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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

Proceeding	91205542
Party	Defendant Baker Hughes Incorporated
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

Halliburton Energy Services, Inc.	§	
	§	Opposition No. 91205542
Opposer/Respondent,	§	
	§	Application Serial No. 85/402,715
v.	§	
	§	Mark: VACS
Baker Hughes Incorporated,	§	
	§	
Applicant/Petitioner.	§	

**FIRST AMENDED PETITION FOR CANCELLATION
IN RESPONSE TO OPPOSER’S MOTION TO DISMISS**

Pursuant to TBMP § 503.03, Applicant/Petitioner Baker Hughes Incorporated files this its First Amended Petition for Cancellation in Response to Opposer Halliburton Energy Services, Inc.’s Motion to Dismiss Applicant’s Counterclaim for Fraud and Memorandum in Support Thereof, and respectfully shows:

I. PARTIES

1. Baker Hughes Incorporated (“Baker Hughes”) is a Delaware corporation located and doing business in Houston, Texas. Baker Hughes is the owner of U.S. Trademark Application Serial No. 85/402,715 seeking to register the mark VACS for “mechanical downhole equipment for use in oil, gas and water wells, namely, downhole tool for removing debris from, and otherwise cleaning, wellbores and downhole casing and tubing.” U.S. Trademark Application Serial No. 85/402,715 was filed August 19, 2011, and claims a first use of the mark VACS on the listed goods at least as early as October, 1998, and a first use in commerce at least as early as July 14, 1999. This application is presently pending and has been published pursuant to 15 U.S.C. § 1062. Upon publication, Respondent initiated an opposition proceeding against Baker Hughes’ application.

2. Upon information and belief, Respondent Halliburton Energy Services, Inc. (“Opposer” or “Respondent”) is a Delaware corporation located and doing business at 10200 Bellaire Blvd., Houston, Texas 77072. Respondent is the owner of record of the U.S. Trademark Registration No. 3,738,313 (“the ‘313 Registration”). The ‘313 Registration was registered on January 12, 2010, for “drilling machines; drilling machines and parts therefor.”

3. Baker Hughes believes that it is being, and will continue to be, damaged by the ‘313 Registration and hereby petitions to cancel the ‘313 Registration based upon the following grounds.

II. FACTS

A. Background of the ‘313 Registration

4. The trademark application that resulted in the issuance of the ‘313 Registration for the mark VAC TECH was filed on December 21, 2006, for “drilling machines; drilling machines and parts thereof” and assigned United States Trademark Application Serial No. 77/069,596 (“the ‘596 Application”). A true and correct copy of the ‘596 Application as originally filed is attached hereto as Exhibit A, the contents of which is hereby incorporated by reference in its entirety. The ‘595 Application was filed under Section 1(b) by Respondent’s predecessor-in-interest, Wellbore Energy Solutions, LLC. In filing the ‘596 Application, Respondent’s attorney of record declared:

“If the [Respondent] is filing under Section 1(b), intent to use, the [Respondent] declares that it has a bona fide intention to use or use through the [Respondent]’s related company or licensee the mark in commerce on or in connection with the identified goods and/or services. 15 U.S.C. Section 1051(b), as amended.

...

The undersigned, being hereby warned that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. Section 1001, and that such willful false statements, and the like,

may jeopardize the validity of the application or any resulting registration, declares that he/she is properly authorized to execute this application on behalf of the [Respondent]; he/she believes the [Respondent] to be the owner of the trademark/service mark sought to be registered, or, if the application is being filed under 15 U.S.C. Section 1051(b), he/she believes [Respondent] to be entitled to use such mark in commerce; to the best of his/her knowledge and belief no other person, firm, corporation, or association has the right to use the mark in commerce, either in the identical form thereof or in such near resemblance thereto as to be likely, when used on or in connection with the goods/services of such other person, to cause confusion, or to cause mistake, or to deceive; and that all statements made of his/her own knowledge are true; and that all statements made on information and belief are believed to be true.”

See Exhibit A, p. 3.

5. On December 28, 2006 the United States Patent and Trademark Office (“USPTO”) assigned the ‘596 application the pseudo mark VACUUM TECH. A true and correct copy of the Notice of Pseudo Mark is attached hereto as Exhibit B, the contents of which is hereby incorporated by reference in its entirety.

6. The USPTO mailed an Office Action on March 13, 2007 that refused registration of Respondent’s mark VAC TECH under Section 2(e)(1) because the proposed mark “merely described a function of the [Respondent]’s goods.” In particular, the March 13, 2007 Office Action stated:

“Here, [Respondent]’s goods are drilling machines, as described by [Respondent] in the application. Drilling involves using vacuum technology to remove dirt and rock. Vacuum excavation comprises a good portion of horizontal excavation especially. Attached Internet evidence shows that vacuums are commonly sold with and as a part of drilling equipment, that vacuum excavation is a separate service regularly performed and advertised by drilling and industrial vacuum companies, and that vacuuming is done as a part of the drilling process. The attached Internet dictionary evidence also shows that “TECH” is a shortened form of the word “technology,” and that “VAC” is a shortened form of the word “vacuum.” Additionally, the attached U.S. Registrations show that the Office has required disclaimer of “TECH” and “VAC” as descriptive of goods.

The combination of the two terms “VAC” and “TECH” does nothing to obviate the descriptiveness of either term; in fact, it does the opposite making the wording more descriptive. [Respondent]’s proposed mark merely describes [Respondent]’s goods – vacuum technology – so the mark is refused registration.”

March 13, 2007 Office Action, pp. 2-3. A true and correct copy of the March 13, 2007 Office Action is attached hereto as Exhibit C, the contents of which is hereby incorporated by reference in its entirety.

7. Respondent’s attorney of record traversed the merely descriptive refusal of the March 13, 2007 Office Action by stating in a Response to Office Action filed on September 14, 2007:

“The Examining Attorney has rejected the mark “VAC TECH” as allegedly merely descriptive. The Examiner cites reproductions of web pages using the term “Vacuum”. However, no where is the term “VAC” cited in connection with specific machines or drilling processes. The word “VAC”, without more, does not describe or identify a particular drilling machine or a type of drilling operation. The Examiner contends that the term “VAC” merely describes vacuuming that is done as a part of the drilling process. The Examiner, however, has not shown that the oilfield industry uses the word “VAC”. Furthermore, the documents cited by the Examiner show that “vac” is not solely a shortened version of “vacuum”. Instead, “vac” may be a shortened version of several different words that have no relation to “vacuum”, e.g., vacancy and vacant. Accordingly, the rejection is not proper and should be removed.”

September 14, 2007 Response to Office Action, p. 1. A true and correct copy of the September 14, 2007 Response to Office Action is attached hereto as Exhibit D, the contents of which is hereby incorporated by reference in its entirety.

8. On October 2, 2007, Respondent’s attorney of record authorized the Trademark Examining Attorney to amend the ‘596 Application from the Principal Register to the Supplemental Register, and to add the following disclaimer statement to the record: “[n]o claim is made to the exclusive right to use “TECH” apart from the mark as shown.” The Trademark Examining Attorney entered the amendments by Examiner Amendment the same day. A true

and correct copy of the Examiner's Amendment entered on October 2, 2007 is attached hereto as Exhibit E, the contents of which is hereby incorporated by reference in its entirety.

9. On October 23, 2007, the USPTO mailed a second Office Action explaining that the Examiner Amendment entered on October 2, 2007 was improper because an applicant may not amend its application to seek registration on the Supplemental Register until an acceptable amendment to allege use under 37 C.F.R. § 2.76 has been timely filed, and re-urged the merely descriptive refusal. A true and correct copy of the October 23, 2007 Office Action is attached hereto as Exhibit F, the contents of which is hereby incorporated by reference in its entirety.

10. Respondent responded to the second Office Action on April 23, 2008 by including an allegation of use and requesting registration on the Supplemental Register. A true and correct copy of the April 23, 2008 Response to Office Action is attached hereto as Exhibit G, the contents of which is hereby incorporated by reference in its entirety. In filing the second Office Action on April 23, 2008, Respondent's attorney of record declared:

"If the [Respondent] is seeking registration under Section 1(b) and/or Section 44 of the Trademark Act, the [Respondent] had a bona fide intention to use or use through the [Respondent]'s related company or licensee the mark in commerce on or in connection with the identified goods and/or services as of the filing date of the application. 37 C.F.R. Secs. 2.34(a)(2)(i); 2.34 (a)(3)(i); and 2.34(a)(4)(ii). If the [Respondent] is seeking registration under Section 1(a) of the Trademark Act, the mark was in use in commerce on or in connection with the goods or services listed in the application as of the application filing date. 37 C.F.R. Secs. 2.34(a)(1)(i). The undersigned, being hereby warned that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. §1001, and that such willful false statements may jeopardize the validity of the application or any resulting registration, declares that he/she is properly authorized to execute this application on behalf of the [Respondent]; he/she believes the [Respondent] to be the owner of the trademark/service mark sought to be registered, or, if the application is being filed under 15 U.S.C. §1051(b), he/she believes [Respondent] to be entitled to use such mark in commerce; to the best of his/her knowledge and belief no other person, firm, corporation, or association has the right to use the mark in commerce, either in the

identical form thereof or in such near resemblance thereto as to be likely, when used on or in connection with the goods/services of such other person, to cause confusion, or to cause mistake, or to deceive; that if the original application was submitted unsigned, that all statements in the original application and this submission made of the declaration signer's knowledge are true; and all statements in the original application and this submission made on information and belief are believed to be true."

See Exhibit G, p. 3.

11. The Trademark Examining Attorney issued a final Office Action on May 15, 2008 re-urging the merely descriptive refusal and explaining that:

"[Respondent]'s response, dated April 23, 2008, states that the [Respondent] is filing an 'accompanying statement of use.' However, no such statement of use had been filed."

May 15, 2008 Final Office Action, p. 2. A true and correct copy of the May 15, 2008 Response to Office Action is attached hereto as Exhibit H, the contents of which is hereby incorporated by reference in its entirety.

12. On November 17, 2008, Respondent's attorney of record filed an Amendment to Allege Use asserting that the mark had been first used in commerce at least as early as May 31, 2008 on or in connection with the applied-for goods; namely, "drilling machines; drilling machines and parts therefor," as well as a specimen described as a "hang tag with the mark printed clearly thereon." A true and correct copy of the November 17, 2008 Amendment to Allege Use and accompanying Specimen is attached hereto as Exhibit I, the contents of which is hereby incorporated by reference in its entirety. In filing the Amendment to Allege Use on November 17, 2008, Respondent's attorney of record declared:

"[Respondent] requests registration of the above-identified trademark/service mark in the United States Patent and Trademark Office on the Principal Register established by the Act of July 5, 1946 (15 U.S.C. Section 1051 et seq., as amended). [Respondent] is the owner of the mark sought to be registered, and is using the mark in commerce on or in connection with the goods/services identified above, as evidenced by the attached specimen(s) showing the mark as used in commerce.

The undersigned being hereby warned that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. Section 1001, and that such willful false statements and the like may jeopardize the validity of this document, declares that he/she is properly authorized to execute this document on behalf of the Owner; and all statements made of his/her own knowledge are true and that all statements made on information and belief are believed to be true.”

See Exhibit I, p. 3.

13. Two days later, the Trademark Examining Attorney mailed an Abandonment Notice that stated that the November 17, 2008 Amendment to Allege Use was an incomplete response to the Office Action issued/mailed on May 15, 2008 because the specimen submitted by Respondent was unacceptable. The Trademark Examining Attorney stated:

“The originally submitted specimen is unacceptable because it appears to be temporary in nature. Specifically, the specimen is identified as a hang tag for drilling machines and parts therefore. The specimen appears as a photocopied piece of paper that appears to have the words “VAC TEC” applied using a label maker or similar printing device. The specimen does not appear to be a valid use of the mark in commerce.

Because the specimen does not support use, the mark may not be amended to the Supplemental Register. Trademark Act Section 23, 15 U.S.C. §1091; 37 C.F.R. §§2.47 and 2.75(a); TMEP §§801.02(b), 815 and 816 *et seq.*

For the above reasons, the [Respondent]’s response does not overcome the final refusal to register the mark as being merely descriptive of the goods. *See* 15 U.S.C. §1052(e)(1); 37 C.F.R. §2.64(a).”

November 19, 2008 Amendment Notice, p. 1. A true and correct copy of the November 19, 2008 Abandonment Notice is attached hereto as Exhibit J, the contents of which is hereby incorporated by reference in its entirety.

14. On April 1, 2009, Respondent filed a Second Amendment to Allege Use asserting that the mark had been first used in commerce at least as early as May 31, 2008 on or in connection with the applied-for goods; namely, “drilling machines; drilling machines and parts therefor,” as well as a second specimen described as “brochure/advertising materials.” A true

and correct copy of the April 1, 2009 Second Amendment to Allege Use and accompanying specimen is attached hereto as Exhibit K, the contents of which is hereby incorporated by reference in its entirety. In filing the Second Amendment to Allege Use on April 1, 2009, Respondent's attorney of record declared:

“[Respondent] requests registration of the above-identified trademark/service mark in the United States Patent and Trademark Office on the Principal Register established by the Act of July 5, 1946 (15 U.S.C. Section 1051 et seq., as amended). [Respondent] is the owner of the mark sought to be registered, and is using the mark in commerce on or in connection with the goods/services identified above, as evidenced by the attached specimen(s) showing the mark as used in commerce.

The undersigned being hereby warned that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. Section 1001, and that such willful false statements and the like may jeopardize the validity of this document, declares that he/she is properly authorized to execute this document on behalf of the Owner; and all statements made of his/her own knowledge are true and that all statements made on information and belief are believed to be true.”

See Exhibit K, p. 3.

15. The Trademark Examining Attorney, on May 13, 2009, issued an Office Action, that superseded the abandonment notice dated November 19, 2008 and stated that the abandonment notice was issued in error. A true and correct copy of the May 13, 2009 Office Action is attached hereto as Exhibit L, the contents of which is hereby incorporated by reference in its entirety. The May 13, 2009 Office Action further rejected the specimen submitted on April 1, 2009 because: “it consists of advertising material for goods. Section 45 of the Trademark Act requires use ‘on the goods or their containers or the displays associated therewith or on tags or labels affixed thereto.’ 15 U.S.C. §1127; *see* 37 C.F.R. §2.56(b)(1); TMEP §§904.04(b)-(c). Respondent lists the specimen as ‘brochure/advertising material’ which appears to be an acknowledgement that the specimen consists of advertising.” See Exhibit L, p. 1.

16. Six months later, on November 13, 2009, Respondent, through its attorney of record, submitted a further Response to Office Action stating:

“In response to the rejection of the specimen of use submitted April 1, 2009, [Respondent] respectfully asserts that the characterization of the specimen in the Allegation of Use as “brochure/advertising” was a misnomer on [Respondent]’s part. Rather, [Respondent] respectfully submits that the specimen functions as a point of sale display closely associated with the goods in the course of trade and in the customary method of presenting the goods to prospective customers. [Respondent] would also respectfully point out that the nature of the goods is such that applying or affixing the mark directly onto the product itself by marking or stamping is not feasible or desirable because the product is used in down hole oil drilling operations. Because the product is a highly engineered tool that operates within well casing to precise specifications of dimension, tolerance, and performance, any markings on the tool are to be avoided.

For these reasons, [Respondent] asserts that the specimen document is suitable to show trademark use because it serves to identify the source of the goods at the point of sale in the ordinary course of trade that is customary for goods of this type in the relevant marketplace and industry. Accordingly, [Respondent] respectfully requests that the rejection of the specimen be withdrawn and that the application proceed to registration.”

November 13, 2009 Response to Office Action, p. 1. A true and correct copy of the November 13, 2009 Response to Office Action is attached hereto as Exhibit M, the contents of which is hereby incorporated by reference in its entirety.

17. In view of the arguments made by Respondent’s attorney of record in the Response to Office Action filed November 13, 2009, the Trademark Examining Attorney accepted the amendment to allege use based on respondent’s “point of sale display” filed on April 9, 2009. See Exhibits K and M. The ‘596 Application was subsequently published on December 11, 2009, and the registration certificate was issued on January 12, 2010.

III. GROUNDS FOR CANCELLATION

A. The '313 Registration was Obtained Fraudulently

18. Baker Hughes re-alleges paragraphs 1-17 herein.

19. Respondent's registration should be cancelled because Respondent's predecessor-in-interest, Wellbore Energy Solutions, LLC, made materially false representations to the United States Patent and Trademark Office by and through its attorney of record knowing such statements to be false and with the intent to deceive the United States Patent and Trademark Office.

20. In particular, during the prosecution of the '596 Application Respondent's attorney of record intentionally made at least two materially fraudulent statements despite being "warned that false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. Section 1001, and that such willful false statements and the like may jeopardize the validity of this document."

21. Respondent's first fraudulent statement was that it was "... entitled to use such mark in commerce; to the best of his/her knowledge and belief no other person, firm, corporation, or association has the right to use the mark in commerce, either in the identical form thereof or in such near resemblance thereto as to be likely, when used on or in connection with the goods/services of such other person, to cause confusion, or to cause mistake, or to deceive" (the "First Fraudulent Statement"). The First Fraudulent Statement was made in the '596 Application filed on December 21, 2006, and in the April 23, 2008 Response to Office Action. See Exhibits A and G.

22. The First Fraudulent Statement was false because Respondent (and its predecessor-in-interest) was not entitled to use the mark in commerce because Baker Hughes' trademark rights in VACS were senior.

23. Respondent's predecessor-in-interest knew the First Fraudulent Statement was false because Baker Hughes had been openly and widely using its mark VACS on the products listed in U.S. Trademark Application Serial No. 85/402,715 since at least as early as July 14, 1999. The goods listed in Baker Hughes' U.S. Trademark Application Serial No. 85/402,715 are identical to goods sold and offered for sale by Respondent and its predecessor-in-interest in connection with its mark VAC TECH. This is because Respondent and its predecessor-in-interest never used the mark in commerce on or in connection with "drilling machines; drilling machines and parts therefor." In particular, Respondent and its predecessor-in-interest never sold or transported, and never intended to sell or transport, in commerce "drilling machines; drilling machines and parts therefor," bearing the mark VAC TECH. Further, Respondent and its predecessor-in-interest never placed the mark VAC TECH on such goods or their containers or the displays associated therewith or on the tags or labels affixed thereto, or on documents associated with the goods or their sale. Instead, Respondent (and its predecessor-in-interest) used the mark VAC TECH on or in connection with mechanical downhole equipment for use in oil, gas and water wells, namely, downhole tool for removing debris from, and otherwise cleaning, wellbores and downhole casing and tubing. Further, the parties' respective customers and potential customers are virtually identical, and the advertising media for the parties' respective goods and the channels of distribution for the parties' respective goods are virtually identical. Thus, at the time Respondent filed the '596 Application, Respondent was well-aware

of Baker Hughes' mark VACS and such knowledge is imputed to Respondent's attorney of record.

24. Respondent's predecessor-in-interest made the First Fraudulent Statement with the intent to deceive the USPTO during the application process in order to distract the USPTO from the fact that another party was using a confusingly similar mark on goods that were identical to Respondent's goods and its predecessor-in-interest's goods well before Respondent and its predecessor-in-interest adopted and began using its mark VAC TECH.

25. The First Fraudulent Statement was material to the registerability of the mark because the USPTO would have refused registration of VAC TECH had it known the truth about Baker Hughes' senior, continuous, and exclusive use of its mark VACS on goods that are identical to Respondent's goods and its predecessor-in-interest's goods on which it uses its VAC TECH mark, i.e., mechanical downhole equipment for use in oil, gas and water wells, namely, downhole tool for removing debris from, and otherwise cleaning, wellbores and downhole casing and tubing.

26. The second fraudulent statement was the statement that Respondent's predecessor-in-interest was "using the mark in commerce on or in connection with all the goods ... identified" in the existing registration, namely, 'drilling machines; drilling machines and parts therefor' "as evidenced by the attached specimen(s) showing the mark as used in commerce" ("Second Fraudulent Statement"). The Second Fraudulent Statement was made in the Amendment to Allege Use filed on November 17, 2008 and the second Amendment to Allege Use filed on April 1, 2009. See Exhibits I and K.

27. The Second Fraudulent Statement was false because Respondent and its predecessor-in-interest never used the mark in commerce on or in connection with "drilling

machines; drilling machines and parts therefor.” In particular, Respondent and its predecessor-in-interest never sold or transported, and never intended to sell or transport, in commerce “drilling machines; drilling machines and parts therefor,” bearing the mark VAC TECH. Further, Respondent and its predecessor-in-interest never placed the mark VAC TECH on such goods or their containers or the displays associated therewith or on the tags or labels affixed thereto, or on documents associated with the goods or their sale. Instead, Respondent and its predecessor-in-interest used the mark on or in connection with mechanical downhole equipment for use in oil, gas and water wells, namely, downhole tool for removing debris from, and otherwise cleaning, wellbores and downhole casing and tubing.

28. Respondent’s predecessor-in-interest knew that the Second Fraudulent Statement was false when it submitted to the USPTO a specimen on April 1, 2009 evidencing use of its mark on or in connection with mechanical downhole equipment for use in oil, gas and water wells, namely, downhole tool for removing debris from, and otherwise cleaning, wellbores and downhole casing and tubing. In so doing, Respondent’s predecessor-in-interest knowingly and intentionally mislead the USPTO to understand that the specimen submitted on April 1, 2009 evidenced use of Respondent’s predecessor-in-interest’s mark on or in connection with “drilling machines; drilling machines and parts therefor” when, in fact, Respondent had never, and has never, used the mark VAC TECH on any drilling machines, or parts therefor.

29. Respondent’s predecessor-in-interest made the Second Fraudulent Statement in order to distract the USPTO from the fact that Baker Hughes was using a mark, VACS, on goods that were identical to Respondent’s actual goods well before Respondent adopted and began using its confusingly similar mark VAC TECH.

30. Thus, through the First Fraudulent Statement and the Second Fraudulent Statement by Respondent's attorney of record, either together or individually, Respondent fraudulently obtained the '313 Registration for the mark VAC TECH. Thus, the '313 Registration should be cancelled.

B. Respondent Abandoned Its Mark VAC TECH

31. Baker Hughes re-alleges paragraphs 1-30 herein.

32. The listed goods of the '313 Registration for VAC TECH are "drilling machines; drilling machines and parts therefor;" however, neither Respondent nor its predecessor-in-interest has ever used the VAC TECH mark on or in connection with such goods. In particular, Respondent and its predecessor-in-interest never sold or transported, and never intended to sell or transport, in commerce "drilling machines; drilling machines and parts therefor," bearing the mark VAC TECH. Further, Respondent and its predecessor-in-interest never placed the mark VAC TECH on such goods or their containers or the displays associated therewith or on the tags or labels affixed thereto, or on documents associated with the goods or their sale. Instead, Respondent and its predecessor-in-interest used the mark on or in connection with different goods, i.e., mechanical downhole equipment for use in oil, gas and water wells, namely, downhole tool for removing debris from, and otherwise cleaning, wellbores and downhole casing and tubing.

33. The specimen filed with the USPTO by Respondent on April 1, 2009 shows use of the mark VAC TECH on or in connection with mechanical downhole equipment for use in oil, gas and water wells, namely, downhole tool for removing debris from, and otherwise cleaning, wellbores and downhole casing and tubing. The specimen filed on April 1, 2009 does not show

use of the mark VAC TECH on or in connection with “drilling machines; drilling machines and parts therefor.”

34. Because neither Respondent nor its predecessor-in-interest has ever used the mark VAC TECH on or in connection “drilling machines; drilling machines and parts therefor,” Respondent has abandoned this mark for these goods and, therefore, the ‘313 Registration should be cancelled.

C. Respondent’s Mark is Likely to Cause Confusion

35. Baker Hughes re-alleges paragraphs 1-34 herein.

36. Baker Hughes has been using its mark VACS on the goods listed in U.S. Trademark Application Serial No. 85/402,715 since at least as early as July 14, 1999. The goods listed in Baker Hughes’ U.S. Trademark Application Serial No. 85/402,715 are identical to goods sold and offered for sale by Respondent in connection with its mark VAC TECH. Thus, Baker Hughes and Respondent are competitors in the field of downhole tools for removing debris from, and otherwise cleaning, wellbores and downhole casing and tubing.

37. Respondent’s mark VAC TECH is substantially similar to Baker Hughes’ mark VACS.

38. Respondent’s actual VAC TECH branded products that it advertises, promotes, sells, leases, offers for sale, and/or offers for lease are downhole tools for removing debris from, and otherwise cleaning, wellbores and downhole casing and tubing, which are identical to Baker Hughes’ VACS branded products that it advertises, promotes, sells, leases, offers for sale, and/or offers for lease.

39. The parties’ respective customers and potential customers for their respective downhole tools for removing debris from, and otherwise cleaning, wellbores and downhole

casing and tubing are virtually identical customer. The advertising media for the parties' respective downhole tools for removing debris from, and otherwise cleaning, wellbores and downhole casing and tubing, and the channels of distribution for these goods, are virtually identical.

40. Baker Hughes has been using its mark VACS on the goods listed in U.S. Trademark Application Serial No. 85/402,715 since at least as early as July 14, 1999. Over the past 13 years Baker Hughes has built a substantial amount of goodwill in connection with its mark VACS, and customers have come to associate the mark VACS with the aforementioned products as emanating from a single source, namely Baker Hughes.

41. In addition, upon information and belief, Respondent had actual knowledge of Baker Hughes' use of its mark VACS on goods that are identical to Respondent's goods well before Respondent began using its mark on goods identical to Baker Hughes' goods. Thus, Respondent's later adoption, use, and registration of its mark VAC TECH was intended to cause confusion among customer and potential customers. In particular, Respondent, intending to capitalize on the goodwill established by Baker Hughes' 13 years of use and unfairly compete with Baker Hugh by causing consumer confusion and diminishing the value of Baker Hughes' mark VACS, began using the mark VAC TECH in connection with downhole tools for removing debris from, and otherwise cleaning, wellbores and downhole casing and tubing, and fraudulently, or otherwise, obtained the '313 Registration.

42. In view of the similarity of the parties' respective marks, goods identified by these marks, customers and potential customers of the goods identified by these marks, advertising media used to promote and advertise the goods identified by these marks, and channels of distribution used by the parties to sell and offer for sale their respective goods identified by these

marks, Respondent's mark so resembles Baker Hughes' mark as to be likely to cause the public to be confused, mistaken, or deceived into believing that Respondent's goods originate from Baker Hughes or are in some way related to, associated with, or sponsored by Baker Hughes and, thus, Baker Hughes is damaged or otherwise harmed. Accordingly, the likelihood of confusion created by Respondent's mark VAC TECH damaged Baker Hughes and supports cancellation of the '313 Registration.

D. Damage/Harm to Baker Hughes

43. As set out above, Baker Hughes is being, and will continue to be damaged by the existence of Respondent's '313 Registration, because the continued registration of the mark of the '313 Registration, to which Respondent is not entitled, creates a likelihood of confusion as to the source of Respondent's goods and those of Baker Hughes. Further, Respondent fraudulently obtained the '313 Registration in violation of federal law. In addition, Respondent has asserted the '313 Registration as a basis to oppose Baker Hughes' application for registration of its mark VACS. Thus, the continued existence of the '313 Registration is being used, and will be used in the future, by Respondent to impair Baker Hughes' ability to freely use and register Baker Hughes' mark VACS.

44. Baker Hughes does not believe that any additional fee is due in connection with this filing; however, the Commissioner is authorized any fees that may be due, or credit any overpayment, to Greenberg Traurig Deposit Account No. 50-2638, Order No. 104697.016300.

PRAYER

WHEREFORE, Applicant/Petitioner Baker Hughes Incorporated prays that this First Amended Petition for Cancellation be granted, that Respondent's trademark registration, U.S.

Trademark Registration No. 3,738,313, be cancelled, and for any and all further other relief that the Trademark Trial and Appeal Board may deem just and proper.

Respectfully submitted,

DATED: September 7, 2012

/Anthony F. Matheny/
Anthony F. Matheny
Mark G. Chretien
GREENBERG TRAUIG LLP
1000 Louisiana Street, Suite 1700
Houston, Texas 77002
Tel: 713-374-3583
Fax: 713-754-7583
E-mail: mathenya@gtlaw.com

ATTORNEYS FOR APPLICANT/PETITIONER,
BAKER HUGHES INCORPORATED

CERTIFICATE OF SERVICE

I hereby certify that on September 7, 2012, a true and correct copy of the foregoing First Amended Petition for Cancellation in Response to Opposer's Motion to Dismiss was served by first class mail, postage prepaid, on the following:

Joel D. Leviton
Fish & Richardson P.C.
60 South Sixth Street, Suite 3200
Minneapolis, Minnesota 55402

Russell N. Rippamonti
Fish & Richardson P.C.
1717 Main Street, Suite 5000
Dallas, Texas 75201

/Anthony F. Matheny/
Anthony F. Matheny

EXHIBIT A

Trademark/Service Mark Application, Principal Register

TEAS Plus Application

Serial Number: 77069596

Filing Date: 12/21/2006

*NOTE: Data fields with the * are mandatory under TEAS Plus. The wording "(if applicable)" appears where the field is only mandatory under the facts of the particular application.*

The table below presents the data as entered.

Input Field	Entered
TEAS Plus	YES
MARK INFORMATION	
*MARK	<u>VAC TECH</u>
*STANDARD CHARACTERS	YES
USPTO-GENERATED IMAGE	YES
LITERAL ELEMENT	VAC TECH
*MARK STATEMENT	The mark consists of standard characters, without claim to any particular font, style, size, or color.
APPLICANT INFORMATION	
*OWNER OF MARK	Wellbore Energy Solutions, LLC
*STREET	6127 Hwy. 90 E
INTERNAL ADDRESS	P.O. Box 51325 Lafayette, LA 70505
*CITY	Broussard
*STATE (Required for U.S. applicants)	Louisiana
*COUNTRY	United States
*ZIP/POSTAL CODE (Required for U.S. applicants only)	70518
PHONE	337-288-8294
FAX	337-993-7970

EMAIL ADDRESS	karceneaux@wellboreenergysolutions.com
AUTHORIZED TO COMMUNICATE VIA EMAIL	No
LEGAL ENTITY INFORMATION	
*TYPE	LIMITED LIABILITY COMPANY
*STATE/COUNTRY WHERE LEGALLY ORGANIZED	Louisiana
GOODS AND/OR SERVICES AND BASIS INFORMATION	
*INTERNATIONAL CLASS	007
*DESCRIPTION	Drilling machines; Drilling machines and parts therefor
*FILING BASIS	SECTION 1(b)
ADDITIONAL STATEMENTS INFORMATION	
*TRANSLATION (if applicable)	
*TRANSLITERATION (if applicable)	
*CLAIMED PRIOR REGISTRATION (if applicable)	
*CONSENT (NAME/LIKENESS) (if applicable)	
*CONCURRENT USE CLAIM (if applicable)	
ATTORNEY INFORMATION	
NAME	William P. Ramey, III
ATTORNEY DOCKET NUMBER	46463-K003US
FIRM NAME	Winstead Sechrest & Minick P.C.
STREET	1450 Lake Robbins Drive
INTERNAL ADDRESS	600 Town Center One
CITY	The Woodlands
STATE	Texas
COUNTRY	United States
ZIP/POSTAL CODE	77380
PHONE	281-681-5960
FAX	281-681-5901
EMAIL ADDRESS	wramey@winstead.com

AUTHORIZED TO COMMUNICATE VIA EMAIL	Yes
OTHER APPOINTED ATTORNEY	Robert C. Shaddox, Henry L. Ehrlich and Rajesh D. Patel
CORRESPONDENCE INFORMATION	
*NAME	William P. Ramey, III
FIRM NAME	Winstead Sechrest & Minick P.C.
*STREET	1450 Lake Robbins Drive
INTERNAL ADDRESS	600 Town Center One
* CITY	The Woodlands
* STATE (Required for U.S. applicants)	Texas
* COUNTRY	United States
* ZIP/POSTAL CODE (Required for U.S. applicants only)	77380
PHONE	281-681-5960
FAX	281-681-5901
* EMAIL ADDRESS	wramey@winstead.com
* AUTHORIZED TO COMMUNICATE VIA EMAIL	Yes
FEE INFORMATION	
NUMBER OF CLASSES	1
FEE PER CLASS	275
TOTAL FEE DUE	275
SIGNATURE INFORMATION	
* SIGNATURE	/Rajesh D. Patel/
* SIGNATORY'S NAME	Rajesh D. Patel
SIGNATORY'S POSITION	Attorney
* DATE SIGNED	12/21/2006
FILING INFORMATION SECTION	
SUBMIT DATE	Thu Dec 21 15:50:30 EST 2006
TEAS STAMP	USPTO/FTK-38.100.144.240-20061221155030945057-77069596-3603115e7afba231d6d4

4c3b491ca188fef-DA-283-20
061221153703201300

Trademark/Service Mark Application, Principal Register

TEAS Plus Application

Serial Number: 77069596

Filing Date: 12/21/2006

To the Commissioner for Trademarks:

Correspondence Information: William P. Ramey, III
600 Town Center One
1450 Lake Robbins Drive
The Woodlands, Texas 77380
281-681-5960(phone)
281-681-5901(fax)
wramey@winstead.com (authorized)

A fee payment in the amount of \$275 will be submitted with the application, representing payment for 1 class(es).

Declaration

The undersigned, being hereby warned that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. Section 1001, and that such willful false statements, and the like, may jeopardize the validity of the application or any resulting registration, declares that he/she is properly authorized to execute this application on behalf of the applicant; he/she believes the applicant to be the owner of the trademark/service mark sought to be registered, or, if the application is being filed under 15 U.S.C. Section 1051(b), he/she believes applicant to be entitled to use such mark in commerce; to the best of his/her knowledge and belief no other person, firm, corporation, or association has the right to use the mark in commerce, either in the identical form thereof or in such near resemblance thereto as to be likely, when used on or in connection with the goods/services of such other person, to cause confusion, or to cause mistake, or to deceive; and that all statements made of his/her own knowledge are true; and that all statements made on information and belief are believed to be true.

Signature: /Rajesh D. Patel/ Date: 12/21/2006

Signatory's Name: Rajesh D. Patel

Signatory's Position: Attorney

RAM Sale Number: 283

RAM Accounting Date: 12/22/2006

Serial Number: 77069596

Internet Transmission Date: Thu Dec 21 15:50:30 EST 2006

TEAS Stamp: USPTO/FTK-38.100.144.240-200612211550309

45057-77069596-3603115e7afba231d6d44c3b4

91ca188fef-DA-283-20061221153703201300

VAC TECH

EXHIBIT B

From: TMDesignCodeComments
Sent: Thursday, December 28, 2006 00:08 AM
To: wramey@winstead.com
Subject: Notice of Pseudo Mark for Serial Number: 77069596
ATTORNEY REFERENCE NUMBER: 46463-K003US

The USPTO may assign pseudo marks, as appropriate, to new applications to assist in searching the USPTO database for conflicting marks. They have no legal significance and will not appear on the registration certificate.

A PSEUDO MARK may be assigned to marks that include words, numbers, compound words, symbols, or acronyms that can have alternative spellings or meanings. For example, if the mark comprises the words 'YOU ARE' surrounded by a design of a box, the pseudo mark field in the USPTO database would display the mark as 'YOU ARE SQUARE'. A mark filed as 'URGR8' would receive a pseudo mark of 'YOU ARE GREAT'.

