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(12) **United States Patent**
Ezaki

(10) **Patent No.: US 6,201,544 B1**
(45) **Date of Patent: Mar. 13, 2001**

(54) **LOCATION FLOOR NUMBER DISPLAY DEVICE IN NAVIGATION APPARATUS**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/132,010**

(22) Filed: **Aug. 10, 1998**

(30) **Foreign Application Priority Data**

Aug. 11, 1997 (JP) 9-216279

(51) **Int. Cl.**[7] **G06T 11/40**

(52) **U.S. Cl.** **345/425**; 345/433; 345/439; 345/427; 345/355; 345/357

(58) **Field of Search** 345/419, 433, 345/353, 969, 357, 425, 439, 427

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(57) **ABSTRACT**

A detailed map is displayed on a display screen by using detailed map information. When a building BL on the detailed map is indicated, a user name list of the building is calculated from building information to display the user name list on a part of the display screen, and a detailed map MP displayed on another part of the display screen is inclined by a birds-eye process to be displayed. The indicated building BL is displayed three-dimensionally with a height corresponding to the number of its floors. When a user is specified from the user name list, the floor number of a floor on which the user is located is calculated from the building information. The floor is displayed by an L-shaped mark FL in the three-dimensionally displayed building such that the number of floors can be identified, and/or the floor number is displayed by the characters FLC.

