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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/010,615	07/24/2009	5474142	026664-000500US	8642

21897 7590 12/14/2009

THE MATTHEWS FIRM
2000 BERING DRIVE
SUITE 700
HOUSTON, TX 77057

EXAMINER

ART UNIT	PAPER NUMBER
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DATE MAILED: 12/14/2009

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



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EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. 90/010,615.

PATENT NO. 5,474,142.

ART UNIT 3993.

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

Office Action in Ex Parte Reexamination	Control No. 90/010,615	Patent Under Reexamination 5,474,142	
	Examiner PETER C. ENGLISH	Art Unit 3993	

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

- a ☐ Responsive to the communication(s) filed on _____. b ☐ This action is made FINAL.
c ☒ A statement under 37 CFR 1.530 has not been received from the patent owner.

A shortened statutory period for response to this action is set to expire 1 month(s) from the mailing date of this letter. Failure to respond within the period for response will result in termination of the proceeding and issuance of an *ex parte* reexamination certificate in accordance with this action. 37 CFR 1.550(d). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).** If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- | | |
|--|---|
| 1. <input type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 3. <input type="checkbox"/> Interview Summary, PTO-474. |
| 2. <input type="checkbox"/> Information Disclosure Statement, PTO/SB/08. | 4. <input type="checkbox"/> _____. |

Part II SUMMARY OF ACTION

- 1a. ☒ Claims 1-8 and 11-15 are subject to reexamination.
1b. ☒ Claims 9 and 10 are not subject to reexamination.
2. ☐ Claims _____ have been canceled in the present reexamination proceeding.
3. ☒ Claims 2-4 and 6-8 are patentable and/or confirmed.
4. ☒ Claims 1,5 and 11-15 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ The drawings, filed on _____ are acceptable.
7. ☐ The proposed drawing correction, filed on _____ has been (7a) ☐ approved (7b) ☐ disapproved.
8. ☐ Acknowledgment is made of the priority claim under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some* c) ☐ None of the certified copies have
 1 ☐ been received.
 2 ☐ not been received.
 3 ☐ been filed in Application No. _____.
 4 ☐ been filed in reexamination Control No. _____.
 5 ☐ been received by the International Bureau in PCT application No. _____.
 * See the attached detailed Office action for a list of the certified copies not received.
9. ☐ Since the proceeding appears to be in condition for issuance of an *ex parte* reexamination certificate except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte* Quayle, 1935 C.D. 11, 453 O.G. 213.
10. ☐ Other: _____

cc: Requester (if third party requester)

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by LeCompte et al. (US 1,891,329).

LeCompte discloses a brake actuation mechanism co-acting with a telescopic drill stem section and actuated by the back pressure of a mud laden (i.e., drilling) fluid for automatically retarding the lowering of additional drill stem into the hole and, if necessary, stopping further lowering of drill stem (p. 1, lines 49-58).

The first element of claim 1: a drilling fluid pressure sensor

LeCompte includes a drilling fluid pressure sensor, disclosing that a "reference character T designates the mud fluid pressure gauge which gives the reading of pressure that the mud laden fluid is being pumped into mud pipe M and through the drill stem line..." (p. 3, lines 8-13, and Figure 1). In combination with the back pressure generated from the movements of the length compensator U, and in co-action with the pressure of the drilling fluid pumped through mud pipe M, LeCompte teaches that a mud laden fluid carrying pipe 82, which is a branch from the mud laden fluid conducting pipe M, is also connected with the valve case 80, and the valve case 80 is provided with a suitable slidable valve 84 which allows the valve to open only sufficiently against a suitable spring 85 to permit steam to pass through valve groove 86 to set the brake (p. 5, lines 51-61). Therefore, the slidable valve 84, as it interacts with the spring 85, senses the back pressure caused by the interaction of the length compensator U and the mud pumped through mud pipe M and mud laden fluid carrying pipe 82.

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The second element of claim 1: a drilling fluid pressure regulator measuring changes in drilling fluid pressure and outputting a signal representing those changes

As explained above, as the pressure changes, LeCompte's slidable valve 84 presses and releases against spring 85 (p. 5, lines 51-61). The slidable valve 84 contains a valve groove 86, that allows steam to pass through in varying amounts, depending on the pressure detected (p. 5, lines 51-61). The steam is generated by steam boiler O, is output through steam pipe P, and passes through valve groove 86 in varying amounts depending on the back pressure of the drilling fluid as detected by slidable valve 84 in interaction with spring 85 (p. 5, lines 43-63). Thus, the steam, output from the boiler O and transferred by the pipe P, is utilized by the slidable valve 84 as a signal to communicate a particular change in pressure at that point in time, which signal thus represents the change in drilling fluid pressure at that particular point in time. Thus, LeCompte discloses measuring a pressure change and outputting a signal representing that change.