You are not required to respond to this notice. However, if you would like to suggest additions or changes to the pseudo mark assigned to your mark, please send an email to TMDesignCodeComments@USPTO.GOV or call 1-800-786-9199 to speak to a Customer Service representative. No fee is necessary. (Please include the serial number of your application on ALL correspondence with the USPTO.) The USPTO will review your request and update the record if appropriate.

The USPTO will not send any further response to your e-mail. Check TESS in approximately two weeks to see if the requested changes have been entered. Requests deemed unnecessary or inappropriate will not be entered.

Pseudo marks assigned to the referenced serial number are listed below.

EXHIBIT C

To: Wellbore Energy Solutions, LLC (wramey@winstead.com)

Subject: TRADEMARK APPLICATION NO. 77069596 - VAC TECH - 46463-K003US

Sent: 3/14/2007 2:08:46 PM

Sent As: ECOM108@USPTO.GOV

Attachments: [Attachment - 1](#)
[Attachment - 2](#)
[Attachment - 3](#)
[Attachment - 4](#)
[Attachment - 5](#)
[Attachment - 6](#)
[Attachment - 7](#)
[Attachment - 8](#)
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Attachment - 47
Attachment - 48
Attachment - 49

[Important Email Information]

UNITED STATES PATENT AND TRADEMARK OFFICE

SERIAL NO: 77/069596

APPLICANT: Wellbore Energy Solutions, LLC

CORRESPONDENT ADDRESS:

WILLIAM P. RAMEY, III
WINSTEAD SECHREST & MINICK P.C.
600 TOWN CENTER ONE
1450 LAKE ROBBINS DRIVE
THE WOODLANDS, TX 77380

MARK: VAC TECH

CORRESPONDENT'S REFERENCE/DOCKET NO : 46463-K003US

CORRESPONDENT EMAIL ADDRESS:

wramey@winstead.com

77069596

RETURN ADDRESS:

Commissioner for Trademarks
P.O. Box 1451
Alexandria, VA 22313-1451

Please provide in all correspondence:

1. Filing date, serial number, mark and applicant's name.
2. Date of this Office Action.
3. Examining Attorney's name and Law Office number.
4. Your telephone number and e-mail address.

OFFICE ACTION

RESPONSE TIME LIMIT: TO AVOID ABANDONMENT, THE OFFICE MUST RECEIVE A PROPER RESPONSE TO THIS OFFICE ACTION WITHIN 6 MONTHS OF THE MAILING OR E-

MAILING DATE.

MAILING/E-MAILING DATE INFORMATION: If the mailing or e-mailing date of this Office action does not appear above, this information can be obtained by visiting the USPTO website at <http://tarr.uspto.gov/>, inserting the application serial number, and viewing the prosecution history for the mailing date of the most recently issued Office communication.

Serial Number 77/069596

The assigned trademark examining attorney has reviewed the referenced application and has determined the following:

Search Results

The Office records have been searched and no similar registered or pending mark has been found that would bar registration under Trademark Act Section 2(d), 15 U.S.C. §1052(d). TMEP §704.02.

However, the application is refused for the following:

Refusal – Merely Descriptive

Registration is refused because the proposed mark merely describes a function of applicant's goods. Trademark Act Section 2(e)(1), 15 U.S.C. §1052(e)(1); TMEP §§1209 *et seq.*

A mark is merely descriptive under Trademark Act Section 2(e)(1), 15 U.S.C. §1052(e)(1), if it describes an ingredient, quality, characteristic, function, feature, purpose or use of the relevant goods and/or services. *In re Gyulay*, 820 F.2d 1216, 3 USPQ2d 1009 (Fed. Cir. 1987); *In re Bed & Breakfast Registry*, 791 F.2d 157, 229 USPQ 818 (Fed. Cir. 1986); *In re MetPath Inc.*, 223 USPQ 88 (TTAB 1984); *In re Bright&Crest, Ltd* 204 USPQ 591 (TTAB 1979); TMEP §1209.01(b). A mark that describes an intended user of a product or service is also merely descriptive within the meaning of Section 2(e)(1). *Hunter Publishing Co. v. Caulfield Publishing Ltd.*, 1 USPQ2d 1996 (TTAB 1986); *In re Camel Mfg. Co., Inc.*, 222 USPQ 1031 (TTAB 1984); *In re Gentex Corp.*, 151 USPQ 435 (TTAB 1966).

The determination of whether a mark is merely descriptive is considered in relation to the identified goods and/or services, not in the abstract. *In re Polo International Inc.*, 51 USPQ2d 1061 (TTAB 1999) (Board found that DOC in DOC-CONTROL would be understood to refer to the "documents" managed by applicant's software, not "doctor" as shown in dictionary definition); *In re Digital Research Inc.*, 4 USPQ2d 1242 (TTAB 1987) (CONCURRENT PC-DOS found merely descriptive of "computer programs recorded on disk;" it is unnecessary that programs actually run "concurrently," as long as relevant trade clearly uses the denomination "concurrent" as a descriptor of this particular type of operating system); *In re Venture Lending Associates*, 226 USPQ 285 (TTAB 1985); *In re American Greetings Corp.*, 226 USPQ 365, 366 (TTAB 1985) ("Whether consumers could guess what the product is from consideration of the mark alone is not the test"); TMEP §1209.01(b).

Here, applicant's goods are drilling machines, as described by applicant in the application. Drilling involves using vacuum technology to remove dirt and rock. Vacuum excavation comprises a good portion of horizontal excavation especially. Attached Internet evidence shows that vacuums are commonly sold with and as a part of drilling equipment, that vacuum excavation is a separate service regularly performed and advertised by drilling and industrial vacuum companies, and that vacuuming is done as a part of the drilling process. The attached Internet dictionary evidence also shows that "TECH" is a shortened form

of the word “technology,” and that “VAC” is a shortened form of the word “vacuum.” Additionally, the attached U.S. Registrations show that the Office has required disclaimer of “TECH” and “VAC” as descriptive of goods.

The combination of the two terms “VAC” and “TECH” does nothing to obviate the descriptiveness of either term; in fact, it does the opposite making the wording more descriptive. Applicant’s proposed mark merely describes applicant’s goods – vacuum technology – so the mark is refused registration.

Although the trademark examining attorney has refused registration, applicant may respond by submitting evidence and arguments in support of registration.

Supplemental Registry Recommended

Should applicant use the proposed mark in commerce and file an amendment to allege use, applicant may then respond to this refusal by amending the application to seek registration on the Supplemental Register.

Trademark Act Section 23, 15 U.S.C. §1091; 37 C.F.R. §§2.47 and 2.75(a); TMEP §§801.02(b), 815 and 816 *et seq.* Note that applicant’s proposed mark is not eligible for registration on the Supplemental Register until an acceptable amendment to allege use under 37 C.F.R. §2.76 has been timely filed. 37 C.F.R. §2.47(d); TMEP §§815.02, 816.02 and 1102.03. Please also note that amending to the Supplemental Register does not preclude applicant from submitting evidence and arguments against the refusal.

If applicant files an amendment to allege use and also amends to the Supplemental Register, please note that the effective filing date of the application will then be the date of filing of the amendment to allege use. 37 C.F.R. §2.75(b); TMEP §§206.01 and 816.02.

To amend to the Supplemental Register, applicant need only provide a written request to do so.

Although Supplemental Register registration does not afford all the benefits of registration on the Principal Register, it does provide the following advantages:

- The registrant may use the registration symbol ®;
- The registration is protected against registration of a confusingly similar mark under §2(d) of the Trademark Act, 15 U.S.C. §1052(d);
- The registrant may bring suit for infringement in federal court; and
- The registration may serve as the basis for a filing in a foreign country under the Paris Convention and other international agreements.

If applicant amends the application to seek registration on the Supplemental Register, applicant must disclaim “VAC,” because such wording appears to be generic in the context of applicant’s goods. *In re Wella Corp.*, 565 F.2d 143, 196 USPQ 7 (C.C.P.A. 1977); *In re Creative Goldsmiths of Washington, Inc.*, 229 USPQ 766 (TTAB 1986); *In re Carolyn’s Candies, Inc.*, 206 USPQ 356 (TTAB 1980); TMEP §1213.03(b).

Response

Applicant should include the following information on all correspondence with the Office: (1) the name and law office number of the trademark examining attorney; (2) the serial number of this application; (3) the mailing date of this Office action; and, (4) applicant's telephone number. 37 C.F.R. §2.194(b)(1);

TMEP §302.03(a).

If applicant has questions about its application or needs assistance in responding to this Office action, please telephone the assigned trademark examining attorney directly at the number below.

TEAS PLUS APPLICANTS MUST SUBMIT DOCUMENTS ELECTRONICALLY OR SUBMIT FEE: TEAS Plus applicants should submit the following documents using the Trademark Electronic Application System (TEAS) at <http://www.uspto.gov/teas/index.html>: (1) written responses to Office actions; (2) preliminary amendments; (3) changes of correspondence address; (4) changes of owner's address; (5) appointments and revocations of attorney; (6) amendments to allege use; (7) statements of use; (8) requests for extension of time to file a statement of use, and (9) requests to delete a §1(b) basis. If any of these documents are filed on paper, they must be accompanied by a \$50 per class fee. 37 C.F.R. §§2.6(a)(1)(iv) and 2.23(a)(i). Telephone responses will not incur an additional fee. NOTE: In addition to the above, applicant must also continue to accept correspondence from the Office via e-mail throughout the examination process in order to avoid the additional fee. 37 C.F.R. §2.23(a)(2).

/AndreaRHack/
Andrea R. Hack
Trademark Examining Attorney
Law Office 108
Ph: 571.272.5413
Fax: 571.273.5413

HOW TO RESPOND TO THIS OFFICE ACTION:

- **ONLINE RESPONSE:** You may respond using the Office's Trademark Electronic Application System (TEAS) Response to Office action form available on our website at <http://www.uspto.gov/teas/index.html>. If the Office action issued via e-mail, you must wait 72 hours after receipt of the Office action to respond via TEAS. **NOTE: Do not respond by e-mail. THE USPTO WILL NOT ACCEPT AN E-MAILED RESPONSE.**
- **REGULAR MAIL RESPONSE:** To respond by regular mail, your response should be sent to the mailing return address above, and include the serial number, law office number, and examining attorney's name. **NOTE: The filing date of the response will be the date of receipt in the Office,** not the postmarked date. To ensure your response is timely, use a certificate of mailing. 37 C.F.R. §2.197.

STATUS OF APPLICATION: To check the status of your application, visit the Office's Trademark Applications and Registrations Retrieval (TARR) system at <http://tarr.uspto.gov>.

VIEW APPLICATION DOCUMENTS ONLINE: Documents in the electronic file for pending applications can be viewed and downloaded online at <http://portal.uspto.gov/external/portal/tow>.

GENERAL TRADEMARK INFORMATION: For general information about trademarks, please visit the Office's website at <http://www.uspto.gov/main/trademarks.htm>

FOR INQUIRIES OR QUESTIONS ABOUT THIS OFFICE ACTION, PLEASE CONTACT THE ASSIGNED EXAMINING ATTORNEY SPECIFIED ABOVE.

Note:

In order to avoid size limitation constraints on large e-mail messages, this Office Action has been split into 5 smaller e-mail messages. The Office Action in its entirety consists of this message as well as the following attachments that you will receive in separate messages:

Email 1 includes the following 4 attachments

1. v-drilling-1
2. v-drilling-2
3. v-drill2-1
4. v-drill2-2

Email 2 includes the following 3 attachments

1. v-drill2-3
2. v-drill2-4
3. v-drill3-1

Email 3 includes the following 5 attachments

1. v-drill3-2
2. v-drill3-3
3. v-drill4-1
4. v-drill4-2
5. v-drill4-3

Email 4 includes the following 7 attachments

1. v-drill4-4
2. v-drill5-1
3. v-drill5-2
4. v-drill5-3
5. v-drill6-1
6. v-drill6-2
7. tech-1

Email 5 includes the following 30 attachments

1. tech-2
2. vac-1
3. vac-2
4. 75532032P001OF003
5. 75532032P002OF003
6. 75532032P003OF003
7. 76316885P001OF003
8. 76316885P002OF003
9. 76316885P003OF003
10. 76319726P001OF003
11. 76319726P002OF003
12. 76319726P003OF003
13. 76479923P001OF003
14. 76479923P002OF003

15. 76479923P003OF003
16. 78367079P001OF002
17. 78367079P002OF002
18. 76449304P001OF003
19. 76449304P002OF003
20. 76449304P003OF003
21. 78040242P001OF002
22. 78040242P002OF002
23. 78159520P001OF001
24. 78520348P001OF003
25. 78520348P002OF003
26. 78520348P003OF003
27. 78593999P001OF002
28. 78593999P002OF002
29. 78594005P001OF002
30. 78594005P002OF002

Please ensure that you receive all of the aforementioned attachments, and if you do not, please contact the assigned-examining attorney.

http://209.85.165.104/search?q=cache:g_4Da4VFbawJ:www.dit.net.au/products.asp%3FCatID%3D184+drilling+vacuum&hl=en&ct=clnk&cd=3&gl=us 03/13/2007 05:32:28 PM

This is Google's cache of <http://www.dit.net.au/products.asp?CatID=184> as retrieved on Feb 21, 2007 10:09:07 GMT. Google's cache is the snapshot that we took of the page as we crawled the web. The page may have changed since that time. [Click here for the current page without highlighting.](#) This cached page may reference images which are no longer available. [Click here for the cached text only.](#) To link to or bookmark this page, use the following url: http://www.google.com/search?q=cache:g_4Da4VFbawJ:www.dit.net.au/products.asp%3FCatID%3D184+drilling+vacuum&hl=en&ct=clnk&cd=3&gl=us

Google is neither affiliated with the authors of this page nor responsible for its content.

These search terms have been highlighted: **drilling vacuum**



"QUALITY PRODUCTS, SERVICE AND PRICE."

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PRODUCT CATALOGUE

PRODUCT CATEGORIES ▾

- > BAROID
- > BUTTON BIT GRINDING EQUIPMENT
- > CARROT AND BELL TAPS
- > CEMENTING PRODUCTS
- > CORE CUTTING BLADES
- > CORE TRAYS AND STORAGE MODULES
- > DIAMOND DRILLING EQUIPMENT
- > DOWN HOLE CAMERA

VACUUM DRILLING EQUIPMENT

VACUUM DRILLING

Description: DIT offers a range of exceptional quality vacuum drilling equipment including :-

- Drill bits
- Drill rods
- Vacuum bags
- Vacuum flasks
- Compensating chucks
- Saver subs
- ...



- > DOWN HOLE CAMERA EQUIPMENT
- > DRAG BITS
- > DRILL RODS AND SUBS
- > DTH HAMMERS & BITS
- > ENVIRONMENTAL PRODUCTS
- > FMC PUMPS AND PARTS
- > GARDNER DENVER MUD PUMP PARTS
- > GEOLOGICAL SUPPLIES
- > GEOTECHNICAL **DRILLING**
- > GRAVEL PACK
- > HAMMER OIL
- > MILCLAY BITS
- > MINI DE-SANDERS
- > MISCELLANEOUS
- > PETOL DRILL PIPE TONGS
- > PVC CASINGS AND SCREENS
- > REPLACEABLE BLADES
- > RIDGID WRENCHES AND PARTS
- > ROCK ROLLER BITS
- > ROD WIPERS
- > SAFETY
- > SAMPLE SPLITTERS
- > SANDVIK SYSTEM 2000
- > SOIL SAMPLING
- > STABILIZERS
- > THREAD GREASE
- > **VACUUM DRILLING** EQUIPMENT
- > WATER LEVEL METERS
- > WATER PRESSURE GAUGES
- > WATER SWIVELS
- > WELL COVERS

	<ul style="list-style-type: none">• Bit subs• Grinding equipment	
Related Link:		
>>> ENQUIRE NOW <<<		

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This is Google's cache of <http://www.vector-vacuums.com/> as retrieved on Mar 8, 2007 22:17:06 GMT. Google's cache is the snapshot that we took of the page as we crawled the web. The page may have changed since that time. Click here for the [current page](#) without highlighting. This cached page may reference images which are no longer available. Click here for the [cached text](#) only. To link to or bookmark this page, use the following url: <http://www.google.com/search?q=cache:8jU6KobNM0J:www.vector-vacuums.com/+drilling+vacuum&hl=en&ct=clnk&cd=7&us>

Google is neither affiliated with the authors of this page nor responsible for its content

These search terms have been highlighted: **drilling vacuum**

Jetters & Municipal Vacs * Dust Collectors * Vacuum and Hydro Excavation Systems * Classifiers * Blast and Recovery Systems * Spill Response System

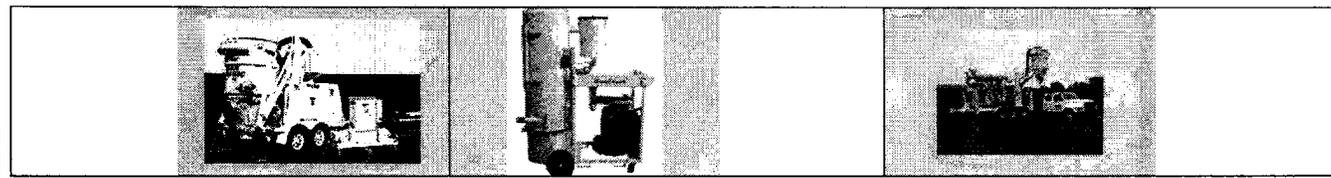


Performance Proven Vacuum Solutions™

Vector Technologies Ltd. has purchased the technology of Ross Cook, Inc., an ISO 9001 Company. We are proud to add these products to the Vector Mobile, Stationary, and Central Vacuum Series line.

Vector Technologies Ltd. (800) 832 4010
6820 N. 43rd Street (414) 247-7100
Milwaukee WI USA 53209 sales@vector-vacuums.com

Industrial Vacuums & Vacuum Systems™



North Carolina Department of Transportation (NCDOT) saves \$3M using VecLoader 721
Conveys material to 1,900 Feet

Tremolite - Vermiculite - Asbestos - Nuclear
Department of Energy Cleans-up Contaminated Waste Sites with
VecLoader Hepa Vac - Hazardous Waste Industrial Vacuum Loaders
VecLoader Hepa Vac Sales Literature

DLA & GSA Financing Available

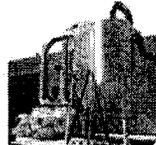
Roofing	Surface Preparation	Hydro Blast Liquid Recovery	Nuclear/Asbestos
Hydro Excavation	Air Excavation	Power Plants	Catalyst Recovery
Primary Metals	Site Remediation	Ship Building/Repair	Glass
Steel Mills	Waste Water	General Industrial	Foundry
Spill Recovery	Brick/Refractory	Emergency Response	Minerals
Bulk Material	Hazardous Waste	Industrial Vacuum Cleaning	Cement
Carbon	Wood/Paper/Pulp	Railroad Car Cleaning	Sewer Cleaning
Municipal/Public Works	Water Jetting	Mini-Truck & Spoils Tanks	Boiler Vacuums
Hi-Rail Vacuums	Black Mould Remediation	Chemicals - Powders and Granular	Hydrocarbon
Cleanrooms	Plastics	Food and Beverage	Car Washes

Vac Attack!



HDD™ Vacuum Excavation Series

For vacuuming of directional drilling fluids and potholing activities.
200- 2000 gallon spoils tank.
To 235 horsepower and 28" Hg.
Wet/Dry Applications!

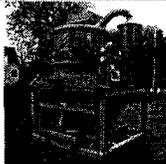


Multi-User Centrifugal and Regenerative Blower Vacuum Systems

Centrifugal or regenerative blower vacuum systems for conveyance distances to 400 feet, with up to 15 operators for central vacuum systems, cleanrooms, and car washes.



PM™ Power Module matched with Cyclonic Baghouses or alternative collection devices.
Modular components for conveyance distances over 400 feet with 16", 28" Hg blowers for central vacuum systems.



Spartan® FM™ Series

Heavy duty vacuums featuring integrated self-dumping hoppers.



VecLoader® Titan® Series

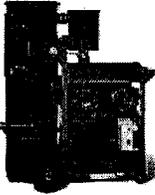
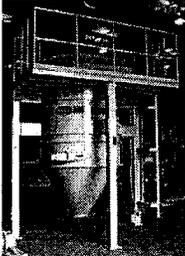
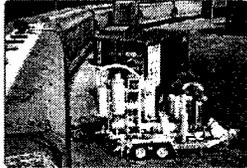
Power of a vacuum truck in a compact trailer package.
50 to 250 horsepower.
To 28" Hg.



Neptune Jetter Vac™ Vacuum Series

Combination Vacuum/Sewer Jetter at 1/3 the price of a vacuum truck.
200-2000 gallon spoils tank.
To 235 horsepower and 28" Hg.



 <p>VecLoader® Spartan® II Series Compact and powerful vacuums. Load into hoppers, drums, and other collection devices.</p>	 <p>VecLoader® Titan® M Series Shipyard vacuums that cost effectively replaces liquid ring vacuums.</p>	 <p>Specialized Systems For hydro excavation, water blast, robotic blast, and spill recovery.</p>
 <p>Hercules Vacuum™ Series An affordable step up from ShopVacs. 3 to 30 horsepower.</p>	 <p>VecLoader® HepaVac® Series Power and performance for environmentally sensitive hazardous materials. To 235 horsepower and 28" Hg.</p>	 <p>Blast & Recovery Systems Completely self-contained vacuum recovery/classification and blasting systems. To 235 horsepower and 28" Hg.</p>
 <p>Roadworthy Cyclone Separator or Baghouse That Works In Conjunction with Any Vacuum System</p>	 <p>Intermediate Separators and Stand-Alone Cyclonic Baghouses</p>	 <p>CSTM Integrated Vacuum Series Portable in-plant vacuum systems. 25 to 300 horsepower. (Shown with 300 horsepower unit.)</p>
 <p>All Vac - Finally a budget vacuum with enough power to tackle rocks and debris!</p>	 <p>C-Vac - Clean, Low Temperature Bulk Transfer of Plastic Pellets, Dry Chemicals, and Food Grade Products Achieves Conveying Rates of Up to 50 tons/hour</p>	 <p>CV Series Vacuum Systems combine portability, pulsed filtration, real power, ease of mobility, rugged design and minimal maintenance.</p>

Vector Technologies Ltd. and its **Vacuum Engineering Division** are leading world designers and manufacturers of powerful industrial vacuums, air and hydro vacuum excavators, combination vacuum & jetters, hydro blast liquid recovery equipment, abrasive blasting and surface preparation equipment, portable dust collectors and baghouses, spill response equipment, asbestos and hazardous waste industrial vacuum removal equipment, and other conveyance products for hazardous and non-hazardous material handling.

For over thirty years, our designs have set world standards for reliability and performance in a variety of industrial and specialized markets. Vector has

For the last 30 years, our designs have set the standards for reliability and performance in a variety of industrial and specialized markets. Vector has provided solutions to organizations of all sizes for an endless number of diverse applications. Each product is serviced and supported by the dedicated Technical Service group. Vector is fully committed to being the leader in Product Design, Product Reliability, and Product Support. Vector! More work in less time!

Vector provides advantages and benefits that far exceed building the best equipment. Experienced in-field service personnel, an extensive parts inventory, and a 24-hour assistance line assure readily available technical support. Vector services include engineering and supplying of central manifold systems, start-up and training, preventive maintenance programs, field repairs, continuing customer education, and equipment rentals and leasing programs. Vector also sells spare parts, and performs repairs and maintenance on all competitive industrial vacuums, dust collectors and baghouses, and abrasive blasting systems.

With good listening, creative ideas, expert designs, quality manufacturing, extensive field tests, and responsive service. Vector maintains its position of leadership. The employees of Vector take great pride in offering dependable and long lasting world-class products at competitive prices.

VecLoader® industrial vacuums are extremely powerful and compact systems. Our industrial vacuums incorporate innovative technology to solve a wide variety of industrial **vacuum** and conveyance needs. Modular in design, VecLoader industrial vacuums can be easily matched to a wide assortment of customer specified cyclone separators, filter receivers, collection systems, classifiers, self-dumping hoppers, and intermediate collection devices. Industrial vacuums are available in liquid propane, gasoline, electric or diesel power, and in skid, crane, truck and trailer mounted configurations.

Equipment rental and lease programs to meet your short or long-term needs. We have a vast, nation-wide distribution network of suppliers and financiers in your geographic location. We showcase our products at www.vacuum-rentals.com

We seek to significantly expand our market presence through buyers, importers, agents, and distributors. Please read the Trade Partner Briefing and then fill out the Trade Partner Participation Form.

Register below to keep current with the latest innovations in industrial **vacuum** technology. We provide newsletters, product catalogs, and promotional packages by either e-mail or fax to the **vacuum** user community.

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ms * Hydro Blast Liquid Recovery Systems * Jetters & Municipal Vacs * Dust Collectors * Vacuum and Hydro Excavation Systems * Classifiers * Blast a

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These search terms have been highlighted: **drilling vacuum**

Patent Storm

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United States Patent 5904453

Drill and vacuum combination

US Patent issued on May 18, 1999

Inventor(s) **ABSTRACT** CLAIMS DESCRIPTION FULL TEXT

Cesar Gavil

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Application

Claims

No. 992562 filed on 1997-12-17

I claim:

vacuum loader

Vacuum Loading Systems To 300 Hp and 28" Hg
www.vacload.com

Current US Class

408/67, 408/124

Field of Search

408/124, 408/67

Examiners

Proctor, Daniel W Howell

Attorney, Agent or Firm

US Patent References

5467836

5653581

1. A drill vacuum combination comprising:

a drill having an inverted L-shaped configuration with a vertical handle including a trigger for generating an activation signal upon the depression thereof, the drill further having a horizontal upper extent with a rotating adjustable drill chuck rotatably mounted to a front face thereof and adapted to releasably receive a drill bit therein, the drill chuck adapted to rotate during the receipt of the activation signal, the front face of the horizontal upper extent further having an annular sleeve mounted in concentric relationship with the drill chuck with a pair of diametrically opposed locking tabs extending therefrom;

a cylindrical tube formed of an elastomeric material that has a bellowed periphery and a spring integrally formed within the tube wherein the spring resides along a helix defined by an apex of each hollowed portion of the tube for urging the tube to a full length thereof an

November 29, 1881
Francis Blake was granted a patent for the speaking phone

Foreign Patent References

1334366 GB Oct., 1973
2940362 DE Apr., 1981
4030067 DE Mar., 1992

an apex of each bellowed portion of the tube for urging the tube to a full length thereof, an end of the tube having a rigid sleeve with a pair of diametrically opposed bores for releasably receiving the locking tabs of the annular sleeve such that the tube resides in concentric relationship with the drill chuck;

a **vacuum** assembly including a plastic sealed container mounted on a lower surface of the horizontal upper extent of the drill, the container having an interior space which resides in communication with the tube via a pair of bores formed in the annular sleeve of the drill and the rigid sleeve of the tube, respectively, the container further having a bag adapter having a first open end in communication with the pair of bores and a second open end, the **vacuum** assembly further including a **vacuum** bag situated within the container with an opening removably connected to the second open end of the bag adapter with the bag being air permeable, the **vacuum** assembly further including a **vacuum** pump mounted within the horizontal upper extent and in communication with the container for creating a **vacuum** within the container, bag and cylindrical tube upon the receipt of the activation signal; and

switch means mounted on a top surface of the horizontal upper extent of the drill, the switch means having a first orientation for only allowing the transmission of the activation signal to the drill chuck, a second orientation for only allowing the transmission of the activation signal to the **vacuum** assembly, and a third orientation for only allowing the transmission of the activation signal to both the drill chuck and **vacuum** assembly.

2. A drill **vacuum** combination comprising:

a drill having an inverted L-shaped configuration with a vertical handle including a trigger for generating an activation signal upon the depression thereof, the drill further having a horizontal upper extent with a rotating adjustable drill chuck rotatably mounted to a front face thereof and adapted to releasably receive a drill bit therein, the drill chuck adapted to rotate during the receipt of the activation signal;

a tube situated in concentric relationship with the drill chuck;

a **vacuum** assembly mounted on the drill and in communication with the tube for generating a **vacuum** upon the receipt of the activation signal; and

switch means mounted on the drill, the switch means having a first orientation for only allowing the transmission of the activation signal to the drill chuck, a second orientation for only allowing the transmission of the activation signal to the **vacuum** assembly, and a third orientation for allowing the transmission of the activation signal to both the drill chuck and **vacuum** assembly.

3. A drill **vacuum** combination as set forth in claim 2 wherein the **vacuum** assembly includes a sealed container mounted on the drill, the container having an interior space which resides in communication with the tube, the **vacuum** assembly further including a **vacuum** bag situated within the container with an opening removably connected in communication with the tube with the bag being air permeable, wherein the **vacuum** pump is adapted for creating a **vacuum** within the container, bag and cylindrical tube upon the receipt of the activation signal.

4. A drill **vacuum** combination as set forth in claim 2 wherein the tube is bellowed and connected to the drill such that the tube extends along an entire length of the drill bit.

connected to the drill such that the tube extends along an entire length of the drill bit.

5. A drill **vacuum** combination as set forth in claim 2 wherein the tube is removably coupled to the drill.

6. A drill **vacuum** combination as set forth in claim 2 wherein an end of the tube has a rigid sleeve with a locking means for releasably coupling with a locking means mounted on an annular sleeve of the drill.

7. A drill **vacuum** combination as set forth in claim 2 wherein the tube is transparent.

8. A drill **vacuum** combination as set forth in claim 2 wherein the tube has measurement indicia printed along a length thereof.

9. A drill **vacuum** combination comprising:

a drill having an inverted L-shaped configuration with a vertical handle including a trigger for generating an activation signal upon the depression thereof, the drill further having a horizontal upper extent with a rotating adjustable drill chuck rotatably mounted to a front face thereof and adapted to releasably receive a drill bit therein, the drill chuck adapted to rotate during the receipt of the activation signal;

a tube having a sleeve mounted on an inboard end thereof which is adapted for being removably situated in concentric relationship with the drill chuck; and

a **vacuum** assembly mounted on the drill and in communication with the tube for generating a **vacuum** upon the receipt of the activation signal;

said **vacuum** assembly including a sealed container mounted on an underside of the drill, the container having an interior space which resides in communication with the tube via a conduit which is attached to the annular sleeve, the **vacuum** assembly further including a **vacuum** bag situated within the container with an opening removably connected in communication with the tube with the bag being air permeable, wherein the **vacuum** pump is adapted for creating a **vacuum** within the container, bag and cylindrical tube upon the receipt of the activation signal;

wherein the tube has measurement indicia printed along a length thereof.

10. A drill **vacuum** combination as set forth in claim 9 wherein the tube is bellowed and connected to the drill such that the tube extends along an entire length of the drill bit.

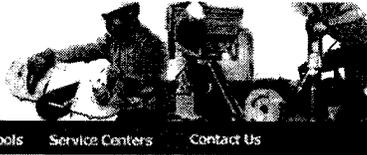
11. A drill **vacuum** combination as set forth in claim 9 wherein the tube is transparent.

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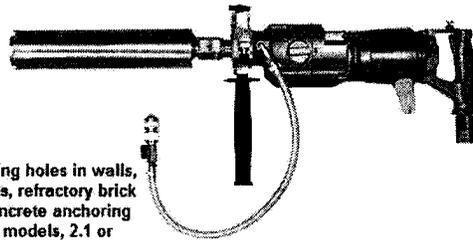
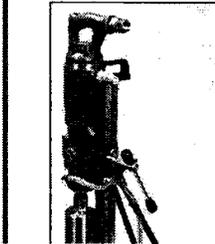


Tool Search



Pneumatic Core Drills
Cut holes up to 6" dia.
Cut holes up to 12" dia.

6" Pneumatic Core Drilling Machine - 3-Speed, 2.1 or 3.8 HP Motor - Hand-Held or Rig Mounted



Ideal for drilling holes in walls, floors, ceilings, refractory brick and for all concrete anchoring systems. Two models, 2.1 or



Rig-Mounted Air Drill

Only 52 lbs.

(Hand Crank can be mounted on either side)

Drilling Capacity:

Hand-Held Drilling - 1/2"-3" dia.

Rig-Mounted Drilling - 1/2"-6" dia.

**Do not use core bits larger than 6" dia. Use gear 1 in a drill stand only.*

See Accessories for anchor stands, centering aid, portable water tank, water collection kit.

[Download PDF Specification Sheet for Model 2 1333 0010 and 2 1335 0010](#)

[Model 2 1333 0010 Schematics \(PDF\)](#)

[Model 2 1335 0010 Schematics \(PDF\)](#)

systems. Two models, 2.1 or 3.8 HP.

3-Speed Hand-held Air Core Drill

Options include metal carrying case, anchor stand, vacuum pump, portable water tank and Unicore Diamond Core Bits.

Standard Equipment:

- Safety Slip Clutch
- 3-Speed Mechanical Gear Box with heat-treated gears
- Built-in Water Swivel
- 1-1/4" x 7 UNC Spindle
- 5/8" x 11 UNC Adapter
- 360° Rotatable Side Handle
- Centering Aid P/N 2 1315 6800

Accessories:

- Metal Carrying Case P/N 5 1212 9000
- Anchor Stand P/N BST 162V
- Vacuum Pump, Pneumatic P/N 253.542
- Portable Water Tank, 3.5 gallons P/N 251.623
- Unicore Wet Diamond Core Bits

Model 2 1333 0010 — 2.1 HP (1.6 kW) Specifications:

3 Speeds (RPM):	400, 900, 1600
Air Motor:	2.1 HP (1.6 kW)
Air Consumption:	77 CFM
Air Pressure:	90 PSI
Air Connection:	3/4" NPT
Bit Connection:	1-1/4"x7 UNC, 5/8"x11 UNC, G 1/2"
Weight:	18 lbs.

Drill & Anchor Stand – 2 1333 0010 SA (49 lbs.)
Drill, Stand & Vacuum Pump – 2 1333 0010 SV (51 lbs.)

Model 2 1335 0010 — 3.8 HP (2.8 kW) Specifications:

3 Speeds (RPM):	300, 700, 1350
Air Motor:	3.8 HP (2.8 kW)
Air Consumption:	123 CFM
Air Pressure:	90 PSI
Air Connection:	3/4" NPT
Bit Connection:	1 1/4"x7 UNC, 5/8"x11 UNC, G 1/2"
Weight:	21 lbs.

Drill & Anchor Stand – 2 1335 0010 SA (52 lbs.)
Drill, Stand & Vacuum Pump – 2 1335 0010 SV (54 lbs.)

