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(12) **United States Patent**
Saarinen

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(54) **STEREOPHONIC REPRODUCTION
MAINTAINING MEANS AND METHODS
FOR OPERATION IN HORIZONTAL AND
VERTICAL A/V APPLIANCE POSITIONS**

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(73) Assignee: **Nokia Corporation, Espoo (FI)**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 470 days.

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Assistant Examiner—Alecia D. Nelson

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(30) **Foreign Application Priority Data**

Feb. 8, 2000 (GB) 0002866

(51) **Int. Cl.**⁷ **G09G 5/00; G06F 1/16**

(52) **U.S. Cl.** **345/156; 361/681; 361/683; 348/794**

(58) **Field of Search** 361/680-683; 341/20-26; 381/59, 333, 335, 336, 386-388, 87; 348/794; 345/156, 169, 173, 158

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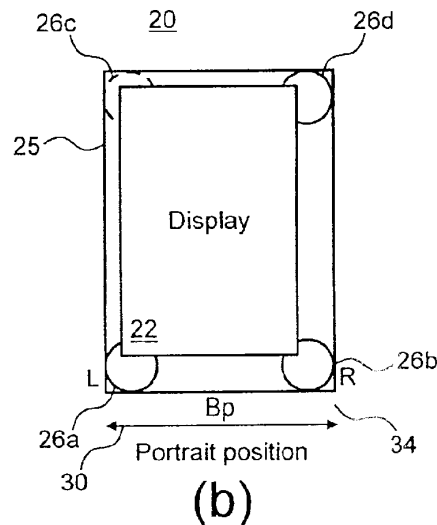
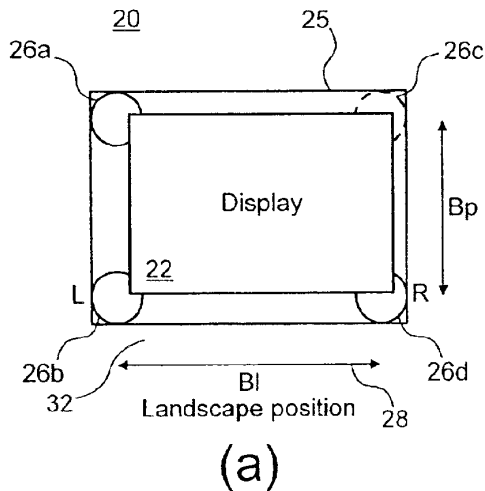
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(57) **ABSTRACT**

Display apparatus including a display and an orientation sensitive interface mechanism is disclosed. In an exemplary embodiment, the orientation sensitive interface includes first and second loudspeaker pairs. The first loudspeaker pair includes first and second loudspeakers and the second loudspeaker pair includes the second and third loudspeaker. The first and second loudspeaker pairs are disposed along transverse directions to each other. The display apparatus comprises a switch which switches between the first loudspeaker pair and the second loudspeaker pair. By providing the respective loudspeaker pairs, and switching between them, it is possible to orient the display apparatus in transverse directions corresponding to respective loudspeaker pairs, yet maintain a substantially stereophonic reproduction for each orientation.

