on the tubing string to act in a position between the first port and the second port along the long axis of the tubing string; a third packer operable to seal about the tubing string and mounted on the tubing string to act in a position offset from the second port along the long axis of the tubing string and on a side of the second port opposite the second packer; a first sleeve positioned relative to the first port, the first sleeve being moveable relative to the first port between a closed port position and a position permitting fluid flow through the first port from the tubing string inner bore; a second sleeve positioned relative to the second port, the second sleeve being moveable relative to the second port between a closed port position and a position permitting fluid flow through the second port from the tubing string inner bore; and a sleeve shifting device for both (i) actuating the first sleeve, as it passes thereby, to form a ball stop on the first sleeve and (ii) for landing in and creating a seal against the second sleeve to permit the second sleeve to be driven from the closed port position to the position permitting fluid flow.

15. The wellbore fluid treatment apparatus of claim 14 wherein the sleeve shifting device is a ball.

16. The wellbore tubing string apparatus of claim 14 further comprising a ball stopper below the ball stop, the ball stopper formed to retain the sleeve shifting device from flowing back and blocking against the ball stop.

17. A method for fluid treatment of a borehole, the method comprising:

a. running a wellbore tubing string apparatus into a wellbore, the wellbore tubing string apparatus including: a tubing string having a tubular wall, a long axis, ports through the wall and an inner bore within the wall; a first sleeve in the tubing string inner bore, the first sleeve being moveable along the inner bore from a first position covering the ports to a second position exposing the ports for fluid flow therethrough; and an actuating device moveable through the inner bore for actuating the first sleeve, as it passes thereby, to form a ball stop on the first sleeve;

b. conveying an actuating device to actuate the first sleeve and generate thereon a ball stop;

c. conveying a sleeve shifting device to land on the ball stop;

d. increasing fluid pressure in the tubing string above the ball stop to move the first sleeve to its second position; and

e. forcing fluid through the ports to fracture a formation accessed through the wellbore.

18. The method of claim 17 further comprising repeating the steps c to e on a second sleeve in the tubing string inner bore.

19. A method for fluid treatment of a borehole, the method comprising:

a. running a wellbore tubing string apparatus into a wellbore, the wellbore tubing string apparatus comprising: a tubing string having a long axis and an inner bore; a first sleeve in the tubing string inner bore, the first sleeve being moveable along the inner bore from a first position to a second position; a second sleeve offset from the first sleeve along the long axis of the tubing string, the second sleeve being moveable along the inner bore from a third position to a fourth position; and a sleeve shifting device for both (i) actuating the first sleeve, as it passes thereby, to form a ball stop on the first sleeve and

(ii) for landing in and creating a seal against the second sleeve to permit the second sleeve to be driven by fluid pressure from the third position to the fourth position;

b. conveying the sleeve shifting device both (i) actuate the first sleeve, as it passes thereby, to form a ball stop on the first sleeve and (ii) land in and create a seal against the second sleeve to permit the second sleeve to be driven by fluid pressure from the third position to the fourth position; and

c. increasing fluid pressure in the tubing string above the second sleeve to drive the second sleeve from the third position to the fourth position.

