

Electronic Patent Application Fee Transmittal

Application Number:	11416704			
Filing Date:	02-May-2006			
Title of Invention:	Method for making particulate slurries and particulate slurry compositions			
First Named Inventor/Applicant Name:	Kewei Zhang			
Filer:	Nicholas Dean Rouse/Audrey Conrad			
Attorney Docket Number:	7957.004			
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:				
Independent claims in excess of 3	1201	8	220	1760
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Preferred Proppants, LLC, Preferred Pipeline, LLC, Preferred Resin Sales, LLC, Ex. 1014, p. 481 of 548 Preferred Resin of Genoa, LLC, Preferred Sands of Wisconsin, LLC				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				1760

Electronic Acknowledgement Receipt

EFS ID:	6375301
Application Number:	11416704
International Application Number:	
Confirmation Number:	8420
Title of Invention:	Method for making particulate slurries and particulate slurry compositions
First Named Inventor/Applicant Name:	Kewei Zhang
Customer Number:	30589
Filer:	Nicholas Dean Rouse/Audrey Conrad
Filer Authorized By:	Nicholas Dean Rouse
Attorney Docket Number:	7957.004
Receipt Date:	02-NOV-2009
Filing Date:	02-MAY-2006
Time Stamp:	16:11:47
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$1760
RAM confirmation Number	2607
Deposit Account	
Authorized User	

File Listing: Preferred Proppants, LLC, Preferred Pipeline, LLC, Preferred Resin Sales, LLC, Ex. 1014, p. 483 of 548
Preferred Resin of Genoa, LLC, Preferred Sands of Wisconsin, LLC

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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1	Miscellaneous Incoming Letter	7957004_SB21_Transmittal_ExcessClaimsFees.pdf	61677 6fa571ea4757ce15e5b933494109040feab44802	no	1
Warnings:					
Information:					
2	Fee Worksheet (PTO-875)	fee-info.pdf	30147 9268b242d38d9643cfaaa96228c59faea234c5a4	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			91824		
<p>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.</p> <p><u>New Applications Under 35 U.S.C. 111</u> 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.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> 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.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> 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.</p>					



UNITED STATES PATENT AND TRADEMARK OFFICE

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

30589 7590 01/07/2010

DUNLAP CODDING, P.C.
PO BOX 16370
OKLAHOMA CITY, OK 73113

EXAMINER

ADMASU, ATNAF S

ART UNIT

PAPER NUMBER

1796

DATE MAILED: 01/07/2010

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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11/416,704 05/02/2006 Kewei Zhang 7957.004 8420

TITLE OF INVENTION: METHOD FOR MAKING PARTICULATE SLURRIES AND PARTICULATE SLURRY COMPOSITIONS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	04/07/2010

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.

Preferred Proppants, LLC, Preferred Pipeline, LLC, Preferred Resin Sales, LLC,
Preferred Resin of Genoa, LLC, Preferred Sands of Genoa, LLC

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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)

30589 7590 01/07/2010

DUNLAP CODDING, P.C.
PO BOX 16370
OKLAHOMA CITY, OK 73113

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.
-----------------	-------------	----------------------	---------------------	------------------

11/416,704 05/02/2006 Kewei Zhang 7957.004 8420

TITLE OF INVENTION: METHOD FOR MAKING PARTICULATE SLURRIES AND PARTICULATE SLURRY COMPOSITIONS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional NO \$1510 \$300 \$0 \$1810 04/07/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
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ADMASU, ATNAF S 1796 507-234000

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, 1 _____
- (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. 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.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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Preferred Resin of Genoa, LLC, Preferred Sands of Wisconsin, LLC



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/416,704	05/02/2006	Kewei Zhang	7957.004	8420
30589	7590	01/07/2010	EXAMINER	
DUNLAP CODDING, P.C. PO BOX 16370 OKLAHOMA CITY, OK 73113			ADMASU, ATNAF S	
			ART UNIT	PAPER NUMBER
			1796	
DATE MAILED: 01/07/2010				

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 321 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 321 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.

Notice of Allowability	Application No.	Applicant(s)	
	11/416,704	ZHANG, KEWEI	
	Examiner	Art Unit	
	ATNAF ADMASU	1796	

-- 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 22 October 2009.
2. ☒ The allowed claim(s) is/are 1-3,8-24,28-41 and 43-48.
3. ☐ 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.

4. ☐ 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.
5. ☐ 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).
6. ☐ 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. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date <u>22 October 2009</u> | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

/ASA/

/Timothy J. Kugel/
Primary Examiner, Art Unit 1796

Preferred Proppants, LLC, Preferred Pipeline, LLC, Preferred Resin Sales, LLC,
Preferred Resin of Genoa, LLC, Preferred Sands of Wisconsin, LLC

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DETAILED ACTION

1. Claims 1-3, 8-24, 28-41 and 43-48 are pending as amended on 22 October 2009 and claims 4-7, 25-27 and 42 are cancelled.

Information Disclosure Statement

2. The information disclosure statement submitted on 22 October 2009 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner has considered the information disclosure statements.
3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 22 October 2009 has been entered.
4. The text of those sections of Title 35, US Code not included in this action can be found in a prior Office Action.

Response to Amendment and Arguments

5. Applicant's amendment to the specification in paragraph [0020] and [0027], filed 22 October 2009, has been fully considered and entered.

6. Applicant's amendment to claim 40, filed 22 October 2009, specifically correcting a typographical error has been fully considered and overcomes the following:

The objection to claim 40 has been withdrawn.

7. Applicant's amendment to claims 1, 23, 36 and 44 to recite the limitation of claim 7; claims 38 and 45 to recite the limitation of claim 14; and claims 21, 31, 34, 40 and 42 to recite the limitation of claim 21 has been fully considered and overcomes the following:

The rejection of claims 1, 2, 4-6, 23-26 and 33 under 35 USC 102(b) as being anticipated by US Patent 5,824,226 (Boyd hereinafter) has been withdrawn.

The rejection of claims 1-6, 23-26, 33, 40, 41, 43 under 35 USC 103(a) as being unpatentable over US Patent Application Publication 2005/0187112 (Goodhue hereinafter) as evidenced by Spherglass® Solid Glass Spheres: A Glass by Potters Industries Inc, 2001. has been withdrawn.

Allowable Subject Matter

8. Claims 1-3, 8-24, 28-41 and 43-48 are allowed for the reasons of record.

9. 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

Art Unit: 1796

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for allowance".

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ATNAF ADMASU whose telephone number is (571)270-5465. The examiner can normally be reached on M-F 8:00-5:30, Flexible Schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon can be reached on 571-272-1498. 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.

/ASA/

/Timothy J. Kugel/
Primary Examiner, Art Unit 1796




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UNITED STATES DEPARTMENT OF COMMERCE
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BIB DATA SHEET

CONFIRMATION NO. 8420

SERIAL NUMBER 11/416,704	FILING or 371(c) DATE 05/02/2006 RULE	CLASS 510	GROUP ART UNIT 1796	ATTORNEY DOCKET NO. 7957.004		
APPLICANTS Kewei Zhang, Calgary, CANADA; ** CONTINUING DATA ***** This appln claims benefit of 60/676,316 05/02/2005 and claims benefit of 60/719,597 09/23/2005 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 05/31/2006						
Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Verified and Acknowledged <u>/ATNAF S ADMASU/</u> Examiner's Signature		<input type="checkbox"/> Met after Allowance Initials	STATE OR COUNTRY CANADA	SHEETS DRAWINGS 0	TOTAL CLAIMS 48	INDEPENDENT CLAIMS 4
ADDRESS DUNLAP CODDING, P.C. PO BOX 16370 OKLAHOMA CITY, OK 73113 UNITED STATES						
TITLE Method for making particulate slurries and particulate slurry compositions						
FILING FEE RECEIVED 4490	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit			

Issue Classification 	Application/Control No. 11416704	Applicant(s)/Patent Under Reexamination ZHANG, KEWEI
	Examiner ATNAF ADMASU	Art Unit 1796

[illegible][illegible]

/ATNAF ADMASU/ Examiner.Art Unit 1796		12/30/2009	Total Claims Allowed:	
(Assistant Examiner)		(Date)	40	
/Timothy J. Kugel/ Primary Examiner, Art Unit 1796		01/04/2010	O.G. Print Claim(s)	O.G. Print Figure
Preferred Proppants, LLC, Preferred Pipeline, LLC, Preferred Resin Sales, LLC,			Ex. 1014, p. 493 of 548	
(Primary Examiner) Preferred Resin of Genoa, LLC, Preferred Sands of Wisconsin LLC		(Date)	1	None

Receipt date: 10/22/2009

11416704 - GAU: 1796
Sheet 1 of 3

Substitute for form 1449/PTO
PTO/SB/08A and 08B
Form 6-2 and Form 6-2.1

**SUPPLEMENTAL
INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Complete if Known	
Application Number	11416704
Filing Date	2006-05-02
First Named Inventor	Kewei Zhang
Art Unit	1796
Examiner Name	ADMASU, ATNAF S
Attorney Docket Number	7957.004

U. S. PATENT DOCUMENTS

EXAM INIT.	Cite No. ¹	Document Number Number-Kind Code ² (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYY
	1	4046795	Martin	09-06-1977
	2	4454056	Kittelmann et al.	06-12-1984
	3	4537595	Gruning et al.	08-27-1985
	4	4564456	Homan	01-14-1986
	5	4654161	Kollmeier et al.	03-31-1987
	6	4689085	Plueddemann	08-25-1987
	7	4898957	Plueddemann et al.	03-06-1990
	8	4891166	Schaefer et al.	01-02-1990
	9	4933327	Plueddemann et al	06-12-1990
	10	5098979	O'Lenick, Jr.	03-24-1992
	11	5149765	O'Lenick, Jr.	09-22-1992
	12	5209775	Bank, et al.	05-11-1993
	13	5240760	George, et al.	08-31-1993
	14	5256805	O'Lenick, Jr.	10-26-1993
	15	5359104	Higgs, et al	10-25-1994
	16	5166297	O'Lenick, Jr.	11-24-1992
	17	5235082	Hill, et al.	08-10-1993
	18	5306434	Schueller, et al.	04-26-1994
	19	5474835	McCarthy, et al.	12-12-1995