The third element of claim 1: a relay responsive to the output signal of said drilling fluid pressure regulator to supply a drill string control signal at an output thereof

In LeCompte, as steam exits through the valve groove 86, it is relayed to the braking system, entering cylinder 67, which then acts against piston 70 (p. 5, line 14 to p. 6, line 15). The output signal of a particular amount of steam through valve groove 86 is relayed to the brake (the drill string controller) and moves cylinder 67 and piston 70 in varying amounts. Thus, LeCompte includes a relay system which sends the modified steam signal, based on changes in drilling fluid pressure, to the braking system.

The fourth element of claim 1: a drill string controller coupled to the relay such that the controller reduces the rate of drill string release when drilling fluid pressure increases, and increases the rate of drill string release when drilling fluid pressure decreases

LeCompte discloses "a brake *setting and releasing* mechanism" (p. 3, lines 24-26, emphasis added). LeCompte explains that the hydraulic brake actuating mechanism is also operated by the telescopic movements of the length compensator U connected into the drill stem (p. 4, lines 123-127). The braking system is capable of increasing or decreasing the rate of

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release of the drill string in direct response to the amount of braking force employed. As LeCompte explains, and as shown in detail in Figure 15, the cable drum brake actuating mechanism embodies a brake setting lever 60, which can be manually actuated through the handle 61, when so desired, instead of being automatically actuated hydraulically. The brake lever 60 is connected with the free end of a brake band 64 riding over the cable drum D by means of a connecting link 65. By this arrangement, the brake band can be brought into braking contact with the cable drum D when so desired *with any degree of frictional contact* when manually operating the brake lever by manipulating the handle thereof for leading off cable from the cable drum, *at any desired speed* for lowering upper drill stem section in to the well hole bored by the drilling bit (p. 4, line 128 to p. 5, line 23, emphasis added).

As to automatically setting or releasing the brake (decreasing or increasing the rate of release) in response to changes in drilling fluid pressure, LeCompte teaches that the means for automatically actuating the brake lever comprises a steam cylinder 67 pivotally supported as at 68, the steam chamber 69 of the cylinder being provided with piston 70 connected to the lower end of a piston rod 71, which leads upwardly through the upper end of the cylinder, the upper end of the piston being pivotally connected to an arm 73 which arm is pivotally connected to a coupling 75, suitably clamped to the brake lever 60 (p. 5, lines 24-35). LeCompte explains that, when the mud pump pressure is normal for safe drilling, the mud pressure against one end of the slidable valve 84 allows the valve to open *only sufficiently* against a suitable spring 85 to permit steam to pass through valve groove 86 to set the brake with such tension as to allow the cable drum to revolve at a speed to lower upper drill stem section at a predetermined speed, and, if for any reason the mud laden fluid pressure increases from normal, due to the collapsible telescopic action of the drill stem length compensator U, the valve will be opened sufficiently to admit more steam into the steam cylinder for quickly raising the piston therein to move the brake lever 60 to quickly set the brake against the cable drum to prevent further lowering of the upper drill stem section into the well hole (p. 5, line 51 to p. 6, line 74, emphasis added). LeCompte then explains that the sliding valve action is automatic as to both the mud laden fluid pressure and the steam, thus *the setting of the brake is automatic relative to the amount of back pressure developed* in the upper drill stem section by the telescopic action of the length compensator U (p. 5, lines 75-81, emphasis added).

LeCompte then teaches the concept of increasing or decreasing the rate of release (setting or releasing of the brake) of the drill string as follows: When the compensator device U is fully extended, the normal working pressure of the mud laden fluid is present and the steam and mud fluid valve will be in such position as to admit such amount of steam into the cylinder 67 as to set the brake to permit the cable drum to revolve at such speed as to lower the upper drill stem section into the hole at a predetermined speed (p. 5, lines 82-96). However, when the length compensator U has collapsed to a point sufficiently to set up a back pressure to the pump, the slidable valve 84 will be *slightly moved by the increased pressure of the mud laden fluid*, allowing more steam to enter the cylinder 67 having the bleeder valve 87, *to further set the brake and slow up feeding of upper drill stem into the hole* (p. 5, lines 97-112, emphasis added). In the event of an additional and more substantial pressure increase, LeCompte discloses the ability to fully engage the brake, further decreasing the rate of release of the drill string to the point where the drill stem is no longer released. In such a circumstance, the sliding valve 84 will have been fully opened and the pressure entering the cylinder 67 and acting against the piston 70 will cause the brake band to be fully set against the cable drum, preventing the further lowering of the upper drill stem section (p. 5, line 115 to p. 6, line 6).