[Email us for more information](#)



Diamond Drill Stand

Combo Anchor / Vacuum





Hydraulic Power Unit

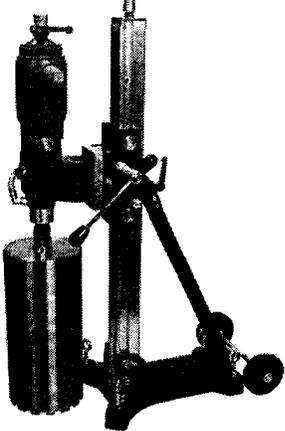
Unicore Diamond Core Bit

Combo Anchor / Vacuum Base

Includes Leveling Bubbles and Adjustable Column for Angle Drilling

[Click here for details](#)

12" Pneumatic Core Drilling Machine - 3-Speed - 3.8 HP Motor




The 2 1328 0050 Core Drill combines a powerful 3.8 HP motor with a rugged 3-speed gearbox to drill holes from 1/2" to 12" diameter. Ideal for heavy-duty drilling in concrete, reinforced concrete, asphalt, natural stone and refractory. No other drill in its class is so light and powerful.

- High-torque 3-speed gearbox for optimal drilling speeds: 300-700-1350 RPM
- 1" to 12" bit capacity
- Heat-treated gears for long life
- Mechanical Slip Clutch protects in case of jamming
- 43" tall drill stand with Quick Lock Motor Mount, positive locking knob and wheels
- Hand-crank can be mounted on either side of the drill stand. The stand angle is adjustable up to 45°
- Built-in Water Swivel
- 1-1/4" x 7 UNC Spindle
- 5/8" x 11 UNC Adapter (optional)

Rig Mounted Core Drill w/ Anchor Stand (shown above)
Wgt. 66 lbs.
Model No.: 2 1328 0050 SA

Rig Mounted Core Drill w/ Anchor Stand & Vacuum Pump
Wgt. 72 lbs.
Model No.: 2 1328 0050 SV

Model 2 1328 0050 SA

3 Speeds (RPM):	300, 700, 1350
Air Motor:	3.8 HP (2.8 kW)

Air Core Drill Motor - P/N 2 1328 0050

Model No. 2 1328 0050 SA

Stands are easily adjustable up to 45° from vertical.

See Accessories for anchor stands, centering aid, portable water tank, water collection kit.

[Download PDF Specification Sheet for Model 2 1328 0050 SA](#)

Air Consumption:	123 CFM
Air Pressure:	90 PSI
Air Connection:	3/4" NPT
Bit Connection:	1-1/4"x7 UNC, 5/8"x11 UNC, G 1/2"
Weight:	66 lbs. (includes motor and drill stand)

* Optional

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Hydraulic Power Unit



Unicore Diamond Core Bit

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- Agricultural Equipment
- Compact Equipment
- Environmental Equipment
- Terrain Leveler Surface Excavation Unit
- Trenching Equipment
- Trenchless Equipment**
- Atlas Bore Planner
- Core Saws
- Culvert Cleaning System
- Drill Head Locators
- Drill Stem
- Drilling Fluid Systems
- Drills
- FieldCalc
- GPR
- GPS Systems
- Modular Mix Systems
- Moles
- Mud Motors
- Pipe Ramming
- Pneumatic Pipe Bursting
- Reclaimers
- Remote High Pressure Pumps
- Remote Lockout
- Rock Tooling
- Sewer Lateral Pipe Bursting
- Static Pipe Bursting
- Terrain Mapping
- Vacuum Excavators
- Parts and Service
- Used Equipment

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Vacuum Excavation Units Perform Multiple Jobs

Today, **vacuum** excavation machines complement a large portion of horizontal directional **drilling** operations - many HDD teams won't leave the shop without them. As usage increases, however, it is clear that these systems are extremely versatile beyond **drilling** projects. While **vacuum** excavation systems are an attractive complement to HDD operations, these units also serve a number of other viable industrial and agricultural applications.

With more utilities underground, **vacuum**-excavation systems present a preferred alternative to hand digging or conventional exposure techniques. With the growing emphasis on preventing damage to buried utilities, **vacuum** excavation is quickly becoming a standard procedure. Many project owners and contractors are establishing policies, and government agencies are adopting regulations specifying **vacuum** excavation to verify utilities before starting HDD projects or excavating.

Atlas Bore Planner

The ATLAS BORE PLANNER planning and mapping software provides a graphic visualization of the job, helping a crew see the job from start to finish.

Core Saws

The CS418 core saw meets your tough cutting challenges - asphalt, concrete, reinforced concrete and more.

Culvert Cleaning System

Drill Head Locators

Vermeer works with leading locator manufacturers to provide state-of-the-art tracking units that maximize your productivity.

Drill Stem

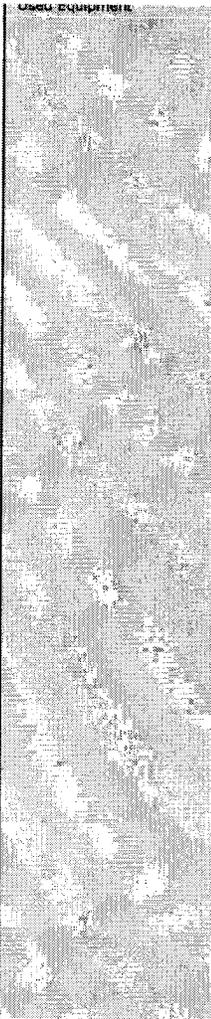
FIRESTICK threads are precision machined and feature a coarse design for faster makeup and breakout, and longer joint life.

Drilling Fluid Systems

Vermeer fluid-mixing systems feature vantiuri/hopper-mixing systems to provide the initial mixing of **drilling**-fluid additives. Afterwards, strategically placed roll jets roll the tank's contents to complete the mixing process and to reduce yield time.

Drills

The Vermeer NAVIGATOR line of horizontal directional units is ideal for the underground installation of gas, electric, water, telecommunication or soil remediation lines - without excavation or



The application of **vacuum**-excavation systems in the field has been successful for a variety of municipalities, utility companies, and contractors alike. In general, a two-person **vacuum**-excavation crew can prepare a job site in advance of an HDD or trenching crew, creating substantial efficiencies.

While **vacuum** excavation units serve a wide variety of industrial needs, many agree the driving force behind the market's growth has clearly been the HDD boom of the 90s. Increased demand for **vacuum**-excavation equipment has created a broad range of product sizes and capabilities, however most applications of these systems are for spoils removal and potholing.

Systems are available in two configurations: **vacuum** only and **vacuum** excavation. **Vacuum** excavation units are able to perform **vacuum**-only operations, as well as small-diameter, non-destructive excavation. Typical jobs for these systems include:

Vacuuming – Removing HDD fluids that accumulate around the entrance of bore holes during **drilling** operations, and general industrial and agricultural cleaning.

Excavation – High-pressure water is used to break up compacted soil, while vacuuming removes it from the opening.

Additional **vacuum** excavation system applications may include picking up wood chips, sawdust, yard wastes, and other ground debris, sewer jetting, cleaning car wash sludge pits, removing waste from animal pens and portable bathrooms, cleaning restaurant grease pits containing floods/spills, and performing certain plumbing services. Other possible uses can include landscape applications such as clearing paths for irrigation lines and in-ground lighting, as well as installing fence posts.

remediation lines – without excavation or trenching.

FieldCalc

For fast HDD calculations in the field, the **FieldCalc** system allows users to calculate setback distance, figure point-to-point bore paths, estimate pullback time and hole volumes and configure outside diameter of multiple ducts.

GPR

Get underground metallic and nonmetallic object information quickly with the **INTERAGATOR** line of ground-penetrating radar systems.

GPS Systems

Designed to fit on various brands and types of machines, **SiteStar Fleet Management System** helps control operating costs by pinpointing the location of equipment, tracking usage rates and providing alert data.

More News

Trenchless Equipment



Trenchless Equipment ... more

Still Installing Fiber After All These Years



Daleo, Inc. rode the HDD-market roller coaster and survived. Today, 80 percent of the Gilroy, California-based company's business is still fiber-optics cable installation, which Daleo, Inc. leaders are proud to call "unique". ... more

Modular Mix Systems

Modular mixing systems provide fast mixing of high volumes of **drilling** fluid for larger-diameter and longer-distance HDD applications, including projects requiring mud motors.

Moles

The patented **HAMMERHEAD MOLE** line is a low-maintenance, cost-effective line of tools with the versatility to handle pipe bursting, ramming or pulling.

Mud Motors

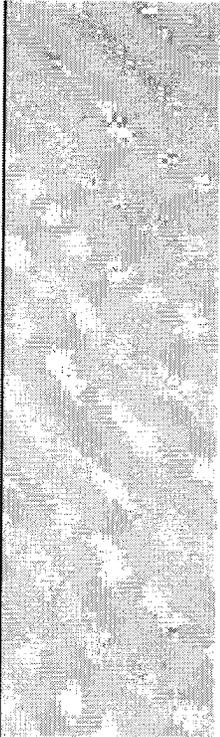
The patented **Survey While Boring Mud Motor** features an innovative "up front" transmitter that allows the operator to know the current location of the bit in the bore path.

Pipe Ramming

Ramming is an excellent, cost-efficient alternative for placing steel casing under roads, railroads, finished landscapes and structures.

Pneumatic Pipe Bursting

With advanced computer modeling technology, high quality alloy steels, more than 60 patent claims and a straightforward, hardworking design, **HammerHead Mole** tools are your high performance, low maintenance solution for a variety of applications.



Remote Lockout

The Remote Lockout System is a two-way communication and control tool that allows workers to lockout drill stem rotation, thrust and fluid flow along the bore path or at the exit site.

Rock Tooling

The Vermeer RockFire line offers the latest in rock-drilling technology. By utilizing a stand-alone compressor and special foam instead of drilling fluid, RockFire heads are able to work in some of the toughest rock conditions you'll encounter.

Sewer Lateral Pipe Bursting

The P230 gives you a light weight, portable, cost effective and efficient method of replacing 4" and 6" sewer laterals in a minimum amount of time.

Static Pipe Bursting

HammerHead HydroBurst pipe bursting systems are designed specifically for gas and water line replacement. The rods are designed to be forced through heavily encrusted, damaged or collapsed lines.

Terrain Mapping

The Terrain-Mapping system uses a reflective laser to direct a beam to a stationary prism, which reflects the beam back to the laser providing height and distance readings.

Vacuum Excavators

Vermeer/Ring-O-Matic vacuum systems are built to offer today's contractor efficient vacuum and vacuum/excavation capabilities.

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Rental Concrete Equipment



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Stone 12 cu/ft Gas Mortar Mixer
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MBW 46" Power Trowel
Oztec Concrete Vibrator(motor, shaft & head)
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Camlever 1/2-yard Concrete Bucket
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Dictionary

Find definitions for:

tech

Pronunciation: (tek), [key] Informal.

—adj.

technical: *The engineers sat together exchanging tech talk.*

—n.

1. a technician: *He's a tech for a film crew.*
2. technology: *She has a good grasp of computer tech.*

tech.

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2. technical.
3. technology.

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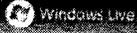
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- ↑
- va
- VA
- Va.
- va
- Vaal
- Vaasa
- vac (1)
- vac (2)
- ▶ **vac (3)**
- vacancy
- vacant
- vacant possession
- vacate
- vacation
- vacationer
- vacationland
- vaccinate
- ↓

vac (3)

vac

abbr

Definition:

- 1.** vacancy
- 2.** vacant
- 3.** PHYSICS vacuum

Print Preview

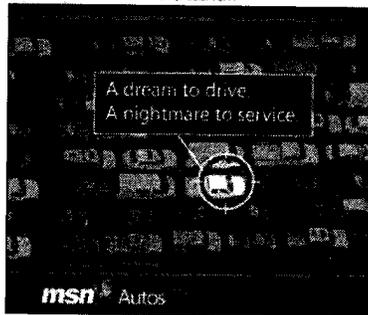
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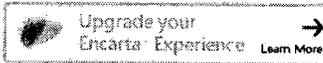
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Print: Mar 13, 2007

75532032

DESIGN MARK

Serial Number
75532032

Status
SECTION 8 & 15-ACCEPTED AND ACKNOWLEDGED

Word Mark
CEMEN TECH

Standard Character Mark
No

Registration Number
2354604

Date Registered
2000/06/06

Type of Mark
TRADEMARK

Register
PRINCIPAL

Mark Drawing Code
(1) TYPED DRAWING

Owner
Cemen Tech, Inc. CORPORATION IOWA 1700 N 14TH STREET Indianola IOWA
50125

Goods/Services
Class Status -- ACTIVE. IC 007. US 013 019 021 023 031 034 035. G
& S: Power operated mobile concrete equipment, namely concrete mixers,
concrete dispensers, grout mixture, fly ash mixers, gunite and
shortcrete machines for producing concrete and cementitious mixtures;
material blenders, aggregate conveyors; sludge conveyors; cake sludge
processors; liquid sludge processors, proportioning systems comprising
of holding hoppers, belt or screw conveyor metering systems,
calibrated gates, continuous or batch mixers and flowable fill systems
comprising of holding hoppers, belt or screw conveyor metering
systems, calibrated gates, continuous or batch mixers. First Use:
1976/01/01. First Use In Commerce: 1977/02/10.

Goods/Services
Class Status -- ACTIVE. IC 006. US 002 012 013 014 023 025 050. G
& S: Cementitious silos made of metal and portable cement silos made of
metal; live bottom storage bins made of metal; heat pulse bins made of
metal. First Use: 1976/01/01. First Use In Commerce: 1977/02/10.

Print: Mar 13, 2007

75532032

Disclaimer Statement

NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO USE "TECH" APART FROM THE MARK AS SHOWN.

Filing Date

1998/08/06

Examining Attorney

OH, WON TEAK

Attorney of Record

WENDY K HARTUNG

CEMEN TECH

Print: Mar 13, 2007

76316885

DESIGN MARK

Serial Number
76316885

Status
REGISTERED

Word Mark
EVO TECH

Standard Character Mark
No

Registration Number
2612520

Date Registered
2002/08/27

Type of Mark
TRADEMARK

Register
PRINCIPAL

Mark Drawing Code
(1) TYPED DRAWING

Owner
MEAD CORPORATION, THE CORPORATION OHIO COURTHOUSE PLAZA NORTHEAST
DAYTON OHIO 45463

Goods/Services
Class Status -- ACTIVE. IC 007. US 013 019 021 023 031 034 035. G
& S: PACKAGING MACHINES. First Use: 2001/03/21. First Use In
Commerce: 2001/03/21.

Prior Registration(s)
1491087;2014751;AND OTHERS

Disclaimer Statement
NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO USE "TECH" APART FROM THE
MARK AS SHOWN.

Filing Date
2001/09/25

Examining Attorney
KHAN, ASMAT

Print: Mar 13, 2007

76316885

Attorney of Record

Thomas A. Boshinski

EVO TECH

Print: Mar 13, 2007

76319726

DESIGN MARK

Serial Number
76319726

Status
REGISTERED

Word Mark
S SCAND TECH

Standard Character Mark
No

Registration Number
2746123

Date Registered
2003/08/05

Type of Mark
TRADEMARK

Register
PRINCIPAL

Mark Drawing Code
(3) DESIGN PLUS WORDS, LETTERS AND/OR NUMBERS

Owner
SCAND TECH USA, L.L.C. LTD LIAB CO CONNECTICUT 440 John Fitch
Boulevard South Windsor CONNECTICUT 06074

Goods/Services
Class Status -- ACTIVE. IC 007. US 013 019 021 023 031 034 035. G
& S: duct cleaning apparatus, namely, suction nozzles and pressurized
nozzles for cleaning ducts; duct cleaning brushes; air powered
cleaning tools, namely, hoses, reels, shut-off valves, nozzles, claw
couplings, brushes, jetstream cables, and abrasive air blaster guns.
First Use: 1999/01/15. First Use In Commerce: 1999/01/15.

Disclaimer Statement
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MARK AS SHOWN.

Filing Date
2001/10/01

Examining Attorney
TOLPIN, BRETT

Print: Mar 13, 2007

76319726

Attorney of Record
Guy D. Yale



SCAND TECH

Print: Mar 13, 2007

76479923

DESIGN MARK

Serial Number

76479923

Status

REGISTERED

Word Mark

Y.S. TECH

Standard Character Mark

No

Registration Number

2882603

Date Registered

2004/09/07

Type of Mark

TRADEMARK

Register

PRINCIPAL

Mark Drawing Code

(3) DESIGN PLUS WORDS, LETTERS AND/OR NUMBERS

Owner

Yen Sen Technology Corp. CORPORATION TAIWAN No.329, Fong-jen Road
Chu-hou Village, Jen-wu Hsiang Kaohsiung Hsien TAIWAN

Goods/Services

Class Status -- ACTIVE. IC 007. US 013 019 021 023 031 034 035. G
& S: Motors for electric machines; Motors for cooling fans, namely,
heat dissipaters. First Use: 2000/05/06. First Use In Commerce:
2000/05/06.

Goods/Services

Class Status -- ACTIVE. IC 009. US 021 023 026 036 038. G & S:
Ventilating fans for eventual incorporation into central processing
units; fans, non-electric heat dissipaters for incorporation into
central processing units. First Use: 2000/05/06. First Use In
Commerce: 2000/05/06.

Goods/Services

Class Status -- ACTIVE. IC 011. US 013 021 023 031 034. G & S:
Ventilating fans for commercial equipment, for commercial or
industrial use. First Use: 2000/05/06. First Use In Commerce:
2000/05/06.

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76479923

Disclaimer Statement

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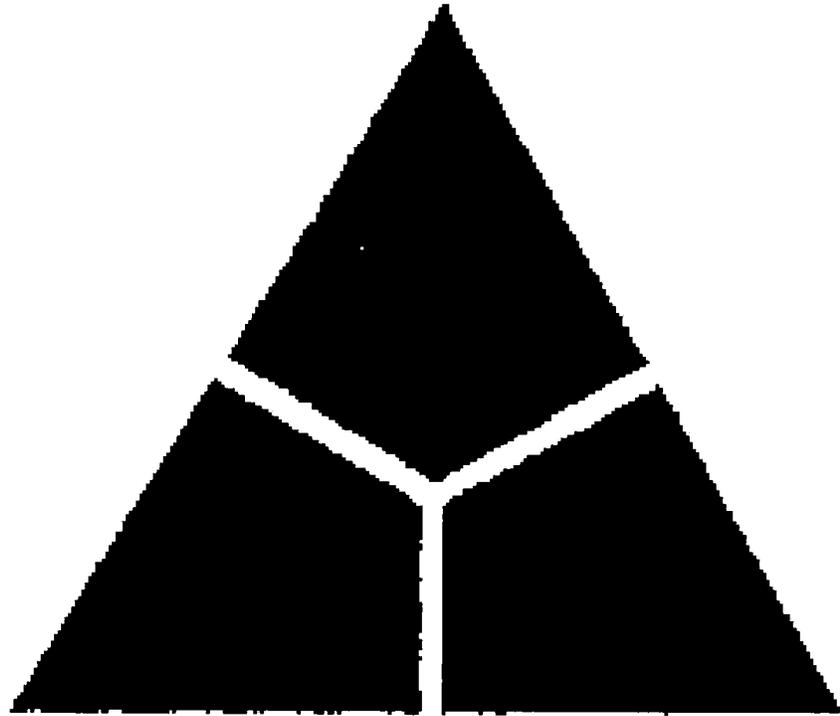
2002/12/31

Examining Attorney

STINE, DAVID

Attorney of Record

Thomas J. Moore



Y.S. TECH

Print: Mar 13, 2007

78367079

DESIGN MARK

Serial Number

78367079

Status

REGISTERED

Word Mark

SMART TECH ON BOARD SELF DIAGNOSING SYSTEM SMART...VERY SMART

Standard Character Mark

No

Registration Number

3142951

Date Registered

2006/09/12

Type of Mark

TRADEMARK

Register

PRINCIPAL

Mark Drawing Code

(3) DESIGN PLUS WORDS, LETTERS AND/OR NUMBERS

Owner

FAIP North America, Inc. CORPORATION ILLINOIS 1825 Greenleaf Ave. Elk Grove Village ILLINOIS 60007

Goods/Services

Class Status -- ACTIVE. IC 007. US 013 019 021 023 031 034 035. G & S: Multi-purpose high pressure washers. First Use: 2003/12/01. First Use In Commerce: 2004/03/01.

Disclaimer Statement

NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO USE "SMART TECH" and "SELF DIAGNOSING SYSTEM" APART FROM THE MARK AS SHOWN.

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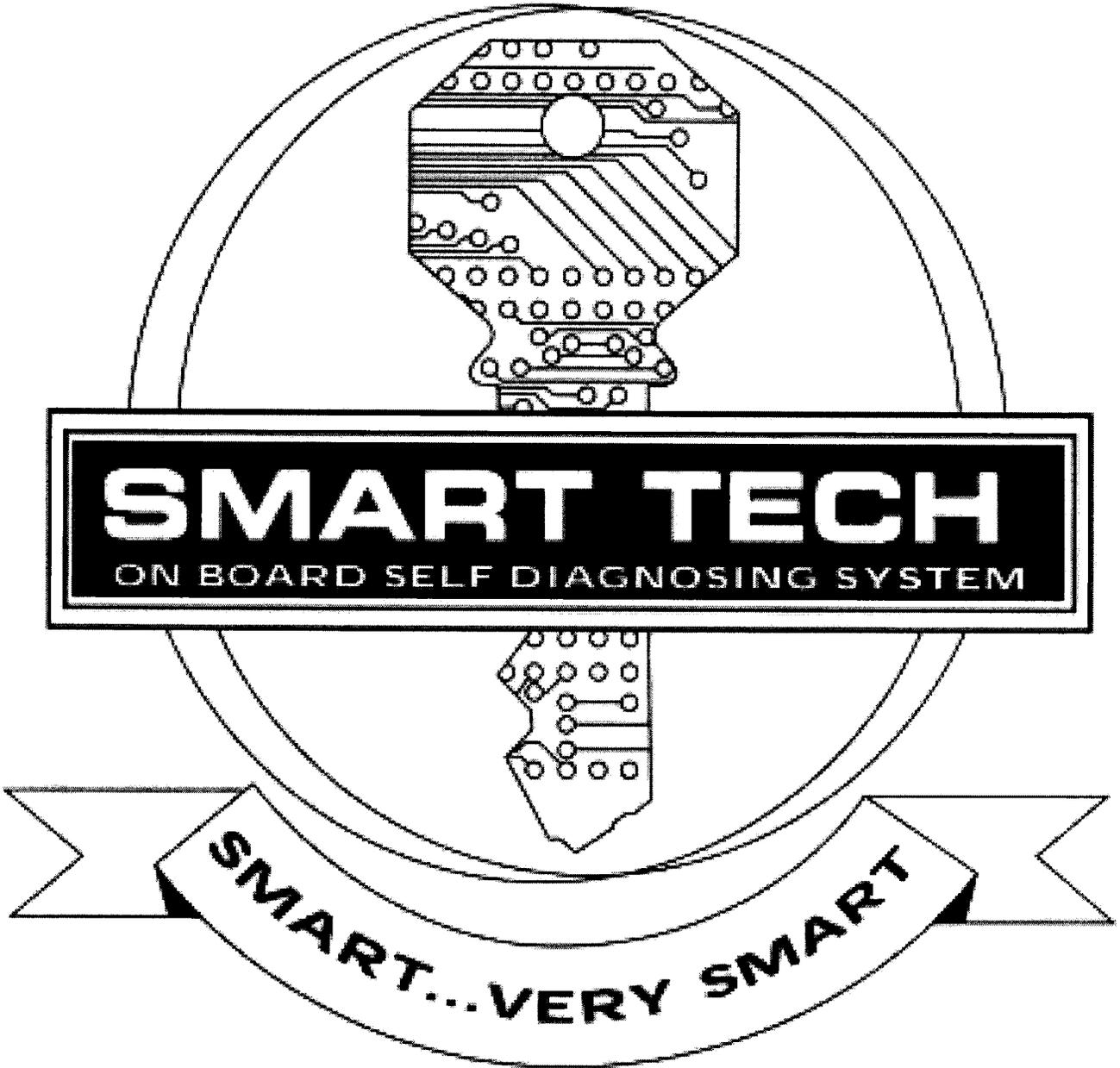
2004/02/12

Examining Attorney

CATALDO, CAROLYN

Attorney of Record

Lynn A. Sullivan



SMART TECH

ON BOARD SELF DIAGNOSING SYSTEM

SMART...VERY SMART

Print: Mar 13, 2007

76449304

DESIGN MARK

Serial Number
76449304

Status
REGISTERED

Word Mark
QUICK VAC

Standard Character Mark
No

Registration Number
2763876

Date Registered
2003/09/16

Type of Mark
TRADEMARK

Register
PRINCIPAL

Mark Drawing Code
(1) TYPED DRAWING

Owner
HAND TOOL DESIGN CORPORATION CORPORATION DELAWARE 501 Silver Side
Road, Suite 105 Wilmington DELAWARE 19809

Goods/Services
Class Status -- ACTIVE. IC 007. US 013 019 021 023 031 034 035. G
& S: pneumatically powered fluid evacuation system comprised of fluid
collecting sphere and hoses for removal of fluid for automotive and
industrial applications. First Use: 2002/02/01. First Use In
Commerce: 2002/02/01.

Disclaimer Statement
NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO USE "VAC" APART FROM THE
MARK AS SHOWN.

Filing Date
2002/09/09

Examining Attorney
OH, WON TEAK

Attorney of Record

Print: Mar 13, 2007

76449304

Robert M. Gamson

QUICK VAC

Print: Mar 13, 2007

78040242

TYPED DRAWING

Serial Number
78040242

Status
REGISTERED

Word Mark
VAC-PAK

Standard Character Mark
No

Registration Number
2888795

Date Registered
2004/09/28

Type of Mark
TRADEMARK

Register
PRINCIPAL

Mark Drawing Code
(1) TYPED DRAWING

Owner
Impact Instrumentation, Inc. CORPORATION NEW JERSEY 27 Fairfield Place
West Caldwell NEW JERSEY 07006

Goods/Services
Class Status -- ACTIVE. IC 010. US 026 039 044. G & S: portable aspirators for medical emergency use to evacuate and clear a patient's airway, and medical bags designed to hold the aforementioned aspirators. First Use: 1984/02/28. First Use In Commerce: 1984/02/28.

Disclaimer Statement
NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO USE VAC APART FROM THE MARK AS SHOWN.

Filing Date
2000/12/21

Examining Attorney
RODRIGUEZ, JOHN

Attorney of Record

Print: Mar 13, 2007

78040242

Edward Dreyfus

Print: Mar 13, 2007

78159520

TYPED DRAWING

Serial Number
78159520

Status
REGISTERED

Word Mark
PATRIOT CHIPPER SHREDDER VAC

Standard Character Mark
No

Registration Number
2794731

Date Registered
2003/12/16

Type of Mark
TRADEMARK

Register
PRINCIPAL

Mark Drawing Code
(1) TYPED DRAWING

Owner
Patriot Products, Inc. CORPORATION WISCONSIN W237 N2889 Woodgate Road
Pewaukee WISCONSIN 53072

Goods/Services
Class Status -- ACTIVE. IC 007. US 013 019 021 023 031 034 035. G
& S: Chipper shredder vacuum machines for comminuting organic lawn
refuse. First Use: 1994/11/14. First Use In Commerce: 1994/11/14.

Disclaimer Statement
NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO USE "CHIPPER SHREDDER VAC"
APART FROM THE MARK AS SHOWN.

Filing Date
2002/08/30

Examining Attorney
GAYNOR, BARBARA

Attorney of Record
Kevin P. Moran

Print: Mar 13, 2007

78520348

DESIGN MARK

Serial Number
78520348

Status
REGISTERED

Word Mark
POWER HANDI VAC

Standard Character Mark
Yes

Registration Number
3020848

Date Registered
2005/11/29

Type of Mark
TRADEMARK

Register
PRINCIPAL

Mark Drawing Code
(4) STANDARD CHARACTER MARK

Owner
Aqua Products, Inc. CORPORATION DELAWARE 25 Rutgers Avenue Cedar Grove
NEW JERSEY 07009

Goods/Services
Class Status -- ACTIVE. IC 011. US 013 021 023 031 034. G & S:
Robotic swimming pool water cleaning units. First Use: 1998/00/00.
First Use In Commerce: 1998/00/00.

Prior Registration(s)
2700593

Disclaimer Statement
NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO USE "POWER" or "VAC" APART
FROM THE MARK AS SHOWN.

Filing Date
2004/11/19

Examining Attorney
VOHRA, SANJEEV

Print: Mar 13, 2007

78520348

Attorney of Record

Lawrence E. Abelman

POWER HANDI VAC

Print: Mar 13, 2007

78593999

DESIGN MARK

Serial Number
78593999

Status
REGISTERED

Word Mark
COMP VAC

Standard Character Mark
Yes

Registration Number
3100406

Date Registered
2006/06/06

Type of Mark
TRADEMARK

Register
PRINCIPAL

Mark Drawing Code
(4) STANDARD CHARACTER MARK

Owner
Guardair Corporation CORPORATION MASSACHUSETTS 54 Second Avenue
Chicopee MASSACHUSETTS 01020

Goods/Services
Class Status -- ACTIVE. IC 007. US 013 019 021 023 031 034 035. G
& S: air powered vacuums for industrial use. First Use: 2004/06/25.
First Use In Commerce: 2004/06/25.

Disclaimer Statement
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MARK AS SHOWN.

Filing Date
2005/03/24

Examining Attorney
LAPTER, ALAIN

Attorney of Record
Donald S. Holland

COMP VAC

Print: Mar 13, 2007

78594005

DESIGN MARK

Serial Number
78594005

Status
REGISTERED

Word Mark
CARRY VAC

Standard Character Mark
Yes

Registration Number
3156547

Date Registered
2006/10/17

Type of Mark
TRADEMARK

Register
PRINCIPAL

Mark Drawing Code
(4) STANDARD CHARACTER MARK

Owner
Guardair Corporation CORPORATION MASSACHUSETTS 54 Second Avenue
Chicopee MASSACHUSETTS 01020

Goods/Services
Class Status -- ACTIVE. IC 007. US 013 019 021 023 031 034 035. G
& S: air powered vacuums for industrial use. First Use: 2004/06/25.
First Use In Commerce: 2004/06/25.

Disclaimer Statement
NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO USE "VAC" APART FROM THE
MARK AS SHOWN.

Filing Date
2005/03/24

Examining Attorney
LAPTER, ALAIN

Attorney of Record
Donald S. Holland

CARRY VAC

EXHIBIT D

Response to Office Action

The table below presents the data as entered.

Input Field	Entered
SERIAL NUMBER	77069596
LAW OFFICE ASSIGNED	LAW OFFICE 108
MARK SECTION (no change)	
ARGUMENT(S)	
<p><u>I. REMARKS</u></p> <p style="margin-left: 20px;"><u>Merely Descriptive</u></p> <p>The Examining Attorney has rejected the mark "VAC TECH" as allegedly merely descriptive. The Examiner cites reproductions of web pages using the term "Vacuum". However, no where is the term "VAC" cited in connection with specific machines or drilling processes. The word "VAC", without more, does not describe or identify a particular drilling machine or a type of drilling operation. The Examiner contends that the term "VAC" merely describes vacuuming that is done as a part of the drilling process. The Examiner, however, has not shown that the oilfield industry uses the word "VAC".</p> <p>Furthermore, the documents cited by the Examiner show that "vac" is not solely a shortened version of "vacuum". Instead, "vac" may be a shortened version of several different words that have no relation to "vacuum", e.g., vacancy and vacant. Accordingly, the rejection is not proper and should be removed.</p>	
<p><u>II. CONCLUSION</u></p> <p>Applicants respectfully request reconsideration of the present application and request that the Examiner call Applicants' attorney at the below listed number if the Examiner believes that such a discussion would be helpful.</p>	
SIGNATURE SECTION	
RESPONSE SIGNATURE	/William P. Ramey, III/
SIGNATORY'S NAME	William P. Ramey, III
SIGNATORY'S POSITION	Attorney for Applicant
DATE SIGNED	09/14/2007
AUTHORIZED SIGNATORY	YES

FILING INFORMATION SECTION

SUBMIT DATE	Fri Sep 14 17:56:14 EDT 2007
TEAS STAMP	USPTO/ROA-38.114.212.125- 20070914175614120757-7706 9596-40028df9055d5f8cdf87 adf917ad9bddd6-N/A-N/A-2 0070914175303931955

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OMB No. 0651-0050 (Exp. 04/2009)

**Response to Office Action
To the Commissioner for Trademarks:**

Application serial no. **77069596** has been amended as follows:

ARGUMENT(S)

In response to the substantive refusal(s), please note the following:

I. REMARKS**Merely Descriptive**

The Examining Attorney has rejected the mark "VAC TECH" as allegedly merely descriptive. The Examiner cites reproductions of web pages using the term "Vacuum". However, no where is the term "VAC" cited in connection with specific machines or drilling processes. The word "VAC", without more, does not describe or identify a particular drilling machine or a type of drilling operation. The Examiner contends that the term "VAC" merely describes vacuuming that is done as a part of the drilling process. The Examiner, however, has not shown that the oilfield industry uses the word "VAC". Furthermore, the documents cited by the Examiner show that "vac" is not solely a shortened version of "vacuum". Instead, "vac" may be a shortened version of several different words that have no relation to "vacuum", e.g., vacancy and vacant. Accordingly, the rejection is not proper and should be removed.

II. CONCLUSION

Applicants respectfully request reconsideration of the present application and request that the Examiner call Applicants' attorney at the below listed number if the Examiner believes that such a discussion would be helpful.

SIGNATURE(S)**Response Signature**

Signature: /William P. Ramey, III/ Date: 09/14/2007

Signatory's Name: William P. Ramey, III

Signatory's Position: Attorney for Applicant

The signatory has confirmed that he/she is an attorney who is a member in good standing of the bar of the highest court of a U.S. state, which includes the District of Columbia, Puerto Rico, and other federal territories and possessions; and he/she is currently the applicant's attorney or an associate thereof; and to the best of his/her knowledge, if prior to his/her appointment another U.S. attorney or a Canadian attorney/agent not currently associated with his/her company/firm previously represented the applicant in this matter: (1) the applicant has filed or is concurrently filing a signed revocation of or substitute power of attorney with the USPTO; (2) the USPTO has granted the request of the prior representative to withdraw; (3) the applicant has filed a power of attorney appointing him/her in this matter; or (4) the applicant's appointed U.S. attorney or Canadian attorney/agent has filed a power of attorney appointing him/her as an associate attorney in this matter.

Serial Number: 77069596

Internet Transmission Date: Fri Sep 14 17:56:14 EDT 2007

TEAS Stamp: USPTO/ROA-38.114.212.125-200709141756141

20757-77069596-40028df9055d5f8cdf87adf91

7ad9bdddc6-N/A-N/A-20070914175303931955

EXHIBIT E

To: Wellbore Energy Solutions, LLC (wramey@winstead.com)
Subject: TRADEMARK APPLICATION NO. 77069596 - VAC TECH - 46463-K003US
Sent: 10/2/2007 6:43:36 PM
Sent As: ECOM108@USPTO.GOV
Attachments:

UNITED STATES PATENT AND TRADEMARK OFFICE

SERIAL NO: 77/069596

MARK: VAC TECH

77069596

CORRESPONDENT ADDRESS:

WILLIAM P. RAMEY, III
WINSTEAD SECHREST & MINICK P.C.
600 TOWN CENTER ONE
1450 LAKE ROBBINS DRIVE
THE WOODLANDS, TX 77380

GENERAL TRADEMARK INFORMATION:
<http://www.uspto.gov/main/trademarks.htm>

APPLICANT: Wellbore Energy Solutions,
LLC

CORRESPONDENT'S REFERENCE/DOCKET

NO:

46463-K003US

CORRESPONDENT E-MAIL ADDRESS:

wramey@winstead.com

EXAMINER'S AMENDMENT

ISSUE/MAILING DATE: 10/2/2007

OFFICE SEARCH: The examining attorney has searched the Office records and has found no similar registered or pending mark which would bar registration under Trademark Act Section 2(d), 15 U.S.C. Section 1052(d). TMEP Section 704.02.

