

(12) **United States Patent**  
**Mathews et al.**

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(54) **METHOD AND SYSTEM FOR DISTRIBUTED NAVIGATION AND AUTOMATED GUIDANCE**

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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 379 days.

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**G01C 21/30** (2006.01)  
**G01C 21/32** (2006.01)

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(58) **Field of Classification Search** ..... 701/209, 701/200, 201, 205, 96; 73/178.12; 340/991, 340/993, 995.18, 995.2, 995.24  
See application file for complete search history.

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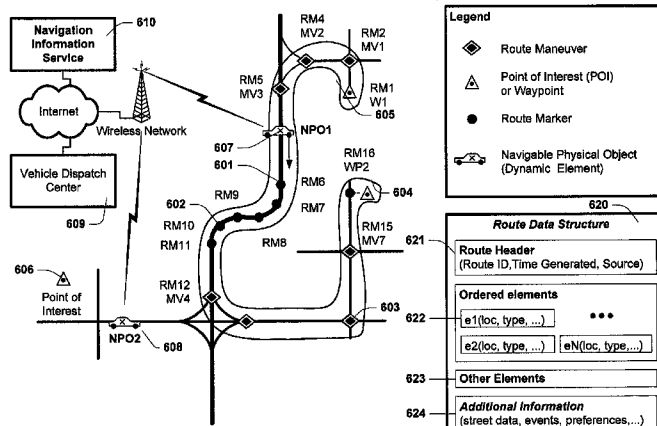
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(57) **ABSTRACT**

The present invention provides for distributed navigation and route guidance using networked computing devices. A computing device may host one or more navigation functional components. The location of a navigable object is sensed and communicated to associated navigation components in a communication network. The navigation components collectively provide guidance information to a navigable object controller. A navigable object controller directs the movement of an navigable object using guidance information to keep it on a specified route. The navigable object controller interacts with the distributed navigation system through an interface, which provides the appropriate presentation of guidance information and functions for the particular type of navigable object controller (e.g., human-machine interface, or system to system). The present invention provides the structures and methods for a flexible navigation and guidance system supporting a variety of network capabilities and computing devices using the same software implementation.

**51 Claims, 16 Drawing Sheets**



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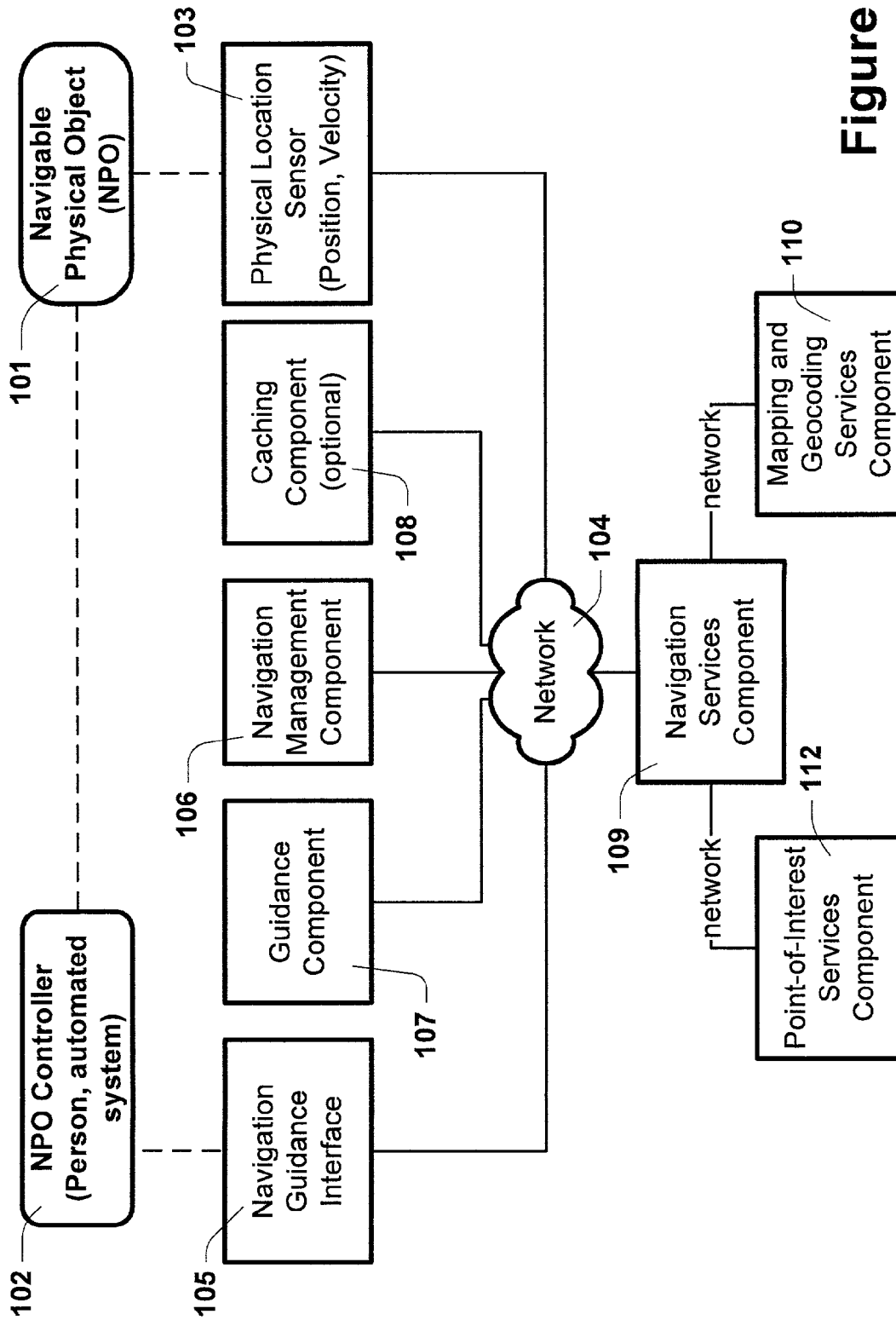


