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Pu et al.

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(54) **MOBILE 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 7/00**

(52) **U.S. Cl.** **701/202**; 701/117; 701/209; 455/456

(58) **Field of Search** 701/200, 201, 701/202, 207, 208, 209, 211, 213, 117; 340/988, 990, 995; 455/456, 457

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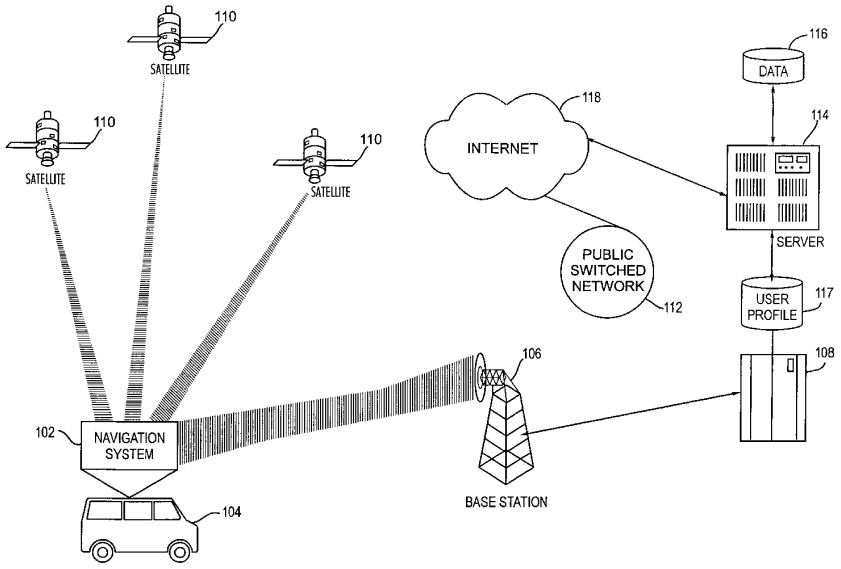
(57) **ABSTRACT**

A client navigation system establishes a wireless connection to a navigation server on a computer network. The client requests a route by uploading start and stop specifications. The server calculates an optimal route based on real-time data available on the network. A generic natural language description is used to specify the optimal route downloaded to the client. The natural language description is independent from the local mapping database software on the client and includes a plain text description for each link using pre-defined generic terms. The client interprets the route, interfaces with the local mapping database and reconstructs the optimal route using a mapping reconstruction algorithm. The route is displayed on the client navigation system using whatever mapping database is present. An enhanced user-interface data-entry feature is provided that anticipates data being entered by users to minimize the data-entry process. The current time zone is derived from the current GPS position and is used to set the clock on the navigation system in the client. Maps are automatically scrolled on a display screen so that a representation of the automobile is always pointing to the right or to the left to allow for additional look-ahead space on certain display systems. A telephone coupled with the navigation system automatically displays the current local time for a called party upon dialing out. The dialed number is used to query a local database for providing local time information.

