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Twitchell et al.

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(54) GPS LOCATION FOR MOBILE PHONES USING THE INTERNET

WO 98/25157 6/1998 (WO) .
 WO 99/19743 4/1999 (WO) .
 WO 99/44073 9/1999 (WO) .

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(73) Assignee: Nokia Mobile Phones Limited, Espoo (FI)

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Assistant Examiner—Fred H. Mull

(51) Int. Cl.⁷ G01S 5/02; H04B 7/185; H04Q 7/20

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(52) U.S. Cl. 342/357.09; 342/357.1; 455/456

(58) Field of Search 342/357.06, 357.09, 342/357.1, 357.13, 450, 457; 455/456, 457, 426; 701/214

(57) ABSTRACT

A position locating system and method are provided for determining a geographic location of a portable remote unit. The locating system includes a communications system having at least one base station and a system controller. The base station bi-directionally couples the remote unit to the system controller through wireless links. The locating system also includes a server coupled to the system controller by a communication infrastructure external to the communications system. The server includes a data store which contains satellite positioning information. In response to a message from the remote unit, the server provides satellite information to the system controller over the communication infrastructure such that the provided satellite information is passed to the remote unit by the base station. The provided satellite information includes information to aid in acquiring a predetermined number of satellites within a satellite positioning system. The acquired satellites provide coded signals for determining the geographic location of the remote unit. In one embodiment, the data communication system is a cellular telephone network and the communication infrastructure is the Internet. The Internet is coupled to the cellular telephone network through a public switched telephone network (PSTN).