30 Claims, 14 Drawing Sheets

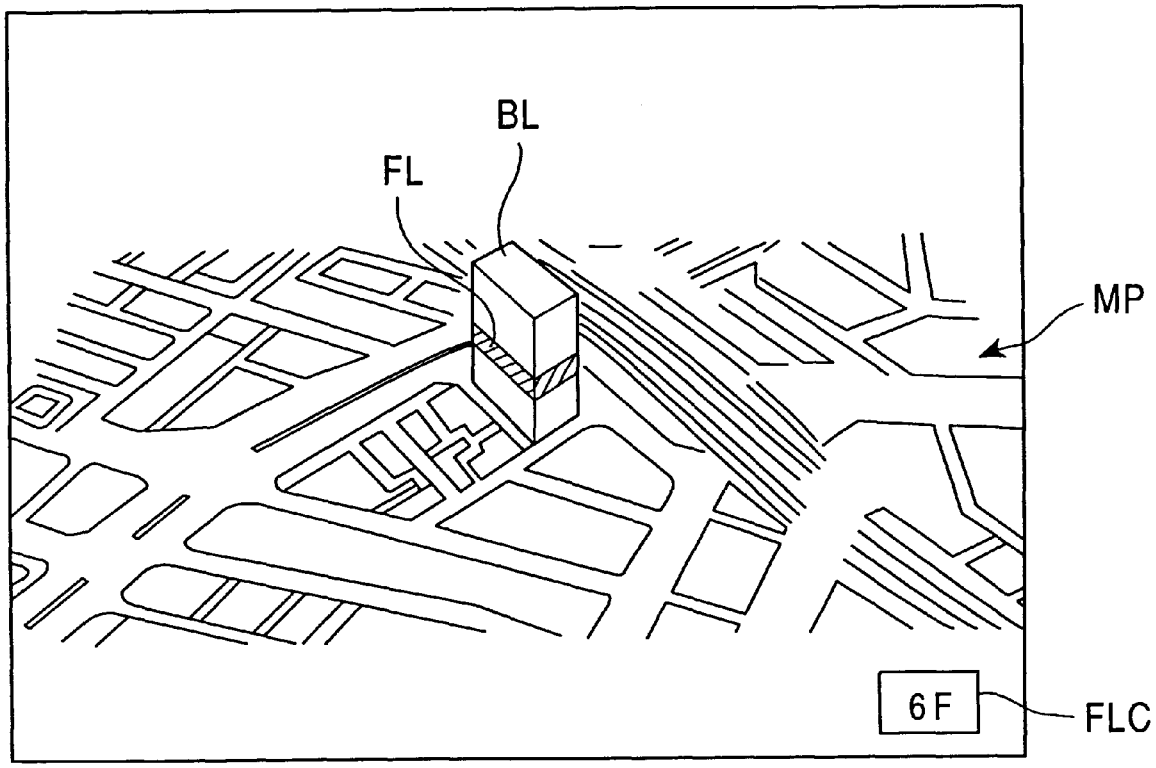

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FIG. 1

