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# United States Patent [19]

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Tamai et al.

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[54] NAVIGATION SYSTEM WITH OFF-ROUTE DETECTION AND ROUTE RECALCULATION

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### [57] ABSTRACT

[21] Appl. No.: 864,515

[22] Filed: Apr. 7, 1992

Where a vehicle deviates from a calculated optimal route, the system displays a message indicating the vehicle's deviation. The driver of the vehicle commands computation of a new optimum route. The system selects a new starting point from a point substantially ahead of the vehicle, recomputes the optimal route, and determines the route from the new starting point to the destination. The new starting point is far enough ahead of the vehicle to ensure that the route computation is completed before the vehicle reaches it. This prevents overrunning the new starting point before the calculation of a new optimum route is completed. Navigation guidance, computed for the new optimal route, is then displayed.

[51] Int. Cl.<sup>5</sup> ..... G08G 1/123

[52] U.S. Cl. .... 340/995; 340/988;  
364/449

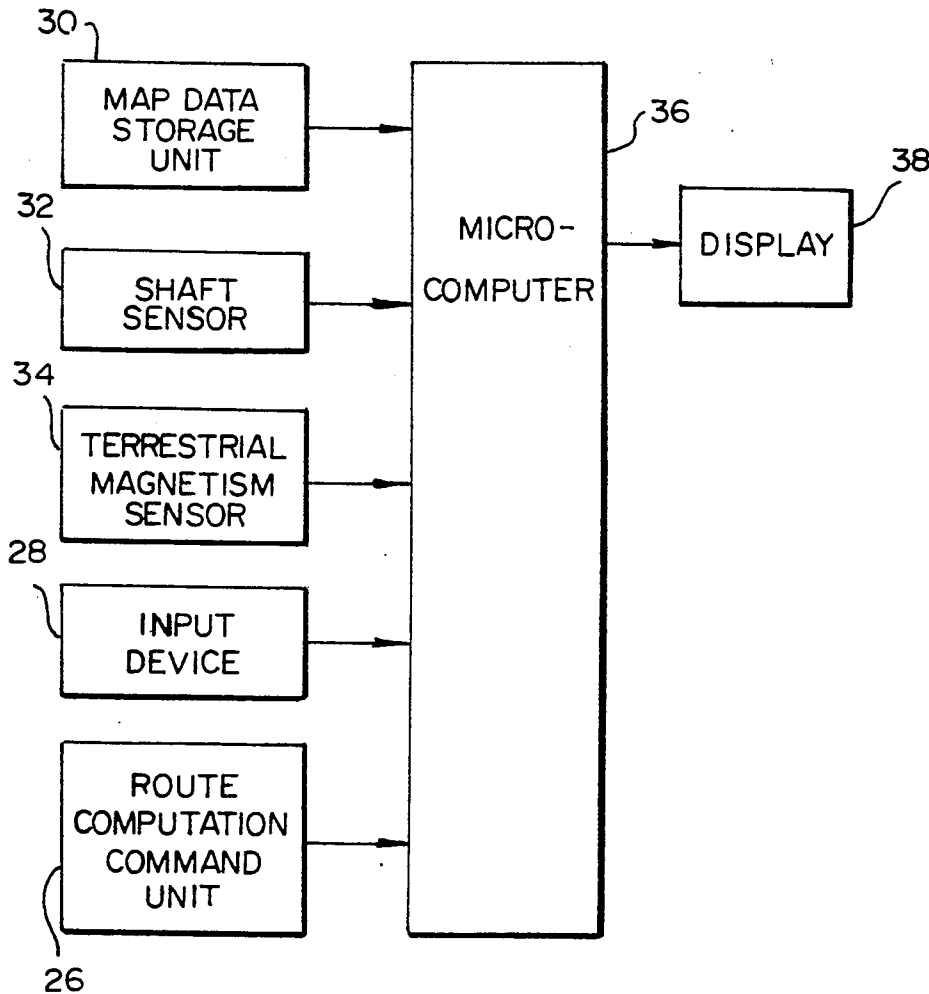
[58] Field of Search ..... 340/990, 995, 988;  
73/178 R; 364/449, 444