AMENDMENT: In accordance with the authorization granted by William P. Ramey, III on October 2, 2007, the application has been AMENDED as indicated below. Please advise the undersigned immediately if there is an objection to the amendment. Otherwise, no response is necessary. TMEP §707.

SUPPLEMENTAL REGISTER: The application is amended to the Supplemental Register. Trademark Act Section 23, 15 U.S.C. §1091; 37 C.F.R. §§2.47 and 2.75(a); TMEP §§801.02(b), 815 and 816 *et seq.*

DISCLAIMER: The following disclaimer statement is added to the record:

No claim is made to the exclusive right to use “TECH” apart from the mark as shown.

15 U.S.C. §1056; TMEP §§1213, 1213.03(a) and 1213.08(a)(i).

/AndreaRHack/
Andrea R. Hack
Trademark Examining Attorney
Law Office 108
Ph: 571.272.5413
Fax: 571.273.5413

STATUS CHECK: Check the status of the application at least once every six months from the initial filing date using the USPTO Trademark Applications and Registrations Retrieval (TARR) online system at <http://tarr.uspto.gov>. When conducting an online status check, print and maintain a copy of the complete TARR screen. If the status of your application has not changed for more than six months, please contact the assigned examining attorney.

To: Wellbore Energy Solutions, LLC (wramey@winstead.com)
Subject: TRADEMARK APPLICATION NO. 77069596 - VAC TECH - 46463-K003US
Sent: 10/2/2007 6:43:37 PM
Sent As: ECOM108@USPTO.GOV
Attachments:

IMPORTANT NOTICE
USPTO OFFICE ACTION HAS ISSUED ON 10/2/2007 FOR
APPLICATION SERIAL NO. 77069596

Please follow the instructions below to continue the prosecution of your application:

VIEW OFFICE ACTION: Click on this link http://portal.uspto.gov/external/portal/tow?DDA=Y&serial_number=77069596&doc_type=EXA&ma (or copy and paste this URL into the address field of your browser), or visit <http://portal.uspto.gov/external/portal/tow> and enter the application serial number to [access](#) the Office action.

PLEASE NOTE: The Office action may not be immediately available but will be viewable within 24 hours of this notification.

RESPONSE MAY BE REQUIRED: You should carefully review the Office action to determine (1) if a response is required; (2) how to respond; and (3) the applicable [response time period](#). Your response deadline will be calculated from **10/2/2007**.

Do NOT hit "Reply" to this e-mail notification, or otherwise attempt to e-mail your response, as the USPTO does NOT accept e-mailed responses. Instead, the USPTO recommends that you respond online using the Trademark Electronic Application System response form at <http://www.uspto.gov/teas/eTEASpageD.htm>.

HELP: For *technical* assistance in accessing the Office action, please e-mail TDR@uspto.gov. Please contact the assigned examining attorney with questions about the Office action.

WARNING

- 1. The USPTO will NOT send a separate e-mail with the Office action attached.**
- 2. Failure to file any required response by the applicable deadline will result in the [ABANDONMENT](#) of your application.**

EXHIBIT F

To: Wellbore Energy Solutions, LLC (wramey@winstead.com)
Subject: TRADEMARK APPLICATION NO. 77069596 - VAC TECH - 46463-K003US
Sent: 10/23/2007 11:31:39 AM
Sent As: ECOM108@USPTO.GOV
Attachments: [Attachment - 1](#)
[Attachment - 2](#)
[Attachment - 3](#)
[Attachment - 4](#)
[Attachment - 5](#)
[Attachment - 6](#)
[Attachment - 7](#)
[Attachment - 8](#)
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UNITED STATES PATENT AND TRADEMARK OFFICE

SERIAL NO: 77/069596

MARK: VAC TECH

CORRESPONDENT ADDRESS:

WILLIAM P. RAMEY, III
WINSTEAD SECHREST & MINICK P.C.
600 TOWN CENTER ONE

77069596

RESPOND TO THIS ACTION:

<http://www.uspto.gov/teas/eTEASpageD.htm>

1450 LAKE ROBBINS DRIVE
THE WOODLANDS, TX 77380

GENERAL TRADEMARK INFORMATION:
<http://www.uspto.gov/main/trademarks.htm>

APPLICANT: Wellbore Energy Solutions,
LLC

**CORRESPONDENT'S REFERENCE/DOCKET
NO:**

46463-K003US

CORRESPONDENT E-MAIL ADDRESS:
wramey@winstead.com

OFFICE ACTION

TO AVOID ABANDONMENT, THE OFFICE MUST RECEIVE A PROPER RESPONSE TO THIS OFFICE ACTION WITHIN 6 MONTHS OF THE ISSUE/MAILING DATE.

ISSUE/MAILING DATE: 10/23/2007

Background

In the Office action dated March 14, 2007, incorporated herein by reference, the application was refused because the proposed mark merely describes the function of applicant's goods. Trademark Act Section 2(e)(1), 15 U.S.C. §1052(e)(1); TMEP §§1209 *et seq.*

In that Office action, applicant was given the recommendation to amend the application to the Supplemental Register if and when an application alleging use was filed with the Office. Trademark Act Section 23, 15 U.S.C. §1091; 37 C.F.R. §§2.47 and 2.75(a); TMEP §§801.02(b), 815 and 816 *et seq.*

In applicant's response, dated September 14, 2007, and incorporated herein by reference, applicant argued against the descriptiveness refusal. The examining attorney has considered applicant's argument and found it unpersuasive, as discussed below.

Based on conversations with the applicant's attorney, on October 2, 2007, the examining attorney issued an Examiner's amendment, incorporated herein by reference, disclaiming the word "TECH" and improperly amending the application to the Supplemental Register. As this amendment to the Supplemental Register was made improperly (discussed further below), applicant must now re-amend the application back to the Principal Register. Further, because the application must remain on the Principal Register, the refusal to register the mark, as detailed in the first Office action and also discussed below, is maintained and continued.

Supplemental Register

The amendment to the Supplemental Register, entered October 2, 2007 was made in error. An application may not be amended to the Supplemental Register unless the applicant has claimed and demonstrated use of the mark, which has not been done in this case. Trademark Act Section 23, 15 U.S.C. §1091; 37 C.F.R. §§2.47 and 2.75(a); TMEP §§801.02(b), 815 and 816 *et seq.* Thus, the application must be amended back

to the Principal Register.

Should applicant use the proposed mark in commerce and file an amendment to allege use, applicant may then respond to the refusals below by amending the application to seek registration on the Supplemental Register. Trademark Act Section 23, 15 U.S.C. §1091; 37 C.F.R. §§2.47 and 2.75(a); TMEP §§801.02(b), 815 and 816 *et seq.* Note that applicant's proposed mark is not eligible for registration on the Supplemental Register until an acceptable amendment to allege use under 37 C.F.R. §2.76 has been timely filed. 37 C.F.R. §2.47(d); TMEP §§815.02, 816.02 and 1102.03. Please also note that amending to the Supplemental Register does not preclude applicant from submitting evidence and arguments against the refusals.

If applicant files an amendment to allege use and also amends to the Supplemental Register, please note that the effective filing date of the application will then be the date of filing of the amendment to allege use. 37 C.F.R. §2.75(b); TMEP §§206.01 and 816.02.

To amend to the Supplemental Register, applicant need only provide a request to do so.

Although Supplemental Register registration does not afford all the benefits of registration on the Principal Register, it does provide the following advantages:

- The registrant may use the registration symbol ®;
- The registration is protected against registration of a confusingly similar mark under §2(d) of the Trademark Act, 15 U.S.C. §1052(d);
- The registrant may bring suit for infringement in federal court; and
- The registration may serve as the basis for a filing in a foreign country under the Paris Convention and other international agreements.

REFUSAL: Applicant must note and address the following refusal to register.

Refusal – Merely Descriptive

Registration is refused because the proposed mark merely describes a function of applicant's goods. Trademark Act Section 2(e)(1), 15 U.S.C. §1052(e)(1); TMEP §§1209 *et seq.*

A mark is merely descriptive under Trademark Act Section 2(e)(1), 15 U.S.C. §1052(e)(1), if it describes an ingredient, quality, characteristic, function, feature, purpose or use of the relevant goods and/or services. *In re Gyulay*, 820 F.2d 1216, 3 USPQ2d 1009 (Fed. Cir. 1987); *In re Bed & Breakfast Registry*, 791 F.2d 157, 229 USPQ 818 (Fed. Cir. 1986); *In re MetPath Inc.*, 223 USPQ 88 (TTAB 1984); *In re BrightCrest, Ltd.* 204 USPQ 591 (TTAB 1979); TMEP §1209.01(b). A mark that describes an intended user of a product or service is also merely descriptive within the meaning of Section 2(e)(1). *Hunter Publishing Co. v. Caulfield Publishing Ltd.*, 1 USPQ2d 1996 (TTAB 1986); *In re Camel Mfg. Co., Inc.*, 222 USPQ 1031 (TTAB 1984); *In re Gentex Corp.*, 151 USPQ 435 (TTAB 1966).

The determination of whether a mark is merely descriptive is considered in relation to the identified goods and/or services, not in the abstract. *In re Polo International Inc.*, 51 USPQ2d 1061 (TTAB 1999) (Board found that DOC in DOC-CONTROL would be understood to refer to the "documents" managed by applicant's software, not "doctor" as shown in dictionary definition); *In re Digital Research Inc.*, 4 USPQ2d 1242 (TTAB 1987) (CONCURRENT PC-DOS found merely descriptive of "computer programs recorded on disk;" it is unnecessary that programs actually run "concurrently," as long as relevant trade clearly uses the denomination "concurrent" as a descriptor of this particular type of operating system); *In re Venture Lending Associates*, 226 USPQ 285 (TTAB 1985); *In re American Greetings Corp.*, 226 USPQ 365, 366 (TTAB 1985) ("Whether consumers could guess what the product is from consideration of the

mark alone is not the test”); TMEP §1209.01(b).

Here, applicant’s goods are drilling machines, as described by applicant in the application. Drilling involves using vacuum technology to remove dirt and rock. Vacuum excavation comprises a good portion of horizontal excavation especially. Internet evidence attached to the first Office action, and incorporated herein by reference, shows that vacuums are commonly sold with and as a part of drilling equipment, that vacuum excavation is a separate service regularly performed and advertised by drilling and industrial vacuum companies, and that vacuuming is done as a part of the drilling process. Internet dictionary evidence attached to the first Office action also shows that “TECH” is a shortened form of the word “technology,” and that “VAC” is a shortened form of the word “vacuum.” Additionally, the attached U.S. Registrations show that the Office has required disclaimer of “TECH” and “VAC” as descriptive of goods.

The combination of the two terms “VAC” and “TECH” does nothing to obviate the descriptiveness of either term; in fact, it does the opposite making the wording more descriptive. Applicant’s proposed mark merely describes applicant’s goods – vacuum technology – so the mark is refused registration. Applicant’s argument against the descriptiveness refusal is essentially that the shortened term “VAC” is not shown in the evidence attached to the first Office action as a term of art in the drilling industry, and that the term may be used as a shortened form of other words, such as “vacancy.”

The fact that a term may have other meanings is immaterial. Descriptiveness is considered in relation to the relevant goods. The fact that a term may have different meanings in other contexts is not controlling on the question of descriptiveness. *In re Chopper Industries*, 222 USPQ 258 (TTAB 1984); *In re Bright-Crest, Ltd.*, 204 USPQ 591 (TTAB 1979); *In re Champion International Corp.*, 183 USPQ 318 (TTAB 1974); TMEP §1209.03(e).

Regarding the use of the shortened word “VAC” in connection with drilling, the examining attorney has attached additional Internet evidence showing that “VAC” as a shortened form of “vacuum” is in common usage among the users of drills and drilling equipment. Consumers would be quite familiar with “VAC” as used in conjunction with drills to mean suction either to mount the drill in place or to remove debris associated with the drilling process. “VAC” is indeed highly descriptive of applicant’s goods. Applicant has now disclaimed “TECH.” The combination of the two terms, “VAC” and “TECH,” are highly descriptive of a feature of applicant’s goods.

Although the trademark examining attorney has refused registration, applicant may respond by submitting evidence and arguments in support of registration.

Response

Applicant should include the following information on all correspondence with the Office: (1) the name and law office number of the trademark examining attorney; (2) the serial number of this application; (3) the mailing date of this Office action; and, (4) applicant's telephone number. 37 C.F.R. §2.194(b)(1); TMEP §302.03(a).

If applicant has questions about its application or needs assistance in responding to this Office action, please telephone the assigned trademark examining attorney directly at the number below.

TEAS PLUS APPLICANTS MUST SUBMIT DOCUMENTS ELECTRONICALLY OR SUBMIT FEE:
TEAS Plus applicants should submit the following documents using the Trademark Electronic Application System (TEAS) at <http://www.uspto.gov/teas/index.html>: (1) written responses to Office actions; (2) preliminary amendments; (3) changes of correspondence address; (4) changes of owner’s address; (5) appointments and revocations of attorney; (6) amendments to allege use; (7) statements of use; (8) requests for extension of time to file a statement of use, and (9) requests to delete a §1(b) basis. If any of

these documents are filed on paper, they must be accompanied by a \$50 per class fee. 37 C.F.R. §§2.6(a)(1)(iv) and 2.23(a)(i). Telephone responses will not incur an additional fee. NOTE: In addition to the above, applicant must also continue to accept correspondence from the Office via e-mail throughout the examination process in order to avoid the additional fee. 37 C.F.R. §2.23(a)(2).

/AndreaRHack/
Andrea R. Hack
Trademark Examining Attorney
Law Office 108
Ph: 571.272.5413
Fax: 571.273.5413

RESPOND TO THIS ACTION: If there are any questions about the Office action, please contact the assigned examining attorney. A response to this Office action should be filed using the form available at <http://www.uspto.gov/teas/eTEASpageD.htm>. If notification of this Office action was received via e-mail, no response using this form may be filed for 72 hours after receipt of the notification. **Do not attempt to respond by e-mail as the USPTO does not accept e-mailed responses.**

If responding by paper mail, please include the following information: the application serial number, the mark, the filing date and the name, title/position, telephone number and e-mail address of the person signing the response. Please use the following address: Commissioner for Trademarks, P.O. Box 1451, Alexandria, VA 22313-1451.

STATUS CHECK: Check the status of the application at least once every six months from the initial filing date using the USPTO Trademark Applications and Registrations Retrieval (TARR) online system at <http://tarr.uspto.gov>. When conducting an online status check, print and maintain a copy of the complete TARR screen. If the status of your application has not changed for more than six months, please contact the assigned examining attorney.

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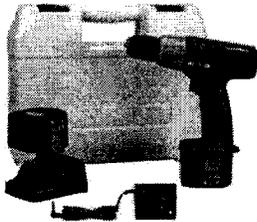


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Ryobi - 12-V Drill / Driver and Cordless Vac Combo

By: Kellie K. Speed



If you're looking to complete those small jobs around the house, what better way than with Ryobi's 12-volt drill/driver and cordless vac combo. When you're away traveling on business, coming home to several home improvement projects can be overwhelming. Leave the job to Ryobi to help make the projects easier.

Ryobi's latest drill/vacuum comes complete with a 12-V cordless drill/driver and vacuum to help make cleaning up a simple

effort. It is easy to clean too - by just emptying the dust cup and changing the filter. For vacuuming those hard-to-reach places, simply attach the crevice and brush heads.

One of the best features of this drill is the variable speed trigger, which allows the user to control drilling and driving from slow to fast. The built-in level is also ideal for accurate 90 degree drilling.

Be sure to check out the magnet tray on top of the drill's battery, which is ideal for storing small screws and bits when working on a project. We all know how useful having all items close by can be to save time.

Like most Ryobi products, you can purchase the cordless drill/vac combo kit (Model HS12VK2) at the Home Depot (www.homedepot.com). For more information on Ryobi tools, visit their site at www.ryobitools.com or call 800-525-2579.

* * *



Kellie K. Speed is a freelance travel writer and restaurant reviewer. Her features have been published in various publications including The Boston Globe, Cahners' Industrial Distribution and Graphic Arts Monthly magazines and Reno Air Approach.

Kellie has reviewed numerous first-class hotels and travel destinations, including Hawaii, California, Arizona, Bermuda and Mexico, to name a few. She has also traveled internationally to Ireland, England, France, Germany, Belgium and the Czech Republic. Next year, she is planning a trip to Tahiti.

Since she is from Massachusetts, she will be providing reviews of local restaurants for Travel-Watch.

If you would like to email Kellie any suggestions or comments, please do so at kkspeed@aol.com.

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Innovative Solutions for Offshore Drilling and Production

HOME BOB SYSTEMS CUTTINGS REELS VACUUM UNITS ZERO DISCHARGE BATH TANKS OTHER PRODUCTS CONTACT US COMPANY PROFILE

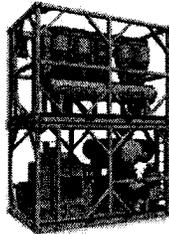
Vacuum units—Featuring the world's first non-sparking, low temperature blower

Meet Our patented RVD cuttings dryer

The heart of Hydro Carbon's patented vacuum system is the world's first non-sparking, low temperature blower.

3200 CFM vacuum system

Our most powerful vacuum unit features a Hibon 200 HP unit coupling 3200 CFM flow with the safety of non-sparking construction and a typical operating temperature of 160°F. The system was developed with GapVax, a leading manufacturer and service provider for vacuum equipment.



The most powerful non-sparking vacuum unit available for highest output and maximum drilling time

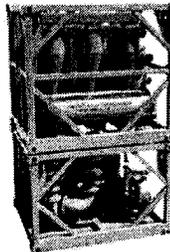
[3200 CFM vacuum info](#)

Since 1992 Hydro Carbon used small non-sparking vane pumps for vacuum services in our zero discharge installations because the Code of Federal Regulations requires non-sparking blowers where gases may be present. Now Hydro Carbon has developed a non-sparking hi-vac unit that runs at lower temperatures, ideal for collecting drill cuttings and solids from drilling fluids. Our hi-vac units maximize your drilling time, minimize maintenance and lower your risk in the presence of explosive gases.

1600 CFM vacuum system

Our new vacuum units are the most advanced in the industry. All units, diesel or electric, feature bronze impellers for spark resistance, a ductile iron casing pressure tested to 150 Psig and the added safety of low-temperature operation.

All the safety features of our largest diesel unit in an electric vacuum system powerful enough to handle drill cuttings



[1600 CFM vacuum info](#)

These units are plumbed off the shakers for collection into a Hydro Carbon cuttings box or installed in a central vacuum system that meets all regulatory standards for Class 1, Division 1 operation.

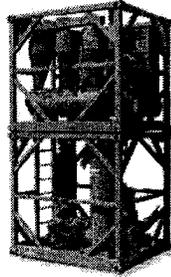
Our new patented Rotary Vacuum Drzer

Our new patented **Rotary Vacuum Dryer (RVD)** cuttings drying system excels in recovering expensive drilling fluids. These high capacity systems, complete with vacuum/separators units, use high speed air to strip cuttings from drilling fluid. This allows you to meet or exceed EPA guidelines and eliminate the need to convey cuttings. RVD screen units fit any shaker configuration to evenly screen the full width and output of the shaker.

See why Hydro Carbon's vacuum systems are superior

Comparison chart of vacuum systems suitable for zero discharge offshore applications

1000 CFM vacuum system

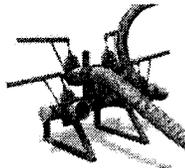


An electric system ideal for rig housekeeping, maintenance or smaller volumes of drill cuttings

[1000 CFM vacuum info](#)

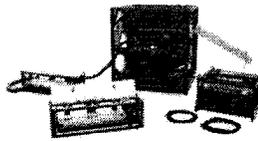
6" constant vac manifold

Allows you to maximize drilling time by switching boxes without shutdown



[Vac manifold info](#)

Rotary Vacuum Dryer



Maximize recovery of expensive drilling fluids and minimize cuttings retention by drying at the shaker.

[RVD system info](#)

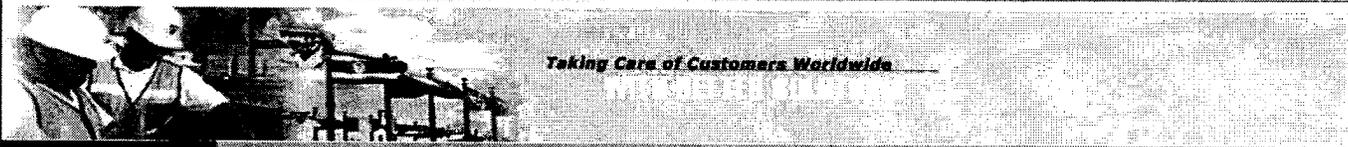
New! Our patented RVD cuttings dryer

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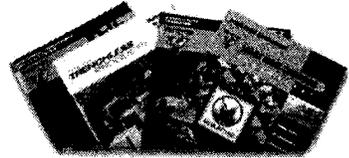
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 - [5 1/2 SWB Product Sheet](#) - Mud Motors: 5 1/2 SWB
 - [Bore Planning Tools Brochure](#) - Atlas Bore Planner: Atlas Bore Planner 3.0
 - [D7x11SII](#) - Drills: D7x11 Series II

GPS Systems	D10x14 - Drills: D10x14
Modular Mix Systems	D16x20A - Drills: D16x20A w/ Rod Loader
Moles	D20x22 - Drills: D20x22
Mud Motors	D24x40SII - Drills: D24x40 Series II
Pipe Ramming	D36x50SII - Drills: D36x50 Series II (10 foot rod)
Pneumatic Pipe Bursting	D36x50SII - Drills: D36x50 Series II (15 foot rod)
Reamers	D80x100SII - Drills: D80x100 Series II
Remote High Pressure Pumps	D100x120 SII - Drills: D100x120
Remote Lockout	D100x120 SII - Drills: D100x120 Series II
Rock Tooling	D200x300 - Drills: D200x300
Sewer Lateral Pipe Bursting	D300x500 - Drills: D300x500
Static Pipe Bursting	D330x500 - Drills: D330x500
Terrain Mapping	D330x500 - Drills:
Vacuum Excavators	Culvert Cleaning Tooling - Culvert Cleaning System: Barrel Cutter Tool
Parts and Service	Interrogator EZ Product Sheet - GPR: Interrogator EZ
Used Equipment	Interrogator II Brochure - GPR: Interrogator II
Manual Request / Equipment Registration	Culvert Cleaning Tooling - Culvert Cleaning System: Push Bucket Tool
	Culvert Cleaning Tooling - Culvert Cleaning System: Pull Bucket Tool
	Culvert Cleaning Tooling - Culvert Cleaning System: Brush Tool
	Culvert Cleaning Tooling - Culvert Cleaning System:
	Firestick II Brochure - Drill Stem:
	Firestick Product Sheet - Drill Stem:
	Bore Planning Tools Brochure - Terrain Mapping: Terrain Mapping System
	Rockfire AS4 Product Sheet - Rock Tooling: AS4 Rockfire
	RS6/RS8 Brochure - Rock Tooling: RS6 Rock Drilling System
	RS8/RS9 Brochure - Rock Tooling: RS8 Rock Drilling System
	RA11 - Rock Tooling: R.A.I.I., Drillhead Tool
	Bore Planning Tools Brochure - FieldCalc: FieldCalc
	McLaughlin Vac Accessories Literature - Vacuum Excavators: McLaughlin V100
	V100 - Vacuum Excavators: McLaughlin V100
	McLaughlin Vac Accessories Literature - Vacuum Excavators: McLaughlin V250
	V250 - Vacuum Excavators: McLaughlin V250
	McLaughlin Vac Accessories Literature - Vacuum Excavators: McLaughlin V500
	V500 - Vacuum Excavators: McLaughlin V500
	McLaughlin Vac Accessories Literature - Vacuum Excavators: McLaughlin V750
	V750 - Vacuum Excavators: McLaughlin V750
	EV150 - Vacuum Excavators: Vac-Tron EV150
	FM150 - Vacuum Excavators: Vac-Tron FM150
	MC850 850 - Vacuum Excavators: Vac-Tron MC850
	MC850 850 - Vacuum Excavators: Vac-Tron MC850
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	PMD850 - Vacuum Excavators: Vac-Tron PMD850
	PMD850 - Vacuum Excavators:
	MX125 - Modular Mix Systems: MX125
	MX240 - Modular Mix Systems: MX240
	MX240 - Modular Mix Systems:
	ST750A Product Sheet - Drilling Fluid Systems: ST750A
	Drill Head Locators Brochure - Drill Head Locators: Eclipse
	CS418 - Core Saws: CS418 (Truck Mount)
	CS418 - Core Saws: CS418 (Trailer Mount)

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VAC			
HOME	STAT-VAC	KITS	
COUPLINGS	COLLECTORS	INSTRUCTIONS	STOP STATIC
STAT-VAC PRICING			
PVC	POLYMER	HOSE	EXCELLON
Conductive	Non-Conductive	KITS	KITS

Sierra Polymer's STAT-VAC line of Conductive Vacuum Hoses are engineered to directly replace conventional "strap-grounded" plastic hoses on Excellon and other multi-spindle drilling and routing machines.

STAT-VAC is a highly conductive (150 ohms per inch) carbon coated elastomer. STAT-VAC 1.1 has a larger diameter 1.062" O.D. and provides a

• *Adaptability* - STAT-VAC with an inlet hose size of .875 O.D. and .687" I.D. can be used with most multi spindle drilling and routing machines. The larger diameter STATVAC1.1 has a 1.062" O.D. Pressure foot adapters can be retrofited for use on most multi-spindle drilling and routing machines.

• *Conductivity* - STAT-VAC is a highly conductive

60% flow volume increase.

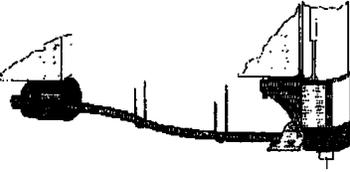
The coating is uniformly applied to the outside surface of the hose. The hose ends of each length are dipped coated to insure I.D. to O.D. continuity. This procedure demands STAT-VAC and STAT-VAC.I be sold exclusively in "kit" form.

When using standard vacuum hose, high velocity air movement and particle abrasion on the inside walls of the vacuum hose generates static charge. Without an effective method of grounding static charge,

the charge either dissipates through the drill bit resulting in damage to the board, or dissipates through the controller damaging sensitive boards. STAT-VAC eliminates problems associated with static electrical discharge.

STAT-VAC Conductive Vacuum Hose was developed by Sierra Polymer in cooperation with Excellon Automation Engineering and is original equipment on all Excellon Mark VII and later machines.

colloidal carbon coated elastomeric tubing. With a volume resistivity of 150 ohms per inch, STAT-VAC hoses effectively dissipate static electrical charge caused by the removal of glass epoxy chips from the drill heads.



• *Reliability* - STAT-VAC Vacuum Hoses are manufactured from materials which last up to fifteen times longer than original hoses.

Original equipment hoses made of PVC typically last 800 hours, while STAT-VAC will last approximately 12,000 hours.

• *Specifications* -

Volume Resistivity: 10^{-7}
Surface Resistivity:150 OHMS/inch
Rockwell hardness:83A

SIERRA POLYMER COMPANY
A Division of
Polymer Plastics Corporation

300 Edison Way
Reno, Nevada 89506
775-856-7000 / 800-426-8871
FAX 775-856-7010

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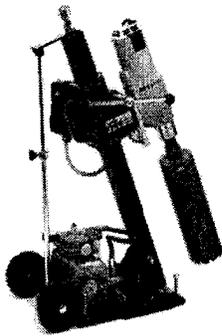
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MK-4096-1 CORE DRILL 20 AMP, SLIP CLUTCH, COMBO VAC OR ANCHOR BASE - INCLUDES A 2, 3, 4, 5, AND 6" WET PREMIUM TURBO CORE BIT FOR CURED CONCRETE WITH HEAVY STEEL REINFORCEMENT

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Technical Details

- 45 DEGREE TILT STAND
- 20 AMP MILWAUKEE MOTOR
- SLIP CLUTCH
- 2-SPEED(450 or 900 RPM)
- COMBO **VAC** OR ANCHOR BASE

Product Description

Product Description

This package includes: 1. MILWAUKEE 20 AMP MOTOR, SLIP CLUTCH, 2-SPEED (450 or 900 RPM) 2. Tilt Stand Tilts up to 45 degree 2-1/2" zinc-plated steel column with ceiling jack Lightweight cast-aluminum base with built-in wheels Positive anchoring for vertical & horizontal **drilling** One-piece removable slide handle easily negotiates close to walls and columns 3. Vacuum Pump The MANTA III Core Drill Rig is built to stand up to the rigors of high performance product **drilling**. The Steel column is precision blanched ground for accurate **drilling**. The hardened rack and pinion gear action combined with precise head play adjustment assures straight drill holes up to 10 inches in diameter. MANTA III Core Drill Rigs Features: Dual plug control box/amp meter A one-piece slide handle easily negotiates close to walls and columns Carriage assembly easily removes from column for convenient transportation and rig set-up Easily detachable feed handle & control amp box for left- or right-side **drilling**

Product Details

ASIN: B000GKUPM

Item model number: MANTA III 4096 CORE DRILL

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This product's forum (0 discussions)

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Topic: _____

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BROACH
CUTTERS**



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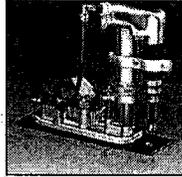
Drillmate's ergonomic design reduces fatigue as it holds and controls the drill just like a G clamp whilst **drilling** through flats, rounds, pipes, channels and timber. [Click here for details.](#)

 [Snap On Drill with Portable Drill Press](#)



VAC-FORCE 2000

Vac-Force 2000 is a lightweight portable hole cutting machine. This unit consists of a vacuum base to clamp to the surface of the material and an air feed cylinder to push the cutter through without any effort by the operator. It also incorporates a safety valve which will not allow air to be supplied to the drill motor unless it is locked to the surface. [Click here for details.](#)



 [Vac Force 2000](#)

EVERGREEN STAINLESS STEEL HOLECUTTING SYSTEM

Specifically designed for stainless steel but works equally well when called upon to cut other materials up to 5mm (3/16") thick including carbon steels, copper, aluminium, and brass as well as many plastics. [Click here for details.](#)



Drillmate Pty Ltd is the Agent and distributor in the Australasian region for this system.

MINI BROACH CUTTERS

MINI BROACH CUTTERS

Super-fast, rugged, heavy-duty holemaker. Cuts holes faster and cleaner than twist drill, up to 8mm thick material.



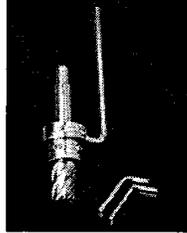
Snap On Cordless with Mini Cutters



SOON TO BE RELEASED

Cutters to cut through 13mm depth using pistol drill.

DRILLMATE BROACH CUTTERS



Arbour - Suits 25mm (1") depth capacity and 26mm (1") diameter. Wet chuck supplies cutting fluid to centre of cutter.

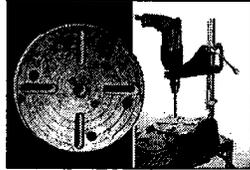


Hole Broach Information

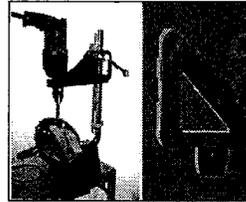


13mm - 26mm in 1mm increments. Capable of **drilling** 25mm depth of cut. Specially developed with thin wall for easy cutting with Drillmate Products.

DRILLMATE OPTIONAL ACCESSORIES



Worktable - gives greater area to support work piece and works in conjunction with the 45 Degree block.



45 degree Block - tilts worktable to 45 degrees for **drilling** of mitre joints.

VAC-FORCE ACCESSORIES

EXHIBIT G

Response to Office Action

The table below presents the data as entered.

Input Field	Entered
SERIAL NUMBER	77069596
LAW OFFICE ASSIGNED	LAW OFFICE 108
MARK SECTION (no change)	
ARGUMENT(S)	
<p>present paper is filed in response to the Office Action mailed October 23, 2007. No further fees are believed due, however, should any fees be due, the Commissioner is authorized to charge said fees, or credit any overpayment, to the Applicant's Credit Deposit Account No. 23-2426.</p>	
<p><u>I. REMARKS</u></p> <p style="padding-left: 40px;"><u>Allegation of use</u></p> <p style="padding-left: 40px;">Applicant respectfully files the accompanying statement of use and requests registration on the Supplemental Register pursuant to at least Trademark Act Section 23, 15 USC §1091. Applicant respectfully requests reconsideration.</p> <p><u>II. CONCLUSION</u></p> <p style="padding-left: 40px;">Applicants respectfully request reconsideration of the present application and request that the Examiner call Applicants' attorney at the below listed number if the Examiner believes that such a discussion would be helpful.</p>	
SIGNATURE SECTION	
DECLARATION SIGNATURE	/William P. Ramey, III/
SIGNATORY'S NAME	William P. Ramey, III
SIGNATORY'S POSITION	Attorney for Applicant
DATE SIGNED	04/23/2008
RESPONSE SIGNATURE	/William P. Ramey, III/
SIGNATORY'S NAME	William P. Ramey, III
SIGNATORY'S POSITION	Attorney for Applicant
DATE SIGNED	04/23/2008
AUTHORIZED SIGNATORY	YES

FILING INFORMATION SECTION

SUBMIT DATE	Wed Apr 23 12:29:34 EDT 2008
TEAS STAMP	USPTO/ROA-38.114.212.125- 20080423122934910057-7706 9596-42094aa23b8a9d14169d b31be8eac9f4633-N/A-N/A-2 0080423121804005570

PTO Form 1957 (Rev 9/2005)

OMB No. 0651-0050 (Exp. 04/2009)

**Response to Office Action
To the Commissioner for Trademarks:**

Application serial no. **77069596** has been amended as follows:

ARGUMENT(S)

In response to the substantive refusal(s), please note the following:

Present paper is filed in response to the Office Action mailed October 23, 2007. No further fees are believed due, should any fees be due, the Commissioner is authorized to charge said fees, or credit any overpayment, to Winstone Account No. 23-2426.

I. REMARKS**Allegation of use**

Applicant respectfully files the accompanying statement of use and requests registration on the Supplemental Register pursuant to at least Trademark Act Section 23, 15 USC §1091. Applicant respectfully requests reconsideration.

II. CONCLUSION

Applicants respectfully request reconsideration of the present application and request that the Examiner call Applicants' attorney at the below listed number if the Examiner believes that such a discussion would be helpful.