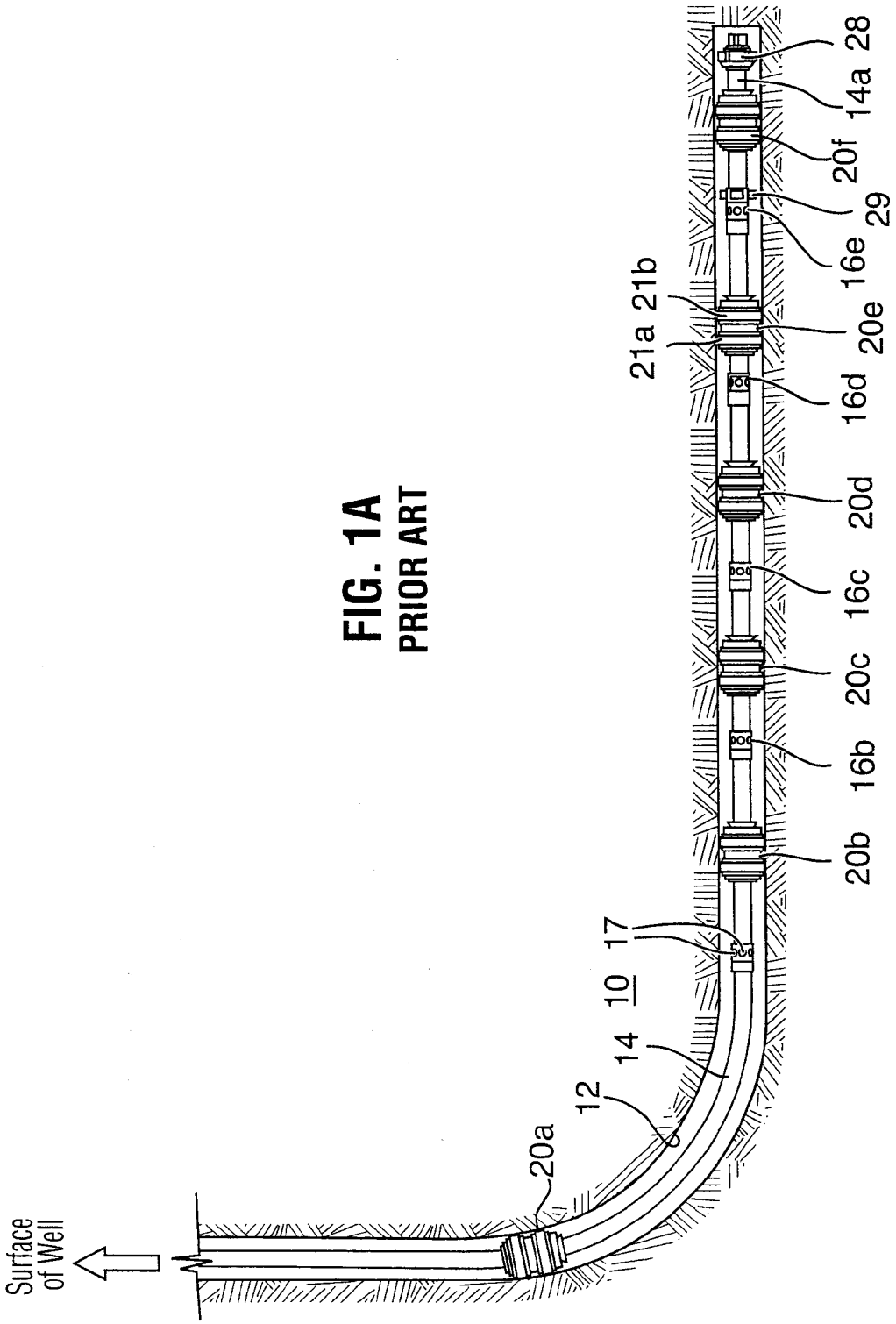


FIG. 1A
PRIOR ART

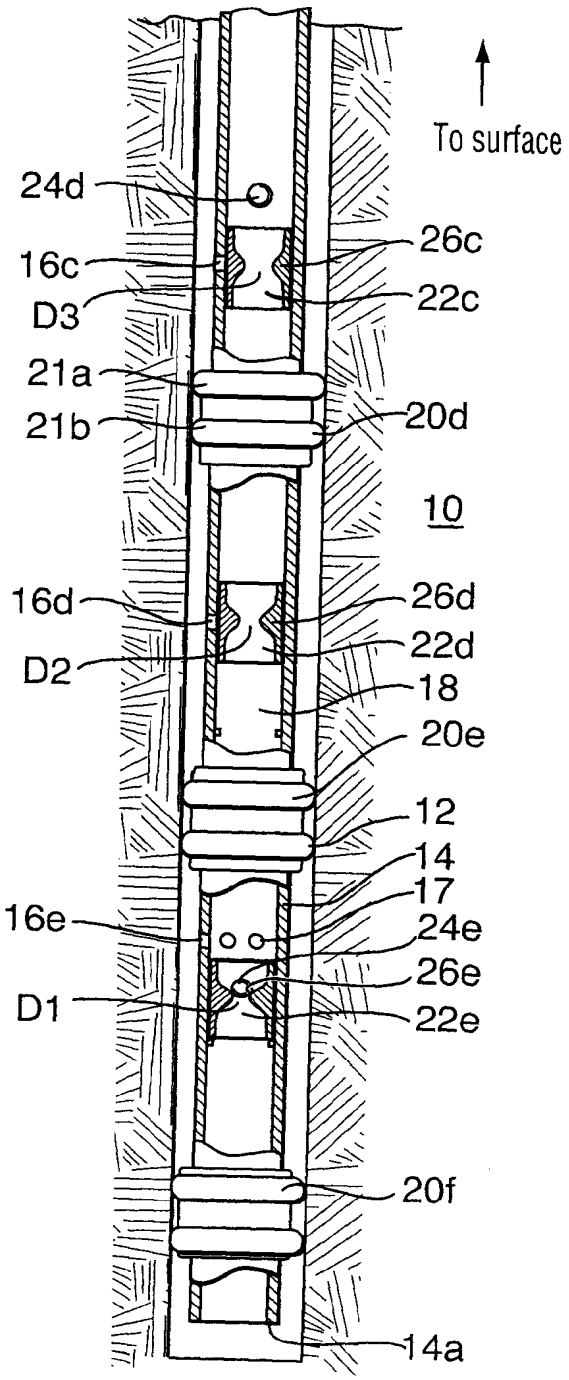


FIG. 1B
PRIOR ART

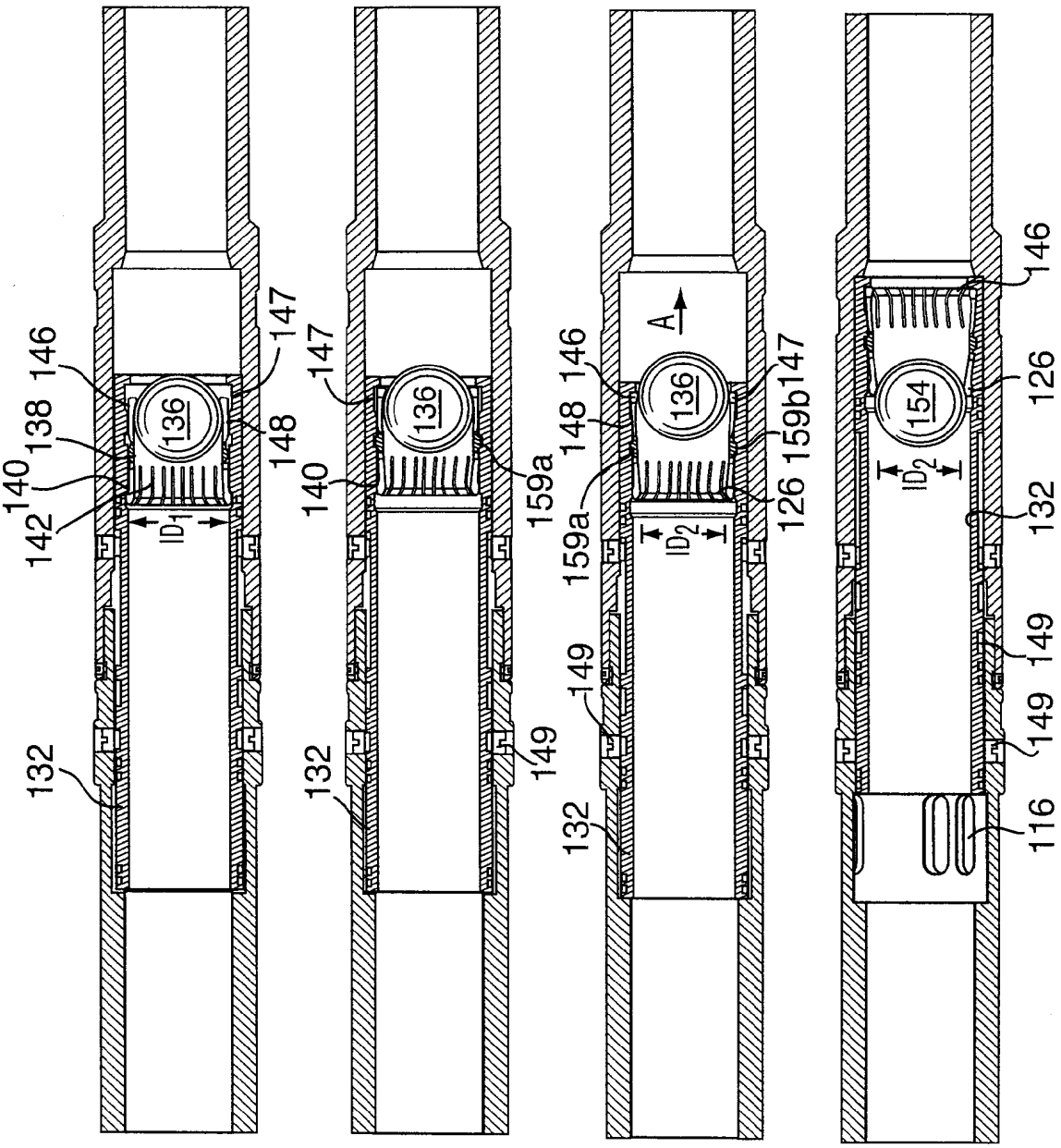


FIG. 2A FIG. 2B FIG. 2C FIG. 2D

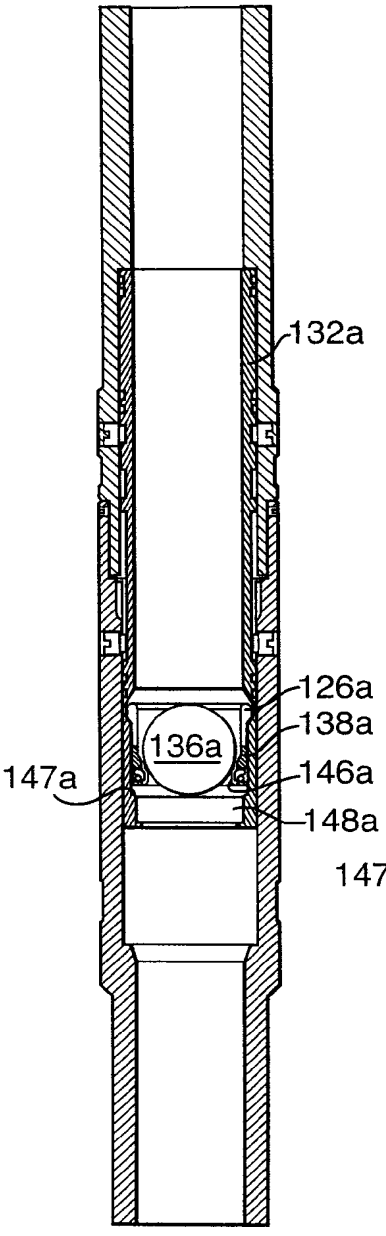


FIG. 2E

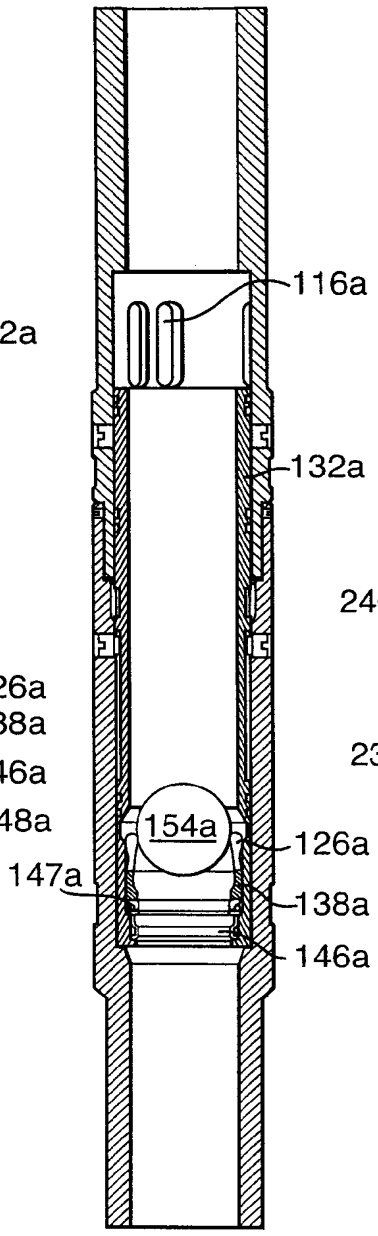


FIG. 2F

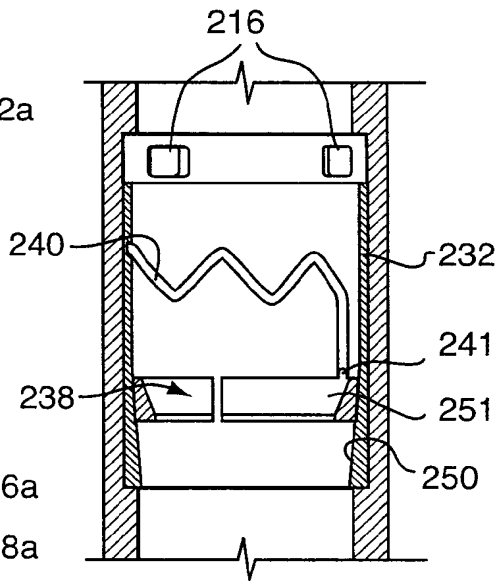


FIG. 3

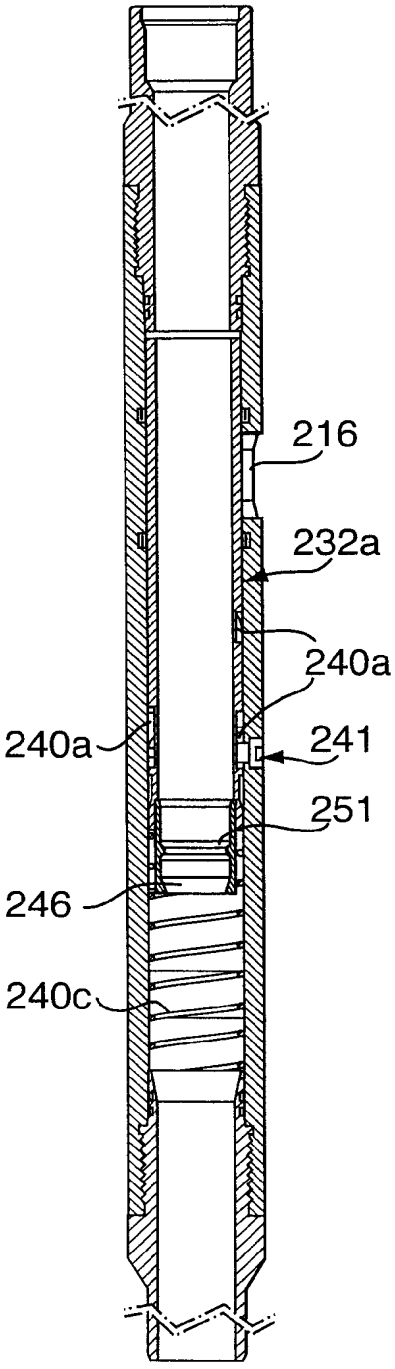


FIG. 3A

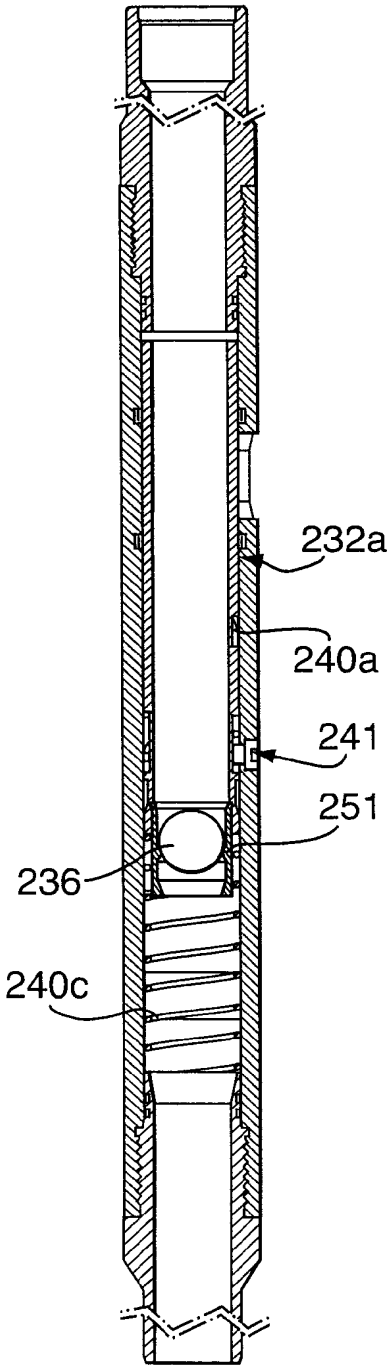


FIG. 3B

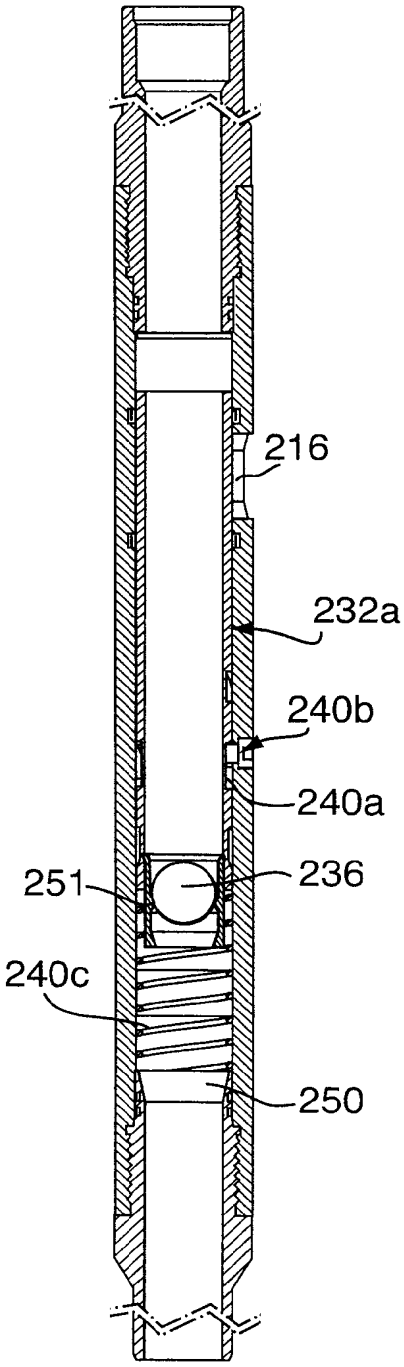


FIG. 3C

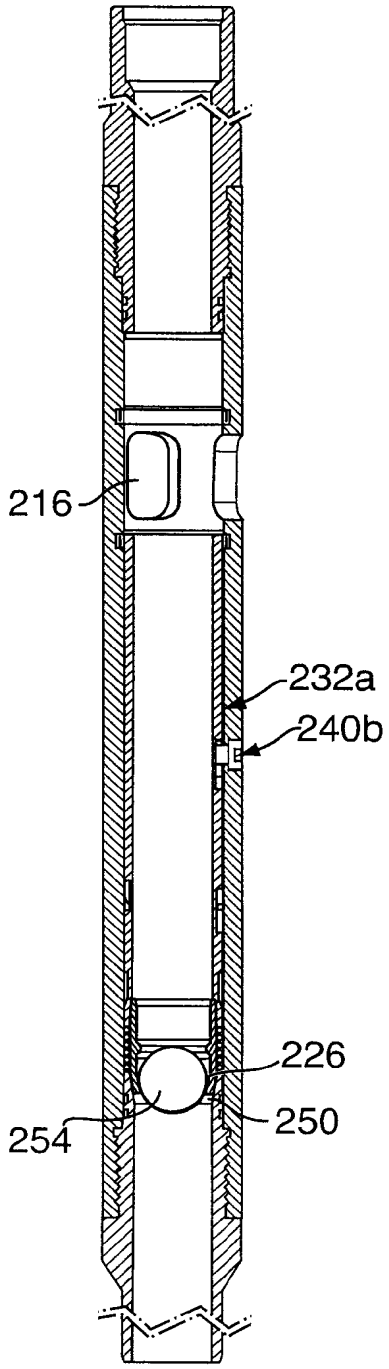


FIG. 3D

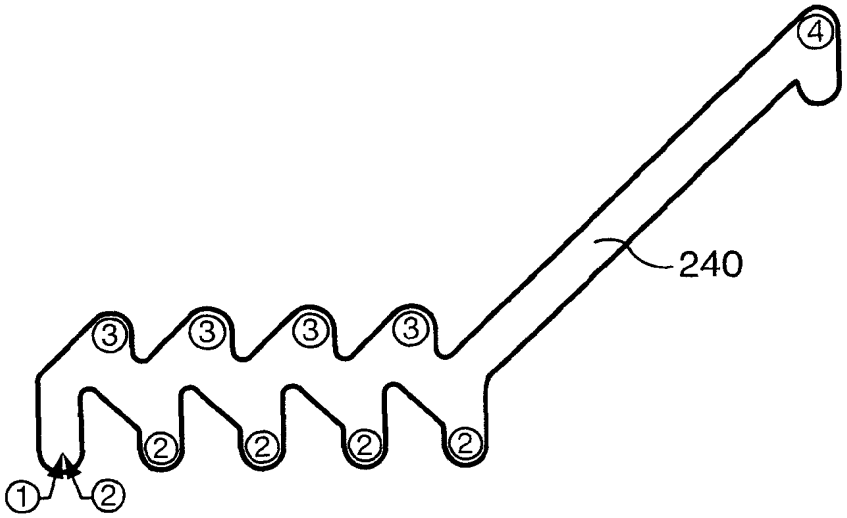


FIG. 3E

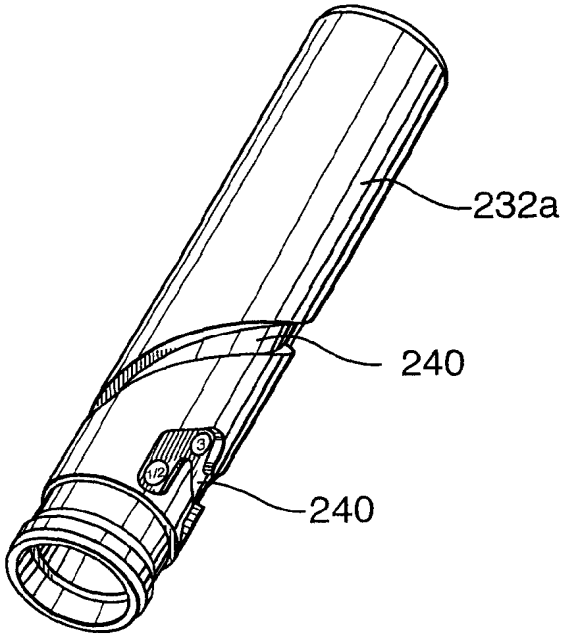


FIG. 3F

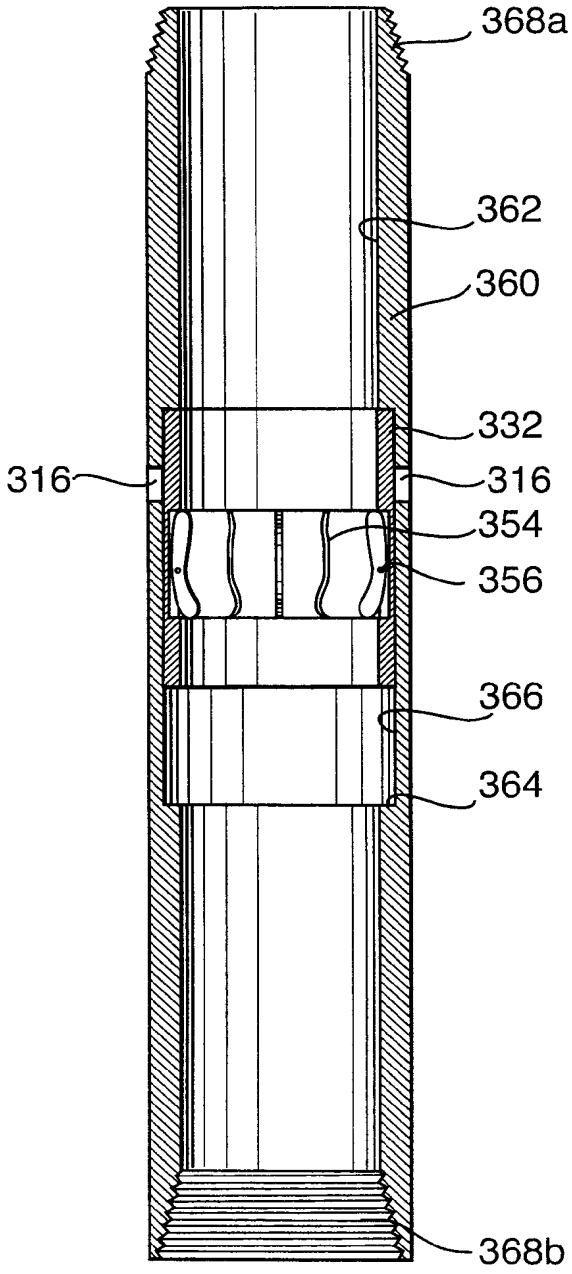


FIG.4

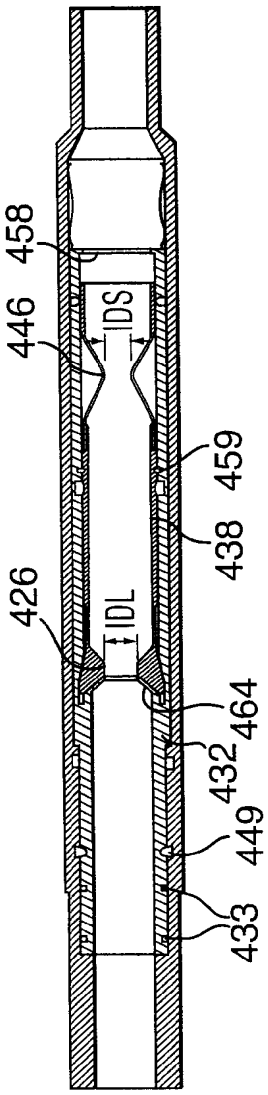


FIG. 5A

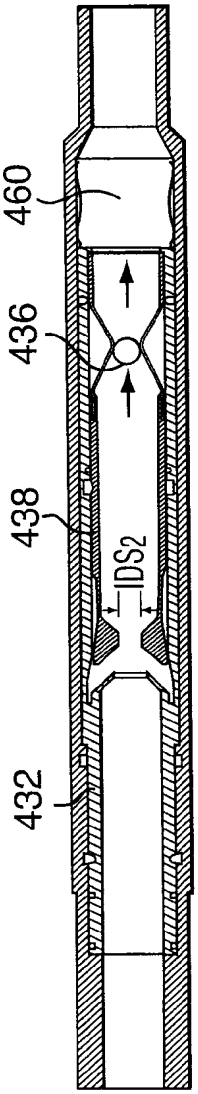


FIG. 5B

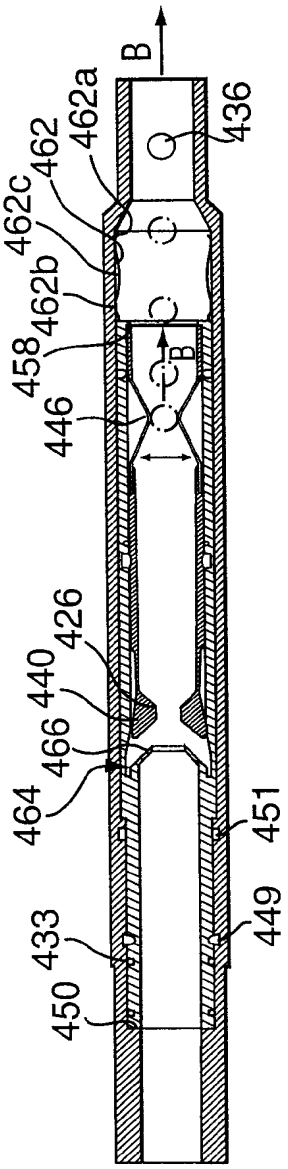


FIG. 5C

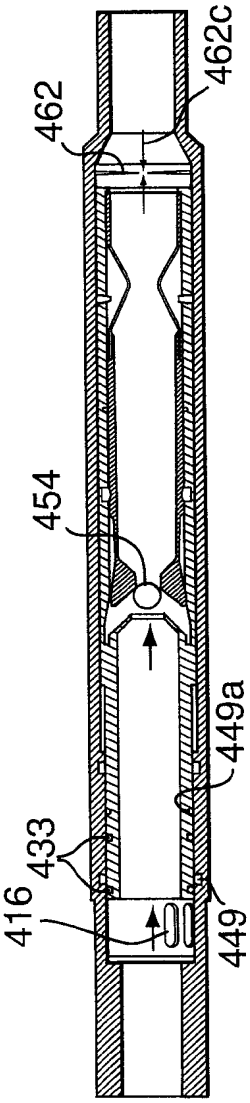


FIG. 5D

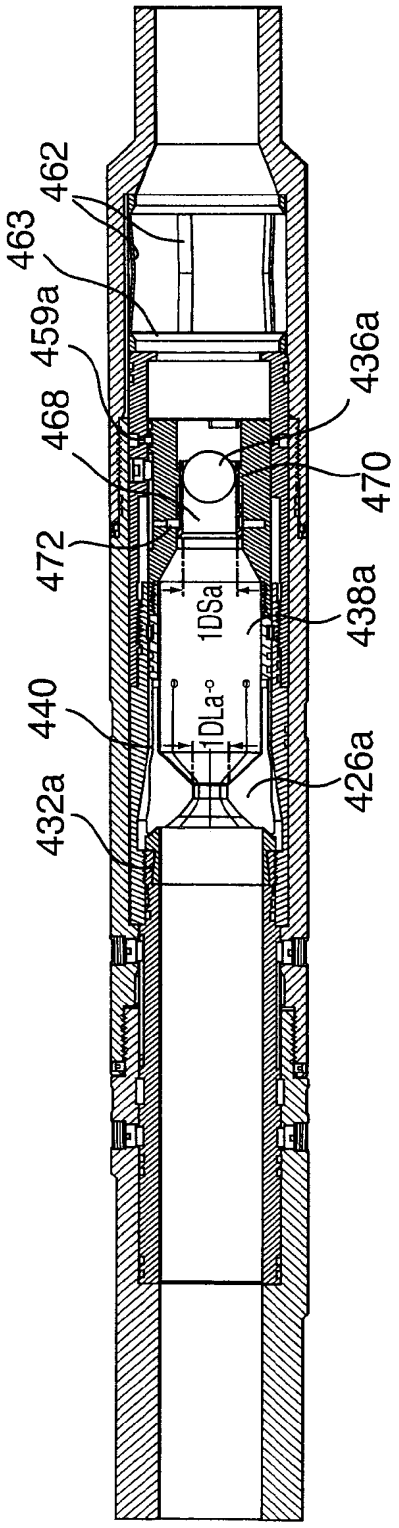


FIG. 5E

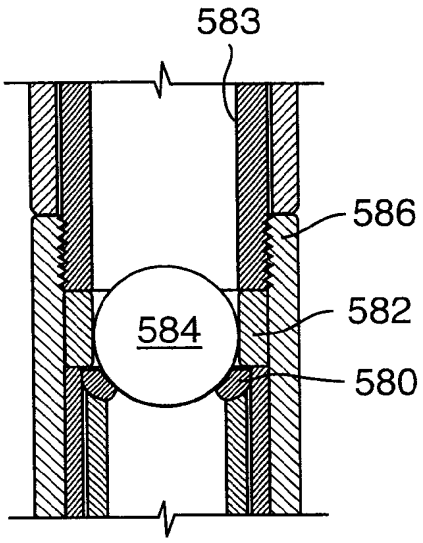


FIG. 6A

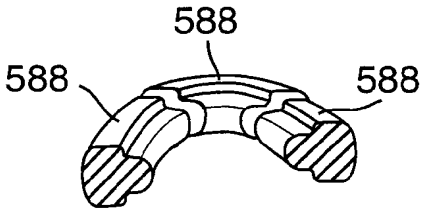


FIG. 6B

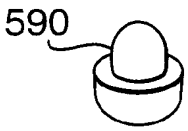


FIG. 6C

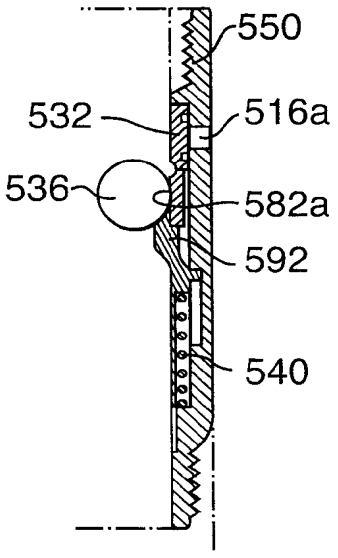


FIG. 6D

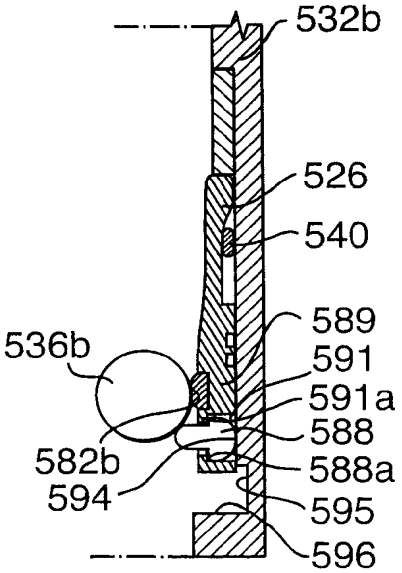


FIG. 6E

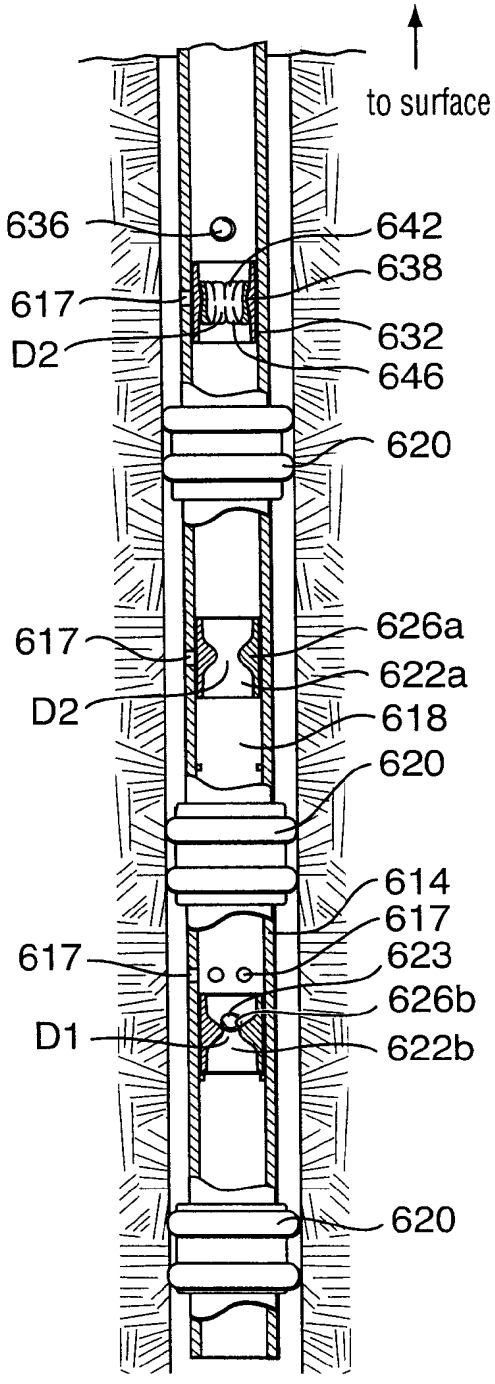


FIG. 7

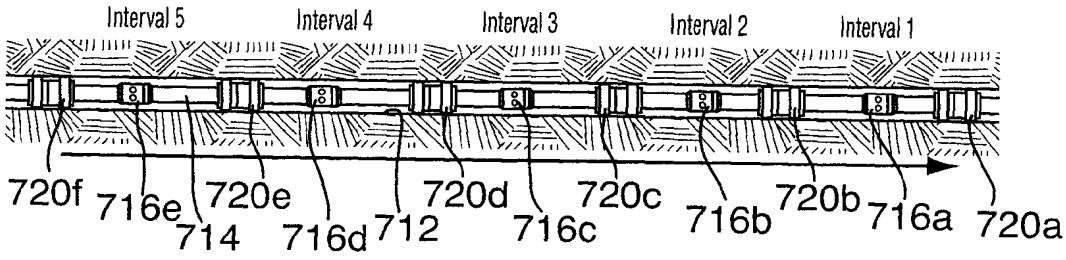


FIG. 8A

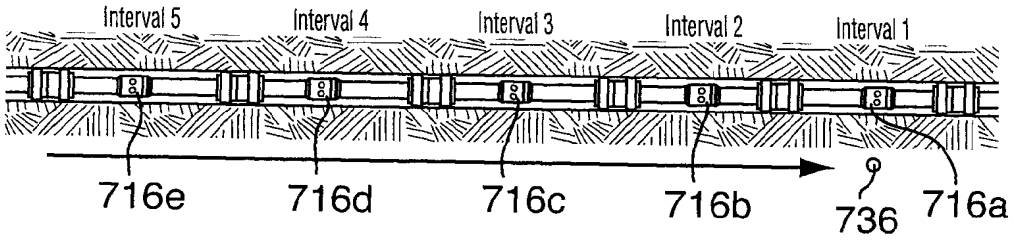


FIG. 8B

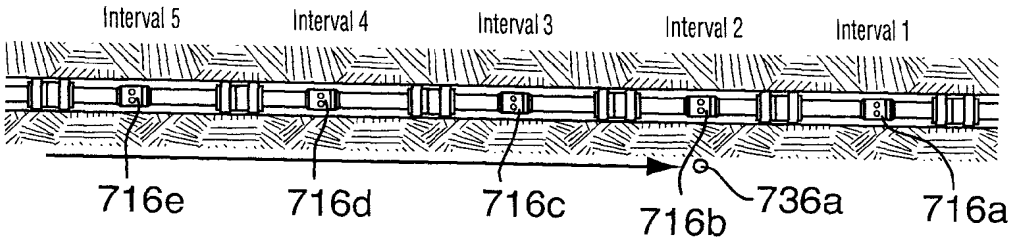


FIG. 8C

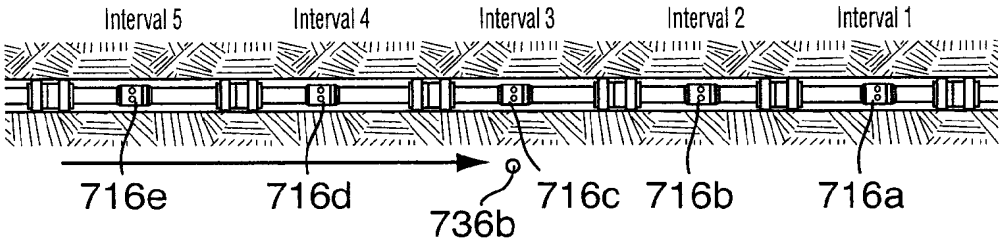


FIG. 8D

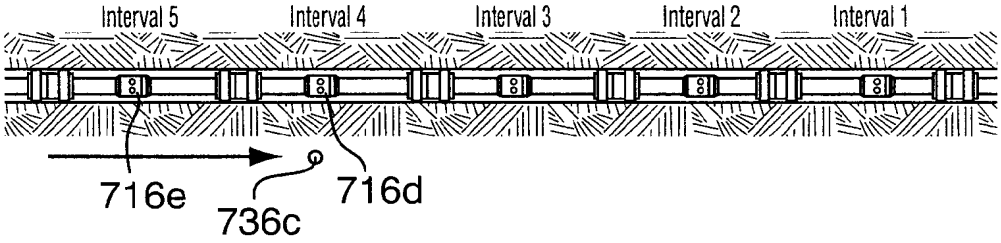


FIG. 8E

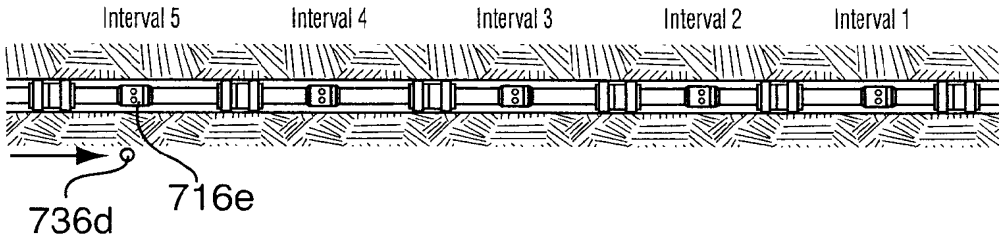


FIG. 8F

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2010/000727

A. CLASSIFICATION OF SUBJECT MATTER
IPC: ***E21B 33/124*** (2006.01) , ***E21B 34/14*** (2006.01)
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: ***E21B 33/124*** (2006.01) , ***E21B 34/14*** (2006.01)

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

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)
Epodoc; keywords: slide, move, shift, sleeve, collar, ball, dart, stop, seat (singly or in combination, variations thereof, with or without class as necessary).

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US7108067 B2 (THEMIG, D.J., et al.) 19 September 2006 (19-09-2006)	1 - 19
A	US6907936 B2 (FEHR, J., et al.) 21 June 2005 (21-06-2005)	1 - 19
A	US3053322 A (KLINE, A.K.) 11 September 1962 (11-09-1962)	1 - 19
A	US2947363 A (SACKETT, T.H., et al.) 2 August 1960 (02-08-1960)	1 - 19
A	US2155609 A (McCLENDON, W.R., et al.) 25 April 1939 (25-04-1939)	1 - 19

[ ] Further documents are listed in the continuation of Box C.

[X] 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	Date of mailing of the international search report
5 July 2010 (05-07-2010)	30 July 2010 (30-07-2010)

Name and mailing address of the ISA/CA	Authorized officer
Canadian Intellectual Property Office Place du Portage I, C114 - 1st Floor, Box PCT 50 Victoria Street Gatineau, Quebec K1A 0C9 Facsimile No.: 001-819-953-2476	Edward Dabrowski (819) 953-1378

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CA2010/000727

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
US7108067B2	19-09-2006	CA2412072A1	19-05-2003
		CA2437635A1	21-02-2004
		CA2437678A1	21-02-2004
		US2003127227A1	10-07-2003
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		US2010065276A1	18-03-2010
US6907936B2	21-06-2005	CA2412072A1	19-05-2003
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		US2010065276A1	18-03-2010
US3053322A	11-09-1962	US3053322A	11-09-1962
US2947363A	02-08-1960	US2947363A	02-08-1960
US2155609A	25-04-1939	US2155609A	25-04-1939

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	BOTTOM SET DOWNHOLE PLUG
First Named Inventor/Applicant Name:	W. Lynn Frazier
Filer:	Robb D. Edmonds/Stacy Lanier
Attorney Docket Number:	MOTI-018

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	82	82
Utility Search Fee	2111	1	270	270
Utility Examination Fee	2311	1	110	110
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Petition fee- 37 CFR 1.17(h) (Group III)	1464	1	130	130