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7 Claims, 4 Drawing Sheets



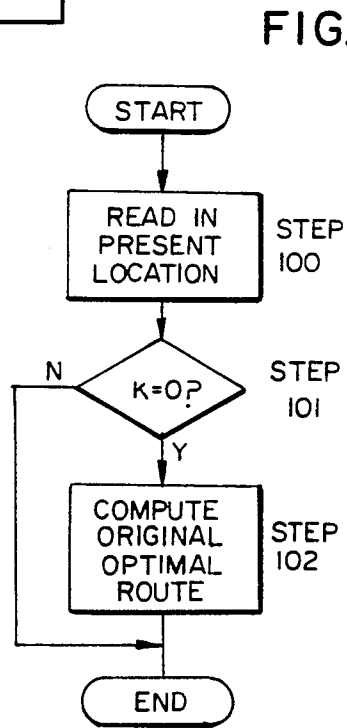
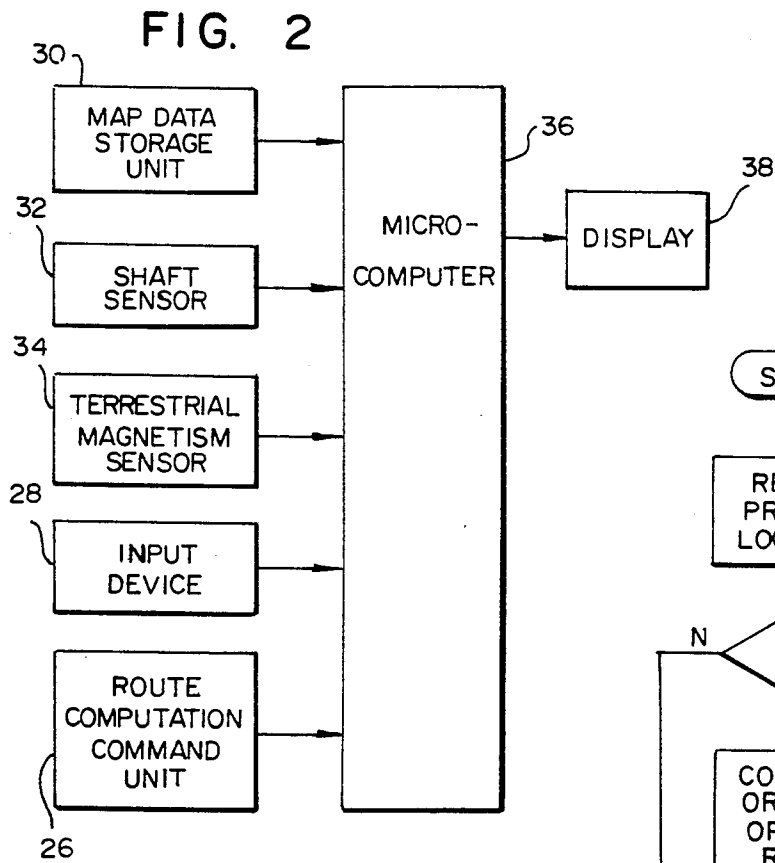
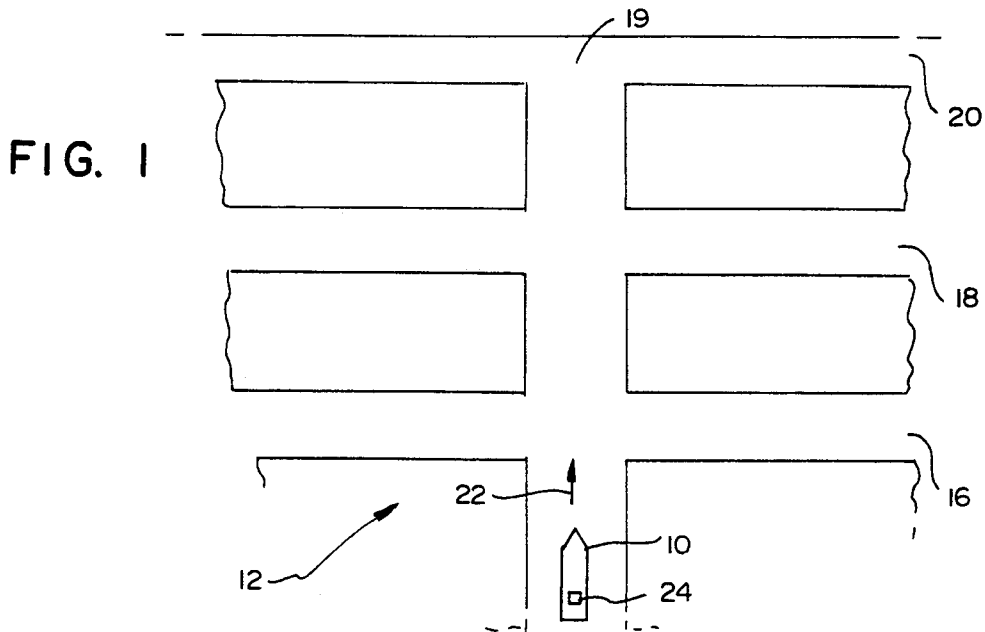


