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Yokota et al.

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(54) **NAVIGATION SYSTEM**

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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.

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(51) **Int. Cl.**⁷ **G06F 165/00**

(52) **U.S. Cl.** **701/208; 701/213; 701/210**

(58) **Field of Search** **701/208, 209, 701/21, 212, 213, 207, 25**

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,897,792 A 1/1990 Hosoi
5,189,430 A 2/1993 Yano et al.

6,253,150 B1 * 6/2001 Nakamura 701/208
6,269,305 B1 * 7/2001 Yamashita 701/209
6,278,938 B1 * 8/2001 Alumbaugh 701/208
6,289,278 B1 * 9/2001 Endo et al. 702/208
6,292,749 B2 * 9/2001 Kohli 701/213

* cited by examiner

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(57) **ABSTRACT**

A travel state monitoring unit monitors whether the vehicle position deviates from a road so as to be in the off-road travel state, on the basis of the map information and the vehicle position. When the vehicle position is in the off-road state, a travel trail generating unit generates off-road travel trail data and stores the data in an off-road travel trail storage unit. A display control unit displays, by the user's instruction, the off-road travel trail superimposed with the map, using the off-road travel trail data. The route search unit searches a route to an off-road point and displays the route.

27 Claims, 13 Drawing Sheets

FUNCTIONAL BLOCK DIAGRAM OF THE NAVIGATION SYSTEM