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**592**

Electronic Acknowledgement Receipt

EFS ID:	10634161
Application Number:	13194871
International Application Number:	
Confirmation Number:	1776
Title of Invention:	BOTTOM SET DOWNHOLE PLUG
First Named Inventor/Applicant Name:	W. Lynn Frazier
Customer Number:	60935
Filer:	Robb D. Edmonds/Stacy Lanier
Filer Authorized By:	Robb D. Edmonds
Attorney Docket Number:	MOTI-018
Receipt Date:	29-JUL-2011
Filing Date:	
Time Stamp:	20:59:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$592
RAM confirmation Number	6103
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1		MOTI_018_Application.pdf	4103804 14146bad756f4e1c4dd6629389c1e9077950159b	yes	25

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Specification	1	21
Claims	22	24
Abstract	25	25

Warnings:

Information:

2	Drawings-only black and white line drawings	MOTI_018_Figures.pdf	477590 1e975dad92baa6c89ce4fa8954ebeb5b56ca0a10	no	7

Warnings:

Information:

3	Oath or Declaration filed	MOTI_018_Declaration_Executed.pdf	268105 29fb420424f6e934a5eb29144e933303ab13e4ed	no	1

Warnings:

Information:

4	Application Data Sheet	MOTI_018_sb0014_FillableApplicationDataSheet.pdf	1031353 3705dc77b41e62c4cfc684e7f78acf6c9c88d9d4	no	4

Warnings:

Information:

5	Transmittal Letter	MOTI018_IDSTransmittal.pdf	165040 00372c849c67264a9d1066430bfee3bfc5fcdf42	no	2

Warnings:

Information:

6	Information Disclosure Statement (IDS) Form (SB08)	MOTI_018_sb08a_IDS.pdf	611555 e60554bd3b2f2b3a5dccab64441e6c8e9545bc10	no	4

Warnings:

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8	Information Disclosure Statement (IDS) Form (SB08)	MOTI018_SupplementalIDS.pdf	987802 79cc52d2a7aab138f0db11a7212bb40d9cad6921	no	6
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9	Petition for 12-month Accelerated Exam	MOTI_018_AESD.pdf	6975597 aee8393105e28a888efcfed5e1b5919573239944	no	48
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10	Petition for 12-month Accelerated Exam	MOTI_018_sb0028_FillablePetitionToMakeSpecialUnderAcceleratedExam.pdf	875795 f38eef41ef8e1ae8a9a81d5d9bc1b85ec3e522f6	no	4
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11	Statement of preexamination search	MOTI_018_Search_Doc.pdf	924193 2ba895c1da226e186f955b2f6c11ed7019805d57	no	7
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12	Foreign Reference	GB914030A.pdf	314204 2685b722994c1895f754260b38ac5eec40b418fe	no	4
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13	Foreign Reference	WO2010127457A1.pdf	2322330 9288800779f71da24a58e291f473d0c56d4110ff	no	53
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14	Non Patent Literature	914001v1_Teledyne_Merla.pdf	4480778 430e333bef57ff52e4b29d1f7b2dac6f03d19e92	no	40
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15	Non Patent Literature	914000v1_Pengo_Catalog.pdf	1501916 4808459b1029acd8c68f52f167783ee51b70a748	no	12
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16	Non Patent Literature	913999v1_MAP.pdf	2204883 db883e66d5604d7a4281c848f7ca0bbba7e4f610	no	46
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17	Non Patent Literature	913998v1_Lovejoy.pdf	1076629 7d8c7386c1ddb9598afed669289ad656a71560ac	no	30
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20	Non Patent Literature	Garfield_1_part_1.pdf	992527 559fe2dc2df467911f1e2e3f8aefee016733a392	no	4
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22	Non Patent Literature	913993v1_Garfield_2.pdf	658636 905f2c5c621f3927cc27a62b55649afa90b869cb	no	6
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25	Non Patent Literature	913990v1_Baker_Hughes_Baker_Oil_Tools_Workover_System.pdf	1891191 fd1d8f7632bfd5a39cb231d8f1ab4244b333a861	no	3
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BOTTOM SET DOWNHOLE PLUG

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of U.S. Patent Application having Serial No. 12/317,497, filed December 23, 2008, the entirety of which is incorporated by reference herein.