FIG. 4

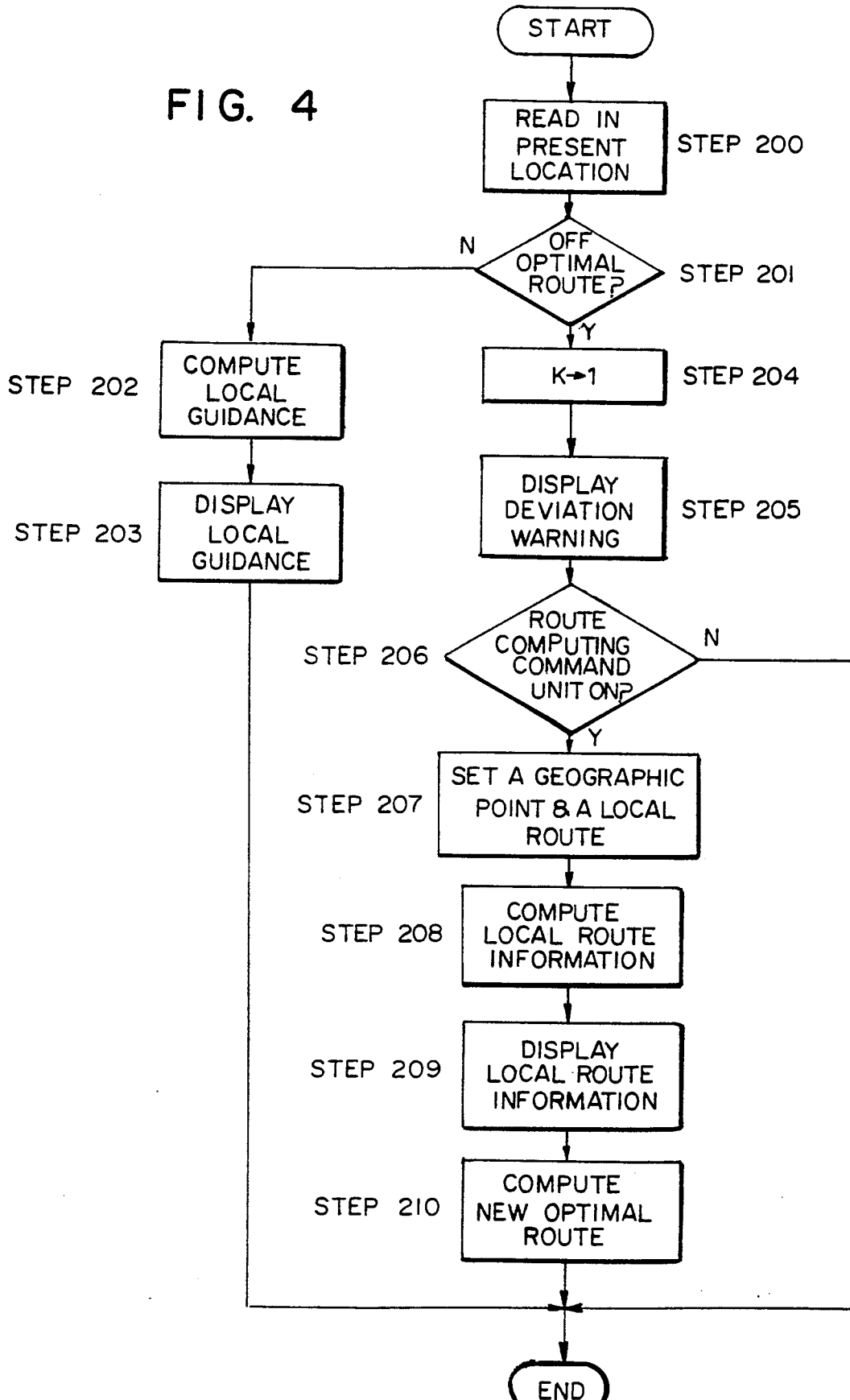


FIG. 5

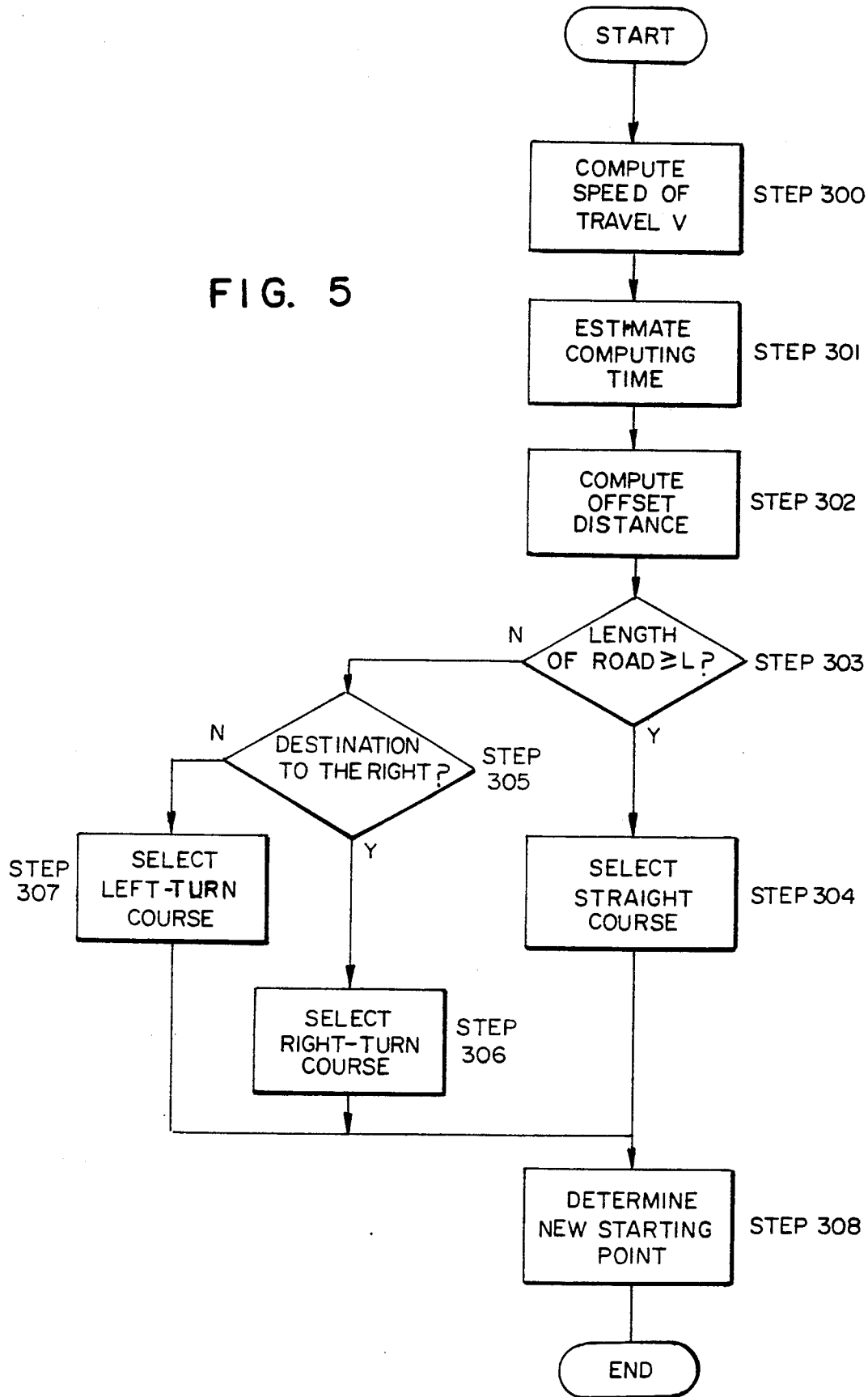


FIG. 6A