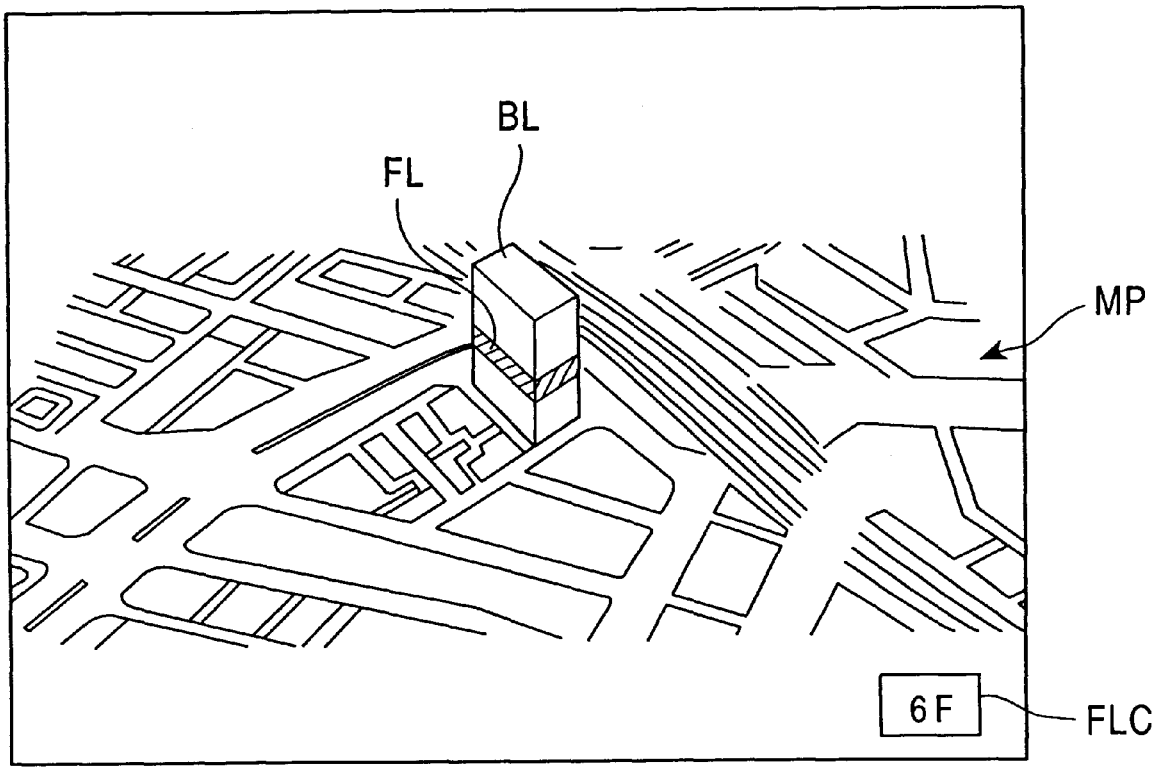

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FIG. 2

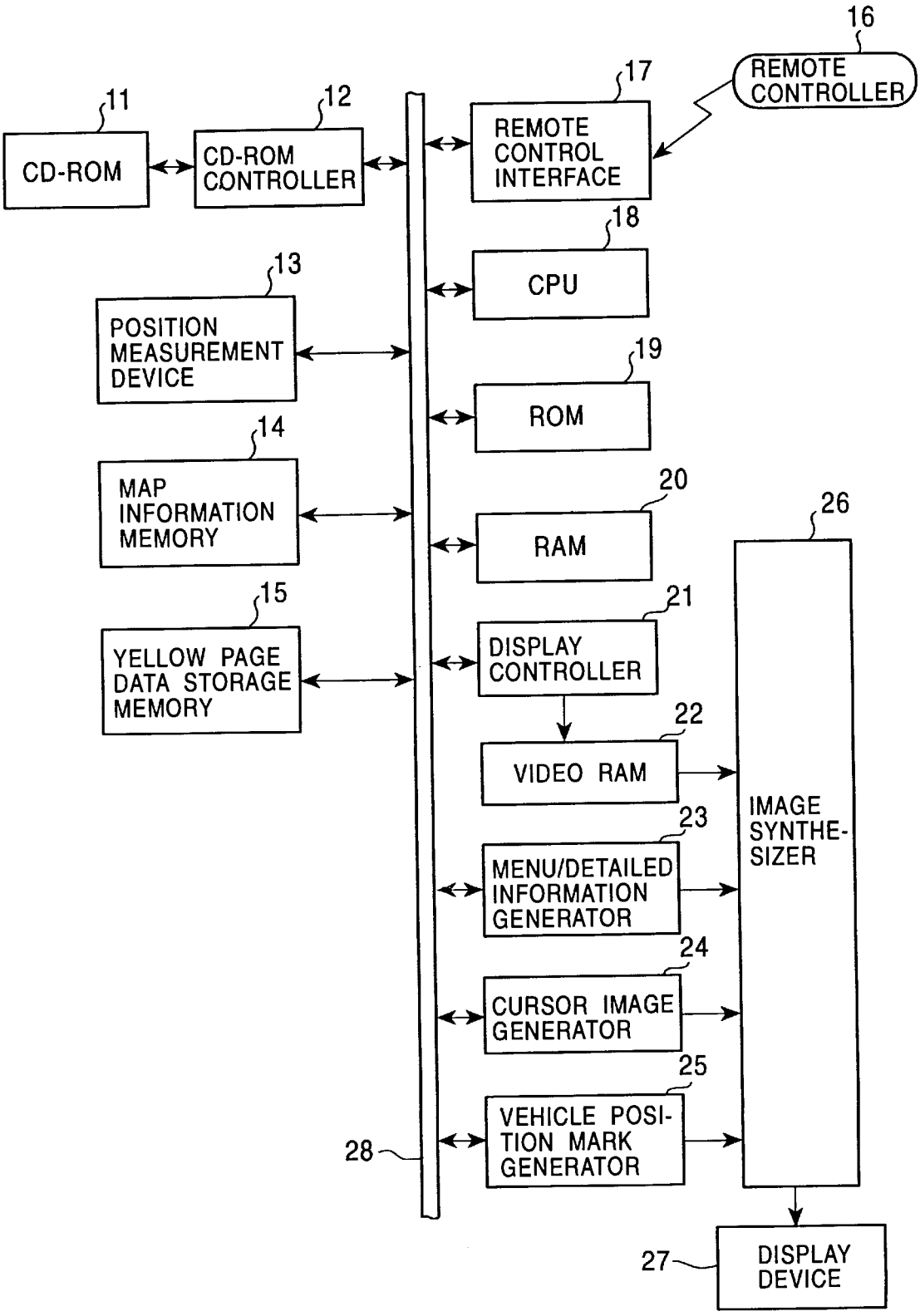