BACKGROUND

Field

[0002] Embodiments described generally relate to downhole tools. More particularly, embodiments described relate to downhole tools that are set within a wellbore with a lower shear mechanism.

Description of the Related Art

[0003] Bridge plugs, packers, and frac plugs are downhole tools that are typically used to permanently or temporarily isolate one wellbore zone from another. Such isolation is often necessary to pressure test, perforate, frac, or stimulate a zone of the wellbore without impacting or communicating with other zones within the wellbore. To reopen and/or restore fluid communication through the wellbore, plugs are typically removed or otherwise compromised.

[0004] Permanent, non-retrievable plugs and/or packers are typically drilled or milled to remove. Most non-retrievable plugs are constructed of a brittle material such as cast iron, cast aluminum, ceramics, or engineered composite materials, which can be drilled or milled. Problems sometimes occur, however, during the removal or drilling of such non-retrievable plugs. For instance, the non-retrievable plug components can bind upon the drill bit, and rotate within the casing string. Such binding can result in extremely long drill-out times, excessive casing wear, or both. Long drill-out times are highly undesirable, as rig time is typically charged by the hour.

[0005] In use, non-retrievable plugs are designed to perform a particular function. A bridge plug, for example, is typically used to seal a wellbore such that fluid is prevented from flowing from one side of the bridge plug to the other. On the other hand, drop ball plugs

allow for the temporary cessation of fluid flow in one direction, typically in the downhole direction, while allowing fluid flow in the other direction. Depending on user preference, one plug type may be advantageous over another, depending on the completion and/or production activity.

[0006] Certain completion and/or production activities may require several plugs run in series or several different plug types run in series. For example, one well may require three bridge plugs and five drop ball plugs, and another well may require two bridge plugs and ten drop ball plugs for similar completion and/or production activities. Within a given completion and/or production activity, the well may require several hundred plugs and/or packers depending on the productivity, depths, and geophysics of each well. The uncertainty in the types and numbers of plugs that might be required typically leads to the over-purchase and/or under-purchase of the appropriate types and numbers of plugs resulting in fiscal inefficiencies and/or field delays.

[0007] There is a need, therefore, for a downhole tool that can effectively seal the wellbore at wellbore conditions; be quickly, easily, and/or reliably removed from the wellbore; and configured in the field to perform one or more functions.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Non-limiting, illustrative embodiments are depicted in the drawings, which are briefly described below. It is to be noted, however, that these illustrative drawings illustrate only typical embodiments and are not to be considered limiting of its scope, for the invention can admit to other equally effective embodiments.

[0009] Figure 1A depicts a partial section view of an illustrative insert for use with a plug for downhole use, according to one or more embodiments described.

[0010] Figure 1B depicts a partial section view of another illustrative embodiment of the insert for use with a plug for downhole use, according to one or more embodiments described.

[0011] Figure 2A depicts a partial section view of an illustrative plug configured with the insert of Figure 1, according to one or more embodiments described.

[0012] Figure 2B depicts a partial section view of the illustrative plug configured with the insert of Figure 1 and a flapper valve, according to one or more embodiments described.

[0013] Figure 2C depicts a partial section view of another illustrative plug with a lower shear mechanism disposed directly on the plug body, according to one or more embodiments.

[0014] Figure 3A depicts a partial section view of the plug of Figure 2A located within a casing prior to installation, according to one or more embodiments described.

[0015] Figure 3B depicts a partial section view of the plug of Figure 2B located within the casing prior to installation, according to one or more embodiments described.

[0016] Figure 3C depicts a partial section view of the plug of Figure 2A located in an expanded or actuated position within the casing, according to one or more embodiments described.

[0017] Figure 3D depicts a partial section view of the plug of Figure 2B located in an expanded or actuated position within the casing, according to one or more embodiments described.

[0018] Figure 4 depicts a partial section view of the expanded plug depicted in Figures 3C and 3D, according to one or more embodiments described.

[0019] Figure 5 depicts an illustrative, complementary set of angled surfaces that function as anti-rotation features to interact and/or engage between a first plug and a second plug in series, according to one or more embodiments described.

[0020] Figure 6 depicts an illustrative, dog clutch anti-rotation feature, allowing a first plug and a second plug to interact and/or engage in series according to one or more embodiments described.

[0021] Figure 7 depicts an illustrative, complementary set of flats and slots that serve as anti-rotation features to interact and/or engage between a first plug and a second plug in series, according to one or more embodiments described.

[0022] Figure 8 depicts another illustrative, complementary set of flats and slots that serve as anti-rotation features to interact and/or engage between a first plug and a second plug in series, according to one or more embodiments described.

DETAILED DESCRIPTION

[0023] A plug for isolating a wellbore is provided. The plug can include one or more lower shear or shearable mechanisms for connecting to a setting tool. The lower shear or shearable mechanism can be located directly on the body of the plug or on a separate component or insert that is placed within the body of the plug. The lower shear or shearable mechanism is adapted to engage a setting tool and release the setting tool when exposed to a predetermined stress that is sufficient to deform the shearable threads to release the setting tool but is less than a stress sufficient to break the plug body. The term "stress" and "force" are used interchangeably, and are intended to refer to a system of forces that may in include axial force, radial force, and/or a combination thereof. The terms "shear mechanism" and "shearable mechanism" are used interchangeably, and are intended to refer to any component, part, element, member, or thing that shears or is capable of shearing at a predetermined stress that is less than the stress required to shear the body of the plug. The term "shear" means to fracture, break, or otherwise deform thereby releasing two or more engaged components, parts, or things or thereby partially or fully separating a single component into two or more components/pieces. The term "plug" refers to any tool used to permanently or temporarily isolate one wellbore zone from another, including any tool with blind passages, plugged mandrels, as well as open passages extending completely therethrough and passages that are blocked with a check valve. Such tools are commonly referred to in the art as "bridge plugs," "frac plugs," and/or "packers." And such tools can be a single assembly (i.e. one plug) or two or more assemblies (i.e. two or more plugs) disposed within a work string or otherwise connected thereto that is run into a wellbore on a wireline, slickline, production tubing, coiled tubing or any technique known or yet to be discovered in the art.

[0024] Figure 1A depicts a partial section view of an illustrative, shearable insert 100 for a plug, according to one or more embodiments. The insert 100 can include a body 102 having a first or upper end 112 and a second or lower end 114. A passageway or bore 110 can be completely or at least partially formed through the body 102. One or more threads 120 can

be disposed or formed on an outer surface of the body 102. The threads 120 can be disposed on the outer surface of the body 102 toward the upper end 112. As discussed in more detail below with reference to Figures 2A-2C and Figures 3A-D, the threads 120 can be used to secure the insert 100 within a surrounding component, such as another insert 100, setting tool, tubing string, plug, or other tool.

[0025] Figure 1B depicts a partial section view of an alternative embodiment of the illustrative, shearable insert 100B for a plug. The insert 100B can include any combination of features of insert 100, and additionally, a ball 150 or other solid impediment can seat against either or both ends of the bore 110 to regulate or check fluid flow therethrough. As depicted in Figure 1B, the body 102 can include a shoulder 155 formed in, coupled to, or otherwise provided, which can be sized to receive the ball 150 and to seal therewith. Accordingly, the ball 150 can seat against the shoulder 155 to restrict fluid flow through the bore 110 from below the insert 100B. An adapter pin 160 can be inserted through the body 102 to cage the ball 150 or other solid impediment in the bore 110, between the pin 160 and the shoulder 155.

[0026] One or more shearable threads 130 can be disposed or formed on an inner surface of the body 102. The shearable threads 130 can be used to couple the insert 100, 100B to another insert 100, 100B, setting tool, tubing string, plug, or other tool. The shearable threads 130 can be located anywhere along the inner surface of the body 102, and are not dependent on the location of the outer threads 120. For example, the location of the shearable threads 130 can be located beneath or above the outer threads 120; toward the first end 112 of the insert 100, 100B, as depicted in Figures 1 and 1B; and/or toward the second end 114 of the insert 100, 100B.

[0027] Any number of shearable threads 130 can be used. The number, pitch, pitch angle, and/or depth of the shearable threads 130 can depend, at least in part, on the operating conditions of the wellbore where the insert 100, 100B will be used. The number, pitch, pitch angle, and/or depth of the shearable threads 130 can also depend, at least in part, on the materials of construction of both the insert 100, 100B and the component, *e.g.*, another insert 100, 100B, a setting tool, another tool, plug, tubing string, *etc.*, to which the insert 100, 100B is connected. The number of threads 130, for example, can range from about 2 to about 100,

such as about 2 to about 50; about 3 to about 25; or about 4 to about 10. The number of threads 130 can also range from a low of about 2, 4, or 6 to a high of about 7, 12, or 20. The pitch between each thread 130 can also vary depending on the force required to shear, break, or otherwise deform the threads 130. The pitch between each thread 130 can be the same or different. For example, the pitch between each thread 130 can vary from about 0.1 mm to about 200 mm; 0.2 mm to about 150 mm; 0.3 mm to about 100 mm; or about 0.1 mm to about 50 mm. The pitch between each thread 130 can also range from a low of about 0.1 mm, 0.2 mm, or 0.3 mm to a high of about 2 mm, 5 mm or 10 mm.

[0028] The shearable threads 130 can be adapted to shear, break, or otherwise deform when exposed to a predetermined stress or force, releasing the component engaged within the body 102. The predetermined stress or force can be less than a stress and/or force required to fracture or break the body 102 of the insert 100, 100B. Upon the threads 130 shearing, breaking, or deforming, the component engaged within the body 102 can be freely removed or separated therefrom.

[0029] Any number of outer threads 120 can be used. The number of outer threads 120, for example, can range from about 2 to about 100, such as about 2 to about 50; about 3 to about 25; or about 4 to about 10. The number of threads 120 can also range from a low of about 2, 4, or 6 to a high of about 7, 12, or 20. The pitch between each thread 120 can also vary. The pitch between each thread 120 can be the same or different. For example, the pitch between each thread 120 can vary from about 0.1 mm to about 200 mm; 0.2 mm to about 150 mm; 0.3 mm to about 100 mm; or about 0.1 mm to about 50 mm. The pitch between each thread 120 can also range from a low of about 0.1 mm, 0.2 mm, or 0.3 mm to a high of about 2 mm, 5 mm or 10 mm.

[0030] The threads 120 and the shearable threads 130 can be right-handed and/or left-handed threads. For example, to facilitate connection of the insert 100, 100B to a setting tool when the setting tool is coupled to, for example, screwed into the insert 100, 100B, the threads 120 can be right-handed threads and the shearable threads 130 can be left-handed threads, or vice versa.

[0031] The outer surface of the insert 100, 100B can have a constant diameter, or its diameter can vary, as depicted in Figures 1A and 1B. For example, the outer surface can include a smaller first diameter portion or area 140 that transitions to a larger, second diameter portion or area 142, forming a ledge or shoulder 144 therebetween. The shoulder 144 can have a first end that is substantially flat, abutting the second diameter 142, a second end that gradually slopes or transitions to the first diameter 140, and can be adapted to anchor the insert into the plug. The shoulder 144 can be formed adjacent the outer threads 120 or spaced apart therefrom, and the outer threads 120 can be above or below the shoulder 144.

[0032] The insert 100, 100B and/or the shearable threads 130 can be made of an alloy that includes brass. Suitable brass compositions include, but are not limited to, admiralty brass, Aich's alloy, alpha brass, alpha-beta brass, aluminum brass, arsenical brass, beta brass, cartridge brass, common brass, dezincification resistant brass, gilding metal, high brass, leaded brass, lead-free brass, low brass, manganese brass, Muntz metal, nickel brass, naval brass, Nordic gold, red brass, rich low brass, tonval brass, white brass, yellow brass, and/or any combinations thereof.

[0033] The insert 100, 100B can also be formed or made from other metallic materials (such as aluminum, steel, stainless steel, copper, nickel, cast iron, galvanized or non-galvanized metals, *etc.*), fiberglass, wood, composite materials (such as ceramics, wood/polymer blends, cloth/polymer blends, etc.), and plastics (such as polyethylene, polypropylene, polystyrene, polyurethane, polyethylethylketone (PEEK), polytetrafluoroethylene (PTFE), polyamide resins (such as nylon 6 (N6), nylon 66 (N66)), polyester resins (such as polybutylene terephthalate (PBT), polyethylene terephthalate (PET), polyethylene isophthalate (PEI), PET/PEI copolymer) polynitrile resins (such as polyacrylonitrile (PAN), polymethacrylonitrile, acrylonitrile-styrene copolymers (AS), methacrylonitrile-styrene copolymers, methacrylonitrile-styrene-butadiene copolymers; and acrylonitrile-butadiene-styrene (ABS)), polymethacrylate resins (such as polymethyl methacrylate and polyethylacrylate), cellulose resins (such as cellulose acetate and cellulose acetate butyrate); polyimide resins (such as aromatic polyimides), polycarbonates (PC), elastomers (such as ethylene-propylene rubber (EPR), ethylene propylene-diene monomer rubber (EPDM), styrenic block copolymers (SBC), polyisobutylene (PIB), butyl rubber, neoprene rubber,

halobutyl rubber and the like)), as well as mixtures, blends, and copolymers of any and all of the foregoing materials.

[0034] Figure 2A depicts a partial section view of an illustrative plug 200 configured with the insert 100, 100B and adapted to receive a ball type impediment or another type of impediment, according to one or more embodiments. The plug 200 can include a mandrel or body 210 having a first or upper end 207 and a second or lower end 208. A passageway or bore 255 can be formed at least partially through the body 210. The body 210 can be a single, monolithic component as shown, or the body 210 can be or include two or more components connected, engaged, or otherwise attached together. The body 210 serves as a centralized support member, made of one or more components or parts, for one or more outer components to be disposed thereon or thereabout.

[0035] The insert 100, 100B can be threaded or otherwise disposed within the plug 200 at a lower end 208 of the body 210. A setting tool, tubing string, plug, or other tool can enter the bore 255 through the first end 207 of the body 210 and can be threaded to or otherwise coupled to and/or disposed within the insert 100. As further described herein, the shearable threads 130 on the insert 100 can be sheared, fractured, or otherwise deformed, releasing the setting tool, tubing string, plug, or other tool from the plug 200.

[0036] The bore 255 can have a constant diameter throughout, or its diameter can vary, as depicted in Figure 2A. For example, the bore 255 can include a larger, first diameter portion or area 226 that transitions to a smaller, second diameter portion or area 227, forming a seat or shoulder 228 therebetween. The shoulder 228 can have a tapered or sloped surface connecting the two diameter portions or areas 226, 227. Although not shown, the shoulder 228 can be flat or substantially flat, providing a horizontal or substantially horizontal surface connecting the two diameters 226, 227. As will be explained in more detail below, the shoulder 228 can serve as a seat or receiving surface for plugging off the bore 255 when a ball (shown in Figure 3C) or other impediment, such as a flapper member 215 (shown in Figures 3D), is placed within the bore 255.

[0037] At least one conical member (two are shown: 230, 235), at least one slip (two are shown: 240, 245), and at least one malleable element 250 can be disposed about the body

210. As used herein, the term "disposed about" means surrounding the component, *e.g.*, the body 210, allowing for relative movement therebetween (*e.g.*, by sliding, rotating, pivoting, or a combination thereof). A first section or second end of the conical members 230, 235 has a sloped surface adapted to rest underneath a complementary sloped inner surface of the slips 240, 245. As explained in more detail below, the slips 240, 245 travel about the surface of the adjacent conical members 230, 235, thereby expanding radially outward from the body 210 to engage an inner surface of a surrounding tubular or borehole. A second section or second end of the conical members 230, 235 can include two or more tapered pedals or wedges adapted to rest about an adjacent malleable element 250. One or more circumferential voids 236 can be disposed within or between the first and second sections of the conical members 230, 235 to facilitate expansion of the wedges about the malleable element 250. The wedges are adapted to hinge or pivot radially outward and/or hinge or pivot circumferentially. The groove or void 236 can facilitate such movement. The wedges pivot, rotate, or otherwise extend radially outward, and can contact an inner diameter of the surrounding tubular or borehole. Additional details of the conical members 230, 235 are described in U.S. Patent No. 7,762,323.

[0038] The inner surface of each slip 240, 245 can conform to the first end of the adjacent conical member 230, 235. An outer surface of the slips 240, 245 can include at least one outwardly-extending serration or edged tooth to engage an inner surface of a surrounding tubular, as the slips 240, 245 move radially outward from the body 210 due to the axial movement across the adjacent conical members 230, 235.