Preferred Proppants, LLC, Preferred Pipeline, LLC, Preferred Resin Sales, LLC,
Preferred Resin of Genoa, LLC, Preferred Sands of Wisconsin, LLC

Ex. 1014, p. 494 of 548

M:\GENERAL\7957 Stikeman Elliott\7957.004 Method for Making Particulate Slurries\Supplemental IDS-1449 sb08.wpd

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.A./

Receipt date: 10/22/2009

11416704 - GAU: 1796
Sheet 2 of 3

Substitute for form 1449/PTO
PTO/SB/08A and 08B
Form 6-2 and Form 6-2.1

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	11416704
Filing Date	2006-05-02
First Named Inventor	Kewei Zhang
Art Unit	1796
Examiner Name	ADMASU, ATNAF S
Attorney Docket Number	7957.004

U. S. PATENT DOCUMENTS

EXAM INIT.	Cite No. ¹	Document Number Number-Kind Code ² (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYY
	20	5616758	McCarthy, et al.	04-01-1997
	21	5653794	Weber, et al.	08-05-1997
	22	6047772	Weaver, et al.	04-11-2000
	23	6132638	Oldenhove	10-17-2000
	24	6277361	Murray	08-21-2001
	25	6323268 B1	Fisher, et al.	11-27-2001
	26	6403163 B1	Fisher, et al.	06-11-2002
	27	5798144	Varanasi, et al.	08-25-1998
	28	6482969 B1	Helmrick, et al.	11-19-2002
	29	6524597 B2	Kashimoto	02-25-2003
	30	6696052 B2	Aeby, et al.	02-24-2004
	31	6830811 B2	Chao	12-14-2004
	32	4960845	O'Lenick, Jr.	10-02-1990
	33	4183814	Ramachadran	01-15-1980
	34	20040023818 A1	Nguyen, Philip D.; et al.	02-05-2004

Examiner Signature: /Atnaf Admasu/ Date Considered: 01/04/2010

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard St.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard St. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

Receipt date: 10/22/2009

11416704 - GAU: 1796
Sheet 3 of 3

Substitute for form 1449/PTO
PTO/SB/08A and 08B
Form 6-2 and Form 6-2.1

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	11416704
Filing Date	2006-05-02
First Named Inventor	Kewei Zhang
Art Unit	1796
Examiner Name	ADMASU, ATNAF S
Attorney Docket Number	7957.004

FOREIGN PATENT DOCUMENTS

EXAM INIT.	Cite No. ¹	Foreign Patent Document Country Code ³ Number ⁴ Kind Code ⁵ (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYY	T ⁶
	1	CA 2213168	Nippon Telegraph and Telephone Corporation et al.	01-18-2005	
	2	GB 2387191 A	BJ Services Company	10-08-2003	
	3	CA 2423031	BJ Services Company	10-07-2003	
	4	JP 58146434	Neos Company Limited	09-01-2007	
	5	WO 2007/033489	Trican Well Service Ltd.	03-29-2007	
	6	WO 2006/116868	Trican Well Service Ltd.	11-09-2006	
	7	WO 2005/100007	Carbo Ceramics, Inc.	10-27-2005	

Examiner Signature: /Atnaf Admasu/ Date Considered: 01/04/2010


*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard St.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard St. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

NON-PATENT DOCUMENTS

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, page(s), volume-issue number(s), publisher, city and/or country where published

Examiner Signature: /Atnaf Admasu/ Date Considered: 01/04/2010

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Unique citation designation number. ² Applicant is to place a check mark here if English language Translation is attached.

Search Notes 	Application/Control No. 11416704	Applicant(s)/Patent Under Reexamination ZHANG, KEWEI
	Examiner ATNAF ADMASU	Art Unit 1796

SEARCHED			
Class	Subclass	Date	Examiner
507	234	12/29/2009	/ASA/
210	679	12/29/2009	/ASA/

SEARCH NOTES		
Search Notes	Date	Examiner
Performed inventors search in EAST and PALM		
See attached EAST search summary	8/27/2008	/ASA/
Additional EAST search was conducted - see EAST search summary	07/11/2009	/ASA/
Inventors search is updated in EAST and PALM	12/29/2009	/ASA/
EAST search is updated - summary is attached	12/29/2009	/ASA/

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
Interference	searched - summary is attached	12/29/2009	/ASA/

Preferred Proppants, LLC, Preferred Pipeline, LLC, Preferred Resin Sales, LLC, Preferred Resin of Genoa, LLC, Preferred Sands of Wisconsin, LLC	Ex. 1014, p. 497 of 548
--	-------------------------

EAST Search History**EAST Search History (I nterference)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L22	254317	slurry	US-PGPUB; USPAT; UPAD	OR	ON	2009/12/29 20:05
L23	2005845	aqueous water H2O	US-PGPUB; USPAT; UPAD	OR	ON	2009/12/29 20:06
L24	1095720	particle particulate	US-PGPUB; USPAT; UPAD	OR	ON	2009/12/29 20:07
L25	255260	hydrophob\$3	US-PGPUB; USPAT; UPAD	OR	ON	2009/12/29 20:07
L26	110350	siloxane organo \$1siloxane polysiloxane	US-PGPUB; USPAT; UPAD	OR	ON	2009/12/29 20:08
L27	179063	betaine quaternary	US-PGPUB; USPAT; UPAD	OR	ON	2009/12/29 20:09
L28	0	(22 with 23 with 24 with 25 with 26 with 27).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2009/12/29 20:12

12/ 29/ 2009 8:13:08 PM

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wsp**

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	66347	((("507") or ("166"))). CLAS.	US-PGPUB; USPAT; USOCR	OR	OFF	2009/12/29 19:30
L2	1270106	particle particulate	US-PGPUB; USPAT; USOCR	OR	ON	2009/12/29 19:30
L3	258509	hydrophobic	US-PGPUB; USPAT; USOCR	OR	ON	2009/12/29 19:30
L4	297493	slurry	US-PGPUB; USPAT; USOCR	OR	ON	2009/12/29 19:30
L5	216040	silane siloxane organosilane organosiloxane organo- siloxane organo-silane polysiloxane	US-PGPUB; USPAT; USOCR	OR	ON	2009/12/29 19:30
L6	2586453	aqueous water	US-PGPUB; USPAT; USOCR	OR	ON	2009/12/29 19:30
L7	142	L1 and L6 and L4 and L2 and L3 and L5	US-PGPUB; USPAT; USOCR	OR	ON	2009/12/29 19:30
L8	125	L1 and L6 and (L4 same L2) and L3 and L5	US-PGPUB; USPAT; USOCR	OR	ON	2009/12/29 19:31
L9	111	(L4 same L2 same L3 same L5)	US-PGPUB; USPAT; USOCR	OR	ON	2009/12/29 19:33
L10	66347	((("507") or ("166"))). CLAS.	US-PGPUB; USPAT; USOCR	OR	OFF	2009/12/29 19:39
L11	297493	slurry	US-PGPUB; USPAT; USOCR	OR	ON	2009/12/29 19:39
L12	216040	silane siloxane organosilane organosiloxane organo- siloxane organo-silane polysiloxane	US-PGPUB; USPAT; USOCR	OR	ON	2009/12/29 19:39
L13	1270106	particle particulate	US-PGPUB; USPAT; USOCR	OR	ON	2009/12/29 19:39
L14	258509	hydrophobic	US-PGPUB; USPAT; USOCR	OR	ON	2009/12/29 19:39
L15	2586453	aqueous water	US-PGPUB; USPAT; USOCR	OR	ON	2009/12/29 19:39
L16	3748	L10 and L11 and (air (carbon adj dioxide) nitrogen)	US-PGPUB; USPAT; USOCR	OR	ON	2009/12/29 19:39

L17	128	L16 and L12 and L13 and L14 and L15	US-PGPUB; USPAT; USOCR	OR	ON	2009/12/29 19:39
L18	34	("20040023818" "4046795" "4183814" "4454056" "4537595" "4564456" "4654161" "4689085" "4891166" "4898957" "4933327" "4960845" "5098979" "5149765" "5166297" "5209775" "5235082" "5240760" "5256805" "5306434" "5359104" "5474835" "5616758" "5653794" "5798144" "6047772" "6132638" "6277361" "6323268" "6403163" "6482969" "6524597" "6696052" "6830811").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2009/12/29 19:42
L19	69	("20040023818" "4046795" "4183814" "4454056" "4537595" "4564456" "4654161" "4689085" "4891166" "4898957" "4933327" "4960845" "5098979" "5149765" "5166297" "5209775" "5235082" "5240760" "5256805" "5306434" "5359104" "5474835" "5616758" "5653794" "5798144" "6047772" "6132638" "6277361" "6323268" "6403163" "6482969" "6524597" "6696052" "6830811").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/12/29 19:43
L20	104	(507/234).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2009/12/29 19:43
L21	705	(210/679).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2009/12/29 19:51
L29	10	((KEWEI) near2 (ZHANG)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2009/12/29 20:19

12/ 29/ 2009 8:21:18 PM

C:\ Documents and Settings\ aadmasu\ My Documents\ EAST\ Workspaces\ 11416704z.wsp

Doc code :IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-08)

Approved for use through 04/30/2008. OMB 0851-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	11416704
Filing Date	2006-05-02
First Named Inventor	Zhang, Kewei
Art Unit	1751
Examiner Name	Figueroa, John J.
Attorney Docket Number	7957.004

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	4454056	A	1984-06-12	Kittelmann, et al. DeGussa	CE 2/17/2010
	2	6060521	A	05/2000 1998-10-29	Sekutowski, et al. Engelhard	CE 2/17/2010

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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	2423031	CA	A1	2003-01-01	BJ Services Company		<input type="checkbox"/>
	2	1071076	CA	A1	1975-10-01	Dresser Industries		<input type="checkbox"/>

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)

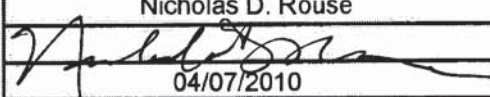
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30589 7590 01/07/2010

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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.

