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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	01/23/2018	9873638	042790.000007	9538

24239 7590 01/03/2018

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

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

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

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

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

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

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

Terrell Dallas Ginn, Milton, KY;
Danny Lynn Gray, Marietta, GA;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

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24239 e 2017-10-13

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

Paper No.

Application No.:	**13/962,903**	**Date Mailed:**	**2017-10-13** **ELECTRONIC**
First Named Inventor:	Terrell Dallas Ginn	Examiner:	LANGEL, WAYNE A
Attorney Docket No.:	042790.000007	Art Unit:	1736
Confirmation No.:	9538	Filing Date:	08/08/2013

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

Commissioner for Patents

PTO-90c (Rev.08-06)

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October 11, 2017

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

In re Application of
GINN ET AL.
Application No. 13/962,903
Filed: 08 August, 2013
Attorney Docket No. 042790.000007

DECISION ON PETITION

This is a decision on the Petition to Accept Color Drawings under 37 C.F.R 1.84 (a) (2), received in the United States Patent and Trademark Office (USPTO) on August 8, 2013.

The petition is **DISMISSED.**

A grantable petition under 37 C.F.R. 1.84(a) (2) must meet the following requirements:

1. Payment of the fee set forth under 37 C.F.R. 1.17(h),
2. Submission of three (3) sets of color drawings, or one (1) set of color drawings if filed by EFS-Web, and
3. The first paragraph of the brief description of the drawings in the Specification contains the following required language:

"The patent or application file contains at least one drawing executed in color. Copies of this patent or patent application publication with color drawing(s) will be provided by the Office upon request and payment of the necessary fee."

The petition did not meet the following requirement(s). 1 ☐ 2 ☐ 3 ☒

The latest filed drawings received on did not meet the standards of requirement # .

A renewed petition filed under 37 C.F.R. 1.84 (a) (2) must be filed within TWO (2) MONTHS of this decision. If a renewed petition is not filed within the TWO (2) Months of this decision the drawings will be printed in black and white.

Telephone inquiries relating to this decision may be directed to the undersigned in the Office of Data Management at 571-272-4200.

/NIOMI P. FARMER/

Office of Data Management
Publications Branch

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)

24239 7590 03/31/2017
MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

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

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

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

TITLE OF INVENTION: SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$480	$480	06/30/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
LANGEL, WAYNE A	1736	071-023000

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

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

1 MOORE & VAN ALLEN PLLC
2 Henry B. Ward, III
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: SUL4R-PLUS, LLC
(B) RESIDENCE: (CITY and STATE OR COUNTRY): LOUISVILLE, KENTUCKY

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 EFT
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☒ The director is hereby authorized to charge ~~the required fee(s),~~ any deficiency, or credits any overpayment, to Deposit Account Number 13-4365 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /hbw/ Date 06/21/2017
Typed or printed name Henry B. Ward, III Registration No. 42,212

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Prolime Agriculture, LLC - Exhibit 1004 - Page 4

Electronic Patent Application Fee Transmittal

Application Number:	13962903
Filing Date:	08-Aug-2013
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Filer:	Henry B. Ward/Rebecca Spillers
Attorney Docket Number:	946478-000027

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	2501	1	480	480

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**480**

Electronic Acknowledgement Receipt	
EFS ID:	29561036
Application Number:	13962903
International Application Number:	
Confirmation Number:	9538
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Customer Number:	24239
Filer:	Henry B. Ward/Rebecca Spillers
Filer Authorized By:	Henry B. Ward
Attorney Docket Number:	946478-000027
Receipt Date:	21-JUN-2017
Filing Date:	08-AUG-2013
Time Stamp:	14:33:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	EFT
Payment was successfully received in RAM	$480
RAM confirmation Number	062217INTEFSW14335900
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	Issue_Fee_Transmittal_946478_000027.pdf	144344 0bee3a57bdb5cbddec17b026cbb26910373e8220	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30895 2226c3c5587056b08ea9f11a69d8f44b4780a6dc	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	175239		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

24239 7590 03/31/2017

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

EXAMINER
LANGEL, WAYNE A

ART UNIT	PAPER NUMBER
1736	

DATE MAILED: 03/31/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

TITLE OF INVENTION: SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$480	$480	06/30/2017

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 ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

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.

Prolime Agriculture, LLC - Exhibit 1004 - Page 9

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)

24239 7590 03/31/2017
MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

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

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

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

TITLE OF INVENTION: SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$480	$480	06/30/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
LANGEL, WAYNE A	1736	071-023000

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

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

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

2. For printing on the patent front page, list

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

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

1 _____
2 _____
3 _____

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

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

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

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

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

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

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

❑ A check is enclosed.

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

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

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

❑ Applicant certifying micro entity status. See 37 CFR 1.29

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

❑ Applicant asserting small entity status. See 37 CFR 1.27

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

❑ Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Prolime Agriculture, LLC - Exhibit 1004 - Page 10

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

24239 7590 03/31/2017

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

EXAMINER	
LANGEL, WAYNE A	
ART UNIT	PAPER NUMBER
1736	

DATE MAILED: 03/31/2017

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

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

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.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B 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.

Privacy Act Statement

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

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

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

Notice of Allowability	Application No. 13/962,903	Applicant(s) GINN ET AL.	
	Examiner WAYNE LANGEL	Art Unit 1736	AIA (First Inventor to File) Status Yes

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

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

1. ☒ This communication is responsive to *the amendment of 3-14-17*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1,3,5-13,16-22,24 and 26-29*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

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

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ 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. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/WAYNE LANGEL/
Primary Examiner, Art Unit 1736

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BIB DATA SHEET

CONFIRMATION NO. 9538

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/962,903	08/08/2013 RULE	071	1736	946478-000027

APPLICANTS

INVENTORS

Terrell Dallas Ginn, Milton, KY;
Danny Lynn Gray, Marietta, GA;

**** CONTINUING DATA ***************************

This appln claims benefit of 61/681,088 08/08/2012

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

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
08/23/2013

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /WAYNE A LANGEL/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		KY	4	29	3

ADDRESS

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709
UNITED STATES

TITLE

SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING

FILING FEE RECEIVED		
1160	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13962903	GINN ET AL.
	Examiner	Art Unit
	WAYNE LANGEL	1736

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
71	63	2-7-14	WAL

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor Name Search	2-7-14	WAL
EAST:		
L1: (gypsum or (calcium adj sulfate)) and C05G3/0088.cpc	3-24-17	WAL
L2: L1 and (binder or lignosulfonate))	3-24-17	WAL
L3: (gypsum or (calcium adj sulfate)) and C05D3/00.cpc.	3-24-17	WAL
L4: L3 and (binder or mlignosulfonate))	3-24-17	WAL
L5: (gypsum or (calcium adj sulate)) and C05D3/02.cpc.	3-24-17	WAL
L6: L5 and)binder or lignosulfonate)	3-24-17	WAL
See EAST Search History	3-24-17	WAL

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
C05G	3/0088	3-24-17	WAL
C05D	3/00	3-24-17	WAL
C05D	3/02	3-24-17	WAL

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13962903	GINN ET AL.
	Examiner	Art Unit
	WAYNE LANGEL	1736

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

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

CLAIM		DATE								
Final	Original									
1	1									
	2									
2	3									
	4									
3	5									
4	6									
5	7									
6	8									
7	9									
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21	27									
22	28									
23	29									

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	111	(gypsum or (calcium adj phosphate)) and C05D3/00.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2015/08/26 08:41
S2	45	S1 and (binder or lignosulfonate)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2015/08/26 08:42
S3	132	(gypsum or (calcium adj sulfate)) and C05D3/00.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2015/08/26 09:32
S4	51	S3 and (binder or lignosulfonate)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2015/08/26 09:33
S5	139	(gypsum or (calcium adj sulfate)) and C05D3/02.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2015/08/26 09:51
S6	49	S5 and (binder or lignosulfonate)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2015/08/26 09:51
S7	139	(gypsum or (calcium adj phosphate)) and C05D3/00.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2017/03/24 16:49
S8	57	S7 and (binder or lignosulfonate)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2017/03/24 16:49
S9	182	(gypsum or (calcium adj sulfate)) and C05D3/02.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2017/03/24 16:51
S10	74	S9 and (binder or lignosulfonate)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2017/03/24 16:52
S11	65	(gypsum or (calcium adj phosphate)) and C05G3/0088.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2017/03/24 16:55
S12	65	(gypsum or (calcium adj phosphate)) and C05G3/0088.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2017/03/24 16:55
S13	58	(gypsum or (calcium adj sulfate)) and C05G3/0088.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2017/03/24 16:56

EAST Search History (Interference)

<This search history is empty>

3/24/2017 8:01:31 PM
C:\Users\wlangel\Documents\EAST\Workspaces\13962903.wsp

Prolime Agriculture, LLC - Exhibit 1004 - Page 17

Prolime Agriculture, LLC - Exhibit 1004 - Page 18

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13962903	GINN ET AL.
	Examiner	**Art Unit**
	WAYNE LANGEL	1736

CPC						
Symbol					**Type**	**Version**
C05D		3	/	00	F	2013-01-01
C05G		3	/	0088	I	2013-01-01
C05D		3	/	02	I	2013-01-01
C05G		3	/	0058	I	2013-01-01
C05G		3	/	00	I	2013-01-01
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CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	23	
/WAYNE LANGEL/ Primary Examiner.Art Unit 1736	03/24/2017	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1,10,11	2

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13962903	GINN ET AL.
	Examiner	**Art Unit**
	WAYNE LANGEL	1736

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
		C 0 5 D 3 / 00 (2006.01.01)	
CROSS REFERENCE(S)		C 0 5 D 3 / 02 (2006.0)	
		C 0 5 G 3 / 00 (2006.0)	
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)		

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	23	
/WAYNE LANGEL/ Primary Examiner.Art Unit 1736	03/24/2017	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1,10,11	2

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13962903	GINN ET AL.
	Examiner	**Art Unit**
	WAYNE LANGEL	1736

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

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	13	17												
	2	14	18												
2	3	15	19												
	4	16	20												
3	5	17	21												
4	6	18	22												
5	7		23												
6	8	19	24												
7	9		25												
8	10	20	26												
9	11	21	27												
10	12	22	28												
11	13	23	29												
	14														
	15														
12	16														

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 23	
/WAYNE LANGEL/ Primary Examiner.Art Unit 1736 (Primary Examiner)	03/24/2017 (Date)	O.G. Print Claim(s) 1,10,11	O.G. Print Figure 2

U.S. Patent and Trademark Office Part of Paper No. 20170324

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/962,903	Filing Date 08/08/2013	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 03/14/2017

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 23	Minus	** 29	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SLIE
ADRIENE SELLMAN

This collection of information is required by 37 CFR 1.16. 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, 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

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

24239 7590 03/14/2017

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

EXAMINER	
LANGEL, WAYNE A	

ART UNIT	PAPER NUMBER
1736	

NOTIFICATION DATE	DELIVERY MODE
03/14/2017	ELECTRONIC

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

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

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

iplaw@mvalaw.com
usptomail@mvalaw.com

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/962,903	GINN ET AL.	
	Examiner	Art Unit	
	WAYNE LANGEL	1736	

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

(1) *WAYNE LANGEL*. (3) *VAIDEHI BACHOTI*.

(2) *HENRY B. WARD, III*. (4)_____.

Date of Interview: *06 March 2017*.

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

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

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

Claim(s) discussed: *all*.

Identification of prior art discussed: *Wommack et al '356 (US 6,287,356); Odom, JR. (US 2006/0180091)*.

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

Mr. Ward proposed amending claims 1, 13, and 21 to require lignosulfonate having solids of 18% to 40% (as opposed to 18% to 48%), and pointed out that suppoprt for the upper value of 40% is found in Example 2 of the specification. Mr. Ward argued that Wommack et al '356 discloses a solids content of "about 48% to about 60%" and that the value of "about 48%" would not overlap with the value of "40%" as recited in the proposed amendment. Mr.Ward furthered argued that it would not be obvious from Odom, JR. to employ a lignosulfonate solids content below about 48% in the process and composition of Wommack et al '356, in view of the Gray Declaration filed on 4-11-16 .

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

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

☐ Attachment

/WAYNE LANGEL/ Primary Examiner, Art Unit 1736	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

———

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

App. No.:	13/962,903	Confirmation No.: 9538
Applicant:	Terrell Dallas Ginn et al.	
Filed:	August 8, 2013	
Group Art Unit:	1736	
Examiner:	Wayne A. Langel	
Title:	**SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**	
Atty Dkt. No.	946478-000027	
Customer No.	24239	

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

AMENDMENT UNDER 37 C.F.R. § 1.111

Sir:

In response to the Office Action dated October 14, 2016, please amend the above-identified application as provided herein.

Amendments to the Claims begin on page 2 of this paper.

Remarks begin on page 7 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently Amended) A method of producing a fertilizer comprising:

feeding synthetic gypsum to a forming device;

feeding a binder composition comprising lignosulfonate having 18% to [[48%]] 40% solids to the forming device; and

forming the material fed to the forming device to a mean pellet size guide number (SGN) from approximately 100 to approximately 500, wherein the resulting pelletized synthetic gypsum has a crush strength from approximately 2 lbf to approximately 12 lbf.

2. (Canceled)

3. (Original) The method of Claim 1, wherein the synthetic gypsum fed to the forming device has a mean particle size of less than 100 microns.

4. (Canceled)

5. (Original) The method of Claim 1, wherein the binder composition comprises a water soluble binder.

6. (Previously Presented) The method of Claim 1, wherein the binder composition also comprises one or more binders selected from the group consisting of brewers condensed solubles, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, and cellulose based polymer binders.

7. (Previously Presented) The method of Claim 1, further comprising feeding an additive to the forming device, wherein the additive is selected from the group consisting of ground calcium carbonate, calcium bentonite, kaolin clays, manganese, zinc, boron, calcium, copper, and elemental sulfur.

8. (Previously Presented) The method of Claim 7, wherein the additive comprises elemental sulfur.

9. (Original) The method of Claim 1, wherein the mean SGN is from approximately 250 to approximately 280.

10. (Original) The method of Claim 1, wherein the forming device comprises a pelletizer.

11. (Original) The method of Claim 1, wherein the forming device comprises a granulator or an extruder.

12. (Original) A fertilizer made by the method of Claim 1.

13. (Currently Amended) A fertilizer comprising:

pellets, the pellets comprising synthetic gypsum and a binder composition comprising lignosulfonate, wherein the binder composition initially has 18% to [[48%]]40% solids at the time of contact with the synthetic gypsum, the pellets further comprising mean pellet SGN from approximately 100 to approximately 500, wherein pellets have a crush strength from approximately 2 to approximately 12 lbf.

14. (Canceled)

15. (Canceled)

16. (Original) The fertilizer of Claim 13, wherein the binder composition comprises a water soluble binder.

17. (Previously Presented) The fertilizer of Claim 13, wherein the binder composition also comprises one or more binders selected from the group consisting of brewers condensed solubles, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, and cellulose based polymer binders.

18. (Previously Presented) The fertilizer of Claim 13, wherein the pellets further comprise an additive, wherein the additive is selected from the group consisting of ground calcium carbonate, calcium bentonite, kaolin clays, manganese, zinc, boron, calcium, copper, and elemental sulfur.

19. (Original) The fertilizer of Claim 13, wherein the pellets further comprise an additive comprising elemental sulfur.

20. (Original) The fertilizer of Claim 13, wherein the mean SGN is from approximately 250 to approximately 280.

21. (Currently Amended) A process for producing a fertilizer comprising:

feeding synthetic gypsum to a dryer;

feeding dried synthetic gypsum and a binder composition comprising lignosulfonate having 18% to [[48%]] 40% solids to a mixer;

mixing the material fed to the mixer;

feeding the mixed material to a forming device;

pelletizing the material fed to the forming device;

feeding the pelletized material to a dryer;

drying the pelletized material;

feeding the dried pelletized material to a screener; and

screening the material fed to the screener to a mean pellet size guide number (SGN) from approximately 100 to approximately 500, wherein the resulting pelletized synthetic gypsum has a crush strength from approximately 2 lbf to approximately 12 lbf.

22. (Original) The process of Claim 21, further comprising recycling unders and overs removed during screening to the mixer.

23. (Canceled)

24. (Original) The process of Claim 21, wherein the synthetic gypsum fed to the mixer has a mean particle size of less than 100 microns.

25. (Canceled)

26. (Previously Presented) The process of Claim 21, further comprising feeding an additive to the mixer, wherein the additive is selected from the group consisting of manganese, zinc, boron, calcium, copper, and elemental sulfur.

27. (Original) The process of Claim 21, further comprising feeding an additive to the mixer, wherein the additive comprises elemental sulfur.

28. (Original) The process of Claim 21, wherein the mean SGN is from approximately 250 to approximately 280.

29. (Original) A fertilizer made by the process of Claim 21.

REMARKS

This Amendment is filed in response to the Office Action dated October 14, 2016. Although not indicated in the Office Action, Applicants believe that this Office Action is a non-final Office Action. Applicants would like to acknowledge, with appreciation, the helpful and constructive telephonic interview granted to the undersigned by Examiner Langel on March 6, 2017. Applicants respectfully request reconsideration of the pending claims in light of the Amendments and Remarks set forth herein, which Applicants consider to be a summary of the matters discussed during the interview as required by 37 C.F.R. § 1.133(b).

Claims 1, 3, 5-13, 16-22, and 26-29 stand rejected. Claims 1, 13, and 21 have been amended. Therefore, Claims 1, 3, 5-13, 16-22, and 26-29 are now pending in the application, with Claims 1, 13, and 21 being in the independent form. Support for the amendments may be found in Paragraph [0056] of the application as filed. Applicants request entry of the amendments to Claims 1, 13 and 21. Applicants respectfully submit that the pending claims are patentable and respectfully request reconsideration in light of the following remarks.

I. Claim Rejections Under 35 U.S.C. § 103

The Office rejected Claims 1, 3, 5, 6, 9-13, 16, 17, 20-22, 24, 28 and 29 under 35 U.S.C. §103 asserting that the claims are unpatentable over U.S. Patent No. 6,287,356 issued to Wommack et al. (hereinafter referred to as "Wommack"). The Office rejected Claims 7, 8, 18, 19, 26 and 27 under 35 U.S.C. § 103 asserting that the claims are unpatentable over Wommack, in further view of U.S. Patent No. 6,413,291 issued to Wommack et al. (hereinafter referred to as "'291 Wommack"). The Office rejected Claims 1, 3, 5, 6, 9-13, 16, 17, 20-22, 24, 28 and 29 under 35 U.S.C. §103 asserting that the claims are unpatentable over Wommack, in view of U.S. Patent Application Publication No. 2006/0180091 issued to Odom (hereinafter referred to as "Odom"). The Office rejected Claims 7, 8, 18, 19, 26 and 27 under 35 U.S.C. § 103 asserting that the claims are unpatentable over Wommack in view of Odom and further in view of '291 Wommack. As discussed in the interview, Applicants respectfully disagree and traverse the rejections for at least the following reasons.

Wommack discloses a water-disintegratable soil conditioner produced from cement kiln dust and other particulate calcium sources containing CaO or $Ca(OH)_2$ and other calcium-containing compounds. Odom discloses a peanut hull gypsum product having peanut hulls in the ratio of at least 30:70 with respect to other components. '291 Wommack discloses water-disintegratable agglomerates made from a particulate calcium source, a water soluble binder and optionally containing a primary plant nutrient source and/or micronutrient source.

As discussed during the interview, Wommack and '291 Wommack are related applications that disclose employing an aqueous solution of a lignosulfonate salt containing "about 48% to about 60% by weight solids." (*See* Wommack at Column 10, lines 16-20 and '291 Wommack at Column 10, lines 23-25). In another embodiment, Wommack and related '291 Wommack further disclose use of a binder comprising "a solution of lignosulfonate having approximately 50% solids". (*See* Wommack at Column 19, lines 46-51 and '291 Wommack at Column 20, lines 56-61). Thus, Wommack and '291 Wommack disclosing increasing the percentage of solids from 48% to 60%.

As discussed during the interview, Applicants have amended independent Claims 1, 13, and 21 to recite a binder composition comprising lignosulfonate having 18% to 40% solids. As further discussed during the interview, independent Claims 1, 13, and 21 do not include any relative terms qualifying the percentages of solids content and, thus, the value of "about 48%" disclosed by Wommack and related '291 Wommack do not overlap with the value of "40%" recited in the independent claims. It was further discussed that Wommack and related '291 Wommack teach away from the solids range recited in independent Claims 1, 13, and 21.

In view of the foregoing, Applicants respectfully submit that independent Claims 1, 13, and 21, and the claims depending therefrom, include recitations that patentably distinguish the claimed invention over Wommack and '291 Wommack, singly and in combination.

In addition to the foregoing, it was discussed during the interview that there is no motivation to combine Wommack and Odom. In this regard, as evidenced by Mr. Gray's Declaration submitted with the Amendment filed on April 11, 2016, the bulk density of crushed peanut hulls used in Odom is materially different from that of synthetic gypsum, both in aerated and compacted form. Mr. Gray's Declaration further evidences that there are material

disadvantages to pelletizing the Odom composition. First, replacing a material portion of the synthetic gypsum with peanut hulls would result in a fertilizer product in which less calcium sulfate is available as a nutrient. Second, replacing a material portion of the synthetic gypsum with crushed peanut hulls would result in a pellet having a materially lower bulk density and, thus, lower weight. As disclosed in Paragraph [0024] of the '903 Application, one of the advantages of pelletized synthetic gypsum produced according to the present invention is that the pellets are capable of being spread using an approximately 800 rpm impeller over distances of approximately 60 feet to 100 feet. Such spreadability is dependent upon not only a high crush strength, but also on the weight and, thus, bulk density of the pellets. Mr. Gray's Declaration further evidences that utilizing a material amount of crushed peanut hulls, which has a materially lower bulk density as compared to synthetic gypsum, would reduce the weight of the resulting pellets and reduce the spreadability of the pellets. Mr. Gray's Declaration further evidences that lighter pellets are more susceptible air resistance and to ambient environmental conditions, such as wind, which can further reduce spreadability. Reduced spreadability is problematic because the distance between passes of the spreader must be reduced in order to obtain the same coverage, which increases the time and cost associated with applying the fertilizer product to a field. In contrast, pelletized synthetic gypsum produced according to the present invention have a higher bulk density and, thus, higher mass enabling the pellets to have a higher kinetic energy and greater momentum when spread. Thus, Mr. Gray's Declaration refutes the Office's contention it would be obvious to form the composition of Odom into pellets, as pellets produced from pelletizing the Odom composition will have materially less calcium sulfate available as a nutrient and will have reduced spreadability.

In light of the foregoing, Applicants respectfully submit that the independent Claims 1, 13, and 21, and the claims depending therefrom, contain recitations that patentably distinguish the claimed invention over the cited references and, therefore should be allowed. Reconsideration and withdrawal of all rejections is respectfully solicited and Applicants kindly request issuance of a corresponding Notice of Allowance.

* * * * *

Conclusion

In view of the amended claims and the remarks presented above, it is respectfully submitted that all of the present claims of the application are in condition for immediate allowance. It is therefore respectfully requested that a Notice of Allowance be issued. The Examiner is encouraged to contact Applicants' undersigned attorney to resolve any remaining issues in order to expedite examination of the present application.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

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Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on March 14, 2017.

Electronic Patent Application Fee Transmittal

Application Number:	13962903
Filing Date:	08-Aug-2013
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Filer:	Henry B. Ward
Attorney Docket Number:	946478-000027

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

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

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 2 months with $0 paid	2252	1	300	300
Miscellaneous:				
		Total in USD ($)		**300**

Electronic Acknowledgement Receipt	
EFS ID:	28620602
Application Number:	13962903
International Application Number:	
Confirmation Number:	9538
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Customer Number:	24239
Filer:	Henry B. Ward
Filer Authorized By:	
Attorney Docket Number:	946478-000027
Receipt Date:	14-MAR-2017
Filing Date:	08-AUG-2013
Time Stamp:	23:11:46
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	EFT
Payment was successfully received in RAM	$300
RAM confirmation Number	031517INTEFSW23133700
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Extension of Time	EOT_946478_000027.pdf	122464 4efe9ec7244690f4b43cefccda36922492b96e02	no	1
Warnings:					
Information:					
2	Amendment/Req. Reconsideration-After Non-Final Reject	Amendment.pdf	60212 07b6638bf86be906591f336678bef3d618c39ab3	no	10
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30968 0ed400ba481d6e158f4e8977e114e7d566b07a08	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	213644		

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

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

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

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

Atty Dkt. No. 946478-000027 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Terrell Dallas Ginn, *et al.*	Confirmation No.: 9538
Appl No.:	13/962,903	Group Art Unit: 1736
Filed:	August 8, 2013	Examiner: LANGEL, WAYNE A
Title:	**SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**	

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

PETITION AND FEE FOR EXTENSION OF TIME 37 C.F.R. § 1.136(a)

Commissioner:

1. This is a petition for an extension of time for a total period of two (2) months to respond to the Office Action dated October 14, 2016.
2. Applicant claims small entity status
3. Calculation of extension fee (37 C.F.R. § 1.17(a)(1)-(a)(5)):

Total Months Requested	Fee For Large Entity	Fee For Small Entity	Fee For Micro Entity
☐ one month	$200.00	$100.00	$50.00
☒ two months	$600.00	$300.00	$150.00
☐ three months	$1,400.00	$700.00	$350.00
☐ four months	$2,200.00	$1,100.00	$550.00
☐ five months*	$3,000.00	$1,500.00	$750.00

**Cannot be used to exceed six-month statutory limit for response to an Official Action.*

☒ Payment by EFT in the amount of $300.
☒ Charge any deficiency or credit any overpayment to Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

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Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on March 14, 2017.

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UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

24239 7590 10/14/2016

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Research Triangle Park, NC 27709

EXAMINER	
LANGEL, WAYNE A	

ART UNIT	PAPER NUMBER
1736	

NOTIFICATION DATE	DELIVERY MODE
10/14/2016	ELECTRONIC

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

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

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

iplaw@mvalaw.com
usptomail@mvalaw.com

Office Action Summary	Application No. 13/962,903	Applicant(s) GINN ET AL.	
	Examiner WAYNE LANGEL	Art Unit 1736	AIA (First Inventor to File) Status Yes

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☐ This action is non-final.

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

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1,3,5-13,16-22,24 and 26-29* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1,3,5-13,16-22,24 and 26-29* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Claims 1, 3, 5, 6, 9-13, 16, 17, 20-22, 24, 28 and 29 are rejected under 35 U.S.C. 103 as being unpatentable over Wommack et al '356 (US 6,287,356) Wommack et al '356 discloses a method of producing a soil conditioner comprising feeding gypsum to a forming device, feeding lignosulfonate as a binder to the forming device, and forming pelletized gypsum having a crush strength of at least 2 pounds, optimally at least about 9 pounds. (See col. 6, lines 1-47, the paragraph bridging columns 10 and 11, and col. 11, lines 40-65.) The gypsum formed by the reaction in the kiln dust and water, as disclosed at col. 6, lines 36-38 of Wommack et al '356 would be synthetic gypsum. Wommack et al '356 discloses a solids concentration for the lignosulfonate binder of about 48% to about 60% by weight at col. 10, lines 18-20, which range overlaps the range of 18% to 48% recited in applicant's claims. The difference between the method and composition disclosed by Wommack et al '356, and that recited in claims 1, 3, 5, 6, 9-13, 16, 17, 20-22, 24, 28 and 29, is that Wommack et al '356 does not disclose that the material should be fed to the forming device to a mean pellet size guide number (SGN) from approximately 100 to approximately 500. It would be obvious to feed the material to the forming device of Wommack et al '356 to a mean pellet size guide number (SGN) from approximately 100 to approximately 500, since it would be within the level of skill of one of ordinary skill in the art to determine a suitable or optimum size for the pellets formed in the process of Wommack et al '356.

Claims 7, 8, 18, 19, 26 and 27 are rejected under 35 U.S.C. 103 as being unpatentable over Wommack et al '356 as applied to claims 1, 13 and 21 above, and further in view of Wommack et al '291 (US 6,413,291). It would be further obvious from Wommack et al '291 to include an additive such as sulfur in the composition of Wommack et al '356. One of ordinary skill in the art would be motivated to do so, since Wommack et al '291 suggests at col. 4, lines 32-50 that a nutrient source such as sulfur is beneficial in a soil conditioning agglomerate containing calcium, and the agglomerates of Wommack et al '291 are analogous to those of Wommack et al '356.

Claims 1, 3, 5, 6, 9-13, 16, 17, 20-22, 24, 28 and 29 are rejected under 35 U.S.C. 103 as being unpatentable over Wommack et al '356 (US 6,287,356) in view of Odom, JR. (US 2006/0180091). Wommack et al '356 discloses a method of producing a soil conditioner comprising feeding gypsum to a forming device, feeding lignosulfonate as a binder to the forming device, and forming pelletized gypsum having a crush strength of at least 2 pounds, optimally at least about 9 pounds. (See col. 6, lines 1-47, the paragraph bridging columns 10 and 11, and col. 11, lines40-65.) The gypsum formed by the reaction in the kiln dust and water, as disclosed at col. 6, lines 36-38 of Wommack et al '356 would be synthetic gypsum. The differences between the method and composition disclosed by Wommack et al '356, and that recited in applicant's claims are that Wommack et al '356 does not disclose that the material should be fed to the forming device to a mean pellet size guide number (SGN) from approximately 100 to approximately 500, and that the lignosulfonate should have a solids content of 18% to 48%. It would be obvious to feed the material to the forming device of Wommack et al

‘356 to a mean pellet size guide number (SGN) from approximately 100 to approximately 500, since it would be within the level of skill of one of ordinary skill in the art to determine a suitable or optimum size for the pellets formed in the process of Wommack et al ‘356. Odom, JR. discloses a composition of matter comprising gypsum and a binder, and teaches in Paragraph [0015] that the lignosulfonate may have a solids content of about 30 to about 40 wt %. It would be further obvious from Odom, JR. to use a lignosulfonate binder in the process of Wommack et al ‘356 having a solids content of about 30 to about 40 wt %. One of ordinary skill in the art would be motivated to do so, since Wommack et al ‘356 specifically discloses calcium lignosulfonate as a suitable binder at col. 4, lines28-32, and Odom, JR. suggests in Paragraph [0015] that calcium lignosulfonate having a solids content of about 30 to about 40 wt % would be a suitable binder when forming gypsum granules or pellets. There is no evidence on record of unexpected results which would emanate from the use of calcium lignosulfonate having a solids content of 18% to 48% as a binder in the process of Wommack et al ‘356, as opposed to solids contents outside such range. Regarding claims 6 and 17, Wommack et al ‘356 further discloses at col. 4, lines 28-40 that sugar-based binders such as molasses may be used, and that mixtures of different binders may be employed.

Claims 7, 8, 18, 19, 26 and 27 are rejected under 35 U.S.C. 103 as being unpatentable over Wommack et al ‘356 in view of Odom, JR. as applied to claims 1, 13 and 21 above, and further in view of Wommack et al ‘291 (US 6,413,291). It would be further obvious from Wommack et al ‘291 to include an additive such as sulfur in the composition of Wommack et al ‘356. One of ordinary skill in the art would be motivated

to do so, since Wommack et al ‘291 suggests at col. 4, lines 32-50 that a nutrient source such as sulfur is beneficial in a soil conditioning agglomerate containing calcium, the agglomerates of Wommack et al ‘291 being analogous to those of Wommack et al ‘356.

The Gray Declaration filed under 37 C.F.R. 1.132 on April 11, 2016 has been reconsidered, but is not convincing of error in the rejection, since Wommack et al ‘356 specifically discloses a lignosulfonate solids concentration of about 48% at col. 10, line 19. In any event, regarding the re4jection over Wommack et al ‘356 in view of Odom, JR., Declarant opines in Paragraph 10 that there would be no motivation to pelletize the composition of Odom, JR. using the pelletizing method of Steel et al (US 2001/0029762). However Wommack et al ‘356 specifically discloses in the paragraph bridging columns 10 and 11 that the preagglomerate mixture, which would include synthetic gypsum, is fed to a pelletizing device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WAYNE LANGEL whose telephone number is (571)272-1353. The examiner can normally be reached on Monday through Friday, 8:30 am - 4:45 pm Eastern Time.

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/WAYNE LANGEL/
Primary Examiner, Art Unit 1736

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

24239 7590 10/11/2016

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

EXAMINER	
LANGEL, WAYNE A	

ART UNIT	PAPER NUMBER
1736	

NOTIFICATION DATE	DELIVERY MODE
10/11/2016	ELECTRONIC

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

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

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

iplaw@mvalaw.com
usptomail@mvalaw.com

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/962,903	GINN ET AL.	
	Examiner	Art Unit	
	WAYNE LANGEL	1736	

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

(1) *WAYNE LANGEL*. (3)_____.

(2) *HENRY B. WARD, III*. (4)_____.

Date of Interview: *04 October 2016*.

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

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

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

Claim(s) discussed: *all*.

Identification of prior art discussed: *Wommack et al '356 (US 6,287,356) and Odom, JR. (US 2006/0180091)*.

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

Mr. Ward pointed out that Wommack et al '356 discloses a solids content for the lignosulfonate from about 48% to about 60% at col. 10, lines 16-20, and that Odom, Jr. discloses a solids content of the lignosulfonate binder from about 30% up to about 70 wt.% in Paragraph [0015], and that one would not be motivated from Odom, Jr. to employ a solids content for the lignosulfonate binder of about 48 % in the process of Wommack et al '356 due to the incompatibility of the processes. In particular, the presence of the peanut hulls in the process of Odom, Jr. would be incompatible with the process of Wommack et al '356. Mr. Ward proposed preparing a Rule 132 Declaration by one of the inventors attesting to the incompatibilty of the processes of Wommack et al '356 and Odom, Jr. The examiner pointed out that the solids content of about 48 % by weight disclosed at col. 10, lines 18-20 of Wommack et al '356 would overlap the weight % of 48 as recited in applicant's claims, such that the use of Odom, Jr.in the rejection was superflous.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

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

☐ Attachment

/WAYNE LANGEL/ Primary Examiner, Art Unit 1736	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

———

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

24239 7590 09/19/2016

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P.O. BOX 13706
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Research Triangle Park, NC 27709

EXAMINER	
LANGEL, WAYNE A	

ART UNIT	PAPER NUMBER
1736	

NOTIFICATION DATE	DELIVERY MODE
09/19/2016	ELECTRONIC

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iplaw@mvalaw.com
usptomail@mvalaw.com

Office Action Summary	Application No. 13/962,903	Applicant(s) GINN ET AL.	
	Examiner WAYNE LANGEL	Art Unit 1736	AIA (First Inventor to File) Status Yes

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *9-1-16*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

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

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1,3,5-13,16-22,24 and 26-29* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1,3,5-13,16-22,24 and 26-29* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *9-1-16* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 5, 6, 9-13, 16, 17, 20-22, 24, 28 and 29 are rejected under 35 U.S.C. 103 as being unpatentable over Wommack et al '356 (US 6,287,356) in view of Odom, JR. (US 2006/0180091). Wommack et al '356 discloses a method of producing a soil conditioner comprising feeding gypsum to a forming device, feeding lignosulfonate as a binder to the forming device, and forming pelletized gypsum having a crush strength of at least 2 pounds, optimally at least about 9 pounds. (See col. 6, lines 1-47, the paragraph bridging columns 10 and 11, and col. 11, lines40-65.) The gypsum formed by the reaction in the kiln dust and water, as disclosed at col. 6, lines 36-38 of Wommack et al '356 would be synthetic gypsum. The differences between the method and composition disclosed by Wommack et al '356, and that recited in applicant's claims are that Wommack et al '356 does not disclose that the material should be fed to the forming device to a mean pellet size guide number (SGN) from approximately 100 to approximately 500, and that the lignosulfonate should have a solids content of 18% to 48%. It would be obvious to feed the material to the forming device of Wommack et al '356 to a mean pellet size guide number (SGN) from approximately 100 to approximately 500, since it would be within the level of skill of one of ordinary skill in the

art to determine a suitable or optimum size for the pellets formed in the process of Wommack et al ‘356. Odom, JR. discloses a composition of matter comprising gypsum and a binder, and teaches in Paragraph [0015] that the lignosulfonate may have a solids content of about 30 to about 40 wt %. It would be further obvious from Odom, JR. to use a lignosulfonate binder in the process of Wommack et al ‘356 having a solids content of about 30 to about 40 wt %. One of ordinary skill in the art would be motivated to do so, since Wommack et al ‘356 specifically discloses calcium lignosulfonate as a suitable binder at col. 4, lines28-32, and Odom, JR. suggests in Paragraph [0015] that calcium lignosulfonate having a solids content of about 30 to about 40 wt % would be a suitable binder when forming gypsum granules or pellets. There is no evidence on record of unexpected results which would emanate from the use of calcium lignosulfonate having a solids content of 18% to 48% as a binder in the process of Wommack et al ‘356, as opposed to solids contents outside such range. Regarding claims 6 and 17, Wommack et al ‘356 further discloses at col. 4, lines 28-40 that sugar-based binders such as molasses may be used, and that mixtures of different binders may be employed.

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/WAYNE LANGEL/
Primary Examiner, Art Unit 1736

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13962903	GINN ET AL.
	Examiner	Art Unit
	WAYNE LANGEL	1736

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
71	63	2-7-14	WAL

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor Name Search	2-7-14	WAL
EAST:		
L1: (gypsum or (calcium adj sulfate)) and C05G3/0088.cpc	6-27-16	WAL
L2: L1 and (bindeer or lignosulfonate)	6-27-16	WAL
L3: (gypsum or (calcium adj sulfate)) and C05D3/00.cpc.	6-27-16	WAL
L4: L3 and (binder or mlignosulfonate))	6-27-16	WAL
L5: (gypsum or (calcium adj sulate)) and C05D3/02.cpc.	6-27-16	WAL
L6: L5 and)binder or lignosulfonate)	6-27-16	WAL

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
C05G	3/0088	6-27-16	WAL
C05D	3/00	6-27-16	WAL
C05D	3/02	6-27-16	WAL

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13962903
Filing Date	2013-08-08
First Named Inventor	Terrell Dallas Ginn
Art Unit	1736
Examiner Name	LANGEL, Wayne A.
Attorney Docket Number	946478-000027

U.S.PATENTS

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	6413291	B1	2002-07-02	Wommack et al.	
	2	6287356	B1	2001-09-11	Wommack et al.	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /W.L./

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20090273113	A1	2009-11-05	Baig	

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] ¡	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							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13962903
	Filing Date	2013-08-08
	First Named Inventor	Terrell Dallas Ginn
	Art Unit	1736
	Examiner Name	LANGEL, Wayne A.
	Attorney Docket Number	946478-000027

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	European Search Report for EP Application No. 13827660.5 dated March 15, 2016	☐

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

EXAMINER SIGNATURE

Examiner Signature	/Wayne Langel/	Date Considered	09/14/2016

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

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /W.L./

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	First Named Inventor	Terrell Dallas Ginn
	Art Unit	1736
	Examiner Name	LANGEL, Wayne A.
	Attorney Docket Number	946478-000027

CERTIFICATION STATEMENT

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

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

OR

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

☒ See attached certification statement.

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

☐ A certification statement is not submitted herewith.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /W.L./

SIGNATURE

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

Signature	/hbw/	Date (YYYY-MM-DD)	2016-09-01
Name/Print	Henry B. Ward, III	Registration Number	42,212

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

Privacy Act Statement

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

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

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

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

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

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

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /WL/

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

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

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

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 CARRINGTON MILL BOULEVARD, SUITE 400
RESEARCH TRIANGLE PARK NC 27709

MAILED
SEP 02 2016
OFFICE OF PETITIONS

In re Application of :
Terrell Dallas Ginn, et al. :
Application No.: 13/962,903 : ON PETITION
Filed: August 8, 2013 :
Attorney Docket No.: 946478-000027 :

This is a decision in response to the petition, filed September 1, 2016, under 37 CFR 1.313(c)(2) to withdraw the above-identified application from issue after payment of the issue fee.

The petition is **GRANTED**.

The above-identified application is withdrawn from issue for consideration of a submission under 37 CFR 1.114 (request for continued examination). See 37 CFR 1.313(c)(2).

Petitioner is advised that the issue fee paid on July 21, 2016, in the above-identified application, cannot be refunded. If, however, the above-identified application is again allowed, petitioner may request that it be applied towards the issue fee required by the new Notice of Allowance. [1]

Telephone inquiries relating to this decision should be directed to the undersigned at (571) 272-3204.

The application is being referred to Technology Center AU 1736 for further processing of the request for continued examination under 37 CFR 1.114, including consideration of the concurrently filed amendment and Information Disclosure Statement (IDS).

/SDB/
Sherry D. Brinkley
Lead Paralegal Specialist
Office of Petitions

[1] *The request to apply the issue fee to the new Notice may be satisfied by completing and returning the new Part B – Fee(s) Transmittal Form (along with any balance due at the time of submission). Petitioner is advised that the Issue Fee Transmittal Form must be completed and timely submitted to avoid abandonment of the application.*

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl No.:	13/962,903	Confirmation No.: 9538
Applicant:	Terrell Dallas Ginn et al.	
Filed:	August 8, 2013	
Group Art Unit:	1736	
Examiner:	LANGEL, Wayne A.	
Title:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING SAME	
Atty Dkt. No.	946478-000027	
Customer No.	24239	

Mail Stop Petition
Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION UNDER 37 CFR § 1.313(c)

Commissioner:

It is respectfully requested that the Examiner withdraw the present application from issuance. Applicant is filing concurrently herewith a Request for Continued Examination (RCE). It is requested that this Petition be entered in favor of the RCE.

The petition fee is being paid at the time of filing via Electronic Funds Transfer (EFT).

The Commissioner is hereby authorized to charge charge any additional fees associated with this Petition or credit any overpayment to Deposit Account 13-4365.

Respectfully submitted,

/hbw /

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC
3015 Carrington Mill Boulevard, Suite 400
Post Office Box 13706
Research Triangle Park, NC 27709
Tel Charlotte Office (704) 331-1027
Fax Charlotte Office (704) 339-5800

Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on September 1, 2016.