Notably, LeCompte's system does not simply go into shut-down, but maintains the requisite braking force *until at such time as the back pressure is reduced, which simultaneously causes the sliding valve to slightly close, admitting less steam* to the cylinder and *causing a slight let up on the braking action* (p. 6, lines 6-16, emphasis added). In the event that the drilling fluid pressure decreases even more, sliding valve 84 will be further closed to allow normal lowering of the upper drill stem section (p. 6, lines 16-30). This setting and releasing of the brake handle increases or decreases the rate of release of the drill string in response to corresponding decreases or increases in drilling fluid pressure as detected by the interaction of the sliding valve 84, spring 85, and valve groove 86, with the steam relayed through cylinder 67 to cause piston 70 to move brake lever 60 to increase or decrease the frictional braking force placed on brake drum D.

Thus, LeCompte discloses a controller that reduces the rate of drill string release when drilling fluid pressure increases, and that increases the rate of drill string release when drilling fluid pressure decreases. While LeCompte is ultimately intended to control the weight on the

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drill bit (p. 2, lines 92-95), LeCompte measures the weight using a telescopic device that reflects the bit weight in the pressure of the drilling fluid. LeCompte, therefore, performs its regulation based on drilling fluid pressure. The fact that the drilling fluid pressure in LeCompte is a proxy for bit weight is irrelevant. Further it is noted that all four parameters involved in the '142 Patent are interrelated means and proxies used to determine the pressure of the bit against the formation.

Claim 11

Claim 11 is a method claim that parallels apparatus claim 1. LeCompte discloses each and every step in the method of claim 11 as explained in detail above.

Claim Rejections - 35 USC § 103

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

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 5 and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bowden '359 (US 3,265,359) in view of Dillon et al. (US 2,005,889) and Hobhouse (US 3,550,697).

Bowden '359 discloses an automatic well drilling control system (column 1, lines 11-12). The system is controlled "to release a supply of drilling line 136 which, in turn, lowers the top end of the drill pipe string..." (column 9, lines 31-32). Bowden '359 discloses a regulator-relay combination that operates identically to that of the claimed invention, in the context of drill line tension (i.e., bit weight) control. A pressure signal proportional to the amount of tension in the drill line (and therefore proportional to the bit weight) is produced by a drill line tension sensor 16 (Figs. 1a and 4; column 3, lines 44-75). The pressure signal is delivered to a Bourdon tube 24a (acting as a pressure regulator), which actuates a flapper 6a (acting as a relay) such that the position of the flapper 6a corresponds to the pressure measured by the sensor 16 (column 2, lines

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46-50; column 4, lines 1-13). The flapper 6a in turn controls the rate at which air is released from a nozzle 5 (acting together with flapper 6a as a relay), thereby controlling the position of a spring-biased diaphragm valve 8 (acting as a drill string controller) in correspondence to the pressure measured by the sensor 16 (column 2, lines 43-67; column 4, lines 10-17). The variable position valve 8 controls the supply of fluid to a fluid motor 14 in proportion to the pressure measured by the sensor 16 (column 3, lines 26-40; column 4, lines 10-20), which in turn controls the position of a brake lever 25c (column 5, lines 4-29; Fig. 6). As a result, the rate of release of the drill string is automatically controlled in proportion to the pressure measured by the sensor 16, i.e., an undesirable increase in drill line tension (which corresponds to an undesirable decrease in bit weight) results in an increase in the rate of release/payout of the drill line (column 5, lines 27-50).

It is noted that, although Bowden '359 does not explicitly state that it controls the "rate" of release of the drill string, the mechanism for actuating the drill string release in Bowden '359 is identical to that shown in the '142 Patent, and therefore would be identical in effect—namely regulating the "rate" of release of the drill string.