[0039] The slips 240, 245 can be designed to fracture with radial stress. The slips 240, 245 can include at least one recessed groove 242 milled or otherwise formed therein to fracture under stress allowing the slips 240, 245 to expand outward and engage an inner surface of the surrounding tubular or borehole. For example, the slips 240, 245 can include two or more, for example, four, sloped segments separated by equally-spaced recessed grooves 242 to contact the surrounding tubular or borehole.

[0040] The malleable element 250 can be disposed between the conical members 230, 235. A three element 250 system is depicted in Figure 2A, but any number of elements 250 can be used. The malleable element 250 can be constructed of any one or more malleable materials

capable of expanding and sealing an annulus within the wellbore. The malleable element 250 is preferably constructed of one or more synthetic materials capable of withstanding high temperatures and pressures, including temperatures up to 450°F, and pressure differentials up to 15,000 psi. Illustrative materials include elastomers, rubbers, TEFLON®, blends and combinations thereof.

[0041] The malleable element(s) 250 can have any number of configurations to effectively seal the annulus defined between the body 210 and the wellbore. For example, the malleable element(s) 250 can include one or more grooves, ridges, indentations, or protrusions designed to allow the malleable element(s) 250 to conform to variations in the shape of the interior of the surrounding tubular or borehole.

[0042] At least one component, ring, or other annular member 280 for receiving an axial load from a setting tool can be disposed about the body 210 adjacent a first end of the slip 240. The annular member 280 for receiving the axial load can have first and second ends that are substantially flat. The first end can serve as a shoulder adapted to abut a setting tool (not shown). The second end can abut the slip 240 and transmit axial forces therethrough.

[0043] Each end of the plug 200 can be the same or different. Each end of the plug 200 can include one or more anti-rotation features 270, disposed thereon. Each anti-rotation feature 270 can be screwed onto, formed thereon, or otherwise connected to or positioned about the body 210 so that there is no relative motion between the anti-rotation feature 270 and the body 210. Alternatively, each anti-rotation feature 270 can be screwed onto or otherwise connected to or positioned about a shoe, nose, cap, or other separate component, which can be made of composite, that is screwed onto threads, or otherwise connected to or positioned about the body 210 so that there is no relative motion between the anti-rotation feature 270 and the body 210. The anti-rotation feature 270 can have various shapes and forms. For example, the anti-rotation feature 270 can be or can resemble a mule shoe shape (not shown), half-mule shoe shape (illustrated in Figure 5), flat protrusions or flats (illustrated in Figures 7 and 8), clutches (illustrated in Figure 6), or otherwise angled surfaces 285, 290, 295 (illustrated in Figures 2A, 2B, 2C, 3A, 3B, 3C, 3D and 5).

[0044] As explained in more detail below, the anti-rotation features 270 are intended to engage, connect, or otherwise contact an adjacent plug, whether above or below the adjacent plug, to prevent or otherwise retard rotation therebetween, facilitating faster drill-out or mill times. For example, the angled surfaces 285, 290 at the bottom of a first plug 200 can engage the sloped surface 295 at the top of a second plug 200 in series, so that relative rotation therebetween is prevented or greatly reduced.

[0045] A pump down collar 275 can be located about a lower end of the plug 200 to facilitate delivery of the plug 200 into the wellbore. The pump down collar 275 can be a rubber O-ring or similar sealing member to create an impediment in the wellbore during installation, so that a push surface or resistance can be created.

[0046] Figure 2B depicts a partial section view of the illustrative plug 200 configured with a flapper-type impediment for regulating flow through the bore 255, according to one or more embodiments. The flapper-type impediment can include a flapper member 215 connected to the body 210 using one or more pivot pins 216. The flapper member 215 can be flat or substantially flat. Alternatively, the flapper member 215 can have an arcuate shape, with a convex upper surface and a concave lower surface. A spring (not shown) can be disposed about the one or more pivot pins 216 to urge the flapper member 215 from a run-in ("first" or "open") position wherein the flapper member 215 does not obstruct the bore 255 through the plug 200, to an operating ("second" or "closed") position, as depicted in Figure 2B, where the flapper member 215 assumes a position proximate to the shoulder or valve seat 228, transverse to the bore 255 of the plug 200. At least a portion of the spring can be disposed upon or across the upper surface of the flapper member 215 providing greater contact between the spring and the flapper member 215, offering greater leverage for the spring to displace the flapper member 215 from the run-in position to the operating position. In the run-in position, bi-directional, *e.g.*, upward and downward or side to side, fluid communication through the plug 200 can occur. In the operating position, unidirectional, *e.g.*, upward. as shown.

[0047] As used herein the term "arcuate" refers to any body, member, or thing having a cross-section resembling an arc. For example, a flat, elliptical member with both ends along the major axis turned downwards by a generally equivalent amount can form an arcuate

member. The terms "up" and "down"; "upward" and "downward"; "upper" and "lower"; "upwardly" and "downwardly"; "upstream" and "downstream"; "above" and "below"; and other like terms as used herein refer to relative positions to one another and are not intended to denote a particular spatial orientation since the tool and methods of using same can be equally effective in either horizontal or vertical wellbore uses. Additional details of a suitable flapper assembly can be found in U.S. Patent No. 7,708,066, which is incorporated by reference herein in its entirety.

[0048] Figure 2C depicts a partial section view of another illustrative plug 200 with a lower shear mechanism disposed directly on the plug body, according to one or more embodiments. This is an alternative configuration where one or more shearable threads 130A are formed directly on the inner surface of the bore 255. No insert 100, 100B is needed. The shearable threads 130A can be made of the same composite material as the body 210 of the plug 200, or can be made from a different material.

[0049] Any number of shearable threads 130A can be used. The number of shearable threads 130A can depend, at least in part, on the operating conditions and/or environment of the wellbore where the plug 200 will be used. The number of threads 130A, for example, can range from about 2 to about 100, such as about 2 to about 50; about 3 to about 25; or about 4 to about 10. The number of threads 130A can also range from a low of about 2, 4, or 6 to a high of about 7, 12, or 20.

[0050] The pitch of the threads 130A can also vary depending on the force required to shear, break, or otherwise deform the threads 130A. The pitch of the threads 130A can be the same or different. For example, the spacing between each thread 130A can vary from about 0.1 mm to about 200 mm; 0.2 mm to about 150 mm; 0.3 mm to about 100 mm; or about 0.1 mm to about 50 mm. The spacing between each thread 120 can also range from a low of about 0.1 mm, 0.2 mm, or 0.3 mm to a high of about 2 mm, 5 mm or 10 mm.

[0051] The shearable threads 130A can be adapted to shear, break, or otherwise deform when exposed to a predetermined stress or force, releasing the component engaged within the body 210. The predetermined stress or force is preferably less than a stress or force required to fracture, break, or otherwise significantly deform the body 210. Upon the threads 130A

shearing, breaking, or deforming, the component engaged within the plug 200 can be freely removed or separated therefrom. The component engaged within the plug 200 via the shearable threads 130A or insert 100 will typically be a rod or extender from a setting tool used to install the plug 200 within a wellbore.

[0052] Figure 3A depicts a partial section view of the plug 200 depicted in Figure 2A, prior to installation or actuation but after being disposed within casing 300, according to one or more embodiments. Figure 3B depicts a partial section view of the plug 200 depicted in Figure 2B, prior to installation or actuation but after being disposed within casing 300, according to one or more embodiments.

[0053] The plug 200 can be installed in a vertical, horizontal, or deviated wellbore using any suitable setting tool adapted to engage the plug 200. One example of such a suitable setting tool or assembly includes a gas operated outer cylinder powered by combustion products and an adapter rod. The outer cylinder of the setting tool abuts an outer, upper end of the plug 200, such as against the annular member 280. The outer cylinder can also abut directly against the upper slip 240, for example, in embodiments of the plug 200 where the annular member 280 is omitted, or where the outer cylinder fits over or otherwise avoids bearing on the annular member 280. The adapter rod 310 is threadably connected to the body 210 and/or the insert 100. Suitable setting assemblies that are commercially-available include the Owen Oil Tools wireline pressure setting assembly or a Model 10, 20 E-4, or E-5 Setting Tool available from Baker Oil Tools, for example.

[0054] During the setting process, the outer cylinder (not shown) of the setting tool exerts an axial force against the outer, upper end of the plug 200 in a downward direction that is matched by the adapter rod 310 of the setting tool exerting an equal and opposite force from the lower end of the plug 200 in an upward direction. For example, in the embodiment illustrated in Figures 3A and 3B, the outer cylinder of the setting assembly exerts an axial force on the annular member 280, which translates the force to the slips 240, 245 and the malleable elements 250 that are disposed about the body 210 of the plug 200. The translated force fractures the recessed groove(s) 242 of the slips 240, 245, allowing the slips 240, 245 to expand outward and engage the inner surface of the casing or wellbore 300, while at the same time compresses the malleable elements 250 to create a seal between the plug 200 and the

inner surface of the casing or wellbore 300, as shown in Figure 4. Figure 4 depicts an illustrative partial section view of the expanded or actuated plug 200, according to one or more embodiments described.

[0055] After actuation or installation of the plug 200, the setting tool can be released from the shearable threads 130, 130A of the plug 200, or the insert 100 that is screwed into the plug 200 by continuing to apply the opposing, axial forces on the body 210 via the adapter rod 310 and the outer cylinder. The opposing, axial forces applied by the outer cylinder and the adapter rod 310 result in a compressive load on the body 210, which is borne as internal stress once the plug 200 is actuated and secured within the casing or wellbore 300. The force or stress is focused on the shearable threads 130, 130A, which will eventually shear, break, or otherwise deform at a predetermined amount, releasing the adapter rod 310 therefrom. The predetermined axial force sufficient to deform the shearable threads 130 and/or 130A to release the setting tool is less than an axial force sufficient to break the plug body 210.

[0056] Using a lower set mechanism, be it the insert 100 or shearable threads 130A directly on the body 210, allows the plug 200 to be squeezed from opposing ends. This provides a more balanced and efficient translation of force to the moveable components about the body 210, and reduces the stress directly applied to the body 210 itself. As such, the body 210 and a majority of the outer components of the plug 200 can be made of a softer, drillable material, such as a composite material, since the stress being asserted thereon during the setting process is reduced. Conventional cast iron and other metallic plugs are set from the upper end of the plug, which translates all of the force needed to squeeze and actuate the plug on the plug body itself. As such, the plug body had to be constructed of a more rigid material capable of withstanding such stress and torque. The lower set mechanism described herein, however, alleviates the torque and stress on the plug body 210, allowing the plug body 210 to be made of lighter, more easily drillable, non-metallic materials.

[0057] Once actuated and released from the setting tool, the plug 200 is left in the wellbore to serve its purpose, as depicted in Figures 3C and 3D. For example, a ball 320 can be dropped in the wellbore to constrain, restrict, and/or prevent fluid communication in a first direction through the body 210. For example, the dropped ball 320 can rest on the transition or ball seat 228 to form an essentially fluid-tight seal therebetween, as depicted in Figure 3C,

preventing downward fluid flow through the plug 200 ("the first direction") while allowing upward fluid flow through the plug 200 ("the second direction"). Alternatively, the flapper member 215 can rotate toward the closed position to constrain, restrict, and/or prevent downward fluid flow through the plug 200 ("the first direction") while allowing upward fluid flow through the plug 200 ("the second direction"), as depicted in Figure 3D.

[0058] The ball 150, 320 or the flapper member 215 can be fabricated from one or more decomposable materials. Suitable decomposable materials will decompose, degrade, degenerate, or otherwise fall apart at certain wellbore conditions or environments, such as predetermined temperature, pressure, pH, and/or any combinations thereof. As such, fluid communication through the plug 200 can be prevented for a predetermined period of time, *e.g.*, until and/or if the decomposable material(s) degrade sufficiently allowing fluid flow therethrough. The predetermined period of time can be sufficient to pressure test one or more hydrocarbon-bearing zones within the wellbore. In one or more embodiments, the predetermined period of time can be sufficient to workover the associated well. The predetermined period of time can range from minutes to days. For example, the degradable rate of the material can range from about 5 minutes, 40 minutes, or 4 hours to about 12 hours, 24 hours or 48 hours. Extended periods of time are also contemplated.

[0059] The pressures at which the ball 150, 320 or the flapper member 215 decompose can range from about 100 psig to about 15,000 psig. For example, the pressure can range from a low of about 100 psig, 1,000 psig, or 5,000 psig to a high about 7,500 psig, 10,000 psig, or about 15,000 psig. The temperatures at which the ball 320 or the flapper member 215 decompose can range from about 100°F to about 750°F. For example, the temperature can range from a low of about 100°F, 150°F, or 200°F to a high of about 350°F, 500°F, or 750°F.

[0060] The decomposable material can be soluble in any material, such as soluble in water, polar solvents, non-polar solvents, acids, bases, mixtures thereof, or any combination thereof. The solvents can be time-dependent solvents. A time-dependent solvent can be selected based on its rate of degradation. For example, suitable solvents can include one or more solvents capable of degrading the soluble components in about 30 minutes, 1 hour, or 4 hours to about 12 hours, 24 hours, or 48 hours. Extended periods of time are also contemplated.

[0061] The pHs at which the ball 150, 320 or the flapper member 215 can decompose can range from about 1 to about 14. For example, the pH can range from a low of about 1, 3, or 5 to a high about 9, 11, or about 14.

[0062] To remove the plug 200 from the wellbore, the plug 200 can be drilled-out, milled, or otherwise compromised. As it is common to have two or more plugs 200 located in a single wellbore to isolate multiple zones therein, during removal of one or more plugs 200 from the wellbore some remaining portion of a first, upper plug 200 can release from the wall of the wellbore at some point during the drill-out. Thus, when the remaining portion of the first, upper plug 200 falls and engages an upper end of a second, lower plug 200, the anti-rotation features 270 of the remaining portions of the plugs 200 will engage and prevent, or at least substantially reduce, relative rotation therebetween.

[0063] Figures 5-8 depict schematic views of illustrative anti-rotation features that can be used with the plugs 200 to prevent or reduce rotation during drill-out. These features are not intended to be exhaustive, but merely illustrative, as there are many other configurations that are effective to accomplish the same results. Each end of the plug 200 can be the same or different. For example, Figure 5 depicts angled surfaces or half-mule anti-rotation features; Figure 6 depicts dog clutch type anti-rotation features; and Figures 7 and 8 depict two flat and slot type anti-rotation features.

[0064] Referring to Figure 5, a lower end of an upper plug 500A and an upper end of a lower plug 500B are shown within the casing 300 where the angled surfaces 285, 290 interact with, interface with, interconnect, interlock, link with, join, jam with or within, wedge between, or otherwise communicate with a complementary angled surface 295 and/or at least a surface of the wellbore or casing 300. The interaction between the lower end of the upper plug 500A and the upper end of the lower plug 500B and/or the casing 300 can counteract a torque placed on the lower end of the upper plug 500A, and prevent or greatly reduce rotation therebetween. For example, the lower end of the upper plug 500A can be prevented from rotating within the wellbore or casing 300 by the interaction with upper end of the lower plug 500B, which is held securely within the casing 300.

[0065] Referring to Figure 6, dog clutch surfaces of the upper plug 600A can interact with, interface with, interconnect, interlock, link with, join, jam with or within, wedge between, or otherwise communicate with a complementary dog clutch surface of the lower plug 600B and/or at least a surface of the wellbore or casing 300. The interaction between the lower end of the upper plug 600A and the upper end of the lower plug 600B and/or the casing 300 can counteract a torque placed on the lower end of the upper plug 600A, and prevent or greatly reduce rotation therebetween. For example, the lower end of the upper plug 600A can be prevented from rotating within the wellbore or casing 300 by the interaction with upper end of the lower plug 600B, which is held securely within the casing 300.

[0066] Referring to Figure 7, the flats and slot surfaces of the upper plug 700A can interact with, interface with, interconnect, interlock, link with, join, jam with or within, wedge between, or otherwise communicate with complementary flats and slot surfaces of the lower plug 700B and/or at least a surface of the wellbore or casing 300. The interaction between the lower end of the upper plug 700A and the upper end of the lower plug 700B and/or the casing 300 can counteract a torque placed on the lower end of the upper plug 700A, and prevent or greatly reduce rotation therebetween. For example, the lower end of the upper plug 700A can be prevented from rotating within the wellbore or casing 300 by the interaction with upper end of the lower plug 700B, which is held securely within the casing 300. The protruding perpendicular surfaces of the lower end of the upper plug 700A can mate in the perpendicular voids of the upper end of the lower plug 700B. When the lower end of the upper plug 700A and the upper end of the lower plug 700B are mated, any further rotational force applied to the lower end of the upper plug 700A will be resisted by the engagement of the lower plug 700B with the wellbore or casing 300, translated through the mated surfaces of the anti-rotation feature 270, allowing the lower end of the upper plug 700A to be more easily drilled-out of the wellbore.

