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Trovato et al.

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[54] **PORTABLE SYSTEM FOR PROVIDING VOICE DRIVING DIRECTIONS**

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[52] **U.S. Cl.** **701/211**; 701/200; 340/988
[58] **Field of Search** .... 701/200, 201, 701/202, 211, 212, 213, 208; 73/178 R; 340/988, 990, 995

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[57] **ABSTRACT**

A travel direction speaking system that is based on a portable laptop computer. The computer determines a route between an origin and a destination using an electronic map, and prepares driving instructions based on the route. Each driving instruction includes the spatial position (longitude and latitude) of a change in direction at which the driving instruction applies. The system includes a Global Positioning System (GPS) unit that provides the GPS determined position of the laptop computer. The computer compares the GPS position to the spatial position and outputs the corresponding driving instruction when the two positions are inferred to be within a specified range of each other. The range can be determined based distance or on a time period required to travel from the current position to a position at which the instructions should be spoken. The time period accounts for the amount of time required to speak the directions, for the reaction time of the driver at the speed that the laptop computer is moving within a vehicle and for an error in position associated with GPS commercial systems. When the time period has elapsed the directions are spoken. The system also includes a text to voice unit that converts the text driving instructions into a voice signal.

13 Claims, 5 Drawing Sheets
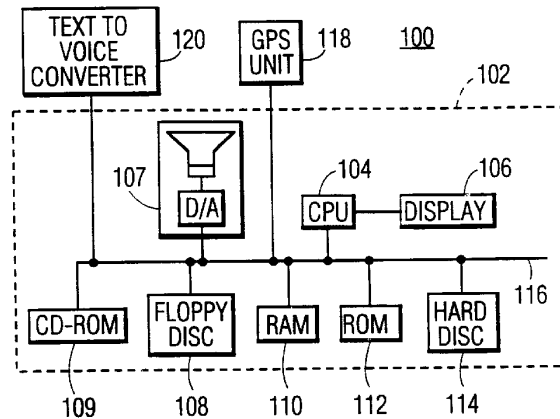
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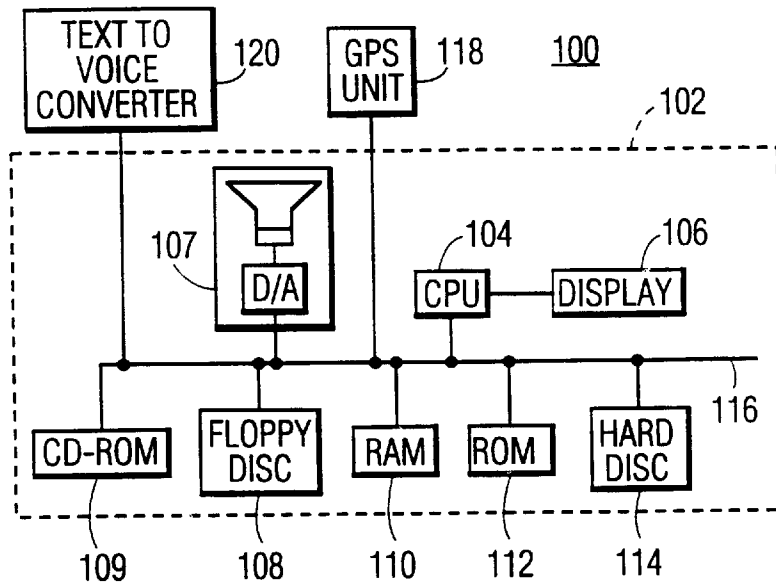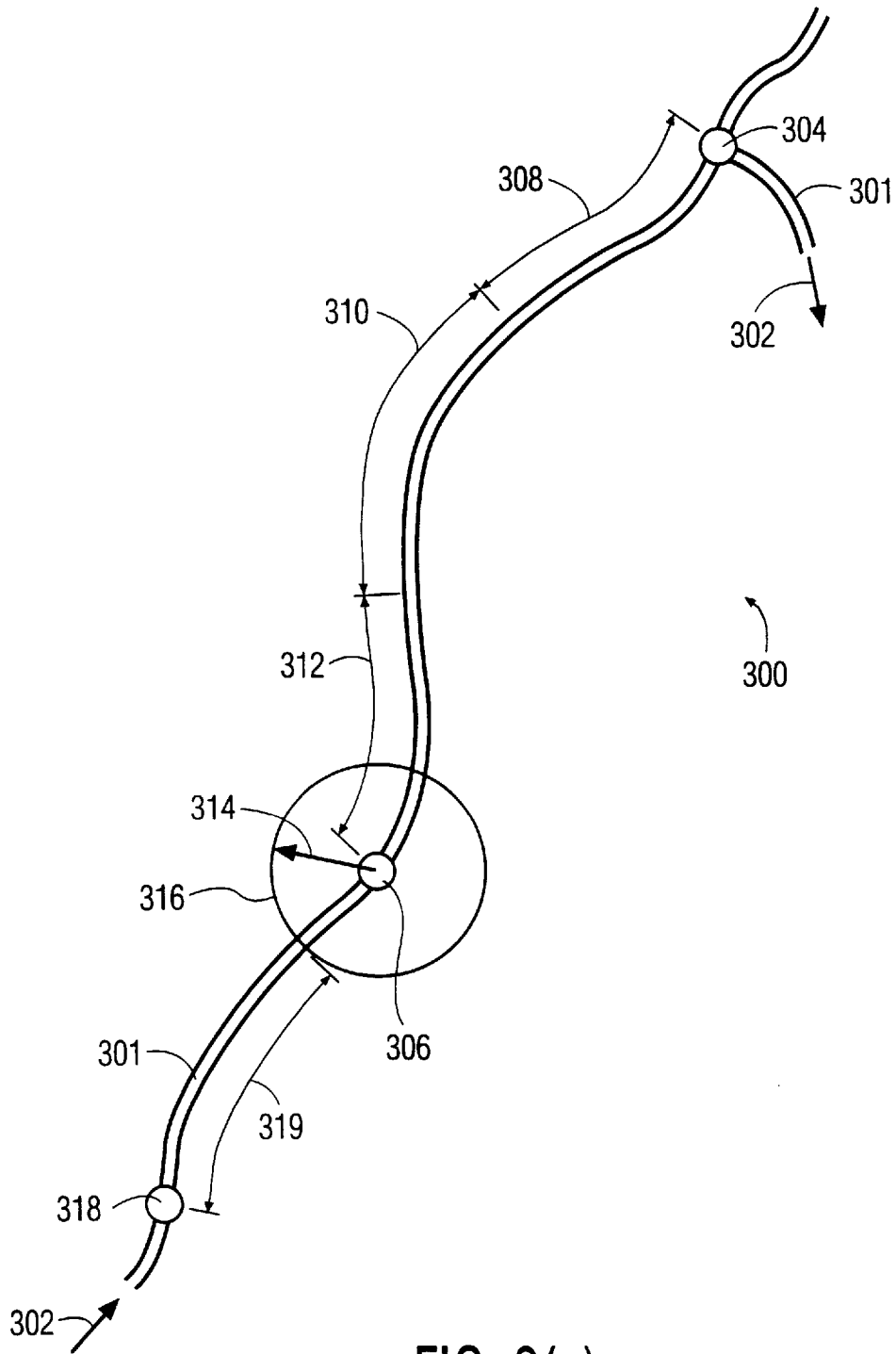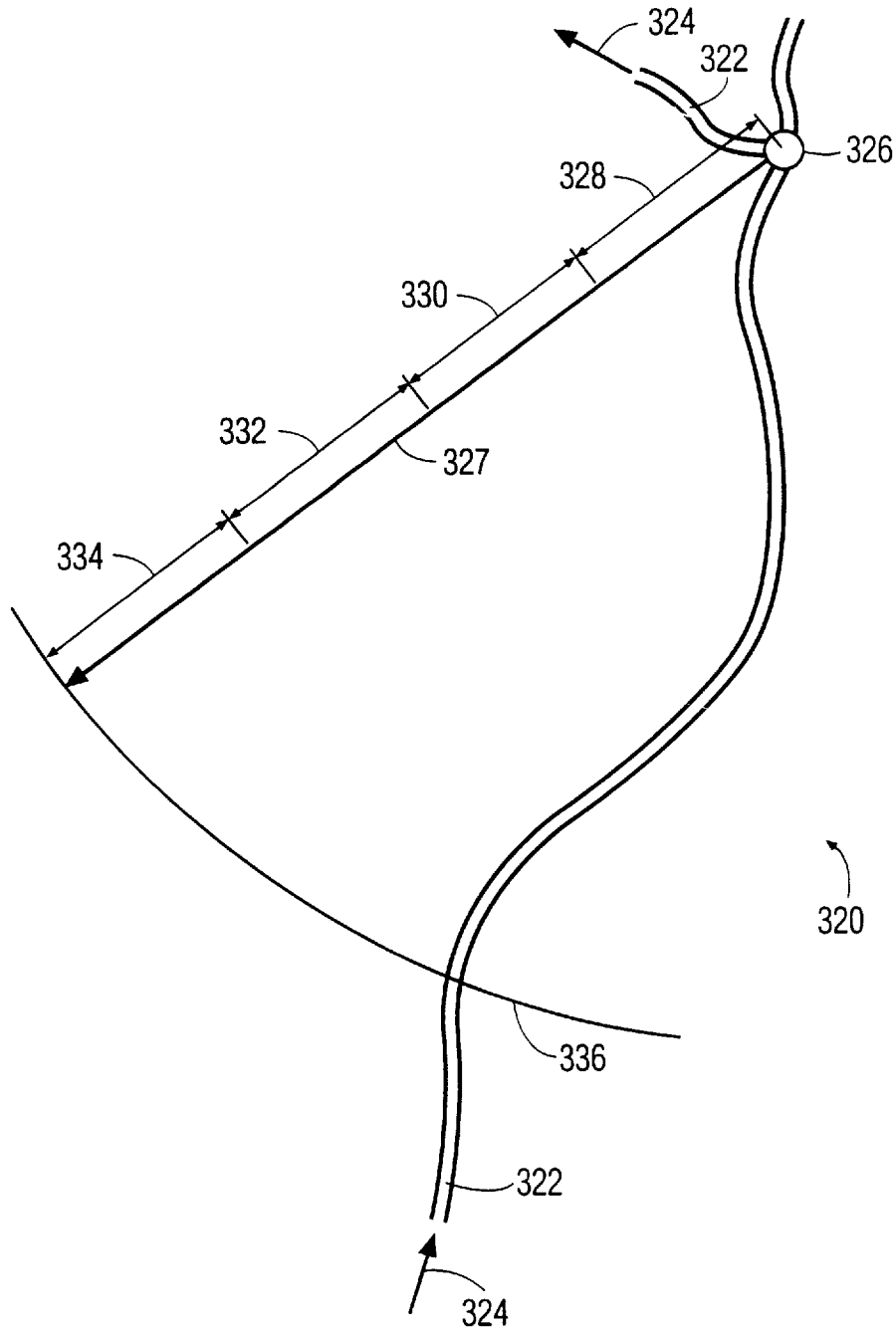
FIG. 1

FIG. 2

FIG. 3(a)

FIG. 3(b)

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