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(54) **Sound imaging method and apparatus.**

(57) The illusion of distinct sound sources distributed throughout the three-dimensional space containing the listener is possible using only conventional stereo playback equipment by processing monaural sound signals prior to playback on two spaced-apart transducers. A plurality of such processed signals corresponding to different sound source positions may be mixed using conventional techniques without disturbing the positions of the individual images. Although two loudspeakers are required the sound produced is not conventional stereo, however, each channel of a left/right stereo signal can be separately processed according to the invention and then combined for playback. The sound processing involves dividing each monaural or single channel signal into two signals and then adjusting the differential phase and amplitude of the two channel signals on a frequency dependent basis in accordance with an empirically derived transfer function that has a specific phase and amplitude adjustment for each predetermined frequency interval over the audio spectrum. Each transfer function is empirically derived to relate to a different sound source location and by providing a number of different transfer functions and selecting them accordingly the sound source can be made to appear to move.

Image Location

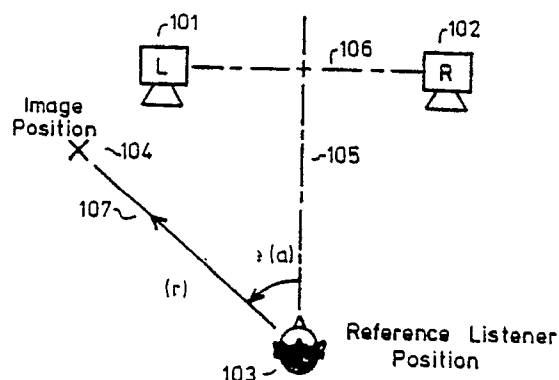


Fig.1

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EUROPEAN SEARCH REPORT

Application Number

EP 89 30 8778

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|---|--|--|---|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.5) |
| X | EP-A-0 142 213 (PHILIPS) * Page 1, lines 1-11; page 6, line 15 - page 7, line 5; page 7, line 22 - page 8, line 23 * | 1,2,8,9 | H 04 S 1/00 |
| A | --- | 3,4 | |
| X | US-A-4 152 542 (COOPER) * Column 1, lines 17-27; column 8, line 57 - column 9, line 2; column 9, line 34 - column 10, line 14; column 10, line 49 - column 11, line 12; column 29, line 56 - column 30, line 10 * | 1,2,8,9 | |
| A | --- | 3 | |
| X | US-A-4 308 424 (BICE, Jr.) * Column 1, lines 7-10; column 2, lines 18-28; column 2, line 40 - column 3, line 45; column 5, line 23 - column 6, line 43; column 7, lines 16-27; column 9, lines 41-67 * | 1,8 | |
| A | ----- | 2,3 | |
| | | | TECHNICAL FIELDS SEARCHED (Int. Cl.5) |
| | | | H 04 S |
| The present search report has been drawn up for all claims | | | |
| Place of search The Hague | | Date of completion of search 01 July 91 | Examiner ZANTI P.V.L. |
| <div>CATEGORY OF CITED DOCUMENTS</div> <div>X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention</div> <div>E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons ----- &: member of the same patent family, corresponding document</div> | | | |