Figure 1

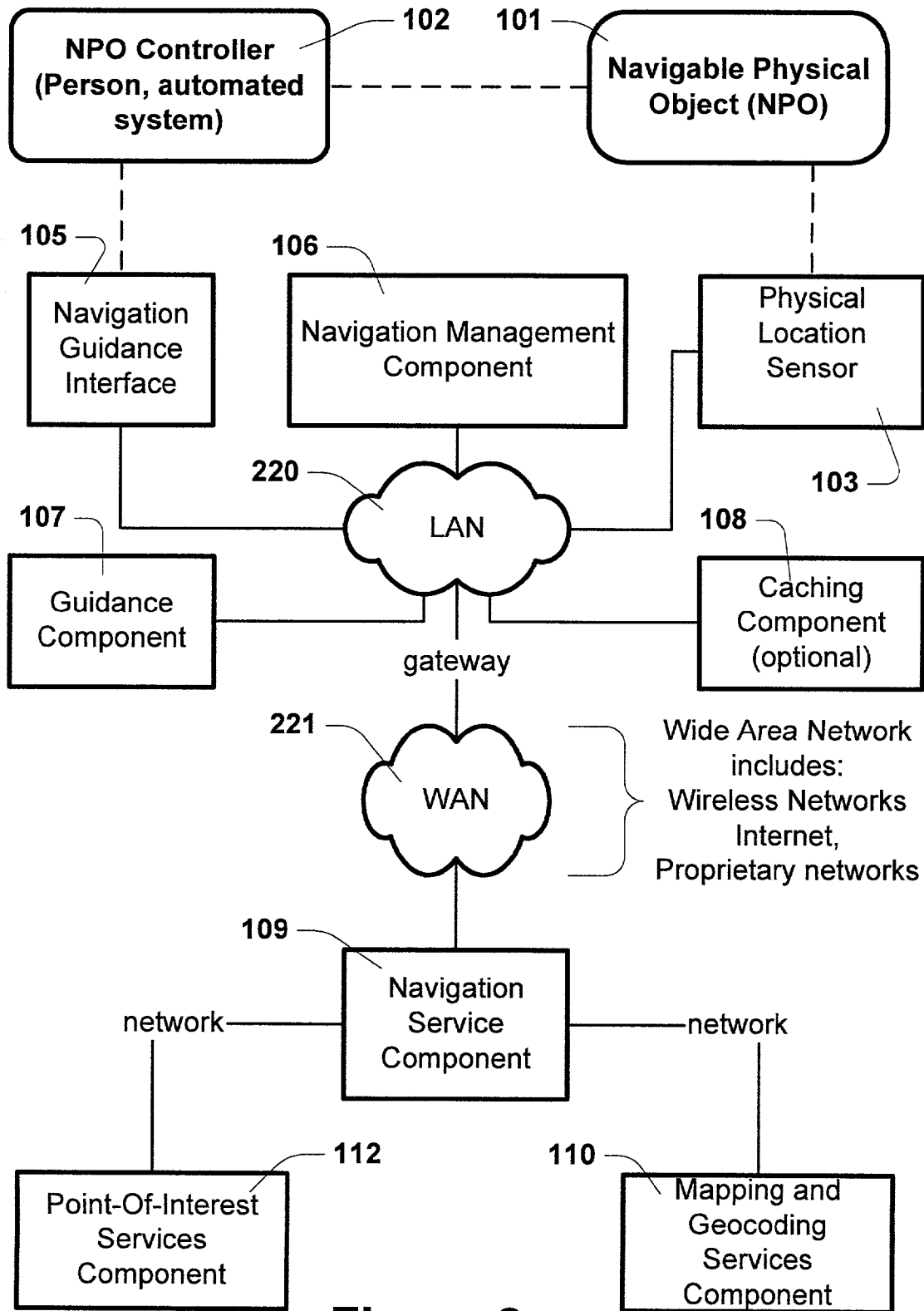


Figure 2

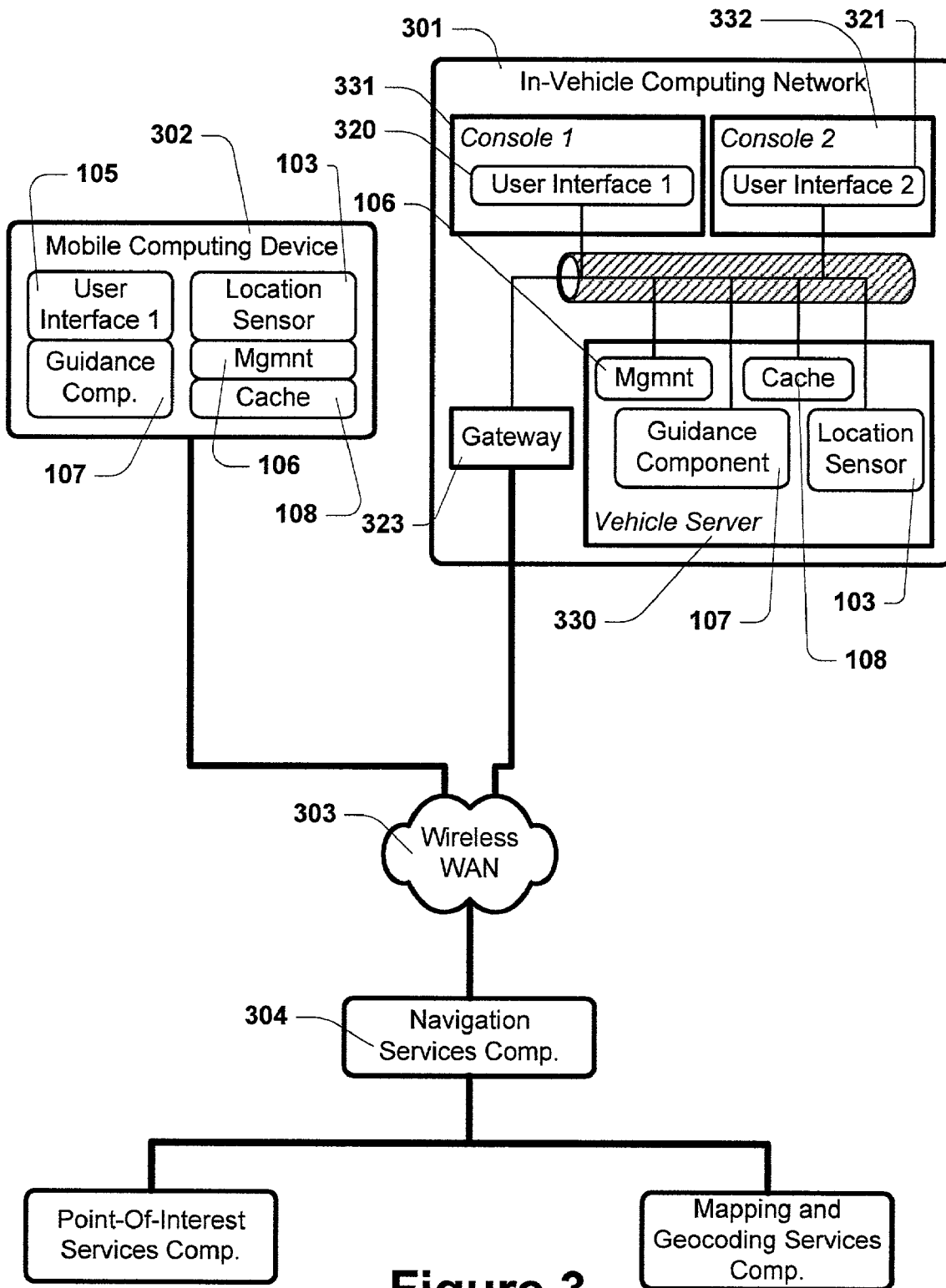


Figure 3

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