Bowden '359 lacks a drilling fluid pressure sensor supplying the pressure signal for controlling the drill string payout. Both Dillon and Hobhouse disclose automatic well drilling control systems including drilling fluid pressure sensors. In Dillon, the payout of the drill line is controlled as a function of drill line tension (i.e., bit weight), drilling motor load, drilling motor speed, and drilling fluid pressure (p. 1, left column, line 54 to right column, line 5). In Dillon, elements 104-107 constitute a drilling fluid pressure sensor providing inputs to a balancing controller 65 that controls the payout of the drill line (Fig. 1a, p. 4, left column, lines 14-32). In the embodiment of Fig. 8 of Hobhouse, elements 103-109 constitute a drilling fluid pressure sensor providing inputs to a controller 111 that controls the drill string payout and the bit weight (column 8, lines 15-51). Hobhouse also suggests the claimed relationship between drilling fluid pressure and drill string release, describing stopping the sinkage of the drill string in response to an increase in drilling fluid pressure, and increasing the sinkage of the drill string in response to a decrease in drilling fluid pressure (column 8, lines 38-49).

From these teachings of Dillon and Hobhouse, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bowden '359 by providing

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a drilling fluid pressure sensor supplying a pressure signal to a/the Bourdon tube for controlling the drill string payout because this enables the variable of drilling fluid pressure to be taken into account in controlling the rate of release of the drill string. This provides for a greater degree of control, while preventing excess drilling fluid pressure from causing damage to the drill string and/or the drilling equipment. One of ordinary skill in the art would know that excess drilling fluid pressure is undesirable and, therefore, would apply the fluid pressure sensor taught by Dillon and Hobhouse to the system of Bowden '359 in order to bring about a decrease in the rate of release of the drill string in response to an undesirable build up in drilling fluid pressure.

With respect to claims 12-15, as already noted above, Dillon teaches an automatic well drilling control system wherein the payout of the drill line is controlled as a function of drill line tension (i.e., bit weight), drilling motor load (i.e., torque), drilling motor speed (i.e., RPM), and drilling fluid pressure (p. 1, left column, line 54 to right column, line 5). From these teachings of Dillon, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bowden '359 by also controlling the rate of release of the drill string as a function of drill string load/torque and drilling motor speed/RPM, in addition to the control based on bit weight and drilling fluid pressure, in order to provide for an even greater degree of control. This insures that undesirable increases in drill string torque or drilling motor RPM will not cause damage to the drill string and/or the drilling equipment.

Patentable Claims

5. The following is an examiner's statement of reasons for patentability and/or confirmation of the claims found patentable in this reexamination proceeding:

Claim 2 is patentable because the cited prior art patents and printed publications fail to teach an automatic drilling system for automatically regulating the rate of release of a drill string based upon input from a drilling fluid pressure sensor, drilling fluid pressure regulator and drilling fluid pressure relay, as defined in independent claim 1, and also automatically regulating the rate of release of the drill string based upon input from a bit weight sensor, a bit weight regulator coupled to the bit weight sensor for measuring changes in bit weight and outputting an output signal representing those changes, and a bit weight relay coupled to the bit weight regulator and responsive to the output signal to supply a drill string control signal, the automatic

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regulation based on bit weight being effected by a controller coupled to the bit weight relay, wherein a decrease in bit weight causes the controller to effect an increase in the rate of release of the drill string and an increase in bit weight causes the controller to effect a decrease in the rate of release of the drill string.

Claim 3 is patentable because the cited prior art patents and printed publications fail to teach an automatic drilling system for automatically regulating the rate of release of a drill string based upon input from a drilling fluid pressure sensor, drilling fluid pressure regulator and drilling fluid pressure relay, as defined in independent claim 1, and also automatically regulating the rate of release of the drill string based upon input from a drill string torque sensor, a drill string torque regulator coupled to the drill string torque sensor for measuring changes in drill string torque and outputting an output signal representing those changes, and a drill string torque relay coupled to the drill string torque regulator and responsive to the output signal to supply a drill string control signal, the automatic regulation based on drill string torque being effected by a controller coupled to the drill string torque relay, wherein a decrease in drill string torque causes the controller to effect an increase in the rate of release of the drill string and an increase in drill string torque causes the controller to effect a decrease in the rate of release of the drill string.