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FIG. 3

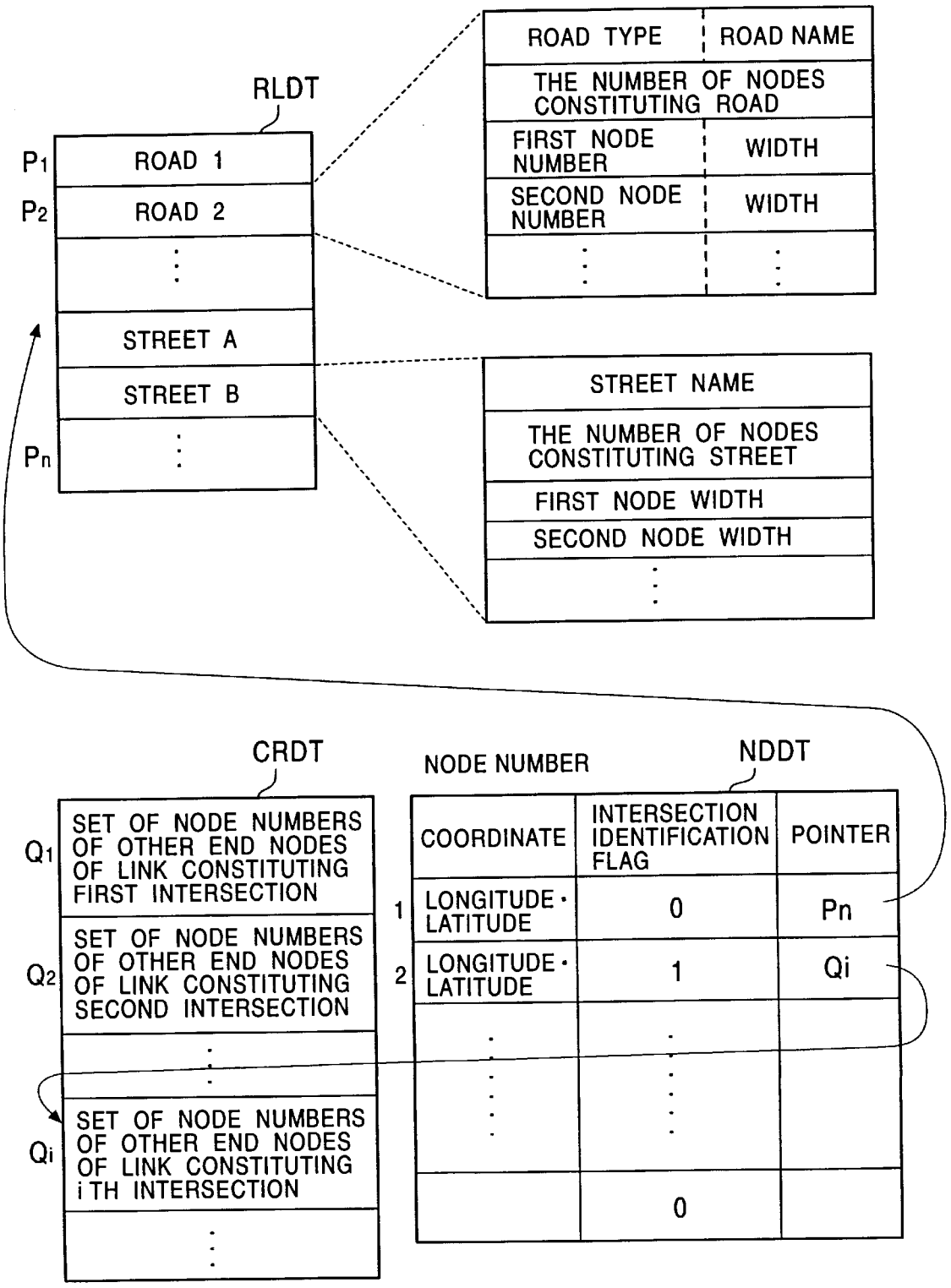

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FIG. 4A