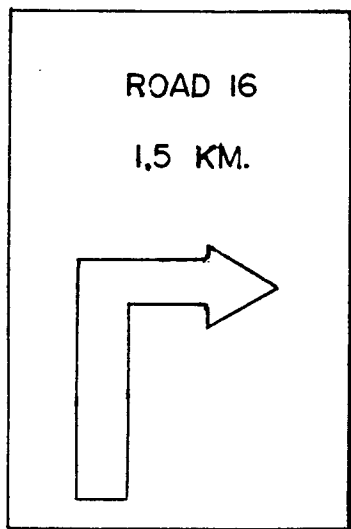


FIG. 6B

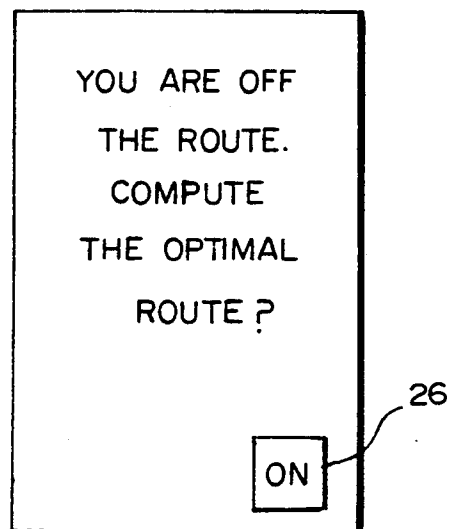


FIG. 6C

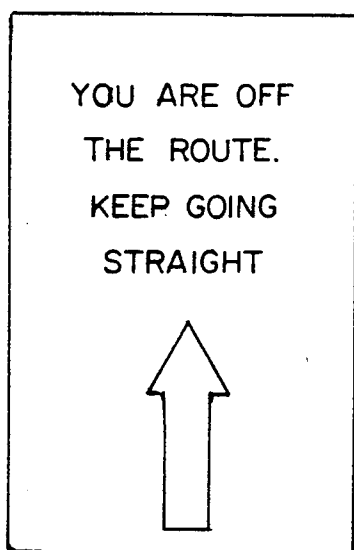
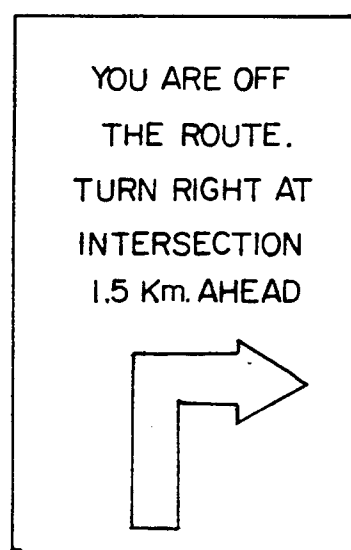


FIG. 6D



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