SIGNATURE(S)**Declaration Signature**

If the applicant is seeking registration under Section 1(b) and/or Section 44 of the Trademark Act, the applicant had a bona fide intention to use or use through the applicant's related company or licensee the mark in commerce on or in connection with the identified goods and/or services as of the filing date of the application. 37 C.F.R. Secs. 2.34(a)(2)(i); 2.34 (a)(3)(i); and 2.34(a)(4)(ii). If the applicant is seeking registration under Section 1(a) of the Trademark Act, the mark was in use in commerce on or in connection with the goods or services listed in the application as of the application filing date. 37 C.F.R. Secs. 2.34(a)(1)(i). The undersigned, being hereby warned that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. §1001, and that such willful false statements may jeopardize the validity of the application or any resulting registration, declares that he/she

is properly authorized to execute this application on behalf of the applicant; he/she believes the applicant to be the owner of the trademark/service mark sought to be registered, or, if the application is being filed under 15 U.S.C. §1051(b), he/she believes applicant to be entitled to use such mark in commerce; to the best of his/her knowledge and belief no other person, firm, corporation, or association has the right to use the mark in commerce, either in the identical form thereof or in such near resemblance thereto as to be likely, when used on or in connection with the goods/services of such other person, to cause confusion, or to cause mistake, or to deceive; that if the original application was submitted unsigned, that all statements in the original application and this submission made of the declaration signer's knowledge are true; and all statements in the original application and this submission made on information and belief are believed to be true.

Signature: /William P. Ramey, III/ Date: 04/23/2008

Signatory's Name: William P. Ramey, III

Signatory's Position: Attorney for Applicant

Response Signature

Signature: /William P. Ramey, III/ Date: 04/23/2008

Signatory's Name: William P. Ramey, III

Signatory's Position: Attorney for Applicant

The signatory has confirmed that he/she is an attorney who is a member in good standing of the bar of the highest court of a U.S. state, which includes the District of Columbia, Puerto Rico, and other federal territories and possessions; and he/she is currently the applicant's attorney or an associate thereof; and to the best of his/her knowledge, if prior to his/her appointment another U.S. attorney or a Canadian attorney/agent not currently associated with his/her company/firm previously represented the applicant in this matter: (1) the applicant has filed or is concurrently filing a signed revocation of or substitute power of attorney with the USPTO; (2) the USPTO has granted the request of the prior representative to withdraw; (3) the applicant has filed a power of attorney appointing him/her in this matter; or (4) the applicant's appointed U.S. attorney or Canadian attorney/agent has filed a power of attorney appointing him/her as an associate attorney in this matter.

Serial Number: 77069596

Internet Transmission Date: Wed Apr 23 12:29:34 EDT 2008

TEAS Stamp: USPTO/ROA-38.114.212.125-200804231229349

10057-77069596-42094aa23b8a9d14169db31be

8eac9f4633-N/A-N/A-20080423121804005570

EXHIBIT H

UNITED STATES PATENT AND TRADEMARK OFFICE

SERIAL NO: 77/069596

MARK: VAC TECH

77069596

CORRESPONDENT ADDRESS:

William P. Ramey, III
Winstead PC
P.O. Box 50784
Dallas TX 75201

RESPOND TO THIS ACTION:

<http://www.uspto.gov/teas/eTEASpageD.htm>

GENERAL TRADEMARK INFORMATION:

<http://www.uspto.gov/main/trademarks.htm>

APPLICANT: Wellbore Energy Solutions,
LLC

**CORRESPONDENT'S REFERENCE/DOCKET
NO:**

46463-K003US

CORRESPONDENT E-MAIL ADDRESS:

OFFICE ACTION

TO AVOID ABANDONMENT, THE OFFICE MUST RECEIVE A PROPER RESPONSE TO THIS OFFICE ACTION WITHIN 6 MONTHS OF THE ISSUE/MAILING DATE.

ISSUE/MAILING DATE:

THIS IS A FINAL ACTION.

This Office action is in response to applicant's communication filed on April 23, 2008.

Background

In the Office action dated March 14, 2007, incorporated herein by reference, the application was refused because the proposed mark merely describes the function of applicant's goods. Trademark Act Section 2(e)(1), 15 U.S.C. §1052(e)(1); TMEP §§1209 *et seq.*

In that Office action, applicant was given the recommendation to amend the application to the Supplemental Register if and when an application alleging use was filed with the Office. Trademark Act Section 23, 15 U.S.C. §1091; 37 C.F.R. §§2.47 and 2.75(a); TMEP §§801.02(b), 815 and 816 *et seq.*

In applicant's response, dated September 14, 2007, and incorporated herein by reference, applicant argued against the descriptiveness refusal. The examining attorney has considered applicant's argument and found it unpersuasive, as discussed below.

Based on conversations with the applicant's attorney, on October 2, 2007, the examining attorney issued an Examiner's amendment, incorporated herein by reference, disclaiming the word "TECH" and improperly amending the application to the Supplemental Register.

An Office action then issued, dated October 23, 2007 (and incorporated herein by reference), requiring

applicant to re-amend the application back to the Principal Register, and maintaining and continuing the descriptiveness refusal.

Applicant's response, dated April 23, 2008, responds to the refusal by an attempt to maintain the application for the Supplemental Register by filing an allegation of use. However, as discussed below, no allegation of use was filed. Thus, the refusal is made final, as is the requirement to remove the application from the Supplemental Register.

FINAL REFUSAL – Merely Descriptive

The refusal under Trademark Act Section 2(e)(1) is now made FINAL for the reasons set forth below. *See* 15 U.S.C. §1052(e)(1); 37 C.F.R. §2.64(a).

A mark is merely descriptive if it describes an ingredient, quality, characteristic, function, feature, purpose or use of the specified goods and/or services. TMEP §1209.01(b); *see In re Steelbuilding.com*, 415 F.3d 1293, 1297, 75 USPQ2d 1420, 1421 (Fed. Cir. 2005); *In re Gyulay*, 820 F.2d 1216, 1217-18, 3 USPQ2d 1009, 1010 (Fed. Cir. 1987). Moreover, a mark that identifies a group of users to whom an applicant directs its goods and/or services is also merely descriptive. TMEP §1209.03(i); *see In re Planalytics, Inc.*, 70 USPQ2d 1453, 1454 (TTAB 2004).

Here, registration is refused because the proposed mark merely describes a function of applicant's goods. Trademark Act Section 2(e)(1), 15 U.S.C. §1052(e)(1); TMEP §§1209 *et seq.*

Applicant's goods are drilling machines and parts for drilling machines. As discussed in the first two Office actions, (which are incorporated by reference inclusive of the evidence), vacuum excavation comprises a good portion of drilling, and of horizontal excavation especially. Internet evidence attached to the first Office action, and incorporated herein by reference, shows that vacuums are commonly sold with and as a part of drilling equipment, that vacuum excavation is a separate service regularly performed and advertised by drilling and industrial vacuum companies, and that vacuuming is done as a part of the drilling process. Internet dictionary evidence attached to the first Office action also shows that "TECH" is a shortened form of the word "technology," and that "VAC" is a shortened form of the word "vacuum." Additionally, attached to the first two office actions, information showing U.S. Registrations show that the Office has required disclaimer of "TECH" and "VAC" as descriptive of goods.

The combination of the two terms "VAC" and "TECH" does nothing to obviate the descriptiveness of either term; in fact, it does the opposite making the wording more descriptive. Applicant's proposed mark merely describes applicant's goods – vacuum technology – so the mark is refused registration.

Internet evidence in this Office action and the first two Office actions shows that "VAC" as a shortened form of "vacuum" is in common usage among the users of drills and drilling equipment. Consumers would be quite familiar with "VAC" as used in conjunction with drills to mean suction either to mount the drill in place, to remove debris associated with the drilling process, or to suction the goods that the drilling process has unearthed. "VAC" is indeed highly descriptive of applicant's goods. Applicant has now disclaimed "TECH." The combination of the two terms, "VAC" and "TECH," are highly descriptive of a feature of applicant's goods.

Thus, the refusal to register applicant's mark, "VAC TECH" based on the descriptiveness of the mark is made FINAL.

In addition, the following requirement is now made FINAL: Amendment from the Supplemental Register. *See* 37 C.F.R. §2.64(a).

FINAL REQUIREMENT – Supplemental Register

The amendment to the Supplemental Register, entered October 2, 2007 was made in error. An application may not be amended to the Supplemental Register unless the applicant has claimed and demonstrated use of the mark, which has not been done in this case. Trademark Act Section 23, 15 U.S.C. §1091; 37 C.F.R. §§2.47 and 2.75(a); TMEP §§801.02(b), 815 and 816 et seq. Thus, the application must be amended back to the Principal Register.

Applicant's response, dated April 23, 2008, states that the applicant is filing an "accompanying statement of use." However, no such statement of use has been filed. Applicant must therefore amend the application to the Principal Register.

Response Guidelines

If applicant does not respond within six months of the mailing date of this final Office action, the application will be abandoned. 15 U.S.C. §1062(b); 37 C.F.R. §2.65(a). Applicant may respond to this final Office action by:

- (1) Submitting a response that fully satisfies all outstanding requirements, if feasible; and/or
- (2) Filing an appeal to the Trademark Trial and Appeal Board, with an appeal fee of \$100 per class.

37 C.F.R. §§2.6(a)(18), 2.64(a); TBMP ch. 1200; TMEP §714.04.

In certain rare circumstances, a petition to the Director may be filed pursuant to 37 C.F.R. §2.63(b)(2) to review a final Office action that is limited to procedural issues. 37 C.F.R. §2.64(a); TMEP §714.04; *see* 37 C.F.R. §2.146(b); TBMP §1201.05; TMEP §1704 (explaining petitionable matters). The petition fee is \$100. 37 C.F.R. §2.6(a)(15).

TEAS PLUS APPLICANTS MUST SUBMIT DOCUMENTS ELECTRONICALLY OR SUBMIT FEE: TEAS Plus applicants should submit the following documents using the Trademark Electronic Application System (TEAS) at <http://www.uspto.gov/teas/index.html>: (1) written responses to Office actions; (2) preliminary amendments; (3) changes of correspondence address; (4) changes of owner's address; (5) appointments and revocations of attorney; (6) amendments to allege use; (7) statements of use; (8) requests for extension of time to file a statement of use, and (9) requests to delete a §1(b) basis. If any of these documents are filed on paper, they must be accompanied by a \$50 per class fee. 37 C.F.R. §§2.6(a)(1)(iv) and 2.23(a)(i). Telephone responses will not incur an additional fee. NOTE: In addition to the above, applicant must also continue to accept correspondence from the Office via e-mail throughout the examination process in order to avoid the additional fee. 37 C.F.R. §2.23(a)(2).

/AndreaRHack/
Andrea R. Hack
Trademark Examining Attorney
Law Office 108
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Wet Dry Hand Vac
18 volt 1.5ah battery
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Screwdriver bits
Vacuum nozzles
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Product Ref: 880/6666027

Classification: Power Tools/ Power Tool Kits

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- » Handles & Knobs
- » Heavy Lifting Gear
- » Hinges & Locks
- » Hooks
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- » Nuts, Bolts & Washers
- » Other Fixings
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- » Staples & Rivets
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Self-lubricating centrifugal drilling mud degasser US Patent Issued on October 10, 1989

Inventor(s)
Harry L. Burgess

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Application
No. 232318 filed on 1988-08-15

Description

Current US Class
184/6.12, 184/6.22, 184/96

Field of Search
184/6.12, 184/6.22, 184/96,
184/97

Examiners
Primary: Henry A Bennet
Assistant: Denise I Ferencik

Attorney, Agent or Firm

TECHNICAL FIELD OF THE INVENTION

This invention relates to apparatus useful in the **drilling** of wells, such as oil wells, wherein a mud pump is used to circulate **drilling** mud under pressure through a drill string, down to and around the drill bit and out into the annulus between the drill string and the bore hole of the well into a mud tank or reservoir; the apparatus of the present invention being useful for degassing **drilling** mud used in the **drilling** of the well. More particularly, this invention relates to a **drilling** mud degasser having a [gear box](#) and means for the continuous self-lubrication of the gear box.

DESCRIPTION OF THE PRIOR ART

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March 17, 1885
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In the **drilling** of wells, such as oil wells, it is a common practice to penetrate the earth with a drill bit supported on a drill string in the bore of a well being drilled. In order to lubricate the drill bit, protect the well against blowouts, etc., it is conventional practice to circulate **drilling** mud under pressure through the drill string down to and around the drill bit and up the annulus between the drill string and the bore of the well. Mud flowing through the well is passed through a suitable device such as a shaker, etc., in order to remove drill cuttings, etc., and is then delivered to a mud reservoir, such as a mud tank, for recirculation to the mud pump for pressured injection into the well.

It is conventional practice to use a mud pump, such as a duplex or a triplex mud pump comprising reciprocating pistons mounted in cylinders for pressuring the incoming **drilling** mud and delivering it to the well bore under pressure. The operation and construction of mud pumps is well known to those of ordinary skill in the art, as illustrated, for example, by the textbook "Mud Pump Handbook" by Samuel L. Collier (Gulf Publishing Co., Houston, Tex., 1983).

It is also known to remove contaminating gases such as air, methane, etc., from the **drilling** mud in the mud tank before it is delivered to a mud pump.

Thus, devices for the removal of contaminating gases from aqueous fluids such as **drilling** muds is disclosed, for example, in Burgess U.S. Pat. No. 3,973,930 dated August 10, 1976 and entitled "**Drilling** Mud Degasser Apparatus and Method", Burgess U.S. Pat. No. 3,999,965 dated Dec. 28, 1976 and entitled "Liquid Treating Apparatus", Burgess U.S. Pat. No. 4,084,946 dated Apr. 18, 1978 and entitled "**Drilling** Mud Degasser", Phillips et al. U.S. Pat. No. 4,088,457 dated May 9, 1978 and entitled "Degassification System", Tkach U.S. Pat. No. 4,201,555 dated May 6, 1980 and entitled "Method and Apparatus for Degassification of Liquid by Inducing Vortexing", Day et al. U.S. Pat. No. 4,326,863 dated Apr. 27, 1982 and entitled "Centrifugal Degasser", Egbert U.S. Pat. No. 4,365,977 dated Dec. 28, 1982 and entitled "**Drilling** Mud Degasser", Underwood U.S. Pat. No. 4,416,672 dated Nov. 22, 1983 and entitled "Degasser", and Burgess U.S. Pat. No. 4,609,385 dated Sept. 2, 1986 and entitled "Multi-Stage Water Deoxygenator". Among the contaminating gases that are removed are air, nitrogen, carbon dioxide, methane, etc.

The present invention is uniquely adapted for use in connection with a **drilling** mud degassing device of the type shown in the Burgess patents, such as Burgess Pat. No. 4,084,946.

BACKGROUND OF THE INVENTION

The **drilling** of deep wells such as oil wells, and especially the **drilling** of offshore oil wells, is a very costly ~~activity~~. For instance, the cost per day of operating an offshore **drilling** rig in comparatively shallow waters of 100 feet or less typically amounts to about \$10,000 per day while the cost of operating a **drilling** vessel in deep waters exceeding depths of 200 feet can cost \$30,000 per day or more.

It is manifest, therefore, that any interruption of the **drilling** operation will be very costly, and that it is highly desirable to avoid all but the most essential of **drilling** interruptions.

As indicated above, it is conventional practice to remove contaminating gases such as methane, air, carbon dioxide, etc., from **drilling** mud before it is pressured and injected into a well bore. If this is not done, there is an everpresent danger that the gas will accumulate in either the drill string or the well bore annulus in an amount sufficient to form a gas pocket.

Therefore, if a **drilling** mud degasser fails to operate properly, the **drilling** operation must be suspended until the **drilling** mud degasser is repaired.

Moreover, since **drilling** operations normally continue on an essentially continuous basis for 1 to 12 months or more, any part of the **drilling** mud degasser that does not have a design life of at least six months is apt to be the cause of an undesired and very expensive interruption of **drilling** operations.

undesired and very expensive interruption of drilling operations.

Drilling mud degassers of the type shown in Burgess U.S. Pat. No. 4,084,946 require a motor, usually an electric motor, which operates a vacuum pump at one rate of speed and a centrifuge tube at another second lower rate of speed. In order to run both the centrifuge tube and the vacuum pump off a single drive shaft, it is necessary to utilize an appropriate gear reduction system, such as a planetary gear reduction system between the motor and the centrifuge tube. Gear reduction systems such as planetary gear reduction systems are normally housed in a gear box.

Since appreciable friction is generated in the gear box during operations, it is necessary that the gear box at all times be properly lubricated with a lubricant which can stand the operating pressures employed. It has been the practice to use a grease, such as a high temperature grease able to withstand temperatures of about 250° F. or more generated in the gear box. Moreover, the gear box needs to be greased on a daily basis and if for any reason the lubrication of the gear box is overlooked by workmen or if the gear box becomes overheated, a gear box failure is likely. When the gear box fails, drilling operations must be interrupted while the drilling mud degasser is taken apart to the extent necessary to replace the damaged gear box with a new gear box. Of course, if a spare gear box is not present on the vessel, an even greater delay will be experienced in bringing a gear box to the vessel. Although the down time of the degasser for the replacement of the gear box will normally be about 2 hours, the down time for the drilling rig will normally amount to 12 hours or more.

There is a need, therefore, for a self-lubricating drilling mud degasser which can operate without maintenance for prolonged periods of time such as about 1 to about 6 months.

SUMMARY OF THE INVENTION

In accordance with the present invention, a self-lubricating centrifugal drilling mud degasser is provided for a degasser of the type wherein a motor is provided with a depending drive shaft. A hollow gear box casing is mounted on the drive shaft and provided with a lubricant inlet port formed therein adjacent the top thereof. A reduction gear arrangement is also provided in the gear box comprising a stationary gear ring fixed to the casing below the inlet port; the ring gear being provided with interior teeth and a lubricant outlet port formed in the groove between two adjacent teeth. A plurality of reduction gears in the gear box are operatively interconnected with the drive shaft.

A lubricant reservoir is located adjacent the gear box and an inlet line is provided interconnecting the lower portion of the lubricant reservoir with the gear box inlet port and with a lubricant outlet line interconnecting the top portion of the lubricant reservoir with the gear box outlet port. As a consequence, since the gear box system is sealed, whenever hot lubricant is pumped from the gear box to the lubricant reservoir, an equivalent quantity of lubricant will automatically flow to the gear box. This is accomplished in accordance with the present invention during operation of the reduction gear system because rotation of the reduction gears about the ring gear will cause the reduction gears to mesh with the adjacent teeth defining the groove between which the outlet port is formed and, as a consequence, a pulse of the lubricant will be pumped from the gear box to the lubricant reservoir and an equivalent pulse of lubricant will flow from the lubricant reservoir back to the gear box.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings;

FIG. 1 is a side elevational view illustrating a self-lubricating drilling mud degasser of the present invention;

FIG. 2 is a side elevational view, partly in section, showing the combination of a motor drive shaft, a motor drive shaft extension, a gear box containing a planetary gear reduction system, a driven gear and a lubricant reservoir of the present

invention;

FIG. 3 is a fragmentary sectional view taken along the lines 3--3 of FIG. 2 illustrating in greater detail the manner in which the lubricant outlet port is formed in a ring gear in accordance with the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing, and especially to FIG. 1, there is shown a drilling mud degasser designated generally by the number 10 interconnected with a mud tank 8 by an inlet line 6 and with a mud pump 4 by way of an outlet line 2.

An appropriate motor of any suitable construction, such as a ~~gasoline~~, a gasoline motor, an electric motor, etc., but preferably an electric motor 20 is provided with a motor handling bracket 21 and a motor support such as a motor support plate 22.

With reference to FIGS. 1 and 2, a motor drive shaft 26 depends from the motor 20 and is provided with a first interior keyway 26 or any other suitable structure for use in operatively connecting the motor drive shaft 26 with a drive shaft extension 36.

In accordance with this embodiment, a drive shaft coupling 30 is provided which is of a tubular construction having a central opening designed to fit over the depending end of the drive shaft 26 and the upstanding end of the drive shaft extension 36, the drive shaft coupling 30 having a third interior keyway 32 and a fourth interior keyway 34 formed therein.

There is also provided a gear box designated generally by the numeral 40 comprising (with reference to FIGS. 2 and 3) an interiorly toothed ring gear 42 provided with a plurality of interior teeth 44 and, in this embodiment, a plurality of circular fastening shafts 75 milled therein for use in assembly of the gear box 40.

With particular reference to FIG. 3, it will be noted that a lubricant outlet port 46 has been formed in the groove between adjacent teeth 44a and 44b for a purpose to be described.

The gear box casing 40 may be formed in any desired manner. In the embodiment shown herein the ring gear 42, for convenience, comprises a part of the gear box casing 40.

Thus, in accordance with this embodiment, there is provided an upper gear box casing member 48 having a lubricant inlet port 50 formed therein and a lower gear box casing member 52. The upper gear box casing member 48 and the lower gear box casing member 52 are interconnected with ring gear 42 by any suitable means. For example, hex bolts 76 extend through upper gear box casing member fastening shafts 49 which are formed in the upper gear box casing flange 47 and are aligned with the ring gear fastening shafts 75 so that the hex bolts 76 can be extended therethrough and threaded into threads tapped into corresponding openings in the fastening flange 54 of the lower gear box casing member 52. An upper bearing 60 is journaled into the upper gear box casing member 48 and a lower bearing 62 is journaled into the lower gear box casing member 52.

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embodiment of the invention, the reduction gear system will comprise a plurality of planetary gears 72 which are mounted in planetary ball bearings 70 carried by a plurality of equally spaced upright planetary gear shafts mounted between laterally spaced planetary gear plates 66.

It will be noted from FIG. 3 that each of the planetary gears 70 is provided with one or more planetary ball bearing lubricant ports 74 which are formed in a groove between adjacent teeth of the planetary gear.

With particular reference to FIG. 2, in accordance with the present invention, a lubricant reservoir 200 is provided with is of any suitable construction being formed, for example, of a lubricant reservoir base plate 202, an upstanding cylindrical lubricant reservoir body 204 and a lubricant reservoir cover plate 206 provided with a lubricant filling plug 208. In accordance with this construction, the upstanding cylindrical lubricant reservoir body 204 is also provided with a lubricant reservoir inlet plug 210, a lubricant reservoir inlet plug 212, a lubricant reservoir outlet plug 214 and upper sight port 220 and a lower sight port 222.

With this construction, and with the lubricant reservoir filling plug 208 open, an appropriate lubricant such as a liquid synthetic hydrocarbon lubricant (e.g., Dextron II ~~synthetic hydrocarbon~~) can be poured into the reservoir until the fluid level inside the lubricant reservoir 200 is at or above the upper sight port 220. Thereafter, the lubricant reservoir plug may be put back in place in order to seal the reservoir. The lower sight port 222 is provided so that visual inspection will show if the level of a lubricant in the reservoir 200 has fallen to an undesirable level, such as the level below lower sight port 222.

An output shaft 77 is fixed in the planetary gear plate 66 in any suitable fashion (not shown) and supported in the lower ball bearing 62 for a purpose to be described.

A vacuum pump 80 of any suitable construction, such as a "regenerative" vacuum pump of the type formed with a disclike body containing oppositely projecting impeller vanes is operatively connected with the drive shaft 26 above the gear box 40. For example, the vacuum pump 80 is secured to the motor support plate 22 by any suitable means such as a plurality of vacuum motor brackets 81 to which a vacuum motor support stand 83 is fixed by any suitable means such as a plurality of hex bolts 84; the vacuum pump 80 being, in turn, fixed to the vacuum pump support stand 83 by upper hex bolts 86.

The vacuum motor brackets 81 are fixed to the cover plate 102 comprising the top of a vacuum chamber 100 which is further defined by a side wall 104 and a bottom wall 106 to which a cylindrical degassed drilling mud chamber 140 is mounted. The interior of the degassing chamber 100 and the cylindrical degassing drilling mud collection chamber 140 are closed from the atmosphere by a collection chamber base plate 142 and the interior of the degassing chamber 100 is operatively interconnected with the vacuum pump 80 by a vacuum hose 82.

With this construction, and on appropriate operation of the vacuum motor 80, it is possible to maintain a suitable vacuum within the vacuum chamber 100 and the cylindrical degassed drilling mud collection chamber 140, such as a pressure of about 10 inches to about 15 inches of mercury.

The output shaft 77 is journaled into the cover plate 102 of the vacuum chamber 100 and extends into the vacuum

vacuum pump.

A drive shaft extension 36 is mounted in the upper ball bearing 60 and is provided at the lower end thereof with a toothed planetary drive gear 39 designed to operatively engage a gear comprising an appropriate reduction system. The reduction gear system may comprise, for example, one or more appropriately sized and operatively interconnected helical gears, herringbone gears, worm gears, planetary gears, etc. In the preferred

The output shaft 77 is journaled into the cover plate 102 of the vacuum chamber 100 and extends into the vacuum chamber 100. A centrifuge tube 110 in the vacuum chamber is provided with centrifuge tube slots 116 in the sidewall thereof adjacent the top thereof and with a centrifuge spider at the top thereof which is fixed to the output shaft 77 by any suitable means such as a spider retaining bolt 114.

An evacuation pump cross brace spider 128 is mounted inside the vacuum chamber 100 adjacent the bottom thereof intermediate the vacuum chamber 110 and the cylindrical degassed drilling mud collection chamber 140. An evacuation chamber is provided which is mounted on the evacuation pump cross brace spider 128 and is defined by an evacuation pump cover plate 124, a cylindrical evacuation pump side wall casing 122 and an evacuation pump base plate 126.

An evacuation pump of any suitable construction, such as one comprising an evacuation pump impeller 130 mounted on the bottom of centrifuge tube 110 is provided which is mounted inside an evacuation pump inlet venturi 132 leading to a degassed drilling mud discharge line 134.

An inlet line 144 is provided which preferably terminates inside the evacuation chamber 120. In this embodiment, the top of the inlet line 144 is spaced from the bottom of the slotted centrifuge tube 110 so that the rotating centrifuge tube 110 can rotate freely without bearing upon the top of the inlet line 144. The resultant "controlled seepage" of drilling mud from the inlet tube 144 into the evacuation chamber 120 does not seriously adversely affect the performance of the drilling mud degasser and obviates the needs for bearings and seals at the bottom of the slotted centrifuge tube 110.

A donut-shaped scheduling float 150 is annularly mounted about the centrifuge tube 110 in the vacuum chamber 100 and is provided with a lower flange 151 which is designed to seat upon a plurality of lower float stops 152 and to bear against a plurality of upper float stops 154.

As will be hereinafter explained in greater detail, drilling mud contaminated with gas is drawn into the degasser of the present invention through the inlet line 144 and centrifugally accelerated inside centrifuge tube 110 and then sprayed through the slots 116 at the top of centrifuge tube 110 into the vacuum chamber 100 where the sprayed drilling mud impacts against the side wall 104. As a consequence, contaminating gas is separated from the drilling mud and the degassed drilling mud flows downwardly into the evacuating chamber 120. A portion of the degassed drilling mud accumulated in the evacuation chamber 120 will be drawn by the evacuation pump inlet venturi 132 into the evacuation pump chamber 120 and discharged therefrom through the degassed drilling mud discharge line 134.

It will be apparent that drilling mud will also accumulate in the evacuation chamber 120 and the vacuum chamber 100 and that the level of the degassed drilling mud in the vacuum chamber 100 will be determined by the rate of charge of drilling mud through the inlet line 144 and the centrifuge slots 116 relative to the rate of discharge of degassed drilling mud through the degassed drilling mud discharge line 134. If gas contaminated drilling mud flows through the inlet line 144 faster than degassed drilling mud is withdrawn through the evacuation pump inlet venturi 132, the drilling mud level will rise until the lower float flange 151 of the scheduling float 150 abuts the upper float stops 152. As the float 150 rises, the open area defined by the slots 116 in the centrifuge 110 is reduced to thereby achieve a balance between the rate at which gas contaminated drilling mud is delivered to the degassing chamber 100 and the rate at which degassed drilling mud is withdrawn through the degassed drilling mud discharge line 134. If the rate of discharge through the line 134 is excessive, the drilling mud level in the vacuum chamber 100 will tend to fall thus increasing the open area of the slots 116 in the venturi tube 120 to permit a greater flow of drilling mud into the degassing chamber 100.

The contaminating gases liberated by the action of the centrifuge tube and the spraying of the drilling mud into the vacuum chamber 100 will be withdrawn from the vacuum chamber 100 by way of the vacuum hose 82.

In order to prevent entrainment of foam or liquid droplets into the hose 82, a foam separation impeller 156 of any suitable

construction comprising, for example, a plate having vanes formed at the outside peripheral edges thereof may be mounted on the output shaft 77 so that the out flowing gas will follow a tortuous path which will permit the occluded foam and the droplets of liquid to accumulate and flow back into the vacuum chamber 100.

OPERATION OF THE PREFERRED EMBODIMENT

It is necessary to maintain a drilling mud at a predetermined weight per gallon, which will vary from well to well. If the drilling mud is diluted for any reason (e.g., by the adsorption of a gas therein), the weight per gallon of drilling mud will decline and the probability of a blow-out will increase. Drilling mud exiting a bore hole will typically weigh about 2 lbs. per gallon less than the degassed drilling mud charged to the well and in extreme situations can amount to as much as 10 lbs. per gallon.

Degassing is accomplished in accordance with the present invention by using a drilling mud degasser 10 to remove contaminated gases from the drilling mud.

During operations, when the motor 20 is energized, rotation of the motor drive shaft 26 will cause rapid rotation of the vanes (not shown) of the vacuum pump 80 in order to generate an appropriate vacuum such as a vacuum of from about 10 to about 15 inches of mercury in the vacuum chamber 100.

The motor drive shaft 26, is connected to the drive shaft extension 36 through the drive shaft coupling 30 by means of a first key 35 mounted in first exterior keyway 28 and third interior keyway 32 and a second key 37 located in second exterior keyway 38 and fourth interior keyway 34. As a consequence, the toothed planetary drive gear 39 on the lower end of the drive shaft extension 36 will cause rotation of the planetary gears 72 at a rate of rotation equivalent to the rate of rotation of the motor drive shaft 26. However, rotation of the planetary gears about the interiorly toothed ring gear 42 will cause the planetary gear plate 66 to rotate at a second significantly lower rate of speed. Thus, for example, the motor drive shaft 26 may be operated at a rate of about 3,600 revolutions per minute while the planetary gear plate 66 may operate at a much slower rate of about 800 revolutions per minute, or upon any other desired gear ratio established in the planetary gear system inside the gear box 40.

Rotation of the planetary gear plate 66 will cause a corresponding rotation of the output shaft 77 and the centrifuge tube 110 connected thereto by means of centrifuge tube spider 112 and centrifuge spider retaining bolt 114.

The suction created by the centrifuge tube 110 will cause gas contaminated drilling mud to be delivered from the mud tank 8 by way of an inlet line 6 to the degasser inlet line 144 and thence to the centrifuge tube 110. Within the centrifuge tube 110 the gas contaminated drilling mud will be centrifugally accelerated in its travel up the wall of centrifuge tube 110 and will then be expelled through the slots 116 at the top of the centrifuge tube as a sheet of drilling mud which will impact upon the sidewall 104 of the vacuum chamber 100. As a consequence, gas contaminants entrained in the drilling mud will be liberated and will pass about the foam separation impeller 156 into the vacuum hose 82 and the vacuum pump 80 for discharge from the system. The thus degassed drilling mud will collect at the bottom of degassing chamber 100 into the cylindrical degassed drilling mud collection chamber 140. The evacuation pump impeller 130, on rotation by rotation of the venturi tube 110 to which it is attached, will cause degassed drilling mud to flow from the collection chamber 140 through the evacuation pump inlet venturi 132 into the evacuation chamber 120 where it will be pumped by the evacuation pump impeller 130 from the degasser 10 through the degassed mud discharge line 134 leading to the inlet line 2 for the mud pump 4 where it is repressured for delivery to the drill string.

During the course of operations, appreciable friction will be generated by the rotation of the planetary gears 72 and the planetary gear plate 66 within the gear box 40. However, on each rotation of a planetary gear 72 past the groove 45 between teeth 44a and 44b of the gear ring, a pulse of lubricant will be forced from the gear box 40 through the lubricant outlet port 46. The hot lubricant will flow through the outlet line 218 to the lubricant reservoir 200 where it will

subject part 70. The hot lubricant will flow through the outlet line 218 to the lubricant reservoir 200 where it will accumulate and be cooled either by positive heat exchange means (not shown) or by atmospheric convection. A pulse of cooled lubricant will be redelivered to the gear box 40 from lubricant reservoir 200 by lubricant inlet line 216.

As a consequence, the gears in the gear box 40 will be properly lubricated and overheating will be avoided.

In this manner, a reliable degassing operation can be conducted continuously for as long as 1 to 6 months without a need to replace the gear box 40.

EXAMPLE

In order to obtain geological information, a test well was to be drilled to the top of the basement rock formation of a geological province, the basement rock formation being located several miles below the surface of the earth. It was estimated that more than a year of continuous drilling would be required in order to reach the desired depth and that sedimentary gas-containing formations would be penetrated during the drilling operation.

Drilling operations were commenced using a drilling mud degasser of the type disclosed in Burgess U.S. Pat. No. 4,084,946 wherein the gear box of the degasser was lubricated with a high temperature grease suitable for lubricating the gear box at gear box operating temperatures of about 250° F. After about 60 days of continuous drilling the gear box failed and had to be replaced. It was replaced with a gear box of the type illustrated in the drawings herein wherein the gear box was interconnected in the illustrated manner with a lubricant reservoir containing Dextron II transmission fluid.

It was found that with this construction the gear box operated at a significantly lower temperature of about 130° F.

Drilling operations were resumed and in a five month period of continuous drilling no further gear box failures were encountered.

It will be apparent to those skilled in the art that the embodiment illustrated herein is a preferred embodiment which is given by way of illustration only, since the drilling mud degasser may be of any of the many mud pump degasser designs known to those skilled in the art. Accordingly, the preferred embodiment is shown for purposes of illustration only, the scope of the present invention being defined by the appended claims.

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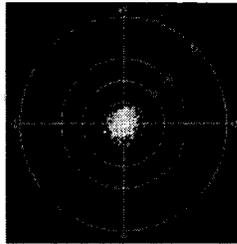
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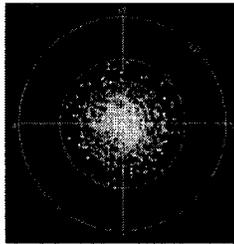
[Burning](#)

Hole Registration Accuracy Technical Database

Hole registration accuracy is measured by an AOI machine. As shown below, hole location is worsened by some causes, therefore this defect should satisfy the quality demanded.