Nicholas D. Rouse	(Depositor's name)
	(Signature)
04/07/2010	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/416,704	05/02/2006	Kewei Zhang	7957.004	8420

TITLE OF INVENTION: METHOD FOR MAKING PARTICULATE SLURRIES AND PARTICULATE SLURRY COMPOSITIONS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	04/07/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
ADMASU, ATNAF S	1796	507-234000

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.

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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)

Trican Well Service Ltd.

Calgary, Alberta CA

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 _____

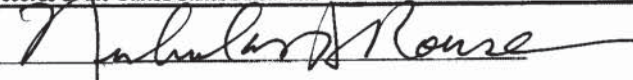
4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☒ Payment by credit card. ELECTRONICALLY TRANSMITTED.
☐ 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 
 Typed or printed name Nicholas D. Rouse

Date 04/07/2010

Registration No. 36,992

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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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No. : 11/416,704 Confirmation No.: 8420
Applicant : Kewei Zhang
Filed : May 2, 2006
Art Unit : 1796
Examiner : Admasu, Atnaf S
Title : Method for Making Particulate Slurries and Particulate Slurry Compositions

Docket No. : 7957.004
Cust. No. : 30589

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**List of Sections Forming Part of This
Information Disclosure Statement**

The following sections are being submitted for this Information Disclosure Statement:

1. ☒ Preliminary Statements
2. ☒ Form PTO-1449 (Modified)
3. ☒ Identification of Prior Application in Which Listed Information Was Already Cited and for Which No Copies Are Submitted or Need Be Submitted
4. ☒ Copies of Listed Information Items Accompanying this Statement

Section 1. Preliminary Statements

Applicants submit herewith patents, publications or other information of which they are aware, which they believe may be material to the examination of this application and in respect of which there may be a duty to disclose.

The filing of this information disclosure statement shall not be construed as a representation that a search has been made (37 C.F.R. § 1.97(g)), an admission that the

information cited is, or is considered to be, material to patentability or that no other material information exists.

The filing of this information disclosure statement shall not be construed as an admission against interest in any manner. Notice of January 9, 1992, 1135 O.G. 13-25, at 25.

Section 2. Form PTO-1449 (Modified)

- ☒ [X] A completed Form PTO-1449 (Modified) is attached hereto.
- ☐ [] No Form 1449 (Modified) is attached.

Section 3. Copies of Listed Information Items Accompanying this Statement

- ☒ [X] As this application is being filed after June 30, 2003, no copies of cited U.S. patents or patent application publications are submitted herewith.
- ☐ [] Regarding the foreign patents and publications and the non-patent documents listed, legible copies of such items [were previously submitted in prior application from which an earlier filing date is claimed for this application, as identified in Section 4] or [are submitted herewith].
- ☐ [] For the Examiner's convenience, the following is a list of U.S. patents and non-patent documents cited herein that were not included in the prior application identified in Section 4:

U.S. Patents:

Non-Patent Documents:

Section 4. Identification of Person(s) Making this INFORMATION DISCLOSURE STATEMENT

The person making this statement is the attorney who signs below on the basis of the information:

- ☐ supplied by the inventor(s)
- ☐ supplied by an individual associated with the filing and prosecution of this application (37 C.F.R. § 1.56(c)).
- ☒ in the attorney's file

Respectfully submitted,



Nicholas D. Rouse, Reg. No. 36,992
DUNLAP CODDING, P.C.
P.O. Box 16370
Oklahoma City, Oklahoma 73113
Customer No.: 30589
Telephone: (405) 607-8600
Facsimile: (405) 607-8686

Attorney for Applicant

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	11/416,704
Filing Date	May 2, 2006
First Named Inventor	Kewei Zhang
Art Unit	1796
Examiner Name	Admasu, Atnaf S
Attorney Docket Number	7957.004

U. S. PATENT DOCUMENTS

EXAM INIT.	Cite No. ¹	Document Number Number-Kind Code ² (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYY
	1	US 4,231,428	Needham et al.	11-04-1980

Examiner Signature: _____ Date Considered: _____

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard St.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard St. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

FOREIGN PATENT DOCUMENTS

EXAM INIT.	Cite No. ¹	Foreign Patent Document Country Code ³ Number ⁴ Kind Code ⁵ (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYY	T ⁶
	1	GB 1584831	Halliburton Company	02-18-1981	
	2	WO 02/22759 A1	Thuslick, Inc.	03-21-2002	

Examiner Signature: _____ Date Considered: _____

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹Applicant's unique citation designation number (optional). ²See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³Enter Office that issued the document, by the two-letter code (WIPO Standard St.3). ⁴For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵Kind of document by the appropriate symbols as indicated on the document under WIPO Standard St. 16 if possible. ⁶Applicant is to place a check mark here if English language Translation is attached.

Electronic Patent Application Fee Transmittal				
Application Number:	11416704			
Filing Date:	02-May-2006			
Title of Invention:	METHOD FOR MAKING PARTICULATE SLURRIES AND PARTICULATE SLURRY COMPOSITIONS			
First Named Inventor/Applicant Name:	Kewei Zhang			
Filer:	Nicholas Dean Rouse/Audrey Conrad			
Attorney Docket Number:	7957.004			
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:				
Utility Appl issue fee	1501	1	1510	1510
Preferred Proppants, LLC, Preferred Pipeline, LLC, Preferred Resin Sales, LLC, Preferred Resin of Genoa, LLC, Preferred Sands of Wisconsin, LLC	1504	1	300	300

Publ Fee-early, voluntary or normal Ex. 1014, p. 508 of 548

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
Total in USD (\$)				1990

Electronic Acknowledgement Receipt

EFS ID:	7371840
Application Number:	11416704
International Application Number:	
Confirmation Number:	8420
Title of Invention:	METHOD FOR MAKING PARTICULATE SLURRIES AND PARTICULATE SLURRY COMPOSITIONS
First Named Inventor/Applicant Name:	Kewei Zhang
Customer Number:	30589
Filer:	Nicholas Dean Rouse/Audrey Conrad
Filer Authorized By:	Nicholas Dean Rouse
Attorney Docket Number:	7957.004
Receipt Date:	07-APR-2010
Filing Date:	02-MAY-2006
Time Stamp:	18:04:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$1990
RAM confirmation Number	4581
Deposit Account	
Authorized User	


File Listing:

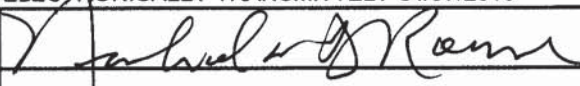
Preferred Proppants, LLC, Preferred Pipeline, LLC, Preferred Resin Sales, LLC, Preferred Resin of Genoa, LLC, Preferred Sands of Wisconsin, LLC					Ex. 1014, p. 510 of 548
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Miscellaneous Incoming Letter	7957004_SB21_TransmittalForm.pdf	82204 e0a80186f87d687e930643cab3aed889058c3f3	no	1
Warnings:					
Information:					
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	Filing Date	May 2, 2006	
	First Named Inventor	Kewei Zhang	
	Art Unit	1796	
	Examiner Name	Admasu, Atnaf S	
Total Number of Pages in This Submission	6	Attorney Docket Number	7957.004

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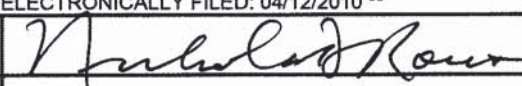
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PATENT SPECIFICATION

(11) 1 584 831

1 584 831

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 (31) Convention Application No. 710751
 (32) Filed 2 Aug. 1976 in
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 (51) INT CL³ E21B 41/00 C09K 17/00
 (52) Index at acceptance
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(54) INCREASING STABILITY OF CONSOLIDATED PERMEABLE PARTICULATE MASS

(71) We, HALLIBURTON COMPANY, a corporation organized under the laws of the State of Delaware, United States of America, of Duncan, Oklahoma, United States of America, 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 relates to a process for increasing the stability of a consolidated earthen or other porous permeable mass to deterioration or degradation, when aqueous fluids such as water, steam, acidic or alkaline solutions or naturally occurring aqueous solutions, flow therein.

Difficulties with naturally or artificially consolidated earthen masses or subterranean formations occur when these formations are exposed to certain media and begin to deteriorate. These masses can be naturally consolidated surface or subterranean masses or artificially consolidated surface or subterranean masses (using, for example, certain resins). Numerous artificial or man-made consolidated masses and procedures have been described using various types of resins and placement procedures. Typical consolidating formulations and procedures are described in the following patents and references:

U.S. 3,176,767 U.S. 3,199,590 U.S. 3,208,522 U.S. 3,209,826 U.S. 3,285,339 U.S. 3,305,017 U.S. 3,443,637 U.S. 3,646,999 U.S. 3,702,783 U.S. 3,706,592 U.S. 3,734,763

Plueddemann, E.P., "Water is Key to New Theory on Resin-to-Fiber Bonding", Modern Plastics, (March, 1970). Harrisberger, W.H.; Coulter, A.W.; and Gurley, D.G., "Application of Recent Advances in the Mechanics of Sand Consolidation," SPE Preprint No. 3589, presented at the 46th Annual Fall Meeting of the SPE of AIME, New Orleans, La., Oct. 3—6, 1971.

A major cause of the breakdown of the consolidating structure of both natural and artificially consolidated permeable masses is the contact of aqueous media with exposed silica surfaces and/or the dislocation of consolidating siliceous matter which binds the permeable masses together. Some exposed silica surfaces occur even in the most carefully placed artificial consolidation formulations. Under certain subterranean conditions, the consolidation may merely deteriorate with time; the consolidation may deteriorate due to thermal expansion and contraction and resulting cracks in the consolidating structure; or by merely chemical attack or reaction of portions of the consolidating structure with fluids in the permeable mass.