[0067] One alternative configuration of flats and slot surfaces is depicted in Figure 8. The protruding cylindrical or semi-cylindrical surfaces 810 perpendicular to the base 801 of the lower end of the upper plug 800A mate with the complementary aperture(s) 820 in the complementary base 802 of the upper end of the lower plug 800B. Protruding surfaces 810 can have any geometry perpendicular to the base 801, as long as the complementary aperture(s) 820 match the geometry of the protruding surfaces 801 so that the surfaces 801

can be threaded into the aperture(s) 820 with sufficient material remaining in the complementary base 802 to resist rotational force that can be applied to the lower end of the upper plug 800A, and thus translated to the complementary base 802 by means of the protruding surfaces 801 being inserted into the aperture(s) 820 of the complementary base 802. The anti-rotation feature 270 may have one or more protrusions or apertures 830, as depicted in Figure 8, to guide, interact with, interface with, interconnect, interlock, link with, join, jam with or within, wedge between, or otherwise communicate or transmit force between the lower end of the upper plug 800A and the upper end of the lower plug 800B. The protrusion or aperture 830 can be of any geometry practical to further the purpose of transmitting force through the anti-rotation feature 270.

[0068] The orientation of the components of the anti-rotation features 270 depicted in all figures is arbitrary. Because plugs 200 can be installed in horizontal, vertical, and deviated wellbores, either end of the plug 200 can have any anti-rotation feature 270 geometry, wherein a single plug 200 can have one end of a first geometry and one end of a second geometry. For example, the anti-rotation feature 270 depicted in Figure 5 can include an alternative embodiment where the lower end of the upper plug 500A is manufactured with geometry resembling 500B and vice versa. Each end of each plug 200 can be or include angled surfaces, half-mule, mule shape, dog clutch, flat and slot, cleated, slotted, spiked, and/or other interdigitating designs. In the alternative to a plug with complementary anti-rotation feature 270 geometry on each end of the plug 200, a single plug 200 can include two ends of differently-shaped anti-rotation features, such as the upper end may include a half-mule anti-rotation feature 270, and the lower end of the same plug 200 may include a dog clutch type anti-rotation feature 270. Further, two plugs 200 in series may each comprise only one type of anti-rotation feature 270 each, however the interface between the two plugs 200 may result in two different anti-rotation feature 270 geometries that can interface with, interconnect, interlock, link with, join, jam with or within, wedge between, or otherwise communicate or transmit force between the lower end of the upper plug 200 with the first geometry and the upper end of the lower plug 200 with the second geometry.

[0069] Any of the aforementioned components of the plug 200, including the body, rings, cones, elements, shoe, anti-rotation features, *etc.*, can be formed or made from any one or more non-metallic materials or one or more metallic materials (such as aluminum, steel,

stainless steel, brass, copper, nickel, cast iron, galvanized or non-galvanized metals, *etc.*). Suitable non-metallic materials include, but are not limited to, fiberglass, wood, composite materials (such as ceramics, wood/polymer blends, cloth/polymer blends, *etc.*), and plastics (such as polyethylene, polypropylene, polystyrene, polyurethane, polyethylethylketone (PEEK), polytetrafluoroethylene (PTFE), polyamide resins (such as nylon 6 (N6), nylon 66 (N66)), polyester resins (such as polybutylene terephthalate (PBT), polyethylene terephthalate (PET), polyethylene isophthalate (PEI), PET/PEI copolymer) polynitrile resins (such as polyacrylonitrile (PAN), polymethacrylonitrile, acrylonitrile-styrene copolymers (AS), methacrylonitrile-styrene copolymers, methacrylonitrile-styrene-butadiene copolymers; and acrylonitrile-butadiene-styrene (ABS)), polymethacrylate resins (such as polymethyl methacrylate and polyethylacrylate), cellulose resins (such as cellulose acetate and cellulose acetate butyrate); polyimide resins (such as aromatic polyimides), polycarbonates (PC), elastomers (such as ethylene-propylene rubber (EPR), ethylene propylene-diene monomer rubber (EPDM), styrenic block copolymers (SBC), polyisobutylene (PIB), butyl rubber, neoprene rubber, halobutyl rubber and the like)), as well as mixtures, blends, and copolymers of any and all of the foregoing materials.

[0070] However, as many components as possible are made from one or more non-metallic materials, and preferably made from one or more composite materials. Desirable composite materials can be or include polymeric composite materials that are wound and/or reinforced by one or more fibers such as glass, carbon, or aramid, for example. The individual fibers can be layered parallel to each other, and wound layer upon layer. Each individual layer can be wound at an angle of from about 20 degrees to about 160 degrees with respect to a common longitudinal axis, to provide additional strength and stiffness to the composite material in high temperature and/or pressure downhole conditions. The particular winding phase can depend, at least in part, on the required strength and/or rigidity of the overall composite material.

[0071] The polymeric component of the composite can be an epoxy blend. The polymer component can also be or include polyurethanes and/or phenolics, for example. In one aspect, the polymeric composite can be a blend of two or more epoxy resins. For example, the polymeric composite can be a blend of a first epoxy resin of bisphenol A and epichlorohydrin and a second cycoaliphatic epoxy resin. Preferably, the cycloaphatic epoxy

resin is ARALDITE® RTM liquid epoxy resin, commercially available from Ciga-Geigy Corporation of Brewster, N.Y. A 50:50 blend by weight of the two resins has been found to provide the suitable stability and strength for use in high temperature and/or pressure applications. The 50:50 epoxy blend can also provide suitable resistance in both high and low pH environments.

[0072] The fibers can be wet wound. A prepreg roving can also be used to form a matrix. The fibers can also be wound with and/or around, spun with and/or around, molded with and/or around, or hand laid with and/or around a metallic material or two or more metallic materials to create an epoxy impregnated metal or a metal impregnated epoxy.

[0073] A post cure process can be used to achieve greater strength of the material. A suitable post cure process can be a two stage cure having a gel period and a cross-linking period using an anhydride hardener, as is commonly known in the art. Heat can be added during the curing process to provide the appropriate reaction energy that drives the cross-linking of the matrix to completion. The composite may also be exposed to ultraviolet light or a high-intensity electron beam to provide the reaction energy to cure the composite material.

[0074] Certain embodiments and features have been described using a set of numerical upper limits and a set of numerical lower limits. It should be appreciated that ranges from any lower limit to any upper limit are contemplated unless otherwise indicated. Certain lower limits, upper limits and ranges appear in one or more claims below. All numerical values are "about" or "approximately" the indicated value, and take into account experimental error and variations that would be expected by a person having ordinary skill in the art.

[0075] Various terms have been defined above. To the extent a term used in a claim is not defined above, it should be given the broadest definition persons in the pertinent art have given that term as reflected in at least one printed publication or issued patent. Furthermore, all patents, test procedures, and other documents cited in this application are fully incorporated by reference to the extent such disclosure is not inconsistent with this application and for all jurisdictions in which such incorporation is permitted.

[0076] While the foregoing is directed to embodiments of the present invention, other and further embodiments of the invention can be devised without departing from the basic scope thereof, and the scope thereof is determined by the claims that follow.

Claims:

What is claimed is:

1. A plug for isolating a wellbore, comprising:

a body having a first end and a second end, wherein the body is formed from one or more composite materials;

at least one malleable element disposed about the body;

at least one slip disposed about the body;

at least one conical member disposed about the body; and

one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof, wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof, and wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and adapted to release the setting tool when exposed to a predetermined axial force.

2. The plug of claim 1, wherein the shearable threads are composite and the predetermined axial force sufficient to deform the shearable threads to release the setting tool is less than an axial force sufficient to break the body.

3. The plug of claim 1, wherein the body is adapted to receive an impediment that restricts fluid flow in at least one direction through the body.

4. The plug of claim 3, wherein the impediment is a ball.

5. The plug of claim 3, wherein the impediment is a flapper valve disposed within the body, wherein the flapper valve is adapted to restrict fluid flow in at least one direction through the body.

6. The plug of claim 3, wherein the impediment is degradable at a predetermined temperature, pressure, pH, or a combination thereof.

7. The plug of claim 1, wherein the first end of the body comprises an anti-rotation feature formed thereon.

8. The plug of claim 1, wherein the second end of the body comprises an anti-rotation feature disposed thereon.

9. The plug of claim 1, wherein the first and second ends of the body each comprises an anti-rotation feature disposed thereon, and the anti-rotation features are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween.

10. The plug of claim 1, wherein the plug is a frac plug.

11. The plug of claim 10, wherein each anti-rotation feature is individually selected from the group consisting of a taper, a mule shoe, a half-mule shoe, flat protrusions or flats, flats and slots, clutches, and one or more angled surfaces.

12. A plug for isolating a wellbore, comprising:

a body having a first end and a second end, wherein the body is formed from one or more composite materials;

at least one malleable element disposed about the body;

at least one slip disposed about the body;

at least one conical member disposed about the body; and

a brass insert screwed into the body proximate the second end of the body and adapted to receive a setting tool that enters the body through the first end thereof, wherein:

the insert comprises one or more shearable threads disposed on an inner surface thereof;

the one or more shearable threads are adapted to engage the setting tool; and

the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined axial force.

13. The plug of claim 12, wherein the outer surface of the brass insert has a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the brass insert within the body.

14. The plug of claim 12, wherein the first and second ends of the body each comprise anti-rotation features formed thereon, and the anti-rotation features of the first and second ends of the body are complementary and adapted to engage each other when two plugs are located in series, preventing relative rotation therebetween.

15. The plug of claim 12, wherein the body is adapted to receive a ball that restricts fluid flow in at least one direction through the body.

16. The plug of claim 12, wherein the predetermined axial force to release the setting tool is less than an axial force required to break the body.

17. The plug of claim 12, wherein the plug is a frac plug.

18. A shearable insert for a plug, comprising:

a body comprising brass, cast iron, or a combination thereof;

one or more threads disposed on an outer surface of the body, the one or more threads adapted to couple with one or more threads of the plug; and

one or more shearable threads disposed on an inner surface of the body, the shearable threads adapted to couple with one or more threads of a setting tool and release the setting tool when exposed to a predetermined axial force.

19. The insert of claim 18, wherein the outer surface of the body comprises a larger diameter and a smaller diameter forming a shoulder therebetween, the shoulder adapted to anchor the body within the plug.

20. The insert of claim 18, wherein the body is made of brass, and the plug is a frac plug.

ABSTRACT

A plug for isolating a wellbore. The plug can include a body having a first end and a second end, wherein the body is formed from one or more composite materials and adapted to receive a setting tool through the first end thereof, at least one malleable element disposed about the body, at least one slip disposed about the body, at least one conical member disposed about the body, and one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof, wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof, and wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and adapted to release the setting tool when exposed to a predetermined axial force.

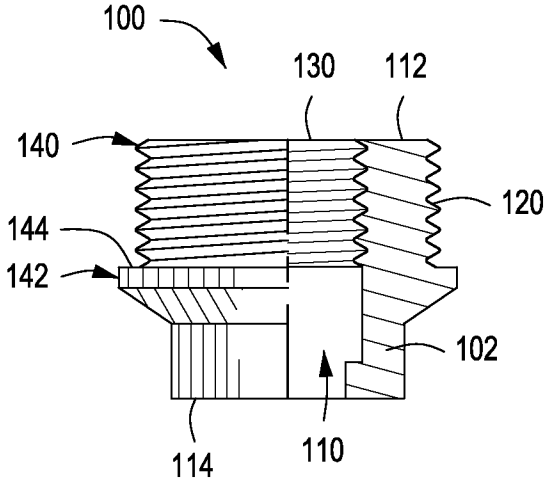

FIG. 1A

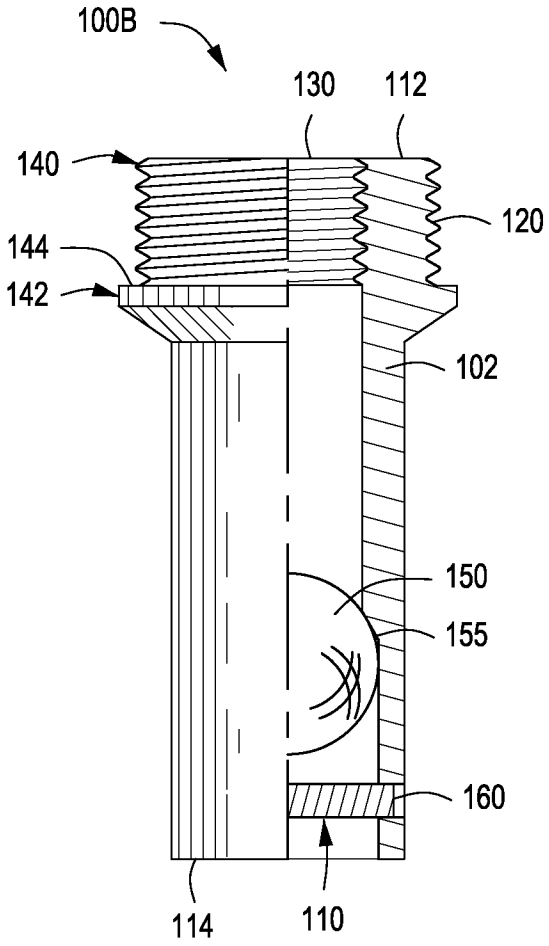

FIG. 1B

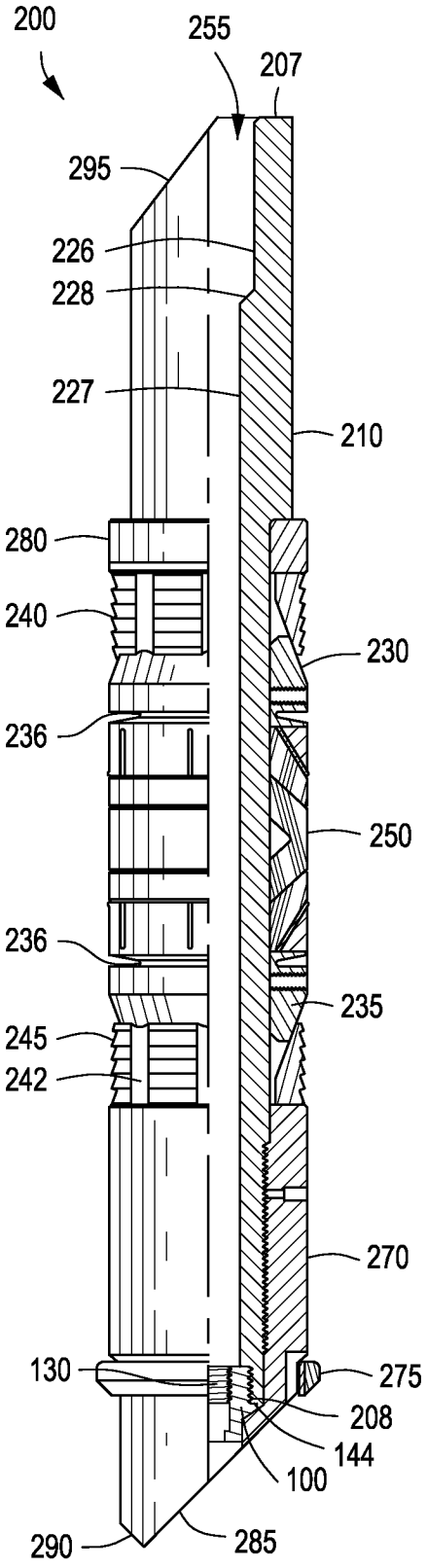

FIG. 2A

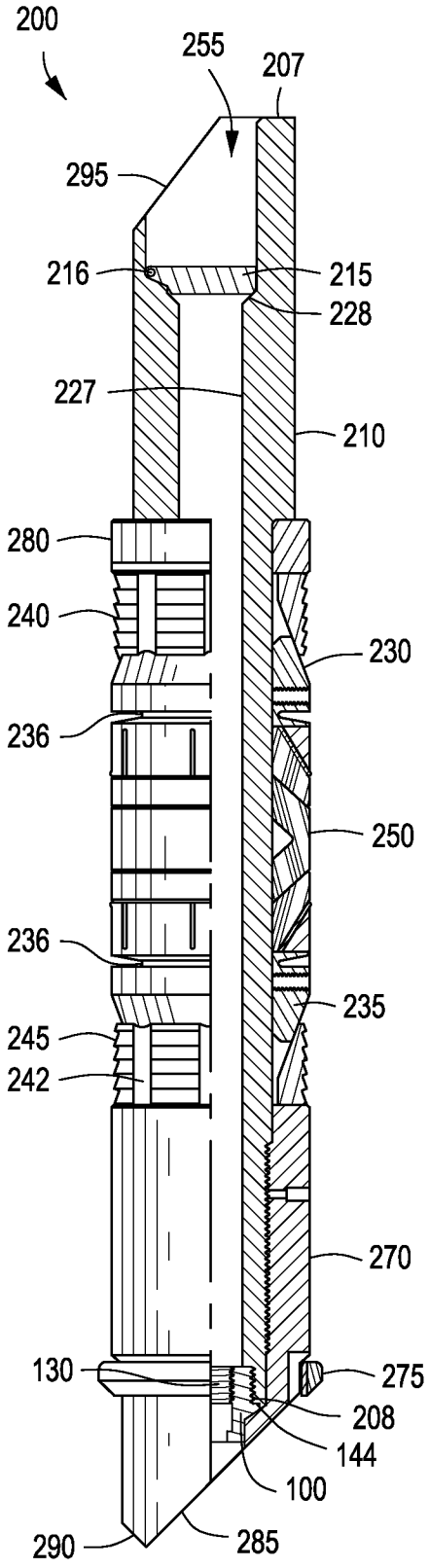
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FIG. 2B