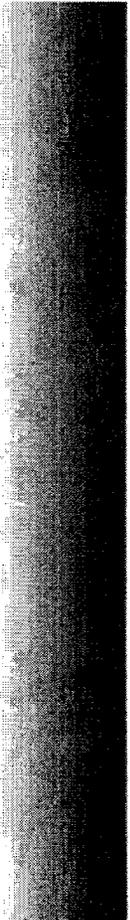
Normal



Bad

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Case	Failure condition	Countermeasure
Poor drill bit strength	Accuracy becomes worse.	To increase strength, change web thickness and web taper. Use VT type drill bit for superior hole registration accuracy
Small chip pocket (Flute volume)	Drill chip pocket is clogged with chip. Which worsens accuracy. If chips go between the entry board and PWB, accuracy will worsen notably.	Enlarge chip pocket volume, change web thickness web taper, and flute land ratio.
Long flute length and body length	When flute length and body length are unnecessarily long, the hole registration accuracy worsens.	Set suitable flute length and body length.
Unsuitable drill bit geometries (Point Angle and helix angle etc.)	Unsuitable drill bit geometries for the PWB application, drilling conditions, and equipment condition worsen accuracy.	Optimize drill bit geometries, (Select suitable geometries for drilling condition)
Unsuitable tungsten carbide material	Increased wearing blunts the drill's cutting edges, causing poor accuracy	Use wear-resistant WC material.
Unbalanced drill point geometries (Chisel point in concentricity, Rip height gap, Chipping, and one sided taper or flare.	Hole position accuracy gets worse from the upper surface of a PWB	Check drill point geometry.

	sided taper or flare, etc.)		
	Unsuitable repointing (See above)	Hole position accuracy gets worse from the upper surface of a PWB.	Check drill point geometry.
	High chipload	Accuracy is worsened by poor chip evacuation and damaged drill bits etc.	Apply suitable chipload. (Please refer to drilling parameters.)
	Low chipload	Promotes wearing, causing poor accuracy.	
	High spindle speed	Tool load increases as cutting resistance increase, making accuracy worse.	Apply suitable spindle speed. (Please refer to drilling parameters.)
	Low spindle speed	Burned swarf will stick to the drill point, and accuracy will worsen.	
	Hit count to high	Promotes wearing, causing poor accuracy.	Apply suitable hit counts.
	To many repoints	It promotes diameter wear, and accuracy will worsen.	Reconsider the number of reprints.
	Panel stack height to high	Drill deflection will increase in proportion to PWB Stacks, making accuracy worse.	Apply suitable PWB stack heights to achieve the quality target.
	High number and thickness of PWB copper layers	The increase of cutting resistance causes wear, and worsens accuracy.	Decrease PWB stack heights and hit count to reduce drill bit damage. Use double drilling method.
	Hard cutting PWB material	The increase of cutting resistance causes wear and chipping, worsening accuracy.	Decrease PWB stack heights and hit count to reduce drill bit damage.
	Unsuitable entry board	Using low performance entry board on PWB's with high hole qualities may not obtain the accuracy.	Use high quality entry board like attached water soluble resin type, multi-layer aluminum type, etc. Control

	not obtain the accuracy demanded.	aluminum type, etc. Control suitable thickness.
Scratching and dust on the front side of entry board	Drill bit is deflected by the unevenness of the entry board, worsening accuracy.	Control the management and handling of entry board. Check the bush for defects.
Unsuitable backup board	Hard back up board causes wear, which worsens accuracy.	Consider suitable hardness.
Unsuitable Stack preparation	Loosely stacked entry board and PWB's (poor PWB stack preparation) causes poor accuracy.	Check stud pins and tapering of the PWB stacking to prevent the entry board flapping and gaps in PWB stack.
Uneven and scratched surface on the PWB	Drill bit was deflected by the unevenness and scratching on the front side of entry board, worsening accuracy.	Check PWB quality.
PWB qualities	Uneven resin and fiber intersections worsen hole accuracy.	Check PWB quality. Example: Check unevenness of PWB using an image processor. AOI machine for measuring hole registration accuracy ---> An extreme striped pattern, etc.
TIR (Total Indicated Runout)	Large dynamic deflection worsens accuracy.	Control spindle run out (maintenance and repair). Recommended value <10 micron (<5 micron is better for <0.3mm drill bits)
Drilling machine's condition	A worn or un-smooth ball screw or linear bearing from constant use worsens accuracy.	Maintain the drilling machine, the checking machine precision, and routine major services
Inevitable	A high vacuum force lifts	Set suitable vacuum force



<p>Unsuitable Vacuum force</p>	<p>A high vacuum force lifts the entry board allowing chips to go in between the entry board and PWB, causing the drill not to center properly. In the case of low vacuum, it worsens chip evacuation and causes chip clogging.</p>	<p>Set suitable vacuum force. (Recommended value: 0.4dia. 100-150 hPa, 0.1dia. 70-140 hPa) Maintain dust catcher system of the drilling machine.</p>
<p>Unsuitable pressure foot force</p>	<p>Low pressure foot force prevents proper clamping of the bush to the entry board, causing chip clogging and poor accuracy.</p>	<p>Set correct pressure foot force. (Recommend: About 100-150 N. Suitable value is depends on application)</p>
<p>Unsuitable bush diameter</p>	<p>A large diameter bush prevents good chip evacuation and worsens accuracy.</p>	<p>Using small inner diameter bush. Example: Change from 10mm to 3mm inner dia.</p>
<p>Uneven contact of bush with entry board</p>	<p>Uneven bush contact, a damaged bush or poor surface condition of the bush contact area causes poor accuracy.</p>	<p>Check whether pressure foot is parallel with the machine table. Check bush contact using PV-Checker. (Recommendation: Over 80% surface touching bush)</p>

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PATENTS
COMMUNITY PATENT REVIEW

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Cold headed center vacuum drill bit

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United States Patent 5452628

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Inventor(s) Montgomery, Jr.; Robert H. (Everett, PA); Shalrer, Daniel C. (Bedford, PA); Elam, James E. (Livonia, MI); Ewing, Paul E. (Farmington Hills, MI)

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Abstract A unit bit for cutting holes in a work surface including a hard wear-resistant insert and a metal body including a top working surface on an irregular surface configuration having a slot for retaining the hard wear-resistant insert. The body having a metal grain structure substantially parallel with the contour of the body. In a preferred embodiment the body is formed by cold-heading.

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Title Information

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Inventor Montgomery, Jr.; Robert H. (Everett, PA); Shalrer, Daniel C. (Bedford, PA); Elahi, Jaffar E. (Livonia, MI); Ewing, Paul E. (Farmington Hills, MI)

Describe this patent:

- Clever
- Complex
- Efficient
- Historic
- Innovative
- Interesting
- Practical
- Simple

Owner/Assignee Kennametal Inc. (Latrobe, PA)
Patent assignment
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Publication Date September 28, 1995

Application Number 06/201,834

PAIR File History Application Data Transaction History
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US Classification

Int'l Classification

Examiner Watts, Douglas D.

Attorney/Law Firm Prizer, John J.
Address

Parent Case This is a divisional of application Ser. No. 07/791,755 filed Nov. 12, 1991 now U.S. Pat. No. 5,297,643, which was a continuation-
1990, now abandoned.

Priority Data

USPTO Field of Search

04/26/2008 title references market technical claims description title for full all comments comments

References

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U.S. References

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Market Review

Estimate the gross annual revenues of the relevant market sector: <input type="radio"/> > \$10B <input type="radio"/> \$5B - \$10B <input type="radio"/> \$2B - \$5B <input type="radio"/> \$500M - \$2B <input type="radio"/> \$10M - \$100M <input type="radio"/> \$1M - \$10M <input type="radio"/> \$500K - \$1M <input type="radio"/> \$100K - \$500K <input type="radio"/> < \$100K		Market Share Estimate the percentage of the relevant market sector this invention will capture: <input type="radio"/> 75% - 100% <input type="radio"/> 50% - 74.99% <input type="radio"/> 25% - 49.99% <input type="radio"/> 5 - 9.99% <input type="radio"/> 2 - 4.99% <input type="radio"/> 1 - 1.99% <input type="radio"/> < 1%	
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Total: \$0		Total: 0.0%	
\$0 \$2.5B \$5B \$7.5B \$10B		0% 25% 50% 75% 100%	
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Reasonable Royalty What percentage of gross sales should the inventor or assignee be paid? <input type="radio"/> 75% - 100% <input type="radio"/> 50% - 74.99% <input type="radio"/> 10 - 24.99% <input type="radio"/> 5 - 9.99% <input type="radio"/> 2 - 4.99% <input type="radio"/> 1 - 1.99%		Public's "Guessimation" of Royalty Value Market Size: N/A [No votes] × Market Share: N/A [No votes] = Reasonable Royalty: N/A [No votes]	
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Competitive Advantage

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Are there viable commercial alternatives for this invention?

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Technical Review

Claims

1. A process for making a drill bit having a body including a top working surface from a blank having a forward end and a rearward end comprising the steps of:

(a) cold-heading said blank to form the drill bit body;

(b) forming a slot transverse to a central axis of the drill bit body to receive an insert and

(c) forming opposing dust collection openings within the drill bit body.

2. A process for making a drill bit having a body including a top working surface from a blank having a forward end and a rearward end comprising the steps of:

4. A process for making a drill bit having a body including a top working surface from a blank having a forward end and a rearward end comprising the steps of:

(a) cold-heading said blank to form the drill bit body, said cold-heading including the steps of:

(1) shaping said blank to a uniform cylindrical size;

(2) molding the forward end of said blank into the shape of a truncated cone;

(3) punching a centering means within the rearward end and forward end of the blank;

(5) shaping a top working surface to form alternating tapered heel surfaces and tapered compression surfaces;

(6) forming an axial bore concentric with the centering means;

(c) forming opposing dust collection openings within the drill bit body.

3. The process as set forth in claim 2 wherein said slot is formed between each pair of alternating tapered conical heel surfaces and tapered conical compression surfaces to receive the insert.

5. The process as set forth in claim 4 wherein said tapered heel surfaces are formed as a convex conical shape and said compression surfaces are formed as a concave depression pie shape.

6. The process as set forth in claim 2 wherein said punching step includes punching a first annular recess within the rearward end of the blank and punching a second annular

Description

This invention relates to drill bits. More particularly, this invention relates to cold headed center vacuum drill bits.

DESCRIPTION OF THE RELATED ART

The drill bit and drill rod are used for drilling holes in a work surface such as a rock strata in the roof of a mine entry for installing roof bolts or receiving explosive charges.

The drill bit which is secured to the working end of the drill rod includes a cylindrical body having a top working surface to which is attached an insert made of a hard wear resistant material, such as cemented carbide or the like. A pair of dust collection openings are positioned beneath the insert in communication with an axial bore extending through the bottom end of the drill bit.

within the drill bit body and then through the hollow drill rod. The cut material is drawn into the drill bit body and through the hollow drill rod using a suitable vacuum pump, or alternatively, by forcing a coolant liquid up through the drill rod and out through the openings to thereby wash away the cut materials and dust.

It is known to manufacture a drill bit body for drilling holes in the roof of a mine entry by performing a series of complex machining operations on a cylindrical steel blank of a limited size. More particularly, it has been the practice to manufacture a drill bit body by initially providing a cylindrical steel blank and then drilling and countersinking a bore hole into the rearward end of the blank. The bore hole is then drilled to a diameter which is slightly larger than the diameter of the inside diameter bore of the drill rod. Next, the top working surface of the blank is machined to a cone shape having alternating tapered heel surfaces and compression surfaces to allow dust and the like to flow around the bit body as the drill bit penetrates into the rock strata. Dust collection openings as previously

surfaces and compression surfaces to allow dust and the like to flow around the bit body as the drill bit penetrates into the rock strata. Dust collection openings as previously described, are then drilled through the side surfaces. Next, a hole is drilled below the openings to provide a securing means such as a 5522 chuck and 9240 clip obtainable from Kennametal Inc. to maintain the bit on the drill steel. Finally, a transverse slot is machined within the top working surface diagonally between the tapered heel surfaces and compression surfaces to provide a means for retaining the cemented carbide insert within the drill bit body.

may be manufactured. For example, the marginal edges formed in the machining of the planar side surfaces of a drill bit body are typically sharp which interferes with air flow and drill dust removal. Furthermore, the formation of a drill bit body by machining removes more of the grain structure than a drill bit body formed in part by cold-heading. It will be appreciated that the increased removal of metal grain structure from a drill bit body by machining weakens the structural integrity of the drill bit thereby adversely affecting the performance of the drill bit. The various machining operations required in the manufacture of a drill bit body represent a substantial portion of the overall cost of the finished product. Accordingly, it would be advantageous if a new method of manufacturing a drill bit body were found that overcomes the problems of the prior art.

One attempt at manufacturing a new type of drill bit body is by casting. The casting of a drill bit body has been found to eliminate some of the machining steps required in the manufacture of a drill bit. However, such cast center vacuum bits suffer from poor casting integrity and strength which may cause premature failure of the drill bit. Moreover, these cast center vacuum bits further suffer from the disadvantage of high cost associated with the investment casting process.

Consequently, a need exists for an improved process and design to eliminate as many of the machining steps in the production of a drill bit body as possible without the sacrifice of certain desired mechanical properties.

To alleviate the aforementioned problems, we have invented a novel drill bit body design and a novel process for manufacturing a drill bit body. The present invention eliminates the necessity for machining of the side surfaces of the drill bit body to form the planar side surface, machining of the top working surface and broaching of the interior hex of the central bore of the drill bit body. The present invention also allows for the elimination of the steps of drilling and countersinking an interior axial bore and machining of one or two broach relief rings. It will be appreciated that the elimination of the broach relief rings has the advantage of providing increased strength to the drill bit body. Further advantages of the present invention are that the drill bit body may be finished more quickly and economically resulting in a stronger steel drill bit body due to forging flow lines (grain structure) which follow the contour of the drill bit body. The drill bit body in accordance with the present invention exhibits superior toughness relative to a machined bit body and eliminates machined sharp corners in the broaching hex members to provide a consistent drill bit body thickness which gives added strength to the insert slot. The drill bit body may be of substantially uniform diameter or, in accordance with another embodiment of the invention, the exterior side surfaces of the drill bit body may taper from the top working surface toward an opposing end of the drill bit body. The degree of taper may be varied as desired.

As used herein the term "taper" refers to a linear or nonlinear widthwise dimensional decrease along the length of the drill bit body.

lower alloyed metals further machining of the bit body is made easier. For example, complex and simple insert slot designs of varying size, position and number may be easily formed within the top of the drill bit body.

Further advantages of the present invention are that complex outer body configurations to improve air flow around the top working surface of the bit body resulting in improved evacuation are now possible and varying socket configurations to secure the drill bit body to a drill rod may now be easily and economically manufactured. For example, in accordance with one embodiment of the present invention, a tapered drill bit body provides additional strength to the top working surface and improved air and material flow during cutting.

SUMMARY OF THE INVENTION

Briefly, according to this invention, there is provided a center vacuum drill bit having a body including a top working surface and a process for making the drill bit.

configuration and a slot for retaining the hard wear-resistant insert. The body of the drill bit is preferably formed by cold-heading to provide a metal grain structure substantially parallel with the contour of the body. The drill bit body may be of substantially uniform diameter or, in accordance with another embodiment of the invention, the drill bit body may taper from the top working surface toward the opposing end of the drill bit body. The degree of taper may be varied as desired.

The drill bit body includes an interior axial bore extending upwardly through an end of the body, at least two opposing recessed inverted C-shaped planar side surfaces exterior of the body extending parallel to a central axis of the body, or tapering from the top working surface toward an opposing end of the drill bit body, and at least two opposing dust

collection openings, each of the openings located through a corresponding planar side surface and in communication with the interior bore. The dust collection openings may be generally oval and positioned at an angle of approximately 45 degrees with respect to the central axis of the drill bit openings may be circular. A pair of oppositely disposed upstanding members arcuate in cross-section extend between the openings.

The openings define a pair of oppositely disposed transverse curved shoulder portions at the lower marginal edges thereof.

compression surfaces. A slot extends transversely between the alternating pair of tapered heel surfaces and compression surfaces to receive the insert.

Each of the tapered heel surfaces is of a slightly convex conical shape extending downwardly and outwardly in a direction away from the central axis. Each of the tapered compression surfaces is of a concave depression pie shape extending downwardly and outwardly toward the associated opening adjoining the planar side surface and inclined at an angle of inclination greater than 20 degrees with respect to the central axis.

The process for making the drill bit having a body including a top working surface from a blank having a forward end and a rearward end broadly includes cold-heading the blank to form the drill bit body and then forming a slot within the top working surface and dust collection openings within the body.

The punching step includes punching a first annular recess within the rearward end of the blank and punching a second annular recess of a diameter larger than said first annular recess within said rearward end of said blank and forming a depression within the forward end of said truncated cone.

A slot is then formed transverse to the central axis between each pair of alternating tapered conical heel surfaces and tapered conical compression surfaces to receive the insert and the dust collection openings are formed in communication with the axial bore within the body.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a drill bit made in accordance with the present invention;

FIG. 2 is a front view of a drill bit made in accordance with the present invention;

FIG. 3 is a cross sectional view of the drill bit of FIG. 2 taken along line 3-3.

FIG. 4 is a side view of a blank from which the drill bit body in accordance with the present invention is made;

FIG. 5 is a partial cross sectional view of a punch and heading die used to form the blank of FIG. 6.

FIGS. 5, 8, and 13 are side views of successive intermediate blanks from which the drill bit body in accordance with the present invention is made;

FIG. 7 is a partial cross sectional view of a punch and heading die used to form the blank of FIG. 8;

FIG. 9 is a side view of the blank of FIG. 8 rotated 90 degrees;

FIG. 10 is a top view of the blank of FIG. 8;

FIG. 12 is a partial cross sectional view of the heading punch and die of FIG. 11 rotated 90 degrees;

FIG. 14 is a cross sectional view of the drill bit body of FIG. 13 taken along line 14-14;

FIG. 15 is a partial cross sectional view of a heading punch and die of FIG. 15 rotated 90 degrees;

FIG. 17 is a side view of a cold headed drill bit body prior to the formation of an insert retention slot;

FIG. 18 is a cross sectional view of the drill bit body of FIG. 17 taken along line 18-18;

FIG. 19 is a top view of the drill bit body of FIG. 17;

FIG. 20 is a perspective view of an alternate embodiment of a drill bit made in accordance with the present invention;

FIG. 21 is a front view of the drill bit of FIG. 20;

FIGS. 22 and 24 are side views of successive intermediate diameters having tapered side surfaces from which a drill bit body in accordance with the present invention is made.

FIGS. 23 and 25 are cross sectional views of the drill bit body of FIGS. 22 and 24 taken along line 23-23 and line 25-25, respectively;

FIG. 26 is a perspective view of an alternate embodiment of a drill bit made in accordance with the present invention;

FIG. 28 is a perspective view of yet another embodiment of a drill bit made in accordance with the present invention;

FIG. 29 is a front view of the drill bit of FIG. 28; and

FIG. 30 is a photomicrograph illustrating the parallel metal grain structure of a polished section of a portion of a cross-section of the drill bit body of FIG. 25 (magnification

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the following description, like reference characters represent like elements. Also, in the following description, it is to be understood that such terms as "forward," "rearward," "upward," "downward," "inward," "outward" and the like are words of convenience and are not to be construed as limiting terms.

Referring now to the figures, FIGS. 1, 2, 20, 21, and 26-29 show a drill bit 10 including a body 14 having a top working surface 16 to which is secured an insert 12 adapted for use with a drill rod (not shown) for performing drilling operations in various types of strata including irregular, hard, soft and medium rock formations. The drill bit 10 may be attached to the drill rod by attachment means such as a snap connection end (not shown) or any other suitable attachment means known to one skilled in the art.

The drill bit body 14 comprises a unitary one piece member formed by cold heading. It will be appreciated that because the drill bit body 14 is formed by cold heading, the drill bit has a metal grain structure that is substantially parallel with the contour of the drill bit body. A drill bit body 14 having a parallel metal grain structure provides a drill bit of improved strength and lower cost than prior art drill bits manufactured by machining.

As shown in FIGS. 1, 2, 20, 21, and 26-29 the drill bit 10 includes an elongated cylindrical body 14 having a top working surface 16. Extending upwardly through an opposing end 15 of the drill bit body 14 is an interior axial bore 18 of hexagonal cross sectional shape. It will be appreciated that the interior axial bore 18 may be of most any suitable cross sectional shape and length to define a female socket to receive in interlocking relationship a male end of the rotating drill rod and transfer rotational force from a drive means (not shown) to the drill bit 10.

The drill bit body 14 may be of substantially uniform diameter, FIGS. 1, 2, 20 and 21 or, in yet another embodiment of the invention, the drill bit body may taper from the top working surface 16 toward an opposing end 15 of the drill bit body, FIGS. 26-29. As used herein the term "taper" refers to a linear or nonlinear widthwise dimensional decrease along the length of the drill bit body.

The degree of taper of the drill bit body 14 may vary. For example, the taper of a drill bit body 14 of approximately 2 inches in length may vary about 0.004 in. in diameter from the top working surface 16 to the opposing end 15. However, it is believed that for additional strength to the top working surface and improved air and material flow during drilling, the

The body 14 includes a pair of opposing dust collection openings 20 positioned at an angle of approximately 45 degrees with respect to a central axis 22 within the drill bit body. Accordingly, the openings 20 are angularly positioned with respect to the central axis 22 and generally diametrically centered with respect to such axis. The openings 20 are preferably of a general oval shape. However, the openings 20 may be of most any suitable shape such as circular or the like.

another and parallel to the vertical central axis 22 of the drill bit body 14, FIGS. 1, 2, 20 and 21 or, in another embodiment, the side surfaces 24 may taper from the top working surface 16 toward an opposing end 15 of the drill bit body, FIGS. 26-29. As shown in FIGS. 1, 2, 20, 21 and 26-29, the openings 20 provide a pair of oppositely disposed, generally transverse curved shoulder portions 26 at the lower marginal edges thereof. It will be appreciated that because the curved shoulder portions 26 are formed from the lower

marginal edges of the openings 20 which are positioned at an angle of approximately 45 degrees with respect to the top portion of the central axis 22, the curved shoulder portions present an edge having a back surface 21 which slopes downwardly and inwardly toward bore 18 thereby facilitating removal of dust and the like to the bore. The shoulder portions 26 are preferably disposed at generally the midpoint of the axial length of the body 14. By this arrangement, the openings 20 are provided with a maximum

The body 14 also includes a pair of oppositely disposed, upstanding members 28 which are made integral with and support the top working surface 16. The members 28 are generally arcuate in cross section and disposed in vertical planes which extend generally transverse to the planes containing the associated openings 20. The members 28 may be parallel. FIGS. 1, 2, 20 and 21 or, in another embodiment, the members 28 may taper from the top working surface 16 toward an opposing end 15 of the drill bit body 14. FIGS. 26-29.

The top working surface 16 of the drill bit body 14 has an irregular surface configuration defined by an alternating first pair of oppositely disposed tapered heel surfaces 30 and a second pair of oppositely disposed tapered compression surfaces 32. The tapered heel surfaces 30 and compression surfaces 32 of the top working surface 16 of the drill bit body 14 cooperatively allow drill dust and the like to flow into the dust collection openings 20 and through axial bore 18. As used herein an "irregular surface" represents a surface having varying distances as measured radially from a point defined by the intersection of a central vertical axis 22 of the drill bit body and a plane normal to the central axis 22 to any point defined by the intersection of the plane and the contour of the irregular surface.

of the drill bit body 14. The tapered heel surfaces 30 are slightly convex conical and extend downwardly and outwardly in a direction away from the vertical central axis 22 of the drill bit body 14 and provide a backup or support for the insert 12. As shown, the angle of the tapered heel surfaces 30 with respect to the upstanding members 28 of the drill bit body 14 may be of any suitable angle to prevent the top working surface 16 of the drill bit body from frictionally engaging the rock strata being drilled. In a preferred embodiment, the tapered heel surfaces 30 form an angle of approximately 25 degrees with respect to horizontal.

The tapered compression surfaces 32, as described herein, are positioned such that each of the surfaces of each pair are disposed on the same side of the plane 30 as to merge into apex edges which lie in substantially the same general plane on opposed sides of the insert 12. The tapered compression surfaces 32 are of a substantially pie shaped concave depression and extend downwardly and outwardly away from the top of the working surface 16 of the drill bit body 14 toward the openings 20. In an alternative embodiment, the tapered compression surfaces 32 extend downwardly and outwardly to curved marginal edges terminating in openings 20 (FIGS. 20, 21 and 28, 29) to promote improved flow of air and dust, debris and the like for discharge and removal through the axial bore 18.

The tapered compression surfaces 32 are preferably disposed at a greater angle of inclination than that of the tapered heel surfaces 30. As shown, the angle of inclination of the abuts with the planar vertical side surface 24 which together cooperatively act as a conduit for dust and the like to flow to the openings 20.

The dust collecting openings 20 are disposed below the tapered compression surfaces 32 such that the compression surfaces and slot 36 have a combined width wise dimension substantially equal to the corresponding transverse dimension of the respective side surfaces 24. The openings 20 are vertically spaced from the top working surface 16 by a predetermined distance such that dust and the like is automatically metered off the tapered compression surfaces 32 past the side surfaces 24 and into the dust collection openings 20. This is accomplished in a manner so as not to crowd the openings 20 thereby preventing bridging or clogging of the openings and the axial bore 18.

The insert 12 secured within the slot 36 may be of a type having a plate-like configuration and made of a high strength, wear-resistant material formed of cemented tungsten carbide or the like. The insert 12 may be permanently or detachably secured within the slot 36. As shown in FIGS. 1, 2, 20, 21 and 26-29 an "A" frame house style tungsten carbide insert is secured within the slot by brazing. Braze shims such as those disclosed in U.S. Pat. No. 4,817,742 may or may not be used to braze the insert to the metal body.

The insert 12 extends laterally outwardly and beyond both ends of the slot 36 a predetermined length and over the openings 20 to provide a clearance for the drill bit body 14 as the drill bit 10 drills a hole. The exposed side surfaces 38 of the insert 12 are in general vertical alignment with the respective side surfaces 24 defining the respective openings 20 as illustrated in FIGS. 1, 20 and 26 and 28. By this arrangement, dust and the like are directed downwardly and outwardly over the compression surfaces 32 for maximum discharge. In addition, by this arrangement the symmetrically disposed tapered heel surfaces 30 and compression surfaces 32 in conjunction with the integral members 28 provide a substantial mass of solid material to maximize the strength characteristics of the top working surface 16.

As shown the dust collecting openings 20 and side surfaces 24 lie in planes which are generally disposed parallel to the vertical central axis 22 of the drill bit 10. Accordingly, the openings 20 are disposed diametrically opposite to one another and define with the tapered heel surfaces 30 and side surfaces 24, dust collection passageways to progressively meter reduced dust material into the openings which extend parallel to one another on opposed sides of the longitudinal central axis 22 of the drill bit body 14.

The improved performance of the drill bit body 14 of the drill bit 10 in accordance with the present invention is achieved by a series of cold-heading operations now described with reference to FIGS. 4-19 and 22-25.

Initially, a length of wire may be drawn through a die preferably made of carbide, to a uniform diameter. The wire may then be fed into a cut-off station and pushed against a stock stop and sheared to form a blank 40 of a suitable length as shown in FIG. 4. It will be appreciated that the blank 40 may be manufactured using conventional techniques known to one skilled in the art and made of most any suitable metal such as AISI 15B35, 4140, 8630 or 8640 steels available from USX Corporation obtainable in either coil stock or rod form.

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Earth penetrating rotary drill bit with helical ports
US Patent Issued on [July 12, 2005](#)

[Inventor\(s\)](#)
[Douglas E. Bise](#) [Abstract](#) [Claims](#) [Description](#) [Full Text](#)

[Application](#)
No. 610112 filed on 2003-06-30

[Current US Class](#)
[175/420.1](#), [175/418](#)

[Examiners](#)
Primary: [William Neuder](#)

[Attorney, Agent or Firm](#)
[Smith, Matthew W.](#)

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Description

BACKGROUND OF THE INVENTION

The invention pertains to an earth penetrating rotary drill bit that has a hard member at the axial forward end thereof. More specifically, the invention pertains to an earth penetrating rotary drill bit that has a hard member at one end thereof and wherein the rotary drill bit contains debris (or dust) ports for evacuating dust and debris from the vicinity of the drilling operation.

The expansion of an underground coal mine requires digging a tunnel that initially has an unsupported roof. To provide support for the roof,

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Lord Byron

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that usually uses an unsupported drill to provide support for the tool,
an earth penetrating rotary drill bit (e.g., a roof drill bit) is used to drill boreholes, which can extend from between about two feet to about (or even greater than) twenty feet, into the earth strata. In this regard, the earth penetrating drill bit is connected to a drill steel. The drill steel is connected to a rotary driver. The rotary driver powers the earth penetrating drill bit so as to drill the earth strata. Roof bolts are affixed within the boreholes and a roof support (e.g., a roof panel) is then attached to the roof bolts. Examples of a conventional roof drill bit with an axial forward slot that carries a blade style hard insert are the KCV4-1RR and KCV4-1 1/32RR Roof Rocket™ drill bits made by Kennametal Inc. of Latrobe, Pa., USA and shown in U.S. Pat. No. 5,172,775 to Sheirer et al.

During the **drilling** operation, rotary drill bits generate debris. This debris can take the form of dust-like fine particles. The debris may also exist as larger particles. During the **drilling** operation, this debris is evacuated under the influence of a vacuum from the vicinity of the **drilling** operation through debris ports (or dust ports) contained in the body of the rotary drill bit. On occasion during the **drilling** operation, a rotary drill bit can generate a large enough volume of debris such that the rotary drill bit is unable to evacuate the debris quickly enough from the vicinity of the **drilling** operation to maintain the efficient operation of the rotary drill bit. When the debris cannot be adequately evacuated from the vicinity of the **drilling** operation, several consequences can occur.

One such consequence is that the speed at which the rotary drill bit operates, and hence the **drilling** rate, must be reduced so as to accommodate the debris. By reducing the speed of the rotary drill bit due to the inability of the rotary drill bit to evacuate debris, the operator is limited in being able to operate the rotary drill bit at its optimum capability. It would be desirable to provide an improved rotary drill bit that better evacuates **drilling** debris so as to enhance the ability of the rotary drill bit to operate at a higher speed.

Another such consequence of the inability to adequately evacuate debris from the vicinity of the **drilling** operation is that the rotary drill bit tends to stick in the bore hole. This causes the **drilling** operation to become less consistent and rougher. It would thus be advantageous to provide an improved rotary drill bit that better evacuates **drilling** debris from the vicinity of the **drilling** operation so as to provide for the smoother operation of the rotary drill bit.

Yet another such consequence of the inability to adequately evacuate debris from the vicinity of the **drilling** operation is that the rotary drill bit tends to overheat. This is due to the presence of **drilling** debris that increases the friction between the rotary drill bit and the earth strata (included the debris). It would thus be advantageous to provide an improved rotary drill bit that better evacuates **drilling** debris from the vicinity of the **drilling** operation so that the rotary drill bit operates cooler, i.e., operates at lower temperature.

Overall, it can be seen that there would be a number of advantages associated with being able to provide an improved earth penetrating rotary drill bit that is able to better evacuate debris from the vicinity of the **drilling** operation. The advantages include allowing for the rotary drill bit to smoothly operate at higher **drilling** rates and yet still be at a lower operating temperature.

SUMMARY OF THE INVENTION

In one form thereof the invention is a drill bit for **drilling** earth strata whereby debris is generated during the **drilling** operation. The drill bit comprises a drill bit body that has a side wall and opposite ends wherein a distal one of the opposite ends of the drill bit body receives a cutting insert. The drill bit body contains a helical debris port in the side wall thereof and a helical scallop surrounds the debris port. The helical scallop is proximate to the cutting insert so that debris from the **drilling** operation impinges upon the helical scallop whereby the helical scallop directs the debris into the helical

debris port.

In yet another form thereof, the invention is a drill bit for **drilling** earth strata so as to generate debris. The drill bit comprises a drill bit body that has a side wall and opposite ends wherein a distal one of the opposite ends of the drill bit body receives a cutting insert. The drill bit body contains a helical debris port in the side wall thereof and a helical scallop surrounds the debris port. The distal end of the drill bit body presents a feeder surface wherein the feeder surface is adjacent to the cutting insert. Debris from the **drilling** operation impinging upon the feeder surface so that the feeder surface feeds the debris into the helical scallop whereby the helical scallop directs the debris into the helical debris port.

In yet another form thereof, the invention is a drill bit that comprises a drill bit body that has a side wall and opposite ends wherein a distal one of the opposite ends of the drill bit body receives a cutting insert. The drill bit body contains at least two helical debris ports in the side wall thereof, and a helical scallop corresponding to each one of the helical debris ports. Each one of the helical scallops surrounds its corresponding debris port so as to define the periphery thereof.

In still another form thereof, the invention is a drill bit that comprises a drill bit body that has a side wall and opposite ends wherein a distal one of the opposite ends of the drill bit body receives a cutting insert. The drill bit body contains a helical debris port in the side wall thereof. The drill bit body contains a helical scallop surrounding each one of the helical debris ports wherein the scallop defines a periphery of the debris port. The helical scallop has a pitch ranging between about 3 inches (about 7.62 centimeters) and about 15 inches (38.1 centimeters).

In one form thereof, the invention is a cold-formed rotary drill bit body that comprises a side wall wherein the side wall contains a helical scallop and the helical scallop presents a pitch ranging between about 3 inches (about 7.62 centimeters) and about 15 inches (38.1 centimeters). The side wall contains a helical debris port wherein the helical scallop surrounds the helical debris port. The bit body further includes opposite ends wherein a distal one of the opposite ends containing a slot for receiving a cutting insert.

In yet another form thereof the invention is a cast rotary drill bit body that comprises a side wall wherein the side wall contains a helical scallop and the helical scallop presents a pitch ranging between about 3 inches (about 7.62 centimeters) and about 15 inches (38.1 centimeters). The side wall contains a helical debris port wherein the helical scallop surrounds the helical debris port. The bit body further includes opposite ends wherein a distal one of the opposite ends containing a slot for receiving a cutting insert.

In another form thereof the invention is a method of making a rotary drill bit body comprising the steps of: providing a rotary drill bit body blank wherein the rotary drill bit body blank is either cast or sold-formed, and the rotary drill bit body blank having a helical scallop, and the rotary drill bit body blank further having a distal end containing a plug and a formed protrusion within the helical scallop; removing the plug so as to form a slot for receiving a cutting insert; and removing the formed protrusion so as to form a helical debris port.

In still another form thereof, the invention is a method of making a rotary drill bit comprising the steps of: providing a drill bit body having a side wall and opposite ends, the drill bit body containing a helical debris port in the side wall thereof, and the drill bit body containing a helical scallop surrounding the debris port; providing a cutting insert; and affixing the cutting insert to the drill bit body at a distal one of the opposite ends thereof so that the helical scallop is proximate to the cutting insert so that debris from the **drilling** operation impinges upon the helical scallop whereby the helical scallop directs the debris into the helical debris port.