19 Claims, 13 Drawing Sheets



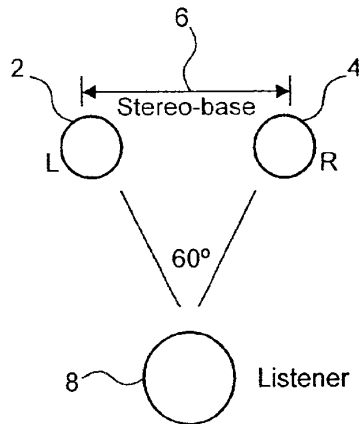


FIG. 1

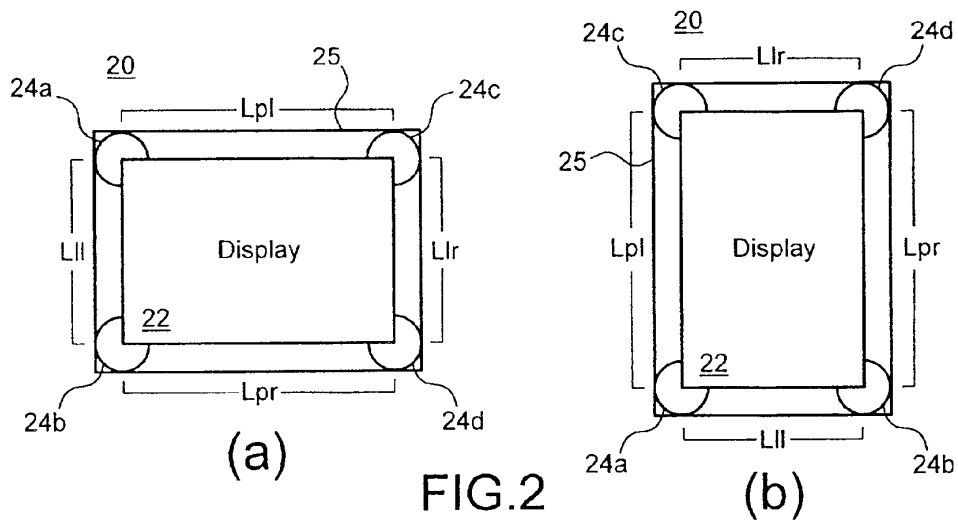


FIG. 2