Prolime Agriculture, LLC - Exhibit 1004 - Page 64

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

App. No.:	13/962,903	Confirmation No.: 9538
Applicant:	Terrell Dallas Ginn et al.	
Filed:	August 8, 2013	
Group Art Unit:	1736	
Examiner:	Wayne A. Langel	
Title:	**SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**	
Atty Dkt. No.	946478-000027	
Customer No.	24239	

Mail Stop: Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT UNDER 37 CFR § 1.111

A Notice of Allowance was issued for the above-referenced application on July 11, 2016. A Notice to File Corrected Application Papers (Notice of Allowance Mailed) was mailed on August 9, 2016, indicating that certain informalities regarding the filed drawings need to be addressed. This Amendment under 37 CFR § 1.111 is being filed in order to submit replacement drawing sheets for the instant application, as requested by the Office in the Notice to File Corrected Application Papers. The amendments do not include any new matter. Applicant requests that this amendment be made of record.

Amendments to the Drawings are discussed beginning on page **2** of this paper.

Remarks begin on page **3** of this paper.

An Appendix containing Four (4) Replacement Drawing Sheets showing Figures 1-3

Prolime Agriculture, LLC - Exhibit 1004 - Page 65

Amendments to the Drawings:

Please REPLACE the drawing sheets containing Figures 1-3 in the instant application with the attached Replacement Sheets for Figures 1-3.

Attachment: Four (4) Replacement Drawing Sheets containing Figures 1-3.

Prolime Agriculture, LLC - Exhibit 1004 - Page 66

REMARKS

Applicants would like to acknowledge, with appreciation, the Notice to File Corrected Application Papers dated August 9, 2016, and the Notice of Allowance issued on July 11, 2016, mailed to the undersigned by Wayne A. Langel, for the above-identified U.S. Patent Application. Applicant is submitting this Amendment in response to the Notice to File Corrected Application Papers, and to provide a complete set of Replacement Drawing Sheets. No new matter has been presented.

Specifically, the Notice to File Corrected Application Papers indicated that the drawings filed on February 6, 2015, includes a Figure 2B which designation is not referenced by the brief description of the specification. In this regard, Applicants note that the replacement drawings filed on February 6, 2015, to replace originally filed Figures 1A and 1B, inadvertently mislabeled the replacement figure intended for Figure 1B as Figure 2B. Applicants further note that originally filed process flow Figure 2 was unintentionally replaced with the Figure 2B filed on February 6, 2016, which is duplicative of Figure 1B in the instant Application. To remedy this error, Applicants have replaced Figure 2B with the originally filed Figure 2, and are providing herewith replacement drawing sheets for the correct Figures 1-3 (Figures 1A, 1B, 2 and 3). Since Figure 2 was originally filed on August 8, 2013, the replacement drawing sheets do not contain new matter.

Applicants respectfully request entry of the amendments to the drawings pursuant to 37 CFR § 1.312.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC
430 Davis Drive, Suite 500
Post Office Box 13706
Research Triangle Park, NC 27709
Tel Charlotte Office (704) 331-1027

Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on September 1, 2016.

Prolime Agriculture, LLC - Exhibit 1004 - Page 67

REPLACEMENT DRAWING SHEET 1 OF 4



FIGURE 1A

REPLACEMENT DRAWING SHEET 2 OF 4

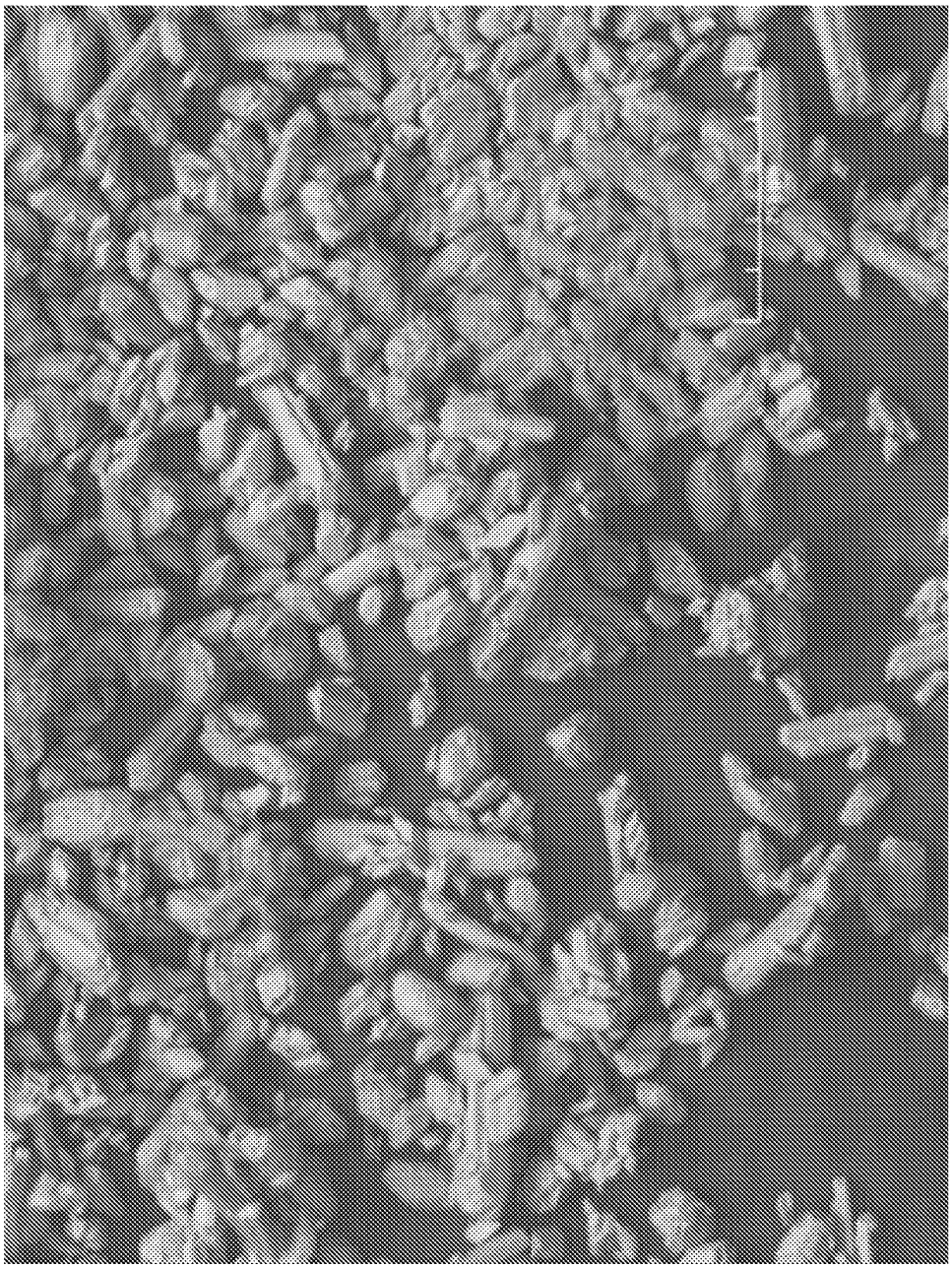


FIGURE 1B

REPLACEMENT DRAWING SHEET 3 OF 4

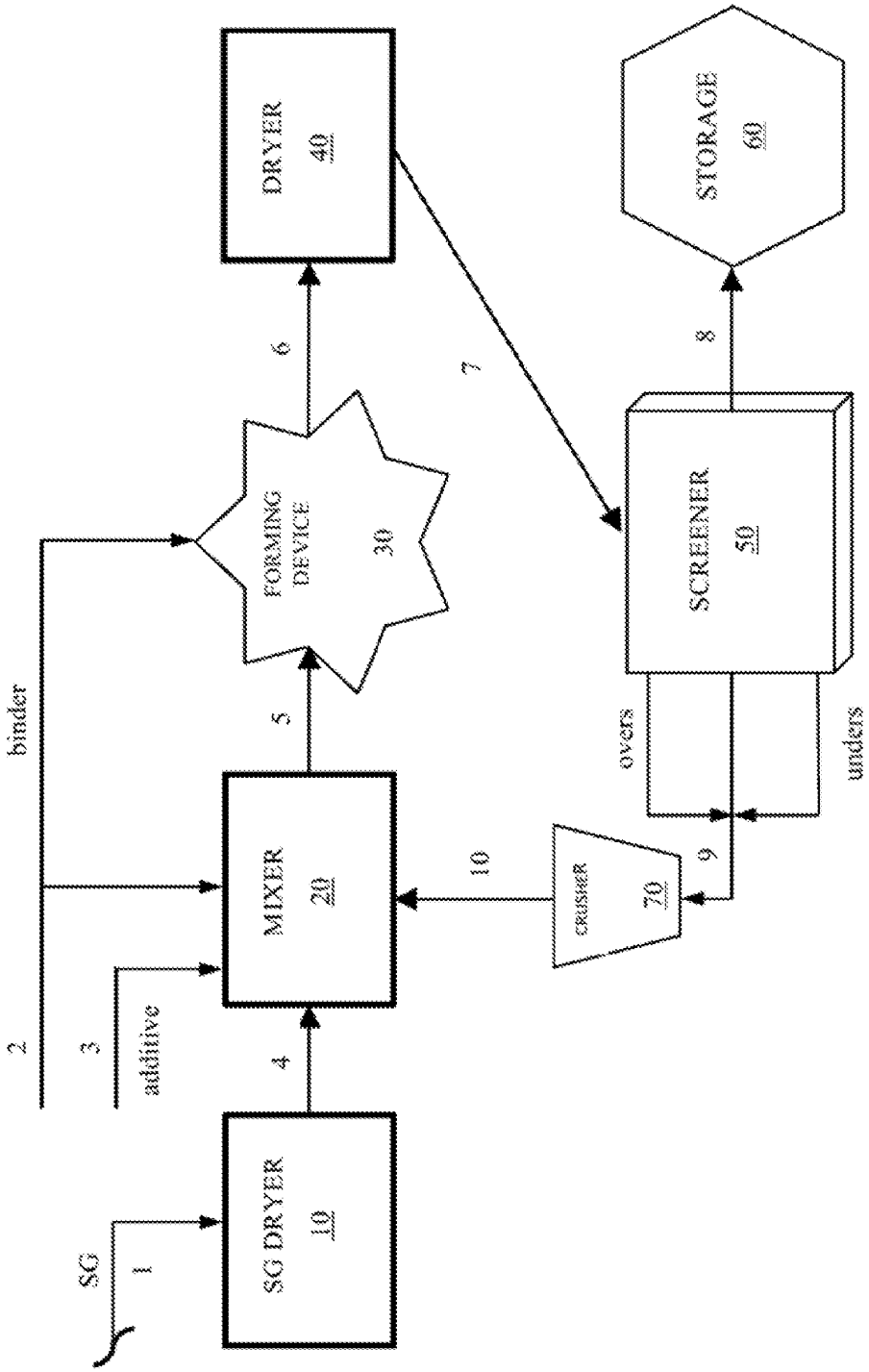


FIGURE 2

REPLACEMENT DRAWING SHEET 4 OF 4

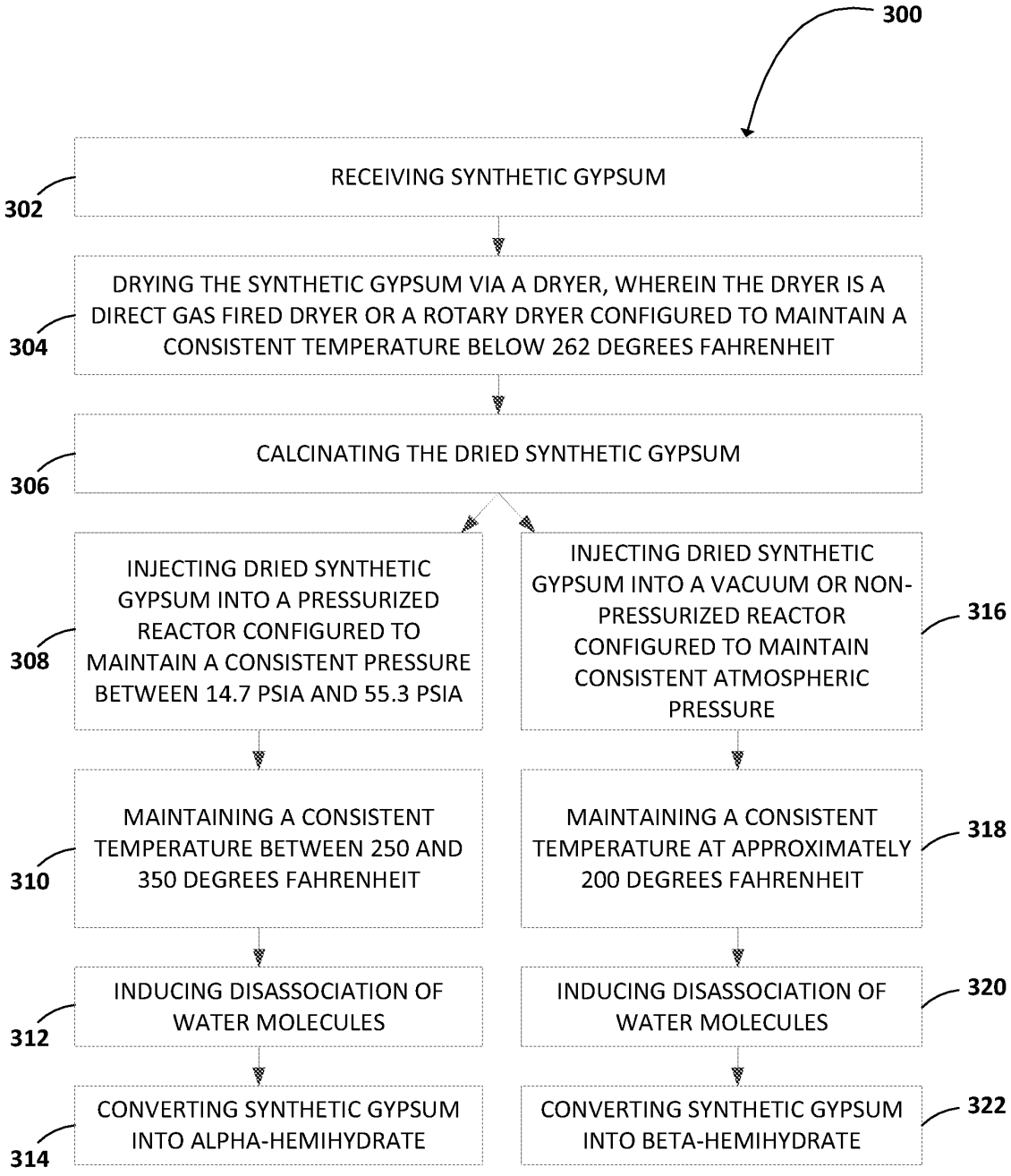


FIGURE 3

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13962903
Filing Date	2013-08-08
First Named Inventor	Terrell Dallas Ginn
Art Unit	1736
Examiner Name	LANGEL, Wayne A.
Attorney Docket Number	946478-000027

U.S.PATENTS

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	6413291	B1	2002-07-02	Wommack et al.	
	2	6287356	B1	2001-09-11	Wommack et al.	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20090273113	A1	2009-11-05	Baig	

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] ¡	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							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13962903
	Filing Date	2013-08-08
	First Named Inventor	Terrell Dallas Ginn
	Art Unit	1736
	Examiner Name	LANGEL, Wayne A.
	Attorney Docket Number	946478-000027

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	European Search Report for EP Application No. 13827660.5 dated March 15, 2016	☐

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

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13962903
	Filing Date	2013-08-08
	First Named Inventor	Terrell Dallas Ginn
	Art Unit	1736
	Examiner Name	LANGEL, Wayne A.
	Attorney Docket Number	946478-000027

CERTIFICATION STATEMENT

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

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

OR

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

☒ See attached certification statement.

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

☐ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/hbw/	Date (YYYY-MM-DD)	2016-09-01
Name/Print	Henry B. Ward, III	Registration Number	42,212

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

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

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

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

REQUEST **For** **CONTINUED EXAMINATION (RCE)** **TRANSMITTAL** Address to: **MAIL STOP RCE** **COMMISSIONER FOR PATENTS** **P.O. BOX 1450** **ALEXANDRIA, VA 22313-1450** (Revised 04/2005)	Application Number: 13962903 Filing Date: August 8, 2013 First Named Inventor: Terrell Dallas Ginn Group Art Unit: 1736 Examiner Name: LANGEL, Wayne A. Confirmation No.: 9538 Attorney Docket No. 946478-000027

This is a request for Continued Examination (RCE) under 37 C.F.R. § 1.114 of the above-identified application. Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application.

1. **Submission required under 37 C.F.R. § 1.114** Note: if the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

ii. ☐ Other _____

b. ☒ Enclosed

i. ☒ Amendment/Reply

ii. ☐ Affidavits(s)/Declarations(s)

iii. ☒ Information Disclosure Statement (IDS); 4 citations listed on PTO Form 1449

iv. ☒ Other : Petition under 37 CFR § 1.313(c) - Petition for Withdrawal of Issuance of Patent

2. **Miscellaneous**

a. ☐ Suspension of action on the above-identified application is requested under 37 C.F.R. §1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 C.F.R. § 1.17(i) required)

b. ☐ Other _____

3. **Fees** The RCE fee under 37 C.F.R. § 1.17(e) is **required by 37 C.F.R. § 1.114 when the RCE is filed**. ($1,700 large entity; $850 small entity; $425 micro entity)

a. ☒ This is a second and subsequent Request for Continued Examination.

b. ☒ Payment of $850 filing fee by EFT.

b. ☒ The Director is hereby authorized to charge any deficiencies or credit any overpayments to Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC
3015 Carrington Mill Boulevard, Suite 400
Post Office Box 13706
Research Triangle Park, NC 27709
Tel Charlotte Office (704) 331-1027
Fax Charlotte Office (704) 339-5800

Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on September 1, 2016.

Electronic Patent Application Fee Transmittal

Application Number:	13962903
Filing Date:	08-Aug-2013
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Filer:	Henry B. Ward/Becky Pegg
Attorney Docket Number:	946478-000027

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Petition Fee-37CFR 1.17(h) (Group II)	2464	1	70	70
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
RCE- 2nd and Subsequent Request	2820	1	850	850
		Total in USD ($)		**920**

Electronic Acknowledgement Receipt	
EFS ID:	26818772
Application Number:	13962903
International Application Number:	
Confirmation Number:	9538
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Customer Number:	24239
Filer:	Henry B. Ward/Becky Pegg
Filer Authorized By:	Henry B. Ward
Attorney Docket Number:	946478-000027
Receipt Date:	01-SEP-2016
Filing Date:	08-AUG-2013
Time Stamp:	18:58:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	EFT
Payment was successfully received in RAM	$920
RAM confirmation Number	090216INTEFSW18583900
Deposit Account	755
Authorized User	Rebecca Pegg
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	946478-000027IDSTransmittal9012016.pdf	98319 6d628e79151a8c0a3e10538a65854419dafc7e03	no	2
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	946478-000027IDS9012016.pdf	1562088 f20b73e0a657201730dfe78eb07921b7487dc0ff	no	4
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Non Patent Literature	946478-000027NPL1_EPSearchReport.pdf	313248 9b24e68dac749e0765c9afd9711d7b86138261ad	no	9
Warnings:					
Information:					
4	Petition to Withdraw from Issue	946478-000027PetitionWithdrawFromIssue.pdf	94910 9dee1ee0a36c8b33355f519f33436a6aed52bd1a	no	2
Warnings:					
Information:					
5		946478-000027ResponseNTFCAP.pdf	99616 9ba55a8116028cac72a849695a56990a7810bb46	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment after Notice of Allowance (Rule 312)	1	1
	Drawings-only black and white line drawings	2	2

	Applicant Arguments/Remarks Made in an Amendment		3	3	
Warnings:					
Information:					
6	Drawings-only black and white line drawings	946478-000027_ReplacementDrawings9012016.pdf	862851 54e9877179ba2f6a9e7685912c9a48282235790f	no	4
Warnings:					
Information:					
7	Request for Continued Examination (RCE)	946478-000027RCE.pdf	99800 1f9f9b528232bb5db194451b54810888af093ece	no	2
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
8	Fee Worksheet (SB06)	fee-info.pdf	32877 cbe2865f50f9913e31916eeb085ae70975d2797d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	3163709		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

Atty Dkt. No. 946478-000027 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Terrell Dallas Ginn et al.	Confirmation No.: 9538
Appl No.:	13/962,903	Group Art Unit: 1736
Filed:	August 8, 2013	Examiner: LANGEL, Wayne A.
Title:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING SAME	

INFORMATION DISCLOSURE STATEMENT

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

Commissioner:

Pursuant to 37 CFR §1.56, the attention of the Patent and Trademark Office is hereby directed to the reference(s) listed on the attached PTO-1449. Unless otherwise indicated herein, one copy of each reference is attached. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the reference(s) be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

1. This Information Disclosure Statement is being filed (a) within three months of the U.S. filing date of this non-CPA application, OR (b) before the mailing date of a first Office Action on the merits in the present application. No certification or fee is required.

☐ 2. This Information Disclosure Statement is being filed before the mailing date of a first Office Action on the merits after the filing of a Request for Continued Examination under 37 CFR §1.114. No certification or fee is required.

☒ 3. This Information Disclosure Statement is being filed with a Request for Continued Examination. No certification or fee is required.

☐ 4. This Information Disclosure Statement is being filed more than three months after the U.S. filing date AND after the mailing date of the first Office Action on the merits, but before the mailing date of a Final Rejection, Notice of Allowance or other action that closes prosecution (e.g., Quayle Action).

☐ a. I hereby certify that each item of information contained in this Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement. 37 CFR §1.97(e)(1).

☐ b. I hereby certify that no item of information in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart

foreign application, and, to my knowledge after making reasonable inquiry, was known to any individual designated in 37 CFR §1.56(c) more than three months prior to the filing of this Information Disclosure Statement. 37 CFR §1.97(e)(2).

☐ c. The required fee of $180 under 37 CFR §1.17(p) will be paid by Electronic Funds Transfer (EFT). Please credit any overpayment or debit any additional fee through Deposit Account No. 13-4365 as needed to ensure consideration of the disclosed information.

☐ 5. This Information Disclosure Statement is being filed more than three months after the U.S. filing date and after the mailing date of a Final Rejection, Notice of Allowance, or other action that closes prosecution (e.g., Quayle Action), but before payment of the Issue Fee. The required fee of $180 under 37 CFR §1.17(p) will be paid by Electronic Funds Transfer (EFT). Please credit any overpayment or debit any additional fee through Deposit Account No. 13-4365 as needed to ensure consideration of the disclosed information.

☐ a. I hereby certify that each item of information contained in this Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement. 37 CFR §1.97(e)(1).

☐ b. I hereby certify that no item of information in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to my knowledge after making reasonable inquiry, was known to any individual designated in 37 CFR §1.56(c) more than three months prior to the filing of this Information Disclosure Statement. 37 CFR §1.97(e)(2).

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC
3015 Carrington Mill Boulevard, Suite 400
Post Office Box 13706
Research Triangle Park, NC 27709
Tel Charlotte Office (704) 331-1027
Fax Charlotte Office (704) 339-5800

Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on September 1, 2016.

DocCode - SCORE

SCORE Placeholder Sheet for IFW Content

Application Number: 13962903 Document Date: 09/01/2016

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

- Drawings – Other than Black and White Line Drawings

Since this was an electronic submission. there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

To access the documents in the SCORE database. refer to instructions below.

At the time of document entry (noted above):

- Examiners may access SCORE content via the eDAN interface.
- Other USPTO employees can bookmark the current SCORE URL (http://Score.uspto.gov/ScoreAccessWeb/).
- External customers may access SCORE content via the Public and Private PAIR interfaces.

Form Revision Date: September 30. 2013

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

24239 7590 08/09/2016
MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

EXAMINER	
LANGEL, WAYNE A	

ART UNIT	PAPER NUMBER
1736	

NOTIFICATION DATE	DELIVERY MODE
08/09/2016	ELECTRONIC

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

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

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

iplaw@mvalaw.com
usptomail@mvalaw.com

UNITED STATES PATENT AND TRADEMARK OFFICE

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

Application No. : 13962903
Applicant : Ginn
Filing Date : 08/08/2013
Date Mailed : 08/09/2016

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Notice of Allowance Mailed

This application has been accorded an Allowance Date and is being prepared for issuance. The application, however, is incomplete for the reasons below.

Applicant is given two (2) months from the mail date of this Notice within which to respond. This time period for reply is extendable under 37 CFR 1.136(a) for only TWO additional MONTHS.

The informalities requiring correction are indicated in the attachment(s). If the informality pertains to the abstract, specification (including claims) or drawings, the informality must be corrected with an amendment in compliance with 37 CFR 1.121 (or, if the application is a reissue application, 37 CFR 1.173). Such an amendment may be filed after payment of the issue fee if limited to correction of informalities noted herein. See Waiver of 37 CFR 1.312 for Documents Required by the Office of Patent Publication, 1280 Off. Gaz. Patent Office 918 (March 23, 2004). In addition, if the informality is not corrected until after payment of the issue fee, for purposes of 35 U.S.C. 154(b)(1)(iv), "all outstanding requirements" will be considered to have been satisfied when the informality has been corrected. A failure to respond within the above-identified time period will result in the application being ABANDONED.

See attachment(s).

A copy of this notice MUST be returned with the reply. Please address response to "Mail Stop Issue Fee, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450".

/Marty Willis/
Publication Branch
Office of Data Management
(571) 272-4200

Application No. 13962903

IDENTIFICATION OF SPECIFICATION/DRAWING INCONSISTENCIES

[X] On Page 6 of the specification there is a brief description of FIG. 1B, but the drawings filed 02/06/2015 do not include a drawing with that designation. Applicant must respond either by supplying the omitted drawing or by amending the specification to remove all references to that drawing.

[X] The drawings filed 02/06/2015 include FIG. 2B, but the specification's brief description of the drawings does not describe a drawing with that designation. Applicant must respond either by amending the specification to add a brief description of that drawing or by correcting the drawings to remove the drawing in question.

[ ] Drawings are present in the application and are referred to in the detailed description of the invention, but the specification does not contain a brief description of the drawings as required by 37 CFR 1.74 and 37 CFR 1.77(b)(8).

[ ] Page of the specification refers to FIG. , but no drawing with that designation is described in the brief description of the drawings and no drawing with that designation is present in the application. Applicant must respond either by amending the specification to remove all references to that drawing, or by supplying that drawing and amending the specification to add a brief description of it.

[ ] In the reissue application, FIG. , is labeled as "New" but is not described in the reissue specification's brief description of the drawings. Applicant must respond by amending the reissue specification's brief description of the drawings to add a brief description of the new drawing.

[ ] OTHER:

[ ] COMMENTS:

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)

24239 7590 07/11/2016
MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

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

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

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

TITLE OF INVENTION: SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	10/11/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
LANGEL, WAYNE A	1736	071-023000

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

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

1 MOORE & VAN ALLEN PLLC
2 Henry B. Ward, III
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: CHARAH, INC.
(B) RESIDENCE: (CITY and STATE OR COUNTRY): LOUISVILLE, KENTUCKY

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 EFT
☐ Payment by credit card. Form PTO-2038 is attached.
☒ The director is hereby authorized to charge ~~the required fee(s),~~ any deficiency, or credits any overpayment, to Deposit Account Number 13-4365 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ Applicant certifying micro entity status. See 37 CFR 1.29
NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
☐ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
☐ Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /hbw/ Date 07/21/2016
Typed or printed name Henry B. Ward, III Registration No. 42,212

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Prolime Agriculture, LLC - Exhibit 1004 - Page 89

Applicants' Response to Interview Summary

Application No.: 13/962,903 **First Named Applicant: CHARAH, INC.**

Examiner: Wayne Langel **Art Unit: 1736** **Status of Application: Allowed**

Participants:
(1) Henry B. Ward, III (IP Counsel); (2) Wayne Langel

Date of Interview: July 13, 2015

Type of Interview Requested:
(1) [X] Telephonic (2) [ ] Personal (3) [ ] Video Conference

Exhibit To Be Shown or Demonstrated: [ ] YES [X] NO
If yes, provide brief description:

Issues Discussed

Issues (Rej., Obj., etc)	Claims/ Fig. #s	Prior Art	Discussed	Agreed	Not Agreed
Others; drawings to be considered			[X]	[X]	[ ]

[ ] Continuation Sheet Attached

Substance of interview:

The examiner informed Mr. Ward that the Drawings have been approved, and that he (the examiner) was inadvertently considering FIG. 1A and FIG. 2B filed on July 14, 2014, rather than corrected FIG. 1A and FIG. 2B filed on February 6, 2015, when objecting to the Drawings in the Notice of Allowance mailed on July 11, 2016.

Date: July 21, 2016

Applicant/Applicant's Representative Signature

/hbw/

Typed/Printed Name of Applicant or Representative

Henry B. Ward, III

Registration Number, if applicable: **42,212**

This collection of information is required by 37 CFR 1.133. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 21 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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

Privacy Act Statement

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

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

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

Electronic Patent Application Fee Transmittal

Application Number:	13962903
Filing Date:	08-Aug-2013
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Filer:	Henry B. Ward/Rebecca Spillers
Attorney Docket Number:	946478-000027

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	2501	1	480	480

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**480**

Electronic Acknowledgement Receipt	
EFS ID:	26415658
Application Number:	13962903
International Application Number:	
Confirmation Number:	9538
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Customer Number:	24239
Filer:	Henry B. Ward
Filer Authorized By:	
Attorney Docket Number:	946478-000027
Receipt Date:	21-JUL-2016
Filing Date:	08-AUG-2013
Time Stamp:	13:54:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$480
RAM confirmation Number	148
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	Issue_Fee_946478_000027.pdf	136764 9f4a1511a5ca0fcaef003b993d1794506aed41ae	no	1
Warnings:					
Information:					
2	Applicant summary of interview with examiner	Applicants_Response_to_Interview_Summary_946478_000027.pdf	218114 06065b6bb29f3c6faf92ed990cee568c73bbcbc1	no	2
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30887 6030485fdd6fc684f3ea1e3dc8c673e1655dc8de	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	385765		

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

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

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

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

24239 7590 07/20/2016

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

EXAMINER	
LANGEL, WAYNE A	

ART UNIT	PAPER NUMBER
1736	

NOTIFICATION DATE	DELIVERY MODE
07/20/2016	ELECTRONIC

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

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

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

iplaw@mvalaw.com
usptomail@mvalaw.com

CORRECTED ***Notice of Allowability***	**Application No.** 13/962,903	**Applicant(s)** GINN ET AL.	
	Examiner WAYNE LANGEL	**Art Unit** 1736	**AIA (First Inventor to File) Status** Yes

-- 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 _____.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1,3,5-13,16-22,24 and 26-29*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   Certified copies:
   a) ☐ All b) ☐ Some *c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
   * Certified copies not received: _____.

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

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ 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. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☒ Interview Summary (PTO-413), Paper No./Mail Date *7-13-16* .
5. ☒ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/WAYNE LANGEL/
Primary Examiner, Art Unit 1736

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

The Drawings have been approved.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WAYNE LANGEL whose telephone number is (571)272-1353. The examiner can normally be reached on Monday through Friday, 8:30 am - 4:45 pm Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. 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.

/WAYNE LANGEL/
Primary Examiner, Art Unit 1736

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/962,903	GINN ET AL.	
	Examiner	Art Unit	
	WAYNE LANGEL	1736	

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

(1) *WAYNE LANGEL*. (3)_____.

(2) *HENRY B. WARD, III*. (4)_____.

Date of Interview: *13 July 2016*.

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

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

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

Claim(s) discussed: *none*.

Identification of prior art discussed: *none*.

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

The examiner informed Mr. Ward that the Drawings have been approved, and that he (the examiner) was inadvertently considering FIG. 1A and FIG. 2B filed on July 14, 2014, rather than corrected FIG. 1A and FIG. 2B filed on February 6, 2015, when objecting to the Drawings in the Notice of Allowance mailed on July 11, 2016..

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

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

☐ Attachment

/WAYNE LANGEL/ Primary Examiner, Art Unit 1736	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

———

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

UNITED STATES PATENT AND TRADEMARK OFFICE

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

24239 7590 07/11/2016

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

EXAMINER	
LANGEL, WAYNE A	
ART UNIT	PAPER NUMBER
1736	

DATE MAILED: 07/11/2016

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

TITLE OF INVENTION: SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	10/11/2016

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 ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

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.

PTOL-85 (Rev. 02/11)

Prolime Agriculture, LLC - Exhibit 1004 - Page 102

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)

24239 7590 07/11/2016
MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

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

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

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

TITLE OF INVENTION: SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	10/11/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
LANGEL, WAYNE A	1736	071-023000

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

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

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

2. For printing on the patent front page, list

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

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

1 _____
2 _____
3 _____

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

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

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

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

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

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

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

❑ A check is enclosed.

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

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

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

❑ Applicant certifying micro entity status. See 37 CFR 1.29

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

❑ Applicant asserting small entity status. See 37 CFR 1.27

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

❑ Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Prolime Agriculture, LLC - Exhibit 1004 - Page 103

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

24239 7590 07/11/2016

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

EXAMINER	
LANGEL, WAYNE A	
ART UNIT	PAPER NUMBER
1736	

DATE MAILED: 07/11/2016

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

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

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.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B 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.

Privacy Act Statement

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

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

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

Notice of Allowability	Application No. 13/962,903	Applicant(s) GINN ET AL.	
	Examiner WAYNE LANGEL	Art Unit 1736	AIA (First Inventor to File) Status Yes

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

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

1. ☒ This communication is responsive to *the Declaration of 4-11-16 and amendment of 4-12-16*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1,3,5-13,16-22,24 and 26-29*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

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

5. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date 6-27-16.

   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. ☐ Notice of References Cited (PTO-892)
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5. ☒ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/WAYNE LANGEL/
Primary Examiner, Art Unit 1736

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Figures 1A and 1B of the Drawings are illegible. Corrected Drawings are required to provide legibility.

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Ward on June 27, 2016.

In claim 13, line 5, after "wherein" the word - -the - - has been inserted.

The following is an examiner's statement of reasons for allowance: The Ginn Declaration filed under 37 CFR 1.132 on April 11, 2016 strongly indicates that the gypsum product of Odom, Jr. '091 (US 2006/0180091) would not have a crush strength from approximately 2 lbf to approximately 12 lbf, due to the presence of the crushed peanut shells which have a lower bulk density than that of synthetic gypsum (see Paragraph 8 on page 3 of the Declaration), and the fact that the pelletized synthetic gypsum produced according to the present invention is capable of being spread using an approximately 800 rpm impeller over distances of approximately 60 feet to 100 feet, which spreadability is dependent upon a high crush strength, weight and bulk density of the pellets (see Paragraph 9 bridging pages 3 and 4 of the Declaration). Moreover,

there would be no motivation from Steele et al (US 2001/0029762) (other than impermissible hindsight) to form the gypsum product of Odom, Jr. '091 into pellets, due to less availability of calcium sulfate as a nutrient because of the peanut hulls and the reduced spreadabilty (see Paragraphs 9 and 10 on pages 3 and 4 of the Declaration). Accordingly the rejection over Odom, Jr. '091 in view of Steele et al is withdrawn.

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

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WAYNE LANGEL whose telephone number is (571)272-1353. The examiner can normally be reached on Monday through Friday, 8:30 am - 4:45 pm Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. 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.

/WAYNE LANGEL/
Primary Examiner, Art Unit 1736

Examiner-Initiated Interview Summary	**Application No.** 13/962,903	**Applicant(s)** GINN ET AL.	
	Examiner WAYNE LANGEL	**Art Unit** 1736	

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

(1) *WAYNE LANGEL*. (3)_____.

(2) *HENRY B. WARD, III*. (4)_____.

Date of Interview: *27 June 2016*.

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

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

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

Claim(s) discussed: *13*.

Identification of prior art discussed: *none*.

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

See Examiner's Amendment..

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

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

☐ Attachment

/WAYNE LANGEL/ Primary Examiner, Art Unit 1736	

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

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

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

Application Number	13962903
Filing Date	2013-08-08
First Named Inventor	Terrell Dallas Ginn
Art Unit	1736
Examiner Name	LANGEL, WAYNE A
Attorney Docket Number	946478-000027

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					

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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							

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13962903
	Filing Date	2013-08-08
	First Named Inventor	Terrell Dallas Ginn
	Art Unit	1736
	Examiner Name	LANGEL, WAYNE A
	Attorney Docket Number	946478-000027

	1	'Kelly Limestone: Capsulated Limestone and Gypsum Pellet Products - February 18, 2012"	
	2	'Kelly Limestone: Material Safety Data Sheets (MSDS) - February 28, 2012"	
	3	'Kelly Limestone: Capsulated Gypsum MSDS – February 28, 2012"	

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

EXAMINER SIGNATURE

Examiner Signature	/Wayne Langel/	Date Considered	06/27/2016

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

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /W.L./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13962903
	Filing Date	2013-08-08
	First Named Inventor	Terrell Dallas Ginn
	Art Unit	1736
	Examiner Name	LANGEL, WAYNE A
	Attorney Docket Number	946478-000027

CERTIFICATION STATEMENT

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

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

OR

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

☒ See attached certification statement.

Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

None

SIGNATURE

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

Signature	/hbw/	Date (YYYY-MM-DD)	2016-04-11
Name/Print	Henry B. Ward, III	Registration Number	42,212

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /W.L./

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

Privacy Act Statement

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

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

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

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

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

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

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

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

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /W.E.S/

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

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

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13962903	GINN ET AL.
	Examiner	**Art Unit**
	WAYNE LANGEL	1736

CPC						
Symbol					**Type**	**Version**
C05D		3	/	00	F	2013-01-01
C05G		3	/	0088	I	2013-01-01
C05D		3	/	02	I	2013-01-01
C05G		3	/	0058	I	2013-01-01
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CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	23	
/WAYNE LANGEL/ Primary Examiner.Art Unit 1736	06/27/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1,10,11	2

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13962903	GINN ET AL.
	Examiner	**Art Unit**
	WAYNE LANGEL	1736

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
		C 0 5 D 3 / 00 (2006.01.01)	
CROSS REFERENCE(S)		C 0 5 D 3 / 02 (2006.01.01)	
		C 0 5 G 3 / 00 (2006.01.01)	

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	23	
/WAYNE LANGEL/ Primary Examiner.Art Unit 1736	06/27/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1,10,11	2

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13962903	GINN ET AL.
	Examiner	**Art Unit**
	WAYNE LANGEL	1736

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

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	13	17												
	2	14	18												
2	3	15	19												
	4	16	20												
3	5	17	21												
4	6	18	22												
5	7		23												
6	8	19	24												
7	9		25												
8	10	20	26												
9	11	21	27												
10	12	22	28												
11	13	23	29												
	14														
	15														
12	16														

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 23	
/WAYNE LANGEL/ Primary Examiner.Art Unit 1736 (Primary Examiner)	06/27/2016 (Date)	O.G. Print Claim(s) 1,10,11	O.G. Print Figure 2

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13962903	GINN ET AL.
	Examiner	Art Unit
	WAYNE LANGEL	1736

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
71	63	2-7-14	WAL

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor Name Search	2-7-14	WAL
EAST:		
L1: (gypsum or (calcium adj sulfate)) and C05G3/0088.cpc	6-27-16	WAL
L2: L1 and (bindeer or lignosulfonate)	6-27-16	WAL
L3: (gypsum or (calcium adj sulfate)) and C05D3/00.cpc.	6-27-16	WAL
L4: L3 and (binder or mlignosulfonate))	6-27-16	WAL
L5: (gypsum or (calcium adj sulate)) and C05D3/02.cpc.	6-27-16	WAL
L6: L5 and)binder or lignosulfonate)	6-27-16	WAL

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
C05G	3/0088	6-27-16	WAL
C05D	3/00	6-27-16	WAL
C05D	3/02	6-27-16	WAL

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13962903	GINN ET AL.
	Examiner	Art Unit
	WAYNE LANGEL	1736

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

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

CLAIM		DATE								
Final	Original									
1	1									
	2									
2	3									
	4									
3	5									
4	6									
5	7									
6	8									
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19	24									
	25									
20	26									
21	27									
22	28									
23	29									

Substitute for form 1449/PTO (Revised 07/2005)				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(Use as many sheets as necessary)*				**Application Number**	13/962,903
				Filing Date	August 8, 2013
				First Named Inventor	Terrell Dallas Ginn et al.
				Group Art Unit	1736
				Examiner Name	Wayne A. Langel
Sheet	**1**	**of**	**2**	**Attorney Docket Number**	946478-000027

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.	Document Number Number - Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages of Relevant Figures Appear
	1.	US-6,029,603	02-29-2000	Evans et al.	
	2.	US-6,613,138 B2	09-02-2003	Welshimer et al.	
	3.	US-7,776,124 B2	08-17-2010	Binder et al.	

U. S. PATENT APPLICATION DOCUMENTS					
Examiner Initials*	Cite No.	Document Number Number - Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages of Relevant Figures Appear
	4.	US-2001/0029762 A1	10-18-2001	Steele et al.	

Examiner Signature		Date Considered	

CHAR2\1567193v1

*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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /W.L./

Substitute for form 1449/PTO (Revised 07/2005)				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(Use as many sheets as necessary)*				**Application Number**	13/962,903
				Filing Date	August 8, 2013
				First Named Inventor	Terrell Dallas Ginn et al.
				Group Art Unit	1736
				Examiner Name	Wayne A. Langel
Sheet	**2**	**of**	**2**	**Attorney Docket Number**	946478-000027

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.	Foreign Patent Document Country Code - Number Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	English Language Translation Attached

OTHER DOCUMENTS			
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s) , volume-issue number(s), publisher, city and/or country where published.	English Language Translation Attached
	5.	International Search Report and Written Opinion of International Application No. PCT/US2013/054212; mailing date January 17, 2014; 9 pages.	

Examiner Signature	/Wayne Langel/	Date Considered	06/27/2016

CHAR2\1567193v1

*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.