22 Claims, 10 Drawing Sheets



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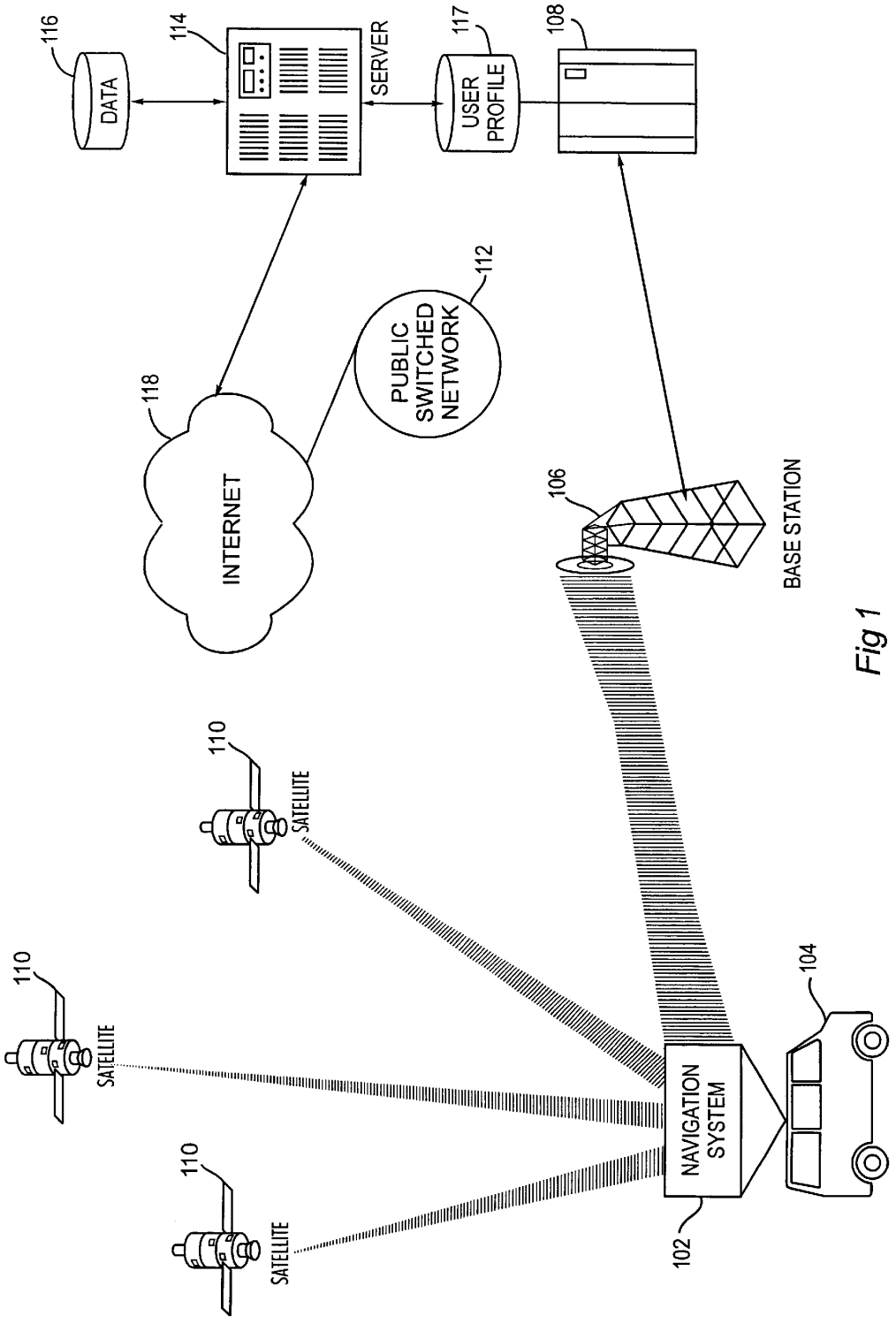