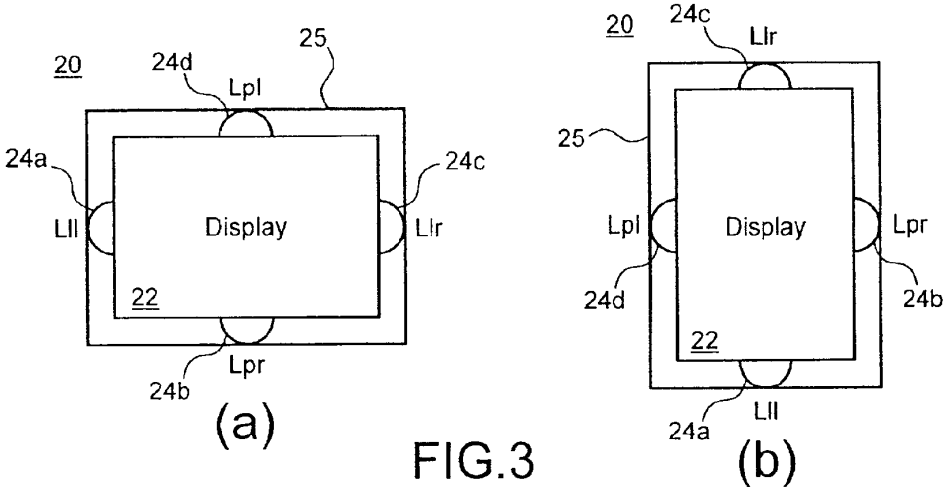


FIG. 3

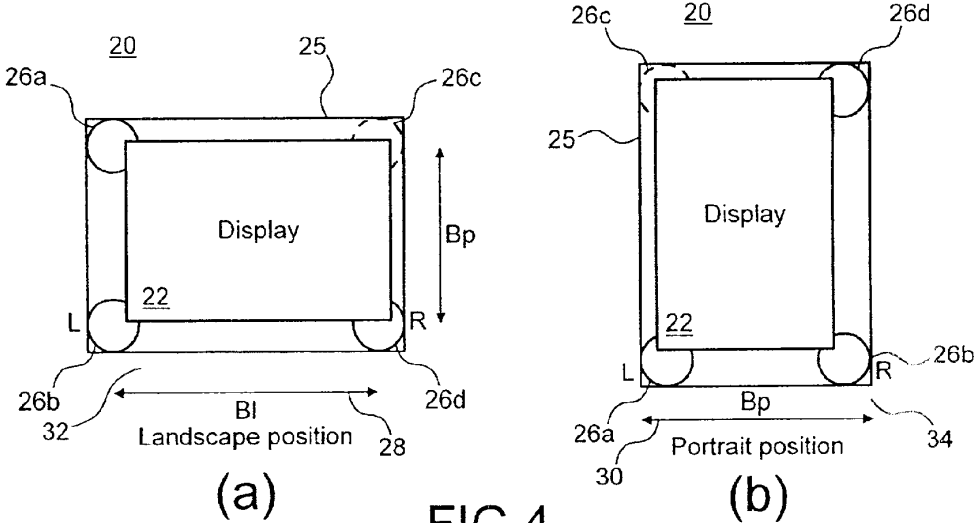


FIG. 4

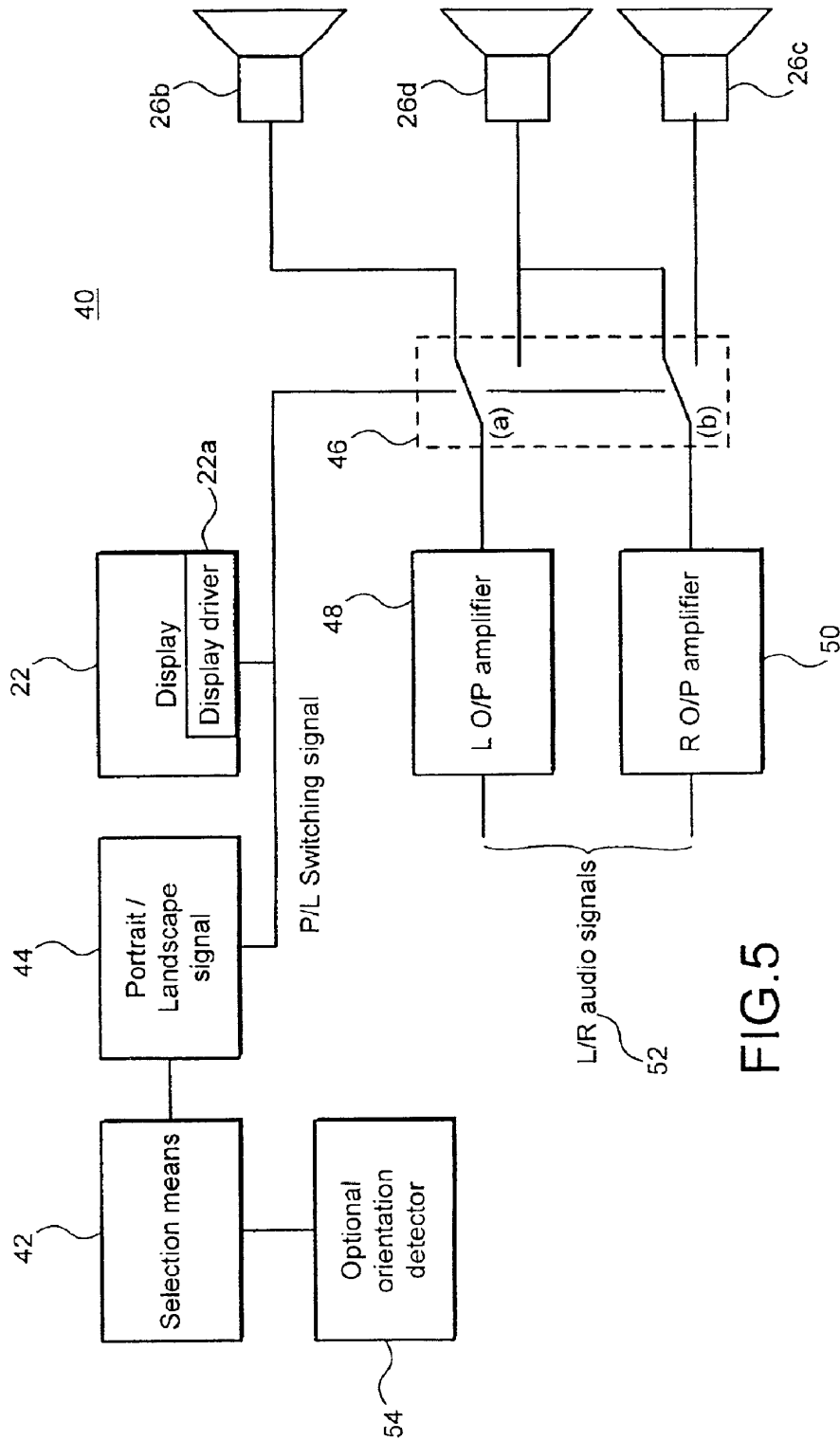


FIG. 5