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BIB DATA SHEET

CONFIRMATION NO. 9538

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/962,903	08/08/2013 RULE	071	1736	946478-000027

APPLICANTS

INVENTORS

Terrell Dallas Ginn, Milton, KY;
Danny Lynn Gray, Marietta, GA;

**** CONTINUING DATA ***************************

This appln claims benefit of 61/681,088 08/08/2012

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

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
08/23/2013

Foreign Priority claimed	☐ Yes ☑ No	☐ Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
35 USC 119(a-d) conditions met	☐ Yes ☑ No					
Verified and Acknowledged	/WAYNE A LANGEL/ Examiner's Signature	Initials	KY	4	29	3

ADDRESS

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709
UNITED STATES

TITLE

SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING

FILING FEE RECEIVED		
1160	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

App. No.:	13/962,903	Confirmation No.: 9538
Applicant:	Terrell Dallas Ginn et al.	
Filed:	August 8, 2013	
Group Art Unit:	1736	
Examiner:	Wayne A. Langel	
Title:	**SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**	
Atty Dkt. No.	946478-000027	
Customer No.	24239	

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

SUPPLEMENTAL AMENDMENT UNDER 37 C.F.R. § 1.111

Sir:

This Supplemental Amendment is being filed to correct a typographical error in Section II(i) of the response dated April 11, 2016, which was filed in response to the Office Action dated October 9, 2015.

Amendments to the Claims begin on page 2 of this paper.

Remarks begin on page 6 of this paper.

Prolime Agriculture, LLC - Exhibit 1004 - Page 123

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

1. (Previously Presented) A method of producing a fertilizer comprising:

feeding synthetic gypsum to a forming device;

feeding a binder composition comprising lignosulfonate having 18% to 48% solids to the forming device; and

forming the material fed to the forming device to a mean pellet size guide number (SGN) from approximately 100 to approximately 500, wherein the resulting pelletized synthetic gypsum has a crush strength from approximately 2 lbf to approximately 12 lbf.

2. (Canceled)

3. (Original) The method of Claim 1, wherein the synthetic gypsum fed to the forming device has a mean particle size of less than 100 microns.

4. (Canceled)

5. (Original) The method of Claim 1, wherein the binder composition comprises a water soluble binder.

6. (Previously Presented) The method of Claim 1, wherein the binder composition also comprises one or more binders selected from the group consisting of brewers condensed solubles, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, and cellulose based polymer binders.

7. (Previously Presented) The method of Claim 1, further comprising feeding an additive to the forming device, wherein the additive is selected from the group consisting of ground calcium carbonate, calcium bentonite, kaolin clays, manganese, zinc, boron, calcium, copper, and elemental sulfur.

8. (Previously Presented) The method of Claim 7, wherein the additive comprises elemental sulfur.

9. (Original) The method of Claim 1, wherein the mean SGN is from approximately 250 to approximately 280.

10. (Original) The method of Claim 1, wherein the forming device comprises a pelletizer.

11. (Original) The method of Claim 1, wherein the forming device comprises a granulator or an extruder.

12. (Original) A fertilizer made by the method of Claim 1.

13. (Previously Presented) A fertilizer comprising:

pellets, the pellets comprising synthetic gypsum and a binder composition comprising lignosulfonate, wherein the binder composition initially has 18% to 48% solids at the time of contact with the synthetic gypsum, the pellets further comprising mean pellet SGN from approximately 100 to approximately 500, wherein pellets have a crush strength from approximately 2 to approximately 12 lbf.

14. (Canceled)

15. (Canceled)

Prolime Agriculture, LLC - Exhibit 1004 - Page 125

16. (Original) The fertilizer of Claim 13, wherein the binder composition comprises a water soluble binder.

17. (Previously Presented) The fertilizer of Claim 13, wherein the binder composition also comprises one or more binders selected from the group consisting of brewers condensed solubles, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, and cellulose based polymer binders.

18. (Previously Presented) The fertilizer of Claim 13, wherein the pellets further comprise an additive, wherein the additive is selected from the group consisting of ground calcium carbonate, calcium bentonite, kaolin clays, manganese, zinc, boron, calcium, copper, and elemental sulfur.

19. (Original) The fertilizer of Claim 13, wherein the pellets further comprise an additive comprising elemental sulfur.

20. (Original) The fertilizer of Claim 13, wherein the mean SGN is from approximately 250 to approximately 280.

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21. (Previously Presented) A process for producing a fertilizer comprising:

feeding synthetic gypsum to a dryer;

feeding dried synthetic gypsum and a binder composition comprising lignosulfonate having 18% to 48% solids to a mixer;

mixing the material fed to the mixer;

feeding the mixed material to a forming device;

pelletizing the material fed to the forming device;

feeding the pelletized material to a dryer;

drying the pelletized material;

feeding the dried pelletized material to a screener; and

screening the material fed to the screener to a mean pellet size guide number (SGN) from approximately 100 to approximately 500, wherein the resulting pelletized synthetic gypsum has a crush strength from approximately 2 lbf to approximately 12 lbf.

22. (Original) The process of Claim 21, further comprising recycling unders and overs removed during screening to the mixer.

23. (Canceled)

24. (Original) The process of Claim 21, wherein the synthetic gypsum fed to the mixer has a mean particle size of less than 100 microns.

25. (Canceled)

26. (Previously Presented) The process of Claim 21, further comprising feeding an additive to the mixer, wherein the additive is selected from the group consisting of manganese, zinc, boron, calcium, copper, and elemental sulfur.

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27. (Original) The process of Claim 21, further comprising feeding an additive to the mixer, wherein the additive comprises elemental sulfur.

28. (Original) The process of Claim 21, wherein the mean SGN is from approximately 250 to approximately 280.

29. (Original) A fertilizer made by the process of Claim 21.

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REMARKS

This Supplemental Amendment is filed to correct a typographical error in Section II(i) of the response dated April 11, 2016, which was filed to respond to the Office Action dated October 9, 2015. No new claim amendments are presented with this Supplemental Amendment. Applicants respectfully request reconsideration of the pending claims in light of the Amendments submitted in the response dated April 11, 2016, and the corrected Remarks set forth herein, which Applicants consider to be a summary of the matters discussed during the interview as required by 37 C.F.R. § 1.133(b).

Claims 1, 3, 5-13, 16-22, and 26-29 stand rejected. Claims 1, 13, and 21 have been amended. Therefore, Claims 1, 3, 5-13, 16-22, and 26-29 are now pending in the application, with Claims 1, 13, and 21 being in the independent form. Applicants respectfully submit that the pending claims are patentable and respectfully request reconsideration in light of the following remarks.

I. Claim Rejections Under 35 U.S.C. § 103

The Office rejected Claims 1, 3, 5, 6, 9-13, 16, 17, 20-22, 24, 28 and 29 under 35 U.S.C. §103 asserting that the claims are unpatentable over U.S. Patent Application Publication No. 2006/0180091 issued to Odom (hereinafter referred to as "Odom"), in view of U.S. Patent Application Publication No. 2001/0029762 issued to Steele et al. (hereinafter referred to as "Steele"). The Office rejected Claims 7, 8, 18, 19, 26 and 27 under 35 U.S.C. § 103 asserting that the claims are unpatentable over Steele as applied to Claims 1, 13 and 21 above, and further in view of U.S. Patent No. 4,015,972 issued to Watkins et al (hereinafter referred to as "Watkins"). As discussed in the interview, Applicants respectfully disagree and traverse the rejections for the following reasons.

(i) The Office's reliance on inherency in a rejection under § 103 is not proper under applicable decisions of the Federal Circuit and Board.

In the Office Action, the Office contends that it would have been obvious to combine the composition of Odom with the pelletizing method of Steele and that it would be expected that the

composition formed according to Odom would have a crush strength from approximately 2 lbf to 12 lbf, since the calcium lignosulfonate in Odom's composition has a solids content in the range of 30% to 40%. In other words, the Office contends that the crush strength from approximately 2 lbf to 12 lbf would be inherent in a pellet formed from the composition of Odom using the pelletizing method of Steele.

As discussed during the interview, Applicants respectfully traverse the Office's reliance on inherency. In *Ex Parte Vigano et al.* (Appeal No. 2010-007666; Application No. 12/044,623) the Board of Patent Appeals and Interferences ("Board") held that "the Examiner's determination that the shrinkage limitation would have been met inherently is legal error in an obviousness rejection." *Id.* at Page 5 (Emphasis provided). The rationale for the Board's decision was that the shrinkage limitation was "a property of the entire composition and is … affected by the components of the composition." *Id.* As explained by the Board, "[t]he Examiner's conclusion of obviousness arises from the proposed combination of materials from two different references. Inherency, however, cannot be based on what is not known. *Id.* (*citing In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993) ("That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown.") (internal quotes and citation omitted)).

For the foregoing reasons, as discussed during the interview, Applicants respectfully submit that the Office Action does not establish *prima facie* obviousness.

(ii) There is no motivation to combine Odom and Steele

The Office Action contends that it would be obvious to combine the composition of Odom with the pelletizing method of Steele since Steele suggests that "a composition comprising gypsum and calcium lignosulfonate in the form of pellets is useful as a carrier for nutrients." (*See* Office Action at Pages 2-3).

As discussed during the interview, Applicants submit that there is no motivation to combine Odom and Steele as proposed in the Office Action. It was discussed during the interview that additional evidence would be required. More specifically, it was discussed that Applicants would submit an acceptable inventor Declaration in support of Applicants'

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contentions. Accordingly, as discussed during the interview, Applicants submit herewith a verified Declaration under 37 C.F.R. § 1.132 of the inventor, Danny Lynn Gray.

As evidenced by Mr. Gray's Declaration, the bulk density of crushed peanut hulls is materially different from that of synthetic gypsum, both in aerated and compacted form. Mr. Gray's Declaration further evidences that there are material disadvantages to pelletizing the Odom composition according to Steele. First, replacing a material portion of the synthetic gypsum with peanut hulls would result in a fertilizer product in which less calcium sulfate is available as a nutrient. Second, replacing a material portion of the synthetic gypsum with crushed peanut hulls would result in a pellet having a materially lower bulk density and, thus, lower weight. As disclosed in Paragraph [0024] of the '903 Application, one of the advantages of pelletized synthetic gypsum produced according to the present invention is that the pellets are capable of being spread using an approximately 800 rpm impeller over distances of approximately 60 feet to 100 feet. Such spreadability is dependent upon not only a high crush strength, but also on the weight and, thus, bulk density of the pellets. Mr. Gray's Declaration further evidences that utilizing a material amount of crushed peanut hulls, which has a materially lower bulk density as compared to synthetic gypsum, would reduce the weight of the resulting pellets and reduce the spreadability of the pellets. Mr. Gray's Declaration further evidences that lighter pellets are more susceptible air resistance and to ambient environmental conditions, such as wind, which can further reduce spreadability. Reduced spreadability is problematic because the distance between passes of the spreader must be reduced in order to obtain the same coverage, which increases the time and cost associated with applying the fertilizer product to a field. In contrast, pelletized synthetic gypsum produced according to the present invention have a higher bulk density and, thus, higher mass enabling the pellets to have a higher kinetic energy and greater momentum when spread. Thus, Mr. Gray's Declaration refutes the Office's contention it would be obvious from Steele to form the composition of Odom into pellets, as pellets produced from pelletizing the Odom composition according to the method disclosed in Steele will have materially less calcium sulfate available as a nutrient and will have reduced spreadability.

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In light of the foregoing, Applicants respectfully submit that the independent Claims 1, 13, and 21, and the claims depending therefrom, contain recitations that patentably distinguish the claimed invention over the cited references and, therefore should be allowed. Reconsideration and withdrawal of all rejections is respectfully solicited and Applicants kindly request issuance of a corresponding Notice of Allowance.

* * * * *

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Conclusion

In view of the amended claims, attached verified Declaration under 37 C.F.R. § 1.132 of the inventor, Danny Lynn Gray, and the remarks presented above, it is respectfully submitted that all of the present claims of the application are in condition for immediate allowance. It is therefore respectfully requested that a Notice of Allowance be issued. The Examiner is encouraged to contact Applicants' undersigned attorney to resolve any remaining issues in order to expedite examination of the present application.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
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Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on April 12, 2016.

Prolime Agriculture, LLC - Exhibit 1004 - Page 133

Electronic Acknowledgement Receipt

EFS ID:	25463567
Application Number:	13962903
International Application Number:	
Confirmation Number:	9538
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Customer Number:	24239
Filer:	Henry B. Ward
Filer Authorized By:	
Attorney Docket Number:	946478-000027
Receipt Date:	12-APR-2016
Filing Date:	08-AUG-2013
Time Stamp:	11:53:08
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Supplemental Response or Supplemental Amendment	SupplementalAmendment.pdf	151270 939fdc6047ce33acc6adbaafd0fadf65619d44da	no	11
Warnings:					
Information:					

Total Files Size (in bytes):	151270

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

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

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

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

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/962,903	Filing Date 08/08/2013	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 04/11/2016

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 23	Minus	** 29	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT 04/12/2016

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 23	Minus	** 29	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/MONIQUE BRUNSON/

This collection of information is required by 37 CFR 1.16. 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, 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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

App. No.:	13/962,903	Confirmation No.: 9538
Applicant:	Terrell Dallas Ginn et al.	
Filed:	August 8, 2013	
Group Art Unit:	1736	
Examiner:	Wayne A. Langel	
Title:	**SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**	
Atty Dkt. No.	946478-000027	
Customer No.	24239	

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

AMENDMENT UNDER 37 C.F.R. § 1.111

Sir:

In response to the Office Action dated October 9, 2015, please amend the above-identified application as provided herein.

Amendments to the Claims begin on page 2 of this paper.

Remarks begin on page 6 of this paper.

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Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently Amended) A method of producing a fertilizer comprising:

feeding synthetic gypsum to a forming device;

feeding a binder composition comprising lignosulfonate having 18% to 48% solids to the forming device; and

forming the material fed to the forming device to a mean pellet size guide number (SGN) from approximately [[150]]100 to approximately [[300]]500, wherein the resulting pelletized synthetic gypsum has a crush strength from approximately 2 lbf to approximately 12 lbf.

2. (Canceled)

3. (Original) The method of Claim 1, wherein the synthetic gypsum fed to the forming device has a mean particle size of less than 100 microns.

4. (Canceled)

5. (Original) The method of Claim 1, wherein the binder composition comprises a water soluble binder.

6. (Previously Presented) The method of Claim 1, wherein the binder composition also comprises one or more binders selected from the group consisting of brewers condensed solubles, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, and cellulose based polymer binders.

7. (Previously Presented) The method of Claim 1, further comprising feeding an additive to the forming device, wherein the additive is selected from the group consisting of ground calcium

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carbonate, calcium bentonite, kaolin clays, manganese, zinc, boron, calcium, copper, and elemental sulfur.

8. (Previously Presented) The method of Claim 7, wherein the additive comprises elemental sulfur.

9. (Original) The method of Claim 1, wherein the mean SGN is from approximately 250 to approximately 280.

10. (Original) The method of Claim 1, wherein the forming device comprises a pelletizer.

11. (Original) The method of Claim 1, wherein the forming device comprises a granulator or an extruder.

12. (Original) A fertilizer made by the method of Claim 1.

13. (Currently Amended) A fertilizer comprising:

pellets, the pellets comprising synthetic gypsum and a binder composition comprising lignosulfonate, wherein the binder composition initially has 18% to 48% solids at the time of contact with the synthetic gypsum, the pellets further comprising mean pellet SGN from approximately [[150]]100 to approximately [[300]]500, wherein pellets have a crush strength from approximately 2 to approximately 12 lbf.

14. (Canceled)

15. (Canceled)

16. (Original) The fertilizer of Claim 13, wherein the binder composition comprises a water soluble binder.

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17. (Previously Presented) The fertilizer of Claim 13, wherein the binder composition also comprises one or more binders selected from the group consisting of brewers condensed solubles, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, and cellulose based polymer binders.

18. (Previously Presented) The fertilizer of Claim 13, wherein the pellets further comprise an additive, wherein the additive is selected from the group consisting of ground calcium carbonate, calcium bentonite, kaolin clays, manganese, zinc, boron, calcium, copper, and elemental sulfur.

19. (Original) The fertilizer of Claim 13, wherein the pellets further comprise an additive comprising elemental sulfur.

20. (Original) The fertilizer of Claim 13, wherein the mean SGN is from approximately 250 to approximately 280.

21. (Currently Amended) A process for producing a fertilizer comprising:

feeding synthetic gypsum to a dryer;

feeding dried synthetic gypsum and a binder composition comprising lignosulfonate having 18% to 48% solids to a mixer;

mixing the material fed to the mixer;

feeding the mixed material to a forming device;

pelletizing the material fed to the forming device;

feeding the pelletized material to a dryer;

drying the pelletized material;

feeding the dried pelletized material to a screener; and

screening the material fed to the screener to a mean pellet size guide number (SGN) from approximately [[150]]100 to approximately [[300]]500, wherein the resulting pelletized synthetic gypsum has a crush strength from approximately 2 lbf to approximately 12 lbf.

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22. (Original) The process of Claim 21, further comprising recycling unders and overs removed during screening to the mixer.

23. (Canceled)

24. (Original) The process of Claim 21, wherein the synthetic gypsum fed to the mixer has a mean particle size of less than 100 microns.

25. (Canceled)

26. (Previously Presented) The process of Claim 21, further comprising feeding an additive to the mixer, wherein the additive is selected from the group consisting of manganese, zinc, boron, calcium, copper, and elemental sulfur.

27. (Original) The process of Claim 21, further comprising feeding an additive to the mixer, wherein the additive comprises elemental sulfur.

28. (Original) The process of Claim 21, wherein the mean SGN is from approximately 250 to approximately 280.

29. (Original) A fertilizer made by the process of Claim 21.

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REMARKS

This Amendment is filed in response to the Office Action dated October 9, 2015. Applicants would like to acknowledge, with appreciation, the helpful and constructive telephonic interview granted to the undersigned by Examiner Langel on March 9, 2016. Applicants respectfully request reconsideration of the pending claims in light of the Amendments and Remarks set forth herein, which Applicants consider to be a summary of the matters discussed during the interview as required by 37 C.F.R. § 1.133(b).

Claims 1, 3, 5-13, 16-22, and 26-29 stand rejected. Claims 1, 13, and 21 have been amended. Therefore, Claims 1, 3, 5-13, 16-22, and 26-29 are now pending in the application, with Claims 1, 13, and 21 being in the independent form. Support for the amendments may be found in Paragraph [0020] of the application as filed. Applicants request entry of the amendments to Claims 1, 13 and 21. Applicants respectfully submit that the pending claims are patentable and respectfully request reconsideration in light of the following remarks.

I. Information Disclosure Statement

Applicants are filing an information disclosure statement (IDS) under 37 C.F.R. § 1.97 concurrently herewith. The IDS comprises screenshots of Kelly Limestone LLC's capsulated gypsum product and the product's Material Safety Data Sheet. Applicants believe that this material appears to be duplicative of U.S. Patent Application Publication No. 2001/0029762 issued to Steele et al., but are submitting this material for purposes of full disclosure.

II. Claim Rejections Under 35 U.S.C. § 103

The Office rejected Claims 1, 3, 5, 6, 9-13, 16, 17, 20-22, 24, 28 and 29 under 35 U.S.C. §103 asserting that the claims are unpatentable over U.S. Patent Application Publication No. 2006/0180091 issued to Odom (hereinafter referred to as "Odom"), in view of U.S. Patent Application Publication No. 2001/0029762 issued to Steele et al. (hereinafter referred to as "Steele"). The Office rejected Claims 7, 8, 18, 19, 26 and 27 under 35 U.S.C. § 103 asserting that the claims are unpatentable over Steele as applied to Claims 1, 13 and 21 above, and further

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in view of U.S. Patent No. 4,015,972 issued to Watkins et al (hereinafter referred to as "Watkins"). As discussed in the interview, Applicants respectfully disagree and traverse the rejections for the following reasons.

(i) The Office's reliance on inherency in a rejection under § 103 is not proper under applicable decisions of the Federal Circuit and Board.

In the Office Action, the Office contends that it would have been obvious to combine the composition of Odom with the pelletizing method of Steele and that it would be expected that the composition formed according to Odom would have a crush strength from approximately 2 lbf to 12 lbf, since the calcium lignosulfonate in Odom's composition has a solids content in the range of 30% to 40%. In other words, the Office contends that the crush strength from approximately 2 lbf to 12 lbf would be inherent in a pellet formed from the composition of Odom using the pelletizing method of Steele.

As discussed during the interview, Applicants respectfully traverse the Office's reliance on inherency. In *Ex Parte Vigano et al.* (Appeal No. 2010-007666; Application No. 12/044,623) the Board of Patent Appeals and Interferences ("Board") held that "the Examiner's determination that the shrinkage limitation would have been met inherently is legal error in an obviousness rejection." *Id.* at Page 5 (Emphasis provided). The rationale for the Board's decision was that the shrinkage limitation was "a property of the entire composition and is … affected by the components of the composition." *Id.* As explained by the Board, "[t]he Examiner's conclusion of obviousness arises from the proposed combination of materials from two different references. Inherency, however, cannot be based on what is not known. *Id.* (*citing In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993) ("That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown.") (internal quotes and citation omitted)).

For the foregoing reasons, as discussed during the interview, Applicants respectfully submit that the Office Action does establish *prima facie* obviousness.

(ii) There is no motivation to combine Odom and Steele

The Office Action contends that it would be obvious to combine the composition of Odom with the pelletizing method of Steele since Steele suggests that "a composition comprising

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gypsum and calcium lignosulfonate in the form of pellets is useful as a carrier for nutrients." (*See* Office Action at Pages 2-3).

As discussed during the interview, Applicants submit that there is no motivation to combine Odom and Steele as proposed in the Office Action. It was discussed during the interview that additional evidence would be required. More specifically, it was discussed that Applicants would submit an acceptable inventor Declaration in support of Applicants' contentions. Accordingly, as discussed during the interview, Applicants submit herewith a verified Declaration under 37 C.F.R. § 1.132 of the inventor, Danny Lynn Gray.

As evidenced by Mr. Gray's Declaration, the bulk density of crushed peanut hulls is materially different from that of synthetic gypsum, both in aerated and compacted form. Mr. Gray's Declaration further evidences that there are material disadvantages to pelletizing the Odom composition according to Steele. First, replacing a material portion of the synthetic gypsum with peanut hulls would result in a fertilizer product in which less calcium sulfate is available as a nutrient. Second, replacing a material portion of the synthetic gypsum with crushed peanut hulls would result in a pellet having a materially lower bulk density and, thus, lower weight. As disclosed in Paragraph [0024] of the '903 Application, one of the advantages of pelletized synthetic gypsum produced according to the present invention is that the pellets are capable of being spread using an approximately 800 rpm impeller over distances of approximately 60 feet to 100 feet. Such spreadability is dependent upon not only a high crush strength, but also on the weight and, thus, bulk density of the pellets. Mr. Gray's Declaration further evidences that utilizing a material amount of crushed peanut hulls, which has a materially lower bulk density as compared to synthetic gypsum, would reduce the weight of the resulting pellets and reduce the spreadability of the pellets. Mr. Gray's Declaration further evidences that lighter pellets are more susceptible air resistance and to ambient environmental conditions, such as wind, which can further reduce spreadability. Reduced spreadability is problematic because the distance between passes of the spreader must be reduced in order to obtain the same coverage, which increases the time and cost associated with applying the fertilizer product to a field. In contrast, pelletized synthetic gypsum produced according to the present invention have a higher bulk density and, thus, higher mass enabling the pellets to have a higher kinetic energy and greater momentum when spread. Thus, Mr. Gray's Declaration refutes the Office's

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contention it would be obvious from Steele to form the composition of Odom into pellets, as pellets produced from pelletizing the Odom composition according to the method disclosed in Steele will have materially less calcium sulfate available as a nutrient and will have reduced spreadability.

In light of the foregoing, Applicants respectfully submit that the independent Claims 1, 13, and 21, and the claims depending therefrom, contain recitations that patentably distinguish the claimed invention over the cited references and, therefore should be allowed. Reconsideration and withdrawal of all rejections is respectfully solicited and Applicants kindly request issuance of a corresponding Notice of Allowance.

* * * * *

Prolime Agriculture, LLC - Exhibit 1004 - Page 145

Conclusion

In view of the amended claims, attached verified Declaration under 37 C.F.R. § 1.132 of the inventor, Danny Lynn Gray, and the remarks presented above, it is respectfully submitted that all of the present claims of the application are in condition for immediate allowance. It is therefore respectfully requested that a Notice of Allowance be issued. The Examiner is encouraged to contact Applicants' undersigned attorney to resolve any remaining issues in order to expedite examination of the present application.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

App. No.:	13/962,903	Confirmation No.: 9538
Applicants:	Terrell Dallas Ginn et al.	
Filed:	August 8, 2013	
Group Art Unit:	1736	
Examiner:	Wayne A. Langel	
Title:	**SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**	
Atty Dkt. No.	946478-000027	
Customer No.	24239	

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

DECLARATION UNDER 37 C.F.R. § 1.132

I, Danny Lynn Gray, hereby declare that:

1. I am a citizen of the United States residing at 3637 Summerford Drive, Marietta, Georgia 30062.

2. I am a co-inventor of the invention that is disclosed and claimed in U.S. Patent Application No. 13/962,903 filed in the U.S. Patent and Trademark Office on August 8, 2013 and titled "*Synthetic Gypsum Fertilizer Product and Method of Making*" (the "'903 Application").

3. I have a Bachelor of Science degree in Civil Engineering from Virginia Polytechnic Institute and State University. I am a registered professional engineer in Arkansas, Georgia, North Carolina, Virginia and West Virginia. I have been employed at Charah, Inc. ("Charah") from 2008 until the present date.

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4. I have assigned my ownership rights in the '903 Application to Charah.

5. I submit this Declaration in support of the patentability of the invention as claimed in Claims 1, 3, 5-13, 16-22, 24, and 26-29 in the '903 Application. I understand that the Office Action dated October 9, 2015, rejects independent Claims 1, 13, and 21 as being unpatentable over U.S. Published Patent Application No. 2006/0180091 issued to Odom, in view of U.S. Published Patent Application No. 2001/0029762 issued to Steele et al. ("Steele"). Specifically, the Office Action contends as follows:

> The difference between the method and composition disclosed by Odom, Jr. '091, and that recited in applicant's claims, is that Odom, Jr. '091 does not disclose that the gypsum should be formed into pellets. Steele et al [sic] disclose a method for making gypsum pellets wherein calcium lignosulfonte [sic] is used as a binder. (See Paragraphs [0011], [0017], [0024] and [0025].) It would be obvious from Steele et al [sic] to form gypsum composition of Odom, Jr. '091 into pellets. One or ordinary skill in the art would be motivated to do so, since Steele et al [sic] suggest in paragraphs [0007] and [0010] that a composition comprising gypsum and calcium lignosulfonate in form of pellets is useful as a carrier for nutrients, and Odom, Jr. '091 discloses in Paragraph [0006] that a purpose of the composition is to serve as a carrier for fertilizer.

6. The '903 Application is directed to pelletized synthetic gypsum for use as a fertilizer and methods of producing pelletized synthetic gypsum for use as a fertilizer. My co-inventor, Terrell D. Ginn ("Terrell Ginn"), and I began the pursuit of pelletized synthetic gypsum for use as a fertilizer and methods of producing pelletized synthetic gypsum for use as a fertilizer on behalf of Charah in 2011. We performed extensive research on pelletizing and granulating synthetic gypsum to manufacture a marketable fertilizer. The goal of our research was to develop synthetic gypsum fertilizer pellets that were economical to manufacture and would have high crush strength, low attrition (*i.e.*, spread evenly without

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breakdown into dust) and a consistent size. The high crush strength and low attrition enables pelletized synthetic gypsum manufactured according to the present invention to be spread over large distances using conventional spreaders, while maintaining their structural integrity. In some instances, the synthetic gypsum pellets of the present invention are capable of being spread using an approximately 800 rpm impeller over distances of approximately 60 feet to 100 feet.

7. Odom requires crushed peanut hulls to be present in the peanut hull gypsum product from at least a ratio of 30:70 to about 70:30. Odom discloses that the resulting composition or material may have a bulk density of from about 35 to about 50 lbs/ft^3.

8. As disclosed in the '903 Application, the bulk density of aerated synthetic gypsum is about 51.3 lbs/ft^3, while the bulk density of compacted synthetic gypsum is about 73.3 lbs/ft^3. In contrast, the bulk density of crushed peanut hulls is about 9.4 to 12 lbs/ft^3 in the aerated form, and about 38-45 lbs/ft^3 in the compacted form, as evidenced by the documentation attached hereto as Exhibits A-C. (*See* Exhibit A at Section 3.3, Exhibit B and C at page 2).

9. I respectfully disagree with the contentions in the Office Action that " [i]t would be obvious from Steele et al [sic] to form gypsum composition of Odom, Jr. '091 into pellets. One of ordinary skill in the art would be motivated to do so, since Steele et al [sic] suggest in paragraphs [0007] and [0010] that a composition comprising gypsum and calcium lignosulfonate in form of pellets is useful as a carrier for nutrients, and Odom, Jr. '091 discloses in Paragraph [0006] that a purpose of the composition is to serve as a carrier for fertilizer…." The bulk density of crushed peanut hulls is materially different from that of synthetic gypsum, both in aerated and compacted form. In my opinion, there are material disadvantages to pelletizing the Odom composition according to Steele. First, replacing a material portion of the synthetic gypsum with peanut hulls would result in a fertilizer product in which less calcium sulfate is available as a nutrient. Second, replacing a material portion of the synthetic gypsum with crushed peanut hulls would result in a pellet having a materially lower bulk density and, thus, lower weight. As disclosed in Paragraph [0024]

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of the '903 Application, one of the advantages of pelletized synthetic gypsum produced according to the present invention is that the pellets are capable of being spread using an approximately 800 rpm impeller over distances of approximately 60 feet to 100 feet. Such spreadability is dependent upon not only a high crush strength, but also on the weight and, thus, bulk density of the pellets. In my opinion, utilizing a material amount of crushed peanut hulls, which has a materially lower bulk density as compared to synthetic gypsum, would reduce the weight of the resulting pellets and reduce the spreadability of the pellets. It is well understood that lighter pellets are more susceptible air resistance and to ambient environmental conditions, such as wind, which can further reduce spreadability. Reduced spreadability is problematic because the distance between passes of the spreader must be reduced in order to obtain the same coverage, which increases the time and cost associated with applying the fertilizer product to a field. In contrast, pelletized synthetic gypsum produced according to the present invention have a higher bulk density and, thus, higher mass enabling the pellets to have a higher kinetic energy and greater momentum when spread.

10. Given that any pellets produced from pelletizing the Odom composition according to the method disclosed in Steele will have materially less calcium sulfate available as a nutrient and will have reduced spreadability, in my opinion, there is no motivation to pelletize the composition of Odom using the pelletizing method of Steele.

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

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This Declaration was executed by me on the date indicated.

Danny Lynn Gray Date: 4/11/2016

Danny Lynn Gray

Atty Dkt. No.946478.000027 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Exhibit A

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Bioresource Technology 99 (2008) 1259–1266
BIORESOURCE TECHNOLOGY

Physical properties of peanut hull pellets

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Abstract

Peanut hull (peanut pods and waste materials from processing of peanuts) was pelleted through a 3/16-in. (4.76 mm) diameter die. The effect of change in moisture content (4.2–21.2%, wet basis) of the pellets (due to exposure of the pellets to low or high humidity storage environments) on physical properties were measured. Pelleting increased the bulk density of the peanut hull from 151 kg/m^3 to more than 600 kg/m^3. Bulk density, particle density and durability of the pelleted peanut hull of pellets were significantly affected by moisture content attained by the pellets during exposure to the low or high humidity environment. Air relative humidity significantly influenced the rate at which the pellets exchange moisture with the environment while air temperature did not. The values of the constants of the GAB model were obtained from moisture sorption isotherm at 25 °C.
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Keywords: Density; Particle size; GAB model; Biomass; Moisture sorption; Peanut hull

1. Introduction

The world economy is presently dominated by technologies that rely on energy from fossil fuels (petroleum, coal and natural gas) to produce power, chemicals and materials. In 2004, about 86% of the energy use in United States (EIA, 2005a) was from fossil fuel. From a sustainable view point, fossil fuels are limited and non-renewable energy source. In addition, there are environmental problems associated with extracting, transporting, and using fossil fuels.

An unavoidable solution to reducing the world's dependency on fossil fuel is the use of renewable resources. Biomass is one of the renewable resources that can contribute significantly to the reduced use of fossil fuel. Biomass are organic materials that are plant or animal based, including but not limited to dedicated energy crops, agricultural crops and trees, food, feed and fiber crop residues, aquatic plants, forestry and wood residues, agricultural wastes, biobased segments of industrial and municipal wastes, processing byproducts and other non-fossil organic materials (ASABE Standard S593, 2006; DOE, 2004).

Biomass resources are abundant in United States. It has been estimated that by mid-21st century, the land resources of the United States will be capable of producing at least one billion dry tons (0.91 billion dry metric tonnes) of biomass feedstock per year (Perlack et al., 2005), a quantity that has been projected to be able to replace at least 30% of petroleum consumption. In 2003, biomass (~200 million dry tons) contributed to nearly 3% (3.05×10^{15} kJ or 2.9 quadrillion BTU) of the nation's energy supply (Perlack et al., 2005). About 4% of this energy (from biomass) was from wastes generated from agro-processing operations (EIA, 2005b) such as peanut hull, a byproduct obtained when graded peanuts are passed through shelling machines resulting in peanut kernels and hulls. Peanut hull could create a significant waste disposal problem around the area where peanut is grown and/or processed. Using a conservative estimate of 25% hulls in peanut (by mass) (FAO, 2005), about 500,000 ton of peanut hulls are annually available as biomass that can potentially be used in fossil fuel replacement around the southern part of the country (total production in this region of United States is 1.92 million tonnes – NASS, 2005).

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Similar to most other byproducts from agro-processing, peanut hulls are lightly-dense (<150 kg/m^3) and therefore cannot be efficiently and economically transported over long distances to areas where they can be effectively utilized. Densification by pelletizing is one of the effective ways that has been used to increase the value of agricultural and biological materials (Barger, 2003; Fasina and Sokhansanj, 1996).

Pellets are manufactured by grinding, conditioning (application of heat and/or moisture) and forcing the ground sample through dies that range in diameter from 4 to 12 mm or even larger (Fasina and Sokhansanj, 1993). Several published studies have shown that moisture content significantly influences the physical properties of biological materials such as peanut hull pellets (McMullen et al., 2005; McNeill et al., 2004; Nelson, 2002). Therefore, the objective of this study was to quantify the physical properties (size, particle density, bulk density, moisture sorption rate and equilibrium moisture relations) of pellets made from peanut hulls and quantify the effect of moisture on these properties.

2. Methods

2.1. Sample preparation and particle size distribution

The peanut hull samples were obtained from a peanut processing plant (Ag. Fibers LLC, Dothan, AL). Two 250 g sub-samples of the peanut hull were sent to a commercial analytical laboratory (General Test Laboratory, Birmingham, AL) for determination of their energy (heating value), ash, hydrogen and carbon contents. Analysis of the samples was carried out in duplicate according to ASTM standardized procedures (ASTM Standard D2013, 2004; ASTM Standard D5142, 2004; ASTM Standard D5373, 2002; and ASTM Standard D5865, 2004). Before pelleting, the samples were ground through a 3.18 mm screen using a hammer mill (Model 358, New Holland Grinder, New Holland, PA).

Particle size distribution of the ground samples was determined according to ASABE Standard S319.3 (2003). About 100 g of material was placed on the top sieve of a nest of successively smaller sieves. For this analysis, seven test sieves plus a pan with aperture sizes ranging from 0.044 mm to 3.36 mm were used. The nest of test sieves was shaken for 10 min in a sieve shaker (Model CL 340, Tyler Inc., Mentor, OH), after which, the mass of material retained on each sieve was recorded. The determination of the geometric mean diameter (d_{gw}) of the sample and the geometric standard deviation of particle diameter (S_{gw}) was carried out according to the ASABE Standard S319.3 (2003):

$$d_{gw} = \log^{-1}\left[\frac{\sum_{i=1}^{n}(W_i \log \bar{d}_i)}{\sum_{i=1}^{n} W_i}\right] \quad (1)$$

$$S_{\log} = \left[\frac{\sum_{i=1}^{n} W_i(\log \bar{d}_i - \log d_{gw})^2}{\sum_{i=1}^{n} W_i}\right]^{1/2} \quad (2)$$

$$S_{gw} = \frac{1}{2} d_{gw}[\log^{-1} S_{\log} - (\log^{-1} S_{\log})^{-1}] \quad (3)$$

where

d_{gw} geometric mean diameter or median size of particles by mass (mm);
$S_{\log}$ geometric standard deviation of log normal distribution by mass in 10-based logarithm (dimensionless);
S_{gw} geometric standard deviation of particle diameter by mass (mm);
W_i mass on ith sieve (g);
n number of sieves plus one pan;
$\bar{d}_i$ $(d_i \times d_{i+1})^{1/2}$;
d_i nominal sieve aperture size of the ith sieve (mm);
d_{i+1} nominal sieve aperture size of the ith+1 sieve (mm).

2.2. Pelleting

A laboratory scale pellet mill (Model CL5, California Pellet Mill Co., San Francisco, CA) was used to manufacture the pellets used in this study. Some of the relevant characteristics of the pellet mill can be found in Table 1. The pellets were made by extruding the ground peanut hull through round cross sectional dies (diameter of 4.76 mm). Before passing through the pellet die, the ground peanut hull was conditioned by injecting steam (85% quality that was generated at 80 psi in a steam generator – Model LG-10, Electro-Steam Generator, Alexandria, VA) onto the sample as it flows through the conditioning chamber of the pellet mill. This caused the temperature and moisture content of the sample to increase to 77 °C and 16.3% (w.b.) (from initial moisture content of 10.2%, w.b.). Frictional heating of the die during pelleting further increased the temperature of the pellets exiting the die to 88 °C. The die size used was 4.76 mm. After pelleting, the pellets were cooled in an environmental chamber (Model AA-5460A, Espec Corp., Hudsonville, MI) set at 22 ± 1 °C and 40 ± 3% relative humidity.

2.3. Moisture adjustment

After manufacturing, the pellets were conditioned to different moisture contents (4.2%, 9.1%, 12.3%, 15.4%, and 21.2%, w.b.). The physical properties of the conditioned pellets were thereafter measured. The moisture levels of

Table 1
Characteristics of the pellet mill used to manufacture peanut hull pellets

Number of rolls	1
Length of die	35.85 mm
Die speed	503 rpm
Distance between knife and die	44.45 mm

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12.3%, 15.4% and 21.2% were obtained by placing pellets at initial moisture content of 9.1% (w.b.) in a high humidity (30 ± 1 °C and 90 ± 3% relative humidity) environment (Model AA-5460A, Espec Corp., Hudsonville, MI). Samples conditioned to moisture content of 4.2% were obtained by placing the pellets in an air-convection oven set at 50 ± 1 °C. The pellets were removed from the chamber or oven after reaching the desired amount of moisture. Conditioned pellets were then placed in a moisture-tight container and the moisture in the pellets were allowed to equilibrate for a period of 24 h at room temperature (22 °C). Before experimentation, the moisture content of the conditioned pellets was verified with a moisture analyzer (Model IR-200, Denver Instruments, Arvada, CO).

2.4. Particle density

The particle density of the pellets was measured by gas comparison pycnometry (Model AccuPyc 1330, Micromeritics Instrument Corp., Norcross, GA) where a known quantity of helium under pressure is allowed to flow from a previously known reference volume into a sample cell containing the material (Woodcock and Mason, 1987; Ortega-Rivas, 2005). Based on the pressure difference between the sample cell and the reference cell, the pycnometer calculates the volume of the material in the sample cell. The ratio of the mass ($m_{\mathbf{p}}$) of pellets (~4 g) in the sample cell to the volume ($V_{\mathbf{p}}$) measured by the pycnometer is the particle density, $\rho_{\mathbf{p}}$ (Eq. (4)). Sample mass was measured with a digital balance accurate to 0.001 g (Model AR3130, Ohaus Corp., Pinebrook, NJ):

$$\rho_{\mathrm{p}} = \frac{m_{\mathrm{p}}}{V_{\mathrm{p}}} \tag{4}$$

2.5. Bulk density

Bulk density was determined by a bulk density measurement apparatus (Burrows Co., Evanston, IL) and according to ASABE Standard S269.4 (2003). This method involves filling the container of the apparatus (volume of 947 mm^3) via a funnel. The material was leveled with the top surface of the container and weighed. Pellet bulk density ($\rho_{\mathbf{b}}$) was obtained from the ratio of measured mass of sample in the container to the volume of the container.

2.6. Durability

The durability (Du) of the pellets was determined according to ASABE Standard S269.4 (2003). A 100 g sample of pellets was tumbled at 50 rpm for 10 min, in a dust-tight enclosure. A No. 5 US Sieve with an aperture size of 4.0 mm was used to retain crumbled pellets after tumbling. Durability is expressed by the percent ratio of mass of pellets retained on the sieve after tumbling ($m_{\mathbf{pa}}$) to mass of pellets before tumbling ($m_{\mathbf{pb}}$) (Eq. (5)). Durability is said to be high when the measured value is above 80%, medium when between 70% and 80%, and low when below 70% (Tabil and Sokhansanj, 1996; Adapa et al., 2003):

$$\mathrm{Du} = 100\frac{m_{\mathrm{pa}}}{m_{\mathrm{pb}}} \tag{5}$$

2.7. Moisture sorption

The moisture sorption properties of the pellets were investigated using an air-tight environmental chamber (1.8 m × 0.9 m × 0.9 m). A schematic diagram of the system is shown in Fig. 1. Air that was fed into the chamber was conditioned by a temperature–humidity conditioner (Model AA-5460A, Parameter Generation and Control Inc., Black Mountain, NC). Combinations of three air temperatures (15, 25, and 40 °C ± 1 °C) and three air relative humidities (45%, 60% and 80% ± 3%) were used to investigate moisture sorption properties of peanut hull pellets. To conduct a test, a single layer of pellets (300–340 g) were placed in a wire mesh basket that hung from a digital balance accurate to 0.01 g (Model, PM4600, Mettler-Toledo, Columbus, OH). The weight of the sample was monitored and recorded at 10-min intervals during exposure to the conditioned air by using Windmill RS232 communication software (Windmill Software Ltd., Manchester, UK) to interface the balance to a personal computer. A data acquisition system (OMB-Daq-56, Omega Engineering Inc., Stamford, CT) was used to monitor the temperature and relative humidity of the conditioned air.

An experiment was stopped when the weight of the sample did not change by more than 0.01 g within a span of 1 h. This generally occurred after 48 h of exposure of the sample to the conditioned air. A moisture analyzer (Model IR-200, Denver Instruments, Arvada, CO) was used to cross check the final moisture content of the pellets. Each temperature and relative humidity combination was performed in duplicate and average values were reported.