BRIEF DESCRIPTION OF THE DRAWINGS

BRIEF DESCRIPTION OF THE DRAWINGS

The following is a brief description of the drawings that form a part of this patent application:

FIG. 1 is an isometric view of one specific embodiment of the earth penetrating rotary drill bit of the invention;

FIG. 2 is an isometric view of the specific embodiment of the earth penetrating rotary drill bit of FIG. 1 wherein the drill bit is rotated in a counter-clockwise direction as shown in the drawings;

FIG. 3 is an isometric view of a cold-formed elongate drill bit body used to make an earth penetrating rotary drill bit like the earth penetrating rotary drill bit of FIG. 1 wherein the drill bit is illustrated prior to machining the slot that receives the cutting insert and prior to the completion of drilling the helical debris ports;

FIG. 4 is an isometric view of the cold-formed elongate drill bit body of FIG. 3 after machining the slot that receives the cutting insert and after completion of drilling the helical debris port;

FIG. 5 is a top view of the earth penetrating rotary drill bit of FIG. 1;

FIG. 6 is an isometric view of another specific embodiment of the earth penetrating rotary drill bit of the invention wherein this embodiment has a lobed cutting insert;

FIG. 7 is an isometric view of the earth penetrating rotary drill bit of FIG. 6 wherein the lobed cutting insert is exploded away from the elongate rotary drill bit body so as to view the bottom surface of the cutting insert;

FIG. 8 is an isometric view of still another specific embodiment of the earth penetrating rotary drill bit of the invention wherein this embodiment has a cutting insert that has two lobes;

FIG. 9 is an isometric view of the earth penetrating rotary drill bit of FIG. 8 wherein the cutting insert is exploded away from the elongate rotary drill bit body so as to view the bottom surface of the cutting insert; and

FIG. 10 is a cross-sectional view of the juncture between the cutting insert and the elongate rotary drill bit body of the embodiment of FIG. 8.

DETAILED DESCRIPTION OF THE INVENTION

Vacuum Pump
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Vacuum Degasing Chambers
Rapid, effortless degasation of silicone compounds. Low Cost
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Rotary drill bit 20 further includes an elongate steel bit body generally designated as 30. Bit body 20 has a distal end (or top end) 32 and a proximate end (bottom end) 34. Bit body 30 further includes a generally cylindrical side wall 36 that presents a cylindrical exterior surface 37 and contains aperture 40 therein. Bit body 30 further defines an interior cavity 38. As is well known in the art, a projection on the drill steel registers with the aperture 40 so as to connect drill steel to the rotary drill bit.

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Bit body 30 contains a helical debris port 46 that is elongate (or helical) in shape. The bit body 30 further contains a helical scallop 48. Helical scallop 48 surrounds the helical debris port 46 so as to define the perimeter of the helical debris port 46

The helical scallop 48 shown in rotary drill bit 20 has an orientation so as to have a pitch that equals about 7.3 inches (18.54 centimeters). The helical scallop 48 may have a pitch that ranges between about 3 inches (7.62 centimeters) and about 15 inches (38.1 centimeters). As an alternative range for the pitch, the helical scallop 48 may have a pitch that ranges between about 5 inches (12.7 centimeters) and about 10 inches (25.4 centimeters). As still another alternate range for the pitch, the helical scallop 48 may have a range of the pitch between about 6 inches (15.24 centimeters) and about 10 inches (25.4 centimeters). The orientation of the helical debris port 46 is such so that it has a pitch like that of the helical scallop 48.

Helical scallop 48 is defined by contiguous surfaces that comprise a top (or axial forward) surface 50, a bottom (or axial rearward) surface 52, and opposite side surfaces 54 and 56. The top surface 50 is generally parallel to the major axis of the helical debris port 46. The one side surface 54 is contiguous with the top surface 50, but is twisted relative to the top surface 50. The other side surface 56 is contiguous with the top surface 50 and has an orientation so as to be generally parallel to the top surface 50. The bottom surface 52 is contiguous with the side surfaces (54, 56), and is oriented so as to face somewhat inwardly toward the cavity 38.

Referring to FIG. 2, it can be seen that the cutting insert 22 and the helical debris port 46 are axially spaced apart in that the cutting insert 22 is axial forward of the helical debris port 46. However, the cutting insert 22 and the helical debris port 46 have a relative vertical orientation so that the helical debris port 46 is on either side (i.e., leading side 24 and trailing side 25) of the cutting insert 22. In this regard, the trailing surface 25 of the cutting insert 22 is rotationally ahead of (i.e., offset in a counter-clockwise rotational direction a shown in FIG. 2 relative to) the rear edge of the helical debris port 46 that is defined by the one side surface 54 of the helical scallop 48. The leading surface 24 of the cutting insert 22 is rotationally behind of (i.e., offset in a clockwise rotational direction as shown in FIG. 2 relative to) the forward edge of the helical debris port 46. What this shows is that vertical downward extensions of the planes in which the leading side surface 24 and the trailing side surface 25 lie will intersect the helical debris port 46. One may characterize this relative positioning as the cutting insert having a vertical orientation relative to the helical debris port so as to be within the vertical extension of the periphery of the helical debris port.

Bit body 30 contains a transverse slot 60 therein at the top end 32 thereof. The transverse slot 60 receives the cutting insert 22. Cutting insert 22 may be affixed within the slot 60 by brazing or the like. Bit body 30 further includes a feeder surface 62 and an inclined surface 64. The feeder surface 62 is adjacent to the inclined surface 64.

In operation, the rotary drill bit 20 is pressed against the earth strata and is driven so as to rotate about its central longitudinal axis. The cutting insert 22 is in direct contact against the earth strata so as to drill a borehole. As a consequence of drilling the borehole, there is generated a volume of debris in the form of fine particles (i.e., dust) and larger particles. The debris is generated at, and hence initially located in, the vicinity of the cutting insert and the upper region of the rotary drill bit.

A vacuum is at the helical debris port 46. Under the influence of the vacuum, the debris moves over the feeder surface 62 and along the helical scallop 48 into the corresponding helical debris port 46. The helical orientation of the debris port 46 and the helical scallop 48 facilitate the efficient and relatively quick evacuation of the debris from the vicinity of the

to and the helical scallop to facilitate the efficient and relatively quick evacuation of the debris from the vicinity of the rotary drill bit 20. The efficient and relatively quick evacuation of the debris from the vicinity of the rotary drill bit 20 provides for the advantages of higher drilling rates along with smoother drilling and cooler drilling.

Referring to FIGS. 3 and 4, in FIG. 3 there is shown a cold-formed steel bit body blank 30A used to make a rotary drill bit like that of rotary drill bit 20. The cold-formed bit body blank 30A contains a plug 44 that is in the general shape of a cutting insert. The bit body blank 30A also presents a formed protrusion 42 in the sidewall thereof.

As shown in FIG. 4, to finish the bit body blank 30A, the plug 44 is machined out (i.e., material is removed) to form a slot 60 and the bit body blank is drilled out (i.e., material is removed) in the area of the formed protrusion 42 to form the helical debris port 46.

Thus, it can be seen that the bit body 30 is made according to the following steps. First, there is the step of providing a cold-formed bit body blank that has a helical scallop, a plug in the location where there will be the cutting insert, and a formed protrusion within the helical scallop and at the location where there will be a helical debris port. Second, there is the step of machining out the plug (i.e., removing material) to form a slot that receives the cutting insert. Third, there is the step of drilling out the bit body in the location of the formed protrusion (i.e., removing material) so as to form the helical debris port.

It should also be appreciated that while the bit body is described as being cold-formed, applicant contemplates that the bit body could be cast.

Referring to FIGS. 6 and 7, there is shown another embodiment of a rotary drill bit generally designated as 70. Rotary drill bit 70 includes a hard carbide (e.g., cobalt cemented tungsten carbide) cutting insert 72. Cutting insert 72 has a trio of lobes 74, 76, 78 wherein each one of the lobes 74, 76, 78 presents a cutting edge 73, 75, 77, respectively, on the top surface 80 of the cutting insert 72. Cutting insert 72 has a bottom surface 82 wherein a lobed projection 84 extends from the bottom surface 82. The cutting insert 72 has a trio of arcuate side surfaces 86. Cutting insert 72 has a structure along the lines of at least one of the cutting inserts disclosed and described in pending U.S. patent application Ser. No. 09/591,644 to Dunn et al. filed on Jun. 9, 2000 for a DRILL BIT, HARD MEMBER AND BIT BODY, and such patent application is incorporated by reference herein.

Rotary drill bit 70 has an elongate bit body 90. Bit body 90 has an opposite top end (or distal end) 92 and bottom end (or proximate end) 94. Bit body 90 has a sidewall 96 that presents a generally cylindrical exterior surface 97 and contains an aperture 98. As mentioned in connection with the description of the connection between the rotary drill bit 20 and the drill steel, a projection on the drill steel registers with the aperture 98 so as to connect the rotary drill bit 70 to the drill steel. Bit body 90 defines an interior cavity 100. The bit body 90 contains at the top end 92 thereof a lobed socket 102.

Bit body 90 contains a helical debris port 108. Bit body 90 further includes a helical scalloped portion 110 that extends from the top end 92 in an axial rearward direction down along the exterior surface 97 of the bit body 90. The helical debris port 108 is located near, but axial forward of, the termination of the helical scalloped portion 110.

The helical scallop 110 has an orientation so as to have a pitch that equals about 3 inches (7.62 centimeters). The helical scallop 110 may have a pitch that ranges between about 3 inches (7.62 centimeters) and about 15 inches (38.1 centimeters). As an alternative range for the pitch, the helical scallop 110 may have a pitch that ranges between about 5 inches (12.7 centimeters) and about 10 inches (25.4 centimeters). As still another alternate range for the pitch, the helical scallop 110 may have a range of the pitch between about 6 inches (15.24 centimeters) and about 10 inches (25.4

centimeters). The orientation of the helical debris port 108 is such so that it has a pitch like that of the helical scallop 110.

In operation, the rotary drill bit 70 is pressed against the earth strata and is driven so as to rotate about its central longitudinal axis. The cutting insert 72 is in direct contact against the earth strata so as to drill a borehole. As a consequence of **drilling** the borehole, there is generated a volume of debris in the form of fine particles (i.e., dust) and larger particles. The debris is generated at and hence initially located in the vicinity of the cutting insert and the upper region of the rotary drill bit.

A **vacuum** is at the helical debris ports 108. Under the influence of the **vacuum**, the debris moves over the surface of the scalloped portion 110 into the corresponding debris port 108. The helical orientation of the debris port 108 and the helical scallop 110 facilitate the efficient and relatively quick **evacuation** of the debris from the vicinity of the rotary drill bit 70. The **efficient** and relatively quick **evacuation** of the debris from the vicinity of the rotary drill bit 70 provides for the advantages of higher **drilling** rates along with smoother **drilling** and cooler **drilling**.

Referring to FIGS. 8 through 10, there is shown still another specific embodiment of a rotary drill bit generally designated as 120. Rotary drill bit 120 includes a hard carbide (e.g., cobalt cemented tungsten carbide) cutting insert 122. Cutting insert 122 includes a top surface 124 that presents cutting edges 126. Cutting insert 122 also has a bottom surface 128 that has positioning projections 130 and spacer bumps 132 extending therefrom. Cutting insert 122 has a transverse surface 134 and a peripheral side surface 136.

Rotary drill bit 120 further includes an elongate bit body 138 that has a top end (distal end) 140 and a bottom end (proximate end) 142. There are a pair of holes 141 in the top end 140 of the bit body 138. Bit body 138 further includes a sidewall 144 that presents an exterior surface 145. Bit body 138 defines an interior cavity 146 and contains an aperture 148. A projection on a drill steel registers with the aperture 140 so as to connect the rotary drill bit 120 to the drill steel.

Bit body 138 further contains a helical debris port 154 and a helical scallop 156. The helical scallop 156 has an orientation may have a pitch that ranges between about 3 inches (7.62 centimeters) and about 15 inches (38.1 centimeters). As an alternative range for the pitch, the helical scallop 156 may have a pitch that ranges between about 5 inches (12.7 centimeters) and about 10 inches (25.4 centimeters). As still another alternate range for the pitch, the helical scallop 156 may have a range of the pitch between about 6 inches (15.24 centimeters) and about 10 inches (25.4 centimeters). The orientation of the helical debris port 154 is such so that it has a pitch like that of the helical scallop 156.

There is a braze joint 160 between the cutting insert 122 and the top end 140 of the bit body 138. The holes 141 in the top end 140 of the bit body 138 receive the positioning projections 130 so as to help position the cutting insert 122 relative to the bit body 138. The spacer bumps 132 help maintain a pre-selected uniform thickness of the braze joint 160 between the cutting insert 122 and the top end 140 of the bit body 138.

In operation, the rotary drill bit 120 is pressed against the earth strata and is driven so as to rotate about its central longitudinal axis. The cutting insert 122 is in direct contact against the earth strata so as to drill a borehole. As a consequence of **drilling** the borehole, there is generated a volume of debris in the form of fine particles (i.e., dust) and larger particles. The debris is generated at and hence initially located in the vicinity of the cutting insert and the upper region of the rotary drill bit.

A **vacuum** is at the helical debris ports 154. Under the influence of the **vacuum**, the debris moves over the scallop surfaces 156 into the corresponding debris port 154. The helical orientation of the debris ports 154 and the helical

scallops 156 facilitate the efficient and relatively quick evacuation of the debris from the vicinity of the rotary drill bit 120. The efficient and relatively quick evacuation of the debris from the vicinity of the rotary drill bit 120 provides for the advantages of higher drilling rates along with smoother drilling and cooler drilling.

It can thus be appreciated that the rotary drill bits disclosed and described herein provide certain improvements and advantages. These drill bits provide for the efficient and improved evacuation of debris from the vicinity of the rotary drill bit during the drilling operation. These rotary drill bits that provide for better evacuation of debris enhance the ability of the rotary drill bit to operate at a higher speed and provide for smoother and cooler operation.

One can appreciate that the present invention includes a method of making a rotary drill bit body comprising the steps of: providing a rotary drill bit body blank wherein the rotary drill bit body blank is either cast or cold-formed, and the rotary drill bit body blank having a helical scallop, and the rotary drill bit body blank further having a distal end containing a plug and a formed protrusion within the helical scallop; removing the plug so as to form a slot for receiving a cutting insert; and removing the formed protrusion so as to form a helical debris port.

One can also appreciate that the present invention provides for a method making a rotary drill bit. This method comprises the steps of: providing a drill bit body having a side wall and opposite ends, the drill bit body containing a helical debris port in the side wall thereof, and the drill bit body containing a helical scallop surrounding the debris port; providing a cutting insert; and affixing the cutting insert to the drill bit body at a distal one of the opposite ends thereof so that the helical scallop is proximate to the cutting insert so that debris from the drilling operation impinges upon the helical scallop whereby the helical scallop directs the debris into the helical debris port.

The patents and other documents identified herein are hereby incorporated by reference herein.

Other embodiments of the invention will be apparent to those skilled in the art from a consideration of the specification (including the drawings) or practice of the invention disclosed herein. It is intended that the specification and examples be considered as illustrative only, with the true scope and spirit of the invention being indicated by the following claims.

* * * * *

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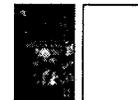
The throughput of the vacuum tank degasser is controlled by the discharge jet or pump. The higher the tank is above the surface of the drilling fluid, the more of the energy from the jet or pump is used to lift the fluid. The throughput volume of the tank decreases with height. Most problems with the vacuum tank degasser are because the tank lift is too high or the jet discharge is not strong enough (Box 9.4).

9.9.3 Pump Degassers or Atmospheric Degassers

The size and weight of the tank degasser lead to the development of smaller and lighter degassing units. There are several configurations, but the pump degassers are typically about 3½ feet in diameter at the top and 8 feet long. An impeller in the head pulls up the drilling fluid

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The size and weight of the tank degasser lead to the development of smaller and lighter degassing units. There are several configurations, but the pump degassers are typically about 3 1/2 feet in diameter at the top and 8 feet long. An impeller in the head pulls up the drilling fluid and discharges it against the inside of the degassing chamber. Degassing is accomplished by the reduction in pressure as the drilling fluid is pulled up to the impeller and then by the impact of the spray discharge.

9.9.4 Magna-Vac™ Degasser

The Burgess Magna-Vac (Burgess Manufacturing Ltd.) is the most sophisticated and complex design among drilling fluid degassers. It combines the more efficient vacuum removal of gas with the lighter weight and smaller size of the pump systems (Figure 9.7).

The drilling fluid is drawn up from the pits through a rotating pipe by a vacuum provided by the regenerative vacuum blower on the top of the unit. The drilling fluid enters the vacuum chamber of the unit through holes in the top of the rotating pipe, and at that point is further accelerated and sprayed outward against the walls of the vacuum chamber. The gas is pulled to the vacuum pump through a narrow gap at the upper

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Thanking you, Dave DeGrussa & Lynley Rattray

 Edson 2000 Rig

THE EDSON 2000 RIG

The rig is mounted on a Chamberlain tractor which is fitted with a bucket to assist clearing or negotiating thick bushland, while its weight gives it an advantage over lighter 4WD tray back vacuum/auger type rigs as it can drill through the hardpan to the interface with blade refusal similar to RAB drilling. It is capable of drilling down to 30 metre in most soil structures.

 Edson 2000 Rig Rear view

The principle of its operation is by suction, the samples are drawn from the tip of the blade, up through the drill stem eliminating contact with other soil structures already drilled. Each sample is dumped into a clear perspex flask allowing the sample to be viewed as it is drilled.

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Apparatus and method for geological drilling and coring

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Inventor(s) Chaffin, John D. (851 Haverford Ave., Pacific Palisades, CA 90272)



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Abstract

applying a vacuum to the drill stem or the annulus of a drilled hole, removing the drilled particles by entrainment in the flow of air created by the vacuum and collection of the drilled particles for visual or other analysis.

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Publication Date July 13, 1978

Application Number 05/555,784

Filing Date March 6, 1975

US Classification 175/60 175/72 175/206 175/212 175/213 175/217

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Examiner Abbott, Frank L.

Assistant Examiner Pate III, William F.

Attorney/Law Firm

Parent Case

This application is a division of application Ser. No. 323,852, filed Jan. 15, 1973, now U.S. Pat. No. 3,887,020, which is a continuation-in-part of application Ser. No. 132,091, now abandoned, filed Apr. 7, 1971.

USPTO Field of Search

175/60 175/206 175/207 175/212 175/213 175/217 175/218 175/171

References

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Market Size

Estimate the gross annual revenues of the relevant market sector:

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Market Share

Estimate the percentage of the relevant market sector this invention will capture:

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50% - 74.99%

25% - 49.99%

10 - 24.99%

5 - 9.99%

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 50% - 74.99%
 25% - 49.99%
 10 - 24.99%
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 1 - 4.99%
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Competitive Advantage

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Technical Review

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Having thus described my invention, I claim:

1. A method of **drilling** in wet, dry, or caving formations with near 100% geologic sample recovery in dry formation and taking core samples in wet formation comprising the steps of:

- A. forming a continuous bore hole in the earth by **drilling** with a hollow stem rotary drill;
- B. removing the drilled material from the bore hole in dry formation by entraining the **drilling** material in a current of air rising in the drill stem created by a **vacuum** applied to the top of the drill stem;
- C. ~~allowing the drilled material from the drill stem to pass a separator for collecting a core sample;~~
- D. separating the drilled material from the air;
- E. collecting the drilled material;
- F. and, when wet formation or the depth limit of the **vacuum** is reached, the steps of disconnecting the **vacuum** from the drill stem;
- G. connecting a **drilling** fluid pump to the hollow drill stem;
- H. pumping **drilling** fluid down the hollow drill stem and removing the drilled material from the bore hole by entraining said material in the **drilling** fluid as it rises in the annulus formed between the hollow drill stem and the earth formation;
- I. and suspended therein in the bore hole the step of taking core samples and raising same to the surface.

2. The method of claim 1 including the further step of pushing a casing down between the earth formation and the drill stem after the wet formation is passed, or sealing off the wet formation with chemical.

3. A method according to claim 2 with the additional steps of disconnecting the **drilling** fluid pump from the drill stem and removing all fluid by **vacuum** and connecting the **vacuum** thereto and removing the drilled material as in steps B through F.

4. A method according to claim 1 and when **drilling** and removing the drilled material by steps B through F, the additional step of forcing air down the annulus to assist the **vacuum** in raising the drilled material up through the drill stem.

Description

FIELD OF THE INVENTION

The field of the invention is the **drilling** and coring of geological structures and obtaining continuous and rapid delivery of strata material as it is being drilled.

Drilling apparatus and methods involving creating an airflow through the drill stem in a drilled hole for withdrawing the drilled particles upward from the bottom of the hole are known. For example, see U.S. Pat. No. 3,291,229, issued Dec. 13, 1966. However, collection of the sampled material, using the known systems, has been very costly and time-consuming with a relatively low degree of accuracy in obtaining a sample which is readily indicative of the subterranean formations. Furthermore, there is no known apparatus or method for switching from the dry method to other methods of **drilling** in a matter of seconds. Ordinarily, this operation would require lengthy delays while very complex machinery

OBJECTS OF THE INVENTION

It is a general object of the present invention to provide a new and novel machine a method for removing strata material from any geological surface and collecting it in an accurate, fast and easy manner without interrupting the **drilling** process.

It is another object to obtain 100% recovery of the sample material

It is another object to obtain 100% recovery of the sample material.

It is yet another object of this invention to provide a more rapid visual correlation between the sample taken and the depth at which the sample was extracted.

Still another object of this invention is a machine having a manifold means which allows switching from dry drilling when water or other unsatisfactory conditions are encountered, and switching back to dry drilling when the conditions have been overcome.

Another object of this invention is an apparatus and method which permits continuous drilling even through "thief" formations or old tunnels.

Other objects and advantages will become apparent from the following description and drawings.

FIG. 1 is a schematic side elevation view of a preferred drilling apparatus according to the invention;

FIG. 2 is a functional schematic of the apparatus showing the relationships of the components;

FIG. 3 is a sectional view, on an enlarged scale, of the final dry collector unit showing also a portion of the truck bed on which it is carried;

FIG. 4 is a top plan view, on a reduced scale, of the collector unit, parts being broken away for purposes of illustration;

FIG. 5 is a schematic view showing an arrangement at the top of the hole for utilization in applying a reverse vacuum or supplying air to the annulus;

FIG. 6 is a perspective view showing a stand for and a collector bag; and

FIG. 7 is a partly sectional view of a preferred drilling bit and connector assembly.

The method of drilling and recovery of geological material by the reverse air vacuum system reduces the amount of time and work required in taking geologic samples because a vacuum system, which results in air velocities upward through the drill stem of 5,000 to 15,000 fpm, is more efficient in lifting the particulate material to the surface than the old high pressure air or water methods. As a result, larger particles can be lifted with attendant reduction in costs associated with drilling to the smaller particle size required by high pressure systems. Also, high pressure systems are more dangerous to persons working around them, while the reverse air vacuum is positively dust free. Lastly, the reverse air weight, and more easily transported into areas which were previously too costly to explore.

Drilling with the reverse air vacuum system provides a high velocity air stream to suck the cuttings of the roller bit or drag bits for their cutting edge and thereby the hole is kept cleaner and the drill can be kept on a solid bottom at all times. Also, when fissures, cracks or tunnels are encountered down the hole, it is impossible to lose circulation. The drill bit can drop through tunnels or open space and keep on drilling. When water in excess of that which can be atomized and drawn out using the vacuum system is encountered, it

drilling. If too much water is encountered, the vacuum attachments are pulled out of the hole, casing is set and a diamond drill bit with standard wire line coring barrel is used until such water-bearing formation is passed and then a casing or fast-setting chemical or casing is placed in the hole to block off the formation that is causing trouble and the vacuum attachments are lowered down the hole, all mud and water sucked out of the hole, and drilling on the reverse air vacuum is resumed.

The apparatus of this invention is a result of 17 years of field research. I have examined every known core drilling machine, and have concluded that apparatus made and operated in accordance with the instant invention is cheaper to operate, per foot of drilled hole, more efficient, faster, safer, more accurate, and does not contribute in any way to

exploration and development of mining areas, the present invention will be a boon to mankind. Many areas in arid and dry climates such as Arizona, Nevada, desert and mountainous country, and most of Australia, require transporting water for hundreds of miles before conventional hard rock core drilling can be accomplished. With the reverse air vacuum system, hard rock drilling can be accomplished with staggering economic savings. Another adaptation of the present method and apparatus is in drilling in the permafrost on the north slope of Alaska to provide holes for the H-beams that support the pipe sections. The drilling of permafrost with any other method requires saline mud, air which melts the ice, or chemicals that coat the walls of the drill hole, keeping other material such as melting permafrost or cement from adhering to the wall of the hole;

melting the drilled cuttings to form a "soup" and pouring them back into the hole around the conductor pipe or H-beams, it will adhere and become solid permafrost.

In high velocity reverse air vacuum drilling according to the instant invention, there is near 100% visual sample recovery of all drilled ore bodies with the sample being deposited in clear polyethylene bags or clear plastic tubes, without any loss or contamination of samples as in other systems. It is more accurate than convention air, mud or diamond drilling, less expensive, dust free, faster and much less expensive. The system is so efficient that it is impossible to lose circulation, under the most adverse conditions, in dry formations. Approximately 100 percent of the cuttings is recovered, even in broken, open fissure or cavernous conditions.

Vacuum drilling in the preferred method and apparatus of the present invention is accomplished by reverse circulation of high velocity air on the vacuum suction side. Clear, uncontaminated air is pulled down the annulus between the drill string and the wall of the hole. The air then travels upward at 10,000 fpm or higher, up the inside of the flush I.D. drill string, carrying chips, dust, and all pertinent elements to a separation and collection system wherein the material is automatically accumulated at the cyclonic separators in, for example, polyethylene bags, where a replication of the uncontaminated mineral stratification in granular form can be examined immediately and accurately.

This invention is a method of drilling in which the reverse air flow of free uncontaminated, above-the-ground-temperature air down the annulus, This keeps the bit 50 to 75% cooler than any other method of air drilling.

Longer operational life of the bit is accomplished by the reverse air flow of free uncontaminated, above-the-ground-temperature air down the annulus. This keeps the bit 50 to 75% cooler than any other method of air drilling.

as the sample comes into the plastic tubes at the cyclonic separators. This process provides, therefore, a continuous visual log of the drilled hole, eliminating the necessity to stop drilling operations for core sampling. If a core sample is desired, in dry formation, a vacuum wire line core barrel is lowered to take such a core.

The apparatus of this invention, with the combination of wire line diamond drill attachment with water or vacuum, driven by a top head drive from 9-1100 rpm, makes it possible to drill to 5,000 feet and beyond. The apparatus has the capacity of regular standard wire line diamond core drilling with water or air assist, or vacuum in dry formations, down-the-hole, and a method of reverse circulation vacuum core drilling in which the reverse air flow of free uncontaminated, above-the-ground-temperature air down the annulus, This keeps the bit 50 to 75% cooler than any other method of air drilling.

Referring to the drawings, the apparatus shown in FIG. 1 includes a truck 10 carrying at the rear a portable drilling tower 11. The tower 11 can be of conventional construction; in the embodiment shown it includes a hydraulic jack 12 which can be operated to fold the tower on the truck for movement to a new location.

The tower supports a hollow drill stem 13, at the lower end of which is a drill bit 14. This bit in the preferred embodiment differs from the conventional tri-cone bit in the provision of an additional heavy skirting between the rollers as shown at 14a in FIG. 7 to assist in the production of a high velocity air stream and the ready pickup of drilled particles adjacent

through which the upper end of the stem extends. The upper end of the stem includes at its upper end a surge chamber 16 to momentarily remove the air velocity to which is connected to hose line 17 which is utilized during reverse vacuum drilling to apply a vacuum to the drill stem.

The source of vacuum for the system is a positive displacement type suction pump or blower means 18 which is mounted on the bed of the truck 10 and which discharges through a muffler 18a. The suction side of the blower is connected with an air cleaning system including an oil-bath air filter 19, an air washer unit 20, a final dry collector unit 21 and cyclonic separators 22, 23. The manner in which these various components are associated with one another will be subsequently described. All of these units or components are conveniently mounted on the truck bed, and, as will be seen, they cooperate with one another to bring about the desired collection of the drill cuttings and the return to the atmosphere of clean, uncontaminated air.

In the general operation of the system, with the valves set as in FIG. 2, and as has earlier been briefly alluded to, the suction pump or blower means 18 operates to apply the continuous vacuum to the hose line 17 connected with the top of the drill stem. The entrained particles leaving the drill stem are carried first through a valve 24 (See FIG. 2), then to a manifold 25 to one or the other of the cyclone separator sets. The paths to the cyclone separators are under the control of the valves 26, 27 which are linked by links such as 28

These valves are of quick snap acting ball type so that they rapidly and practically instantaneously close and open and provide a flow path equal in area to the flow area of the pipes or conduits; such valves as such for other uses are known to those skilled in the art, and the details of their construction play no part in my invention.

As will be subsequently explained in somewhat greater detail, the cyclonic separators serve as the point of initial collection of drill cuttings. After leaving the cyclone separator sections, the air stream (relieved of the major and most fine particles) is delivered to the final dry collector section 21, where the very fine particles are captured and can be collected. The stream then moves on into the air washer and oil-bath air filter sections 20, 19 respectively and thence to and out the discharge of the blower.

The air washer comprises a casing 20a having an input conduit 43 at one end and an exhaust conduit 32 at the opposite end. A water pump 31 is connected with a source of water (not shown) and delivers it under high pressure to a series of spray atomizing nozzles 33 adjacent the input end. A series of transverse baffles in the form of excelsior packs 20b are spaced along the casing. These act to collect any moistened dust carried on past the final dry collector section. The casing 20a is provided with a removable cover or wall so that the packs 20b can be removed and washed, and the residue collected for analysis.

is shown in a metal wire holder or stand 35, the open mouth of the bag being secured to a ring on the holder by an internal tapered wedge ring 36 with a bottom plate 37 providing a standard. These bags can be slipped up inside a hollow plastic tube 22a, 23a located at the lower or discharge end of the cyclone separators, an air tight sliding bottom support plate or trapdoor being used to hold the bags in place within the tubes during collection. However, in many cases collection may be made in the tubes without the use of the bags.

The structure of the final air collector 21 is generally shown in FIGS. 3 and 4. Basically it comprises an outer housing 28 which is sub-divided into an upper bag compartment 39 and a lower hopper section 40 by a horizontal partition 41. The partition 41 is provided with a row of openings 42 having rounded upper projections 43 which form the bag chamber. Vacuum is imposed to the bag compartment 39 through the line 43.

Within the bag chamber are mounted two rows of finely woven fabric bags 44. The closed upper ends of these bags are suspended from a rod 45, which is mounted for rapid longitudinal oscillation under the influence of oscillating motor 46, which may be an electric motor. The lower, open, ends of the bags are sleeved over and secured to the flanges at the partition openings. As will be evident, air is drawn through the bags from the chamber below and any particles carried by the air will be intercepted by and deposited on the

The airstream from the cyclone separators enters the hopper section 40 through the line 47, which comes from the second or smaller of the cyclone separators. As can be seen particularly from FIG. 4, the line 47 runs along the side of the collector and venturi nozzles 47a communicate with openings in the line so that the air, as it enters the chamber, is given added velocity to distribute it more uniformly across the chamber.

The hopper has a sloping hopper bottom which preferably is of highly polished interior construction, or alternatively, coated with Teflon, stainless steel or similar material.

discharge 49 of the hopper. A ball valve 50 controls discharge. In addition, a bleeder valve 51 is located below valve 50 so that when the latter is closed, the vacuum can be relieved in the space below the valve. The space below the valve is occupied by another collector tube 52 which can be fitted in any desired way to the discharge and can be removed therefrom once the valve is closed.

The particles cut in the hole and drawn up through the hollow drill stem 13 range in size from microns to one-half inch and above. Drilling with 10,000 to 30,000 pounds of coarse material, traveling in the center of the plastic tube at such velocities that it is almost impossible to detect any separation; an ordinary flour sifter can be utilized to determine the percentages of powder, the size of the cuttings and the condition of the cutters on the bit by sifting a portion of a "grab" sample from one of the large cyclones.

The velocity of air passing up through the drill stem ranges from 5,000 to 15,000 fpm, and the internal diameter of the drill stem may be from less than 1 inch to more than 10 inches. Particles collected at the cyclone separators and dropped into the collector tubes reflect very closely the actual stratification within the hole, since the material is delivered within seconds to the tubes in the same order that it has been cut. We have found that changes in depth are reflected by the changing color.

In a typical example, a 1 1/2 inch drill stem was used with similar diameter hose, and the large cyclones were approximately 6 inches in diameter. This provides a sufficient drop in velocity so that the cuttings will spin out and drop into the collector tubes.

In vacuum drilling in any kind of rock, the drill bit 14 preferably is such that the normal openings between the three legs of the tri-cone are closed up or skirted down as close to the center or below center in order to build up the velocity of the free air entering between the teeth and under the skirt. This is in order to assist in picking up the cuttings as they are cut. The rollers 15 are of a diameter which is the same as the inside diameter of the drill pipe. The drill bit according to the preferred embodiment is shown in FIG. 7. The body of the bit is the same size as the connector 53, known in the drilling art as a double female drill sub. The bit has what is known in the drilling art as a threaded pin 14a, as does the drill pipe which has a pin at the lower end. This arrangement insures a high velocity air stream on the vacuum side which moves the particulate drilled material at over 5,000 fpm, depending on the inside diameter of the drill stem. This velocity is maintained up to delivery to the cyclone separators. By utilizing high velocity, and particularly, increasing the velocity in the vicinity of the bit, the drill bit is kept cooler than in high pressure forced air systems or even water. As a result, it is possible to use three cone vacuum roller drill bits or drag bits at much greater depths and for longer periods.

provided so that in conventional wet drilling, the rollers will be kept clean of dirt, rock or mud. On the reverse air vacuum, these same passages are used to keep dust out of the bearings, keeping them free to roll and not freeze up. This, in combination with washing the oil out of the bearings before the bit goes into the hole, makes the vacuum bit re-usable as high as seven times before the bearings go out, with a result in economy to the driller and his client.

The jack means 12 of FIG. 1 may be used to position the drill tower at any conventional angle to drill angled holes. In fact, using high velocity air on the vacuum side, the problems of conventional means are employed to automatically control the weight of the drill bit on the drilled material to insure optimum cutting. Since the removal of strata material at the cyclone collector tubes is virtually instantaneous, the operator can vary the weight of the drill bit more rapidly to avoid temporary heat buildup.

When drilling through "thief" formations or loose fissure material, using the high velocity vacuum system, there is no loss of circulation. In conventional high pressure air drilling, the huge volume of air required to pressurize the hole "bleeds" the cuttings off into the thief formation, the drill chips are not removed from the drill bit with consequent damage to the drill bit and loss of hole-making capacity, sometimes resulting in stuck drill stem or drill pipe. In the reverse air vacuum system as thus far described, the annulus is not

In operation, the apparatus of the present invention permits drilling and recovery of sample material using high velocity air on the vacuum side down to 5,000 feet or beyond. If water is reached having a flow of less than 8 gallons per minute, the high vacuum system will continue to remove the drilled material and merely requires the additional step of

water is reached having a flow of less than 5 gallons per minute, the high vacuum system will continue to remove the drilled material and merely requires the additional step of removing the water from the drilled material.

As water is encountered while drilling, the reverse air vacuum system will continue to remove the drilled material up to a capacity of the high velocity air of from 2 to 8 gallons per minute, depending on the inside diameter of the drill pipe. 1 inch, 2 gallons per minute, 1 1/2 inch, 4 gallons per minute, 2 inch, 5 1/2 gallons per minute, 2 1/2 inch, 6 gallons per minute; the valves 24, 24a, 54 and 54a are operated to disconnect the vacuum drilling system and switch to other types of drilling procedures which may utilize drilling fluid supplied through line 55 and pump 56. The vacuum system blower can in fact be kept running if desired, drawing outside air through the system through the line 24b at valve 24a, which is just ahead of the blower 18. It is quite important that valves 24 and 24a be operated simultaneously, by direct linking, common control, or otherwise.