Fig 1

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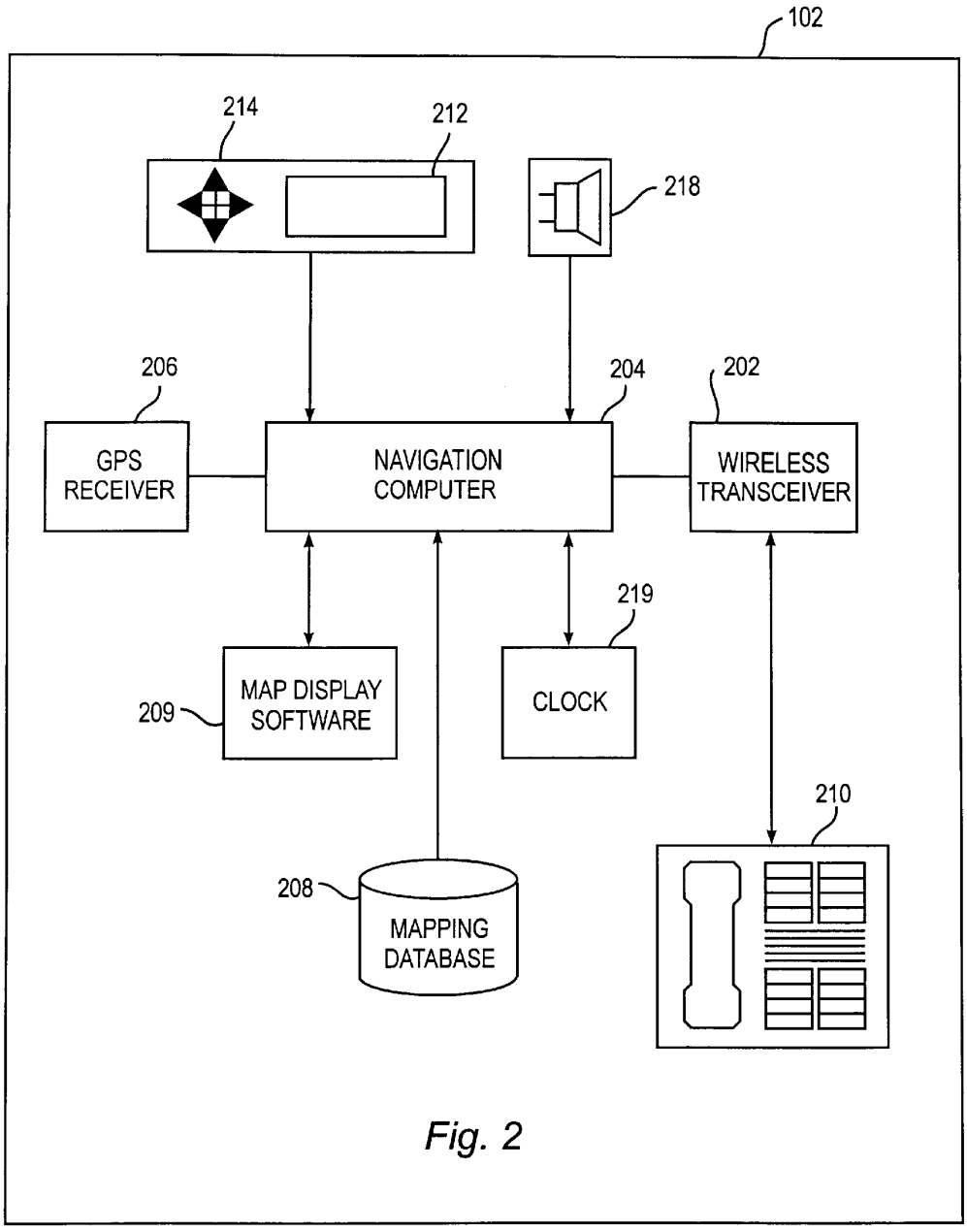

Fig. 2

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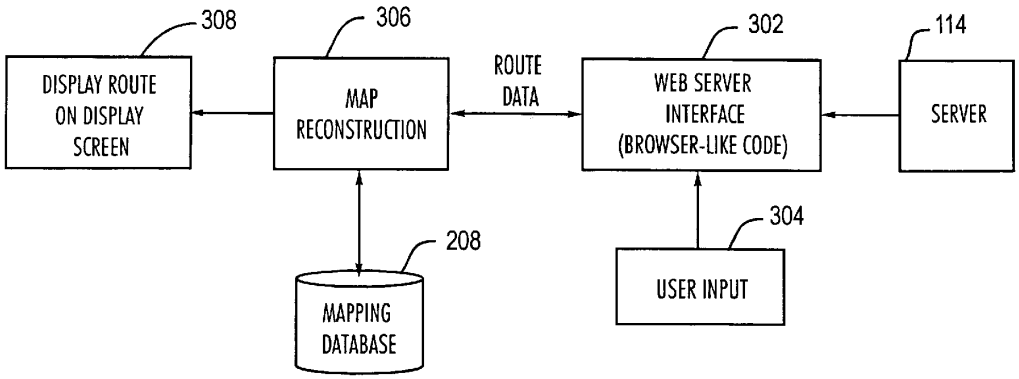