We have now found that certain organosilicon compounds can be used to stop or significantly decrease the degradation of naturally and artificially consolidated permeable masses which have exposed silica surfaces or siliceous material which are subject to attack by aqueous media flowing therein.

According to the invention, there is provided a process for increasing the stability of a permeable consolidated particulate mass against aqueous fluids flowing therein, whilst maintaining the permeability of the mass, which mass contains exposed siliceous surfaces, which comprises contacting the mass with a treating fluid containing at least one organosilicon compound having a hydrophobic group and a silica bonding group to cause said organosilicon compound to form a hydrophobic protective film on said siliceous surfaces, the presence of the said film not substantially reducing the permeability of the mass.

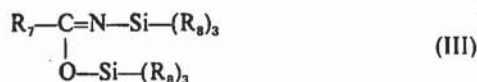
Among the preferred organosilicon compounds are those represented by one of the following formulae:



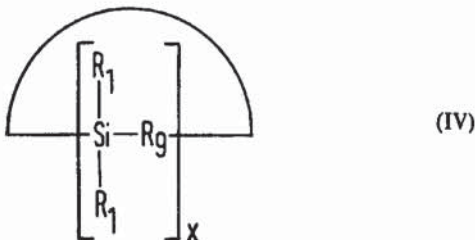
wherein each R_1 is independently an alkyl, cycloalkyl, alkenyl, cycloalkenyl or aryl radical, or a hydrocarbon radical comprising a combination of two or more of these radicals containing up to 18 carbon atoms; each R_2 is independently a halogen radical, $-OR_3$ or $-OH$; each R_3 is independently an alkyl radical or aryl radical or a combination thereof containing up to 10 carbon atoms; and n is 1, 2 or 3;



wherein each R_4 is independently equal to R_1 ; each R_5 is independently a halogen radical; each R_6 is independently $-N_3$ (i.e. azide or triazo), $-NH-Si-(R_4)_3$, or $-N(CH_3)-Si-(R_4)_3$; m is 2 or 3; q is 0 or 1; p is 1 or 2; and $m+q+p=4$; or



wherein R_7 is independently equal to R_1 or R_5 ; and each R_8 is independently equal to R_3 or a hydrogen atom, with at least one R_8 equal to R_3 ; or



wherein R_9 is $-O-$ or $-NH-$; and x is 3 or 4.

The process of the present invention can be used with any naturally occurring consolidation or artificial or man-made consolidation. For example, the process can be used with the consolidating resins and procedures described in the references cited above. It is especially useful for preferred resins such as the phenol formaldehyde type resin, the epoxy resins, the furan resin systems, the inorganic silica-based consolidation systems, and the vinyl type polymer consolidation systems. Since the only essential reactive group in the organosilicon compounds of this invention is the silica bonding group, the compositions and processes of this invention do not normally react with or bond with the natural or artificial consolidating resin.

Thus, the process of this invention is practically universally applicable to any permeable mass having exposed siliceous surfaces. If desired, optional resin bonding functional groups can be incorporated in the materials used in the processes of this invention.

In the process of this invention, at least one organosilicon compound is maintained in contact with the permeable mass under conditions which will allow the organosilicon compound to bond to the exposed silica surfaces, leaving the hydrophobic group exposed and forming a hydrophobic film on the siliceous surfaces. This contact can be established and maintained by any one of several conventional procedures.

For example, for permeable masses having exposed peripheral surfaces, the organosilicon compound can be placed on the porous mass by merely spraying or pouring the organosilicon compound onto the mass or diluting it with a carrier fluid and then spraying the fluid onto the permeable mass. For subterranean formations such as those encountered in oil wells, earthen dams and other subterranean structures, the organosilicon composition is preferably placed in a carrier fluid and injected or pumped through the permeable mass and maintained under quiescent

conditions for a sufficient length of time to ensure that the organosilicon has bonded to the silica surfaces forming the hydrophobic film. Normally, the contact time required is very short and may even be considered to be instantaneous. However, the overall reaction condition such as concentration of any necessary reactants, concentration of the organosilicon compounds, temperature and other factors which would affect the necessary reactions, must be considered.

For certain preferred organosilicon compounds the silica bonding group is in a coupled or encapsulated state which requires the presence of minute amounts of water to hydrolyze the silica bonding group and thus allow the organosilicon compound to bond to the silica surfaces. For most subterranean formations, the amount of water necessary is normally available within the formation. For some applications, it may be necessary or desirable to add small amounts of water to the carrier fluid to speed up the hydrolysis of the organosilicon compound to the desired rate. The treating step of this invention may be added to conventional consolidating procedures so that the organosilicon compound is available upon initial consolidation of the consolidating resin. Alternatively, the process of this invention can be applied as a single or repeated remedial step for those wells in which water and sand production is an imminent problem. For use with conventional consolidating procedures, the hydrophobic organosilicon compound, e.g. silane, should not be applied until the consolidating resin has at least attained an initial set.

Conventional consolidating steps such as preflush, cleaning and post-flush steps can be used in conjunction with the process of this invention to ensure uniform placement and treatment of the desired formations. It has been found that a minimum concentration of organosilicon compound can be used because only the exposed siliceous surfaces are treated. Any excess organosilicon compound can be removed from the formation by allowing the fluid to flow back into the well and away from the formation, or the excess organosilicon can be flushed further into the formation being treated, in which case it will bond to exposed silica surfaces therein.

Typically, the organosilicon compounds may be present in the carrier in concentrations of, for example, 0.1 to 15% by weight. Lower concentrations affect the practical rate of treatment and the extent of treatment. Higher concentrations merely result in an excess of organosilicon compound which must be removed or flushed into the formation. With the application of certain organosilicon combinations to certain resins, an over treating effect is observed. This effect can be readily detected prior to any proposed treatment, by simple laboratory tests. With some hydrophobic organosilicon compounds, the treatment results in by-products such as ammonia which are produced upon hydrolysis of the organosilicon compound. It is known that some by-products have detrimental reactions with certain resin combinations, particularly with higher concentrations. The effect of this overexposure can be reduced by the use of lower organosilicon concentrations and by reduction in the contacting time.

The carrier fluid used for the organosilicon compounds can be an aqueous medium such as water. The mixture may be a solution or an emulsion. However, an organic carrier fluid such as a commercially available solvent or hydrocarbon oil such as diesel oil, is preferred. Under some conditions, it may be desirable to apply the organosilicon compound without a separate carrier fluid, in which case the neat organosilicon compound will be its own carrier fluid. The organosilicon compound can be contacted with the permeable mass under ambient conditions and at temperatures in the range of about 50°F to 300°F.

Normally pH, typically encountered contaminants, and other formation conditions are not critical but contaminants should be avoided which will react with the organosilicon bonding group or any other optional reactive group which may be desired, thereby interfering with the silica bonding reaction. Preferably, the hydrophobic group is a simple or substituted hydrocarbon group which is relatively unreactive under the conditions of most earthen or subterranean formations.

The organosilicon compounds which can be used in the process of this invention are those which have a hydrophobic group and a silica bonding group. Silicon normally has a valence of 4 and the formulae shown herein are intended to have the number of radicals necessary to satisfy that valence. Preferred classes of organosilicon compounds for this invention include: organohalogen silanes, organosilane esters, silyl acetamides, cyclosiloxanes, cyclosilazanes and silazanes. Preferred organosilicon compounds are described by the formulae I to IV given above.

- Specific examples of formula I are trihexylchlorosilane, triphenylchlorosilane, trimethylchlorosilane, dimethyldichlorosilane, phenyltrichlorosilane, methylvinyl dichlorosilane, octadecyltrichlorosilane, triethylbromosilane, triethylfluorosilane, vinyl triethoxysilane, amyltriethoxysilane, dimethyldiethoxysilane, phenyltriethoxysilane, methyltriethoxysilane, diphenyldimethoxysilane, methylphenyldimethoxysilane, trimethylethoxysilane, 7 - octenyltri - methoxysilane, octadecyltriethoxysilane, bis - (cycloheptenyl) - methyldichlorosilane, bis - (cycloheptenyl)triethoxysilane, benzyltriethoxysilane and diphenylsilanediol.
- Specific examples of formula II are hexamethyl - disilazane, azidotrimethylsilane, methylphenyldiazidosilane, hexaphenyldisilazane, heptamethyldisilazane, dimethyldiazidodisilane, triphenylsilazide and diphenyldiazidosilane.
- Specific examples of formula III are bis - (trimethylsilyl)acetamide, bis - (dimethylsilyl)acetamide and N - Methyl - N - trimethylsilyl - acetamide.
- Specific examples of formula IV are octamethyl - cyclotetrasiloxane and octamethylcyclo - tetrasilazane, hexamethylcyclotrisilazane, hexamethylcyclo - trisiloxane, 2,2 - dimethyl - tetraphenylcyclotrisiloxane, hexaphenylcyclotrisiloxane and octaphenylcyclotetrasiloxane.
- The following Examples serve to illustrate various embodiments of the invention. Parts, percentages, proportions and concentrations are by weight unless indicated otherwise.

EXAMPLES

Consolidations Prepared for Water Resistance Tests

- Fifty grams of Oklahoma No. 1 sand were packed into a vertically mounted thin walled section of glass tubing (7/8" inside diameter and 7" long) to a height of 3.5". In the bottom section of the glass tubing was positioned a perforated rubber stopper. To retain the test sand while permitting effluent fluids to pass through the test sand, a wire screen with a thin layer of glass wool on top of it was placed over the perforation (inside the glass tubing). All treating fluids were injected through the test sand at 72°F using 10 psig. Each furan resin consolidation was prepared by injecting the following treating fluids through the test sands.