A standard wire line coring apparatus (not shown) can be employed after casing has been set to keep the diamond drill pipe from flopping around. After passing through the given period of time, the pressure is released, if the hole holds pressure, then casing can be removed after all water and mud has been vacuumed out of the hole and the diamond drilling apparatus has been removed and the system can be switched back to the reverse air vacuum system through use of valves 54, 58, 24 and 24a.

As earlier mentioned, the drill cuttings can be collected in plastic bags at the cyclone separators 22, 23 and in plastic bags or tubes at the final dry collector 21. The cuttings are deposited essentially in stratified form, reflecting the strata which has been drilled through. The bags, which are removed from the cyclonic separators when filled, can be laid out on a flat surface to dry, or the cuttings can be placed in a container for analysis. It is possible to correlate the depth from which the sample is taken with the sampled material.

FIG. 5 shows an arrangement wherein the reverse air vacuum system can be employed with a down-the-hole hammer drill bit (not shown). A drill stem seal 57 seals off the annulus of the drilled hole and provides an air tight rotary seal with drill stem 13. Using a down-the-hole hammer, which is well known in the art and forms no part of the present invention, air is forced down the drill stem to operate the cylinder of the hammer. This is effected (refer to FIG. 2) by closing valve 24 and opening valves 54 and 58. The cuttings, chips and particles are removed from the hole by high velocity air caused by applying the vacuum system of FIG. 2 through opening valve 60, which provides a path to a line 59, which connects with the annulus (FIG. 5). When valve 60 is opened, valve 24a should be shifted to reconnect the suction side of the blower with the system. As in the previous

It will be apparent that by using the arrangement of FIG. 5, vacuum drilling fluid or compressed air can selectively be applied to either the annulus or stem, and by the same token, using either the FIG. 1 arrangement or FIG. 5 arrangement, drilling mud or compressed air can be supplied to the drill string with vacuum or no vacuum on the drill string. Thus drilling fluid can be used in the conventional manner of drilling, pumping it down through the stem and up through the annulus by closing valve 24, and opening valves 54 and 54a. Valve 61 would remain closed, as would valve 60. A switch can be made from drilling fluid to compressed air by reclosing valve 54 and opening valve 58. Compressed air can be supplied to the annulus in the FIG. 5 arrangement by a vacuum system through the stem, by opening valves 24 and 24a, and valves 54 and 54a remaining closed.

Detecting means may be employed within or in the vicinity of the collection of the cuttings to detect various changes occurring within the drilled strata. For instance, galvanometer means may be positioned such that the particulate matter passing thereover would indicate the presence of water. This is of distinct advantage because the high velocity air vacuum drilling could be interrupted by manipulation of the valves heretofore described, and the diamond drill attachments brought into drilling position for drilling the wet strata. Also, from a geochemical standpoint, it is important to know whether or not the Ph of certain of the strata is basic or alkaline and ordinary testing methods may be employed on a continuous basis for this purpose.

stem 13. With the sealing arrangement, air from blower 18 (or from a separate source) can be applied to the annulus in order to assist the vacuum in lifting the material through the drill stem. Also, and as earlier described, it is possible to pull a vacuum on the annulus and remove the cuttings from the bore hole by vacuum with air assist and entrain material up the annulus and out the annulus through the seal to the separator means. While not shown in the drawings, it is envisioned that additional pipes or casing may be placed in the hole to provide for controlled cross sectional area during pulling of vacuum on the annulus.

The recovered material in the plastic tubes may be split by a "Jones" splitter to give the geologist smaller samples for analysis. Also, it is possible to take "grab" samples by quickly changing back and forth from the one set of the cyclonic separators to the other set. The bleeder valves 30 operate to relieve the vacuum in the respective cyclonic separators when the valves 25, 27 are closed, thus permitting access to the collection tubes 22a, 23a.

From the foregoing, it will be seen that this invention is one well adapted to attain all of the ends and objects hereinabove set forth together with other advantages which are obvious and which are inherent to the structure.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations.

As many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

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Title Vacuum drilling of unsaturated tufts at a potential radioactive-waste repository, Yucca Mountain, Nevada

Creator/Author Whitfield, H.S.

Publication Date 1985 Dec 31

OSTI Identifier OSTI ID: 59846 ; DE86008852

Report Number(s) CONF-8511172-4

DOE Contract Number AI08-76ET44802

Resource Type Conference

EXHIBIT I

Trademark/Service Mark Amendment to Allege Use (15 U.S.C. Section 1051(c))

The table below presents the data as entered.

Input Field	Entered
SERIAL NUMBER	77069596
LAW OFFICE ASSIGNED	LAW OFFICE 108
NOTICE OF ALLOWANCE	NO
EXTENSION OF USE	NO
REQUEST TO DIVIDE	NO
MARK SECTION	
STANDARD CHARACTERS	YES
USPTO-GENERATED IMAGE	YES
LITERAL ELEMENT	VAC TECH
OWNER SECTION (no change)	
ATTORNEY SECTION (current)	
NAME	William P. Ramey, III
FIRM NAME	Winstead PC
CITY	P.O.
STATE	Box
POSTAL CODE	50784
COUNTRY	United States
PHONE	281-681-5960
FAX	214-745-5390
ATTORNEY DOCKET NUMBER	46463-K003US
ATTORNEY SECTION (proposed)	
NAME	William P. Ramey, III
FIRM NAME	Winstead PC

STREET	P.O. Box 50784
CITY	Dallas
STATE	Texas
POSTAL CODE	75201
COUNTRY	United States
PHONE	281-681-5960
FAX	214-745-5390
ATTORNEY DOCKET NUMBER	46463-K003US
GOODS AND/OR SERVICES SECTION	
INTERNATIONAL CLASS	007
CURRENT IDENTIFICATION	Drilling machines; Drilling machines and parts therefor
GOODS OR SERVICES	KEEP ALL LISTED
FIRST USE ANYWHERE DATE	05/31/2008
FIRST USE IN COMMERCE DATE	05/31/2008
SPECIMEN FILE NAME(S)	\\TICRS\EXPORT4\IMAGEOUT4\770\695\77069596.xml1\AA U0002.JPG
SPECIMEN DESCRIPTION	hang tag with the mark printed clearly thereon
PAYMENT SECTION	
NUMBER OF CLASSES	1
SUBTOTAL AMOUNT	100
TOTAL AMOUNT	100
SIGNATURE SECTION	
SIGNATURE	/WPR/
SIGNATORY'S NAME	William P. Ramey
SIGNATORY'S POSITION	Attorney of record
DATE SIGNED	11/17/2008
FILING INFORMATION	
SUBMIT DATE	Mon Nov 17 18:43:06 EST 2008
TEAS STAMP	USPTO/AAU-38.96.192.188-2 0081117184306590172-77069 596-400ba22ed7c4c967f4ae4 3021f5ee46d5a8-DA-4282-20

081117183828946461

**Trademark/Service Mark Amendment to Allege Use
(15 U.S.C. Section 1051(c))**

To the Commissioner for Trademarks:

VAC TECH

VAC TECH

Request for Reconsideration after Final Action

The table below presents the data as entered.

Input Field	Entered
SERIAL NUMBER	77069596
LAW OFFICE ASSIGNED	LAW OFFICE 108
MARK SECTION (no change)	
ADDITIONAL STATEMENTS SECTION	
SUPPLEMENTAL REGISTER	The applicant seeks registration of the mark on the Supplemental Register (i.e., a change of the words 'Principal Register' to 'Supplemental Register'). NOTE: The applicant has separately filed an Allegation of Use, to change the basis of this application from Section 1(b), intent-to-use, to Section 1(a), use in commerce.
SIGNATURE SECTION	
RESPONSE SIGNATURE	/WPR/
SIGNATORY'S NAME	William P. Ramey, III
SIGNATORY'S POSITION	Attorney of record
DATE SIGNED	11/17/2008
AUTHORIZED SIGNATORY	YES
CONCURRENT APPEAL NOTICE FILED	NO
FILING INFORMATION SECTION	
SUBMIT DATE	Mon Nov 17 18:46:18 EST 2008
TEAS STAMP	USPTO/RFR-38.96.192.188-2 0081117184618610286-77069 596-430417c9045ae5529f4d7 c22b23f28db72-N/A-N/A-200 81117183752220917

Request for Reconsideration after Final Action To the Commissioner for Trademarks:

Application serial no. **77069596** has been amended as follows:

ADDITIONAL STATEMENTS

Supplemental Register

The applicant seeks registration of the mark on the Supplemental Register (i.e., a change of the words 'Principal Register' to 'Supplemental Register'). NOTE: The applicant has separately filed an Allegation of Use, to change the basis of this application from Section 1(b), intent-to-use, to Section 1(a), use in commerce.

SIGNATURE(S)

Request for Reconsideration Signature

Signature: /WPR/ Date: 11/17/2008

Signatory's Name: William P. Ramey, III

Signatory's Position: Attorney of record

The signatory has confirmed that he/she is an attorney who is a member in good standing of the bar of the highest court of a U.S. state, which includes the District of Columbia, Puerto Rico, and other federal territories and possessions; and he/she is currently the applicant's attorney or an associate thereof; and to the best of his/her knowledge, if prior to his/her appointment another U.S. attorney or a Canadian attorney/agent not currently associated with his/her company/firm previously represented the applicant in this matter: (1) the applicant has filed or is concurrently filing a signed revocation of or substitute power of attorney with the USPTO; (2) the USPTO has granted the request of the prior representative to withdraw; (3) the applicant has filed a power of attorney appointing him/her in this matter; or (4) the applicant's appointed U.S. attorney or Canadian attorney/agent has filed a power of attorney appointing him/her as an associate attorney in this matter.

The applicant is not filing a Notice of Appeal in conjunction with this Request for Reconsideration.

Serial Number: 77069596

Internet Transmission Date: Mon Nov 17 18:46:18 EST 2008

TEAS Stamp: USPTO/RFR-38.96.192.188-2008111718461861

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Side - 1

NOTICE OF ABANDONMENT
MAILING DATE: Nov 19, 2008

The trademark application identified below was abandoned because the applicant's response failed to meet the relevant statutory and/or regulatory requirements.

SERIAL NUMBER: 77069596
MARK: VAC TECH
OWNER: Wellbore Energy Solutions, LLC

Side - 2

UNITED STATES PATENT AND TRADEMARK OFFICE
COMMISSIONER FOR TRADEMARKS
P.O. BOX 1451
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William P. Ramey, III
Winstead PC
P.O. Box 50784
Dallas , TX 75201

UNITED STATES PATENT AND TRADEMARK OFFICE

SERIAL NO: 77/069596

MARK: VAC TECH

77069596

CORRESPONDENT ADDRESS:

William P. Ramey, III
Winstead PC
P.O. Box 50784
Dallas TX 75201

GENERAL TRADEMARK INFORMATION:
<http://www.uspto.gov/main/trademarks.htm>

APPLICANT: Wellbore Energy Solutions,
LLC

CORRESPONDENT'S REFERENCE/DOCKET

NO:

46463-K003US

CORRESPONDENT E-MAIL ADDRESS:

ABANDONED – INCOMPLETE RESPONSE TO FINAL ACTION

ISSUE/MAILING DATE:

This Office has declared the application abandoned for failure to file a complete response to the Office action. 15 U.S.C. §1062(b); 37 C.F.R. §2.65(a). *See* TMEP §§718.03 and 718.03(a). Applicant's letter filed on November 17, 2008, is an incomplete response to the Office action issued/mailed on May 15, 2008 because the specimen is refused as detailed below.

Specimen Unacceptable

The originally submitted specimen is unacceptable because it appears to be temporary in nature. Specifically, the specimen is identified as a hang tag for drilling machines and parts therefore. The specimen appears as a photocopied piece of paper that appears to have the words "VAC TEC" applied using a label maker or similar printing device. The specimen does not appear to be a valid use of the mark in commerce.

Because the specimen does not support use, the mark may not be amended to the Supplemental Register. Trademark Act Section 23, 15 U.S.C. §1091; 37 C.F.R. §§2.47 and 2.75(a); TMEP §§801.02(b), 815 and 816 *et seq.*

For the above reasons, the applicant's response does not overcome the final refusal to register the mark as being merely descriptive of the goods. *See* 15 U.S.C. §1052(e)(1); 37 C.F.R. §2.64(a).

PLEASE NOTE: When a trademark examining attorney holds an application abandoned for failure to file a complete response, applicant may *not* file a petition to revive under 37 C.F.R. §2.66, based on unintentional delay. TMEP §§715.03(a) and 1714.01(f)(ii). However, applicant may file a petition to the Director under 37 C.F.R. §2.146 to request a reversal of the holding of abandonment. The Director will reverse the holding only if there is clear error or abuse of discretion. TMEP §1713. For information on filing a petition to the Director, see TMEP §1705 available at the USPTO website at www.uspto.gov/main/trademarks.htm

If the applicant files a petition to the Director, the petition should be sent to the following address:

**Commissioner for Trademarks
P.O. Box 1451
Alexandria, VA 22313-1451**

/AndreaRHack/
Andrea R. Hack
Trademark Examining Attorney
Law Office 108
Ph: 571.272.5413
Fax: 571.273.5413
email: Andrea.Hack@uspto.go

STATUS CHECK: Check the status of the application at least once every six months from the initial filing date using the USPTO Trademark Applications and Registrations Retrieval (TARR) online system at <http://tarr.uspto.gov>. When conducting an online status check, print and maintain a copy of the complete TARR screen. If the status of your application has not changed for more than six months, please contact the assigned examining attorney.

Trademark/Service Mark Amendment to Allege Use (15 U.S.C. Section 1051(c))

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Input Field	Entered
SERIAL NUMBER	77069596
LAW OFFICE ASSIGNED	LAW OFFICE 108
EXTENSION OF USE	NO
MARK SECTION	
STANDARD CHARACTERS	YES
USPTO-GENERATED IMAGE	YES
LITERAL ELEMENT	VAC TECH
OWNER SECTION (current)	
NAME	Wellbore Energy Solutions, LLC
STREET	P.O. Box 51325 Lafayette, LA 70505 6127 Hwy. 90 E
CITY	Broussard
STATE	Louisiana
ZIP/POSTAL CODE	70518
COUNTRY	United States
PHONE	337-288-8294
FAX	337-993-7970
OWNER SECTION (proposed)	
NAME	Wellbore Energy Solutions, LLC
STREET	P.O. Box 51325 Lafayette, LA 70505 6127 Hwy. 90 E

CITY	Broussard
STATE	Louisiana
ZIP/POSTAL CODE	70518
COUNTRY	United States
PHONE	337-288-8294
FAX	337-993-7970
EMAIL	wramey@winstead.com
GOODS AND/OR SERVICES SECTION	
INTERNATIONAL CLASS	007
CURRENT IDENTIFICATION	Drilling machines; Drilling machines and parts therefor
GOODS OR SERVICES	KEEP ALL LISTED
FIRST USE ANYWHERE DATE	05/31/2008
FIRST USE IN COMMERCE DATE	05/31/2008
SPECIMEN FILE NAME(S)	
ORIGINAL PDF FILE	<u>SPN0-3811421271-091535219 . VACTECH Brochure.pdf</u>
CONVERTED PDF FILE(S) (1 page)	<u>\\TICRS\EXPORT6\IMAGEOUT6\770\695\77069596\xml1\AAU0002.JPG</u>
SPECIMEN DESCRIPTION	Brochure/Advertising materials
REQUEST TO DIVIDE	NO
PAYMENT SECTION	
NUMBER OF CLASSES IN USE	1
SUBTOTAL AMOUNT [ALLEGATION OF USE FEE]	100
TOTAL AMOUNT	100
SIGNATURE SECTION	

DECLARATION SIGNATURE	/William P. Ramey, III/
SIGNATORY'S NAME	William P. Ramey, III
SIGNATORY'S POSITION	Attorney
DATE SIGNED	04/01/2009
FILING INFORMATION	
SUBMIT DATE	Wed Apr 01 09:24:06 EDT 2009
TEAS STAMP	USPTO/AAU-38.114.212.71-2 0090401092406960158-77069 596-440e1fec4e2f1c46dccc2 69f4af5b59cbe2-DA-5960-20 090401091535219132

**Trademark/Service Mark Amendment to Allege Use
(15 U.S.C. Section 1051(c))**

To the Commissioner for Trademarks:

9 5/8" Vac Tech™ Specifications

FM 027 Rev. 00 02/01/09



Model Number: CWVAC 101

Operating Specifications:

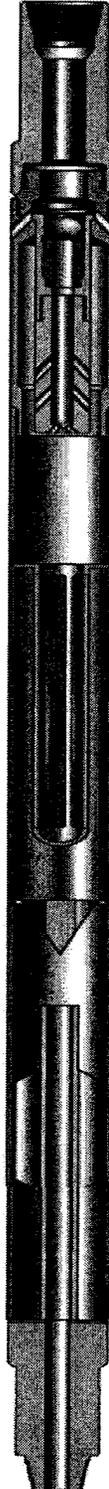
- **Tool in Tension w/ Rotation:**
*Recommended <90 RPM's
- **Tool in Compression w/ Rotation:**
*Recommended 25 klps down / 60 RPM
- **Trip in Hole (TIH) Speed:**
*Requires surge modeling
- **Pull Out of Hole (POOH) Speed:**
*Requires swab modeling

Tool Qualifications:

- **All Tools Built In Accordance With:**
*API Specification 5CT PSL-2
*API Specification RP 7G

Tool Weight:

*2,620 lbs (1,188 Kg)



Casing ID (in)	8.755 – 8.535
Casing drift (in)	8.599 – 8.379
Max body OD (in)	7.875
Seat ID (in)	1.436
Activation ball OD (in)	1.500
Shear pressure (psi)	1,700 psi
Number of exit jet nozzles	6
Exit Jet nozzle size (in)	0.850
Internal circulating ports (in)	0.375
Number of internal circulating ports	15
Fishing neck OD (in)	6.125
Capacity of each chamber (cu.ft.)	3.63
Standard chamber length (ft)	18.67
Chamber type	7 5/8", 39#
TFA thru tool before activation (sq.in.)	1.62
TFA thru jet nozzles (sq.in.)	3.40
TFA thru return ports (sq.in.)	3.72
Knock-out screen gap width (in) <i>(standard – other options available)</i>	0.125
TFA thru Knock-out screen (sq.in.)	216
Knock-out screen length (in)	48
Knock-out screen material	17-4 Stainless Steel
Velocity Tube ID (in)	2.469
Vortex port size in the velocity tube (in)	0.1875
Number of ports per chamber section	16
Vortex port phasing (degrees)	45
Burst pressure (psi) (V-Thd Box)	6,815
Collapse pressure (psi) (V-Thd Box)	6,603
Fishing neck length (in)	12
Tool Connection Specifications	
P-110 Casing (TPI Class 3)	V Thread (N-3)
Operating torque (ft-lbs)	25,000
Max make-up torque (ft-lbs)	30,000
Torsional yield (ft-lbs) (V-Thd Pin)	82,668
Tensile strength (lbs) (V-Thd Box)	481,917
Rig Connection Specifications	
Connection type	4 1/2" IF
Torsional yield strength (ft-lbs)	51,700
Make-up torque (ft-lbs)	27,000
*Tensile strength (lbs)	1,278,000

Velocity Guideline:

	2 BPM	3 BPM	4 BPM	5 BPM
Velocity Tube	337	506	675	844
Chamber	48	72	96	120

9 5/8" Vac Tech™ Specifications

FM 027 Rev. 00 02/01/09



Model Number: CWVAC 101

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 - *Recommended <90 RPM's
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 - *Recommended 25 kips down / 60 RPM
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 - *Requires surge modeling
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Trademark/Service Mark Amendment to Allege Use (15 U.S.C. Section 1051(c))

The table below presents the data as entered.

Input Field	Entered
SERIAL NUMBER	77069596
LAW OFFICE ASSIGNED	LAW OFFICE 108
EXTENSION OF USE	NO
MARK SECTION	
STANDARD CHARACTERS	YES
USPTO-GENERATED IMAGE	YES
LITERAL ELEMENT	VAC TECH
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NAME	Wellbore Energy Solutions, LLC
STREET	P.O. Box 51325 Lafayette, LA 70505 6127 Hwy. 90 E
CITY	Broussard
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ZIP/POSTAL CODE	70518
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CONVERTED PDF FILE(S) (1 page)	<u>\\TICRS\EXPORT6\IMAGEOUT6\770\695\77069596\xml1\AAU0002.JPG</u>
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REQUEST TO DIVIDE	NO
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NUMBER OF CLASSES IN USE	1
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SIGNATURE SECTION	

DECLARATION SIGNATURE	/William P. Ramey, III/
SIGNATORY'S NAME	William P. Ramey, III
SIGNATORY'S POSITION	Attorney
DATE SIGNED	04/01/2009
FILING INFORMATION	
SUBMIT DATE	Wed Apr 01 09:24:06 EDT 2009
TEAS STAMP	USPTO/AAU-38.114.212.71-2 0090401092406960158-77069 596-440e1fec4e2f1c46dccc2 69f4af5b59cbe2-DA-5960-20 090401091535219132

**Trademark/Service Mark Amendment to Allege Use
(15 U.S.C. Section 1051(c))**

To the Commissioner for Trademarks:

9 5/8" Vac Tech™ Specifications

FM 027 Rev. 00 02/01/09



Model Number: CWVAC 101

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- Tool In Tension w/ Rotation:
 - *Recommended <90 RPM's
- Tool In Compression w/ Rotation:
 - *Recommended 25 kips down / 60 RPM
- Trip In Hole (TIH) Speed:
 - *Requires surge modeling
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Tool Qualifications:

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*2,620 lbs (1,188 Kg)



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Tensile strength (lbs) (V-Thd Box)	481,917
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Connection type	4 1/2" IF
Torsional yield strength (ft-lbs)	51,700
Make-up torque (ft-lbs)	27,000
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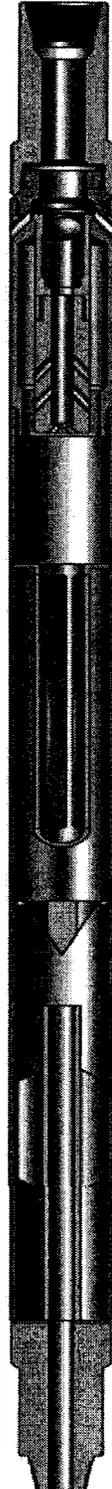
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Make-up torque (ft-lbs)	27,000
*Tensile strength (lbs)	1,278,000

UNITED STATES PATENT AND TRADEMARK OFFICE

SERIAL NO: 77/069596

MARK: VAC TECH

77069596

CORRESPONDENT ADDRESS:

William P. Ramey, III
Winstead PC
P.O. Box 50784
Dallas TX 75201

RESPOND TO THIS ACTION:

<http://www.uspto.gov/teas/eTEASpageD.htm>

GENERAL TRADEMARK INFORMATION:

<http://www.uspto.gov/main/trademarks.htm>

APPLICANT: Wellbore Energy Solutions,
LLC

**CORRESPONDENT'S REFERENCE/DOCKET
NO:**

46463-K003US

CORRESPONDENT E-MAIL ADDRESS:

OFFICE ACTION

TO AVOID ABANDONMENT, THE OFFICE MUST RECEIVE A PROPER RESPONSE TO THIS OFFICE ACTION WITHIN 6 MONTHS OF THE ISSUE/MAILING DATE.

ISSUE/MAILING DATE:

This Office action supersedes the abandonment notice dated November 19, 2008, which was in error. Upon further examination, the application should not have been abandoned; rather, an Office action requiring an acceptable specimen showing use of the mark in commerce with the listed goods should have issued. The examining attorney regrets the error and any inconvenience.

A requirement to provide a valid specimen is now issued.

Specimens Unacceptable

April 1, 2009 Specimen

The specimen submitted on April 1, 2009 is not acceptable because it consists of advertising material for goods. Section 45 of the Trademark Act requires use "on the goods or their containers or the displays associated therewith or on tags or labels affixed thereto." 15 U.S.C. §1127; see 37 C.F.R. §2.56(b)(1); TMEP §904.04(b)-(c). Applicant lists the specimen as "brochure/advertising material" which appears to be an acknowledgement that the specimen consists of advertising.

Material that functions merely to tell prospective purchasers about the goods, or to promote the sale of the goods, is unacceptable to show trademark use. Indeed, invoices, business cards, announcements, price lists, listings in trade directories, order forms, bills of lading, leaflets, brochures, advertising circulars and other printed advertising material, while normally acceptable for showing use in connection with services, generally are not acceptable specimens for showing trademark use in connection with goods. *See In re MediaShare Corp.*, 43 USPQ2d 1304, 1307 (TTAB 1997); *In re Schiapparelli Searle*, 26 USPQ2d 1520, 1522 (TTAB 1993); TMEP §§904.0(b)-(c).

An amendment to allege use must include a specimen showing the applied-for mark in use in commerce for each class of goods specified in the amendment to allege use. Trademark Act Sections 1 and 45, 15 U.S.C. §§1051, 1127; 37 C.F.R. §§2.56, 2.76(b)(2); TMEP §§904, 904.07(a), 1104.09(e).

Therefore, applicant must submit the following:

- (1) A substitute specimen showing the mark in use in commerce for each class of goods specified in the amendment to allege use; and
- (2) The following statement, verified with an affidavit or signed declaration under 37 C.F.R. §2.20: “**The substitute specimen was in use in commerce prior to the filing of the amendment to allege use.**” 37 C.F.R. §2.59(b)(1);TMEP §904.05. If submitting a specimen requires an amendment to the dates of use, applicant must also verify the amended dates. 37 C.F.R. §2.71(c).

Examples of specimens for goods are tags, labels, instruction manuals, containers, photographs that show the mark on the goods or packaging, or displays associated with the goods at their point of sale. TMEP §§904.03 *et seq.*

November 17, 2008 Specimen

The specimen submitted on November 17, 2008 is unacceptable because it appears to be temporary in nature. Specifically, the specimen is identified as a hang tag for drilling machines and parts therefor. The specimen appears as a photocopied piece of paper that appears to have the words “VAC TEC” applied using a label maker or similar printing device. The specimen does not appear to be a valid use of the mark in commerce.

Specimen Requirement

Therefore, applicant must submit the following:

- (2) A substitute specimen showing the mark in use in commerce for each class of goods specified in the amendment to allege use; and
- (3) The following statement, verified with an affidavit or signed declaration under 37 C.F.R. §2.20: “**The substitute specimen was in use in commerce prior to the filing of the amendment to allege use.**” 37 C.F.R. §2.59(b)(1);TMEP §904.05. If submitting a specimen requires an amendment to the dates of use, applicant must also verify the amended dates. 37 C.F.R. §2.71(c).

Examples of specimens for goods are tags, labels, instruction manuals, containers, photographs that show the mark on the goods or packaging, or displays associated with the goods at their point of sale. TMEP

§§904.03 *et seq.*

Applicant may not withdraw the amendment to allege use as the application is for the Supplemental Register. 37 C.F.R. §§2.47(d), 2.75(b); TMEP §§815.02, 1102.03.

Pending a proper response, registration is refused because the specimen does not show the applied-for mark in use in commerce as a trademark. 15 U.S.C. §§1051, 1127; 37 C.F.R. §§2.56, 2.76; TMEP §§904, 904.07(a), 1104.09(e).

Response Guidelines

Applicant should include the following information on all correspondence with the Office: (1) the name and law office number of the trademark examining attorney, (2) the serial number and filing date of the application, (3) the mailing date of this Office action, (4) applicant's name, address, telephone number and e-mail address (if applicable), and (5) the mark. 37 C.F.R. §2.194(b)(1); TMEP §302.03(a).

Applicant should also set forth a current business address in its response. 37 C.F.R. §2.32(a)(4); TMEP §803.05.

If applicant has questions about its application or needs assistance in responding to this Office action, please telephone the assigned trademark examining attorney. The examining attorney may be able to resolve issues in the Office action through an examiner's amendment. Therefore, to expedite handling of this application, the applicant is encouraged to telephone or email the examining attorney.

Should the applicant opt for a written response, to expedite prosecution of this application, applicant is encouraged to file its response to this Office action online via the Trademark Electronic Application System (TEAS), which is available at <http://www.uspto.gov/teas/index.html>.

TEAS PLUS APPLICANTS MUST SUBMIT DOCUMENTS ELECTRONICALLY OR SUBMIT FEE: TEAS Plus applicants should submit the following documents using the Trademark Electronic Application System (TEAS) at <http://www.uspto.gov/teas/index.html>: (1) written responses to Office actions; (2) preliminary amendments; (3) changes of correspondence address; (4) changes of owner's address; (5) appointments and revocations of attorney; (6) amendments to allege use; (7) statements of use; (8) requests for extension of time to file a statement of use, and (9) requests to delete a §1(b) basis. If any of these documents are filed on paper, they must be accompanied by a \$50 per class fee. 37 C.F.R. §§2.6(a)(1)(iv) and 2.23(a)(i). Telephone responses will not incur an additional fee. NOTE: In addition to the above, applicant must also continue to accept correspondence from the Office via e-mail throughout the examination process in order to avoid the additional fee. 37 C.F.R. §2.23(a)(2).

/AndreaRHack/
Andrea R. Hack
Trademark Examining Attorney
Law Office 108
Ph: 571.272.5413

Fax: 571.273.5413
email: Andrea.Hack@uspto.go

RESPOND TO THIS ACTION: Applicant should file a response to this Office action online using the form at <http://www.uspto.gov/teas/eTEASpageD.htm>, waiting 48-72 hours if applicant received notification of the Office action via e-mail. For *technical* assistance with the form, please e-mail TEAS@uspto.gov. For questions about the Office action itself, please contact the assigned examining attorney. **Do not respond to this Office action by e-mail; the USPTO does not accept e-mailed responses.**

If responding by paper mail, please include the following information: the application serial number, the mark, the filing date and the name, title/position, telephone number and e-mail address of the person signing the response. Please use the following address: Commissioner for Trademarks, P.O. Box 1451, Alexandria, VA 22313-1451.

STATUS CHECK: Check the status of the application at least once every six months from the initial filing date using the USPTO Trademark Applications and Registrations Retrieval (TARR) online system at <http://tarr.uspto.gov>. When conducting an online status check, print and maintain a copy of the complete TARR screen. If the status of your application has not changed for more than six months, please contact the assigned examining attorney.

Response to Office Action

The table below presents the data as entered.

Input Field	Entered
SERIAL NUMBER	77069596
LAW OFFICE ASSIGNED	LAW OFFICE 108
MARK SECTION (no change)	
ARGUMENT(S)	
<p>In response to the rejection of the specimen of use submitted April 1, 2009, Applicant respectfully asserts that the characterization of the specimen in the Allegation of Use as "brochure/advertising" was a misnomer on Applicant's part. Rather, Applicant respectfully submits that the specimen functions as a point of sale display closely associated with the goods in the course of trade and in the customary method of presenting the goods to prospective customers. Applicant would also respectfully point out that the nature of the goods is such that applying or affixing the mark directly onto the product itself by marking or stamping is not feasible or desirable because the product is used in down hole oil drilling operations. Because the product is a highly engineered tool that operates within well casing to precise specifications of dimension, tolerance, and performance, any markings on the tool are to be avoided.</p> <p>For these reasons, Applicant asserts that the specimen document is suitable to show trademark use because it serves to identify the source of the goods at the point of sale in the ordinary course of trade that is customary for goods of this type in the relevant marketplace and industry. Accordingly, Applicant respectfully requests that the rejection of the specimen be withdrawn and that the application proceed to registration.</p> <p>In the alternative, Applicant requests to amend the application back to the Principal Register and to withdraw the Allegation of Use pursuant to 37 CFR §2.76(h). Under 37 CFR §2.76(h), Applicant may withdraw the Allegation of Use for any reason prior to publication. In this case, the subject application has not been published.</p>	
ADDITIONAL STATEMENTS SECTION	
MISCELLANEOUS STATEMENT	Please delete the amendment to the Supplemental Register and please withdraw the allegation of use.
SIGNATURE SECTION	
RESPONSE SIGNATURE	/William P. Ramey, III/
SIGNATORY'S NAME	William P. Ramey, III
SIGNATORY'S POSITION	Attorney of record, Texas bar member
DATE SIGNED	11/13/2009

AUTHORIZED SIGNATORY	YES
FILING INFORMATION SECTION	
SUBMIT DATE	Fri Nov 13 14:55:14 EST 2009
TEAS STAMP	USPTO/ROA-97.65.237.198-2 0091113145514113843-77069 596-4609295616877e2cbe577 471b5bf5e5a37-N/A-N/A-200 91113134639797644

PTO Form 1957 (Rev 9/2005)
OMB No. 0651-0050 (Exp. 04/30/2011)

Response to Office Action To the Commissioner for Trademarks:

Application serial no. **77069596** has been amended as follows:

ARGUMENT(S)

In response to the substantive refusal(s), please note the following:

In response to the rejection of the specimen of use submitted April 1, 2009, Applicant respectfully asserts that the characterization of the specimen in the Allegation of Use as "brochure/advertising" was a misnomer on Applicant's part. Rather, Applicant respectfully submits that the specimen functions as a point of sale display closely associated with the goods in the course of trade and in the customary method of presenting the goods to prospective customers. Applicant would also respectfully point out that the nature of the goods is such that applying or affixing the mark directly onto the product itself by marking or stamping is not feasible or desirable because the product is used in down hole oil drilling operations. Because the product is a highly engineered tool that operates within well casing to precise specifications of dimension, tolerance, and performance, any markings on the tool are to be avoided.

For these reasons, Applicant asserts that the specimen document is suitable to show trademark use because it serves to identify the source of the goods at the point of sale in the ordinary course of trade that is customary for goods of this type in the relevant marketplace and industry. Accordingly, Applicant respectfully requests that the rejection of the specimen be withdrawn and that the application proceed to registration.

In the alternative, Applicant requests to amend the application back to the Principal Register and to withdraw the Allegation of Use pursuant to 37 CFR §2.76(h). Under 37 CFR §2.76(h), Applicant may withdraw the Allegation of Use for any reason prior to publication. In this case, the subject application has not been published.

ADDITIONAL STATEMENTS

Please delete the amendment to the Supplemental Register and please withdraw the allegation of use.

SIGNATURE(S)**Response Signature**

Signature: /William P. Ramey, III/ Date: 11/13/2009

Signatory's Name: William P. Ramey, III

Signatory's Position: Attorney of record, Texas bar member

The signatory has confirmed that he/she is an attorney who is a member in good standing of the bar of the highest court of a U.S. state, which includes the District of Columbia, Puerto Rico, and other federal territories and possessions; and he/she is currently the applicant's attorney or an associate thereof; and to the best of his/her knowledge, if prior to his/her appointment another U.S. attorney or a Canadian attorney/agent not currently associated with his/her company/firm previously represented the applicant in this matter: (1) the applicant has filed or is concurrently filing a signed revocation of or substitute power of attorney with the USPTO; (2) the USPTO has granted the request of the prior representative to withdraw; (3) the applicant has filed a power of attorney appointing him/her in this matter; or (4) the applicant's appointed U.S. attorney or Canadian attorney/agent has filed a power of attorney appointing him/her as an associate attorney in this matter.

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