Fig. 3

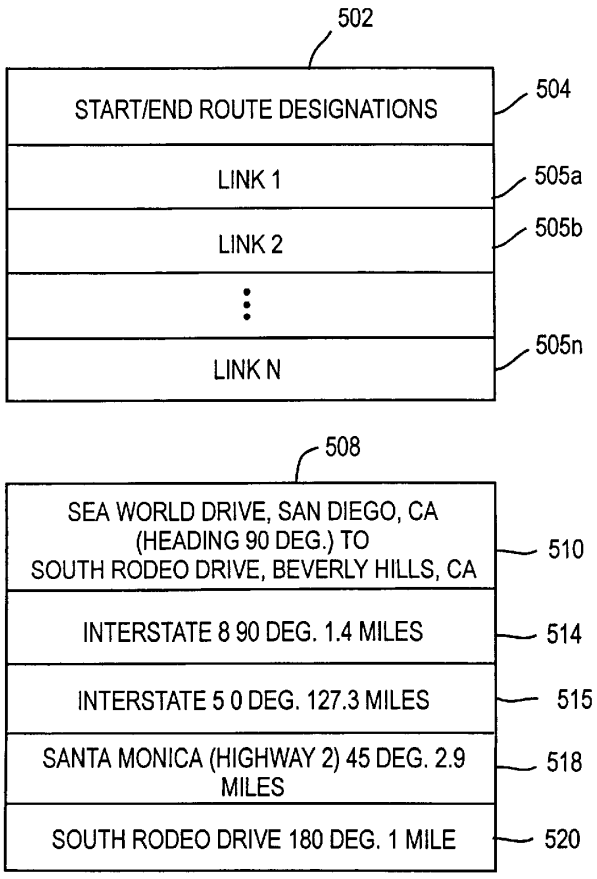

Fig. 5

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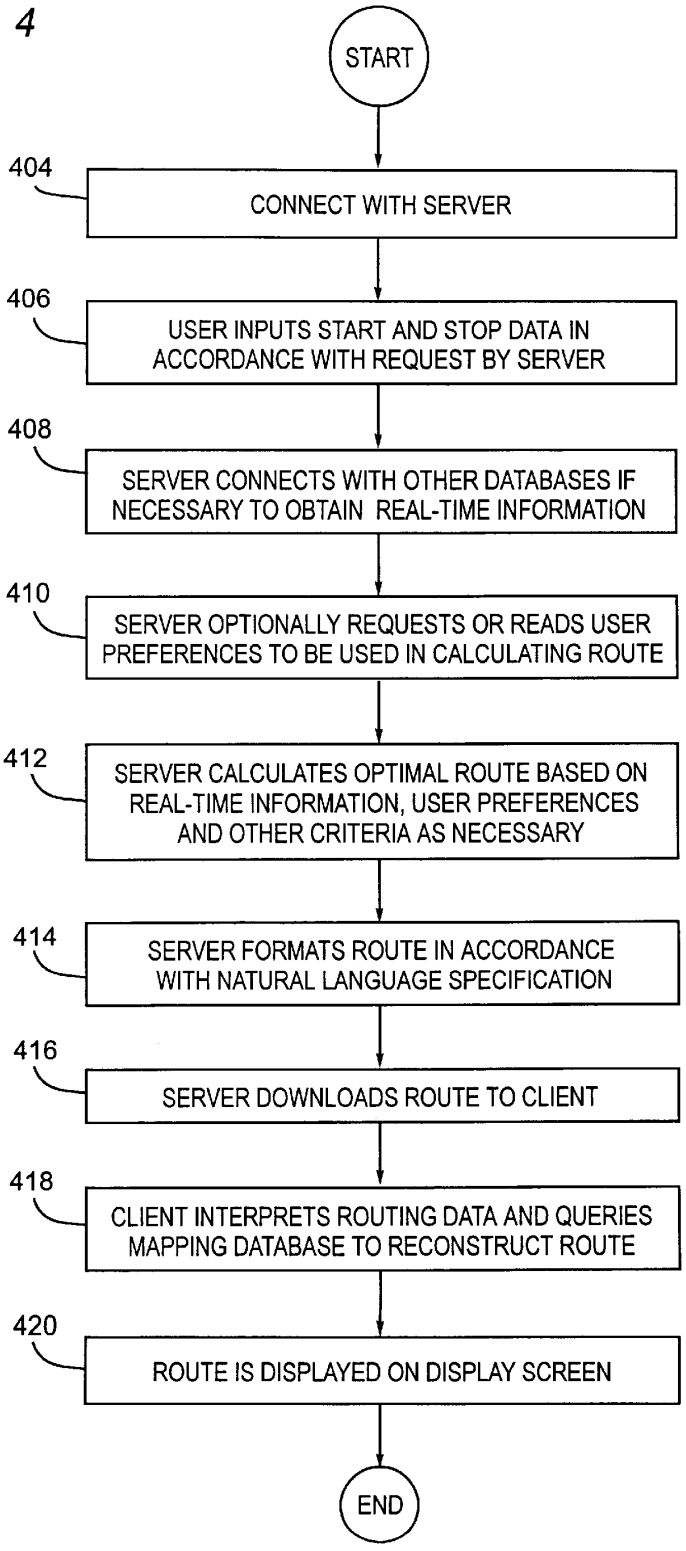
Fig. 4



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