Claim 4 is patentable because the cited prior art patents and printed publications fail to teach an automatic drilling system for automatically regulating the rate of release of a drill string based upon input from a drilling fluid pressure sensor, drilling fluid pressure regulator and drilling fluid pressure relay, as defined in independent claim 1, and also automatically regulating the rate of release of the drill string based upon input from a drill string RPM sensor, a drill string RPM regulator coupled to the drill string RPM sensor for measuring changes in drill string RPM and outputting an output signal representing those changes, and a drill string RPM relay coupled to the drill string RPM regulator and responsive to the output signal to supply a drill string control signal, the automatic regulation based on drill string RPM being effected by a controller coupled to the drill string RPM relay, wherein an increase in drill string RPM causes the controller to effect an increase in the rate of release of the drill string and a decrease in drill string RPM causes the controller to effect a decrease in the rate of release of the drill string.

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Claims 6, 7 and 8 are patentable because of their dependency from claims 2, 3 and 4, respectively.

Not All Claims Reexamined

6. This action is directed only to the claims for which reexamination was requested. With respect to such claims, requester has alleged that a substantial new question of patentability (SNQ) exists, and upon review, it has been determined that the alleged SNQ in fact is present for claims 1-8 and 11-15. No determination was made with respect to the existence or nonexistence of a SNQ with respect to claims 9 and 10 for which reexamination was not specifically requested.

Remarks

7. Litigation involving Patent No. 5,474,142 (*National Oilwell Varco LP v. Pason Systems USA*, US District-Colo, No. 1:03cv2579) has been stayed for the purposes of reexamination. Accordingly, a shortened statutory period of 1 month is set for response to Office actions in this proceeding. See MPEP 2263.

8. Extensions of time under 37 CFR 1.136(a) will not be permitted in these proceedings because the provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Additionally, 35 U.S.C. 305 requires that *ex parte* reexamination proceedings "will be conducted with special dispatch" (37 CFR 1.550(a)). Extensions of time in *ex parte* reexamination proceedings are provided for in 37 CFR 1.550(c).

9. In order to ensure full consideration of any amendments, affidavits or declarations, or other documents as evidence of patentability, such documents must be submitted in response to this Office action. Submissions after the next Office action, which is intended to be a final action, will be governed by the requirements of 37 CFR 1.116, which will be strictly enforced.

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10. Any proposed amendment filed in this reexamination proceeding must be made in accordance with 37 CFR 1.530(d)-(j) and comply with the formal requirements of 37 CFR 1.52(a) and (b). See MPEP 2250.

11. Responses to this Office action may be submitted by facsimile and should be directed to the Central Reexamination Unit using facsimile number 571-273-9900. A confirmation of receipt will be generated automatically for all papers transmitted via this facsimile number.

All responses to be delivered by the United States Postal Service (USPS) should be addressed as follows:

Mail Stop Ex Parte Reexam
Central Reexamination Unit
Commissioner for Patents
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Alexandria, VA 22313-1450

Hand-delivered responses should be labeled "Attn: Central Reexamination Unit" and delivered to:

Customer Service Window
Randolph Building, Lobby Level
401 Dulany Street
Alexandria, VA 22314

Submissions for reexamination proceedings may also be submitted through EFS-Web (the USPTO's web-based document submission system).

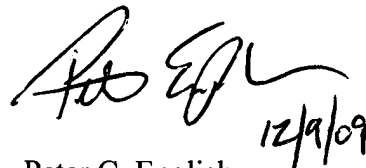
12. Any document filed by either the patent owner or third party requester ***must be served*** on the other party (or parties in a merged proceeding) in the reexamination proceeding in the manner provided by 37 CFR 1.248. See 37 CFR 1.550(f) and MPEP 2266.03.

13. The patent owner is reminded of the continuing responsibility under 37 CFR 1.565(a) to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving the patent throughout the course of this reexamination proceeding. The third party requester is also reminded of the ability to similarly apprise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.

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14. Any inquiry concerning this communication or earlier communications from the Reexamination Examiner should be directed to Peter English whose telephone number is 571-272-6671. The examiner can normally be reached on Monday through Thursday (7:00 AM - 5:00 PM). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andres Kashnikow, can be reached at 571-272-4361.

For general information regarding reexamination proceedings please call the Central Reexamination Unit at 571-272-7705. For guidance on reexamination practice and procedure please call the Office of Patent Legal Administration at 571-272-7703. Information regarding this reexamination proceeding may be obtained from the Patent Application Information Retrieval (PAIR) system. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.



Peter C. English
Primary Examiner
Central Reexamination Unit

Conferees: *MCG*
BXR

pe
9 December 2009