ACCORDING TO THE INVENTION

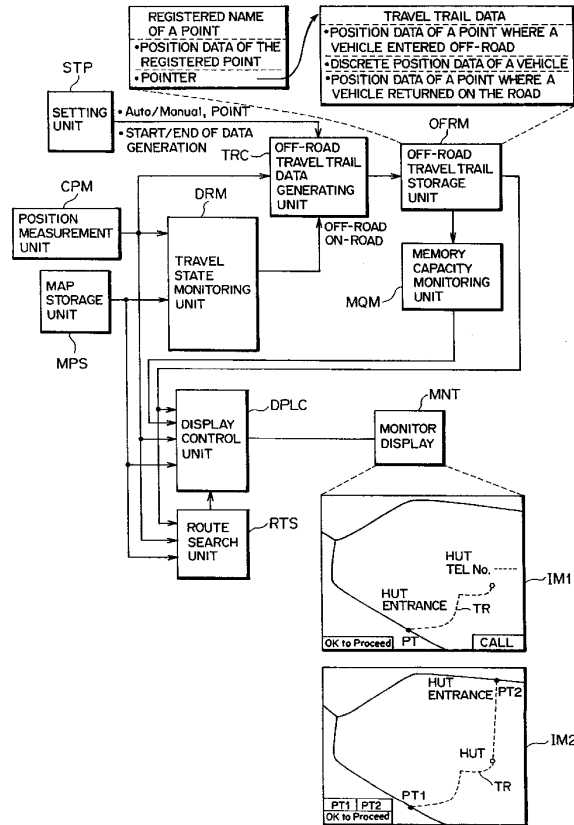


FIG. 1

FUNCTIONAL BLOCK DIAGRAM OF THE NAVIGATION SYSTEM ACCORDING TO THE INVENTION

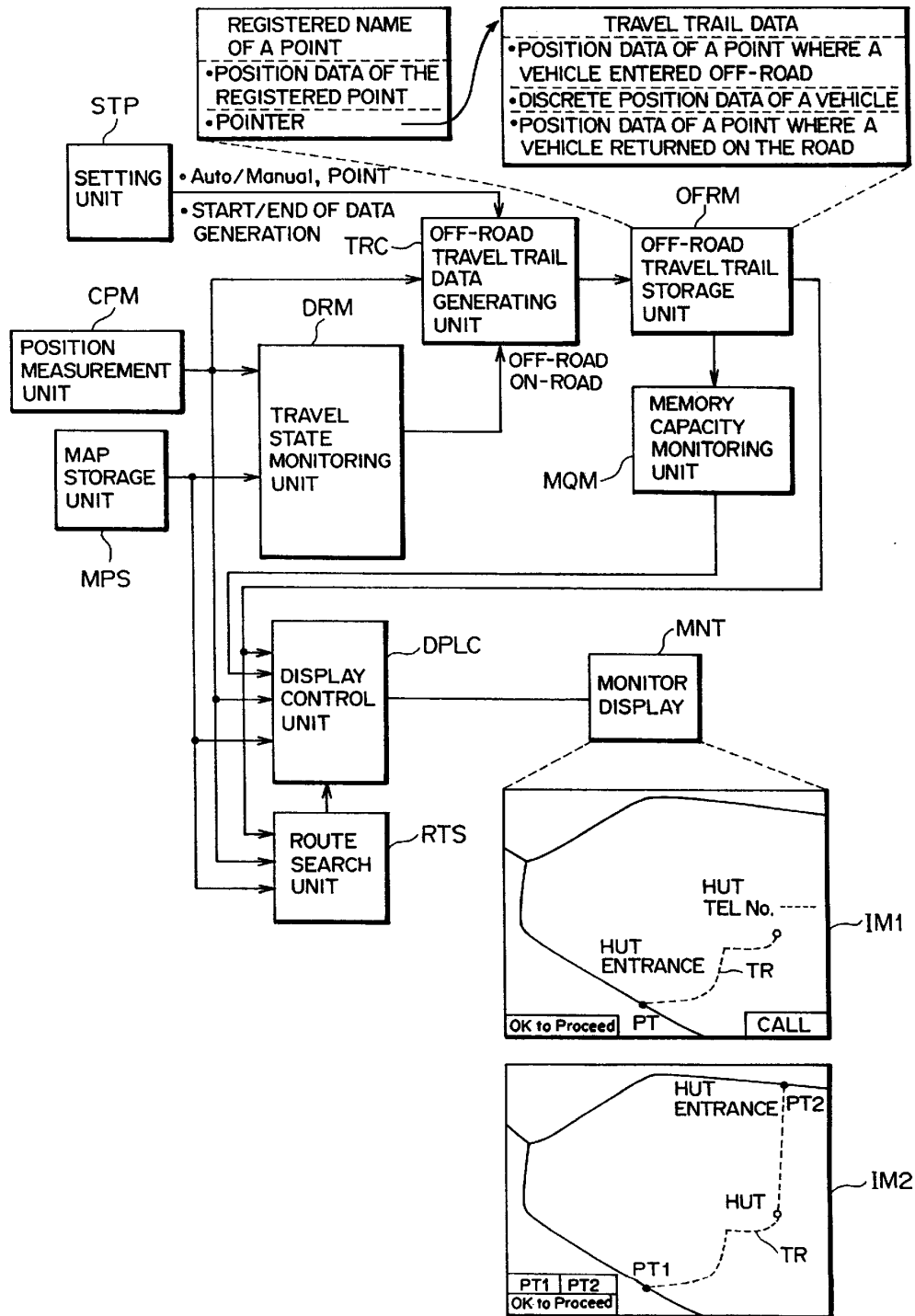


FIG. 2

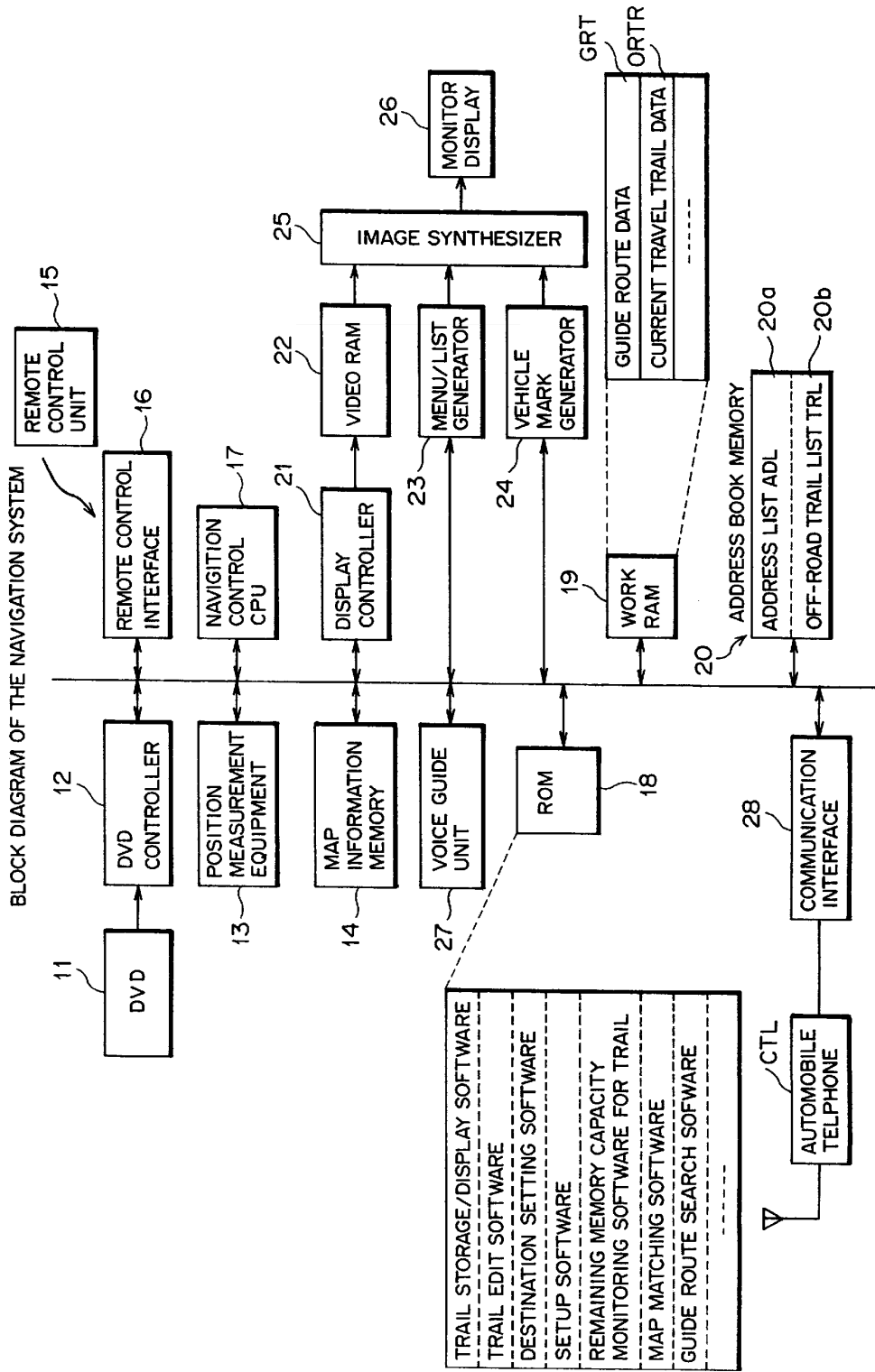


FIG. 3

CONSTRUCTION OF THE ADDRESS BOOK MEMORY

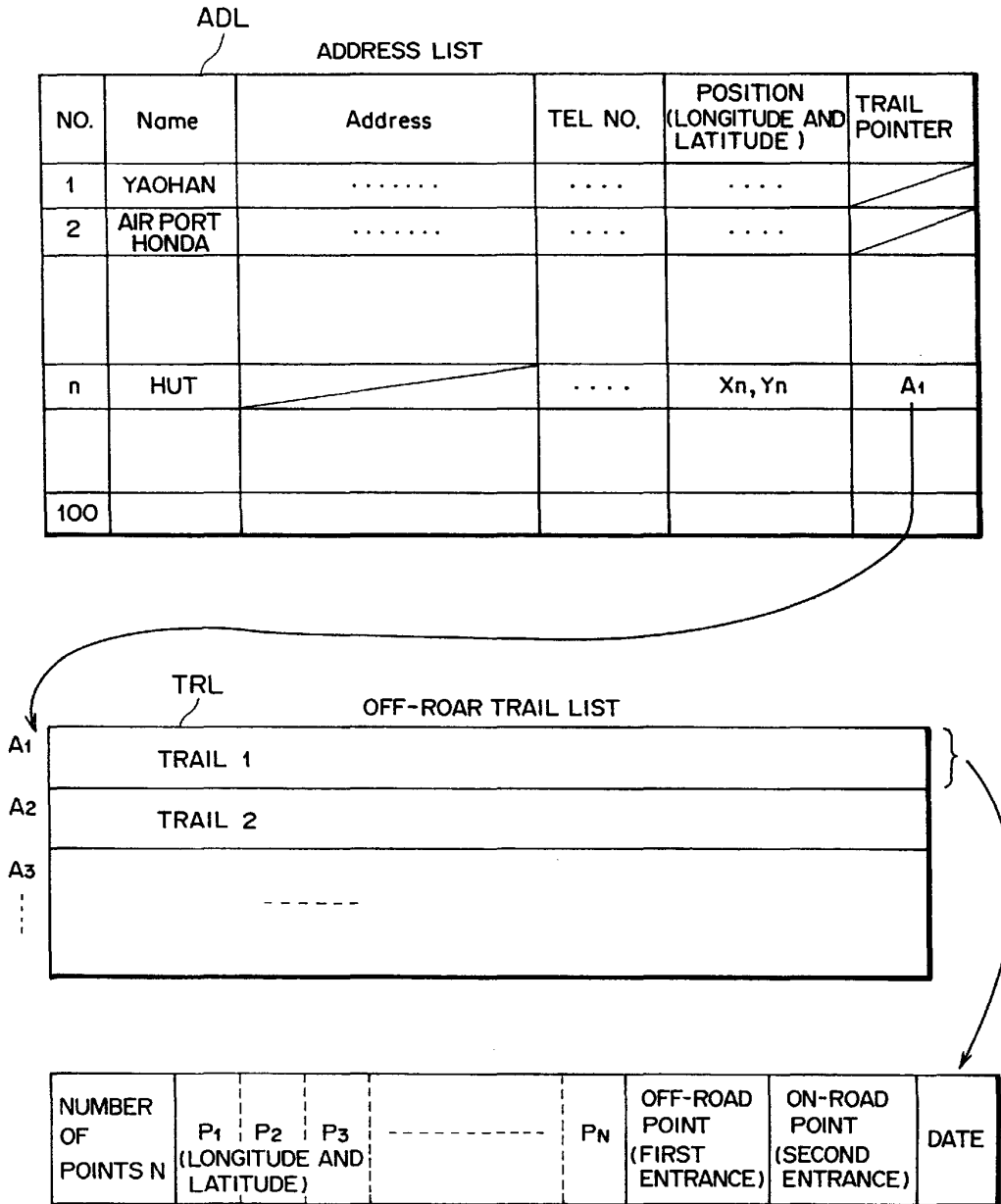
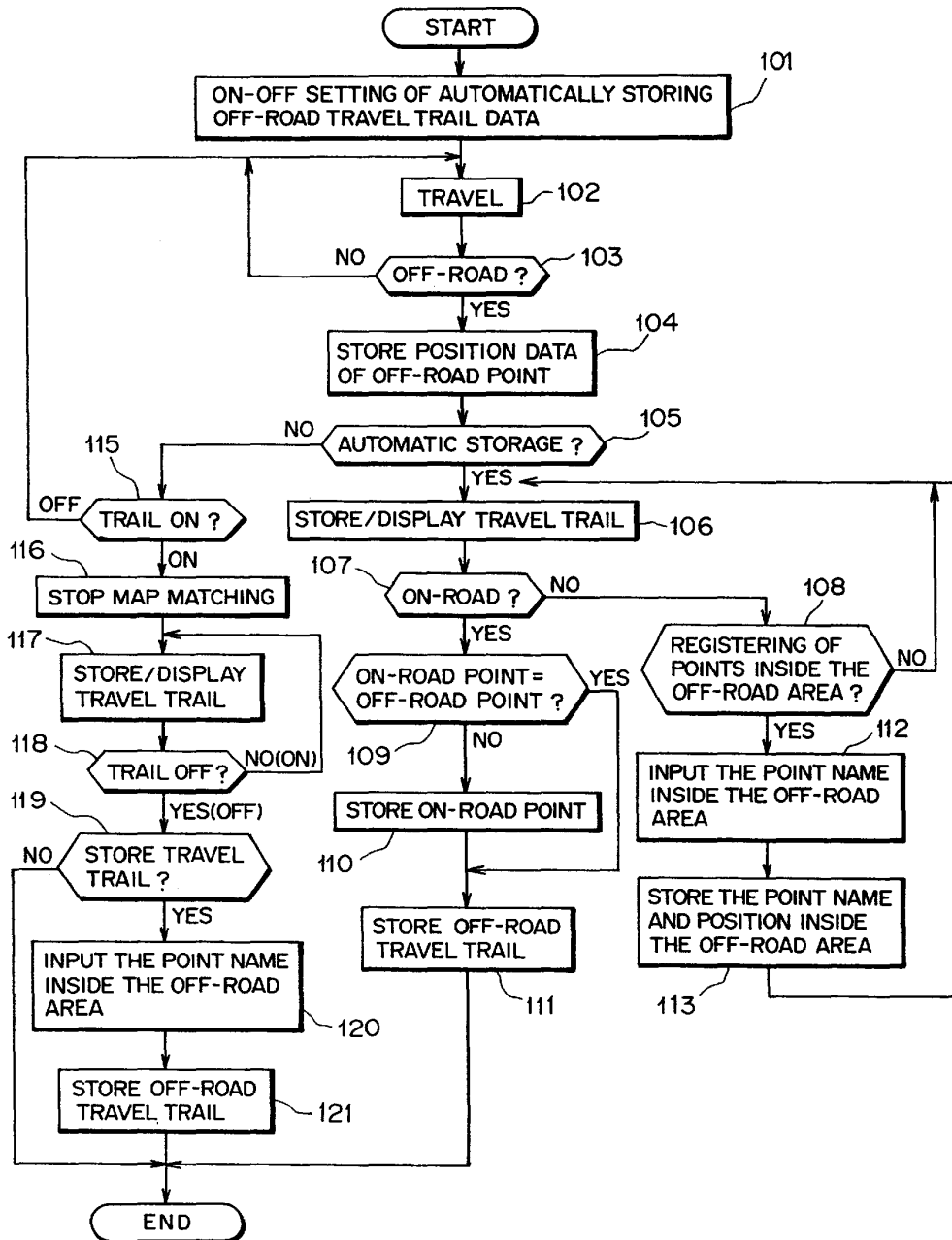


FIG. 4

PROCESSING FLOW OF STORING OFF-ROAD TRAVEL TRAIL DATA



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