	Treating Sequence	Treating Fluid	Volume, cc	
35	1	Standard Brine	100	35
	2	Diesel Oil preflush	130	
	3	Furan Resin	70	
	4	Diesel Oil Spacer	70	
	5	Diesel Oil-phthalylchloride Catalyst	350	
40	The resultant resin-treated sands were allowed to cure at 200°F for seven days at atmospheric pressure. During this cure period diesel oil-catalyst solution was contained in the pore spaces. Three separate consolidations were made for treatment with each hydrophobic silicon to be tested. Each consolidation was divided equally into two separate test core sections (top and bottom). In this manner a total of six test cores were available for each silicon chemical treatment. Three consolidations (six cores) were made for standards which were not subjected to silicon chemical treatments. Clean Oklahoma No. 1 sand was used because better duplication in strengths can be obtained from one test to another.			40
45				45
50	Hydrophobic Silicone Treating Procedure of Furan Resin Consolidated Sands Each test consolidation was flushed with the following fluids (72°F) at 10 psig.			50
	Treating Sequence	Treating Fluid	Volume, cc	
	1	Diesel Oil (to stabilize flow)	300	
	2	Standard Brine	100	
55	3	Diesel Oil Containing Silicone Chemicals*	20	55

*The percentage of hydrophobic silicon chemical dissolved in the diesel oil ranged from 1% to 10% by volume dependent on the particular test involved. These

are arbitrary volumes of carrier fluid and hydrophobic silicon selected for use in the initial study. However, low volumes and concentrations of hydrophobic silicon may be workable for specific applications. Optimum volumes and concentrations can be readily determined in view of this disclosure.

The "standard" consolidations were subjected to the same treatment as described above except the silicon chemical was left out of the No. 3 treating fluid.

Each treated consolidation was placed in a 200°F environment for 24 hours. Although the hydrophobic silicon chemical should react upon contact with the exposed silica surface, 24 hours were allowed for these exploratory tests.

Six standard cores (72°F) were tested for compressive strength properties. These consolidations were not to be subjected to boiling water tests.

The treatment of the consolidations with a brine solution prior to injecting the diesel oil containing the hydrophobic silicon chemical was done in these preliminary tests to insure that enough water would be present, if necessary, to react with the silicon for facilitating chemical bonding to the exposed sand surfaces. This, however, may not be necessary since sufficient water will probably be present on the sand to promote the necessary reaction.

The treated and "standard" consolidations were placed in a 200°F environment for 24 hours with the pore spaces filled with the diesel oil or hydrophobic silicon diesel oil solution. At the end of this period the cores were transferred to a 212°F boiling fresh water environment. The consolidations remained in boiling water continuously for seven days (168 hours). Compressive strengths (at 72°F) of these hydrophobic silicon treated consolidations were compared to the "standard" consolidation strengths after both had been subjected to the boil test. The compressive strengths (at 72°F) of the standard consolidations (not subjected to boil tests) were also compared to "standard" consolidations (subjected to boil tests).

Consolidations Prepared for Surface (Wettability) Properties

The following test sand mixture was used to determine if the hydrophobic silicon compound would change substantially the wettability properties of the furan resin consolidation.

Materials	Parts By Wt.
Oklahoma #1 Sand	88
Silica fines	10
Bentonite	2

This sand was selected since it represents many formation sands as to size distribution and clay content. Also, it was felt that with the increased surface area of the fine particles present more detectable damage, due to any change in surface properties would likely occur.

Two test consolidations were prepared with the sand contained inside tetrafluoroethylene tubing (1" inside diameter by 4" in length). Into each tetrafluoroethylene enclosure were packed first 5 grams of Oklahoma No. 1 sand (1/4" in height) followed by 3—1/3" of clayey test sand, and 5 grams (1/4" in height) layer of Oklahoma No. 1 sand on top of the clayey sand. Appropriate size screens were positioned at the lower end of each vertically mounted tetrafluoroethylene tube to permit retention of the sands while permitting production of effluent fluids therethrough. The tetrafluoroethylene sleeves were housed with a heating jacket (metal enclosure). Into each test sand (maintained at 105°F) were injected, using 20 psig, the following 105°F treating fluids.

Treating Sequence	Treating Fluid	Treating Vol., cc
1	Standard Brine*	20
2	Standard Brine**	800
3	Diesel Oil**	800
4	Diesel Oil Preflush	150
5	Furan Resin	100
6	Diesel Oil Spacer	100
7	Diesel Oil-Phthalyl Chloride Catalyst	400

*Allowed the clays to hydrate overnight after this treating step.

**Flow to stabilized flow conditions.

The consolidations were allowed to cure for 24 hours at 140°F. The consolidations then were treated as described below:

5	Treating Fluid Sequence	Treating Fluid	Consolidation #1	Consolidation #2	5
	1	Standard Brine	100	100	
	2	Diesel Oil	50	None	
		Diesel Oil containing 0.5 cc Trimethylchlorosilane		50	

10 All treating fluids were injected at 140°F using 20 psig. Both consolidations were permitted to remain in a 140°F environment for 18 hours, i.e., with the pore spaces filled with the step 2 treating fluid. Consolidation No. 1 (Standard) was run to determine permeability damage which can be expected to result by the treatment with brine and diesel oil.

15 The diesel oil permeabilities of the respective consolidations (no. 1 and 2) were obtained by injecting 400 cc of diesel oil (140°F) through each consolidation to stabilize flow conditions. Squeeze pressure was 20 psig.

TABLE I

Water Resistance Data Concerning the Treatment of Furan Resin Consolidations With Hydrophobic Silicon Compounds*

20	Hydrophobic Silicon Chemical	% By Vol. Diesel Oil Overflush Solution	% Retention of Compressive Strength of Furan Resin Consolidation After Exposure to 7 Days (168 hrs) 212°F Fresh Water		20
25	None			75.19	25
	Trimethylchlorosilane	1		106.1	
	Trihexylchlorosilane	1		106.7	
	Triphenylchlorosilane	1		99.8	
	Hexamethyldisilazane	1		97.7	
30	Hexamethyldisilazane	10		52.2	30
	Octylmethyldichlorosilane	10		98.0	
	Dimethyldiethoxysilane	10		98.5	
	Dimethyldiethoxysilane	1		90.0	
	Dimethyldichlorosilane	1		90.7	
35	N-9-bis-(trimethylsilyl)-adenine	Not oil soluble			35
	Amyltriethoxysilane	10		91.96	
	Trimethylmethoxysilane	10		90.0	
	1,3-bis-(3-glycidopropyl)-Tetramethyldisiloxane	10		85.7	
40	Bis-(trimethylsilyl)-acetamide	10		91.5	40
	Azidotrimethylsilane	10		94.4	

*Original compressive strengths of standards (not boiled) averaged 2002 psi. Each strength figure reported in this table was obtained from the average strength obtained on 6 cores (3 consolidations).

TABLE 2

Diesel Oil Flow Tests on Consolidation 1 (Untreated) And 2
(Treated With Hydrophobic Silicone Chemical)

	Test Core 1*	Test Core 2*	
5			5
	Permeability of Consolidation before brine and diesel oil treatment	446 md	
	Permeability of Consolidation after brine and diesel oil treatment	405.4 md	
10	Permeability damage, % loss, due to brine and diesel oil treatment	9.1%	10
	Permeability of Consolidation before brine and diesel oil-hydrophobic silicone treatment	661.2 md	
15	Permeability of Consolidation after brine and diesel oil-hydrophobic silicone treatment	587.8 md	15
	Permeability damage, % loss, due to brine and diesel oil-hydrophobic silicone treatment	11%	
20	Loss or gain attributable to hydrophobic silicone treatment	11%-9%=-2%**	20

*Test core No. 1 was a standard core which was not to be subjected to hydrophobic silicone treatment whereas Test Core No. 2 was to be silicone treated.

**This figure is within experimental error. Some possible allowances should be considered for the differences in the original consolidated test sand permeabilities prior to treatment and permeability tests. Both loose sands were packed to the same diesel oil permeability prior to furan resin consolidations, however, after consolidation the test cores were characterized by different permeabilities.

WHAT WE CLAIM IS:—

1. A process for increasing the stability of a permeable consolidated particulate mass against aqueous fluids flowing therein, whilst maintaining the permeability of the mass, which mass contains exposed siliceous surfaces, which comprises: contacting the mass with a treating fluid containing at least one organosilicon compound having a hydrophobic group and a silica bonding group to cause said organosilicon compound to form a hydrophobic protective film on the said siliceous surfaces, the presence of the said film not substantially reducing the permeability of the mass.

2. A process according to claim 1 wherein the said permeable mass is one which has been consolidated by injecting therein a hardenable fluid.

3. A process according to claim 1 or 2, wherein the treating fluid is injected into said permeable mass and maintained therein under conditions which cause said organosilicon compound to form a protective film on substantially all the exposed siliceous surfaces; and thereafter excess fluid is flushed from the mass.

4. A process according to claim 1, 2 or 3, wherein the treating fluid comprises 0.1—15% by weight of at least one hydrophobic organosilicon compound having at least one hydrophobic organic group and at least one silica bonding group selected from organohalogen silanes, organosilane esters, silazanes, silylacetamides, cyclosiloxanes and cyclosilazanes, wherein the halogen is fluorine, chlorine, bromine or iodine, the organic radicals are alkyl and/or aryl, each alkyl or aryl radical containing up to 18 carbon atoms;

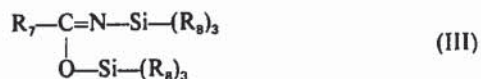
5. A process according to claim 4, wherein the or each hydrophobic silicon compound is selected from compounds represented by one of the following formulae:



wherein each R_1 is independently an alkyl, cycloalkyl, alkenyl, cycloalkenyl or aryl radical, or a hydrocarbon radical comprising a combination of two or more of these radicals containing up to 18 carbon atoms; each R_2 is independently a halogen radical, $-OR_3$ or $-OH$; each R_3 is independently an alkyl radical or aryl radical or a combination thereof containing up to 10 carbon atoms; and n is 1, 2 or 3;

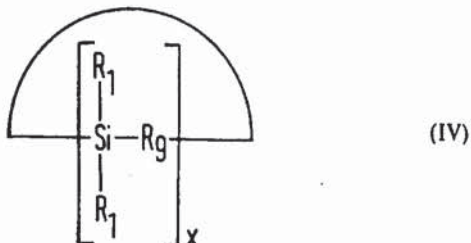


wherein each R_4 is independently equal to R_1 ; each R_5 is independently a halogen radical; each R_6 is independently $-N_3$, $-NH-Si-(R_4)_3$, or $-N(CH_3)-Si-(R_4)_3$; m is 2 or 3; q is 0 or 1; p is 1 or 2; and $m+q+p=4$; or



- 5 wherein R_7 is independently equal to R_1 or R_5 ; and each R_8 is independently equal to R_3 or a hydrogen atom, with at least one R_8 equal to R_3 ; or

5



wherein R_9 is $-O-$ or $-NH-$; and x is 3 or 4.