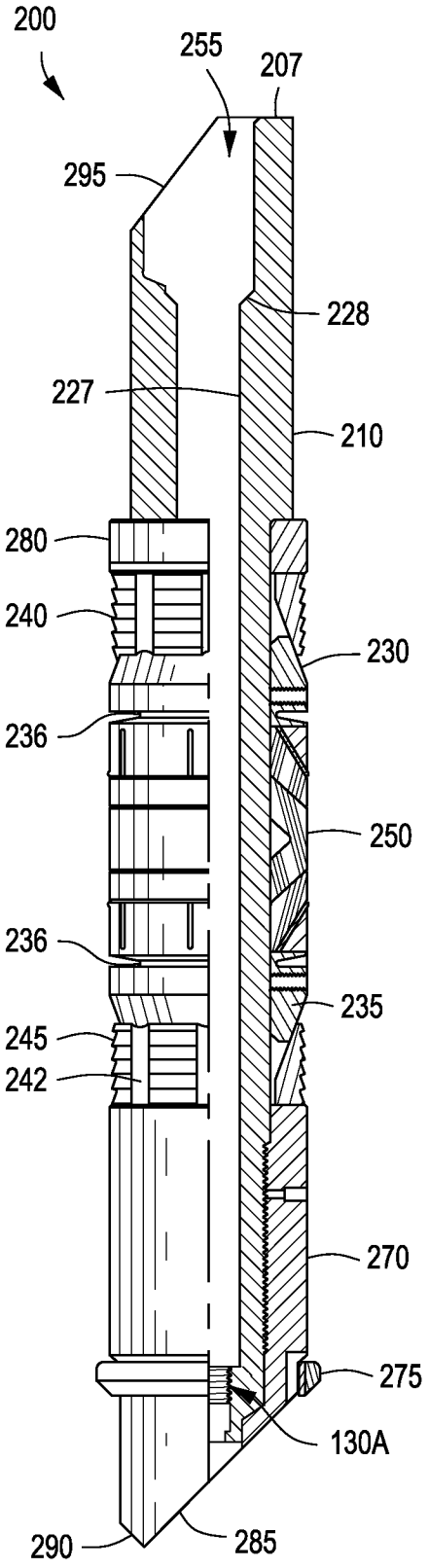
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FIG. 2C

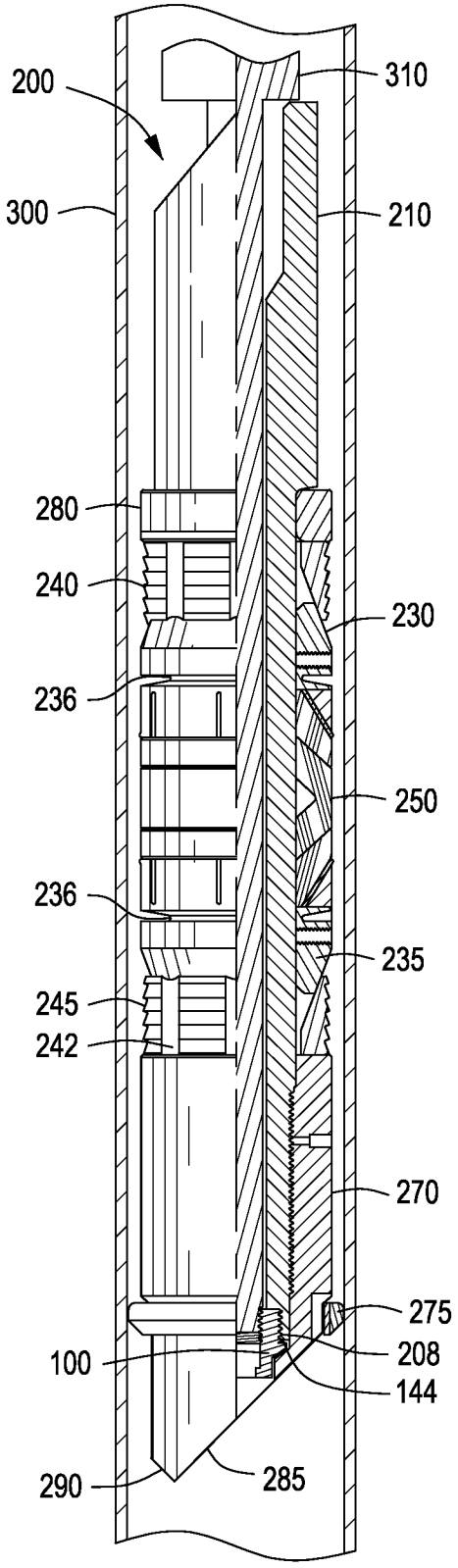
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FIG. 3A

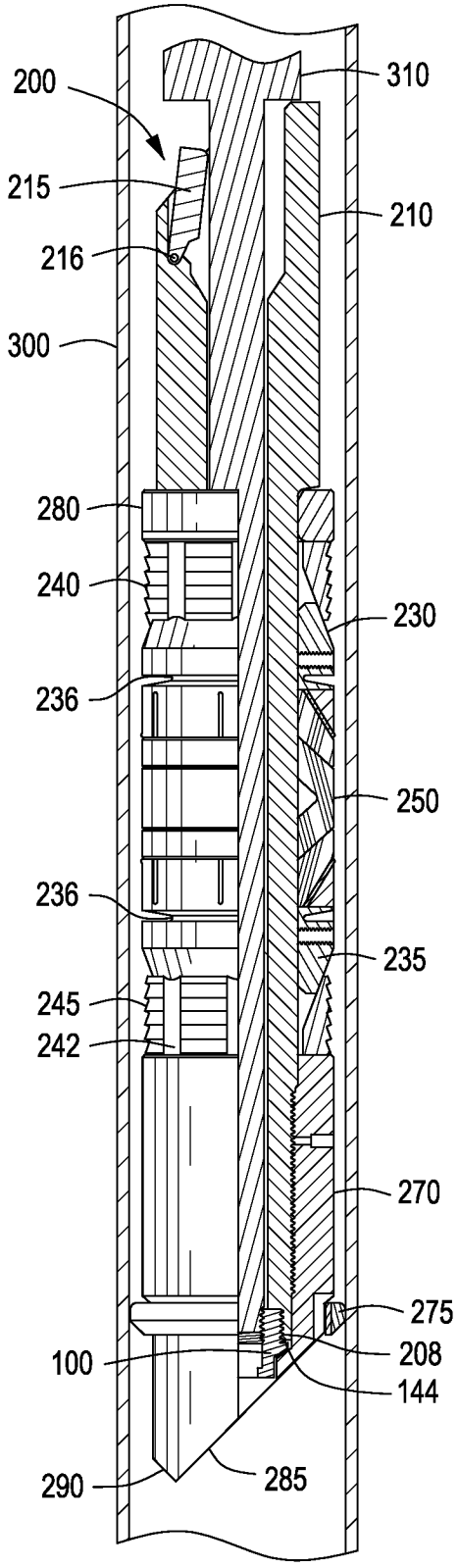
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FIG. 3B

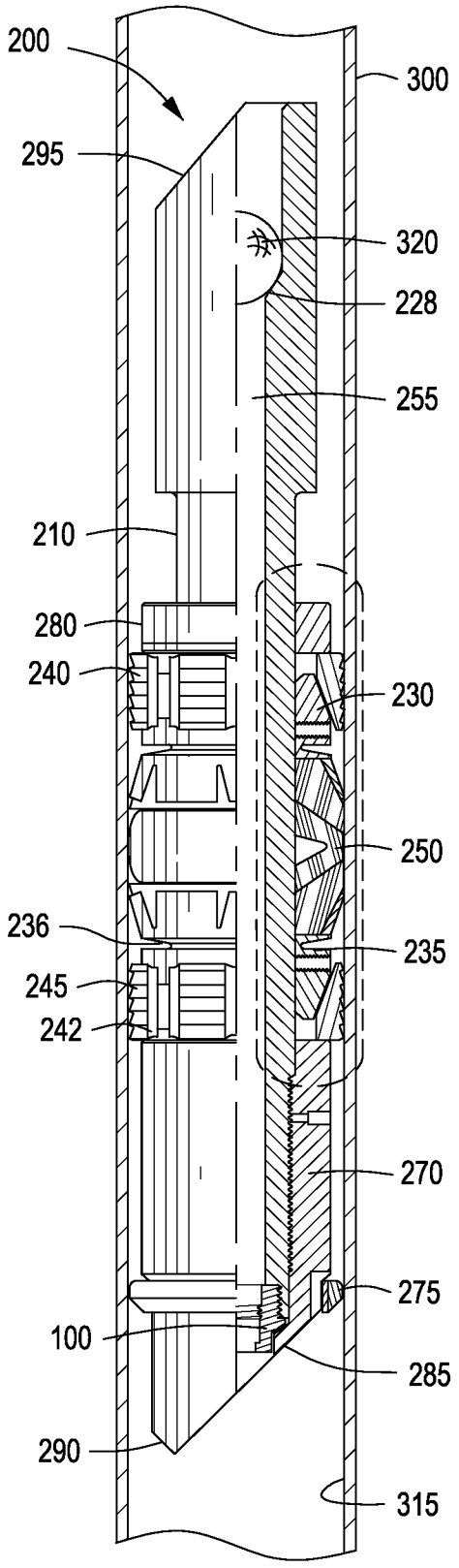
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FIG. 3C

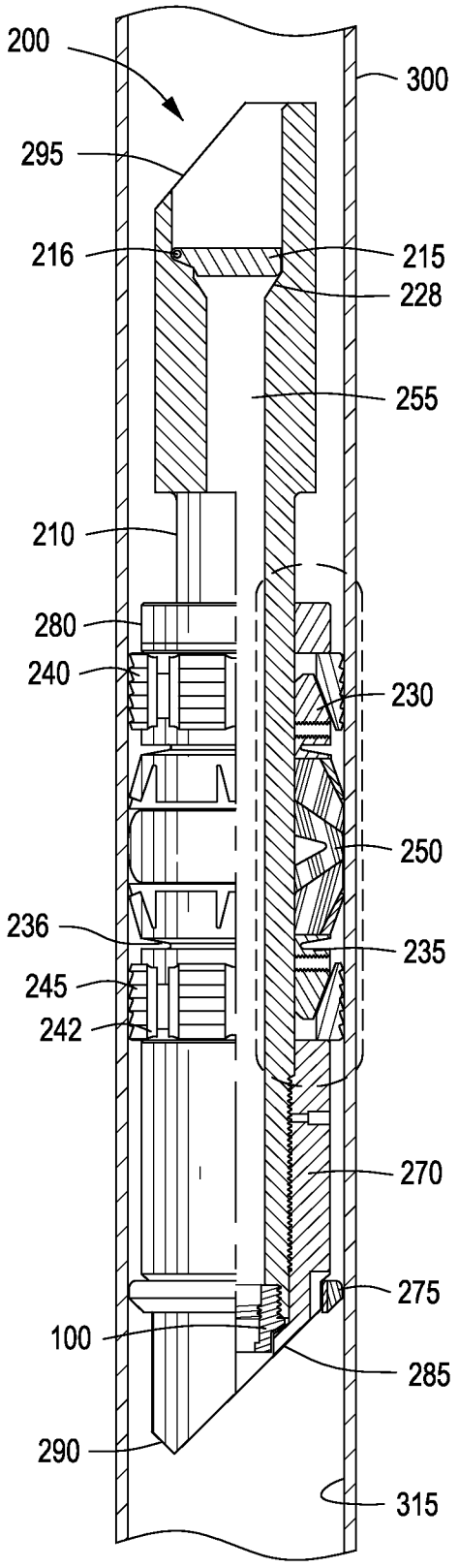
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FIG. 3D

