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## (12) United States Patent Yokota et al.

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(54) NAVIGATION S	YSTEM
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(75) Inventors: Tatsuo Yokota, Torrance; Hikaru

Wako, Redondo Beach, both of CA

(US)

(73) Assignee: Alpine Electronics, Inc., Tokyo (JP)

(\*) 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.: 09/813,230

(22) Filed: Mar. 19, 2001

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Primary Examiner—Richard M. Camby (74) Attorney, Agent, or Firm—Brinks Hofer Gilson & Lione

#### (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

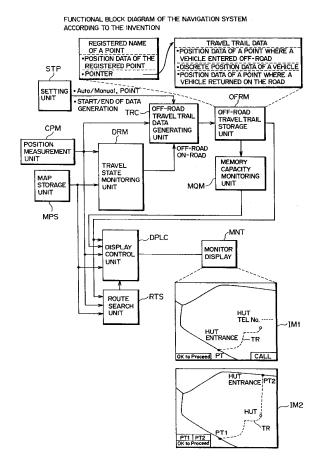
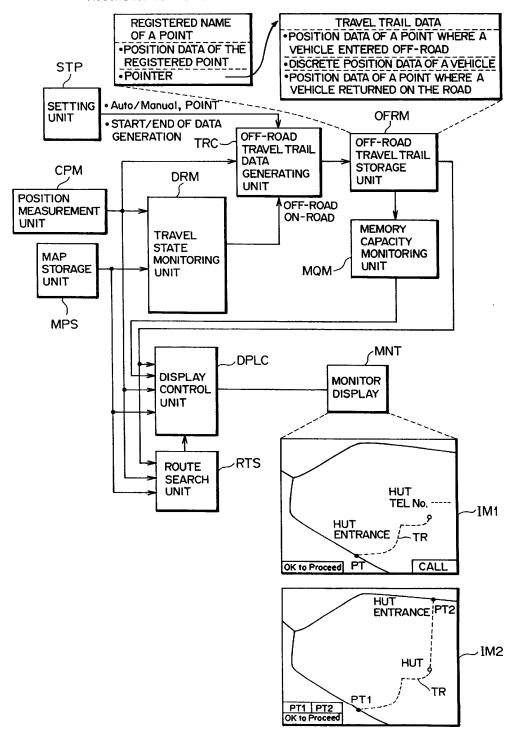
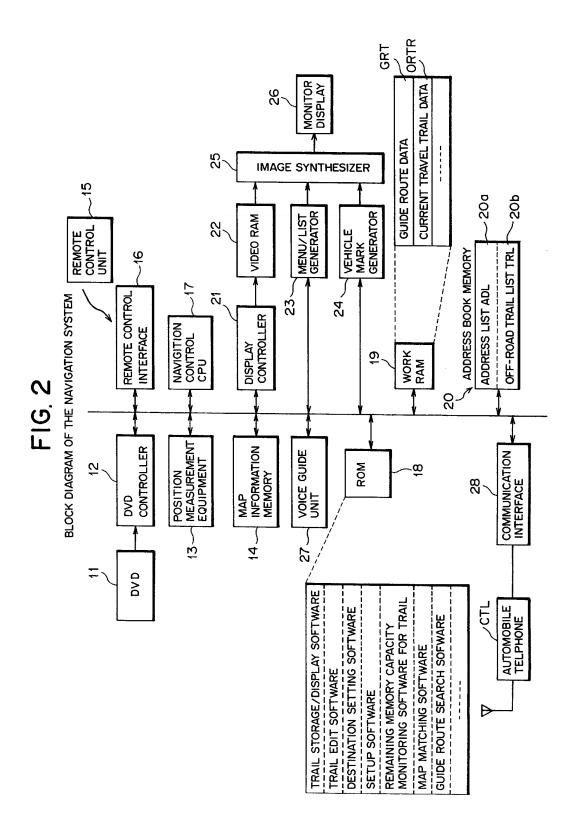




FIG. 1
FUNCTIONAL BLOCK DIAGRAM OF THE NAVIGATION SYSTEM ACCORDING TO THE INVENTION

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FIG. 3

## CONSTRUCTION OF THE ADDRESS BOOK MEMORY

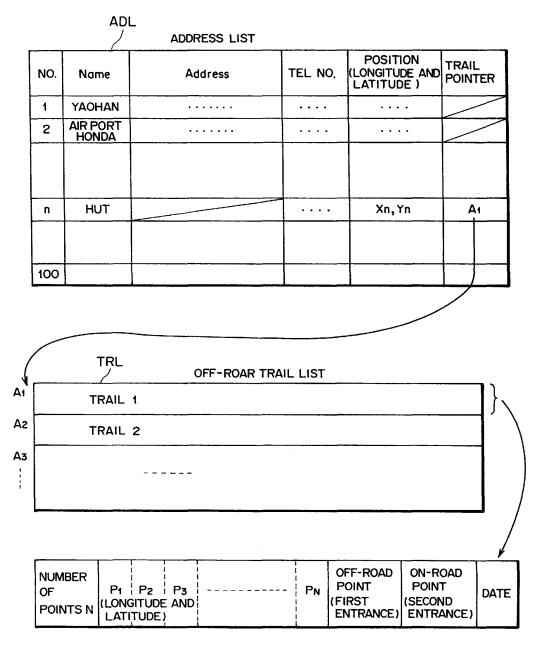
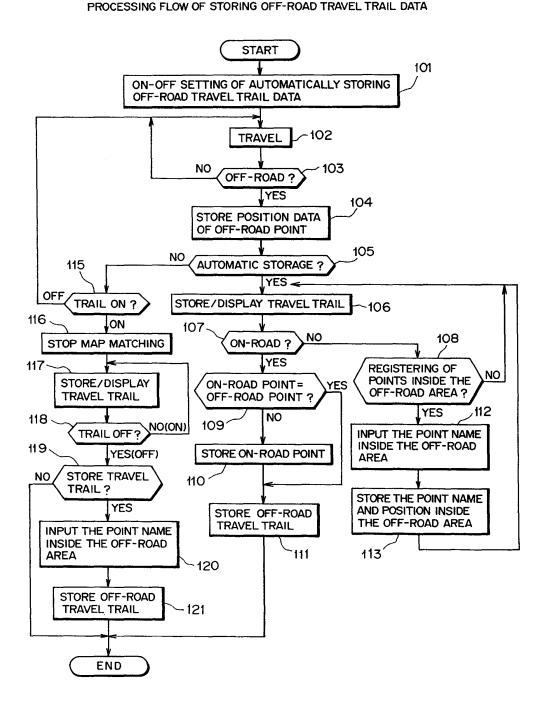




FIG. 4



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