10

6. A process according to claim 1 substantially as herein described in the Examples.

10

7. A consolidated permeable mass which has been treated by the process of any of claims 1 to 6.

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



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(54) Title: MUD SYSTEM AND METHOD

(57) **Abstract:** A novel mud system and method reduce torque on drilling surfaces and coat geological formations to reduce the chances of formation reaction. The mud system comprises a fluid having weighting materials and a viscosifier. An additive in the form of water repellent particles is interspersed in the fluid. The water repellent particles comprise natural graphite having a particle size of less than 25 microns, a silicate material having a particle size of less than 15 microns, a silicone material, and processed wax treated with polyglycol. A method for reducing torque on drilling surface includes providing a drilling fluid, combining the above-identified additive with the drilling fluid, and allowing the drilling fluid and the additive to fill and level contact areas.

MUD SYSTEM AND METHOD

FIELD OF THE INVENTION

The present invention relates to drilling muds, which include compositions for reducing friction and torque, particularly in connection with oil drilling.

5

BACKGROUND OF THE INVENTION

Drilling mud is used in the sinking of boreholes including deep boreholes sunk in the search for hydrocarbons. The drilling mud lubricates the drill pipe and acts as a carrier for excavated drill cuttings. The drilling mud is pumped down
10 the drill pipe through nozzles in the drill bit at the bottom of the borehole and up the annulus between the drill pipe and the borehole wall. Drilled cuttings generated by the drill bit are transported by the drilling mud to the surface of the borehole where they are separated from the drilling mud and discarded. The drilling mud may then be cleaned and re-used.

15 In addition to its function as a carrier for cuttings, a drilling mud operates to lubricate the drill pipe and bit as well as the wall of the borehole, thereby reducing torque, overpull, and wear as well as the sticking of the drill pipe in the borehole. The drilling mud further provides a hydrostatic balance with the geological structure being drilled thereby minimizing the possibility of cave-ins and keeping
20 high pressure hydrocarbons from entering the borehole before a casing is run. The drilling mud additionally forms an impermeable membrane on the borehole to prevent the liquid phase in the drilling fluid from migrating to the geological formation, causing clays and shales to swell. In addition, the drilling mud acts to cool the drill bit and other high pressure wear areas. The drilling mud should
25 possess a suitable viscosity so as to suspend the drill cuttings when the drilling mud pumps are stopped. To enhance these functions, the drilling mud may incorporate additives such as hydrocarbon oil lubricants and polymers for controlling flow characteristics of the drilling mud.

30 A satisfactory drilling mud should be chemically inert, non-toxic, and nonpolluting. Oil based muds are known to have superior lubricating qualities to water based muds, but generally have unacceptable toxicity and pollution levels.

In recognition of this fact, U.S. Patent No. 5,401,719 discloses a drilling mud which excludes components that are harmful to the environment. The drilling mud additive of the aforementioned patent further improved the lubricating qualities of water based drilling muds to approach those of oil based products.

5 However, this prior art system suffers from various deficiencies. Although the lubrication of the disclosed additive improved upon that of prior water based additives, it is still desirable to improve the lubricating and water repellent properties of the additive.

A further difficulty of pre-existing systems, including that of the
10 aforementioned U.S. patent, is the necessity of continuous operator monitoring. Continuous monitoring has been necessary because previous systems have been insufficiently water repellent to coat the formation thereby preventing chemical reaction. The possibility of the occurrence of a chemical reaction renders continuous operator monitoring necessary.

15

SUMMARY OF THE INVENTION

It is accordingly an object of the invention to provide a chemically inert, non-polluting, nontoxic mud system.

It is a further object of the invention to provide a mud system having
20 improved lubricating and water repellent properties.

It is still a further object of the invention to provide a mud system which eliminates the need for continuous operator monitoring of drilling operations.

To achieve the foregoing objects, and in accordance with the purpose of the invention as embodied and broadly described herein, there is provided a mud
25 system that comprises a water based fluid and water repellent particles interspersed in the water based fluid. The water repellent particles comprise a combination of graphite, a silicate material, a silicone material, and processed wax treated with polyglycol. The system coats a geological formation such that it is sealed from the drilling fluid.

30 In yet another aspect, a method of the invention comprises the steps of providing a drilling fluid, combining an additive with the drilling fluid, and allowing the drilling fluid and the additive to fill and level contact areas, thereby reducing

torque values. The additive comprises water repellent particles interspersed in the drilling fluid, the water repellent particles comprising a combination of graphite, a silicate material, a silicone material, and processed wax treated with polyglycol.

- 5 These and other objects and advantages of the preferred embodiments will become apparent through the detailed description of the invention and its preferred embodiments.

DETAILED DESCRIPTION

- 10 According to an embodiment of the invention, a drilling fluid is provided which is preferably water-based in order to minimize polluting effects. The water-based drilling fluid of this embodiment includes weighting minerals to increase fluid density and viscosifiers to enhance viscosity. Suitable weighting materials include, but should not be limited to barite, calcium carbonate, ferrous oxide, and
- 15 hematite. Suitable viscosifiers include biodegradable environmentally friendly materials including, but not limited to carboxy methyl cellulose (CMC) and polyanionic cellulose (PAC) polymers. An additive is combined with the drilling fluid in order to enhance water repellency and minimize surface tension. The additive is preferably chemically inert and exhibits low surface tension
- 20 characteristics of approximately 20 Dynes/cm². All components of the additive are chemically inert, non toxic, and nonpolluting.

- In a preferred embodiment, the additive includes natural graphite, a silicate material, a silicone material, and a processed wax treated with polyglycol. The graphite component is preferably 100% natural crystalline flake graphite having a
- 25 particle size of less than 25 microns. However, synthetic and/or amorphous graphite can also be used. The silicate material components falls within the micaceous mineral group and may include koalinite or phlogophite and preferably has a particle size smaller than 15 microns and more preferably less than one micron. The processed wax is a non sticky, brittle waxy solid treated with a
- 30 polyglycol. The processed wax exhibits pliable and coating properties. When the graphite is impregnated with the processed wax, the combined materials act as an initial binding to metal to form a thin pliable film on the metal components in

the borehole. The silicone component is a dimethyl polysiloxane based emulsion listed in the Merck Index as symethicone, and is also known as PMDS. The dimethyl polysiloxane enhances the water repellency or hydrophobic nature of the impregnated graphite and silicate particles. When dispersed in a drilling fluid, these particles increase surface tension between the predominately water wet surface in the borehole. Surfaces with a difference in surface tension tend to repel each other, thereby enhancing lubrication. Furthermore, when the particles are dispersed in the fluid, the fluid forms a membrane that coats the geological formation to seal it from the drilling fluid and prevent formation reaction.

10 The graphite and silicate particles combined may constitute between 70% to 80%, and preferably about 75% of the mass of the additive. The PMDS composition may be up to 22% of the mass and the processed wax may range from 1% to 3% of the mass of the additive. The specific gravity of the additive is preferably between 1.6 and 2.0 kg/dm³. The pH of the additive is preferably
15 between 8.0 and 8.5 (10% by weight in water).

 The above-described additive composition is a powder type lubricant that is added to the above-described drilling fluid. Lubrication is effected by filling, dressing and leveling action, thereby separating the opposing contact surfaces, increasing the actual load bearing area, and thereby decreasing the actual load. Reduced load values result in lower friction and torque values or simultaneously protecting the opposing surfaces. As opposed to a liquid type lubricant, powder type lubricants fill and level uneven surfaces to increase the load bearing area and lower the load per unit area. The pliable particles of the above-described additives have an affinity for metal and coat metal surfaces forming a thin layer.
20 As the particles of the additive have a very low surface tension, the difference in surface tension of the thin layer between the drill string and borehole improves lubrication and consequently minimizes rotary torque and friction.

 Additionally, the above-described powder type lubricant is stable in temperatures in excess of 500 °F, whereas liquid type lubricants generally are not. Furthermore, the additive lowers the high temperature/high pressure filtrate values in any drilling fluid and has an effect on long term filtration rates and
30

minimizing filtrate invasion. The additive further has a direct reduction effect on seepage losses.

A further benefit of the above-described additive is the stabilization of rheological properties. This stabilization leads to greater hole cleaning efficiency.

- 5 Water based drilling fluids and in particular viscous fluids or salt containing fluids are susceptible to air entrapment. The surface area of the dispersed air forms an emulsion that contracts and expands with changes in pressure and temperature. This fluctuation in rheology and density is undesirable and is minimized by the additive described above.

- 10 Additionally, the above described additive has a strong defoaming action and maximizes air and gas breakout. The additive minimizes the viscosifying effect of the entrapped air and stabilizes the viscosity after the entrapped air is removed. Due the above described release of air and gases and the coating ability of the additive, the corrosion rate of the metal surfaces is very low. Due to
15 reduction in surface tension, the invention imparts an effective defoaming action thereby ensuring air and gas removal. This action ensures a de-serated drilling fluid and protects polymeric additives from being damaged by high temperature oxygen degradation. The additive further helps to extend the temperature stability of the polymers by providing improved heat transmission and transfer
20 medium, thereby increasing the temperature range of polymers.

- The adhesive properties of the additive causes it to coat and smear the entire surface of the casing and drill string and to establish a presence throughout the borehole wall thereby minimizing downhole frictional forces. The filling and coating action of the additive creates smoother surfaces and thereby reduces
25 wear between surfaces and the borehole. The smoother surfaces additionally cause a reduction in torque and drag and eliminate previously existing downhole vibrations and shock. The smoother surfaces further reduce wear on the drill string and the drilling tools and bit, thereby reducing premature metal and seal failures. By preventing borehole problems as described above, the system
30 optimizes logging operations and cementing operations.