2.8. Moisture sorption isotherm

The equilibrium relative humidity (ERH) method was employed to determine the equilibrium moisture relationship of the peanut hull pellets at 25 °C. This method consists of bringing air into equilibrium with a material of fixed moisture content. This method has been found to be simpler and faster than bringing a sample to equilibrium with air at a fixed temperature and relative humidity (Rao and Pfost, 1980). The pellets were adjusted to 11 moisture levels (2.0%, 2.8%, 4.3%, 5.5%, 7.5%, 9.1%, 10.0%, 12.0%, 14.2%, 17.3% and 21.6%, dry basis) using the methodology described earlier on (see Section 2.3). The moisture content of samples was verified using a moisture analyzer (Model IR-200, Denver Instruments, Arvada, CO).

A water activity instrument (HygroLab 2-H3, Rotronic Instrument Corp., Huntington, NY) was used to measure

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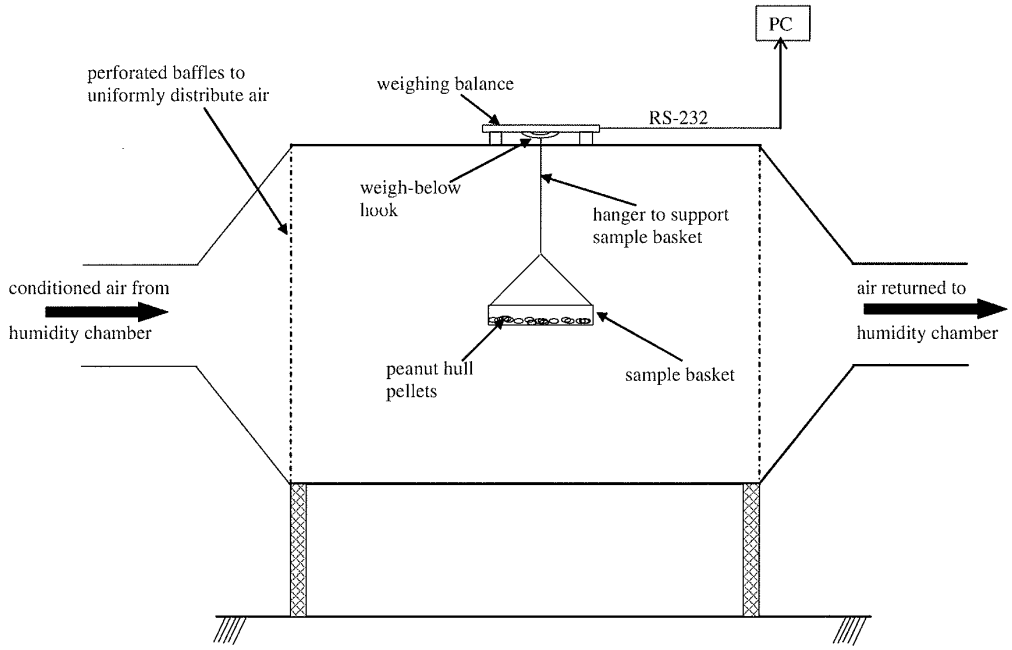


Fig. 1. Schematic diagram of setup for moisture sorption study.

the equilibrium relative humidity of preconditioned samples. To conduct a test, the conditioned sample was placed in the sample holder of the water activity instrument. A sealed measurement system was formed by placing the water activity probe on top of the sample holder. The probe is equipped with a small fan that circulates air within the sample container, a thin film capacitance sensor that is capable of measuring relative humidity from 0% to 100% with an accuracy of ±1.5% and a platinum RTD (resistance temperature detector) temperature probe with an accuracy of ±0.3 °C. The measurement system was then transferred into the temperature controlled-chamber set at a temperature of 25 °C. The relative humidity and dry bulb temperature output from the water activity meter was continuously recorded on a personal computer until equilibrium was reached (usually less than 4 h). The moisture content of a sample at a measured water activity was taken as the equilibrium moisture content of that sample (EMC). Equilibrium moisture content/water activity analysis was carried out in triplicate.

2.9. Data analysis

Except for the moisture sorption isotherm measurements that were carried out in triplicate, all other measurements were carried out in duplicate. Statistical analysis and equation fitting using appropriate procedures in SAS statistical software package (SAS, 2005) were performed on all data sets.

3. Results and discussion

3.1. Compositional analysis

The data obtained on the composition (heating value, ash, hydrogen and carbon contents) of peanut hulls is summarized in Table 2. Also shown on the table are the corresponding values for switchgrass – a high yielding perennial grass that has been identified to have potential as a bioenergy crop by the US Department of Energy (McLaughlin and Kszos, 2005; McLaughlin et al., 1999). Statistical anal-

Table 2
Heating value and composition of peanut hull and switchgrass

Component	Reference	Peanut hull	Switchgrass
Moisture	ASTM Standard D2013 (2004)	9.94 (0.24)[A]	8.60 (0.05)
Ash (% d.b.)	ASTM Standard D5142 (2004)	2.91 (0.13)[a]	2.96 (0.11)[a]
Carbon (% d.b.)	ASTM Standard D5373 (2002)	50.61 (1.41)[a]	48.21 (2.21)[a]
Hydrogen (% d.b.)	ASTM Standard D5373 (2002)	6.15 (0.19)[a]	5.58 (0.31)[a]
Heating value (MJ/kg)	ASTM Standard D5865 (2004)	19.93 (1.10)[a]	19.20 (1.21)[a]

[A] Values are means of duplicate and numbers in parentheses are standard deviation.

[a] In each row, values with the same letter are not significantly different ($P < 0.05$).

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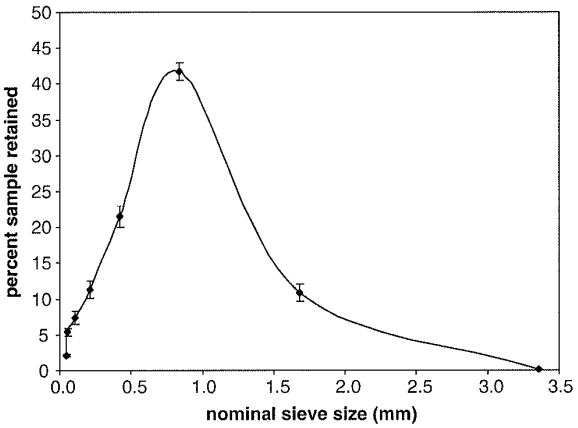


Fig. 2. Particle size distribution for peanut hull grind. Error bands are standard deviations from experimental data.

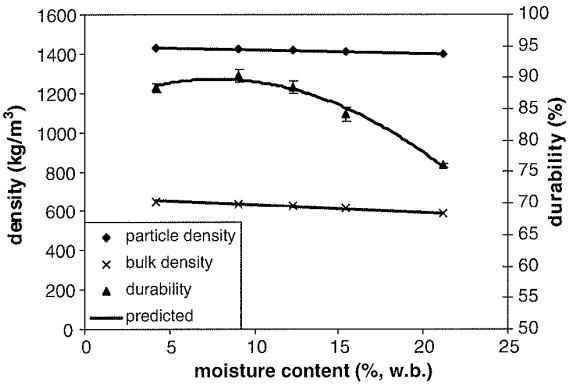


Fig. 3. Effect of moisture content on particle density, bulk density and durability of peanut hull pellets.

ysis using the analysis of variance procedure (SAS, 2005) indicate that the heating value, ash, hydrogen and carbon contents of peanut hulls were not significantly different ($P < 0.05$) from those of switchgrass, confirming the potential of using peanut hulls for bioenergy applications in the Southeastern part of United States.

3.2. Particle size distribution

The particle size distribution of the peanut hull samples after grinding is shown in Fig. 2. There was skewness in the distribution of the particle size (i.e., a log–normal distribution). This is typically obtained for naturally occurring particle populations (Rhodes, 1998). Similar response was reported for alfalfa, wheat straw, barley straw and corn stover grinds (Mani et al., 2004; Yang et al., 1996). Forty-two percent (42%) and twenty-two percent (22%) of the peanut hull samples were retained on #20 (aperture size of 0.841 mm) and #40 (aperture size of 0.420 mm) US sieves, respectively. Using the ASABE standard equations (Eqs. (1)–(3)), the geometric mean diameter (d_{gw}) and the geometric standard deviation (S_{gw}) of the ground peanut hull grind were estimated to be 0.653 mm and 0.748 mm, respectively.

3.3. Particle density and bulk density

Particle and bulk densities of peanut hull pellets are important parameters that are needed in the design of systems for the ventilation and cooling of pellets during storage (Fasina and Sokhansanj, 1995; Pabis et al., 1998). In general, particle density and bulk density of the pellets decreased linearly with increase in moisture content (Fig. 3). The decrease in the values of both bulk and particle density is due to the expansion of the pellet, hence, an increase in the volume of the pellets with increase in moisture content (McMullen et al., 2005). Eqs. (6) and (7) respectively relate the effects of moisture content on particle density (ρ_p) and bulk density (ρ_b) of the pellets:

$$\rho_p = 1438.90 - 1.77M; \quad R^2 = 0.976 \tag{6}$$

$$\rho_b = 667.39 - 3.58M; \quad R^2 = 0.969 \tag{7}$$

where M is moisture content of pellets in percent wet basis. It should be noted that the bulk density of the unprocessed peanut hull was 151 ± 3.2 kg/m^3. Pelleting, therefore, reduced the amount of space required to store peanut hull by more than four fold since the bulk density of the pellets was greater than 600 kg/m^3.

3.4. Durability

Durability (Du) of the pellets increased initially with moisture content and reached a maximum of 90.3% at 9.1% moisture content. Further increase in moisture content reduced durability (Fig. 3) to 76.0%. Similar trends have been reported for alfalfa pellets (Fasina and Sokhansanj, 1992), poultry litter pellets (McMullen et al., 2005) and switchgrass pellets (Colley, 2006). It is suspected that initially, the binding forces of the water molecules strengthened the bond between individual particles in the pellets. Further increase in moisture caused the disruption of the particulate bonds. The result is a two phase system of particles and water with no capillary force present to maintain the pellet structure. This leaves the pellet with cracks which make the pellets susceptible to breakage (Thomas and van der Poel, 1996).

According to the durability rating developed by Adapa et al. (2003), peanut hull pellets can be classified to have high durability (84.1–90.3%) at moisture contents between 4.2% and 15.4%; and medium durability at moisture content values greater than 15.4%. Eq. (8) was used to relate the durability of the pellets to moisture content:

$$\mathrm{Du} = 85.102 + 1.19M - 0.077M^2; \quad R^2 = 0.985 \tag{8}$$

where M is moisture content of pellets in percent wet basis.

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3.5. Moisture sorption rate

The effects of air temperature and relative humidity on rate of moisture sorption by the pellets are shown in Figs. 4–6. Irrespective of temperature of the environment, the pellets absorbed moisture when exposed to air conditioned to relative humidity of 60% and 80%, and lost moisture when the relative humidity of the air was 45%. The pellets absorbed up to 4.9% points of moisture when in contact with the conditioned air for a duration of up to 48 h. McMullen et al. (2005) reported up to 6% points of moisture gain when poultry litter pellets were exposed to humid air for 40 h.

The non-linear estimation procedure (NLIN) in the statistical package was used to fit an exponential model (Eq. (9)) to the moisture sorption data. The estimated values for moisture sorption rate constant (k) and equilibrium moisture content (M_f) are given in Table 3:

$$\frac{M - M_f}{M_i - M_f} = \exp(-kt) \tag{9}$$

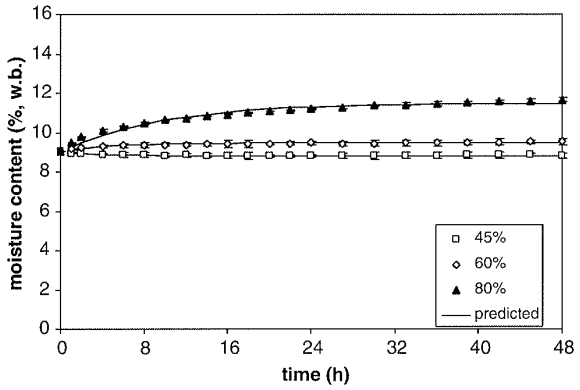


Fig. 4. Moisture sorption of peanut hull pellets at relative humidities of 45%, 60% and 80%, and temperature of 15 °C. Error bands are standard deviations from experimental data.

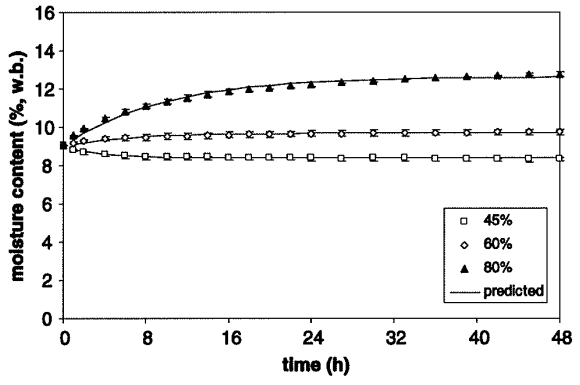


Fig. 5. Moisture sorption of peanut hull pellets at relative humidities of 45%, 60% and 80%, and temperature of 25 °C. Error bands are standard deviations from experimental data.

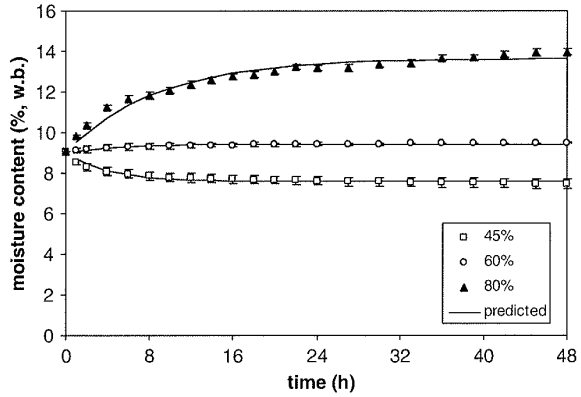


Fig. 6. Moisture sorption of peanut hull pellets at relative humidities of 45%, 60% and 80%, and temperature of 40 °C. Error bands are standard deviations from experimental data.

Table 3
Estimated values of k and M_f (Eq. (9))

Temperature (°C)	Parameter	Relative humidity (%)		
		45	60	80
15	k (h^{-1})	0.293	0.223	0.105
	M_f (%, w.b.)	8.82	9.46	11.49
	s.e.[a]	0.014	0.037	0.134
	R^2	0.99	0.99	0.99
25	k (h^{-1})	0.287	0.166	0.104
	M_f (%, w.b.)	8.40	9.69	12.65
	s.e.	0.029	0.048	0.121
	R^2	0.99	0.99	0.99
40	k (h^{-1})	0.244	0.175	0.117
	M_f (%, w.b.)	7.58	9.44	13.64
	s.e.	0.083	0.033	0.255
	R^2	0.99	0.99	0.99

[a] Standard error of estimate.

where

t time (h);
M instantaneous moisture content (%, w.b.);
M_i initial moisture content of pellets (9.1% w.b.);
M_f final moisture content of pellets (%, w.b.);
k sorption rate (h^{-1}).

The values of correlation coefficient, R^2 (~0.99) and standard error (between 0.014 and 0.255) showed that Eq. (9) adequately predicted the experimental data. Further statistical analysis indicated the estimated values of k and M_f were significantly affected (at 95% confidence level) by relative humidity and not by temperature (Table 3). A similar result was obtained for moisture absorption by poultry litter pellets (McMullen et al., 2005).

3.6. Moisture sorption isotherm

The plot (Fig. 7) of the moisture sorption data for peanut hull pellets at 25 °C was sigmoidal (Type II) in shape.

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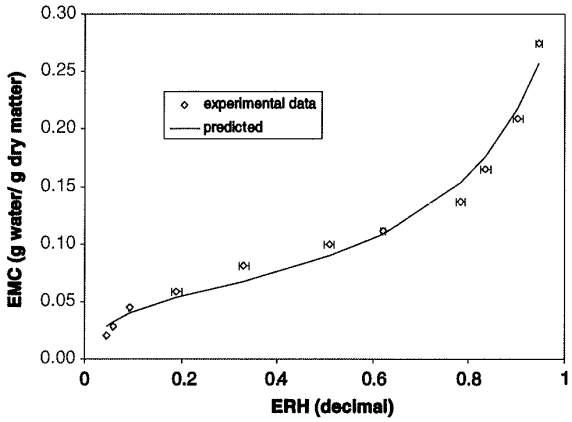


Fig. 7. Experimental and predicted (GAB model – Eq. (10)) moisture sorption isotherm of peanut hull pellets at temperature of 25 °C. Error bands are standard deviations from experimental data. EMC and ERH are equilibrium moisture content and equilibrium relative humidity, respectively.

This is typical of moisture sorption data for biological materials (Bell and Labuza, 2000). Water activity (on the x-axis) of the plot is a measure of the amount of free water in a biological material, which determines the amount of moisture that is available for microbial activity, enzymatic activity and for chemical reaction. With water activity above 0.8, there is sufficient water in the material to promote mold growth (12% w.b. for peanut hull pellets) while water activity of 0.9 and above (corresponding to 17.0% w.b. moisture content for peanut hull pellets) allows for bacterial growth (Wilhelm et al., 2004).

The experimental moisture sorption data was fitted to the GAB – Gugenheim, Anderson and de Boer – (van den Berg and Bruin, 1981) model (Eq. (10)). This model has been widely used to describe and represent the sorption behavior of biological materials (Moraga et al., 2006; Talla et al., 2005; Timmermann et al., 2001; Iglesias and Chirife, 1995; Maroulis et al., 1988). In addition, the GAB equation has been recommended by the European Project Group COST 90 on Physical Properties of Foods (Wolf et al., 1985) as the fundamental equation for the characterization of water sorption of food materials:

$$\mathrm{EMC} = \frac{M_o \cdot C \cdot K \cdot \mathrm{ERH}}{(1 - K \cdot \mathrm{ERH})(1 + (C - 1) \cdot K \cdot \mathrm{ERH})}; \quad R^2 = 0.998;\ \text{s.e.} = 0.9328 \tag{10}$$

where

EMC equilibrium moisture content (g water/g solids);
ERH equilibrium relative humidity (decimal);
M_o monolayer moisture content (g water/g solids);
C constant related to monolayer sorption heat;
K constant related to multilayer sorption heat.

The estimated values of the constants C, K and M_o were 28.864%, 0.794% and 5.2% (dry basis), respectively. These values illustrate the presence of a monolayer, with strongly bound water molecules ($C \gg 1$), and a multilayer, which has characteristics comparable to bulk liquid ($K \sim 1$; Quirijns et al., 2005). The water activity that was calculated to be in equilibrium with the estimated monolayer moisture content was 0.198. The monolayer moisture content is the moisture content that is optimal for the stability of the biological materials during storage (Moraga et al., 2006). Beyond this value, deteriorative reactions are accelerated in the product. Therefore, maximum stability for peanut hull pellets stored at 25 °C will be obtained when the relative humidity of the environment is 19.8%.

4. Conclusions

Data on the physical properties (bulk density, particle density, durability, moisture sorption rate and moisture sorption isotherm at 25 °C) of peanut hull pellets were obtained. Pelleting increased the bulk density of peanut hull by more than four fold thus reducing the amount of space required for storage and transportation by more than four fold. There was a linear decrease in bulk and particle density of conditioned pellets as moisture content of the pellets increased. Maximum durability of 90.1% was obtained for the conditioned pellets at moisture content of 9.1%. The pellets absorbed up to 4.8% points of moisture within 48 h of exposure to humid air with increased rate of moisture absorption with increase in air relative humidity and temperature. The monolayer moisture content obtained from the fit of the GAB model to the moisture sorption isotherm at 25 °C was 5.2% dry basis.

Acknowledgements

The authors wish to acknowledge the Alabama Agricultural Land Grant Alliance and Alabama Agricultural Experiment Station for providing the funds for this project.

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Prolime Agriculture, LLC - Exhibit 1004 - Page 160

Atty Dkt. No.946478.000027 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Terrell Dallas Ginn	Confirmation No.: 9538
Appl No.:	13/962,903	Group Art Unit: 1736
Filed:	August 8, 2013	Examiner: LANGEL, WAYNE A
Title:	**SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**	

Exhibit B

CHAR2\1785468v1

HOME
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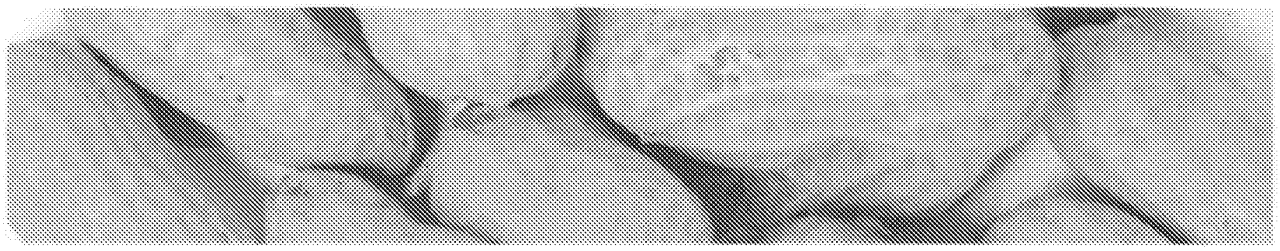
WHY
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OUR
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(OURPRODUCTS.ASPX)

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RESOURCES
(GROWERRESOURCES.ASPX)

INDUSTRY
NEWS
(INDUSTRYNEWS.ASPX)

ABOUT (ABOUT.ASPX)



GROUND HULLS

Golden's finely ground peanut hulls are made of fibrous material, which is light to dark brown with no detectable odor.

PHYSICAL CHARACTERISTICS:

Prolime Agriculture, LLC - Exhibit 1004 - Page 162

Color:	Light to dark brown
Odor:	Essentially none
PH:	5-6 Bulk (typical 5.0)
Moisture (Karl Fisher):	6.5% Maximum (typical 6.0)
Bulk density:	12-14 lbs./CuFt.
Carrying capacity:	dry, free flowing
Water: (wt/wt basis):	51 – 52%
Oil: (wt/wt basis):	31 - 32%
Absorption:	
Water: (wt/wt basis):	168% - 169%
Oil: (wt/wt basis):	90% - 91%

CHEMICAL COMPOSITION:

Crude fiber:	57.7%
Protein:	6% - 8%
Kjeldahl factor:	5.46
Ash:	0.02
Lignin, permanganatc:	6.78%
Cellulose:	51 - 55%
Total dry matter:	12.7%

NUTRITIONAL ANALYSIS:

Calories:	350 per 100g
	79%

Prolime Agriculture, LLC - Exhibit 1004 - Page 163

Total carbohydrate:	
Dietary fiber, total:	71g per 100g

APPLICATIONS

Bedding materials (livestock and small animals)

Feed ingredient

Absorbent material

Fiber ingredient

Cellulosic products

Inert filler products

Extender products

Soil additives

Soil amendment products

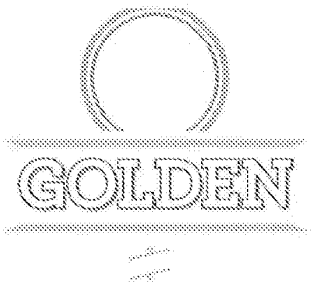
Alternative biomass fuel

Lost circulation materials

INTERESTED IN PURCHASING OUR PRODUCTS?

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Terrell Dallas Ginn	Confirmation No.: 9538
Appl No.:	13/962,903	Group Art Unit: 1736
Filed:	August 8, 2013	Examiner: LANGEL, WAYNE A
Title:	**SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**	

Exhibit C

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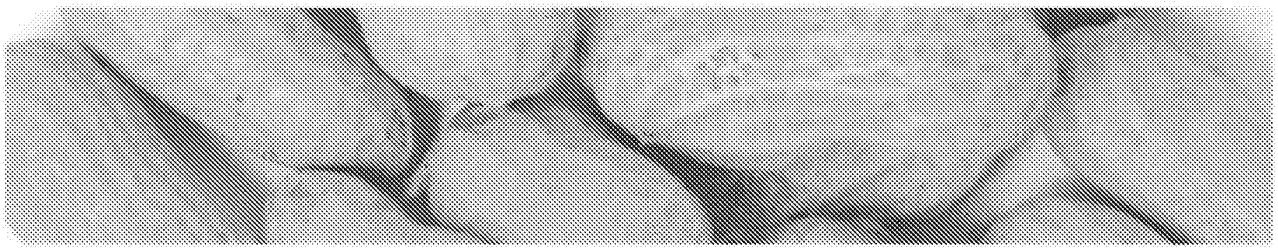
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PELLETED PEANUT HULLS

Golden's pelleted peanut hulls are 5/16-inch in diameter and one inch in length. They have excellent flow characteristics and contain no additives or binders.

VARIABLE CHARACTERISTICS:

Pellet diameter:	5/16"

Prolime Agriculture, LLC - Exhibit 1004 - Page 167

Bulk density:	(lb. per cubic Ft.) 38 - 45 (Typical 40)
Btu value:	(Btu/lb) 7850 – 8100

PHYSICAL COMPOSITION*

Color:	Light to dark brown
Odor:	Essentially none
Moisture (Karl Fisher):	4.5% - 6% (Typically 5%)

CHEMICAL COMPOSITION*

Ash:	2.5% - 3.5%
Crude fiber:	60% - 65%
Cellulose:	35% - 45%
Lignin:	27% - 33%

* The total analysis does not approximate 100 percent because the crude fiber assay includes much of the cellulose and lignin.

APPLICATIONS

Feed ingredient

Absorbent material

Fiber ingredient

Cellulosic products

Inert filler products

Extender products

Soil additives

Prolime Agriculture, LLC - Exhibit 1004 - Page 168

Soil amendment products

Alternative biomass fuel

INTERESTED IN PURCHASING OUR PRODUCTS?

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(http://www.peanutsusa.com/)

(http://www.peanut-institute.org/index.asp)

(http://www.nutfruit.org/en/)

(http://www.ilovepecans.org/)

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Electronic Patent Application Fee Transmittal

Application Number:	13962903
Filing Date:	08-Aug-2013
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Filer:	Henry B. Ward
Attorney Docket Number:	946478-000027

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

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

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 3 months with $0 paid	2253	1	700	700
Miscellaneous:				
Submission- Information Disclosure Stmt	2806	1	90	90
		Total in USD ($)		**790**

Electronic Acknowledgement Receipt	
EFS ID:	25450684
Application Number:	13962903
International Application Number:	
Confirmation Number:	9538
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Customer Number:	24239
Filer:	Henry B. Ward
Filer Authorized By:	
Attorney Docket Number:	946478-000027
Receipt Date:	11-APR-2016
Filing Date:	08-AUG-2013
Time Stamp:	23:36:16
Application Type:	Utility under 35 USC 111(a)

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Warnings:					
Information:					
2	Transmittal Letter	Transmittal_for_IDS_946478_000027.pdf	97443 d120a02bacbdebb2fdfba8888b68e6f20cdd934b	no	2
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3	Information Disclosure Statement (IDS) Form (SB08)	IDS_946478_000027.PDF	659617 f68eb503b3774a4cd3b06e0e75a48e275d11dba5	no	4
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Warnings:					
Information:					
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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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

New International Application Filed with the USPTO as a Receiving Office

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

Atty Dkt. No. 946478.000027 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Terrell Dallas Ginn, et al.	Confirmation No.: 9538
Appl No.:	13/962,903	Group Art Unit: 1736
Filed:	August 8, 2013	Examiner: LANGEL, WAYNE A
Title:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING	

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

PETITION AND FEE FOR EXTENSION OF TIME 37 C.F.R. § 1.136(a)

Commissioner:

1, This is a petition for an extension of time for a total period of three (3) months to respond to the Office Action dated January 9, 2016.
2. Applicant claims small entity status
3. Calculation of extension fee (37 C.F.R. § 1.17(a)(1)-(a)(5)):

Total Months Requested	Fee For Large Entity	Fee For Small Entity	Fee For Micro Entity
☐ one month	$200.00	$100.00	$50.00
☐ two months	$600.00	$300.00	$150.00
☒ three months	$1,400.00	$700.00	$350.00
☐ four months	$2,200.00	$1,100.00	$550.00
☐ five months*	$3,000.00	$1,500.00	$750.00

**Cannot be used to exceed six-month statutory limit for response to an Official Action.*

☒ Payment by EFT in the amount of $700.
☒ Charge any deficiency or credit any overpayment to Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC
3015 Carrington Mill Boulevard, Suite 400
Post Office Box 13706
Research Triangle Park, NC 27709
Tel Charlotte Office (704) 331-1027
Fax Charlotte Office (704) 339-5800

Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on April 11, 2016.

CHAR2\1785183v1

Atty Dkt. No.946478.000027 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Terrell Dallas Ginn	Confirmation No.:	9538
Appl No.:	13/962,903	Group Art Unit:	1736
Filed:	August 8, 2013	Examiner:	LANGEL, WAYNE A
Title:	**SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**		

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

INFORMATION DISCLOSURE STATEMENT CITATION UNDER 37 C.F.R. § 1.97

Commissioner:

Attached is a list of documents on form PTO-1449 along with a copy of any cited foreign patent documents and non-patent literature documents in accordance with 37 CFR 1.98(a)(2).

It is requested that the Examiner consider these documents and officially make them of record in accordance with the provisions of 37 C.F.R. § 1.97 and Section 609 of the MPEP. By identifying the listed documents, Applicant in no way makes any admission as to the prior art status of the listed documents, but is instead identifying the listed documents for the sake of full disclosure.

This Information Disclosure Statement is being filed more than three months after the U.S. filing date and after the mailing date of the first Office Action on the merits, but before the mailing date of a Final Rejection, Notice of Allowance or other action that closes prosecution (e.g., Quayle Action), under 37 C.F.R. §1.97(c)(2).

The required fee of $180 under 37 C.F.R. §1.17(p) will be paid by Electronic Funds Transfer (EFT). Please credit any overpayment or debit any additional fee through Deposit Account No. 13-4365;

It is believed that there is no additional fee associated with this Communication, however, the Commissioner is hereby authorized to charge payment of any additional fee associated with this Communication, or credit any overpayment to Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

Henry B. Ward, III

Registration No. 42,212

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC

3015 Carrington Mill Boulevard, Suite 400
Post Office Box 13706
Research Triangle Park, NC 27709
Tel Charlotte Office (704) 331-1027
Fax Charlotte Office (704) 339-5800

Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on April 11, 2016.

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

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	13962903
	Filing Date	2013-08-08
	First Named Inventor	Terrell Dallas Ginn
	Art Unit	1736
	Examiner Name	LANGEL, WAYNE A
	Attorney Docket Number	946478-000027

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					

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

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

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

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

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13962903
	Filing Date	2013-08-08
	First Named Inventor	Terrell Dallas Ginn
	Art Unit	1736
	Examiner Name	LANGEL, WAYNE A
	Attorney Docket Number	946478-000027

	1	'Kelly Limestone: Capsulated Limestone and Gypsum Pellet Products - February 18, 2012"	
	2	'Kelly Limestone: Material Safety Data Sheets (MSDS) - February 28, 2012"	
	3	'Kelly Limestone: Capsulated Gypsum MSDS – February 28, 2012"	

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

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13962903
	Filing Date	2013-08-08
	First Named Inventor	Terrell Dallas Ginn
	Art Unit	1736
	Examiner Name	LANGEL, WAYNE A
	Attorney Docket Number	946478-000027

CERTIFICATION STATEMENT

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

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

OR

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

☒ See attached certification statement.

Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

None

SIGNATURE

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

Signature	/hbw/	Date (YYYY-MM-DD)	2016-04-11
Name/Print	Henry B. Ward, III	Registration Number	42,212

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

Privacy Act Statement

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

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

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

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

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

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

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

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

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

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

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

24239 7590 03/15/2016

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

EXAMINER	
LANGEL, WAYNE A	

ART UNIT	PAPER NUMBER
1736	

NOTIFICATION DATE	DELIVERY MODE
03/15/2016	ELECTRONIC

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

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

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

iplaw@mvalaw.com
usptomail@mvalaw.com

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/962,903	GINN ET AL.	
	Examiner	Art Unit	
	WAYNE LANGEL	1736	

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

(1) *WAYNE LANGEL*. (3)_____.

(2) *HENRY B. WARD, III*. (4)_____.

Date of Interview: *09 March 2016*.

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

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

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

Claim(s) discussed: *1,3,5-13,16-22,24 and 26-29*.

Identification of prior art discussed: *Odom, Jr. '091 (US 2006/0180091); Steele et al (US 2001/0029762)*.

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

Mr. Ward argued that a holding of inherency regarding the crush strength is not appropriate unless the products are substantially identical, and pointed out that the product of Odom, Jr. '091 includes about 30 to 70% peanut hulls, which would be expected to affect the crush strength. Mr. Ward also pointed out that it would be difficult to pelletize the composition of of Odom, Jr. '091 because of the dectreased bulk density resulting from the peanut hulls. Mr. Ward proposed submitting a Declaration under 37 CFR 1.132 by one of the inventors attesting to this latter point.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

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

☐ Attachment

/WAYNE LANGEL/ Primary Examiner, Art Unit 1736	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

———

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

24239 7590 10/09/2015

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

EXAMINER	
LANGEL, WAYNE A	

ART UNIT	PAPER NUMBER
1736	

NOTIFICATION DATE	DELIVERY MODE
10/09/2015	ELECTRONIC

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

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

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

iplaw@mvalaw.com
usptomail@mvalaw.com

Office Action Summary	Application No. 13/962,903	Applicant(s) GINN ET AL.	
	Examiner WAYNE LANGEL	Art Unit 1736	AIA (First Inventor to File) Status Yes

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

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

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1,3,5-13,16-22,24 and 26-29* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1,3,5-13,16-22,24 and 26-29* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 5, 6, 9-13, 16, 17, 20-22, 24, 28 and 29 are rejected under 35 U.S.C. 103 as being unpatentable over Odom, Jr.'091 (US 2006/0180091) (newly cited) in view of Steele et al (US 2001/0029762). Odom, Jr. '091 discloses a method for forming a gypsum product, wherein the composition includes from about 45 to about 49% gypsum and from about 2 to about 10 wt% binder (see Paragraph [0004], and teaches in Paragraph [0015] that the binder may be calcium lignosulfonate having a solids content ranging from about 30 to about 40 wt %. It would be expected that the composition formed according to the process of Odom, Jr. '091 would have a crush strength from approximately 2 lbf to approximately 12 lbf, since the calcium lignosulfonate has a solids content ranging from about 30 to about 40 wt %. The difference between the method and composition disclosed by Odom, Jr. '091, and that recited in applicant's claims, is that Odom, Jr. '091 does not disclose that the gypsum should be formed into pellets. Steele et al disclose a method for making gypsum pellets wherein calcium lignosulfonte is used as the binder. (See Paragraphs [0011], [0017], [0024] and [0025].) It would be obvious from Steele et al to form the gypsum composition of Odom, Jr. '091 into pellets.

One of ordinary skill in the art would be motivated to do so, since Steele et al suggest in paragraphs [0007] and [0010] that a composition comprising gypsum and calcium lignosulfonate in the form of pellets is useful as a carrier for nutrients, and Odom, Jr. '091 discloses in Paragraph [0006] that a purpose of the composition is to serve as a carrier for fertilizer.

Claims 7, 8, 18, 19, 26 and 27 are rejected under 35 U.S.C. 103 as being unpatentable over Odom, Jr. '091 in view of Steele as applied to claims 1, 13 and 21 above, and further in view of Watkins et al (US 4,015,972). It would be further obvious from Watkins et al to include sulfur as an additive for the soil amendment of Odom, Jr '091. One of ordinary skill in the art would be motivated to do so, since Watkins et al suggest at col. 9, lines 16-22 that the presence of sulfur increases the resistance to attrition of gypsum .

The Gray Declaration filed under 37 C.F.R. 1.132 on August 20, 2015 has been considered, but is not convincing of error in the rejection. The Declaration provides evidence that there is a relationship between the percentage of solids in the lignosulfonate binder and the crush strength and that the crush strength correlates with the percentage of solids in the lignosulfonate binder. However it would be expected that the composition formed according to the process of Odom, Jr. '091 would have a crush strength from approximately 2 lbf to approximately 12 lbf, since Odom, Jr. '091 discloses in Paragraph [0015] that the binder has a solids content of from about 30 to about 40 wt %.

Odom, Jr. '090 is made of record as constituting a substantial equivalent of Odom, Jr. '091.

Young is made of record for disclosing a soil amendment comprising calcium sulfate and a binder.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WAYNE LANGEL whose telephone number is (571)272-1353. The examiner can normally be reached on Monday through Friday, 8:30 am - 4:45 pm Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. 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.

/WAYNE LANGEL/

Primary Examiner, Art Unit 1736

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

24239 7590 09/02/2015

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

EXAMINER	
LANGEL, WAYNE A	

ART UNIT	PAPER NUMBER
1736	

NOTIFICATION DATE	DELIVERY MODE
09/02/2015	ELECTRONIC

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

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

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

iplaw@mvalaw.com
usptomail@mvalaw.com

Office Action Summary	Application No. 13/962,903	Applicant(s) GINN ET AL.	
	Examiner WAYNE LANGEL	Art Unit 1736	AIA (First Inventor to File) Status Yes

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *8-20-15*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

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

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1,3,5-13,16-22,24 and 26-29* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1,3,5-13,16-22,24 and 26-29* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 5-13, 16-22, 24 and 26-29 are rejected under 35 U.S.C. 103 as being unpatentable over Odom, Jr.'091 (US 2006/0180091) (newly cited) in view of Steele et al (US 2001/0029762). Odom, Jr. '091 discloses a method for forming a gypsum product, wherein the composition includes from about 45 to about 49% gypsum and from about 2 to about 10 wt% binder (see Paragraph [0004], and teaches in Paragraph [0015] that the binder may be calcium lignosulfonate having a solids content ranging from about 30 to about 40 wt %. It would be expected that the composition formed according to the process of Odom, Jr. '091 would have a crush strength from approximately 2 lbf to approximately 12 lbf, since the calcium lignosulfonate has a solids content ranging from about 30 to about 40 wt %. The difference between the method and composition disclosed by Odom, Jr. '091, and that recited in applicant's claims, is that Odom, Jr. '091 does not disclose that the gypsum should be formed into pellets. Steele et al disclose a method for making gypsum pellets wherein calcium lignosulfonte is used as the binder. (See Paragraphs [0011], [0017], [0024] and [0025].) It would be obvious from Steele et al to form the gypsum composition of Odom, Jr. '091 into pellets.

One of ordinary skill in the art would be motivated to do so, since Steele et al suggest in paragraphs [0007] and [0010] that a composition comprising gypsum and calcium lignosulfonate in the form of pellets is useful as a carrier for nutrients, and Odom, Jr. '091 discloses in Paragraph [0006] that a purpose of the composition is to serve as a carrier for fertilizer.

The Gray Declaration filed under 37 C.F.R. 1.132 on Augustv 20, 2015 has been considered, but is not convincing of error in the rejection. The Declaration provides evidence that there is a relationship between the percentage of solids in the lignosulfonate binder and the crush strength and that the crush strength correlates with the percentage of solids in the lignosulfonate binder. However it would be expected that the composition formed according to the process of Odom, Jr. '091 would have a crush strength from approximately 2 lbf to approximately 12 lbf, since Odom, Jr. '091 discloses in Paragraph [0015] that the binder has a solids content of from about 30 to about 40 wt %.

Odom, Jr. '090 is made of record as constituting a substantial equivalent of Odom, Jr. '091.

Young is made of record for disclosing a soil amendment comprising calcium sulfate and a binder.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WAYNE LANGEL whose telephone number is (571)272-1353. The examiner can normally be reached on Monday through Friday, 8:30 am - 4:45 pm Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/WAYNE LANGEL/
Primary Examiner, Art Unit 1736

Notice of References Cited	Application/Control No. 13/962,903	Applicant(s)/Patent Under Reexamination GINN ET AL.	
	Examiner WAYNE LANGEL	Art Unit 1736	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-4,028,088 A	06-1977	Young; Donald C.	C05C1/00	423/396
*	B	US-2006/0180091 A1	08-2006	Odom; Rete R. JR.	A01N25/08	119/171
*	C	US-2006/0180090 A1	08-2006	Odom; Rete R. JR.	A01N25/08	119/171
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13962903	GINN ET AL.
	Examiner	Art Unit
	WAYNE LANGEL	1736

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
71	63	2-7-14	WAL

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor Name Search	2-7-14	WAL
EAST:		
L1: (gypsum or (calcium adj sulfate)) and C05G3/0088.cpc	8-26-15	WAL
L2: L1 and (bindeer or lignosulfonate)	8-26-15	WAL
L3: (gypsum or (calcium adj sulfate)) and C05D3/00.cpc.	8-26-15	WAL
L4: L3 and (binder or mlignosulfonate))	8-26-15	WAL
L5: (gypsum or (calcium adj sulate)) and C05D3/02.cpc.	8-26-15	WAL
L6: L5 and)binder or lignosulfonate)	8-26-15	WAL

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

App. No.:	13/962,903	Confirmation No.: 9538
Applicant:	Terrell Dallas Ginn et al.	
Filed:	August 8, 2013	
Group Art Unit:	1736	
Examiner:	Wayne A. Langel	
Title:	**SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**	
Atty Dkt. No.	946478-000027	
Customer No.	24239	

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

AMENDMENT UNDER 37 C.F.R. § 1.111

Sir:

In response to the Office Action dated February 20, 2015, please amend the above-identified application as provided herein.

Amendments to the Claims begin on page 2 of this paper.

Remarks begin on page 7 of this paper.

Prolime Agriculture, LLC - Exhibit 1004 - Page 199

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently Amended) A method of producing a fertilizer comprising:

feeding synthetic gypsum to a forming device;

feeding a binder composition comprising lignosulfonate having 18% to 48% solids to the forming device; and

forming the material fed to the forming device to a mean pellet size guide number (SGN) from approximately 150 to approximately 300, wherein the resulting pelletized synthetic gypsum has a crush strength from approximately 2 lbf to approximately 12 lbf.

2. (Canceled)

3. (Original) The method of Claim 1, wherein the synthetic gypsum fed to the forming device has a mean particle size of less than 100 microns.

4. (Canceled)

5. (Original) The method of Claim 1, wherein the binder composition comprises a water soluble binder.