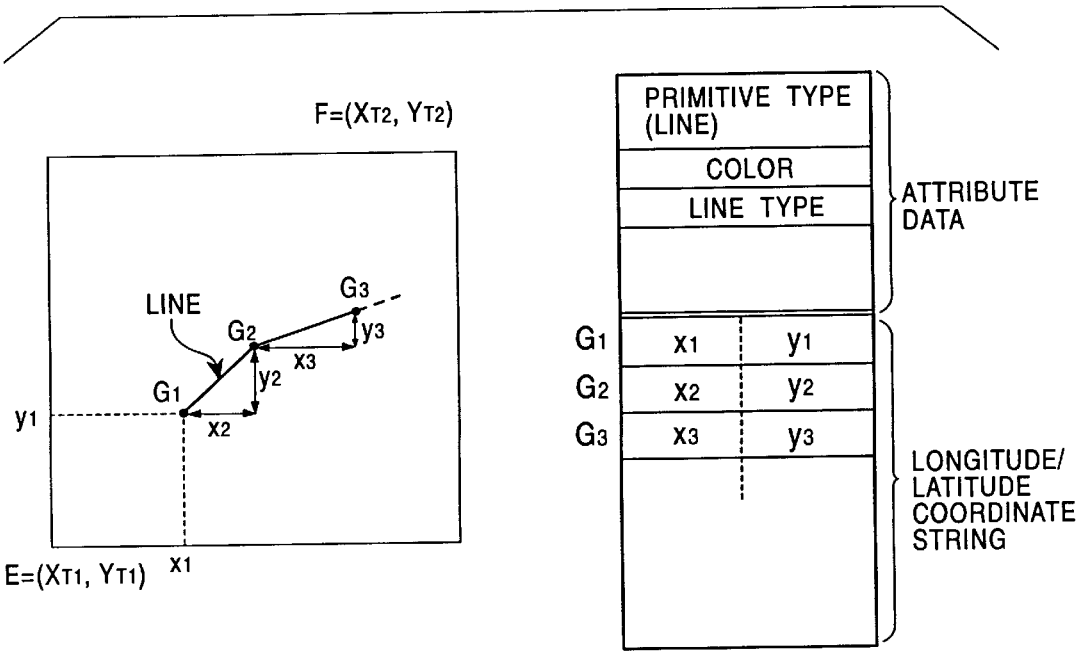
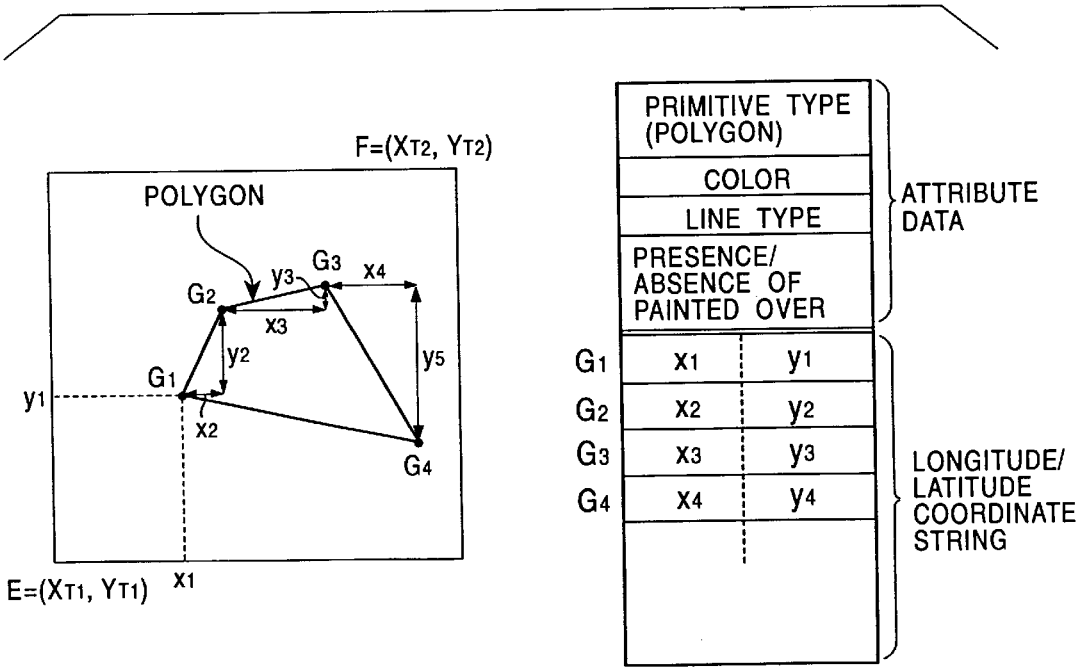


FIG. 4B



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