Because the particles of the additive are predominantly water repellent and create a water repellent film that coats clay type material in the well bore, the

additive assists in physical inhibition. The particles of the additive are forced into pores or microfractures in the clay by differential pressure and downhole dynamics. This process forms a seal and reduces fluid invasion into the clay formation. The particles of the additive thereby stabilize mechanically
5 troublesome shales.

With regard to drilled solids, the coating effect of the additive reduces dispersion of the solid and the drilling fluid. Furthermore, the drilled solids are firmer and in better physical condition due to the reduction in degradation caused by the protective coating. The improved condition of the drill solids allows more
10 accurate visual analysis and evaluation by geologists.

Additionally, the above described additive has positive effects on drilling equipment. Due to the coating effect of the water repellent particles, membranes also known as thin filter cakes eliminate pipe sticking tendencies. Due to lubrication properties, the additive enhances conditions for gaining maximum
15 performance from directional tools and drill string design. The lubrication effect further protects tools and reduces premature failures of steering, measuring, and telemetric downhole tools.

The low surface tension of the particles of the additive creates several additional positive effects. First, the particle cause reduction or elimination of bit and bottom hole assembly balling between metal and drilled claimed minerals. Thus, the time for tripping, logging, and casing run operations is shortened. Additionally, diamond and PDC bits can be used because of the surface tension effect with optimum performance comparable to that in oil based muds. The low surface tension further insures maximum lift-off and reduces formation damage
25 and clean up time.

The non-polluting, environmentally friendly, and chemically inert properties provide great advantages over oil based mud systems. Legislation governing the use of hydrocarbon based drilling fluids increases the demand for the development of such a product. Because the particles of the additives are totally
30 chemically inert, they are not absorbed into the food chain or any form of aquatic life. The system is extremely low or totally free of hydrocarbon content. In particular, the additive has less than 25 ppm residual.

The system described above also maximizes the usage of available drilling horsepower. In the case of offshore drilling operation from existing platforms, it provides the operator with far more options to reach reserves of hydrocarbon previously unreachable. The fluid system further gives the operators both land and offshore, the option to utilize smaller drilling package design that can alter the economics of bringing hydrocarbon reserve into production. Finally, the drilling fluid can be used without any chemistry knowledge or chemical additive management.

It will be apparent to those skilled in the art that various modifications and variations can be made in the system and method of the present invention without departing from the spirit and scope of the invention. Thus, it is intended that the present invention cover the modifications and variations of this invention provided that they come within the scope of the appended claims and their equivalents.

WHAT IS CLAIMED IS:

1. A mud system comprising:
a drilling fluid comprising weighting materials and a viscosifier; and
water repellent particles interspersed in the drilling fluid, the water
5 repellent particles comprising a combination of graphite, a silicate material, a
silicone material, and processed wax treated with polyglycol, wherein the system
coats a geological formation such that it is sealed from the drilling fluid.
2. The system of claim 1, wherein the water repellent particles have a
surface tension no greater than 25 Dynes/cm².
- 10 3. The system of claim 1, wherein the graphite has a particle size of
no greater than 25 microns and the silicate material has a particle size of no
greater than 15 microns.
4. The mud system of claim 1, wherein the weighting materials
comprise at least one of barite, calcium carbonate, ferrous oxide, and hematite.
- 15 5. The mud system of claim 1, wherein the viscosifier comprises a
biodegradable environmentally friendly material.
6. The mud system of claim 5, wherein the viscosifier comprises one
of CMC and PAC polymers.
7. The mud system of claim 1, wherein the graphite comprises natural
20 graphite.
8. The mud system of claim 1, wherein the silicate material comprises
one of kaolinite and phlogophite.
9. The mud system of claim 1, wherein the processed wax is solid,
brittle, and non-sticky.
- 25 10. The mud system of claim 1, wherein the processed wax has a
particle size of less than one micron.
11. The mud system of claim 1, wherein the processed wax is treated
with polyglycol.
12. The mud system of claim 1, wherein the graphite is impregnated
30 with the processed wax so as to form a thin pliable film which binds to metal.
13. The mud system of claim 1, wherein the silicone component
comprises dimethylsiloxane.

14. The mud system of claim 1, wherein the graphite and silicate materials comprise 70 to 80 percent of the mass of the composition and the processed wax comprises from 1 to 3 percent of the mass of the composition.

15. The mud system of claim 1, wherein the specific gravity is between
5 1.6 and 2.0 kg/dm³ and the pH is 8.0 to 8.5.

16. A mud system comprising:
a drilling fluid comprising weighting materials and a viscosifier; and
water repellent particles interspersed in the drilling fluid, the water
repellent particles comprising a combination of graphite having a particle size no
10 greater than 25 microns, a silicate material having a particle size no greater than
15 microns, a silicone material, and processed wax treated with polyglycol,
wherein the water repellent particles have a surface tension no greater than 25
Dynes/cm² such that the system coats a geological formation such that the
geological formation is sealed from the drilling fluid.

15 17. A method for reducing torque in a borehole used for drilling, the
method comprising the steps of:
providing a drilling fluid;
combining an additive with the drilling fluid, the additive comprising water
repellent particles interspersed in the fluid, the water repellent particles
20 comprising natural graphite, a silicate material, a silicone material, and processed
castor oil wax treated with polyglycol; and
allowing the drilling fluid and the additive to fill and level contact areas,
thereby reducing torque values and to coat the geological formation, thereby
reducing chances of formation reaction.

25 18. The method of claim 17, wherein the step of providing a drilling fluid
comprises providing weighting materials comprising at least one of barite,
calcium carbonate, ferrous oxide, and hematite.

19. The method of claim 17, wherein the step of providing a drilling fluid
comprises providing a viscosifier including a biodegradable environmentally
30 friendly material.

20. The method of claim 19, wherein providing a viscosifier comprises
providing one of CMC and PAC polymers.

21. The method of claim 17, wherein the step of combining an additive comprises providing natural graphite.

22. The method of claim 17, wherein the step of providing an additive comprises providing a silicate material containing one of koalinite and
5 phlogophite.

23. The method of claim 17, wherein the step of providing an additive comprises providing solid, brittle, and non-sticky wax.

24. The method of claim 1, wherein the step of providing an additive comprises providing processed wax having a particle size of less than one
10 micron.

25. The method of claim 24, further comprising treating the processed wax with polyglycol.

26. The method of claim 1, further comprising impregnating the graphite with the processed wax so as to form a thin pliable film which binds to metal.

27. The mud system of claim 1, wherein the silicone component
15 comprises simethicone.

28. The method of claim 17, further comprising providing an additive wherein the graphite and silicate materials comprise 70 to 80 percent of the mass of the composition and the processed wax comprises from 1 to 3 percent of the
20 mass of the composition.

29. The method of claim 17, further comprising providing an additive wherein the specific gravity is between 1.6 and 2.0kg/dm³ and the pH is 8.0 to 8.5.

30. The method of claim 17, further comprising providing an additive
25 wherein the graphite has a particle size of no greater than 25 microns and the silicate material has a particle size of no greater than 15 microns.

31. The method of claim 17, wherein the water repellent particles have a surface tension no greater than 25 Dynes/cm².

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/28563

A. CLASSIFICATION OF SUBJECT MATTER

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US CL : 507/140, 127

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

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Minimum documentation searched (classification system followed by classification symbols)

U.S. : 507/140, 127

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

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

EAST, CAPLUS

search terms: drilling fluid, graphite, silicate

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,401,719 A (DEBEER) 28 March 1995, see abstract	1-31
A	WO 98/49116 A1 (CROSFIELD LIMITED) 05 November 1998, see abstract.	1-31



Further documents are listed in the continuation of Box C.



See patent family annex.

* " Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
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Date of the actual completion of the international search

27 NOVEMBER 2001

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14 DEC 2001

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Confirmation Number:	8420
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First Named Inventor/Applicant Name:	Kewei Zhang
Customer Number:	30589
Filer:	Nicholas Dean Rouse/Audrey Conrad
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Time Stamp:	17:17:42
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	7957004_SB21_TransmittalForm_ForeignReferences.pdf	82462 21d576f168c0854b33dbcb4299c723e6122d7bc1	no	1

Warnings:

Preferred Proppants, LLC, Preferred Pipeline, LLC, Preferred Resin Sales, LLC,

Ex. 1014, p. 534 of 548

Information:

Preferred Resin of Genoa, LLC, Preferred Sands of Wisconsin, LLC

2	Foreign Reference	7957004_CitedForeignReferences_4-12-10.pdf	1004146 5cd6fc3bd823865a691c9e6d9701cdfba341ce95	no	20
Warnings:					
Information:					
Total Files Size (in bytes):				1086608	
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/416,704	05/02/2006	Kewei Zhang	7957.004	8420
30589 7590 04/19/2010 DUNLAP CODDING, P.C. PO BOX 16370 OKLAHOMA CITY, OK 73113			EXAMINER ADMASU, ATNAF S	
			ART UNIT 1796	PAPER NUMBER
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DUNLAP CODDING, P.C.
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EXAMINER

ATNAF ADMASU

ART UNIT	PAPER
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Commissioner for Patents

The information disclosure statement submitted on 07 April 2010 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner has considered the information disclosure statement.

/ASA/

/Timothy J. Kugel/
Primary Examiner, Art Unit 1796

PTO-90C (Rev.04-03)

Receipt date: 04/07/2010

11416704 - GAU: 1796
Sheet 1 of 1

Substitute for form 1449/PTO
PTO/SB/08A and 08B
Form 6-2 and Form 6-2.1

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	11/416,704
Filing Date	May 2, 2006
First Named Inventor	Kewei Zhang
Art Unit	1796
Examiner Name	Admasu, Atnaf S
Attorney Docket Number	7957.004

U. S. PATENT DOCUMENTS				
EXAM INIT.	Cite No. ¹	Document Number Number-Kind Code ² (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYY
	1	US 4,231,428	Needham et al.	11-04-1980

Examiner Signature: _____ Date Considered: _____

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard St.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard St. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

FOREIGN PATENT DOCUMENTS					
EXAM INIT.	Cite No. ¹	Foreign Patent Document Country Code ³ Number ⁴ Kind Code ⁵ (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYY	T ⁶
	1	GB 1584831	Halliburton Company	02-18-1981	
	2	WO 02/22759 A1	Thuslick, Inc.	03-21-2002	

Examiner Signature: /Atnaf Admasu/ Date Considered: 04/14/2010

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard St.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard St. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.