6. (Currently Amended) The method of Claim 1, wherein the binder composition also comprises one or more binders [[is]] selected from the group consisting of brewers condensed solubles, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, and cellulose based polymer binders.

Prolime Agriculture, LLC - Exhibit 1004 - Page 200

7. (Previously Presented) The method of Claim 1, further comprising feeding an additive to the forming device, wherein the additive is selected from the group consisting of ground calcium carbonate, calcium bentonite, kaolin clays, manganese, zinc, boron, calcium, copper, and elemental sulfur.

8. (Previously Presented) The method of Claim 7, wherein the additive comprises elemental sulfur.

9. (Original) The method of Claim 1, wherein the mean SGN is from approximately 250 to approximately 280.

10. (Original) The method of Claim 1, wherein the forming device comprises a pelletizer.

11. (Original) The method of Claim 1, wherein the forming device comprises a granulator or an extruder.

12. (Original) A fertilizer made by the method of Claim 1.

13. (Currently Amended) A fertilizer comprising:

pellets, the pellets comprising synthetic gypsum and a binder composition comprising lignosulfonate, wherein the binder composition initially has ~~having~~ 18% to 48% solids at the time of contact with the synthetic gypsum, the pellets further comprising mean pellet SGN from approximately 150 to approximately 300, wherein pellets have a crush strength from approximately 2 to approximately 12 lbf.

14. (Canceled)

15. (Canceled)

Prolime Agriculture, LLC - Exhibit 1004 - Page 201

16. (Original) The fertilizer of Claim 13, wherein the binder composition comprises a water soluble binder.

17. (Currently Amended) The fertilizer of Claim 13, wherein the binder composition also comprises one or more binders [[is]] selected from the group consisting of brewers condensed solubles, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, and cellulose based polymer binders.

18. (Previously Presented) The fertilizer of Claim 13, wherein the pellets further comprise an additive, wherein the additive is selected from the group consisting of ground calcium carbonate, calcium bentonite, kaolin clays, manganese, zinc, boron, calcium, copper, and elemental sulfur.

19. (Original) The fertilizer of Claim 13, wherein the pellets further comprise an additive comprising elemental sulfur.

20. (Original) The fertilizer of Claim 13, wherein the mean SGN is from approximately 250 to approximately 280.

Prolime Agriculture, LLC - Exhibit 1004 - Page 202

21. (Currently Amended) A process for producing a fertilizer comprising:

feeding synthetic gypsum to a dryer;

feeding dried synthetic gypsum and a binder composition comprising lignosulfonate having 18% to 48% solids to a mixer;

mixing the material fed to the mixer;

feeding the mixed material to a forming device;

pelletizing the material fed to the forming device;

feeding the pelletized material to a dryer;

drying the pelletized material;

feeding the dried pelletized material to a screener; and

screening the material fed to the screener to a mean pellet size guide number (SGN) from approximately 150 to approximately 300, wherein the resulting pelletized synthetic gypsum has a crush strength from approximately 2 lbf to approximately 12 lbf.

22. (Original) The process of Claim 21, further comprising recycling unders and overs removed during screening to the mixer.

23. (Canceled)

24. (Original) The process of Claim 21, wherein the synthetic gypsum fed to the mixer has a mean particle size of less than 100 microns.

25. (Canceled)

26. (Previously Presented) The process of Claim 21, further comprising feeding an additive to the mixer, wherein the additive is selected from the group consisting of manganese, zinc, boron, calcium, copper, and elemental sulfur.

Prolime Agriculture, LLC - Exhibit 1004 - Page 203

27. (Original) The process of Claim 21, further comprising feeding an additive to the mixer, wherein the additive comprises elemental sulfur.

28. (Original) The process of Claim 21, wherein the mean SGN is from approximately 250 to approximately 280.

29. (Original) A fertilizer made by the process of Claim 21.

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REMARKS

This Amendment is filed in response to the Office Action dated February 20, 2015. Applicants would like to acknowledge, with appreciation, the helpful and constructive telephonic interview granted to the undersigned by the Examiner on July 15, 2015. Applicant respectfully requests reconsideration in light of the Amendments and Remarks set forth herein, which Applicants consider to be a summary of the matters discussed during the interview as required by 37 C.F.R. § 1.133(b).

Claims 1, 3-13, 15-22, and 24-29 stand rejected. Claims 4, 15, and 25 have been canceled. As discussed during the interview, Claims 1, 6, 13, 17 and 21 have been amended. Therefore, Claims 1, 3, 5-13, 16-22, and 24, 26-29 are now pending in the application, of which Claims 1, 13, and 21 are independent. Support for the amendments may be found in Paragraph [0024] of the specification. Applicants request entry of the amendments to Claims 1, 13 and 21. Applicants respectfully submit that the pending claims are patentable and respectfully request reconsideration in light of the following remarks.

I. Claim Rejections Under 35 U.S.C. § 112(a)

The Office rejected Claims 1, 3, 5-13, 16-22, 24 and 26-29 under 35 U.S.C. § 112(a) or 35 U.S.C. §112 (pre-AIA), first paragraph, asserting that the claims fail to comply with the written description and the enablement requirement. Without acquiescing in the rejection and in an attempt to advance prosecution, as discussed during the interview, Applicants have amended Claims 1, 13 and 21 to recite that the binder composition comprises lignosulfonate. Based on these amendments, Applicants respectfully request withdrawal of the rejection under 35 U.S.C. § 112.

II. Claim Rejections Under 35 U.S.C. § 103

The Office rejected Claims 1, 3-6, 9-13, 15-17, 20-22, 24, 25, 28 and 29 under 35 U.S.C. §103 asserting that the claims are unpatentable over U.S. Patent Publication No. 2001/0029762 to Steele et al ("Steele"). The Office rejected Claims 7, 8, 18, 19, 26 and 27 under 35 U.S.C. §

Prolime Agriculture, LLC - Exhibit 1004 - Page 205

103 asserting that the claims are unpatentable over Steele et al. as applied to Claims 1, 13 and 21 above, and further in view of Watkins et al.

As discussed and agreed in the interview, independent method Claims 1 and 21, as amended herein, recite recitations that patentably distinguish the present invention over Steele. Regarding independent product Claim 13, it was discussed during the interview that additional evidence would be required. More specifically, it was discussed that an acceptable inventor Declaration establishing a relationship between the recited percentage of solids in the lignosulfonate binder and the crush strength and that the crush strength correlates with the percentage of solids in the lignosulfonate binder would overcome the rejection of Claim 13 under 35 U.S.C. §103 based on Steele. Accordingly, as discussed during the interview, Applicants submit herewith a verified Declaration under 37 C.F.R. § 1.132 of the inventor, Danny Lynn Gray. As evidenced by Mr. Gray's Declaration, for embodiments of the present invention utilizing a binder composition comprising lignosulfonate, there is a relationship between the percentage of solids in the lignosulfonate binder and the crush strength and the crush strength correlates with the percentage of solids in the lignosulfonate binder.

In addition, as discussed during the interview, Mr. Gray's Declaration also refutes the contention in the Office Action that "[i]t would be obvious to employ a sulfonated lignin having a solids content of 18% to 48% as the binder in the process of Steele et al. One of ordinary skill in the art would be motivated to do so, since it would be within the skill of one of ordinary skill in the art to determine a suitable or optimum solids content for the binder of Steele et al." More specifically, Mr. Gray's Declaration explains that the strengths achieved by the pellets taught by Steele in each of the disclosed formation processes are primarily driven by the calcination process and, as such, there is no motivation to determine a suitable or optimum solids content for the binder of Steele as contended in the Office Action.

In light of the foregoing, Applicants respectfully submit that the independent Claims 1, 13, and 21, and the claims depending therefrom, contain recitations that patentably distinguish the claimed invention over the cited references and, therefore should be allowed. Reconsideration and withdrawal of all rejections is respectfully solicited and Applicants kindly request issuance of a corresponding Notice of Allowance.

Prolime Agriculture, LLC - Exhibit 1004 - Page 206

Conclusion

In view of the amended claims, attached verified Declaration under 37 C.F.R. § 1.132 of the inventor, Danny Lynn Gray, and the remarks presented above, it is respectfully submitted that all of the present claims of the application are in condition for immediate allowance. It is therefore respectfully requested that a Notice of Allowance be issued. The Examiner is encouraged to contact Applicants' undersigned attorney to resolve any remaining issues in order to expedite examination of the present application.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC
430 Davis Drive, Suite 500
Post Office Box 13706
Research Triangle Park, NC 27709
Tel Charlotte Office (704) 331-1027

Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on August 20, 2015.

Prolime Agriculture, LLC - Exhibit 1004 - Page 207

Atty Dkt. No. 946478.000027 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Terrell Dallas Ginn et al.	Confirmation No.:	9538
Appl No.:	13/962,903	Group Art Unit:	1736
Filed:	August 8, 2013	Examiner:	LANGEL,Wayne A.

Title: **SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**

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

PETITION AND FEE FOR EXTENSION OF TIME 37 C.F.R. § 1.136(a)

This is a petition for an extension of time for a total period of three (3) month to respond to the Office Action dated February 20, 2015.

1. Applicant claims **SMALL** entity status
2. Calculation of extension fee (37 C.F.R. § 1.17(a)(1)-(a)(5)):

Total Months Requested	Fee For Large Entity	Fee For Small Entity	Fee For Micro Entity
☐ one month	$200.00	$100.00	$50.00
☐ two months	$600.00	$300.00	$150.00
☒ three months	$1,400.00	$700.00	$350.00
☐ four months	$2,200.00	$1,100.00	$550.00
☐ five months*	$3,000.00	$1,500.00	$750.00

**Cannot be used to exceed six-month statutory limit for response to an Official Action.*

☒ Payment by EFT in the amount of **$700.00**.
☒ Charge any deficiency or credit any overpayment to Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC
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Post Office Box 13706
Research Triangle Park, NC 27709
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Fax Charlotte Office (704) 339-5800

Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on August 20, 2015.

CHAR2\1714851v1

Electronic Patent Application Fee Transmittal

Application Number:	13962903
Filing Date:	08-Aug-2013
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Filer:	Henry B. Ward/Joy Pickett
Attorney Docket Number:	946478-000027

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

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

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 3 months with $0 paid	2253	1	700	700
Miscellaneous:				
		Total in USD ($)		**700**

Electronic Acknowledgement Receipt	
EFS ID:	23269197
Application Number:	13962903
International Application Number:	
Confirmation Number:	9538
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Customer Number:	24239
Filer:	Henry B. Ward/Joy Pickett
Filer Authorized By:	Henry B. Ward
Attorney Docket Number:	946478-000027
Receipt Date:	20-AUG-2015
Filing Date:	08-AUG-2013
Time Stamp:	18:00:24
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$700
RAM confirmation Number	4633
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Oath or Declaration filed	946478_000027_Declaration.pdf	6414584 47e5766aa930b6cfd4eb6706fb356fc7fb446bd0	no	8
Warnings:					
Information:					
2		946478_000027_Amendment.pdf	37710 f273a4246e1258baf930b88ffe7c7ef54d72829b	yes	9

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	6
	Applicant Arguments/Remarks Made in an Amendment	7	9

Warnings:					
Information:					
3	Extension of Time	946478_000027_ThreeMonthsEOT.pdf	128007 fa64f4509403f67704c342be4c61f7035fbbb75e	no	1
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	31230 b31401a8d2883ac35ba9b635fe97df7f0d1e7fde	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	6611531		

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

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

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

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

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

App. No.:	13/962,903	Confirmation No.: 9538
Applicants:	Terrell Dallas Ginn et al.	
Filed:	August 8, 2013	
Group Art Unit:	1736	
Examiner:	Wayne A. Langel	
Title:	**SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**	
Atty Dkt. No.	946478-000027	
Customer No.	24239	

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

DECLARATION UNDER 37 C.F.R. § 1.132

I, Danny Lynn Gray, hereby declare that:

1. I am a citizen of the United States residing at 3637 Summerford Drive, Marietta, Georgia 30062.

2. I am a co-inventor of the invention that is disclosed and claimed in U.S. Patent Application No. 13/962,903 filed in the U.S. Patent and Trademark Office on August 8, 2013 and titled "*Synthetic Gypsum Fertilizer Product and Method of Making*" (the "'903 Application").

3. I have a Bachelor of Science degree in Civil Engineering from Virginia Polytechnic Institute and State University. I am a registered professional engineer in Arkansas, Georgia, North Carolina, Virginia and West Virginia. I have been employed at Charah, Inc. ("Charah") from 2008 until the present date.

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4. I have assigned my ownership rights in the '903 Application to Charah.

5. I submit this Declaration in support of the patentability of the invention as claimed in Claims 1, 3, 5-13, 16-22, 24, and 26-29 in the '903 Application. I understand that the Office Action dated February 20, 2015, rejects independent Claims 1, 13, and 21 as being unpatentable over U.S. Published Patent Application No. 2001/0029762 to Steele et al. ("Steele"). Specifically, the Office Action contends as follows:

> The difference between the process and fertilizer disclosed by Steele et al, and that recited in Claims 1, 3-6, 9-13, 15-17, 20-22, 24, 25, 28, and 29, is that Steele et all do not disclose that the binder composition should have 18% to 48% solids. Steele et al disclose in Paragraph [0024] that the binder may be a sulfonated lignin such as calcium lignosulfonate. It would be obvious to employ a sulfonated lignin having a solids content of 18% to 48% as the binder in the process of Steele et al. One of ordinary skill in the art would be motivated to do so, since it would be within the skill of one of ordinary skill in the art to determine a suitable or optimum solids content for the binder of Steele et al. Applicants' argument, that the feature of a binder composition having 18% to 48% solids is advantageous as it contributes to the recited crush strength, is not convincing, since there is no evidence on record to support such contention.

6. The '903 Application is directed to pelletized synthetic gypsum for use as a fertilizer and methods of producing pelletized synthetic gypsum for use as a fertilizer. My co-inventor, Terrell D. Ginn ("Terrell Ginn"), and I began the pursuit of pelletized synthetic gypsum for use as a fertilizer and methods of producing pelletized synthetic gypsum for use as a fertilizer on behalf of Charah in 2011. We performed extensive research on pelletizing and granulating synthetic gypsum to manufacture a marketable fertilizer. The goal of our research was to develop synthetic gypsum fertilizer pellets that were economical to manufacture and would have high crush strength, low attrition (*i.e.*, spread evenly without

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breakdown into dust) and a consistent size. We determined that water-soluble binders could be used to produce fertilizer pellets having high crush strength, low attrition and consistent size. Such water-soluble binders could include brewers condensed solubles, lignosulfonate, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, or cellulose based polymer binders. In developing the commercial manufacturing process on behalf of Charah, a binder composition comprising lignosulfonate was selected for its cost and ready availability.

7. Based upon research performed on behalf of Charah, Terrell Ginn and I determined that when the fertilizer pellets were formed using synthetic gypsum with a lignosulfonate binder, utilizing a lignosulfonate binder initially having 18% to 48% solids at the time of contact with the synthetic gypsum, consistently achieved fertilizer pellets having a crush strength in a range of 2 lbf to 12 lbf. As evidence to support this determination, I am attaching hereto at Exhibit 1 a summary of two (2) tests performed on August 19, 2011, at FEECO International, Inc. and the results obtained utilizing lignosulfonate as the binder for synthetic gypsum wherein the lignosulfonate has solids percentage content at two (2) levels: (i) Test 1 utilizes a lignosulfonate initially having 40% solids at the time of contact with the synthetic gypsum and (ii) Test 2 utilizes a lignosulfonate initially having 25% solids at the time of contact with the synthetic gypsum. As stated in the test results for Test 1 attached hereto at Exhibit 1, utilizing fertilizer pellets formed using synthetic gypsum and a lignosulfonate binder initially having a solids percentage content of 40% solids at the time of contact with the synthetic gypsum resulted in fertilizer pellets with a dried crush strength of 3-3.5 lbf. As stated in the test results for Test 2 attached hereto at Exhibit 1, utilizing fertilizer pellets formed using synthetic gypsum and a lignosulfonate binder initially having a solids percentage content of 25% solids at the time of contact with the synthetic gypsum resulted in fertilizer pellets with a dried crush strength of 4.5-5.0 lbf. The reason the dry crush strength for Test 1 was less than the dry crush strength for Test 2 is that the lignosulfonate of Test 1 was dosed to provide a combined net pellet solids binder

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content of 2.5% by weight whereas the lignosulfonate of Test 2 was dosed to provide a combined net pellet solids binder content of 3.75% by weight. Thus, for embodiments of the present invention utilizing a binder composition comprising lignosulfonate, I believe there is a relationship between the percentage of solids in the lignosulfonate binder and the crush strength and that the crush strength correlates with the percentage of solids in the lignosulfonate binder.

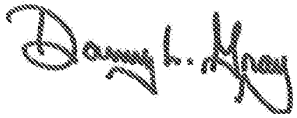
8. I also respectfully disagree with the contentions in the Office Action that "[i]t would be obvious to employ a sulfonated lignin having a solids content of 18% to 48% as the binder in the process of Steele et al. One of ordinary skill in the art would be motivated to do so, since it would be within the skill of one of ordinary skill in the art to determine a suitable or optimum solids content for the binder of Steele et al." In this regard, Steele discloses two (2) separate formation processes for the pellets. The first relies on extrusion of the gypsum and the second relies on mixing the gypsum with binders, but both include calcination during the final drying step. For example, in the case of extrusion, Steele discloses in Paragraph [0011] that "[a] soil amendment product made according to this process does not require a binder because the compaction of the extrusion and the heating provide a calcined, hard product." Similarly, for the formation process using a binder, Steele discloses in Paragraph [0012] "drying to calcine the pellets" and in Paragraph [0032] utilizing a dryer to tumble the pellets "until the gypsum is calcined." Partially calcining the gypsum pellets has the effect of driving the gypsum toward the chemical makeup of "Plaster of Paris" similar to the material used to make casts. Steele specifically discloses this in Paragraph [0021] when Steele states that "[t]hese hemihydrate and/or anhydride granules are essentially plasters (Plaster of Paris)...." Thus, in my opinion, the strengths achieved by the pellets taught by Steele in each of the aforementioned formation processes are primarily driven by the calcination process and, as such, there is no motivation to determine a suitable or optimum solids content for the binder of Steele as contended in the Office Action.

* * * * *

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

This Declaration was executed by me on the date indicated.



Danny Lynn Gray

Date: August 20, 2015

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EXHIBIT 1

FEECO International

Lab Data Sheet

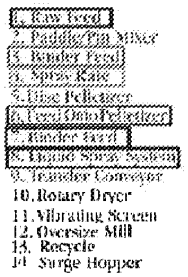
Test Number: FTL1277 **Test Date:** August 19, 2011 **Lab Manager:** Ron Eichhorn **Salesperson:** Chris K

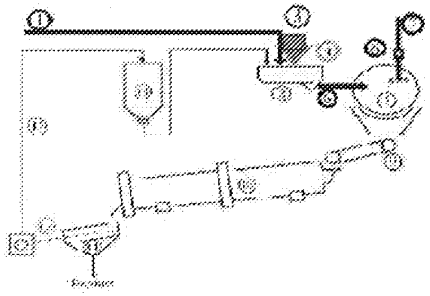
Prepared For:

Danny Gray

Charah
12601 Planside Dr.
Louisville, KY 402901

Lab Equipment Used:
Pin Mixer, Pelletizer





Hazardous Materials

Health:	0
Flammability:	0
Reactivity:	0
Ambient Temp:	80
Humidity:	65

Lab Purpose: Agglomerate Gypsum Sludge into 6x16 mesh pellets using Lignin as a binder.

Test #: 1

Pin Mixer

Material	Feed Rate	Density	Binder	% Solids	Binder Rate	PSI	Spray Nozzle(s)	Speed	End Mat'l Moisture	End Mesh Size	End Dry Strength	Attrition
Synthetic Gypsum	2.0 lbs		Lignosulfonate, calc	40	.03	-, -, -, -,	-, -, -, -	900	8.5	35 -		
Pre-dried to 1% moisture	1.0 lbs											

Pelletizer

Material	Feed Rate	Feed Location	Binder	% Solids	Binder Rate	Spray Location(s)	Pan RPM	Pan Angle	End Mat'l Moisture	End Mesh Size	End Dry Strength	Attrition
Synthetic Gypsum	3.0 lbs	+6,-6	Lignosulfonate, cal	40		+4,-4, -, -, -	22	53	12	10 - 5	3-3.5	

Test Comments: Pre-dried gypsum sludge with 20% moisture down to a fine powder with approx. 1% moisture. Hand blended 2 parts pre-dried powder gypsum with 1 part wet gypsum with 20% moisture to end up with a hand mix feed material with 7.5% moisture.
Fed 2 lbs of hand blended material in pin mixer and added 0.2 lbs of lignin with 40% solids or 4 parts lignin w/50% solids with 1 part water. Results: Blended material with addition of lignin was a wet fluff with no agglomerated and 8.5% final discharge moisture.
Fed blend with lignin which dischaged from pin mixer onto pan pelletizer and sprayed on the same solution of 40% lignin as the material rotated around pan pelletizer. Results: Small seed pellets formed and grew uniformly across pan pelletizer to 5-10 mesh in size. Dried crush strength was 3-3.5 lbs.
To increase crush stength, may need to blend more dry to allow for more lignin in final dried pellets.

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Test #: 2

Pin Mixer

Material	Feed Rate	Density	Binder	% Solids	Binder Rate	PSI	Spray Nozzle(s)	Speed	End Mat'l Moisture	End Mesh Size	End Dry Strength	Attrition
Synthetic Gypsum	3.5 lbs		Lignosulfonate, calc	25	0.35 lbs	-, -, -, -,	-, -, -, -	900	6	-		

Pre-dried to 1% moisture

Pelletizer

Material	Feed Rate	Feed Location	Binder	% Solids	Binder Rate	Spray Location(s)	Pan RPM	Pan Angle	End Mat'l Moisture	End Mesh Size	End Dry Strength	Attrition
Synthetic Gypsum	3.5 lbs	+6,-6	Lignosulfonate, cal	25	0.27 lbs	+4,-4, -, -, -	21	53	12	10 - 5	4.5-5	

Test Comments: Dried 3.5 lbs gypsum sludge down to 1% moisture and fed into batch pin mixer. Added 0.35 lbs lignin with 25% solids binder. Results: Uniform blend discharged with no agglomerates and approx. 6% moisture.
Fed blend onto pan pelletizer and sprayed on 25% solid solution as material rotated around pan. Results: Seed pellets formed and grew uniformly across pan pelletizer to 5-10 mesh is size. Dried crush strength was 4.5-5.0 lbs.

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PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/962,903	Filing Date 08/08/2013	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	08/20/2015	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 23	Minus	** 29	= 0	X $40 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $210 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	**0**

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/TRINA STEPTOE/

This collection of information is required by 37 CFR 1.16. 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, 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

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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

24239 7590 07/22/2015

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

EXAMINER	
LANGEL, WAYNE A	

ART UNIT	PAPER NUMBER
1736	

NOTIFICATION DATE	DELIVERY MODE
07/22/2015	ELECTRONIC

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

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

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

iplaw@mvalaw.com
usptomail@mvalaw.com

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/962,903	GINN ET AL.	
	Examiner	Art Unit	
	WAYNE LANGEL	1736	

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

(1) *WAYNE LANGEL*.

(2) *HENRY B. WARD, III*.

(3) *CHRISTOPHER J. KNORS*.

(4) _____.

Date of Interview: *15 July 2015*.

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

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

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

Claim(s) discussed: *1,6,13,17 and 21*.

Identification of prior art discussed: *Steele et al (US 2001/0029762)*.

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

The participants proposed amending claims 1, 13 and 21 to require that the binder composition comprises lignosulfonate The examiner agreed that such amendment would obviate the rejection of the method claims (independent claims 1 and 21) over Steele et al, but that additional evidence would be required as to product claim 13, since it is not clear what the crush strength of the gypsum pellets of Steele et al would be. The participants also proposed amending claims 6 and 17 to recite that the binder composition "may also comprise of one or more binders…" The examiner suggested that such language be changed to "the binder composition also comprises one or more binders…" to make it clear that the additional binder is required..

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

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

☐ Attachment

/WAYNE LANGEL/ Primary Examiner, Art Unit 1736	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

———

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

24239 7590 02/20/2015

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

EXAMINER	
LANGEL, WAYNE A	

ART UNIT	PAPER NUMBER
1736	

NOTIFICATION DATE	DELIVERY MODE
02/20/2015	ELECTRONIC

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

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

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

iplaw@mvalaw.com
usptomail@mvalaw.com

Office Action Summary	Application No. 13/962,903	Applicant(s) GINN ET AL.	
	Examiner WAYNE LANGEL	Art Unit 1736	AIA (First Inventor to File) Status Yes

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *2-6-15*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

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

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1,3-13,15-22 and 24-29* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1,3-13,15-22 and 24-29* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *2-6-15* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Claims 1, 3, 5-13, 16-22, 24 and 26-29 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no “description support” in the original specification for employing a binder composition “having 18% to 48% solids”. Applicants’ argument, that support is found in Paragragh [0024] of the specification, is not convincing, since that passage discloses thatr a binder of “lignosulfonate having 18% to 48% solids” is fed into the mixer. Such disclosure would not provide support for feeding binders other than lignosulfonate and having 18% to 48% solids to the forming device, and in particular would not provide support for feeding a water soluble binder or the binders recited in applicants’ claim 6 to the forming device, wherein such binders would have a solids content of 18% to 48%.

Claims 1, 3, 5-13, 16-22, 24 and 26-29 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The “enabling “ disclosure is not commensurate in scope with the subject matter recited in the claims,

since it is clear from Paragragh [0024] of the specification that the binder composition having a solids content of 18% to 48% is lignosulfonate, as opposed to other binders. In re Borkowski, 164 USPQ 642. Regarding claims 5, 6, 16 and 17, the specification does not enable one to provide a water soluble binder having a solids content of 18% to 48%, or to provide binder compositions as recited in claims 6 and 17 having a solids content of 18% to 48%.

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-6, 9-13, 15-17, 20-22, 24, 25, 28 and 29 are rejected under 35 U.S.C. 103 as being unpatentable over Steele et al. Steele et al is relied upon as discussed in the Office Action mailed on February 14, 2014. The difference between the process and fertilizer disclosed by Steele et al, and that recited in claims 1, 3-6, 9-13, 15-17, 20-22, 24, 25, 28 and 29, is that Steele et al do not disclose that the binder composition should have 18% to 48% solids. Steele et al disclose in Paragragh [0024] that the binder may be a sulfonated lignin such as calcium lignosulfonate. It would be obvious to employ a sulfonated lignin having a solids content of 18% to 48% as the binder in the process of Steele et al. One of ordinary skill in the art would be motivated to do so, since it would be within the skill of one of ordinary skill in the art to determine a suitable or optimum solids content for the binder of Steele et al. Applicants' argument,

that the feature of a binder composition having 18% to 48% solids is advantageous as it contributes to the recited crush strength, is not convincing, since there is no evidence on record to support such contention.

Claims 7, 8, 18, 19, 26 and 27 are rejected under 35 U.S.C. 103 as being unpatentable over Steele et al as applied to claims 1, 13 and 21 above, and further in view of Watkins et al. It would be further obvious from Watkins et al to include sulfur as an additive for the soil amendment of Steele et al. Watkins et al is relied upon as discussed in the Office Action mailed on February 14, 2014.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WAYNE LANGEL whose telephone number is (571)272-1353. The examiner can normally be reached on Monday through Friday, 8:30 am - 4:45 pm Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. 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.

/WAYNE LANGEL/
Primary Examiner, Art Unit 1736

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REQUEST **For** **CONTINUED EXAMINATION (RCE)** **TRANSMITTAL** Address to: **MAIL STOP RCE** **COMMISSIONER FOR PATENTS** **P.O. BOX 1450** **ALEXANDRIA, VA 22313-1450** (Revised 04/2005)	Application Number: 13/962,903 Filing Date: August 8, 2013 First Named Inventor: Terrell Dallas Ginn et al. Group Art Unit: 1736 Examiner Name: LANGEL, Wayne A.. Confirmation No.: 9538 Attorney Docket No. 946478.000027
This is a request for Continued Examination (RCE) under 37 C.F.R. § 1.114 of the above-identified application. Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application.	

1. **Submission required under 37 C.F.R. § 1.114** Note: if the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

ii. ☐ Other:

b. ☒ Enclosed

i. ☒ Amendment/Reply

ii. ☐ Affidavits(s)/Declarations(s)

iii. ☐ Information Disclosure Statement (IDS); of cites listed on PTO Form 1449

iv. ☒ Other: Petition for Three (3) Months Extension of Time; and one (1) Exhibit A, in further response to the final Office Action dated August 6, 2014, showing paper Submission of Replacement Drawings mailed via Express Mail to the U.S. Patent & Trademark Office on February 6, 2015.

2. **Miscellaneous**

a. ☐ Suspension of action on the above-identified application is requested under 37 C.F.R. §1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 C.F.R. § 1.17(i) required)

b. ☐ Other _____

3. **Fees** The RCE fee under 37 C.F.R. § 1.17(e) is **required by 37 C.F.R. § 1.114 when the RCE is filed**. ($1,200 large entity; $600 small entity; $300 micro entity)

a. ☐ This is a second and subsequent Request for Continued Examination.

b. ☒ Payment of **$600.00** RCE filing fee by EFT.

c. ☒ The Director is hereby authorized to charge any deficiencies or credit any overpayments to Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC
3015 Carrington Mill Boulevard, Suite 400
Post Office Box 13706
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Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on February 6, 2015.

Atty Dkt. No. 946478.000027 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Terrell Dallas Ginn et al.	Confirmation No.: 9538
Appl No.:	13/962,903	Group Art Unit: 1736
Filed:	August 8, 2013	Examiner: LANGEL, Wayne A.
Title:	**SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**	

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

PETITION AND FEE FOR EXTENSION OF TIME 37 C.F.R. § 1.136(a)

Commissioner:

1, This is a petition for an extension of time for a total period of Three (3) Months to submit an Amendment Under 37 C.F.R. 1.114 in response to the final Office Action dated August 6, 2014.
2. Applicant claims "**SMALL ENTITY**" status.
3. Calculation of extension fee (37 C.F.R. § 1.17(a)(1)-(a)(5)):

Total Months Requested	Fee For Large Entity	Fee For Small Entity	Fee For Micro Entity
☐ one month	$200.00	$100.00	$50.00
☐ two months	$600.00	$300.00	$150.00
☒ three months	$1,400.00	$700.00	$350.00
☐ four months	$2,200.00	$1,100.00	$550.00
☐ five months*	$3,000.00	$1,500.00	$750.00

**Cannot be used to exceed six-month statutory limit for response to an Official Action.*

☒ Payment by EFT in the amount of **$700.00.**
☒ Charge any deficiency or credit any overpayment to Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

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MOORE & VAN ALLEN PLLC
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Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on February 6, 2015.

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

App. No.:	13/962,903	Confirmation No.: 9538
Applicant:	Terrell Dallas Ginn et al.	
Filed:	August 8, 2013	
Group Art Unit:	1736	
Examiner:	Wayne A. Langel	
Title:	**SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**	
Atty Dkt. No.	946478-000027	
Customer No.	24239	

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

AMENDMENT UNDER 37 C.F.R. § 1.116

Sir:

In response to the final Office Action dated August 6, 2014, please amend the above-identified application as provided herein.

Amendments to the Claims begin on page 2 of this paper.

Amendments to the Drawings begin on page 7 of this paper.

Remarks begin on page 8 of this paper.

A Request for Continued Examination under 37 C.F.R. § 1.114(a) is being filed concurrently herewith.

Prolime Agriculture, LLC - Exhibit 1004 - Page 235

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently Amended) A method of producing a fertilizer comprising:

feeding synthetic gypsum to a forming device;

feeding a binder composition having 18% to 48% solids to the forming device; and

forming the material fed to the forming device to a mean pellet size guide number (SGN) from approximately 150 to approximately 300, wherein the resulting pelletized synthetic gypsum has a crush strength from approximately 2 lbf to approximately 12 lbf.

2. (Canceled)

3. (Original) The method of Claim 1, wherein the synthetic gypsum fed to the forming device has a mean particle size of less than 100 microns.

4. (Original) The method of Claim 1, wherein the binder composition comprises a lignosulfonate.

5. (Original) The method of Claim 1, wherein the binder composition comprises a water soluble binder.

6. (Previously Presented) The method of Claim 1, wherein the binder composition is selected from the group consisting of brewers condensed solubles, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, and cellulose based polymer binders.

Prolime Agriculture, LLC - Exhibit 1004 - Page 236

7. (Previously Presented) The method of Claim 1, further comprising feeding an additive to the forming device, wherein the additive is selected from the group consisting of ground calcium carbonate, calcium bentonite, kaolin clays, manganese, zinc, boron, calcium, copper, and elemental sulfur.

8. (Previously Presented) The method of Claim 7, wherein the additive comprises elemental sulfur.

9. (Original) The method of Claim 1, wherein the mean SGN is from approximately 250 to approximately 280.

10. (Original) The method of Claim 1, wherein the forming device comprises a pelletizer.

11. (Original) The method of Claim 1, wherein the forming device comprises a granulator or an extruder.

12. (Original) A fertilizer made by the method of Claim 1.

13. (Currently Amended) A fertilizer comprising:

pellets, the pellets comprising synthetic gypsum and a binder composition having 18% to 48% solids, the pellets further comprising mean pellet SGN from approximately 150 to approximately 300, wherein pellets have a crush strength from approximately 2 to approximately 12 lbf.

14. (Canceled)

15. (Original) The fertilizer of Claim 13, wherein the binder composition comprises a lignosulfonate.

Prolime Agriculture, LLC - Exhibit 1004 - Page 237

16. (Original) The fertilizer of Claim 13, wherein the binder composition comprises a water soluble binder.

17. (Previously Presented) The fertilizer of Claim 13, wherein the binder composition is selected from the group consisting of brewers condensed solubles, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, and cellulose based polymer binders.

18. (Previously Presented) The fertilizer of Claim 13, wherein the pellets further comprise an additive, wherein the additive is selected from the group consisting of ground calcium carbonate, calcium bentonite, kaolin clays, manganese, zinc, boron, calcium, copper, and elemental sulfur.

19. (Original) The fertilizer of Claim 13, wherein the pellets further comprise an additive comprising elemental sulfur.

20. (Original) The fertilizer of Claim 13, wherein the mean SGN is from approximately 250 to approximately 280.

Prolime Agriculture, LLC - Exhibit 1004 - Page 238

21. (Currently Amended) A process for producing a fertilizer comprising:

feeding synthetic gypsum to a dryer;

feeding dried synthetic gypsum and a binder composition having 18% to 48% solids to a mixer;

mixing the material fed to the mixer;

feeding the mixed material to a forming device;

pelletizing the material fed to the forming device;

feeding the pelletized material to a dryer;

drying the pelletized material;

feeding the dried pelletized material to a screener; and

screening the material fed to the screener to a mean pellet size guide number (SGN) from approximately 150 to approximately 300, wherein the resulting pelletized synthetic gypsum has a crush strength from approximately 2 lbf to approximately 12 lbf.

22. (Original) The process of Claim 21, further comprising recycling unders and overs removed during screening to the mixer.

23. (Canceled)

24. (Original) The process of Claim 21, wherein the synthetic gypsum fed to the mixer has a mean particle size of less than 100 microns.

25. (Original) The process of Claim 21, wherein the binder composition comprises a lignosulfonate.

26. (Previously Presented) The process of Claim 21, further comprising feeding an additive to the mixer, wherein the additive is selected from the group consisting of manganese, zinc, boron, calcium, copper, and elemental sulfur.

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27. (Original) The process of Claim 21, further comprising feeding an additive to the mixer, wherein the additive comprises elemental sulfur.

28. (Original) The process of Claim 21, wherein the mean SGN is from approximately 250 to approximately 280.

29. (Original) A fertilizer made by the process of Claim 21.

Prolime Agriculture, LLC - Exhibit 1004 - Page 240

Amendments to the Drawings:

Applicants are concurrently submitted via Express Mail two (2) Replacement Drawing Sheets showing Figures 1A and 2B in their original photographic format. A copy of the transmittal titled "Submission of Replacement Drawings", which includes an Express Mail certificate, is attached hereto at Exhibit A.

Attachments: Submission of Replacement Drawings and Express Mail transmittal certificate.

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REMARKS

This Amendment is filed in response to the final Office Action dated August 6, 2014. Claims 1, 3-13, 15-22, and 24-29 are pending in the application, in which Claims 1, 13, and 21 are independent. Claims 1, 3-13, 15-22, and 24-29 are rejected. Claims 2, 14, and 23 were previously canceled. Claims 1, 13 and 21 have been amended. Support for the amendments may be found in Paragraph [0024] of the specification. A Request for Continued Examination under 37 C.F.R. § 1.114(a) is being filed concurrently herewith. Applicants request entry of the amendments to Claims 1, 13 and 21. Applicants respectfully submit that the pending claims are patentable and respectfully requests reconsideration in light of the following remarks.

I. Drawing Objections

Applicants note that both Drawing Figures 1A and 2B initially filed on August 8, 2013, and Replacement Drawings electronically filed on July 14, 2014, were objected by the Office as being illegible (too dark). In reply to the drawing objections, Applicants are concurrently submitted via Express Mail two (2) Replacement Drawing Sheets showing Figures 1A and 2B in their original photographic format. A copy of the transmittal titled "Submission of Replacement Drawings", which includes an Express Mail transmittal certificate, is attached hereto at Exhibit A. No amendments have been made to the drawings.

II. Claim Rejections

Claims 1, 3-6, 9-13, 15-17, 20-22, 24, 25, 28, and 29 were rejected under 35 U.S.C. § 102(a)(1) as being anticipated by or, in the alternative, under 35 U.S.C. § 103 as obvious over U.S. Patent Publication No. 2001/0029762 to Steele et al ("Steele"). Claims 7, 8, 18, 19, 26, and 27 were rejected under 35 U.S.C. § 103 as being unpatentable over Steele.

In the Office Action, the Office asserts that Steele inherently teaches a crush strength of approximately 2 lbf to approximately 12 lbf. Applicants respectfully disagree. As affirmed by

Prolime Agriculture, LLC - Exhibit 1004 - Page 242

the Federal Circuit in *Par Pharmaceutical, Inc. v. TWI Pharmaceuticals, Inc.*, (Fed. Cir. 2014), quoting *Hansgirg v. Kemmer*, 102 F.2d 212, 214 (C.C.P.A. 1939) and *In re Oelrich*, 666 F.2d 578, 581 (C.C.P.A. 1981):

> Inherency, however, may not be established by probabilities or possibilities. The mere that that a certain thing may result from a given set of circumstances is not sufficient. If, however, the disclosure is sufficient to show that the natural result flowing from the operation as taught would resent in the performance of the questioned function, it seems to be well settled that the disclosure should be regarded as sufficient.

Contrary to the assertion page 3 of the Office Action, there is no "apparent inconsistency" for Applicants to explain. The issue is whether the "natural result" flowing from the soil amendment product, as disclosed in Steele, is a product that has a crush strength of approximately 2 lbf to approximately 12 lbf. Applicants respectfully submit that Steele, as a matter of law, is simply insufficient to establish this required fact to properly reject the invention as recited in independent Claims 1, 13, and 21 under either 35 U.S.C. § 102(a)(1) or § 103.

Nevertheless, in an effort to further the prosecution of the present application, Applicants have amended independent Claims 1, 13, and 21 to recite that the binder composition has 18% to 48% solids. Steele discloses the use of various binders for its soil amendment product, however, not only does Steele not teach or suggest the use of binders containing solids, Steele does not teach or suggest the use of binder compositions having 18% to 48% solids. This feature is advantageous as it contributes to the recited crush strength and further distinguishes the claimed invention from the soil amendment product disclosed in Steele.

Accordingly, it is respectfully submitted that independent Claims 1, 13, and 21 as amended, and the claims depending therefrom, include recitations that patentably distinguish the claimed invention over the cited reference and that the rejections directed to these claims be withdrawn.

* * * * *

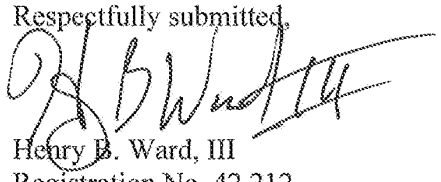
Prolime Agriculture, LLC - Exhibit 1004 - Page 243

Conclusions

In view of the amended claims and the remarks presented above, it is respectfully submitted that all of the present claims of the application are in condition for immediate allowance. It is therefore respectfully requested that a Notice of Allowance be issued. The Examiner is encouraged to contact Applicant's undersigned attorney to resolve any remaining issues in order to expedite examination of the present application.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 13-4365.

Respectfully submitted,



Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
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Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on February 6, 2015.

Prolime Agriculture, LLC - Exhibit 1004 - Page 244

Atty Dkt. No.: 946478-000027 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Terrell Dallas Ginn et al.	Confirmation No.:	9538
Appl No.:	13/962,903	Group Art Unit:	1736
Filed:	August 8, 2013	Examiner:	LANGEL, Wayne A.
Title:	**SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**		

Mail Stop AF
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

SUMBISSION OF REPLACEMENT DRAWINGS

In further response to the final Office Action dated August 6, 2014, the Applicants note that the Examiner objected to the drawings submitted on August 8, 2013. The final Office Action indicates that Replacement Drawings are necessary because the Examiner objected to Drawing Figures 1A and 2B as being illegible (too dark). Applicants submit herewith two (2) Replacement Drawings showing a legible copy of Drawing Figure 1A and 2B.

The Applicants also note that a Petition Fee in the amount of $70.00 under 37 C.F.R § 1.17(h) was **PAID** and **ACCEPTED** on August 8, 2013, in the above-identified U.S. patent application.

Applicants do not believe that any fee is due with this submission. However, the Commissioner is hereby authorized to charge Deposit Account 13-4365 for any fee deficiency or credit said Account for any overpayment.

