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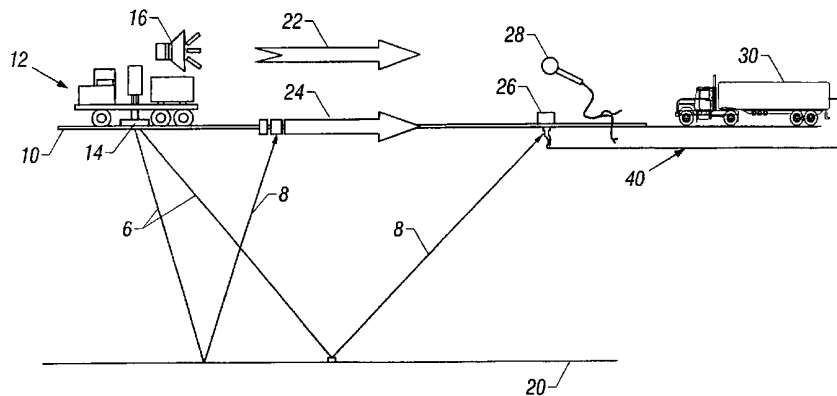
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(54) Title: DETERMINISTIC CANCELLATION OF AIR-COUPLED NOISE PRODUCED BY SURFACE SEISMIC SOURCES



(57) Abstract: A speaker system (16) is used in conjunction with a surface seismic source (12) that may be vibratory or impulsive. The speaker system produces a sound (22) signal that propagates primarily through the air. Microphones (28) are located near the seismic spread and arranged to be decoupled from ground vibrations. A transfer function between the microphone and the geophones in the seismic spread is determined from the speaker signal and used to filter out the airborne noise produced by the surface seismic source. In a first embodiment of the invention, the surface seismic source is a vibrator and the speaker system signal is uncorrelated with the vibrator sweep. In another embodiment of the invention, the speaker signal may be correlated with the vibrator signal. In the second method, two vibrator sweeps are executed with opposite speaker polarities so that the sum and difference of the two records provides the speaker and the vibrator data respectively. In either case, the speaker system is made of two speakers located equidistant and on opposite sides of the baseplate so as to be able to simulate a speaker centered at the baseplate location. The method of the invention may also be used with multiple vibratory sources operated in a predetermined phase-relationship. The noise-attenuated signals may then be processed to separate out the contributions of the individual sources. Another embodiment of the invention uses accelerometer measurements of the reaction mass or the base plate of the vibrators or a combination of the two measurements to invert the noise-attenuated signals.

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**A. CLASSIFICATION OF SUBJECT MATTER**  
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**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)  
EPO-Internal, INSPEC, COMPENDEX, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 596 803 A (GEOPHYSIQUE CIE GLE) 11 May 1994 (1994-05-11)  column 3, line 43 -column 4, line 19 ---	1-3, 23, 27-29, 36-40
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A	US 3 729 704 A (FARR J) 24 April 1973 (1973-04-24) column 7, line 30 - line 44 -----	1

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Information on patent family members

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