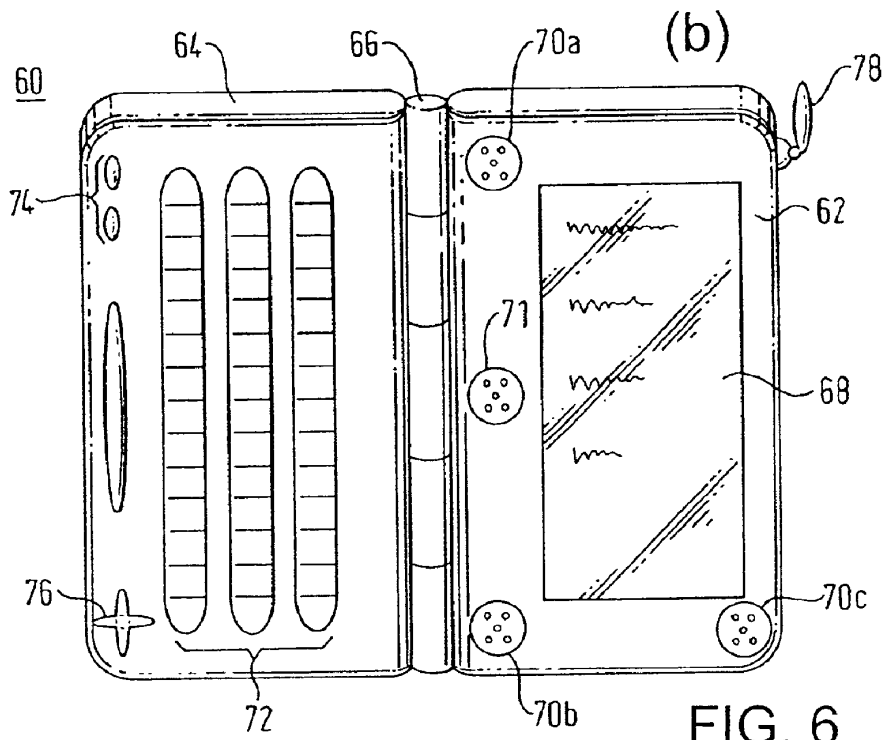
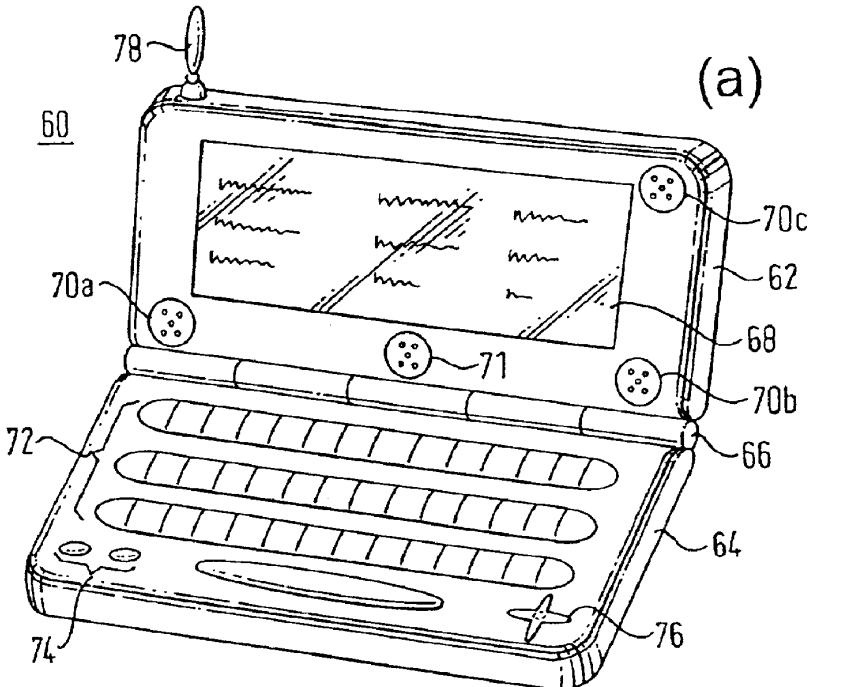


FIG. 6

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