Respectfully submitted,

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC
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EG571869875US

"Express Mail" Mailing Label Number: EG 571869875 US
Date of Deposit: February 6, 2015

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to: Commissioner for Patents, Office of Petitions, Mail Stop PETITION, P.O. Box 1450, Alexandria, VA 22313-1450

Joy Pickett (704) 331-1550

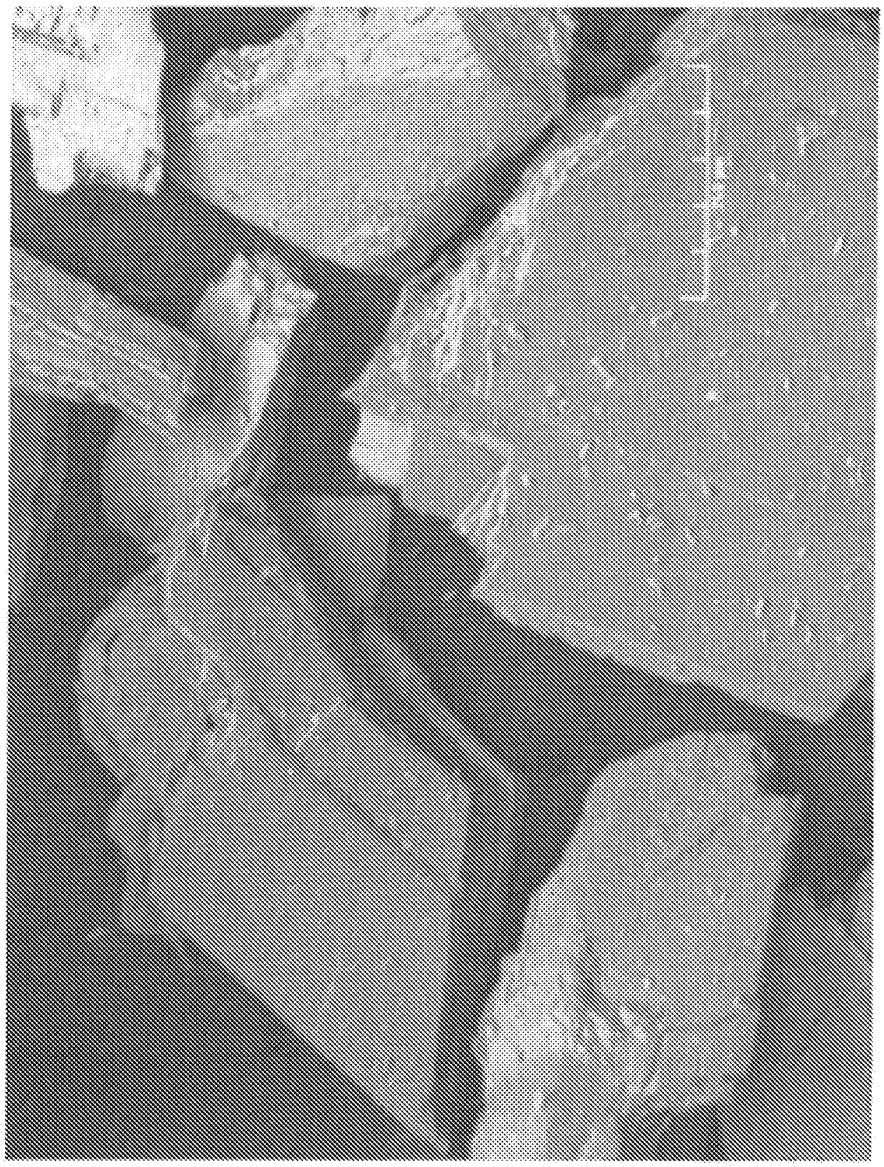


FIG. 1A

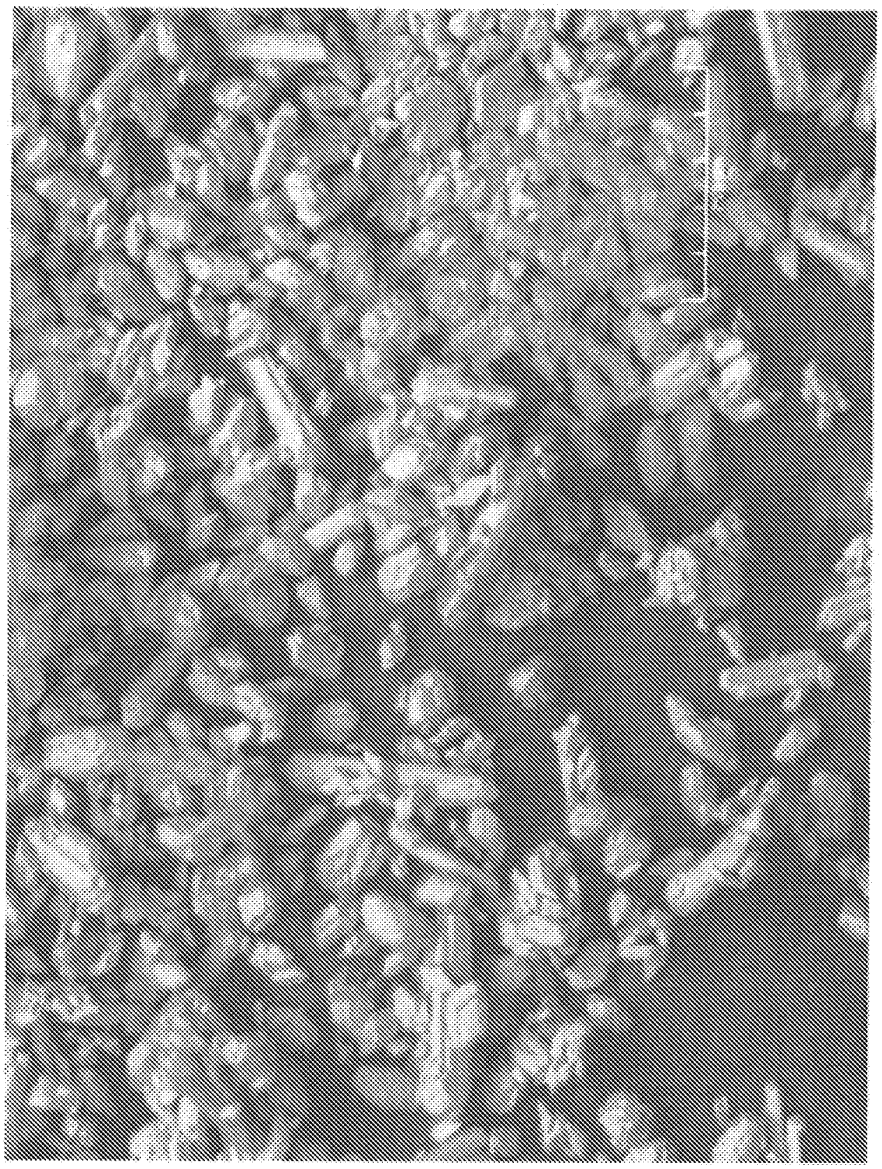


FIG. 2B

Electronic Patent Application Fee Transmittal

Application Number:	13962903
Filing Date:	08-Aug-2013
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Filer:	Henry B. Ward/Joy Pickett
Attorney Docket Number:	946478-000027

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

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

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 3 months with $0 paid	2253	1	700	700
Miscellaneous:				
Request for Continued Examination	2801	1	600	600
		Total in USD ($)		**1300**

Electronic Acknowledgement Receipt	
EFS ID:	21430314
Application Number:	13962903
International Application Number:	
Confirmation Number:	9538
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Customer Number:	24239
Filer:	Henry B. Ward/Joy Pickett
Filer Authorized By:	Henry B. Ward
Attorney Docket Number:	946478-000027
Receipt Date:	06-FEB-2015
Filing Date:	08-AUG-2013
Time Stamp:	18:17:39
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$1300
RAM confirmation Number	5510
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	946478_000027_RCE.pdf	102010 e2a868251ef33b9ae4e2d876d995c094864252eb	no	2
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2	Extension of Time	946478_000027_ThreeMonthsEOT.pdf	126510 b063ff025fcd7f585b7dc77f88dfa051919c17cc	no	1
Warnings:					
Information:					
3		946478_000027_AFAmendmentAccompanyingRCE.pdf	6089262 a8ecd827ebe57897932b1d97a07dc4f74a279a33	yes	10

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment Submitted/Entered with Filing of CPA/RCE	1	1
Claims	2	6
Drawings-only black and white line drawings	7	7
Applicant Arguments/Remarks Made in an Amendment	8	10

Warnings:					
Information:					
4	Examination support document	946478_000027_EXHIBIT_A_SubmissionofReplacementDrawingsX.pdf	23393220 453f20b6d40f79734e909efdcefb1b892cc32af3	no	3
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	32913 8857baf87bd00dcd1c292a2c9539fef044d1ba3f	no	2
Warnings:					
Information:					

Total Files Size (in bytes):	29743915

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

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

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

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

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/962,903	Filing Date 08/08/2013	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☒ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	**140**
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☒ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	**360**
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	**500**

APPLICATION AS AMENDED – PART II

AMENDMENT **02/06/2015**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	(Column 3) ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 26	Minus	** 29	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	**0**

AMENDMENT

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/ANGELA JONES/

This collection of information is required by 37 CFR 1.16. 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, 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.

SCORE Placeholder Sheet for IFW Content

Application Number: 13962903 Document Date: 02/06/2015

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

- Drawings – Other than Black and White Line Drawings

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

To access the documents in the SCORE database, refer to instructions below.

At the time of document entry (noted above):

- Examiners may access SCORE content via the eDAN interface.
- Other USPTO employees can bookmark the current SCORE URL (http://Score.uspto.gov/ScoreAccessWeb/).
- External customers may access SCORE content via the Public and Private PAIR interfaces.

Form Revision Date: September 30, 2013

02-09-15

IFW

Atty Dkt. No.: 946478-000027

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

OPAP AKIMA-4 FEB 0 6 2015 PATENT & TRADEMARK OFFICE

In re:	Terrell Dallas Ginn et al.	Confirmation No.:	9538
Appl No.:	13/962,903	Group Art Unit:	1736
Filed:	August 8, 2013	Examiner:	LANGEL, Wayne A.

CANCELLED FEB 0 6 2015

Title: **SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**

Mail Stop AF
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

SUMBISSION OF REPLACEMENT DRAWINGS

In further response to the final Office Action dated August 6, 2014, the Applicants note that the Examiner objected to the drawings submitted on August 8, 2013. The final Office Action indicates that Replacement Drawings are necessary because the Examiner objected to Drawing Figures 1A and 2B as being illegible (too dark). Applicants submit herewith two (2) Replacement Drawings showing a legible copy of Drawing Figure 1A and 2B.

The Applicants also note that a Petition Fee in the amount of $70.00 under 37 C.F.R § 1.17(h) was **PAID** and **ACCEPTED** on August 8, 2013, in the above-identified U.S. patent application.

Applicants do not believe that any fee is due with this submission. However, the Commissioner is hereby authorized to charge Deposit Account 13-4365 for any fee deficiency or credit said Account for any overpayment.

Respectfully submitted,

Henry B. Ward, III
Registration No. 42,212

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"Express Mail" Mailing Label Number: EG 571869875 US
Date of Deposit: February 6, 2015

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to: Commissioner for Patents, Office of Petitions, Mail Stop PETITION, P.O. Box 1450, Alexandria, VA 22313-1450

Joy Pickett (704) 331-3650



FIG. 1A

Best Available Copy

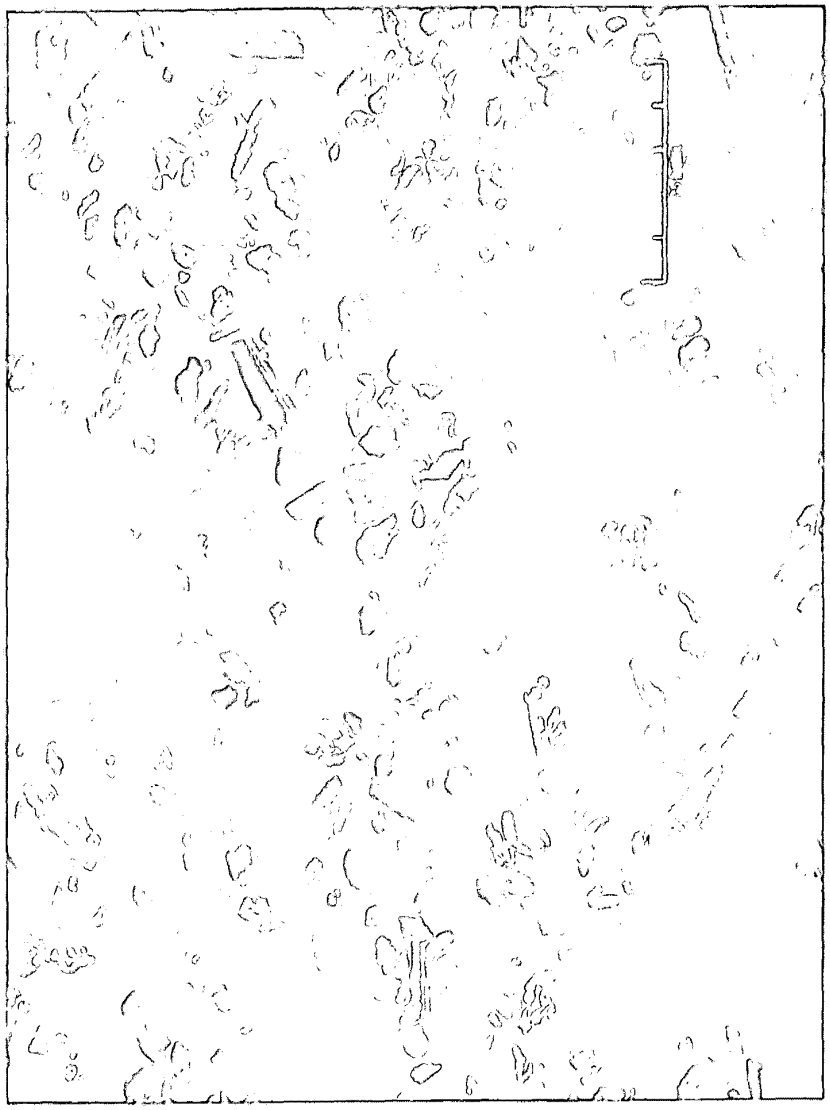


FIG. 2B

DocCode - SCORE

SCORE Placeholder Sheet for IFW Content

Application Number: **13962903** Document Date: **02/06/2015**

The presence of this form in the IFW record indicates that the following document type was received in paper and is scanned and stored in the SCORE database.

- Drawings

Images of the original documents are scanned in gray scale or color and stored in SCORE. Bi-tonal images are also stored in IFW. Defects visible in both IFW and SCORE are indicative of defects in the original paper documents.

To access the documents in the SCORE database, refer to instructions developed by SIRA.

At the time of document entry (noted above):

- Examiners may access SCORE content via the eDAN interface.
- Other USPTO employees can bookmark the current SCORE URL (http://Score.uspto.gov/ScoreAccessWeb/).
- External customers may access SCORE content via the Public and Private PAIR interfaces.

Form Revision Date: September 17, 2013

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 NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027

CONFIRMATION NO. 9538

24239
MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

PUBLICATION NOTICE

OC00000073097641

Title:SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING

Publication No.US-2015-0027181-A1
Publication Date:01/29/2015

NOTICE OF PUBLICATION OF APPLICATION

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

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

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

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

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

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

Office of Petitions: Routing Sheet



Application No.: 13/962,903

This application is being forwarded to your office for further processing. A decision has been rendered on a petition filed in this application.

- [x] **GRANTED**
- [ ] **DISMISSED**
- [ ] **DENIED**

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

24239 7590 10/27/2014

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

EXAMINER	
LANGEL, WAYNE A	

ART UNIT	PAPER NUMBER
1736	

NOTIFICATION DATE	DELIVERY MODE
10/27/2014	ELECTRONIC

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

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

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

iplaw@mvalaw.com
usptomail@mvalaw.com

UNITED STATES PATENT AND TRADEMARK OFFICE

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

In re Application of	:	
Terrell Dallas Ginn, et al.	:	
Application No.: 13/962,903	:	ON PETITION
Filed: August 8, 2013	:	
Attorney Docket No.: 946478-000027	:	

This is a decision on the petition under 37 CFR § 1.78(c), filed July 16, 2014, to accept an unintentionally delayed claim under 35 U.S.C. § 119(e) for the benefit of priority to the prior-filed provisional applications set forth in the concurrently filed Application Data Sheet (ADS).

The petition is **GRANTED.**

A petition for acceptance of a claim for late priority under 37 CFR § 1.78(c) is only applicable to those applications filed after the expiration of the period specified in 37 CFR § 1.78(a)(4). In addition, the petition under 37 CFR § 1.78(c) must be accompanied by:

(1) the reference required by 35 U.S.C. § 119(e) and 37 CFR § 1.78(a)(3) of the prior-filed application, which must be filed in an Application Data Sheet, unless previously submitted;
(2) the petition fee set forth in § 1.17(m); and
(3) a statement that the entire delay between the date the claim was due under 37 CFR § 1.78(a)(4) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional.

Additionally, the nonprovisional application claiming the benefit of the prior-filed provisional application must have been filed within twelve months of the filing date of the prior-filed provisional application.

All the above requirements having been satisfied, the late claim for benefit of priority under 35 U.S.C. § 119(e) is accepted as being unintentionally delayed.

The granting of the petition to accept the delayed benefit claim to the prior-filed applications under 37 CFR § 1.78(c) should not be construed as meaning that this application is entitled to the benefit of the filing date of the prior-filed applications. In order for this application to be entitled to the benefit of the prior-filed applications, all other requirements under 35 U.S.C. §119(e) and under 1.78 must be met. Similarly, the fact that the corrected Filing Receipt accompanying this decision on petition includes the prior-filed applications should not be construed as meaning that applicant is entitled to the claim for benefit of priority to the prior-

filed applications noted thereon. Accordingly, the examiner will, in due course, consider this benefit claim and determine whether the application is entitled to the benefit of the earlier filing date.

A corrected Filing Receipt, which includes the priority claim to the prior-filed provisional application, accompanies this decision on petition.

Any inquiries concerning this decision may be directed to the undersigned at (571) 272-3204. All other inquiries concerning either the examination procedures or status of the application should be directed to the Technology Center.

The application is being forwarded to Technology Center AU 1736 for consideration by the examiner of the claim under 35 U.S.C. §119(e) for the benefit of priority to the prior-filed provisional application.

/SDB/

Sherry D. Brinkley
Paralegal Specialist
Office of Petitions

Attachment: Corrected Filing Receipt

Office of Petitions: Decision Count Sheet

Mailing Month

Application No. 13962903

13962903

For US serial numbers: enter number only, no slashes or commas. Ex: 10123456
For PCT: enter "51+single digit of year of filing+last 5 numbers", Ex. for PCT/US05/12345, enter 51512345

Deciding Official: BRINKLEY, SHERRY

Count (1) - Palm Credit 13/962,903

Decision: GRANT

FINANCE WORK NEEDED
☐ Select Check Box for YES

GRANT

Decision Type: 535 - 37 CFR 1.78(a)(3) & (a)(6) UNINTENTIONAL DELAY F

535

Notes:

Count (2)

Decision: n/a

FINANCE WORK NEEDED
☐ Select Check Box for YES

Decision Type: NONE

Notes:

Count (3)

Decision: n/a

FINANCE WORK NEEDED
☐ Select Check Box for YES

Decision Type: NONE

Notes:

Initials of Approving Official (if required)

If more than 3 decisions, attach 2nd count sheet & mark this box ☐

Printed on: *10/22/2014*

Office of Petitions Internal Document - Ver. 5.0

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
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/962,903	08/08/2013	1736	1160	946478-000027	29	3

CONFIRMATION NO. 9538

CORRECTED FILING RECEIPT

24239
MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709

OC00000071494339

Date Mailed: 10/23/2014

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

Inventor(s)

Terrell Dallas Ginn, Milton, KY;
Danny Lynn Gray, Marietta, GA;

Applicant(s)

Terrell Dallas Ginn, Milton, KY;
Danny Lynn Gray, Marietta, GA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 61/681,088 08/08/2012

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 08/23/2013

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/962,903**

Projected Publication Date: 01/29/2015

Non-Publication Request: No

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

Prolime Agriculture, LLC - Exhibit 1004 - Page 265

Title

SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING

Preliminary Class

071

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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

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

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

Prolime Agriculture, LLC - Exhibit 1004 - Page 266

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

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 NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/962,903	08/08/2013	1736	1160	946478-000027	29	3

CONFIRMATION NO. 9538

CORRECTED FILING RECEIPT

24239
MOORE & VAN ALLEN PLLC
P.O. BOX 13706
3015 Carrington Mill Boulevard, Suite 400
Research Triangle Park, NC 27709



Date Mailed: 10/23/2014

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

Inventor(s)

Terrell Dallas Ginn, Milton, KY;
Danny Lynn Gray, Marietta, GA;

Applicant(s)

Terrell Dallas Ginn, Milton, KY;
Danny Lynn Gray, Marietta, GA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 61/681,088 08/08/2012

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 08/23/2013

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/962,903**

Projected Publication Date: 01/29/2015

Non-Publication Request: No

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

Title

SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING

Preliminary Class

071

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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

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

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

UNITED STATES PATENT AND TRADEMARK OFFICE

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Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

24239 7590 08/06/2014

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
Research Triangle Park, NC 27709

EXAMINER	
LANGEL, WAYNE A	

ART UNIT	PAPER NUMBER
1736	

NOTIFICATION DATE	DELIVERY MODE
08/06/2014	ELECTRONIC

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

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

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

iplaw@mvalaw.com
usptomail@mvalaw.com

Office Action Summary	Application No. 13/962,903	Applicant(s) GINN ET AL.	
	Examiner WAYNE LANGEL	Art Unit 1736	AIA (First Inventor to File) Status Yes

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7-16-14*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

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

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1,3-13,15-22 and 24-29* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1,3-13,15-22 and 24-29* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *7-14-14* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-6, 9-13, 15-17, 20-22, 24, 25, 28 and 29 are rejected under 35 U.S.C. 102(a)(1) as anticipated by or, in the alternative, under 35 U.S.C. 103 as obvious over Steele et al, for the reasons given in the last Office Action.

Claims 7, 8, 18, 19, 26 and 27 are rejected under 35 U.S.C. 103 as being unpatentable over Steele et al, for the reasons given in the last Office Action.

Applicants' argument, that to anticipate a claim, a reference must teach every element of the rejected claim, is not convincing, since Steele et al disclose the pelletizing of synthetic gypsum in the presence of such binders as starches, cellulosic ethers and water-soluble polymers. (See Paragraghs [0018], [0020] and Paragraghs [0022] through [[0025].) In an event, it would be obvious to employ synthetic gypsum as

the calcium sulfate which is pelletized in the process of Steele et al. One of ordinary skill in the art would be motivated to do so, since Steele et al suggest in Paragragh [0018] that synthetic gypsum is synonymous to gypsum in Paragragh [0018], and Steele et al clearly teach in Paragragh [0022] that the binder is added to the calcium sulfate to assist in pellet formation. Applicants' argument, that when the3 claims under consideration recite a range, it must be determined whether the prior art (a) discloses a specific example falling within the claimed range or (b) discloses a range which touches or overlaps the claimed range, but no specific examples falling within the claimed range are disclosed, is not convincing, since this does not apply when the rejection is based on inherency. The process disclosed by Steele et al would inherently result in pelletized synthetic gypsum having a crush strength from approximately 2 lbf to approximately 12 lbf, since the process of Steele et al entails the pelletizing of synthetic gypsum in the presence of such binders as starches, cellulosic ethers and water-soluble polymers, which are identical or substantially identical to the binders recited in applicants' claim 6. Applicants' specification provides evidence that the step of pelletizing synthetic gypsum in the presence of a binder such as starches, cellulosic ethers or water-soluble polymers will result in pellets having a mean pellet size guide number (SGN) from approximately 150 to approximately 300, and a crush strength of approximately 2 lbf to approximately 12 lbf. Applicants have not explained the apparent inconsistency in alleging that the process of Steele et al would not result in pelletized synthetic gypsum having a crush strength of approximately 2 lbf to approximately 12 lbf, while also arguing that the process recited in applicants' claims do result in pelletized synthetic

gypsum having a crush strength of approximately 2 lbf to approximately 12 lbf, when the positive process steps recited in applicants' claims are fully disclosed by Steele et al. Applicants' argument, that Steele et al do not teach or suggest (a) a specific example falling within the claimed range of crush strength recited in independent claims 1, 13 and 21, or (b) a range of crush strength which touches or overlaps the claimed range of crush strength recited in independent claims 1, 13 and 21, is not convincing, since such range of crush strength would be inherent in the process of Steele et al, for the reasons presented hereinbefore.

The Drawings filed on July 14, 2014 are objected to in that Figures 1A and 1B are illegible (too dark).

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WAYNE LANGEL whose telephone number is (571)272-

1353. The examiner can normally be reached on Monday through Friday, 8:30 am - 4:45 pm Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. 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.

/WAYNE LANGEL/
Primary Examiner, Art Unit 1736

.

Attorney Docket: 946478-000027

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Ginn et al.	Confirmation No.: 9538
App. No.:	13/962,903	Group Art Unit: 1736
Filed:	August 8, 2013	Examiner: Wayne A. Langel
Title:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING SAME	

MAIL STOP: PETITION
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION FOR THE ACCEPTANCE OF AN UNINTENTIONALLY DELAYED CLAIM TO THE BENEFIT OF AN EARLIER FILING DATE

APPLICANT HEREBY PETITIONS FOR THE ACCEPTANCE OF AN UNINTENTIONALLY DELAYED CLAIM TO THE BENEFIT OF AN EARLIER FILING DATE

Enclosed herewith are the following items:

(1) Petition fee;
(2) Amendment;
(3) Supplemental Application Data Sheet; and
(4) Statement that the entire delay was unintentional.

1. Petition fee
   ☒ $850.00 Surcharge set forth in 37 CFR 1.17(t).

2. Amendment
   ☒ An amendment to the first paragraph of the application including the unintentionally omitted reference is attached hereto.

3. Supplemental Application Data Sheet
   ☒ A Supplemental Application Data Sheet including the unintentionally omitted reference is attached hereto.

4. STATEMENT: The entire delay between the date the claim was due under paragraph (a)(2)(ii) of this section and the date the claim was filed was unintentional.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC
430 Davis Drive, Suite 500
Post Office Box 13706
Research Triangle Park, NC 27709
Tel Charlotte Office (704) 331-1027
Fax Charlotte Office (704) 339-5800

Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on July 16, 2014.

Attorney Docket: 946478-000027

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Ginn et al.	Confirmation No.: 9538
App. No.:	13/962,903	Group Art Unit: 1736
Filed:	August 8, 2013	Examiner: Wayne A. Langel
Title:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING SAME	

Mail Stop: Application
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

AMENDMENT UNDER 37 C.F.R. § 1.78

Madam:

Please amend the above-identified application as follows:

Amendments to the Specification begin on page 2 of this paper.

There are no **Amendments to the Claims**.

Remarks begin on page 3 of this paper.

Amendments to the Specification:

Please insert the following paragraph below the title of the specification:

This patent application claims priority to and hereby incorporates by reference the entire contents of U.S. Provisional Patent Application No. 61/681,088 entitled "SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING" filed on August 8, 2012.

Prolime Agriculture, LLC - Exhibit 1004 - Page 280

Remarks

Applicants amend the specification to submit a claim to the benefit of an earlier filing date for the instant patent application. No new matter is added. Please enter this amendment prior to further examination of this application.

No fees are believed due for this amendment. Should any fees be due, authorization is hereby given to charge any deficiency in applicable fees, or credit any overcharges, for this response to Deposit Account No. 13-4365 of Moore & Van Allen PLLC.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC
430 Davis Drive, Suite 500
Post Office Box 13706
Research Triangle Park, NC 27709
Tel Charlotte Office (704) 331-1027
Fax Charlotte Office (704) 339-5800

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Prolime Agriculture, LLC - Exhibit 1004 - Page 281

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Ginn et al.	Confirmation No.: 9538
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Mail Stop: Application
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

SUPPLEMENTAL APPLICATION DATA SHEET UNDER 37 C.F.R. § 1.76(c) IN U.S. PATENT APPLICATION NO. 13/962,903

Madam:

Applicants hereby submit the following Supplemental Application Data modifying the Domestic Benefit/National Stage Information, in accordance with 37 C.F.R. § 1.76(c).

Applicants are submitting a Supplemental ADS to add a claim to the benefit of an earlier filing date.

Issuance of a Corrected Filing Receipt is respectfully requested.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC
430 Davis Drive, Suite 500
Post Office Box 13706
Research Triangle Park, NC 27709
Tel Charlotte Office (704) 331-1027
Fax Charlotte Office (704) 339-5800

Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on July 16, 2014

SUPPLEMENTAL

PTO/AIA/14 (03-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	946478-000027
	Application Number	13/962,903
Title of Invention	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING SAME	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Terrell	Dallas	Ginn	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Milton	State/Province	KY	Country of Residence	US

Mailing Address of Inventor:

Address 1	322 Mount Carmel Road		
Address 2			
City	Milton	State/Province	KY
Postal Code	40045	Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Danny	Lynn	Gray	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Marietta	State/Province	GA	Country of Residence	US

Mailing Address of Inventor:

Address 1	3637 Summerford Dr.		
Address 2			
City	Marietta	State/Province	GA
Postal Code	30062	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

PTO/AIA/14 (03-13)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	946478-000027
	Application Number	13/962,903
Title of Invention	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING SAME	

☐ **An Address is being provided for the correspondence Information of this application.**			
Customer Number	24239		
Email Address	iplaw@mvalaw.com	Add Email	Remove Email

Application Information:

Title of the Invention	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING SAME		
Attorney Docket Number	946478-000027	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	4	**Suggested Figure for Publication (if any)**	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	24239		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61681088	2012-08-08

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

PTO/AIA/14 (03-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	946478-000027
	Application Number	13/962,903
Title of Invention	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING SAME	

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.
In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

PTO/AIA/14 (03-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	946478-000027
	Application Number	13/962,903
Title of Invention	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING SAME	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

(●) Assignee	( ) Legal Representative under 35 U.S.C. 117	( ) Joint Inventor
( ) Person to whom the inventor is obligated to assign.	( ) Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. [x]

Organization Name	CHARAH, INC.		
Mailing Address Information For Applicant:			
Address 1	12601 Plantside Drive		
Address 2			
City	Louisville	**State/Province**	KY
Country	US	Postal Code	40299
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

PTO/AIA/14 (03-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	946478-000027
	Application Number	13/962,903
Title of Invention	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING SAME	

Assignee 1

Complete this section only if non-applicant assignee information is desired to be included on the patent application publication in accordance with 37 CFR 1.215(b). Do not include in this section an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest), as the patent application publication will include the name of the applicant(s).

If the Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Signature	/hbw/			Date (YYYY-MM-DD)	2014-07-16
First Name	Henry B.	Last Name	Ward, III	Registration Number	42212

Additional Signature may be generated within this form by selecting the Add button.

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

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

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

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

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

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

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

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

Electronic Patent Application Fee Transmittal

Application Number:	13962903
Filing Date:	08-Aug-2013
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Filer:	Henry B. Ward/Becky Pegg
Attorney Docket Number:	946478-000027

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Pet. Delay Sub or Restore Priority-Claim	2454	1	850	850
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**850**

Electronic Acknowledgement Receipt

EFS ID:	19588347
Application Number:	13962903
International Application Number:	
Confirmation Number:	9538
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Customer Number:	24239
Filer:	Henry B. Ward/Becky Pegg
Filer Authorized By:	Henry B. Ward
Attorney Docket Number:	946478-000027
Receipt Date:	16-JUL-2014
Filing Date:	08-AUG-2013
Time Stamp:	17:46:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$850
RAM confirmation Number	4164
Deposit Account	
Authorized User	

File Listing:

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

1	Petition for review by the Office of Petitions.	946478-000027PetitionforPrioirtyClaim7-16-14.pdf	95638 289c4e48bec1a7e1a43392248542ba9d605d1cce	no	2
Warnings:					
Information:					
2		946478-000027AmendmentToSpecification7-14-14.pdf	97957 6e60ac3954e68e5f6d373f90b40315dc2252aa53	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Supplemental Response or Supplemental Amendment	1	1
	Specification	2	2
	Applicant Arguments/Remarks Made in an Amendment	3	3

Warnings:					
Information:					
3		946478-000027SuppADS7-15-14.pdf	1648752 47ac73c326822f87424355606ecd81bff791cd0e	yes	7

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Supplemental Response or Supplemental Amendment	1	1
	Application Data Sheet	2	7

Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30598 bcc494ff46e25cc978a2267e6883a521b47d27ac	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	1872945	

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

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

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

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

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

App. No.:	13/962,903	Confirmation No.: 9538
Applicant:	Terrell Dallas Ginn et al.	
Filed:	August 8, 2013	
Group Art Unit:	1736	
Examiner:	Wayne A. Langel	
Title:	**SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**	
Atty Dkt. No.	946478-000027	
Customer No.	24239	

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

AMENDMENT UNDER 37 C.F.R. § 1.111

Sir:

In response to the non-final Office Action dated February 14, 2014, please amend the above-identified application as follows:

AMENDMENTS TO THE DRAWINGS begin on page 2 of this paper.

AMENDMENTS TO THE CLAIMS begin on page 3 of this paper.

REMARKS begin on page 7 of this paper.

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AMENDMENTS TO THE DRAWINGS

Applicants submit herewith at Replacement Sheets for Figures 1A and 1B. No amendments have been made to the drawings.

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AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of producing a fertilizer comprising:

feeding synthetic gypsum to a forming device;

feeding a binder composition to the forming device; and

forming the material fed to the forming device to a mean pellet size guide number (SGN) from approximately 150 to approximately 300, wherein the resulting pelletized synthetic gypsum has a crush strength from approximately 2 lbf to approximately 12 lbf.

2. (Canceled)

3. (Original) The method of Claim 1, wherein the synthetic gypsum fed to the forming device has a mean particle size of less than 100 microns.

4. (Original) The method of Claim 1, wherein the binder composition comprises a lignosulfonate.

5. (Original) The method of Claim 1, wherein the binder composition comprises a water soluble binder.

6. (Currently Amended) The method of Claim 1, wherein the binder composition ~~comprises at least one of~~ is selected from the group consisting of brewers condensed solubles, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, [[or]] and cellulose based polymer binders.

7. (Currently Amended) The method of Claim 1, further comprising feeding an additive to the forming device, wherein the additive ~~comprises at least one of~~ is selected from the group consisting of ground calcium carbonate, calcium bentonite, kaolin clays, manganese, zinc, boron, calcium, copper, and elemental sulfur.

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8. (Currently Amended) The method of Claim [[9]] 7, wherein the additive comprises elemental sulfur.

9. (Original) The method of Claim 1, wherein the mean SGN is from approximately 250 to approximately 280.

10. (Original) The method of Claim 1, wherein the forming device comprises a pelletizer.

11. (Original) The method of Claim 1, wherein the forming device comprises a granulator or an extruder.

12. (Original) A fertilizer made by the method of Claim 1.

13. (Currently Amended) A fertilizer comprising:

pellets, the pellets comprising synthetic gypsum and a binder composition, the pellets further comprising mean pellet SGN from approximately 150 to approximately 300, wherein pellets have a crush strength from approximately 2 to approximately 12 lbf.

14. (Canceled)

15. (Original) The fertilizer of Claim 13, wherein the binder composition comprises a lignosulfonate.

16. (Original) The fertilizer of Claim 13, wherein the binder composition comprises a water soluble binder.

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17. (Currently Amended) The fertilizer of Claim 13, wherein the binder composition ~~comprises at least one of~~ is selected from the group consisting of brewers condensed solubles, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, [[or]] and cellulose based polymer binders.

18. (Currently Amended) The fertilizer of Claim 13, wherein the pellets further comprise an additive ~~comprising at least one of~~, wherein the additive is selected from the group consisting of ground calcium carbonate, calcium bentonite, kaolin clays, manganese, zinc, boron, calcium, copper, and elemental sulfur.

19. (Original) The fertilizer of Claim 13, wherein the pellets further comprise an additive comprising elemental sulfur.

20. (Original) The fertilizer of Claim 13, wherein the mean SGN is from approximately 250 to approximately 280.

21. (Currently Amended) A process for producing a fertilizer comprising:
feeding synthetic gypsum to a dryer;
feeding dried synthetic gypsum and a binder composition to a mixer;
mixing the material fed to the mixer;
feeding the mixed material to a forming device;
pelletizing the material fed to the forming device;
feeding the pelletized material to a dryer;
drying the pelletized material;
feeding the dried pelletized material to a screener; and
screening the material fed to the screener to a mean pellet size guide number (SGN) from approximately 150 to approximately 300, wherein the resulting pelletized synthetic gypsum has a crush strength from approximately 2 lbf to approximately 12 lbf.

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22. (Original) The process of Claim 21, further comprising recycling unders and overs removed during screening to the mixer.

23. (Canceled)

24. (Original) The process of Claim 21, wherein the synthetic gypsum fed to the mixer has a mean particle size of less than 100 microns.

25. (Original) The process of Claim 21, wherein the binder composition comprises a lignosulfonate.

26. (Currently Amended) The process of Claim 21, further comprising feeding an additive to the mixer, wherein the additive ~~comprises at least one of~~ is selected from the group consisting of manganese, zinc, boron, calcium, copper, and elemental sulfur.

27. (Original) The process of Claim 21, further comprising feeding an additive to the mixer, wherein the additive comprises elemental sulfur.

28. (Original) The process of Claim 21, wherein the mean SGN is from approximately 250 to approximately 280.

29. (Original) A fertilizer made by the process of Claim 21.

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REMARKS

This Amendment is filed in response to the non-final Office Action dated February 14, 2014. Claims 1-29 are pending in the application, in which Claims 1, 13, and 21 are independent. Claims 1-29 are rejected. Claims 2, 14, and 23 have been canceled. Claims 1, 6-8, 13, 17, 18, 21, and 26 have been amended. Support for the amendments may be found in the original claims, specification, and drawings. Applicants respectfully request entry of the amendments to Claims 1, 6-8, 13, 17, 18, 21 and 26 and issuance of a Notice of Allowance in light of the remarks below.

Applicant respectfully submits that the pending claims are patentable and respectfully requests reconsideration in light of the following remarks.

I. The Rejections Under 35 U.S.C. § 102(a)(1) Should Be Withdrawn.

Claims 1-6, 9-17, 20-25, 28 and 29 were rejected under 35 U.S.C. 102(a)(1) as being anticipated by or, in the alternative, under 35 U.S.C. 103 as obvious over U.S. Patent Publication No. 2001/0029762 to Steele et al ("Steele").

Independent Claims 1, 13, and 21 have been amended to recite a method of producing a fertilizer, a fertilizer, and a process for producing a fertilizer, respectively, wherein the resulting pelletized synthetic gypsum has a crush strength from approximately 2 lbf to approximately 12 lbf. Support for the amendments can be found in presently canceled dependent Claims 2, 14, and 23, as well as in Paragraphs [0004], [0008], [0011], and [0020], in the specification of the present application.

Steele generally teaches a soil amendment product of agglomerated or compacted calcined calcium sulfate. The soil amendment product is combined with an effective amount of a binder such as a clay, lignin, or starch to assist the calcium sulfate in pelletization.

To anticipate a claim under 35 U.S.C. §102, a reference must teach every element of the rejected claim. *See Verdegaal Bros. v. Union Oil Co. of California* 814 F.2d 628, 631, 2 USPQ 2d 1051, 1053 (Fed. Cir. 1987) (holding that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference"); and *see also* M.P.E.P. § 2131.

When the claims under consideration recite a range, it must be determined (a) whether

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the prior art (a) discloses a specific example falling within the claimed range or (b) discloses a range which touches or overlaps the claimed range, but no specific examples falling within the claimed range are disclosed. In the case where the prior art discloses a specific example falling within the claimed range, then the recited range is taught by the prior art. *See Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985); and *see also* M.P.E.P. § 2131.03(I).

However, when the prior art discloses a range which touches or overlaps the claimed range, but no specific examples falling within the claimed range are disclosed, then a determination must be made as to whether the claimed subject matter is disclosed in the reference with "sufficient specificity" to constitute an anticipation under the statute. *See Atofina v. Great Lakes Chem. Corp*, 441 F.3d 991, 999, 78 USPQ2d 1417, 1423 (Fed. Cir. 2006). As explained in M.P.E.P. § 2131.03(II):

> When the prior art discloses a range which touches or overlaps the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation. In order to anticipate the claims, the claimed subject matter must be disclosed in the reference with "sufficient specificity to constitute an anticipation under the statute." What constitutes a "sufficient specificity" is fact dependent. If the claims are directed to a narrow range, and the reference teaches a broad range, depending on the other facts of the case, it may be reasonable to conclude that the narrow range is not disclosed with "sufficient specificity" to constitute an anticipation of the claims. See, e.g., *Atofina v. Great Lakes Chem. Corp*, 441 F.3d 991, 999, 78 USPQ2d 1417, 1423 (Fed. Cir. 2006) wherein the court held that a reference temperature range of 100-500 degrees C did not describe the claimed range of 330-450 degrees C with sufficient specificity to be anticipatory. Further, while there was a slight overlap between the reference's preferred range (150-350 degrees C) and the claimed range, that overlap was not sufficient for anticipation. "[T]he disclosure of a range is no more a disclosure of the end points of the range than it is each of the intermediate points." *Id.* at 1000, 78 USPQ2d at 1424. Any evidence of unexpected results within the narrow range may also render the claims unobvious. The question of "sufficient specificity" is similar to that of "clearly envisaging" a species from a generic teaching. See MPEP § 2131.02. A 35 U.S.C. 102/ 103 combination rejection is permitted if it is unclear if the reference teaches the range with "sufficient specificity." The examiner must, in this case, provide reasons for anticipation as well as a *>reasoned< statement regarding obviousness. *Ex parte Lee*, 31 USPQ2d 1105 (Bd. Pat. App. & Inter. 1993) (expanded Board).

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The Federal Circuit has repeatedly held that a "*prima facie* case of obviousness typically exists when the ranges of a claimed composition overlap the ranges disclosed in the prior art." *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ2d 1379, 1382 (Fed. Cir. 2003); *see also In re Harris*, 409 F.3d 1339, 1341, 74 USPQ2d 1951, 1953 (Fed. Cir. 2005); *In re Geisler*, 116 F.3d 1465, 1469, 43 USPQ2d 1362, 1364-65 (Fed. Cir. 1997). However, the foregoing rule should only be applied in "cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims." *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). Furthermore, in cases where the "disclosed range is so broad as to encompass a very large number of possible distinct compositions," a *prima facie* case of obviousness may not be established based on overlapping ranges. *In re Peterson*, 315 F.3d at 1392; 65 USPQ2d at 1382 (n. 1, citing *In re Baird*, 16 F.3d 380, 29 USPQ2d 1550 (Fed. Cir. 1994) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992)).

