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APPLICANT: WORKMAN AND CHAMBERS
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DOCKET NO: WG-96-09
ART UNIT: 2201
EXAMINER: LOBO, I.

FOR: ADAPTIVE CONTROL OF MARINE SEISMIC STREAMERS

Box FEE AMENDMENT
Commissioner of Patents and Trademarks
Washington, D.C. 20231

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GROUP 2201
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Dear Sir:

Please enter the following amendment with respect to the patent application identified above. A petition for a one-month extension of time, to January 22, 1998, accompanies this amendment.

AMENDMENT

In response to the Office Action dated September 22, 1997, please amend the application as follows:

In the Claims:

Please make the following changes:

Delete claim 6.

Amend claims 1, 4, 5, 7 and 9 as follows.

Add claim 11 as follows

1. (Amended) A system for controlling the position and shape of marine seismic streamer cables, comprising the steps of:

receiving a plurality of real time signals, including hydrophone noise, from a marine seismic data acquisition system and a plurality of threshold parameters, including maximum allowable hydrophone noise, from an input device;

comparing the real time signals to the threshold parameters to determine if the streamer cables should be repositioned; and

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repositioning the streamer cables when the real time hydrophone noise signal is within the maximum allowable hydrophone noise threshold and when the remaining real time signals exceed the threshold parameters.

4. (Amended) The system of claim 3, wherein the receiving step further comprises the steps of:

receiving real time signals including streamer cable positions, streamer cable shapes, streamer cable separations, obstructive hazard positions, and subsurface seismic coverage; and

receiving threshold parameters including minimum allowable separations between streamer cables, minimum allowable separations between any streamer cable and an obstructive hazard, and minimum allowable subsurface seismic coverage;

*Q2
cont.*

and the sending step further comprises the steps of:

determining if the streamer cables are in an at risk situation; and

sending the position correction to the streamer device controller when the streamer cables are at risk.

5. (Amended) The system of claim 4, wherein the receiving step further comprises the step of:

receiving real time signals including recorded seismic data;
and the sending step further comprises the steps of:

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determining if the streamer cables are in use for recording seismic data; and

sending the position correction to the streamer device controller when the streamer cables are not in use for recording seismic data.

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67. (Amended) The system of claim [6], 1 wherein the threshold parameter of maximum allowable hydrophone noise is a single noise threshold which is applied across the entire frequency spectrum of the seismic survey.

A4
88. (Amended) The system of claim [6] 1, wherein the threshold parameter of maximum allowable hydrophone noise is a weighted noise threshold which varies and is applied as a function of the frequency spectrum of the seismic survey.

A5
Cont.
107. (Added) A system for controlling the position and shape of marine seismic streamer cables, comprising the steps of:

receiving a plurality of real time signals, including streamer cable positions, streamer cable shapes, streamer cable separations, obstructive hazard positions, subsurface seismic coverage, recorded seismic data and hydrophone noise, from a marine seismic data acquisition system;

receiving a plurality of threshold parameters, including minimum allowable separations between streamer cables, minimum allowable separations between any streamer cable and an obstructive hazard, minimum allowable subsurface seismic coverage and maximum allowable hydrophone noise, from an input device;

calculating a position correction that will keep the streamer cables within the threshold parameters;

determining if the streamer cables are in an at risk situation;

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conclude
sending the position correction to a streamer device controller for adjusting a plurality of streamer positioning devices when the streamer cables are in an at risk situation;

determining if the streamer cables are in use for recording seismic data;

sending the position correction to the streamer device controller when the streamer cables are not in use for recording seismic data;

determining if the real time signals of hydrophone noise are within the threshold parameters of maximum allowable hydrophone noise; and

sending the position correction to the streamer device controller when the real time hydrophone noise is within the maximum allowable hydrophone noise threshold.

REMARKS

This amendment is in response to the examiner's Office Action of September 22, 1997 in this patent application. Reconsideration and reexamination of this patent application is respectfully requested in view of the foregoing amendments and the following remarks.

In the Office Action, claims 1-10 were rejected under 35 U.S.C 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, the examiner stated that the specification is void of any description of the threshold parameters and how the streamer control processor compares real time signals with them.

Lines 10-15 on page 9 of the specification contain the following description of the threshold parameters:

"Threshold parameters may include a plurality of values for: minimum allowable separations between streamer cables 13, minimum allowable subsurface seismic coverage, maximum allowable hydrophone noise levels, and minimum allowable separations between any streamer cable 13 and any obstructive hazard."

Lines 14-23 on page 12 of the specification contain a further description of how maximum allowable noise thresholds are chosen.

Lines 12-20 on page 10 of the specification contain the following description of the comparison of the real time signals with the threshold parameters:

At step 41, the streamer control processor 40 determines if the streamer cables 13 need to be repositioned by comparing the real time signals received from the network solution system 10, the seismic binning system 30, and the seismic data recording system 18 with the threshold parameters received from the terminal 32. At step 42, it is determined if any of the real time signals exceed any threshold parameter received from the terminal 32.

Since the threshold parameters are allowable minimums or maximums, this passage is a sufficient description of comparing the corresponding real time signals to the threshold parameters by determining if the minimum or maximum is exceeded. Lines 25 on page 12 through line 6 on page 13 of the specification contain a

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