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.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/416,704	05/25/2010	7723274	7957.004	8420

30589 7590 05/05/2010
DUNLAP CODDING, P.C.
PO BOX 16370
OKLAHOMA CITY, OK 73113

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 484 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):

Kewei Zhang, Calgary, CANADA;

ELECTRONICALLY FILED: 06/17/2010

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent No.: 7,723,274 B2

Serial No.: 11/416,704

Issued: 05/25/2010

Inventor: Kewei Zhang

Atty. Docket No.: 7957.004

Customer No.: 30589

Attn: Certificate of Correction Branch

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

**REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT
FOR PTO AND/OR APPLICANT'S MISTAKES (37 CFR 1.322(a) and 1.323)**

Enclosed are:

[X] sb21 Transmittal Form; and

[X] 1 sheet(s) of form sb44 Certificate of Correction.

[X] PTO ERRORS

The exact column and line number where the mistakes occur in the patent as well as reference to the exact page and line number where the correct information occurs in the application file:

In the Specification:

Column 7, line 22: After "U.S. Pat. Nos." delete "4,054,161;" .
(See Amendment filed, 10/22/2009, pg. 3, line 1)

Column 8, line 28: Delete "fended" and replace with -- tended -- .
(See Application filed, 05/12/2006, pg. 14, ¶ 26, line 11)

In the Claims:

Column 11, line 41: After "organic" delete "guarternary" and replace with
-- quarternary -- .

(See Amendment filed, 10/22/2009, pg. 4, Claim 1, line 12)

Column 13, line 2: Delete "guarternary" and replace with -- quarternary -- .

(See Amendment filed, 10/22/2009, pg. 8, line 7)

Column 13, line 3: Delete "guarternary" and replace with -- quarternary -- .

(See Amendment filed, 10/22/2009, pg. 8 line 7)

☒ No fee is submitted herewith.

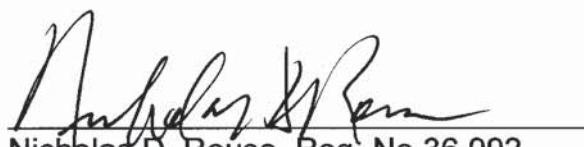
☐ APPLICANT'S ERRORS

It is noted that errors appear in this patent of a clerical or typographical nature or a minor character as more fully described below. These errors occurred in good faith, and correction thereof does not involve such changes in the patent as would constitute new matter or would require re-examination. Thus, a Certificate of Correction is requested.

The exact column and line number where the mistakes occur in the patent are:

☒ RETURN OF CERTIFICATE

Please send the Certificate of Correction to the undersigned.



Nicholas D. Rouse, Reg. No.36,992

DUNLAP CODDING, P.C.

P.O. Box 16370

Oklahoma City, Oklahoma 73113

Telephone: 405/607-8600

Facsimile: 405/607-8686

Attorney for Applicant

UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

Page 1 of 1

PATENT NO. : 7,723,274 B2

APPLICATION NO.: 11/416,704

ISSUE DATE : 05/25/2010

INVENTOR(S) : Kewei Zhang

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Specification:

Column 7, line 22: After "U.S. Pat. Nos." delete "4,054,161;" .

Column 8, line 28: Delete "fended" and replace with -- tended -- .

In the Claims:

Column 11, line 41: After "organic" delete "quaternary" and replace with -- quaternary -- .

Column 13, line 2: Delete "quaternary" and replace with -- quaternary -- .

Column 13, line 3: Delete "quaternary" and replace with -- quaternary -- .

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Dunlap Coddling, P.C.
P.O. Box 16370
Oklahoma City, OK 73113

Nicholas D. Rouse, Reg. No. 36,992

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. 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 1.0 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: Attention Certificate of Corrections Branch, 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.

Preferred Proppants, LLC, Preferred Pipeline, LLC, Preferred Resin Sales, LLC,
Preferred Resin of Genoa, LLC, Preferred Sands of Wisconsin, LLC

Ex. 1014, p. 542 of 548

Electronic Acknowledgement Receipt

EFS ID:	7833099
Application Number:	11416704
International Application Number:	
Confirmation Number:	8420
Title of Invention:	METHOD FOR MAKING PARTICULATE SLURRIES AND PARTICULATE SLURRY COMPOSITIONS
First Named Inventor/Applicant Name:	Kewei Zhang
Customer Number:	30589
Filer:	Nicholas Dean Rouse/Julie Rose
Filer Authorized By:	Nicholas Dean Rouse
Attorney Docket Number:	7957.004
Receipt Date:	17-JUN-2010
Filing Date:	02-MAY-2006
Time Stamp:	11:39:26
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	sb21Transmittal_COC_1pg.pdf	60250 690e1e2886ebfa4c8b1def790fb250abc549bb05	no	1

Warnings:

Preferred Proppants, LLC, Preferred Pipeline, LLC, Preferred Resin Sales, LLC,

Ex. 1014, p. 543 of 548

Information:


Preferred Resin of Genoa, LLC, Preferred Sands of Wisconsin, LLC


2	Request for Certificate of Correction	Request_for_Certificate_of_Correction_2pgs.pdf	56978 30f628580873de2da20892674159e830a90c81ce	no	2
Warnings:					
Information:					
3	Request for Certificate of Correction	sb44_Certificate_of_Correction_1pg.pdf	40145 67186d109e735348ccff4e6d4228e009dd031fd6	no	1
Warnings:					
Information:					
Total Files Size (in bytes):			157373		
<p>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.</p> <p><u>New Applications Under 35 U.S.C. 111</u> 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.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> 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.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> 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.</p>					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FORM <i>(to be used for all correspondence after initial filing)</i>	Application Number	11/416,704
	Filing Date	05/02/2006
	First Named Inventor	Kewei Zhang
	Art Unit	1796
	Examiner Name	Atnaf Admasu
Total Number of Pages in This Submission	Attorney Docket Number	7957.004

ENCLOSURES (Check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Reply to Missing Parts/ Incomplete Application <input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____ <input type="checkbox"/> Landscape Table on CD	<input type="checkbox"/> After Allowance Communication to TC <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): Certificate of Correction
Remarks 1. sb21 Transmittal Form (1 pg); 2. Request for Certificate of Correction (2 pgs); and 3. sb44 Certificate of Correction (1 pg.).		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT			
Firm Name	DUNLAR CODDING, P.C.		
Signature			
Printed name	Nicholas D. Rouse		
Date	06/17/2010	Reg. No.	36,992

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			
Typed or printed name	Nicholas D. Rouse	Date	06/17/2010

This collection of information is required by 37 CFR 1.5. 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 2 hours 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.

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,723,274 B2
APPLICATION NO. : 11/416704
DATED : May 25, 2010
INVENTOR(S) : Kewei Zhang

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Specification:

Column 7, line 22: After "U.S. Pat. Nos." delete "4,054,161;".

Column 8, line 28: Delete "fended" and replace with -- tended --.

In the Claims:

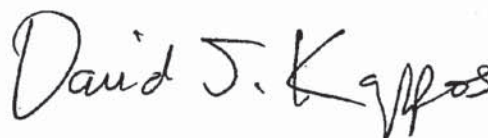
Column 11, line 41: After "organic" delete "guarternary" and replace with -- quarternary --.

Column 13, line 2: Delete "guarternary" and replace with -- quarternary --.

Column 13, line 3: Delete "guarternary" and replace with -- quarternary --.

Signed and Sealed this

Twentieth Day of July, 2010

A handwritten signature in black ink that reads "David J. Kappos". The signature is written in a cursive, flowing style.

David J. Kappos

Director of the United States Patent and Trademark Office

AO 120 (Rev. 08/10)

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
---	---

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court _____ for the Eastern District of Texas _____ on the following

☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO. 16-1214	DATE FILED 10/31/2016	U.S. DISTRICT COURT for the Eastern District of Texas
PLAINTIFF Trican Well Service Ltd.		DEFENDANT Preferred Proppants, LLC and Preferred Sands, LLC
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 7,723,274	5/25/2010	Trican Well Service Ltd.
2 8,236,738	8/7/2012	Trican Well Service Ltd.
3		
4		
5		

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY <input type="checkbox"/> Amendment <input type="checkbox"/> Answer <input type="checkbox"/> Cross Bill <input type="checkbox"/> Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
-------	-------------------	------

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director

Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

Preferred Proppants, LLC, Preferred Sands of Genoa, LLC, Preferred Resin of Genoa, LLC, Preferred Resin of Genoa, LLC, Preferred Sands of Wisconsin, LLC

Ex. 1014, p. 547 of 548

TO: <p style="text-align: center;">Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450</p>	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
---	--

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the Southern District of Texas on the following Trademarks or Patents.

Docket No. 4:17-cv-01340	Date Filed: 5/1/2017	U.S District Court SOUTHERN DISTRICT OF TEXAS
Plaintiff(s) Trican Well Service, Ltd.		Defendant(s) Preferred Proppants, LLC, et al.
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
A copy of the complaint is being mailed with this form.		
1. 7,723,274		
2. 8,236,738		
3.		
4.		
5.		
In the above-entitled case, the following patent(s)/trademark(s) have been included:		
DATE INCLUDED	INCLUDED BY Amendment Answer Cross Bill Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1.		
2.		
3.		
4.		
5.		
In the above-entitled case, the following decision has been rendered or judgment issued:		
DECISION/JUDGMENT		
Clerk: David J. Bradley, Clerk	By Deputy Clerk: H. Carr	Date: 5/3/2017