

**IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE**

Appl. No.	:	18/457,139	Confirmation No.	:	2112
Applicant	:	Clinton Moss	Applicant	:	Gunnar LLP
Filed	:	Aug. 28, 20231	Title	:	Method and Apparatus For Magnetic Ranging While Drilling
TC/A.U.	:	3676			
Examiner	:	STEPHENSON, Daniel P.			
Docket No.	:	1018-00008			
Customer No.	:	139716			

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

RESPONSE TO OFFICE ACTION OF MARCH 20, 2024

In response to the Office Action mailed on March 20, 2024 (“Office Action”), allowance of this application is respectfully requested in light of the remarks and claim amendments presented herein. This Response is electronically filed within three (3) months of the mailing date of the Office Action and therefore no extension is believed to be needed. The Commissioner is authorized to charge Deposit Account No. 601514 for any other fees required to make the filing of the Response timely.

The Claims are reflected in the listing of claims beginning on page 2.

Applicant’s Remarks/Arguments begin on page 6.

Amendments to the Claims:

1. An apparatus for magnetic ranging comprising:

a power supply;

at least one section of drill pipe configured to be operatively connected to the power supply;

at least one wire inside the at least one section of drill pipe that connects the power supply and the at least one section of drill pipe, wherein the connection between the wire and the drill pipe is a rigid connection that maintains ~~is capable of maintaining~~ its rigid connection as the at least one section of drill pipe is drilling;

a first electrically insulated member electrically connected with the at least one section of drill pipe and that is capable of causing electrical energy to exit a section of drill pipe;

and

a sensor for detecting a magnetic ranging signal.
2. The apparatus of claim 1 further comprising a second electrically insulated member located further downhole from the first electrically insulated member.
3. The apparatus of claim 1 wherein the sensor is part of the bottom hole assembly.
4. The apparatus of claim 1 wherein the sensor is part of the drill pipe.
5. The apparatus of claim 1 wherein the drill pipe is coiled tubing.
6. The apparatus of claim 1 wherein the drill pipe is a section of threaded drill pipe.

7. The apparatus of claim 1 wherein the power supply is connected to the drill pipe using at least one wire of a multiribbon wire.

8. The apparatus of claim 1 wherein the power supply is connected to the drill pipe using one or more conductors.

9. An apparatus for magnetic ranging comprising:
a power supply;
at least one section of drill pipe operatively connected to the power supply;
at least one wire inside the at least one section of drill pipe that connects the power supply and the at least one section of drill pipe, wherein the connection between the wire and the drill pipe is a rigid connection and is not spring loaded;
a first electrically insulated member electrically connected with the at least one section of drill pipe and that is capable of causing electrical energy to exit a section of drill pipe;
and
a sensor for detecting a magnetic ranging signal.

10. The apparatus of claim 9 further comprising a second electrically insulated member located further downhole from the first electrically insulated member.

11. The apparatus of claim 9 wherein the sensor is part of the bottom hole assembly.

12. The apparatus of claim 9 wherein the sensor is part of the drill pipe.

13. The apparatus of claim 9 wherein the drill pipe is coiled tubing.

14. The apparatus of claim 9 wherein the drill pipe is a section of threaded drill pipe.
15. The apparatus of claim 9 further comprising a second electrically insulated member located further downhole from the first electrically insulated member.
16. The apparatus of claim 9 wherein the power supply is connected to the drill pipe using at least one wire of a multiribbon wire.
17. The apparatus of claim 9 wherein the power supply is connected to the drill pipe using one or more conductors.
18. An apparatus for magnetic ranging comprising:
 - a power supply;
 - at least one section of drill pipe configured to be operatively connected to the power supply;
 - at least one wire inside the at least one section of drill pipe that connects the power supply and the at least one section of drill pipe, wherein the connection between the wire and the drill pipe maintains ~~is capable of maintaining~~ a continuous electrical connection while the at least one section of drill pipe is drilling;
 - a first electrically insulated member electrically connected with the at least one section of drill pipe and that is capable of causing electrical energy to exit a section of drill pipe;
 - and
 - a sensor for detecting a magnetic ranging signal.
19. A method of magnetic ranging comprising:

installing a sensor that senses a magnetic ranging signal in a wellbore;
installing a first electrically insulative gap sub in a wellbore;
installing at least one section of drill pipe in a wellbore that is connected to the electrically insulative gap sub;
connecting a power supply to at least one section of drill pipe using at least one wire that is located inside the at least one section of drill pipe, wherein the connection from the at least one wire to the at least one section of drill pipe is made at surface and is a rigid connection;
energizing the power supply to cause current to flow down the drill pipe and inject into a wellbore formation and travel to a target well to create a magnetic ranging signal;
sampling the magnetic ranging signal; and
adjusting the drilling operations to alter a characteristic of the drilling operations.

20. The method of claim 19 further comprising adjusting the drilling operations to alter a second characteristic of the drilling operations.

21. The method of claim 19 further comprising installing a second electrically insulative gap sub downhole from the first electrically insulative gap sub.

22. The method of claim 19 wherein the step of sampling the magnetic ranging signal occurs while drilling is taking place.

REMARKS

In responding to the Office Action, Applicant has presented only those arguments that Applicant believes are warranted. Applicant has not, for example, responded to every factual or legal issue raised by the Office, and Applicant has not presented every argument supporting patentability that may be relevant. The decision not to address a factual or legal issue raised or to present a certain argument in support, or to cancel certain claims shall not be construed as Applicant's agreement with the Office on such issue or effect a waiver of Applicant's right to address such issues or make such arguments in the future. In the Office Action, the Examiner allowed claims 9-17 and rejected claims 1-8 and 16-22. The Examiner's rejections are addressed below.

Claim Objections

In paragraph 2 of the Office Action, the Examiner has objected to claim 19 because of a spelling error. In the amended claims, applicant has corrected the spelling of "pipe" in claim 19, thereby addressing the Examiner's objection.

Double Patenting Rejection

In paragraphs 3 and 4 of the Office Action, the Examiner has issued a nonstatutory double patenting rejection of claims 19-22 over claims 10-13 of U.S. Patent No. 11, 781,421, which is the parent of the instant application. Applicant is submitting a terminal disclaimer in accordance with 37 CFR 1.321(c) and paying the appropriate fee. Reconsideration of the double patenting rejection of claims 19-22 in the Office Action is respectfully requested in light of the applicant's remarks and submitted terminal disclaimer.

Claim Rejections

In the Office Action, the Examiner has rejected claims 1-4 and 18 as being anticipated by U.S. Patent No. 9,759,060 to Kuckes. Of these claims, only claim 1 and 18 are independent. Applicant has amended claims 1 and 18 to recite that the connection between the wire and the drill pipe maintains a continuous electrical connection while the at least one section of drill pipe is drilling. This is not taught by Kuckes. In fact, Kuckes teaches the opposite of having a continuous electrical connection while the drill pipe is drilling. Any time that drilling is taking place in Kuckes, Kuckes teaches that the spring loaded contacts do not maintain a connection between the wire 90 and the pipe 57. Accordingly, claims 1 and 18 are not disclosed in Kuckes and Applicant respectfully request allowance of claims 1 and 18. Further, claims 2-4 and 6-8 depend from claim 1 and are also not disclosed by Kuckes, thus Applicant respectfully requests allowance of these claims.

In paragraph 8 of the Office Action, the Examiner has rejected pending claim 5 as being obvious over Kuckes. Pending claim 5 also depends from claim 1. In light of the amendment and arguments with respect to claim 1, Applicant also respectfully request allowance of claim 5.

Applicant has also amended claim 20, which depends from claim 19, to correct a clerical error when originally filed. Claim 20 now recites that a second characteristic of the drilling operation is adjusted, thereby further limiting claim 19's recitation that a characteristic of the drilling operation is adjusted.

In light of Applicant's response, Applicant respectfully requests allowance of all pending claims. Applicant thanks the Examiner for the consideration and effort on this file. If there are any questions or if additional information is needed, the Examiner is invited to telephone or email the undersigned.

Respectfully submitted,

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Response to Office Action of March 20, 2024

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