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WA 98503 (US). **BUTTERS, Lisa, C.** [US/US]; 409 1st Street, Langley, WA 98260 (US).

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(74) Agents: **DALEY-WATSON, Christopher, J.** et al.; P.O. Box 1247, Seattle, WA 98111-1247 (US).

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(71) Applicant (*for all designated States except US*): **WAVBANK, INC** [US/US]; 301 First Street, P.O. Box 412, Langley, WA 98260 (US).

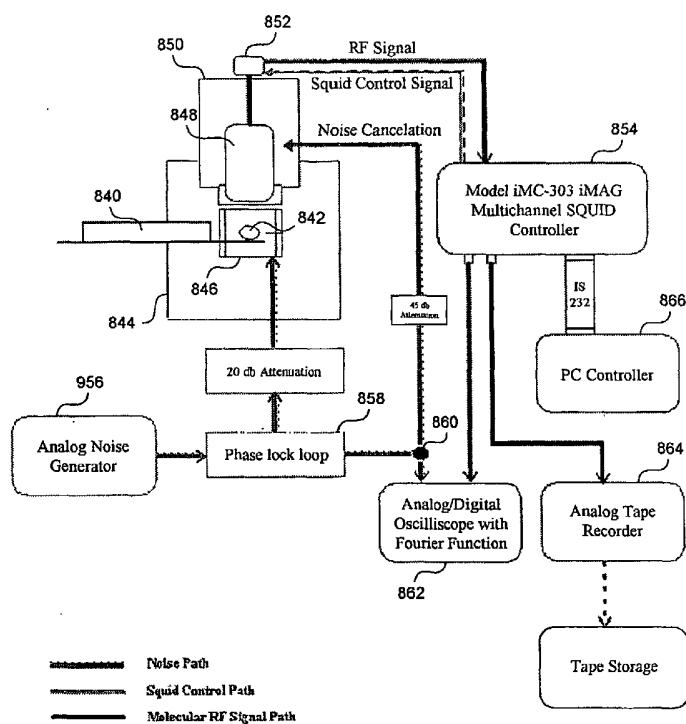
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(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **BUTTERS, John, T.** [US/US]; 409 1st Street, Langley, WA 98260 (US). **BUTTERS, Bennett, M.** [US/US]; 3421 Stikes Drive, Lacey,

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR SAMPLE DETECTION BASED ON LOW-FREQUENCY SPECTRAL COMPONENTS



(57) Abstract: Method and apparatus for detecting a selected material in a sample are disclosed. In the method, the sample (842) is placed adjacent a detector coil (846), for generating an electromagnetic time-domain signal composed of sample source radiation. The signal is first conditioned to convert the signal to an amplified conditioned signal from which frequency components above a selected frequency have been removed, then filtered to selectively pass low-frequency spectral components that are (i) in a frequency range between dc and 50KHz, and (ii) characteristic of the selected material. The filtered signal is cross-correlated with a data set of low-frequency spectral components that are (i) in a frequency range between dc and 50KHz, and (ii) characteristic of a selected material, to produce a frequency-domain spectrum in the frequency range within DC to 50KHz. This spectrum is then used to determine whether the frequency-domain spectrum contains one or more low-frequency signal components that are characteristic of the presence or absence of such material in the sample.



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INTERNATIONAL SEARCH REPORT

International application No.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G01N 27/00

US CL : 702/27, 28, 30; 250/339.07

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 702/27, 28, 30

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 practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,541,413 A (Pearson et al) 30 July 1996 (30.07.1996), col. 6, lines 33-65	1-21
A	US 5,508,203 A (FULLER et al) 16 April 1996 (16.04.1996), abstract	1-21
A	US 4,822,169 A (DISTL et al) 18 April 1989 (18.04.1989), column 17, lines 42 +	1-21

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

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"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

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P.O. Box 1450
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Facsimile No. (703)305-3230

Authorized officer

Marc Hoff *Diane Ince*
Telephone No. 703-308-0956

INTERNATIONAL SEARCH REPORT

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Continuation of Item 4 of the first sheet:

Sample Detection Based on Low-frequency Spectral Components