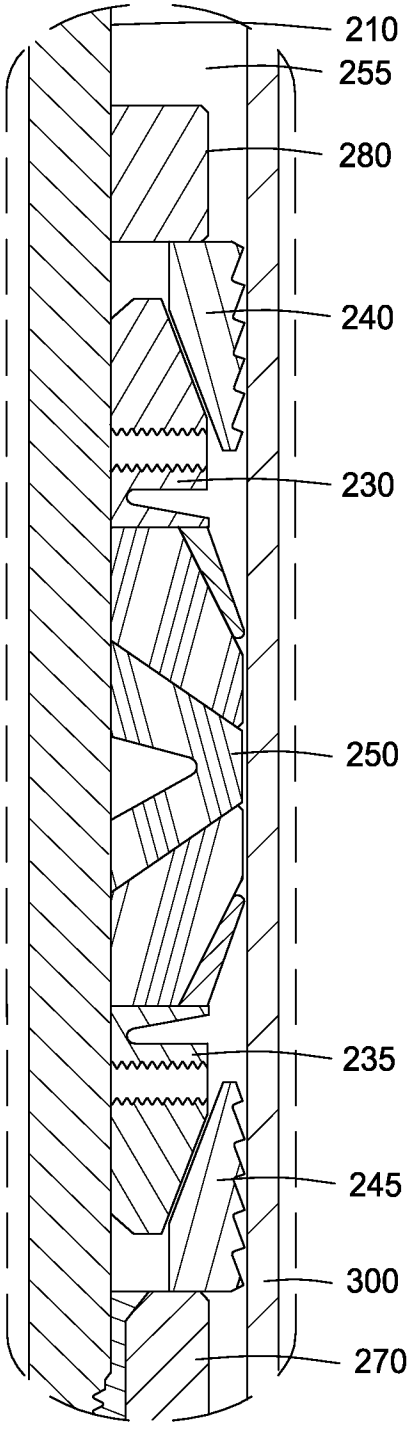

FIG. 4

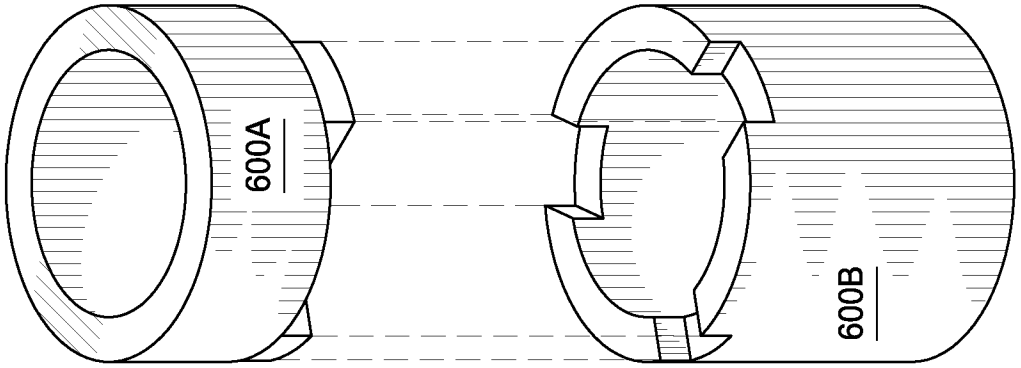

FIG. 6

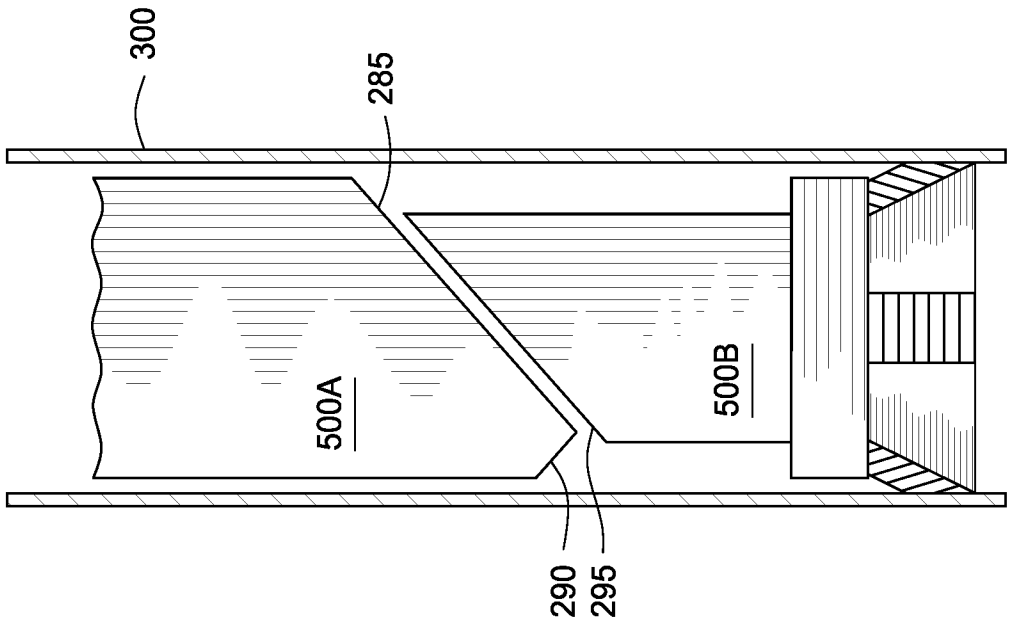

FIG. 5

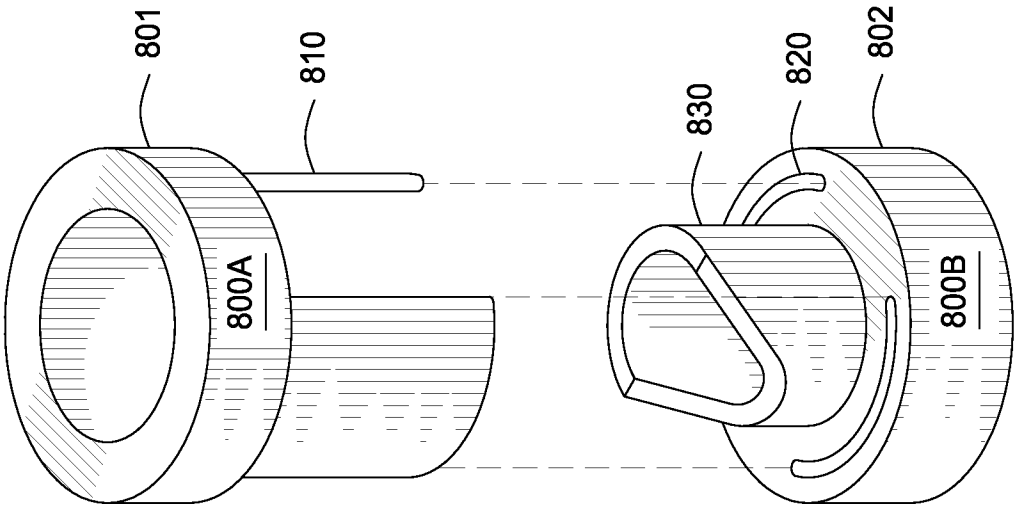

FIG. 8

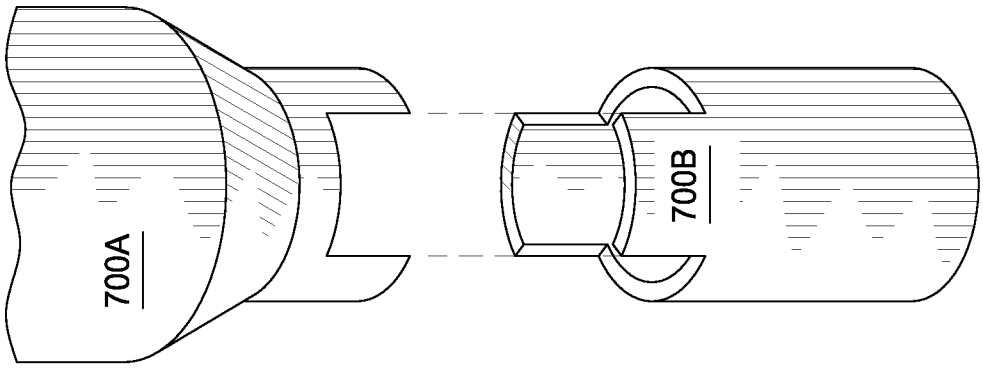

FIG. 7

PTO/SB/01A (01-09)
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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	BOTTOM SET DOWNHOLE PLUG

As the below named inventor(s), I/we declare that:

This declaration is directed to:

- [x] The attached application, or
- [ ] United States application or PCT international application number _____
  filed on _____
  - [ ] As amended on _____ (if applicable);

I/we believe that I/we am/are the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought;

I/we have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment specifically referred to above;

I/we acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me/us to be material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT International filing date of the continuation-in-part application.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

All statements made herein of my/our own knowledge are true, all statements made herein on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and may jeopardize the validity of the application or any patent issuing thereon.

FULL NAME OF INVENTOR(S)

Inventor one: W. Lynn Frazier Date: 7/27/11

Signature: W. Lynn Frazier Citizen of: United States

Inventor two: _____ Date: _____

Signature: _____ Citizen of: _____

- [ ] Additional inventors or a legal representative are being named on _____ additional form(s) attached hereto.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MOTI-018
	Application Number	
Title of Invention	BOTTOM SET DOWNHOLE PLUG	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Applicant Information:

Applicant 1 Remove

Applicant Authority ◉ Inventor ○ Legal Representative under 35 U.S.C. 117 ○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	W.	Lynn	Frazier	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Corpus Christi	State/Province	TX	Country of Residence i	US

Citizenship under 37 CFR 1.41(b) i: US

Mailing Address of Applicant:

Address 1	5655 Bear Lane
Address 2	Suite 100

City	Corpus Christi	State/Province	TX
Postal Code	78405	Country i	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	60935		
Email Address	docketing@edmondsnolte.com	Add Email	Remove Email

Application Information:

Title of the Invention	BOTTOM SET DOWNHOLE PLUG		
Attorney Docket Number	MOTI-018	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	7	Suggested Figure for Publication (if any)	1

PTO/SB/14 (11-08)
Approved for use through 09/30/2010. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MOTI-018
	Application Number	
Title of Invention	BOTTOM SET DOWNHOLE PLUG	

Publication Information:

☐	Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐	**Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	60935		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation in part of	12317497	2008-12-23

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

Remove

Application Number	Country [i]	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			○ Yes ○ No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.

Assignee 1 Remove

PTO/SB/14 (11-08)
Approved for use through 09/30/2010. OMB 0651-0032
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MOTI-018
	Application Number	
Title of Invention	BOTTOM SET DOWNHOLE PLUG	

If the Assignee is an Organization check here. ☐				
Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information:			
Address 1			
Address 2			
City		**State/Province**	
Country [i]		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the **Add** button. Add

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/Robb D. Edmonds/			Date (YYYY-MM-DD)	2011-07-29
First Name	Robb D.	Last Name	Edmonds	Registration Number	46681

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant: W. Lynn Frazier	§	Conf. No.:	Not Yet Assigned
	§		
	§		
Filed: Concurrently Herewith	§	Art Unit:	Not Yet Assigned
	§		
Serial No.: Not Yet Assigned	§	Examiner:	Not Yet Assigned
	§		
For: Bottom Set Downhole Plug	§	Docket No.:	MOTI-018
	§		
	§	Customer No.:	60935

Commissioner for Patents
Mail Stop Amendment
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF INFORMATION DISCLOSURE STATEMENT

Dear examiner:

Applicant submits herewith an Information Disclosure Statement ("IDS") for the above-referenced patent application for accelerated examination. An Accelerated Examination Support Document ("AESD") is also submitted therewith. The AESD includes three U.S. patents (2,714,932; 4,437,516; and 5,224,540) that Applicant deems most closely related to the subject matter of the claims.

Conclusion

Applicant respectfully requests the examiner to accept and consider the IDS during the accelerated examination of the application. Further, Applicant submits that the application is in condition for allowance, and respectfully requests that the examiner allow the claims of the application to issue in a U.S. patent.

Respectfully submitted,

/Robb D. Edmonds/

Robb D. Edmonds
Registration No. 46,681

Dated: July 29, 2011

EDMONDS & NOLTE, PC
16815 Westheimer Road
Suite 130
Houston, Texas 77058
Office: 281-480-2700
Fax: 281-480-2701

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	
				Filing Date	June 29, 2011
				First Named Inventor	W. Lynn Frazier
				Art Unit	
(Use as many sheets as necessary)				Examiner Name	
Sheet	1	of	6	Attorney Docket Number	MOTI-018

Examiner's Initials	US Document Number	Publication Date	Name of Patentee of Applicant of Cited Document
	20030024706	2/6/2003	Allamon
	20030188860	10/9/2003	Zimmerman et al.
	20070051521	3/8/2007	Fike et al.
	20070107908	5/17/2007	Vaidya et al.
	20080060821	3/13/2008	Smith et al.
	20080110635	5/15/2008	Loretz et al.
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	20100132960	1/3/2010	Shkurti et al.
	20100155050	1/24/2010	Frazier
	20100252252	10/7/2010	Harris et al.
	20100263876	10/21/2010	Frazier
	20100276159	11/4/2010	Mailand et al.
	20100288503	11/18/2010	Cuiper et al.
	20110036564	2/17/2011	Williamson
	20110061856	3/17/2011	Kellner et al.
	20110088915	4/21/2011	Stanojcic et al.
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	2040889	5/23/1933	Whinnen
	2223602	10/4/1938	Cox
	2286126	7/5/1940	Thornhill
	2376605	5/22/1945	Lawrence
	2593520	10/11/1945	Baker et al.
	2616502	3/15/1948	Lenz
	2640546	6/2/1953	Baker et al.
	2713910	7/26/1955	Baker et al.
	2737242	8/19/1952	Baker
	2756827	6/7/1948	Farrar
	2830666	7/12/1956	Rhodes
Date Considered		**Examiner Signature**	

Examiner's Initials	US Document Number	Publication Date	Name of Patentee of Applicant of Cited Document
	2833354	2/15/1955	Sailers
	3013612	12/16/1964	Angel
	3054453	3/14/1955	Bonner
	3062296	12/1/1960	Brown
	3082824	3/20/1959	Taylor et al.
	3160209	10/19/1956	Bonner
	3163225	2/15/1961	Perkins
	3273588	9/20/1966	Dollison
	3282342	11/21/1963	Mott
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	4185689	1/29/1980	Harris
	4391547	7/5/1983	Jackson
	4436151	3/13/1984	Callihan et al.
	4457376	7/3/1984	Carmody et al.
	4493374	1/15/1985	Magee, Jr.
	4532995	8/6/1985	Kaufman
	4554981	11/26/1985	Davies
	4556541	1/28/1986	Moussy et al.
	4585067	4/29/1986	Blizzard et al.
	4595052	6/17/1986	Kristiansen
	4602654	1/29/1986	Stehling et al.
	4688641	8/25/1987	Knieriemen
Date Considered		**Examiner Signature**	

Examiner's Initials	US Document Number	Publication Date	Name of Patentee of Applicant of Cited Document
	4708163	11/24/1987	Deaton
	4708202	11/24/1987	Sukup et al.
	4776410	10/11/1988	Perkin et al.
	4784226	11/15/1988	Wyatt
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	4830103	5/16/1989	Blackwell et al.
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	5020590	6/4/1991	McLeod
	5095980	3/17/1992	Watson
	5113940	5/19/1992	Glaser
	5154228	10/13/1992	Gambertoglio et al.
	5183068	2/2/1993	Prosser
	5188182	2/23/1993	Echols, III et al
	5207274	5/4/1993	Streich et al.
	5209310	5/11/1993	Clydesdale
	5230390	7/27/1993	Zastresek et al.
	5234052	8/10/1993	Coone et al.
	5253705	10/19/1993	Clary et al.
	5311939	5/17/1994	Pringle et al.
	5316081	5/31/1994	Baski et al
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	5419399	5/30/1995	Smith
	5564502	10/15/1996	Crow et al.
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	6098716	8/8/2000	Hromas et al.
	6142226	11/7/2000	Vick
	6152232	11/28/2000	Webb et al.
	6167963	1/2/2001	McMahan
	6182752	2/6/2001	Smith, Jr. et al.
	6199636	3/13/2001	Harrison
	6283148	9/4/2001	Spears et al.
	6491108	12/10/2002	Slup
Date Considered		**Examiner Signature**	

Examiner's Initials	US Document Number	Publication Date	Name of Patentee of Applicant of Cited Document
	6629563	10/7/2003	Doane
	6695049	2/24/2004	Ostocke et al.
	6708770	3/23/2004	Slup et al.
	6725935	4/27/2004	Szarka et al.
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	6796376	9/28/2004	Frazier
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	6834717	12/28/2004	Bland
	6851489	2/8/2005	Hinds
	6902006	6/7/2005	Myerley et al.
	6918439	7/19/2005	Dallas
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	7021389	4/4/2006	Bishop et al.
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	7069997	7/4/2006	Coyes et al.
	7107875	9/19/2006	Haugen et al.
	7128091	10/31/2006	Istre, Jr.
	7281584	10/16/2007	McGarian et al.
	7337847	3/4/2008	McGarian et al.
	7350582	4/1/2008	McKeachnie et al.
	7527104	5/5/2009	Branch et al.
	7552779	6/30/2009	Murray
	7604058	10/20/2009	McGuire
	7637326	12/29/2009	Bolding et al.
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	7644774	1/12/2010	Branch et al.
	7673677	3/9/2010	King et al.
	7740079	6/22/2010	Clayton et al.
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	7784550	8/31/2010	Nutley et al.
	7810558	10/12/2010	Shkurti et al.
	7866396	1/11/2011	Rytlewski
	7878242	2/1/2011	Gray
	7886830	2/15/2011	Bolding et al.
Date Considered		**Examiner Signature**	

Examiner's Initials	US Document Number	Publication Date	Name of Patentee of Applicant of Cited Document
	7909108	3/22/2011	Swor et al.
	7909109	3/22/2011	Angman et al.
	7918278	4/5/2011	Barbee
	7921923	4/12/2011	McGuire
	7921925	4/12/2011	Maguire et al.
	7926571	4/19/2011	Hofman
	RE17217	2/19/1929	Burch
Examiner Initials	**Document Number**	**Publication Date**	**Foreign Patent Documents**
	GB914030	12/28/1962	KIGASS LIMITED
	WO2010127457	11/11/2010	PACKERS PLUS ENERGY SERVICES INC.
Examiner Initials		**Non Patent Literature Documents**	
		"Teledyne Merla Oil Tools-Products-Services," Teledyne Merla, 08/1990 (40 pages)	
		"78/79 Catalog: Packers-Plugs-Completions Tools," Pengo Industires, Inc., 1978-1979 (12 pages)	
		"MAP Oil Tools Inc. Catalog," MAP Oil Tools, 04/1999 (46 pages)	
		"Lovejoy-where the world turns for couplings," Lovejoy, Inc., 12/2000 (30 pages)	
		"Halliburton Services, Sales & Service Catalog," Halliburton Services, 1970-1971 (2 pages)	
Date Considered		**Examiner Signature**	

Examiner Initials		Non Patent Literature Documents
		"1975-1976 Packer Catalog," Gearhart-Owen Industries Inc., 1975-1976 (52 pages)
		"Formation Damage Control Utilizing Composite-Bridge Plug Technology for Monobore, Multizone Stimulation Operations," Gary Garfield, SPE, 05/15/2001 (8 pages)
		"Composite Bridge Plug Technique for Multizone Commingled Gas Wells," Gary Garfield, SPE, 03/24/2001 (6 pages)
		"Composite Research: Composite bridge plugs used in multi-zone wells to avoid costly kill-weight fluids," Gary Garfield, SPE, 03/24/2001 (4 pages)
		"It's About Time-Quick Drill Composite Bridge Plug," Baker Oil Tools, 06/2002 (2 pages)
		"Baker Hughes-Baker Oil Tools-Workover Systems-QUIK Drill Composite Bride Plug," Baker Oil Tools, 12/2000 (3 pages)
		"Baker Hughes 100 Years of Service,"Baker Hushes In Depth, Special Centennial Issue, Publication COR-07-13127, Volume 13, Number 2, Baker Hughes Incorporated, 07/2007 (92 pages)
Date Considered		**Examiner Signature**

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	W. Lynn Frazier
Art Unit	
Examiner Name	
Attorney Docket Number	MOTI-018

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	Application Number	
	Filing Date	
	First Named Inventor	W. Lynn Frazier
	Art Unit	
	Examiner Name	
	Attorney Docket Number	MOTI-018

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	Filing Date	
	First Named Inventor	W. Lynn Frazier
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	Examiner Name	
	Attorney Docket Number	MOTI-018

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Robb D. Edmonds/	Date (YYYY-MM-DD)	2011-07-29
Name/Print	Robb D. Edmonds	Registration Number	46681

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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In re Applicant: W. Lynn Frazier	§	Conf. No.:	Not Yet Assigned
	§		
	§		
Filed: Concurrently Herewith	§	Art Unit:	Not Yet Assigned
	§		
Serial No.: Not Yet Assigned	§	Examiner:	Not Yet Assigned
	§		
For: Bottom Set Downhole Plug	§	Docket No.:	MOTI-018
	§		
	§	Customer No.:	60935

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P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Dear examiner:

Applicant submits herewith a Supplemental Information Disclosure Statement ("SIDS") for the above-referenced patent application for accelerated examination. The SIDS includes references that are related to the subject matter of the claims but not deemed most closely related to the subject matter of the claims. The references in the SIDS are made of record only in the interest of complete and full disclosure.

Conclusion

Applicant respectfully requests the examiner to accept and consider the SIDS during the accelerated examination of the application. Further, Applicant submits that the application is in condition for allowance, and respectfully requests that the examiner allow the claims of the application to issue in a U.S. patent.

Respectfully submitted,

/Robb D. Edmonds/

Robb D. Edmonds
Registration No. 46,681

Dated: July 29, 2011

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