Steele does not teach or suggest (a) a specific example falling within the claimed range of crush strength recited in independent Claims 1, 13, and 21, or (b) a range of crush strength which touches or overlaps the claimed range of crush strength recited in independent Claims 1, 13, and 21. Indeed, Steele does not even discuss or even recognize the importance of crush strength on the manufacturability and usability of a pelletized synthetic gypsum fertilizer.

Accordingly, it is respectfully submitted that independent Claims 1, 13, and 21 as amended, and the claims depending therefrom, include recitations that patentably distinguish the claimed invention over the cited reference and that the rejections directed to these claims be withdrawn.

II. The Rejections Under 35 U.S.C. § 112(b) Should Be Withdrawn.

The Office Action rejected Claims 6-9, 17, 18 and 26 under 35 U.S.C. 112 (b) or 35 U.S.C. 112, second paragraph, asserting that the claims are indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Office Action asserts that the recitation of "at least one of…and" is improper Markush or alternative technology. Regarding Claim 8, the Office Action asserts that there is no antecedent basis for "the additive".

Prolime Agriculture, LLC - Exhibit 1004 - Page 302

Claims 6, 7, 17, 18, and 26 have been amended to be definite and particularly point out and distinctly claim the subject matter. Specifically, Claims 6, 7, 17, 18, and 26 have been amended to recite proper Markush terminology. Claim 8 has been amended to properly depend from Claim 7.

Prolime Agriculture, LLC - Exhibit 1004 - Page 303

CONCLUSIONS

In view of the amended claims and the remarks presented above, it is respectfully submitted that all of the present claims of the application are in condition for immediate allowance. It is therefore respectfully requested that a Notice of Allowance be issued. The Examiner is encouraged to contact Applicant's undersigned attorney to resolve any remaining issues in order to expedite examination of the present application.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
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Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on July 14, 2014.

Prolime Agriculture, LLC - Exhibit 1004 - Page 304

Electronic Patent Application Fee Transmittal

Application Number:	13962903
Filing Date:	08-Aug-2013
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Filer:	Henry B. Ward
Attorney Docket Number:	946478-000027

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 2 months with $0 paid	2252	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**300**

Electronic Acknowledgement Receipt

EFS ID:	19573953
Application Number:	13962903
International Application Number:	
Confirmation Number:	9538
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Customer Number:	24239
Filer:	Henry B. Ward
Filer Authorized By:	
Attorney Docket Number:	946478-000027
Receipt Date:	14-JUL-2014
Filing Date:	08-AUG-2013
Time Stamp:	23:46:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$300
RAM confirmation Number	8528
Deposit Account	
Authorized User	

File Listing:

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

1	Extension of Time	946478-000027EOT.pdf	125958 30552766a27489154ce924dccc4b9bd80fbb4c80	no	1
Warnings:					
Information:					
2	Drawings-only black and white line drawings	946478-000027ReplacementDrawings.pdf	970329 1ad35e15ddbcc843929f13e76b9b61a34a6ce0b8	no	2
Warnings:					
Information:					
3	Amendment/Req. Reconsideration-After Non-Final Reject	Amendment.pdf	169498 e6c7354ea3f36408e6d6aa25c672dda742089f0b	no	11
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30654 efabaf34c060131ae35ae62c0a966e908bbee48b	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1296439		

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

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

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

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

Atty Docket No. 946478-000027 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Terrell Dallas Ginn et al.	Confirmation No.: 9538
App. No.:	13/962,903	Group Art Unit: 1736
Filed:	August 8, 2013	Examiner: Wayne A. Langel
Title:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING	

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

PETITION AND FEE FOR EXTENSION OF TIME 37 C.F.R. § 1.136(a)

This is a petition for an extension of time for a total period of two (2) months to respond to the Office Action dated February 14, 2014.

2. Applicant claims small entity status.

3. Calculation of extension fee (37 C.F.R. § 1.17(a)(1)-(a)(5)):

Total Months Requested	Fee For Large Entity	Fee For Small Entity	Fee For Micro Entity
☐ one month	$200.00	$100.00	$50.00
☒ two months	$600.00	$300.00	$150.00
☐ three months	$1,400.00	$700.00	$350.00
☐ four months	$2,200.00	$1,100.00	$550.00
☐ five months*	$3,000.00	$1,500.00	$750.00

**Cannot be used to exceed six-month statutory limit for response to an Official Action.*

☒ Payment via EFT in the amount of $300.

☒ Please charge any deficiency or credit any overpayment to Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC
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Fax Charlotte Office (704) 339-5800

Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on July 14, 2014.



FIG. 1A



FIG. 2B

SCORE Placeholder Sheet for IFW Content

Application Number: 13962903 Document Date: 07/14/2014

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

- Drawings – Other than Black and White Line Drawings

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

To access the documents in the SCORE database, refer to instructions below.

At the time of document entry (noted above):

- Examiners may access SCORE content via the eDAN interface.
- Other USPTO employees can bookmark the current SCORE URL (http://Score.uspto.gov/ScoreAccessWeb/).
- External customers may access SCORE content via the Public and Private PAIR interfaces.

Form Revision Date: September 30, 2013

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/962,903	Filing Date 08/08/2013	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **07/14/2014**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 26	Minus	** 29	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	**0**

AMENDMENT

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/eugenia v. hardy/

This collection of information is required by 37 CFR 1.16. 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, 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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027	9538

24239 7590 02/14/2014
MOORE & VAN ALLEN PLLC
P.O. BOX 13706
Research Triangle Park, NC 27709

EXAMINER	
LANGEL, WAYNE A	

ART UNIT	PAPER NUMBER
1736	

NOTIFICATION DATE	DELIVERY MODE
02/14/2014	ELECTRONIC

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

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

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

iplaw@mvalaw.com
usptomail@mvalaw.com

Office Action Summary	Application No. 13/962,903	Applicant(s) GINN ET AL.	
	Examiner WAYNE LANGEL	Art Unit 1736	AIA (First Inventor to File) Status Yes

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

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

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-29* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-29* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *8-8-13* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6, 9-17, 20-25, 28 and 29 are rejected under 35 U.S.C. 102(a)(1) as anticipated by or, in the alternative, under 35 U.S.C. 103 as obvious over Steele et al (US 20010029762). No distinction is seen between the method and fertilizer disclosed by Steele et al, and that recited in claims 1-6, 9-17, 20-25, 28 and 29. Steele et al disclose a soil amendment comprising pelletized gypsum in combination with a binder such as sulfonated lignin. (See the Abstract and Paragraghs [0017], [0018] and [0022] through [0025].) It would be expected that the soil amendment formed according to the process of Steele et al would have an SGN of n150 to 300, since the process disclosed by Steele et al is identical to that disclosed in applicants' specification. In any event, it would be obvious to operate the pelletizer of Steele et al so as to form a product having

an SGN of 150-250, since it would be within the skill of one of ordinary skill in the art to determine a suitable or optimum SGN for the gypsum pellets of Steele et al.

Claims 7, 8, 18, 19, 26 and 27 are rejected under 35 U.S.C. 103 as being unpatentable over Steele et al as applied to claims 1, 13 and 21 above, and further in view of Watkins et al (US 4,015,972). It would be further obvious from Watkins et al to include sulfur as an additive for the soil amendment of Steel et al, since Watkins suggest the desirability of including sulfur as an additive for gypsum at col. 3, lines 34-68. Regarding claims 7, 18 and 26, it would also be obvious from Watkins to include such additives as copper or zinc in the gypsum pellets of Steele et al, since Watkins et al disclose the benefits of such micronutrients in combination with gypsum as a fertilizer at col. 8, lines 40-65.

> The following is a quotation of 35 U.S.C. 112(b):
> (b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.
>
> The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6-9, 17, 18 and 26 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention. The recitation of “at least one of…and” is improper Markush or alternative terminology. In claim 8, there is no antecedent basis for “the additive”.

The Drawings are objected to in the Figures 1A and 1B are illegible (too dark).

Van de Walle et al is made of record for disclosing a binder for the granulation of fertilizers.

Harrison et al is made of record for disclosing the agglomeration nof gypsum in the presence of lignosulfonate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WAYNE LANGEL whose telephone number is (571)272-1353. The examiner can normally be reached on Monday through Friday, 8:30 am - 4:45 pm Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. 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.

/WAYNE LANGEL/

Primary Examiner, Art Unit 1736

Search Notes (continued)	Application/Control No.	Applicant(s)/Patent under Reexamination	
	13/962,903	GINN ET AL.	
	Examiner	Art Unit	
	WAYNE LANGEL	1736	

SEARCHED			
Class	Subclass	Date	Examiner
71	63	2/7/2014	WAL

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
Inventor Namer Search	2/7/2014	WAL

Notice of References Cited	Application/Control No. 13/962,903	Applicant(s)/Patent Under Reexamination GINN ET AL.	
	Examiner WAYNE LANGEL	Art Unit 1736	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2001/0029762	10-2001	Steele et al.	71/63
*	B	US-4,954,134	09-1990	Harrison et al.	23/313R
*	C	US-5,078,779	01-1992	Van de Walle et al.	71/63
*	D	US-4,015,972	04-1977	Watkins et al.	71/31
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

Substitute for form 1449/PTO (Revised 07/2005)				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(Use as many sheets as necessary)*				**Application Number**	13/962,903
				Filing Date	August 8, 2013
				First Named Inventor	Terrell Dallas Ginn et al.
				Group Art Unit	1736
				Examiner Name	Wayne A. Langel
Sheet	**1**	**of**	**2**	**Attorney Docket Number**	946478-000027

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.	Document Number Number - Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages of Relevant Figures Appear
	1.	US-6,029,603	02-29-2000	Evans et al.	
	2.	US-6,613,138 B2	09-02-2003	Welshimer et al.	
	3.	US-7,776,124 B2	08-17-2010	Binder et al.	

U. S. PATENT APPLICATION DOCUMENTS					
Examiner Initials*	Cite No.	Document Number Number - Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages of Relevant Figures Appear
	4.	US-2001/0029762 A1	10-18-2001	Steele et al.	

Examiner Signature		Date Considered	

CHAR2\1567193v1

*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.

Substitute for form 1449/PTO (Revised 07/2005)				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(Use as many sheets as necessary)*				**Application Number**	13/962,903
				Filing Date	August 8, 2013
				First Named Inventor	Terrell Dallas Ginn et al.
				Group Art Unit	1736
				Examiner Name	Wayne A. Langel
Sheet	**2**	**of**	**2**	**Attorney Docket Number**	946478-000027

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.	Foreign Patent Document Country Code - Number Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	English Language Translation Attached

OTHER DOCUMENTS			
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s) , volume-issue number(s), publisher, city and/or country where published.	English Language Translation Attached
	5.	International Search Report and Written Opinion of International Application No. PCT/US2013/054212; mailing date January 17, 2014; 9 pages.	

Examiner Signature		Date Considered	

CHAR2\1567193v1

*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.

Electronic Acknowledgement Receipt

EFS ID:	18146864
Application Number:	13962903
International Application Number:	
Confirmation Number:	9538
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell Dallas Ginn
Customer Number:	24239
Filer:	Henry B. Ward
Filer Authorized By:	
Attorney Docket Number:	946478-000027
Receipt Date:	07-FEB-2014
Filing Date:	08-AUG-2013
Time Stamp:	17:03:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	IDS.pdf	92987 5c9c5d0db74a5a9cde78f2f5f3a2dbf6cefc3a8a	no	1

Warnings:	
Information:	

2	Information Disclosure Statement (IDS) Form (SB08)	PTO-1449.pdf	129902 35b70461171dc8463d8385d42b63b65eb83c22d8	no	2

Warnings:	
Information:	
This is not an USPTO supplied IDS fillable form	
Total Files Size (in bytes):	222889

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

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

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

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

Atty Dkt. No. 946478-000027 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventors:	Terrell Dallas Ginn et al.	Confirmation No.: 9538
App. No.:	13/962,903	Group Art Unit: 1736
Filed:	August 8, 2013	Examiner: Wayne A. Langel
Title:	**SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING**	

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

INFORMATION DISCLOSURE STATEMENT CITATION UNDER 37 C.F.R. § 1.97

Sir:

Attached is a list of documents on form PTO-1449 along with a copy of any cited foreign patent documents and non-patent literature documents in accordance with 37 CFR 1.98(a)(2).

It is requested that the Examiner consider these documents and officially make them of record in accordance with the provisions of 37 C.F.R. § 1.97 and Section 609 of the MPEP. By identifying the listed documents, Applicant in no way makes any admission as to the prior art status of the listed documents, but is instead identifying the listed documents for the sake of full disclosure.

This Information Disclosure Statement is being filed before the mailing date of a first Office Action on the merits in the present application.

It is believed that there is no fee associated with this Communication, however, the Commissioner is hereby authorized to charge payment of any fee associated with this Communication, or credit any overpayment to Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC
430 Davis Drive, Suite 500
Post Office Box 13706
Research Triangle Park, NC 27709
Tel Charlotte Office (704) 331-1027
Fax Charlotte Office (704) 339-5800

Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on February 7, 2014.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/962,903

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	29 minus 20 =	* 9	x 40 =	360	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	1090		TOTAL	

APPLICATION AS AMENDED - PART II

AMENDMENT A

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

AMENDMENT B

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/962,903	08/08/2013	1731	1160	946478-000027	29	3

CONFIRMATION NO. 9538

UPDATED FILING RECEIPT

24239
MOORE & VAN ALLEN PLLC
P.O. BOX 13706
Research Triangle Park, NC 27709

OC000000065863182

Date Mailed: 01/07/2014

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

Inventor(s)

Terrell Dallas Ginn, Milton, KY;
Danny Lynn Gray, Marietta, GA;

Applicant(s)

Terrell Dallas Ginn, Milton, KY;
Danny Lynn Gray, Marietta, GA;

Power of Attorney: None

Domestic Applications for which benefit is claimed - None.
A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 08/23/2013

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/962,903**

Projected Publication Date: 02/12/2015

Non-Publication Request: No

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

Prolime Agriculture, LLC - Exhibit 1004 - Page 328

Title

SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING

Preliminary Class

106

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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

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

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

12-20-13



Atty Docket No. 946478-000027 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Terrell Dallas Ginn et al.	Confirmation No.: 9538
App. No.:	13/962,903	Group Art Unit: 1731
Filed:	August 8, 2013	Examiner: Not Yet Assigned
Title:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING	

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

RESPONSE TO NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION AND THE NOTICE OF INCOMPLETE REPLY (NONPROVISIONAL)

In response to the Notice to File Missing Parts of Application of Nonprovisional Application dated September 4, 2013 and the Notice of Incomplete Reply (Nonprovisional) dated December 13, 2013, enclosed are the following:

- ☒ A new Application Data Sheet in compliance with 37 CFR 1.76 identifying the mailing address and residence of each inventor.
- ☒ Applicant claims small entity status.
- ☐ Fees in the amount of $ surcharge under 37 C.F.R.§ 1.16(f) are being authorized via EFT when electronically filing
- ☒ Any deficiency, additional fee, or credit may be charged to our Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

Date: December 19, 2013

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC
430 Davis Drive, Suite 500
Post Office Box 13706
Research Triangle Park, NC 27709
Tel Charlotte Office (704) 331-1027
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OPAP
DEC 19 2013
PATENT & TRADEMARK OFFICE
AKINA-18

Atty Docket No. 946478-000027 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Terrell Dallas Ginn et al.	Confirmation No.: 9538
App. No.:	13/962,903	Group Art Unit: 1731
Filed:	August 8, 2013	Examiner: Not Yet Assigned
Title:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING	

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

PETITION AND FEE FOR EXTENSION OF TIME 37 C.F.R. § 1.136(a)

This is a petition for an extension of time for a total period of two (2) months to respond to the Notice to Filing Missing Parts of Nonprovisional Application dated September 4, 2013 and the Notice of Incomplete Reply (Nonprovisional) dated December 13, 2013.

2. Applicant claims small entity status.

3. Calculation of extension fee (37 C.F.R. § 1.17(a)(1)-(a)(5)):

Total Months Requested	Fee For Large Entity	Fee For Small Entity	Fee For Micro Entity
☐ one month	$200.00	$100.00	$50.00
☒ two months	$600.00	$300.00	$150.00
☐ three months	$1,400.00	$700.00	$350.00
☐ four months	$2,200.00	$1,100.00	$550.00
☐ five months*	$3,000.00	$1,500.00	$750.00

**Cannot be used to exceed six-month statutory limit for response to an Official Action.*

☒ Payment by check in the amount of $200.00. A one-month extension of time ($100.00) was previously submitted via EFT on December 4, 2013, with the response to the Notice to File Missing Parts of Nonprovisional Application dated September 4, 2013.

☒ Please charge any deficiency or credit any overpayment to Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

Date: December 19, 2013

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC
430 Davis Drive, Suite 500
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12/24/2013 ZJUHAR1 00000011 13962903
01 FC:2252 200.00 OP

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PTO/AIA/14 (11-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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OPAP AKMA-8 DEC 19 2013 PATENT & TRADEMARK OFFICE

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	946478-000027
	Application Number	
Title of Invention	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Terrell	Dallas	Ginn	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Milton	State/Province	KY	Country of Residence	US

Mailing Address of Inventor:

Address 1	322 Mount Carmel Road		
Address 2			
City	Milton	State/Province	KY
Postal Code	40045	Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Danny	Lynn	Gray	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Marietta	State/Province	GA	Country of Residence	US

Mailing Address of Inventor:

Address 1	3637 Summerford Drive		
Address 2			
City	Marietta	State/Province	GA
Postal Code	30062	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

PTO/AIA/14 (11-13)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	946478-000027
	Application Number	
Title of Invention	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING	

☐ An Address is being provided for the correspondence Information of this application.			
Customer Number	24239		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING		
Attorney Docket Number	946478-000027	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)		**Suggested Figure for Publication (if any)**	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	24239		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the application number blank.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

PTO/AIA/14 (11-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	946478-000027
	Application Number	
Title of Invention	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING	

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Authorization to Permit Access:

☐ Authorization to Permit Access to the Instant Application by the Participating Offices

PTO/AIA/14 (11-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	946478-000027
	Application Number	
Title of Invention	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING	

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.
In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◉ Assignee	○ Legal Representative under 35 U.S.C. 117	○ Joint Inventor
○ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☒

Organization Name	Charah, Inc.		
Mailing Address Information For Applicant:			
Address 1	12601 Plantside Drive		
Address 2			
City	Louisville	**State/Province**	KY
Country	US	Postal Code	40299
Phone Number		Fax Number	

PTO/AIA/14 (11-13)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	946478-000027
	Application Number	
Title of Invention	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING	

Email Address	

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication . An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Signature	/hbw/			Date (YYYY-MM-DD)	2013-12-19
First Name	Henry B.	Last Name	Ward, III	Registration Number	42212

Additional Signature may be generated within this form by selecting the Add button.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	946478-000027
	Application Number	
Title of Invention	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**



EXPRESS MAIL CERTIFICATE

EXPRESS MAIL LABEL NUMBER: EI 658911130 US

Date of Deposit: December 19, 2013

First Named Inventor: Terrell Dallas Ginn

For: SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING

Attorney Docket No.: 946478-000027

I hereby certify that the following documents:

1. Petition and Fee for Extension of Time 37 C.F.R. § 1.136(a) (1 page).
2. Response to Notice to File Missing Parts of Nonprovisional Application dated September 4, 2013 and Notice of Incomplete Reply (Nonprovisional) dated December 13, 2013 (1 page).
3. Application Data Sheet (6 pages).
4. Check in the amount of $200.
5. Express Mail Certificate (1 page).

are being deposited in a single envelope with the United States Postal Services "Express Mail" service under 37 C.F.R. 1.10 on the date indicated above and such envelope is addressed to: Mail Stop Missing Parts, P.O. Box 1450, Alexandria, VA 22313-1450

Maggie Purvis
(Name of Person Mailing Documents)

(Signature of Person Mailing Documents)

CHAR2\1356080v1

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/962,903

APPLICATION AS FILED - PART I

	(Column 1)	(Column 2)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE($)	FEE($)		RATE($)	FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	29 minus 20 =	* 9	x 40 =	360	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	1090		TOTAL	

APPLICATION AS AMENDED - PART II

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

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/962,903	08/08/2013	Terrell Dallas Ginn	946478-000027

CONFIRMATION NO. 9538

24239
MOORE & VAN ALLEN PLLC
P.O. BOX 13706
Research Triangle Park, NC 27709

FORMALITIES LETTER

OC000000065420026

Date Mailed: 12/13/2013

NOTICE OF INCOMPLETE REPLY (NONPROVISIONAL)

Filing Date Granted

The U.S. Patent and Trademark Office has received your reply on 12/04/2013 to the Notice to File Missing Parts (Notice) mailed 09/04/2013 and it has been entered into the nonprovisional application. The reply, however, does not include the following items required in the Notice. A complete reply must be timely filed to prevent ABANDONMENT of the above-identified application. Replies should be mailed to: Mail Stop Missing Parts, Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450.

Applicant is given **TWO MONTHS** from the date of the Notice to File Missing Parts (Notice) mailed 09/04/2013 within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- A mailing address for each inventor has not been submitted. A new application data sheet (ADS) in compliance with 37 CFR 1.76 or inventor's oath or declaration in compliance with 37 CFR 1.63 identifying the mailing address and residence (if the inventor lives at a location which is different from where the inventor customarily receives mail) is required.
  Terrell Dallas Ginn
  Danny Lynn Gray

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/wtsige/

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

Prolime Agriculture, LLC - Exhibit 1004 - Page 342

PTO/AIA/01 (06-12)
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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING

As the below named inventor, I hereby declare that:

This declaration is directed to:

- ☐ The attached application, or
- ☑ United States application or PCT international application number 13/962,903 filed on August 8, 2013.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Danny Lynn Gray Date (Optional) :

Signature: Danny Lynn Gray

Note: An application data sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/SB/AIA01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

Privacy Act Statement

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

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

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

PTO/AIA/01 (06-12)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING

As the below named inventor, I hereby declare that:

This declaration is directed to:

- ☐ The attached application, or
- ☑ United States application or PCT international application number 13/962,903 filed on August 8, 2013.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

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LEGAL NAME OF INVENTOR

Inventor: Terrell Dallas Ginn Date (Optional): _____

Signature: _____

Note: An application data sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/SB/AIA01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

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

Atty Dkt. No. 946478.000027 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Ginn et al.	Confirmation No.: 9538
Appl No.:	13/962,903	Group Art Unit: 1731
Filed:	August 8, 2013	Examiner: Not Yet Assigned
Title:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING	

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

PETITION AND FEE FOR EXTENSION OF TIME 37 C.F.R. § 1.136(a)

This is a petition for an extension of time for a total period of one (1) month to respond to the Office Action dated September 4, 2013.

2. Applicant claims small entity status
3. Calculation of extension fee (37 C.F.R. § 1.17(a)(1)-(a)(5)):

Total Months Requested	Fee For Large Entity	Fee For Small Entity	Fee For Micro Entity
☒ one month	$200.00	$100.00	$50.00
☐ two months	$600.00	$300.00	$150.00
☐ three months	$1,400.00	$700.00	$350.00
☐ four months	$2,200.00	$1,100.00	$550.00
☐ five months*	$3,000.00	$1,500.00	$750.00

**Cannot be used to exceed six-month statutory limit for response to an Official Action.*

☒ Payment by EFT in the amount of $100.00.
☒ Charge any deficiency or credit any overpayment to Deposit Account No. 13-4365.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
MOORE & VAN ALLEN PLLC
430 Davis Drive, Suite 500
Post Office Box 13706
Research Triangle Park, NC 27709
Tel Charlotte Office (704) 331-1027
Fax Charlotte Office (704) 339-5800

Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on December 4, 2013.

Atty Dkt. No. 946478.000027 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Ginn et al.	Confirmation No.: 9538
Appl No.:	13/962,903	Group Art Unit: 1731
Filed:	August 8, 2013	Examiner: Not Yet Assigned
Title:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING	

SUBMISSION OF DECLARATION FOR U.S. APPLICATION NO. 13/962,903 ERROR! REFERENCE SOURCE NOT FOUND.

Commissioner for Patents
Post Office Box 1450
Alexandria, Virginia 22313-1450

Sir:

☒ Transmitted herewith is the executed Declaration for the above-referenced application.

☒ Applicant claims Small entity status.

☒ Payment of $ 70 fee previously made at the time this application was filed.

Respectfully submitted,

/hbw/

Henry B. Ward, III
Registration No. 42,212

CUSTOMER NUMBER 24239
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Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on December 4, 2013.

Electronic Patent Application Fee Transmittal

Application Number:	13962903
Filing Date:	08-Aug-2013
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell D. Ginn
Filer:	Henry B. Ward
Attorney Docket Number:	946478-000027

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with $0 paid	2251	1	100	100

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**100**

Electronic Acknowledgement Receipt

EFS ID:	17549743
Application Number:	13962903
International Application Number:	
Confirmation Number:	9538
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell D. Ginn
Customer Number:	24239
Filer:	Henry B. Ward
Filer Authorized By:	
Attorney Docket Number:	946478-000027
Receipt Date:	04-DEC-2013
Filing Date:	08-AUG-2013
Time Stamp:	19:50:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$100
RAM confirmation Number	6967
Deposit Account	
Authorized User	

File Listing:

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

1	Oath or Declaration filed	946478-000027_Declarations.pdf	1730608 e9f40e065e7a463deb41ecacb1fdf7d5471c6baa	no	4
Warnings:					
Information:					
2	Extension of Time	EOT.pdf	145449 7944d7087433732a96697fe4dc7b58ed786ad8d6	no	1
Warnings:					
Information:					
3	Oath or Declaration filed	Submission_of_Declaration.pdf	91597 2819e3a6b3e1f17db7a00d5cef5c53a45fe86c34	no	1
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30649 367de5ccfac3e72c2f4b9e2deb97467aff6c42a3	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	1998303	

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

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

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

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

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/962,903	08/08/2013	Terrell D. Ginn	946478-000027

CONFIRMATION NO. 9538

24239
MOORE & VAN ALLEN PLLC
P.O. BOX 13706
Research Triangle Park, NC 27709

FORMALITIES LETTER

OC000000063411848

Date Mailed: 09/04/2013

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The inventor's oath or declaration or an application data sheet (ADS) naming each inventor has not been submitted. An inventor's oath or declaration in compliance with 37 CFR 1.63 or 1.64 executed by or with respect to each inventor, or a properly executed ADS in compliance with 37 CFR 1.76 identifying each inventor by his or her legal name, mailing address, and residence (if an inventor lives at a location which is different from where the inventor customarily receives mail) is required. If an ADS as set forth above is provided, the filing of the inventor's oath or declaration may be postponed until the application is otherwise in condition for allowance. See 37 CFR 1.53(f).

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

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

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

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/mhteklu/

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

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/962,903

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	29 minus 20 =	* 9	x 40 =	360	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	1090		TOTAL	

APPLICATION AS AMENDED - PART II

AMENDMENT A

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

AMENDMENT B

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/962,903	08/08/2013	1731	1160	946478-000027	29	3

CONFIRMATION NO. 9538

24239
MOORE & VAN ALLEN PLLC
P.O. BOX 13706
Research Triangle Park, NC 27709

FILING RECEIPT

OC000000063411847

Date Mailed: 09/04/2013

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

Inventor(s)

Terrell D. Ginn, Residence Not Provided;

Applicant(s)

Terrell D. Ginn, Residence Not Provided;

Power of Attorney: None

Domestic Applications for which benefit is claimed - None.
A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 08/23/2013

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/962,903**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

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

Prolime Agriculture, LLC - Exhibit 1004 - Page 356

Title

SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING

Preliminary Class

106

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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

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

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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PTO/AIA/15 (03-13)
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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	946478-000027
First Named Inventor	Terrell D. Ginn
Title	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
Filed via EFS	August 8, 2013

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☐ **Fee Transmittal Form** (PTO/SB/17 or equivalent)
2. ☐ **Applicant asserts small entity status.** See 37 CFR 1.27
3. ☐ **Applicant certifies micro entity status.** See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
4. ☑ **Specification** [*Total Pages* 30] Both the claims and abstract must start on a new page. *(See MPEP § 608.01(a) for information on the preferred arrangement)*
5. ☑ **Drawing(s)** (35 U.S.C. 113) [*Total Sheets* 4]
6. **Inventor's Oath or Declaration** [*Total Pages* ____] *(including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e))*
   a. ☐ Newly executed (original or copy)
   b. ☐ A copy from a prior application (37 CFR 1.63(d))
7. ☐ **Application Data Sheet** * *See note below.* See 37 CFR 1.76 (PTO/AIA/14 or equivalent)
8. **CD-ROM or CD-R** in duplicate, large table, or Computer Program (*Appendix*)
   ☐ Landscape Table on CD
9. **Nucleotide and/or Amino Acid Sequence Submission** *(if applicable, items a. – c. are required)*
   a. ☐ Computer Readable Form (CRF)
   b. ☐ Specification Sequence Listing on:
      i. ☐ CD-ROM or CD-R (2 copies); or
      ii. ☐ Paper
   c. ☐ Statements verifying identity of above copies

ADDRESS TO: **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450**

ACCOMPANYING APPLICATION PAPERS

10. ☐ **Assignment Papers** (cover sheet & document(s)) Name of Assignee ____
11. ☐ **37 CFR 3.73(c) Statement** (*when there is an assignee*) ☐ **Power of Attorney**
12. ☐ **English Translation Document** (*if applicable*)
13. ☐ **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    ☐ Copies of citations attached
14. ☐ **Preliminary Amendment**
15. ☐ **Return Receipt Postcard** (*MPEP § 503*) (*Should be specifically itemized*)
16. ☐ **Certified Copy of Priority Document(s)** (*if foreign priority is claimed*)
17. ☐ **Nonpublication Request** Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
18. ☑ **Other:** Petition to Accept Black and White Drawings

***Note:** (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 **must** be included in an Application Data Sheet (ADS).
(2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

19. CORRESPONDENCE ADDRESS

☑ The address associated with Customer Number: 24239 OR ☐ Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone		Email	

Signature		Date	August 8, 2013
Name (Print/Type)	Henry B. Ward, III	Registration No. (Attorney/Agent)	42,212

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING

BACKGROUND

[0001] Industrial process plants for chemical manufacturing and power plants often produce a calcium sulfate by-product or co-product referred to herein as synthetic gypsum. Synthetic gypsum, produced by power plants, sometimes referred to as flue-gas desulfurization ("FGD") gypsum, is a by-product recovered from flue gas streams resulting from the burning of energy sources containing concentrations of sulfur (e.g., coal). Synthetic gypsum is normally produced from scrubbing the flue gas stream with a limestone slurry that will capture the sulfur released from the fuel burned in the boiler. The limestone slurry and captured sulfur can be dewatered to separate the liquids and solids to create a calcium sulfate product that is referred to as "synthetic gypsum".

[0002] In contrast to synthetic gypsum, "natural gypsum" is mined from naturally occurring deposits in various regions of the world. In most cases, natural gypsum is formed as sea water evaporates. Capillary action brings saline water to the surface where the salts are precipitated. As such, natural gypsum is generally found in layers formed under salt water. In addition to the wallboard industry and cement manufacturing, natural gypsum is also utilized in agriculture as calcium and sulfur are two key nutrient components needed by plants. More specifically, natural gypsum and can contain calcium sulfate at varying concentrations, usually at less moisture content and lower calcium sulfate purity as compared to synthetic gypsum. Natural gypsum, because of its lower moisture content and free flowing granular form, can be easier to spread with conventional farm equipment. Because natural gypsum has insoluable mineral components and also solubilizes rather slowly, natural gypsum can provide a slow continual

release of low level sulfur to the soil for more than just the year it is applied. However, this slow release of sulfur can reduce the availability of the sulfur from natural gypsum when it is needed to promote plant growth, which can be a disadvantage since the sulfur is not readily available and, thus, leaches through the soil without adding nutrients to the plant at the time period when needed.

[0003] Synthetic gypsum is unique in that the industrial process from which it is derived causes the calcium sulfate to have a very fine particle size typically in the range of 5 to 150 micron and, therefore, it has greater surface area and retains moisture from the dewatering process. Disadvantageously, fine particle minerals are known to have difficult physical handling properties when they contain moisture causing the materials to stick to material handling equipment and spreading devices. The finer particle size causes the moisture to be difficult to separate from the solid particles. Although FGD systems can generate large quantities of synthetic gypsum products, because of the difficult physical handling properties, only a portion of the synthetic gypsum produced can be beneficially recycled for use in the wallboard industry. Lesser quantities of synthetic gypsum are processed and utilized in the cement manufacturing industry. The remaining synthetic gypsum must be placed in landfills or deposited in surface impoundments. Since the production of synthetic gypsum is rapidly increasing as new scrubbers are added to new or existing power plants in order to comply with federal, state or local air pollution control regulations, a need exists to increase the beneficial uses of synthetic gypsum.

BRIEF SUMMARY

[0004] Embodiments of the invention are directed to processing and forming, which can include pelletizing, granulating, or extruding, synthetic gypsum and methods and systems for producing pelletized synthetic gypsum. In a first aspect of the invention, a method of producing

a fertilizer is provided. The method includes processing the synthetic gypsum and then discharging the processed synthetic gypsum onto a forming device, which may comprise a pelletizer, granulator, or extruder. The method further includes feeding a binder composition to the processing equipment and/or forming device. Additionally, the method includes pelletizing the material fed to the pelletizer to a mean pellet size guide number ("SGN") from approximately 150 to approximately 300. In some embodiments, the mean pellet SGN is from approximately 250 to approximately 280. The resulting pelletized synthetic gypsum has a crush strength from approximately 2 pound-force ("lbf") to approximately 12 lbf. In another embodiment, the resulting pelletized synthetic gypsum has a crush strength from approximately 3 lbf to approximately 8 lbf. In another embodiment, the resulting pelletized synthetic gypsum has a crush strength from approximately 4 lbf to approximately 6 lbf.

[0005] In some embodiments of the method, the synthetic gypsum fed to the forming device has a mean particle size of less than 100 microns.

[0006] In some embodiments of the method, the binder composition includes a water soluble binder. In some embodiments, the binder composition includes a water soluble binder that comprises, or is one or more of the group consisting of, brewers condensed solubles, lignosulfonate, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, or cellulose based polymer binders. The lignosulfonate may be a calcium lignosulfonate.

[0007] In some embodiments, the method further includes feeding an additive to the mixer or to the forming device. The additive can include at least one of finely ground calcium

carbonate, calcium bentonite, kaolin clays, manganese, zinc, boron, calcium, copper, and elemental sulfur. In particular embodiments, the additive includes elemental sulfur.

[0008] In another aspect of the invention, a fertilizer is provided. The fertilizer includes pellets. The pellets include synthetic gypsum and a binder composition. The pellets have a mean pellet SGN from approximately 150 to approximately 300. In some embodiments the mean SGN is from approximately 250 to approximately 280. The resulting pelletized synthetic gypsum has a crush strength from approximately 2 lbf to approximately 12 lbf. In another embodiment, the resulting pelletized synthetic gypsum has a crush strength from approximately 4 lbf to approximately 8 lbf. In another embodiment, the resulting pelletized synthetic gypsum has a crush strength from approximately 4 lbf to approximately 6 lbf.

[0009] In some embodiments of the fertilizer, the binder composition includes a water soluble binder. In some embodiments, the binder composition includes a water soluble binder that comprises, or is one or more of the group consisting of, brewers condensed solubles, lignosulfonate, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, or cellulose based polymer binders. The lignosulfonate may be a calcium lignosulfonate.

[0010] In some embodiments of the fertilizer, the pellets further include an additive. The additive can include at least one of finely ground calcium carbonate, calcium bentonite, kaolin clays, manganese, zinc, boron, calcium, copper, and elemental sulfur. In particular embodiments, the additive includes elemental sulfur. In particular embodiments, the additive includes elemental sulfur.

[0011] In another aspect of the invention, a process for producing a fertilizer is provided. The process includes feeding synthetic gypsum to a dryer, feeding dried synthetic gypsum and a binder composition to a mixer, mixing the material fed to the mixer, feeding the mixed material to a forming device, pelletizing the material fed to the forming device, feeding the pelletized material to a dryer, drying the pelletized material, feeding the dried pelletized material to a screener, and screening the dried pelletized material fed to the screener to a mean pellet SGN from approximately 150 to approximately 300. In some embodiments, the mean SGN is from approximately 250 to approximately 280. The process further includes recycling unders and overs removed during screening to the mixer. The resulting pelletized synthetic gypsum has a crush strength from approximately 2 lbf to approximately 12 lbf. In another embodiment, the resulting pelletized synthetic gypsum has a crush strength from approximately 3 lbf to approximately 8 lbf. In another embodiment, the resulting pelletized synthetic gypsum has a crush strength from approximately 4 lbf to approximately 6 lbf.

[0012] In some embodiments of the process, the synthetic gypsum fed to the mixer has a mean particle size of less than 100 microns.

[0013] In some embodiments of the process, the binder composition includes a water soluble binder. In some embodiments, the binder composition includes a water soluble binder that comprises, or is one or more of the group consisting of, brewers condensed solubles, lignosulfonate, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, or cellulose based polymer binders. The lignosulfonate may be a calcium lignosulfonate.

[0014] In some embodiments, the process further includes feeding an additive to the mixer. The additive can include at least one of finely ground calcium carbonate, calcium bentonite, kaolin clays, manganese, zinc, boron, calcium, copper, and elemental sulfur. In particular embodiments, the additive includes elemental sulfur.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Having thus described embodiments of the invention in general terms, reference will now be made to the accompanying drawings, where:

Fig. 1A is a 100 times magnification illustration of natural gypsum, in accordance with embodiments of the present invention;

Fig. 1B is a 100 times magnification illustration of synthetic gypsum, in accordance with embodiments of the present invention; and

Fig. 2 illustrates a process for pelletizing synthetic gypsum, in accordance with embodiments of the present invention.

Fig. 3 illustrates two (2) processes for drying synthetic gypsum, in accordance with embodiments of the present invention.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0016] Embodiments of the present invention now may be described more fully hereinafter with reference to the accompanying drawings, in which some, but not all, embodiments of the invention are shown. Indeed, the invention may be embodied in many different forms and should not be construed as limited to the embodiments set forth herein;

rather, these embodiments are provided so that this disclosure may satisfy applicable legal requirements. Like numbers refer to like elements throughout.

[0017] Synthetic gypsum is generally produced in limestone-forced oxidation scrubbers that remove sulfur dioxide from the flue gas stream after coal combustion. In general, a wet scrubbing process first exposes the flue gases to a slurry of hydrated lime. The lime slurry is formed by grinding limestone to a small particle size and combining the powdered limestone with water to make a mixture that can be pumped at regulated flow rates to the scrubber equipment. Capture of sulfur by the lime slurry occurs in an absorber vessel and initially forms calcium sulfite ($CaSO_3 \cdot 0.5H_2O$). The scrubber slurry is then transferred to a storage tank where the aeration occurs. Forcing additional air into the system oxidizes the calcium sulfite and converts it into gypsum, i.e., $CaSO_4 \cdot 2H_2O$ that results in solids concentration. The higher solids gypsum is pumped to a dewatering system. At the dewatering portion of the gypsum handling process the gypsum is dewatered and washed to remove water-soluble salts and elements such as sodium chlorides, potassium chlorides and boron (B). Dewatering can also take place during the oxidation process. Generally, the final step of the gypsum production process involves partial removal of water by a combination of centrifugation and vacuum filtration so that the synthetic gypsum as a moisture content of approximately 6% to approximately 16%. The synthetic gypsum that is recovered is high quality and suitable for various industrial (e.g., wallboard) uses. As noted above, the supply of synthetic gypsum is increasing due to more stringent environmental regulations coupled with the addition of new equipment at coal-fired power plants.

[0018] While synthetic gypsum and natural gypsum generally have similar chemical properties (i.e., calcium and sulfur percentage compositions), synthetic gypsum cannot be

effectively utilized in the agriculture industry due to its difficult material handling properties. Synthetic gypsum and natural gypsum have other material differences. Synthetic gypsum typically has a higher purity of CaSO4 in comparison to natural gypsum. Synthetic gypsum production also yields much smaller particle sizes than the natural gypsum that is mined. Most synthetic gypsum has a particle size less than 250 microns and often includes particle sizes less than 200 microns, less than 150 microns, less than 100 microns, and even less than 50 microns. Indeed, most synthetic gypsum has particle sizes in the range of approximately 5-150 microns. **Fig. 1A** illustrates a 100x magnification of typical natural mined gypsum. By comparison, **Fig. 1B** illustrates a 100x magnification of typical synthetic gypsum. As illustrated, synthetic gypsum obtained is generally multiple orders of magnitude smaller than natural mined gypsum. As an example, an analysis of synthetic gypsum from a power plant in Ohio (which is typical of synthetic gypsum) in comparison with natural gypsum mined in Ohio produced the following results:

Table 1: Comparison of Synthetic Gypsum and Natural Gypsum Particle Size

Particle Size	Synthetic Gypsum (%)	Natural Gypsum (%)
>250 microns	0.14	100
150-250 microns	3.2	0
105-150 microns	33	0
74-105 microns	33	0
<74 microns	31	0

[0019] Due to the small particle sizes of synthetic gypsum, its moisture retention and resultant difficulty in material handling, agricultural applicability is minimal due to difficulties of feeding synthetic gypsum through spreading equipment onto or into the soil. Within the agriculture industry typical spreading equipment are designed to handle granular materials and are not capable of spreading such small particles that stick together. Synthetic gypsum, if it

could be effectively spread as an agricultural product, is a soluble source of the essential plant nutrients, calcium and sulfur, that would improve overall plant growth and also would improve the physical properties of some soils (especially heavy clay soils). Advantageously, the present invention provides a pelletized, granulated, or extruded synthetic gypsum that will promote soil aggregation and, thus, will (1) help prevent dispersion of soil particles, (2) reduce surface crust formation, (3) promote seedling emergence, and (4) increase water infiltration rates and movement through the soil profile. The pelletized, granulated, or extruded synthetic gypsum of the present invention also reduces erosion losses of soils and nutrients and reduce concentrations of soluble phosphorus in surface water runoff. Chemical properties improved by application of the pelletized, granulated, or extruded synthetic gypsum of the present invention include the mitigation of subsoil acidity and aluminum toxicity. This enhances deep rooting and the ability of plants to take up adequate supplies of water and nutrients during drought periods. The pelletized, granulated, or extruded synthetic gypsum of the present invention can also be used for sodic soil reclamation and can also be included as a component in synthetic soils for nursery, greenhouse, and landscape use.

[0020] Embodiments of the present invention are directed to reducing the moisture content and increasing the particle size of synthetic gypsum and improving its ease of spreading while maintaining the beneficial properties. Significant properties of pelletized synthetic gypsum for use as fertilizer include particle size and crush strength. Desirable particle sizes in some embodiments have a mean pellet SGN of approximately 100 to approximately 500, in some embodiments from approximately 100 to approximately 300, in some embodiments from approximately 150 to approximately 300, in some embodiments from approximately 200 to approximately 300, in some embodiments from approximately 250 to approximately 350, and in

some embodiments from approximately 250 to approximately 280. SGN is utilized generally in the fertilizer industry and is simply the diameter of the median granule size and is expressed in millimeters multiplied by 100. For example, a measurement of an SGN of 250 would correspond to a median granule size of 2.50 millimeters. Desirable crush strengths in some embodiments are from approximately 1 lbf to approximately 12 lbf, in some embodiments from approximately 2 lbf to approximately 10 lbf, in some embodiments from approximately 2 lbf to approximately 8 lbf, in some embodiments from approximately 3 lbf to approximately 8 lbf, in some embodiments greater than 2 lbf, in some embodiments greater than 3 lbf, and in some embodiments greater than 5 lbf. Another desirable measure of crush strength is the ability of the synthetic gypsum pellets of the present invention to substantially maintain integrity when being spread using an approximately 700 rotation per minute ("rpm") impeller up to an approximately 800 rpm impeller. Advantageously, such the synthetic gypsum pellets of the present invention are capable of being spread from approximately 60 feet to 100 feet, or in other embodiments, 70 feet to 90 feet or in still other embodiments 80 feet to 100 feet.

[0021] In order to achieve desired physical properties of the pellet, one or more binder additives may be utilized. In one embodiment, the binder composition includes a water soluble binder. In some embodiments, the binder composition includes a water soluble binder that comprises, or is one or more of the group consisting of, brewers condensed solubles, lignosulfonate, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, or cellulose based polymer binders. The lignosulfonate may be a calcium lignosulfonate.

[0022] Lignosulfonates, which are water-soluble anionic polyelectrolyte polymers. Lignosulfonates may vary in molecular mass from about 1,000 to about 140,000. An exemplary lignosulfonate is Norlig A™ calcium lignosulfonate solution supplied by LignoTech USA, Houston, TX. In some embodiments, it is desirable for the amount (wt.%) of lignosulfonate in the final pellet to be at least approximately 1%, in some embodiments from approximately 1% to approximately 5%, and in some embodiments approximately 2%.

[0023] **Fig. 2** illustrates one embodiment of a process for forming synthetic gypsum pellets. Synthetic gypsum is inputted into a dryer **10**, through feed line **1**, to reduce the moisture content and then introduced into a mixer **20**, such as a paddle/pin via feed line **4**. A binder is introduced to the mixer **20** via feed line **2**. Additional additives (if desired) may be introduced via feed line **3**. A recycle line **10** may also input material into the mixer **20**. While **Fig. 2** illustrates separate feed lines, it will be appreciated that the components may be input separately through the same feed line(s) or at the same time through the same feed line(s). While a paddle/pin mixer **20** is described, it will be appreciated that any suitable mixer type may be utilized to mix the synthetic gypsum, binder, and optional additional additives.

[0024] In one embodiment, a pin mixer is used in which dried synthetic gypsum having a density of 50 lbs/ft^3 to 65 lbs/ft^3 is fed at a rate of approximately 10 tons per hour ("tph") to approximately 18 tph. A binder of lignosulfonate having 18% to 48% solids is fed into the pin mixer at a rate of approximately 1 gallon per minute ("gpm") to approximately 8 gpm at a pressure of 35 psi to 55 psi. The spray location in one embodiment is +2, -6. The pin mixer mixes the contents at a speed of 250 rpm to 480 rpm and, in one embodiment, at 278 rpm. The synthetic gypsum mixture exits the pin mixture with a moisture content of 4% to 8%.

[0025] Regarding the drying step, synthetic gypsum may be converted into one of two hemihydrate forms of calcium sulfate ($CaSO4 \cdot \frac{1}{2}H2O$) through a series of one or more drying processes. Figure 4 illustrates a general process flow for executing the conversion of synthetic gypsum into hemihydrate. First, the synthetic gypsum may be dried. The purpose of drying the synthetic gypsum may be to remove free moisture from the raw material. Drying the synthetic gypsum may reduce its weighted moisture content from a typical range of approximately 6% to approximately 16% to less than approximately 1%. In some embodiments, a direct gas fired dryer or a rotary dryer may be utilized to dry the synthetic gypsum. The dryer may be configured to maintain a consistent temperature below the gypsum calcining temperature, the point at which dissociation of combined water begins to take place, of approximately 262°F. In one embodiment, the synthetic gypsum is dried in a direct gas fired flash dryer at approximately 100°F for approximately 2 to 20 seconds and, more preferably, 2 to 12 seconds.

[0026] In one optional embodiment, the dried synthetic gypsum may then be calcinated, a heating process wherein calcium sulfate is converted into hemihydrate through the disassociation of water molecules. Calcination may be performed, for example, by flash drying at high temperatures, cooking in large kettles, heating in furnaces or rotary kilns, using steam, cooking in aqueous suspensions, or the like. Typically, two types of hemihydrate can be formed from dried synthetic gypsum, namely alpha-hemihydrate and beta-hemihydrate.

[0027] Alpha-hemihydrate may be obtained by calcinating synthetic gypsum in a pressurized environment. Synthetic gypsum may be injected into a pressurized reactor configured to maintain a typical pressure range of 14.7 psia (1 atmosphere) to 55.3 psia (3.8 atmospheres). A fluid, such as pressurized air, steam, water, or combustion gases, may be injected into the reactor for creating a fluidized bed of gypsum, controlling humidity in the

reactor, and/or for heating purposes. The temperature within the reactor may be monitored or controlled to maintain a temperature range from approximately 250°F to 350°F with a preferred temperature for inducing the disassociation of water molecules being between 280°F and 300°F. Typically, the temperature is raised above 262°F, but kept below 325°F, to ensure that no other types of calcium sulfates are formed.

[0028] Beta-hemihydrates may be obtained by calcinating synthetic gypsum in a similar process as described above. However, to obtain beta-hemihydrates, the calcination process may occur in a vacuum environment, or at atmospheric pressure (e.g., 1 atmosphere). Typically, the temperature is maintained at or near 200°F to induce the disassociation of water molecules.

[0029] Upon the disassociation of water molecules, the calcinated synthetic gypsum may be converted into alpha- or beta-hemihydrate forms of calcium sulfate. In some embodiments, the calcination process may include multiple calcinations. Multiple calcinations may strengthen the hemi-hydrate product. In other embodiments, other temperature and/or pressure ranges may be used to convert the synthetic gypsum into hemihydrate, and the calcination process may be conducted over a predetermined period of time or on a time schedule.

[0030] Figure 3 illustrates a general process flow for the conversion of synthetic gypsum into hemihydrate. At block **302**, the process includes receiving synthetic gypsum. At block **304**, the process includes drying the synthetic gypsum via a dryer, wherein the dryer is a direct gas fired dryer or a rotary dryer configured to maintain a consistent temperature below 262 °F. At block **306** the process includes calcinating the dried synthetic gypsum, wherein calcinating the dried synthetic gypsum includes one of two processes.

[0031] To generate alpha-hemihydrate, at block **308**, the process includes injecting the dried synthetic gypsum into a pressurized reactor configured to maintain a consistent pressure

between 14.7 and 55.3 psia (between 1 and 3.8 atmospheres). At block **310**, the process includes maintaining a consistent temperature between 250 °F and 350 °F. At block **312**, the process includes inducing the disassociation of water molecules in the synthetic gypsum. At block **314**, the process includes converting the synthetic gypsum into alpha-hemihydrate.

[0032] To generate beta-hemihydrate, at block **316** the process includes injecting the dried synthetic gypsum into a vacuum or non-pressurized reactor configured to maintain consistent atmospheric pressure. At block **318**, the process includes maintaining a consistent temperature at approximately 200 °F. At block **320**, the process includes inducing the disassociation of water molecules in the synthetic gypsum. At block **322**, the process includes converting the synthetic gypsum into beta-hemihydrate.

[0033] While not illustrated in Fig. 2, it may be desirable to exclude a drying step for the synthetic gypsum prior to input into the mixer **20**. Typically, synthetic gypsum produced has a moisture content of greater than about 6%, and in some embodiments from approximately 8% to approximately 16%. In some embodiments, it is desirable to dry the synthetic gypsum to a moisture content of less than about 10%, in some embodiments less than about 7%, in some embodiments, less than about 5%, in some embodiments less than about 3%, and in some embodiments less than about 1%. In some embodiments, the synthetic gypsum is dried to approximately 1% moisture content prior to mixing/pelletizing.

[0034] Once mixed, the material exits the mixer **20** via line **5** and enters the forming device **30**. The forming device **30** may comprise a pelletizer, a granulator or an extruder. As used herein, a "pellet" means a fertilizer product made by a pelletizer, granulator, or extruder. The pelletizer may be any type of pelletizer such as disc/pan pelletizer, flat die pelletizer, ring die pelletizer, screw press pelletizer, hydraulic pelletizer, or the like. In other embodiments a

granulator or extruder may be used instead of a pelletizer. Additional binder may be introduced to the forming device **30** via line **2** if necessary. Typically, the binder is introduced into the forming device **30** via a spray system so as to conduct the addition of the binder in as uniform manner as possible.

[0035] In one embodiment, a pelletizer is used in which mixed synthetic gypsum is fed at a rate of approximately 10 tph to approximately 18 tph. The feed location in one embodiment is +2, -3. A binder of lignosulfonate having 18% to 48% solids is fed into the pelletizer at a rate of approximately 1 gallon per minute ("gpm") to approximately 8 gpm at a pressure of 35 psi to 55 psi. The spray location in one embodiment is +2, -6, -3, -10, -2, -8. The pelletizer pelletizes the mixed synthetic gypsum and binder using a pan rate of 5 rpm to 12 rpm at an angle of 50 degrees to 68 degrees. The synthetic gypsum pellets exit with a moisture content of 4% to 12%.

[0036] After pellet formation, the pellets exit the forming device **30** via line **6** and enter dryer **40** to remove excess moisture. The dryer **40** may be any type of dryer such as a rotary dryer, fluid bed dryer, drum dryer, or the like. Once the pellets have been dried, they exit the dryer **40** via line **7** and enter a screener **50**. The screener acts to screen out pellets that are too large or too small as desired. Typical screeners include vibrating screeners, rotary screeners, and the like. The final product exits the screener via line **8** to storage container **60**. Overs (i.e., pellets larger than specification) and unders (i.e., pellets smaller than specification) exit the screener and may be recycled to the mixer **20** via line **10**. Typically, the overs and unders are first introduced to a crusher, such as a hammermill, **70** via line **9** prior to recycling back to the mixer **20**.

[0037] In some embodiments, it may be desirable to add a micronutrient mix to the synthetic gypsum for an improved fertilizer product. It is contemplated that any material may be

added to the synthetic gypsum prior to forming depending upon the desired final product. Non-limiting example additives include calcium carbonate, kaolin clays, zinc, manganese, iron, copper, boron, carbon, chromium, lime, and humic acid. One exemplary additive is Wolf Trax Cropmix DDP available from Wolf Trax Inc., Winnipeg, Manitoba, Canada. Cropmix DDP contains 2% boron, 1% copper, 1% iron, 18% manganese, and 17% zinc.

[0038] In some exemplary embodiments, elemental sulfur is utilized as an additive. The use of elemental sulfur provides unique benefits to the fertilizer product. As noted above, sulfur is an important nutrient needed by plants. However, sulfur is only absorbed by plant-life in sulfate (SO_4) form. Elemental sulfur, when added to the soil, will slowly oxidize into sulfate form. The rate of oxidation may vary due to numerous factors such as microbiological population of the soil, the physical properties of the elemental sulfur source, and environmental conditions of the soil including temperature, soil moisture and aeration, soil pH, and fertility status of the soil. As elemental sulfur slowly oxidizes, it provides a continuous supply of sulfate to the plants. As such, a fertilizer that includes synthetic gypsum with elemental sulfur as an additive has the beneficial property of a "fast release" sulfate in the form of the synthetic gypsum with a continuous slow release of sulfate from the oxidation of elemental sulfur.

[0039] In some embodiments, the resulting pellet is particularly soluble in water. A benefit to the small raw material particle size of synthetic gypsum is the ease of dissolving the pellets into water. As noted above, some agricultural uses include applying synthetic gypsum in aqueous solution and sprayed to the plants. As such, the pelletized synthetic gypsum has the benefit of spreadability via conventional fertilizer spreaders as well as solubility in order to utilize the synthetic gypsum in solution with water.

EXAMPLES

EXAMPLE 1

[0040] Pelletization testing was conducted on synthetic gypsum with an objective to produce synthetic gypsum pellets demonstrating approximately 0.1 per cent attrition loss and 5.9 pounds average compression strength, with an approximate 92 per cent minus 4X plus 20 mesh fraction and about 85 per cent in the minus 6X plus 16 mesh range. Approximately 30 gallons of dried synthetic gypsum was tested. Norlig A™ calcium lignosulfonate solution was supplied by LignoTech USA as liquid binder additive.

[0041] The synthetic gypsum was analyzed for moisture content and bulk density *(see table 2)*.

TABLE 2: Processed Material Properties

Processed Materia	Moisture Content	Density *(aerated)*	Density *(compacted)*
		lbs / ft^3	*lbs / ft*^{3}
synthetic gypsum	1.5%	51.3	73.2

[0042] A Mars Mineral 8D32L Pin Mixer was utilized for testing the synthetic gypsum, using 25:75 Norlig A™ calcium lignosulfonate solution to water as liquid binder *(see table 3)*.

[0043] A pin mixer is a high speed, conditioning and micro-pelletizing device that converts powders into small agglomerates through the action of a high speed rotor shaft and pin assembly and the addition of liquids such as water, binders, oil or surfactants. The 8D32L Pin Mixer has an 8" diameter by 32" long mixing chamber, with two available binder nozzle ports. Its maximum feed throughput is 10 cubic feet per hour.

[0044] For each test run, the first port was used for liquid binder addition. The first two numbers of the nozzle tip size represent the angle of the flat spray. The second two numbers indicate the flow rate. The 4001 nozzle tip has the capability of applying 0.1 gallons of water per

minute in a 40 degree spray pattern at 40 psi. Test parameters and conditions for the pin mixer operation are tabulated below *(see table 3)*.

TABLE 3: 8D32L Pin Mixer Parameters and Conditions

Test	Feed		25:75 Norlig A™ to Water				Pin Mixer					GP	
Run	Rate		Nozzle	p	Rate		f	I	% F	P	T	MC	ABD
	ft³/hr	*lbs/min*	*tip*	*PSI*	*gal/min*	*lbs/min*	*RPM*	*A*		*HP*	*°F*	*%*	*lbs/ft³*
1	6.7	5.75	4001	3	0.03	0.23	1500	31	63%	12	122	5.4	46.3

p = pressure; f = rotational frequency; I = current; % F = per cent full load current; P = power;
GP = green pellet; T = temperature; MC = moisture content; ABD = aerated bulk density

[0045] A Mars Mineral DP-14 bench scale disc pelletizer was utilized for further testing the 8D32L Pin Mixer discharge, also using 25:75 Norlig A™ calcium lignosulfonate solution to water as liquid binder *(see table 3)*.

[0046] A disc pelletizer is an inclined, slowly spinning pan that rolls particulates into agglomerates. Both angle and speed are adjustable to control movement of the material. The growth of a pellet is similar to that of a snowball rolling down a hill, gaining size as it goes. Pellet size is manipulated by binder spray location, material feed location, pan speed and pan angle. Since gravity is the central force involved, disc pelletizers are efficient machines.

[0047] The DP-14 Agglo-Miser has a 14" diameter pan, the depth of which can be adjusted to 3", 6" or 9". Feed material and liquid binder are added manually to model automated systems utilized on larger scale discs or drums. For disc pelletization, the DP-14 pan depth was adjusted to 3"

[0048] The DP-14 disc was operated at the parameters indicated below *(see table 4)*. Liquid binder was applied to the feed material in the pan by means of a plastic spray bottle.

TABLE 4: DP-14 Disc Parameters

Test	Feed			25:75 NA to W		Pan		GP	
Run	ID	MC	Position	Application		f	Tilt	MC	ABD
		%	*clock*	*clock*	*in. to p*	*RPM*	*°*	*%*	*lbs/ft³*
1A	Run 1 Discharge	4.0	5	5	5	32	57	9.0	61.7

MC = moisture content; NA = Norlig A™ calcium lignosulfonate; W = water;
in. to p = inches from pan perimeter; f = rotational frequency; GP = green pellet;
ABD = aerated bulk density

[0049]

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[0050] Representative green pellets from test run 1A were dried in an 80°C convection oven and analyzed for moisture content, bulk density, attrition loss, compression strength (see table 4), and particle size (see table 5). A Mettler Toledo HR83-P Moisture Analyzer, set at 80°C, standard (constant temperature) drying program and switch-off criterion 5 (i.e., 1 mg per 140 seconds), was utilized. Bulk density analysis was conducted on the pellets, as discharged. Attrition analysis measured per cent losses of minus 10X plus 16 mesh pellets after 5 minutes on a 45 mesh screen in a Ro-Tap® test sieve shaker. Compression strength analysis was conducted on ⅛ inch diameter pellets.

[0051] Representative pin mixer discharge from test run 1, as fed to the DP-14 disc, was dried in an 80°C convection oven and analyzed by for moisture content, bulk density (see table 4), and particle size (see table 6).

TABLE 5: Pellet Properties

Test Run	Pelletizer Model(s)	% NA Solids *in* DP	*in* AP	AP % MC	Bulk Density *(aerated)* *lbs / ft³*	*(compacted)* *lbs / ft³*	% Attrition Loss	Compression *intact @ n lbs*
1A	8D32L to DP-14	1.5%	1.5%	0.1%	57.0	63.8	0.7%	3.7
1	8D32L	0.6%	0.6%	0.1%	54.4	n/a	n/a	n/a

NA = Norlig A™ calcium lignosulfonate; DP = (theoretically) dry pellets having 0.0% moisture content;
AP = actual pellets as analyzed; MC = moisture content

TABLE 6: Pellet Size

Sieve	Run 1A *8D32L to DP-14* *1.5% Norlig A Solids* *0.1% Moisture Content* Retained	Cumulative
4 mesh	0.7%	0.7%
6 mesh	0.4%	1.1%
10 mesh	32.5%	33.5%
16 mesh	62.1%	95.6%
20 mesh	2.4%	98.0%
30 mesh	0.1%	98.1%
Pan	1.9%	100.0%
	96.3% -4 X +20 mesh	
	93.6% -6 X +16 mesh	

TABLE 7: DP-14 Disc Feed Particle Size

Sieve	Run 1 Discharge *0.6% Norlig A Solids* *0.1% Moisture Content*	
	Retained	Cumulative
16 mesh	10.5%	10.5%
20 mesh	5.8%	16.3%
45 mesh	14.6%	30.9%
80 mesh	23.9%	54.8%
120 mesh	17.0%	71.7%
200 mesh	17.1%	88.8%
Pan	11.2%	100.0%

[0052] Pellets matching the size requirement and nearly matching the durability requirement were made from the low moisture synthetic gypsum, utilizing 25:75 Norlig A™ calcium lignosulfonate solution to water as liquid binder, with a Mars Mineral DP-14 Disc Pelletizer, fed with discharge from a Mars Mineral 8D32L Pin Mixer (see tables 2 and 3). These pellets exhibited 0.7 per cent attrition loss and 3.7 pounds average compression strength (see table 4). Ninety six per cent of the pellets, as discharged from the disc pelletizer, were in the minus 4 X plus 20 mesh fraction, and nearly 94 per cent were in the minus 6 X plus 16 mesh range (see table 5).

EXAMPLE 2

[0053] Synthetic gypsum sludge with 20% moisture was dried to a 1% moisture powder. Two parts dried gypsum were blended with one part sludge for a hand mix feed material with 7.5% moisture. Two (2) lbs of hand blended material was fed to a pin mixer with 0.2 lbs. lignosulfonate with 40% solids. The blended material with addition of the lignosulfonate was a wet fluff with no agglomerated particles and 8.5% final discharge moisture.

[0054] The blended material was discharged from the pin mixer to a pan pelletizer and sprayed with the same solution of 40% solids lignosulfonate as the material rotated around the pan pelletizer.

[0055] Small seed pellets formed and grew uniformly across the pan pelletizer to 5-10 mesh in size. Dried crush strength was measured to be 3-3.5 lbs. It is believed that a higher ratio of dried synthetic gypsum to sludge may increase crush strength by allowing for increased amounts of lignosulfonate in the final dried pellets.

EXAMPLE 3

[0056] 12% moisture synthetic gypsum and dried synthetic gypsum (1% moisture) was tested. In a first run a 50/50 mix of dry and wet synthetic gypsum was sprayed with lignosulfonate with 2% solids. During the addition of lignosulfonate, the mixture turned to a mud-like consistency and failed to granulate.

[0057] In a second run, 2500g of dry gypsum and 2% solids lignosulfonate (94g) mixed with 100g. of water was tested. The product granulated very well and the final crush strength of the pellets were between 3 lbf and 8 lbf.

[0058] In a third run, 12% moisture synthetic gypsum was combined with an equal amount of bentonite clay. With addition of 2% solids lignosulfonate, the product granulated very well and pellets with a crush strength of 8 lbf and 18 lbf was obtained.

[0059] While the present invention has been described in connection with the exemplary embodiments thereof, it will be understood that any modification will be apparent to those of ordinary skill in the art and that this application is intended to cover any adaptations or variations

thereof. Therefore, it is intended that this invention be limited only by the claims and equivalents thereof.

EXAMPLE 4

[0060] Full Scale Testing: Synthetic gypsum was dried from 8%, 10% 12% 14% and 16% moistures to less than 2% moisture. Dried gypsum was subsequently combined with 1% to 5% calcium bentonite in powder form to create a powder mixture that was fed to a mixer where a binder and water were added. The addition of binder liquid concentration varied between 25% and 65% binder and 75% and 35% water. At the mixer the addition of liquid varied between 1% and 14% of the solids by weight. Once thoroughly mixed, the mixture was discharged onto a pelletizer where the agglomeration process results in pellets of various size ranges from less than 500 micron diameter to 50 mm (2 inch) diameter. Once the pellets are formed to a desired size range, the pellets are routed to a dryer where the free moisture content is reduced to 0% to 4% by weight. The dried pellets are then processed through the screening equipment and crushers to attain the desired SGN range.

[0061] In some instances the pellets are dried to a moisture content that varies between 0% and 2.5% to cure the pellet. Strengths of the pellet are adjusted based on the binder concentrations and point where the binder is applied. In some circumstances the binder is added and the mixer from 1% to 10% of the solids weight and in some instances the binder is added on the pan pelletizer at 1% to 10% of the solids weight.

[0062] In one variation of the process, ground calcium carbonate powder is added to the synthetic gypsum to increase the weight of pellets and to improve pelletization process. Ground calcium carbonate is added at concentrations between 1% to 5% by weight prior to the mixer in

order to improve the pellet formation. The ground calcium carbonate powder is ground to a size that has a minimum of 90% passing a 325 mesh screen in order for the powder to enhance the pellet formation and improve pellet growth on the pan pelletizer.

[0063] In one embodiment the recycle concentration is increased from 2% to 40% to improve the pellet strengths. Recycled pellets are crushed to a size of 1 mm or less and then added to the dried gypsum prior to mixing in the pin mixer. The combination of recycled pellets and dried gypsum are then mixed with an adjusted binder concentration to reach 1% to10% binder with the binder fluid added at both the mixer and on the pan at various concentrations from 1% to 8% at each location.

EXAMPLE 5

Tests have also been conducted spread width of pelletized synthetic gypsum according to the present invention. In one embodiment, 100 lbs of synthetic gypsum pellets having a SGN of 360 and a hardness of 2.5 kg (5.5 pounds) was fed through a feedgate having a 2 inch diameter to a spreader having a fan frame of 3.50 inches to 3.75 inches with fin settings of 1-2-1-2 spinning at speeds of 700 rpm, 750 rpm and 800 rpm. Wind conditions were north-north-west at 8 miles per hour ("mph"). The vehicle carrying the spreader was traveling at 15 mph. Under these conditions, the spread was 70 feet to 78 feet.

EXAMPLE 6

Tests have also been conducted spread width of pelletized synthetic gypsum according to the present invention. In one embodiment, 100 lbs of synthetic gypsum pellets having a SGN of 299 and a hardness of 1.5 kg (3.3 pounds) was fed through a feedgate having a 2 inch diameter to

a spreader having a fan frame of 3.50 inches to 3.75 inches with fin settings of 1-2-1-2 spinning at speeds of 700 rpm and 750 rpm. Wind conditions were north-north-west at 8 miles per hour ("mph"). The vehicle carrying the spreader was traveling at 15 mph. Under these conditions, the spread was 65 feet to 75 feet.

[0064] While certain exemplary embodiments have been described and shown in the accompanying drawings, it is to be understood that such embodiments are merely illustrative of and not restrictive on the broad invention, and that this invention not be limited to the specific constructions and arrangements shown and described, since various other changes, combinations, omissions, modifications and substitutions, in addition to those set forth in the above paragraphs, are possible. Those skilled in the art will appreciate that various adaptations, modifications, and combinations of the just described embodiments can be configured without departing from the scope and spirit of the invention. Therefore, it is to be understood that, within the scope of the appended claims, the invention may be practiced other than as specifically described herein.

WHAT IS CLAIMED IS:

1. A method of producing a fertilizer comprising:

feeding synthetic gypsum to a forming device;

feeding a binder composition to the forming device; and

forming the material fed to the forming device to a mean pellet size guide number (SGN) from approximately 150 to approximately 300.

2. The method of Claim 1, wherein the resulting pelletized synthetic gypsum has a crush strength from approximately 2 lbf to approximately 12 lbf.

3. The method of Claim 1, wherein the synthetic gypsum fed to the forming device has a mean particle size of less than 100 microns.

4. The method of Claim 1, wherein the binder composition comprises a lignosulfonate.

5. The method of Claim 1, wherein the binder composition comprises a water soluble binder.

6. The method of Claim 1, wherein the binder composition comprises at least one of brewers condensed solubles, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, or cellulose based polymer binders.

7. The method of Claim 1, further comprising feeding an additive to the forming device, wherein the additive comprises at least one of ground calcium carbonate, calcium bentonite, kaolin clays, manganese, zinc, boron, calcium, copper, and elemental sulfur.

8. The method of Claim 9, wherein the additive comprises elemental sulfur.

9. The method of Claim 1, wherein the mean SGN is from approximately 250 to approximately 280.

10. The method of Claim 1, wherein the forming device comprises a pelletizer.

11. The method of Claim 1, wherein the forming device comprises a granulator or an extruder.

12. A fertilizer made by the method of Claim 1.

13. A fertilizer comprising:

pellets, the pellets comprising synthetic gypsum and a binder composition, the pellets further comprising mean pellet SGN from approximately 150 to approximately 300.

14. The method of Claim 13, wherein pellets have a crush strength from approximately 2 to approximately 12 lbf.

15. The fertilizer of Claim 13, wherein the binder composition comprises a lignosulfonate.

16. The fertilizer of Claim 13, wherein the binder composition comprises a water soluble binder.

17. The fertilizer of Claim 13, wherein the binder composition comprises at least one of brewers condensed solubles, sodium carbonate lignin, cane molasses, beet syrup, beet molasses, desugared beet molasses, whey, starch, starch derivatives, soy solubles with cane molasses, hydrolyzed collagen, amino acid solutions, cellulose derivatives, or cellulose based polymer binders.

18. The fertilizer of Claim 13, wherein the pellets further comprise an additive comprising at least one of ground calcium carbonate, calcium bentonite, kaolin clays, manganese, zinc, boron, calcium, copper, and elemental sulfur.

19. The fertilizer of Claim 13, wherein the pellets further comprise an additive comprising elemental sulfur.

20. The fertilizer of Claim 13, wherein the mean SGN is from approximately 250 to approximately 280.

21. A process for producing a fertilizer comprising:

feeding synthetic gypsum to a dryer;

feeding dried synthetic gypsum and a binder composition to a mixer;

mixing the material fed to the mixer;

feeding the mixed material to a forming device;

pelletizing the material fed to the forming device;

feeding the pelletized material to a dryer;

drying the pelletized material;

feeding the dried pelletized material to a screener; and

screening the material fed to the screener to a mean pellet size guide number (SGN) from approximately 150 to approximately 300.

22. The process of Claim 21, further comprising recycling unders and overs removed during screening to the mixer.

23. The process of Claim 21, wherein the resulting pelletized synthetic gypsum has a crush strength from approximately 2 lbf to approximately 12 lbf.

24. The process of Claim 21, wherein the synthetic gypsum fed to the mixer has a mean particle size of less than 100 microns.

25. The process of Claim 21, wherein the binder composition comprises a lignosulfonate.

26. The process of Claim 21, further comprising feeding an additive to the mixer, wherein the additive comprises at least one of manganese, zinc, boron, calcium, copper, and elemental sulfur.

27. The process of Claim 21, further comprising feeding an additive to the mixer, wherein the additive comprises elemental sulfur.

28. The process of Claim 21, wherein the mean SGN is from approximately 250 to approximately 280.

29. A fertilizer made by the process of Claim 21.

SYNTHETIC GYPSUM FERTILIZER PRODUCT
AND METHOD OF MAKING

ABSTRACT

Embodiments of the invention are directed to pelletized synthetic gypsum and methods and systems for producing pelletized synthetic gypsum. Synthetic gypsum is combined with a binder composition and pelletized to a desired size. The binder composition may include lignosulfonate. Additives may be included in the pellets such as various plant nutrients and micro-nutrients. An additive may include elemental sulfur. The resulting pellets may have a mean pellet size guide number (SGN) from approximately 150 to approximately 300 and a crush strength from approximately 2 lbf to approximately 12 lbf

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FIGURE 1A



FIGURE 1B

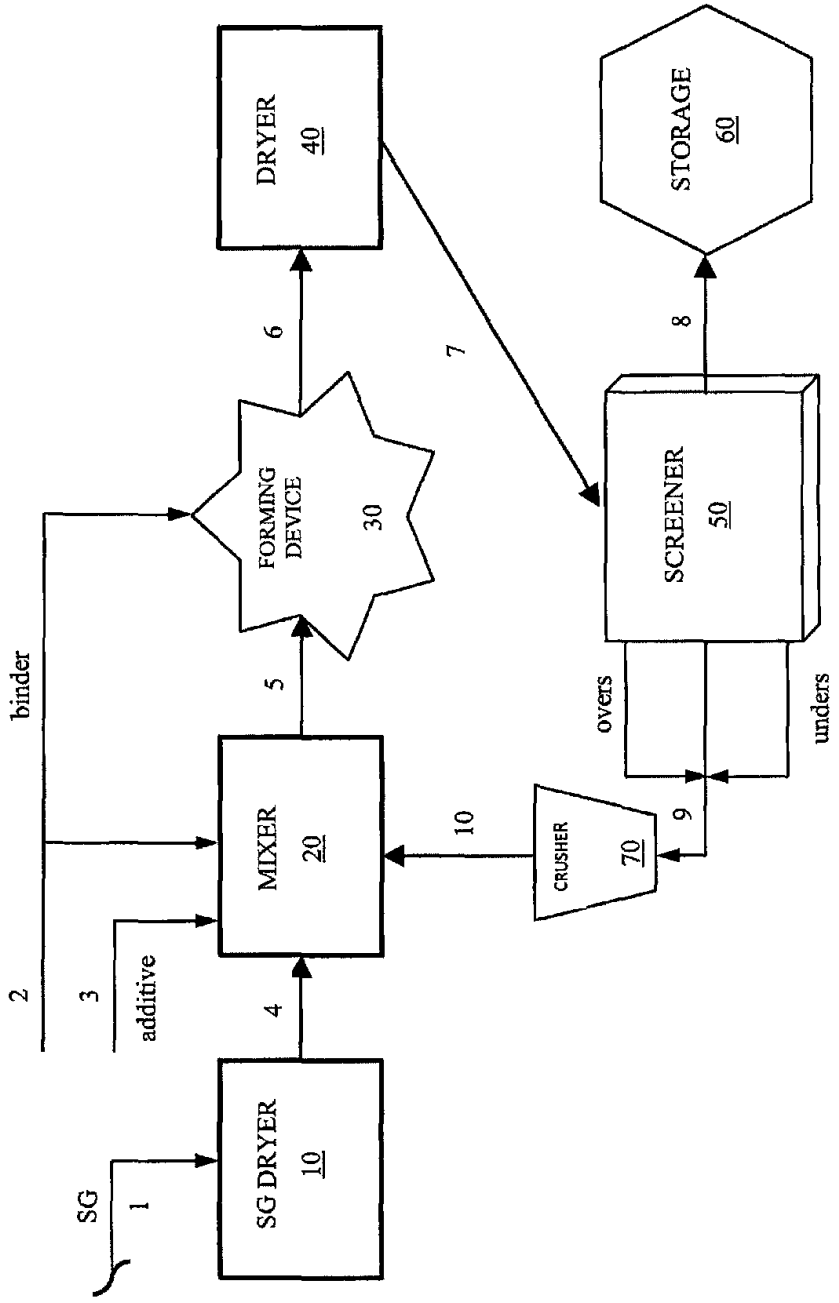


FIGURE 2

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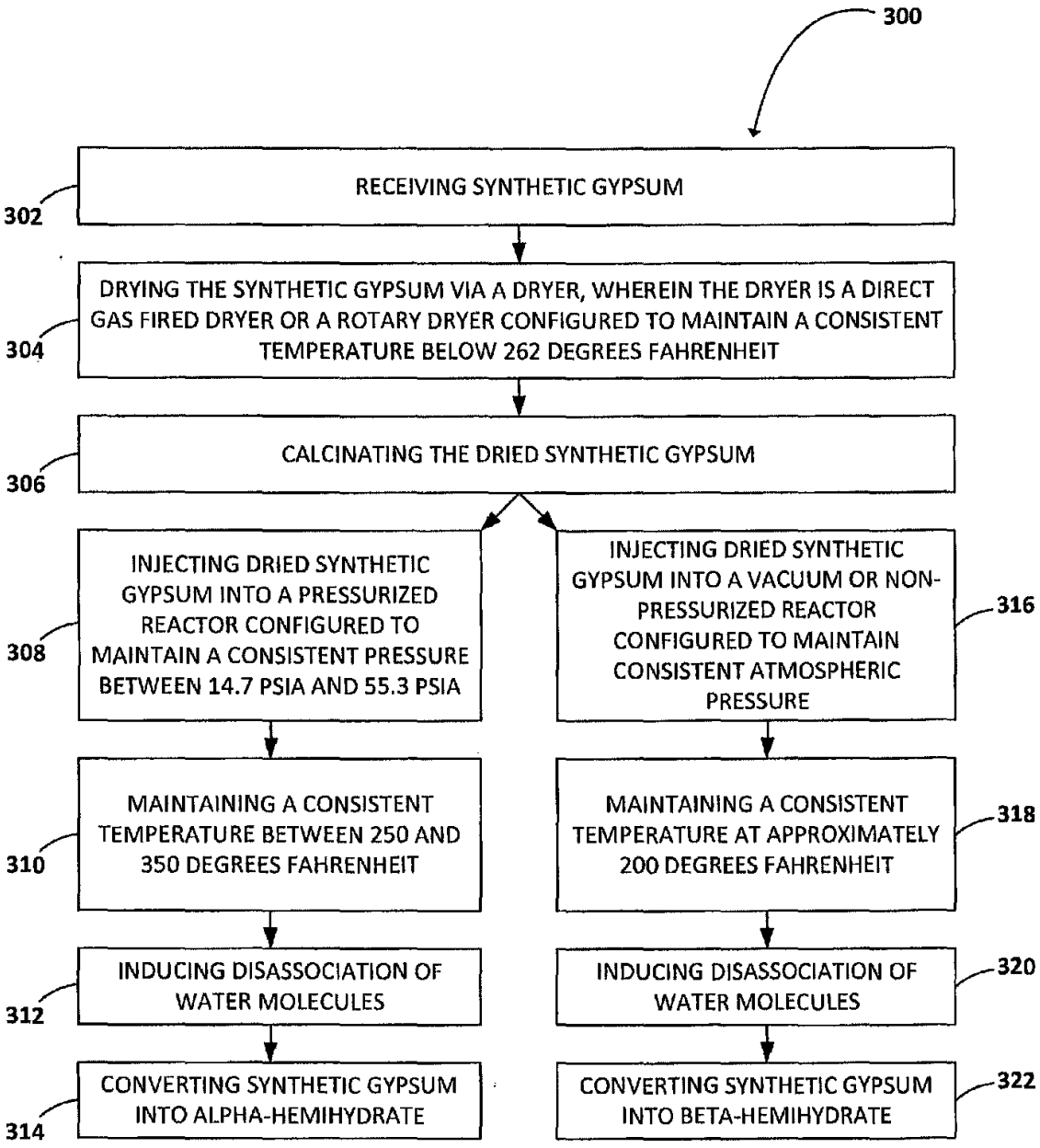

300
RECEIVING SYNTHETIC GYPSUM
302
DRYING THE SYNTHETIC GYPSUM VIA A DRYER, WHEREIN THE DRYER IS A DIRECT GAS FIRED DRYER OR A ROTARY DRYER CONFIGURED TO MAINTAIN A CONSISTENT TEMPERATURE BELOW 262 DEGREES FAHRENHEIT
304
CALCINATING THE DRIED SYNTHETIC GYPSUM
306
INJECTING DRIED SYNTHETIC GYPSUM INTO A PRESSURIZED REACTOR CONFIGURED TO MAINTAIN A CONSISTENT PRESSURE BETWEEN 14.7 PSIA AND 55.3 PSIA
308
MAINTAINING A CONSISTENT TEMPERATURE BETWEEN 250 AND 350 DEGREES FAHRENHEIT
310
INDUCING DISASSOCIATION OF WATER MOLECULES
312
CONVERTING SYNTHETIC GYPSUM INTO ALPHA-HEMIHYDRATE
314
INJECTING DRIED SYNTHETIC GYPSUM INTO A VACUUM OR NON-PRESSURIZED REACTOR CONFIGURED TO MAINTAIN CONSISTENT ATMOSPHERIC PRESSURE
316
MAINTAINING A CONSISTENT TEMPERATURE AT APPROXIMATELY 200 DEGREES FAHRENHEIT
318
INDUCING DISASSOCIATION OF WATER MOLECULES
320
CONVERTING SYNTHETIC GYPSUM INTO BETA-HEMIHYDRATE
322

FIGURE 3

Atty Dkt. No. 946278-000027 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Terrell D. Ginn et al.	Confirmation No.: Not Yet Assigned
Appl No.:	Not Yet Assigned	Group Art Unit: Not Yet Assigned
Filed:	August 8, 2013	Examiner: Not Yet Assigned
Title:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING	

Attention: Office of Petitions
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Alexandria, VA 22313-1450

PETITION TO ACCEPT BLACK AND WHITE PHOTOGRAPH(S) AS DRAWING(S) (37 C.F.R. § 1.84(b)(1))

1. Petition is hereby made to accept black and white photograph(s) in this case.
2. Black and white photographs are electronically submitted herewith.
3. It has been determined that black and white photographs are the best medium for disclosing the subject matter to be patented and are necessary for this application.
4. Applicant claims small entity status.
4. The Petition fee of $70.00 (37 C.F.R. § 1.17(h)) is enclosed herewith.

Please charge Deposit Account 13-4365 for any fee deficiency or credit said Account for any overpayment.

Respectfully submitted,

/hbw/

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Electronically filed via the EFS-Web Electronic Filing System of the United States Patent and Trademark Office on August 8, 2013.

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell D. Ginn
Filer:	Henry B. Ward/Maggie Purvis
Attorney Docket Number:	946478-000027

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	70	70
Utility Search Fee	2111	1	300	300
Utility Examination Fee	2311	1	360	360
Pages:				
Claims:				
Claims in excess of 20	2202	9	40	360
Miscellaneous-Filing:				
Late Filing Fee for Oath or Declaration	2051	1	70	70

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Petition:				
Petition Fee-37CFR 1.17(h) (Group II)	2464	1	70	70
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1230**

Electronic Acknowledgement Receipt	
EFS ID:	16543781
Application Number:	13962903
International Application Number:	
Confirmation Number:	9538
Title of Invention:	SYNTHETIC GYPSUM FERTILIZER PRODUCT AND METHOD OF MAKING
First Named Inventor/Applicant Name:	Terrell D. Ginn
Customer Number:	24239
Filer:	Henry B. Ward/Maggie Purvis
Filer Authorized By:	Henry B. Ward
Attorney Docket Number:	946478-000027
Receipt Date:	08-AUG-2013
Filing Date:	
Time Stamp:	21:15:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$1230
RAM confirmation Number	6717
Deposit Account	
Authorized User	

File Listing:

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

1	Transmittal of New Application	Transmittal.pdf	1101651 645cc044905ca8993de52730d7becbdc7f610308	no	1
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Information:					
2		Utility_Application_.pdf	475185 e6cde91357b5f3b2344449c1d7cf4d7e97a8084e	yes	30
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Specification		1	24	
	Claims		25	29	
	Abstract		30	30	
Warnings:					
Information:					
3	Drawings-other than black and white line drawings	Figures.PDF	437458 e87f1e5f4a9f31c3bad57d563399ac08a5ccddd9	no	4
Warnings:					
Information:					
4	Petition for review by the Office of Petitions.	Petition_to_Accept_Black_and_White_Drawings.pdf	93917 d4fb4c05acf5de02ae20842e1633d072e2ff1e78	no	1
Warnings:					
Information:					
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Warnings:					
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		Total Files Size (in bytes):	2148248		

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

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

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Application Number: 13962903 Document Date: 08/08/2013

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