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29 Claims, 7 Drawing Sheets

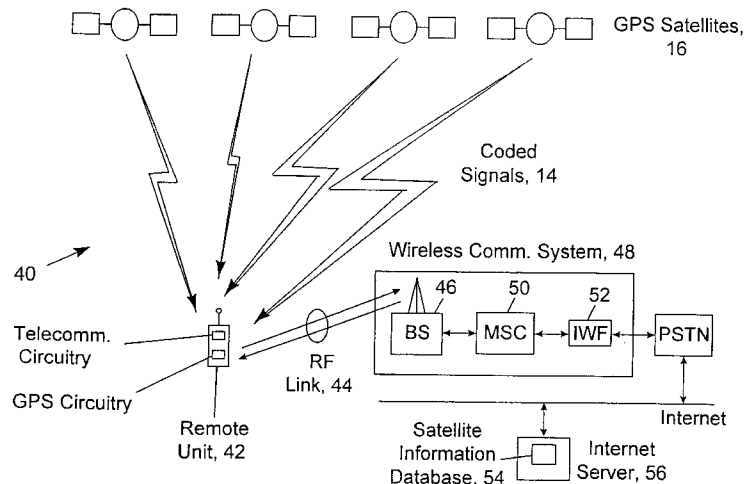


Fig. 1
Prior Art

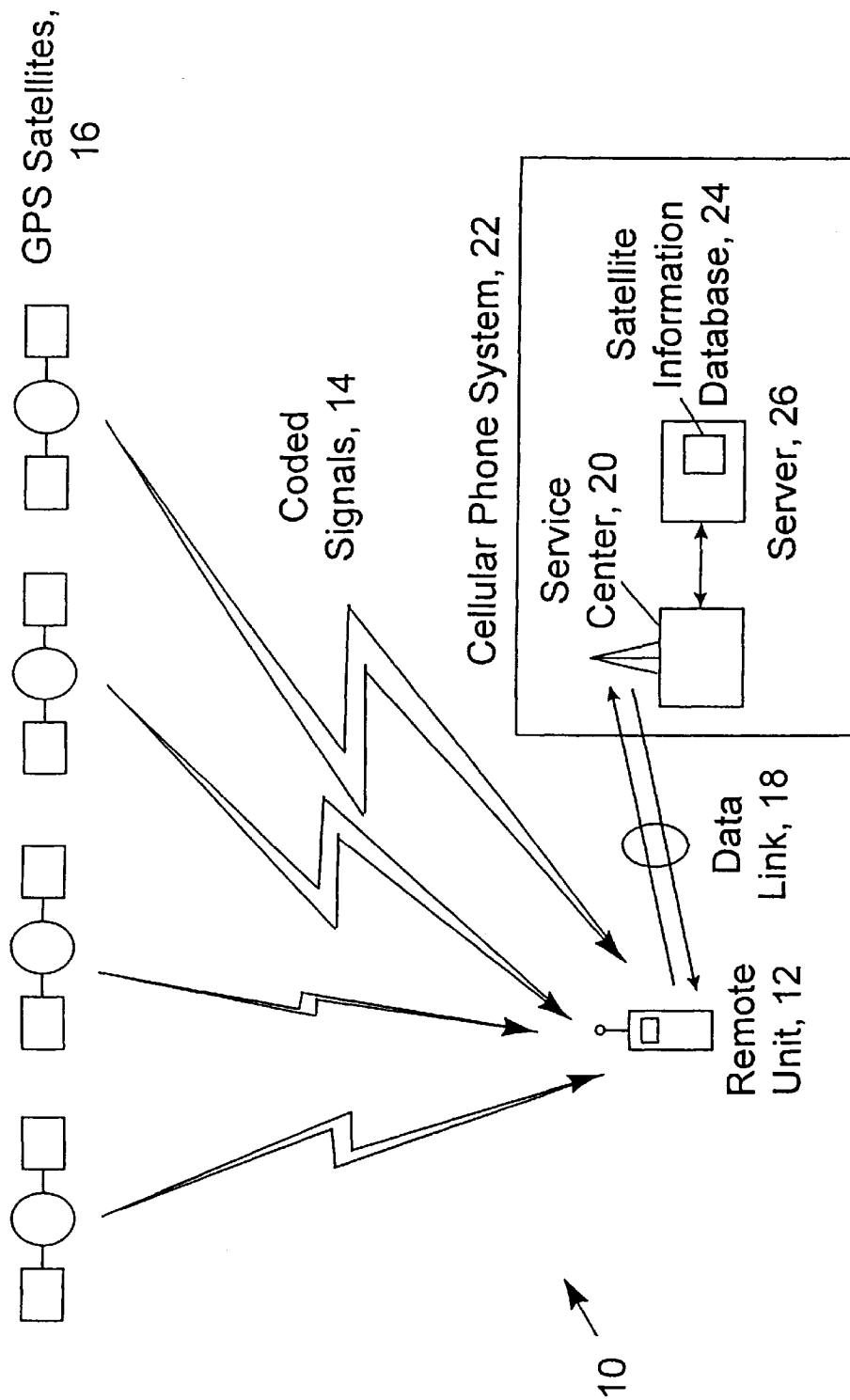


Fig. 2

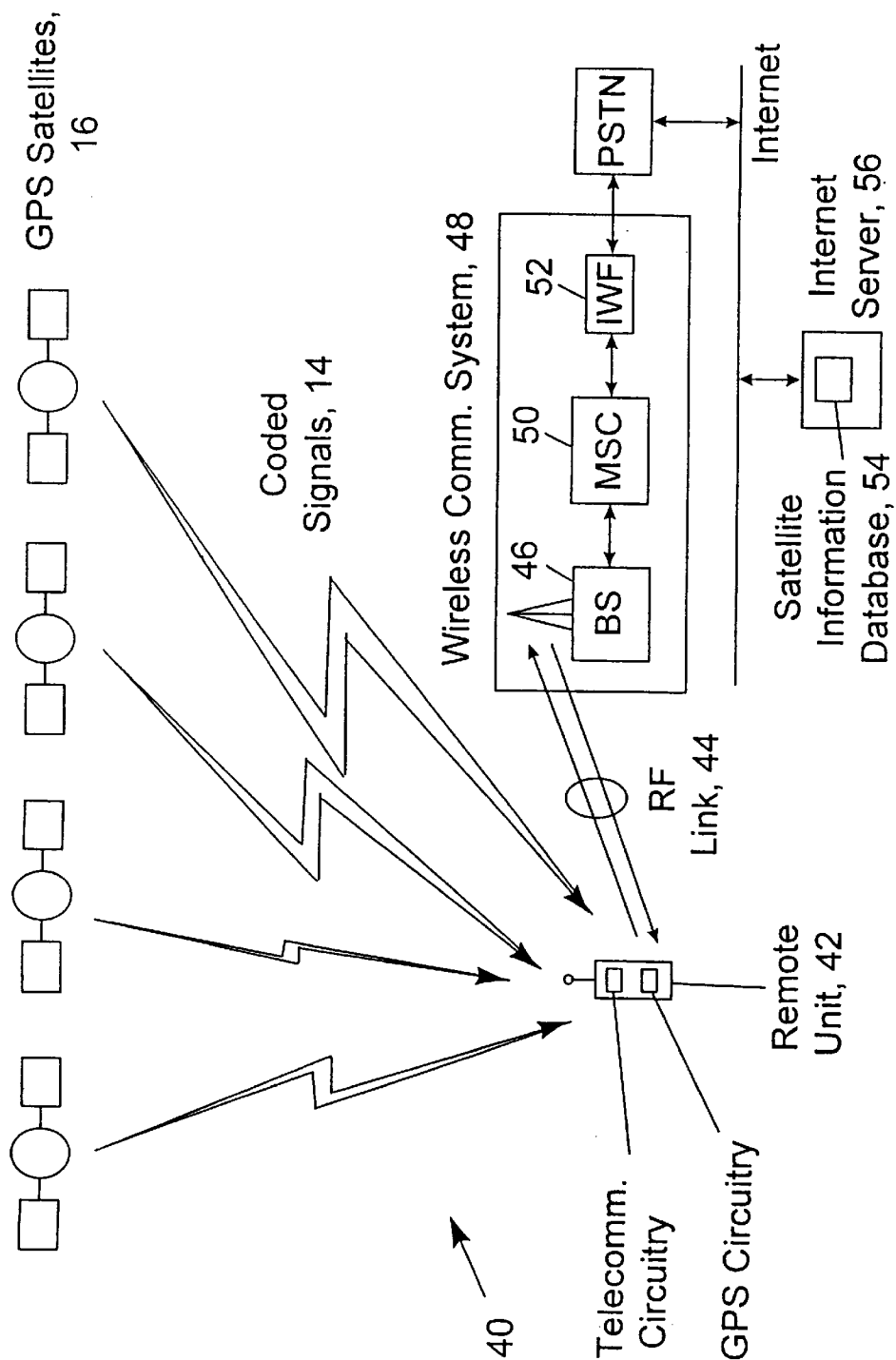
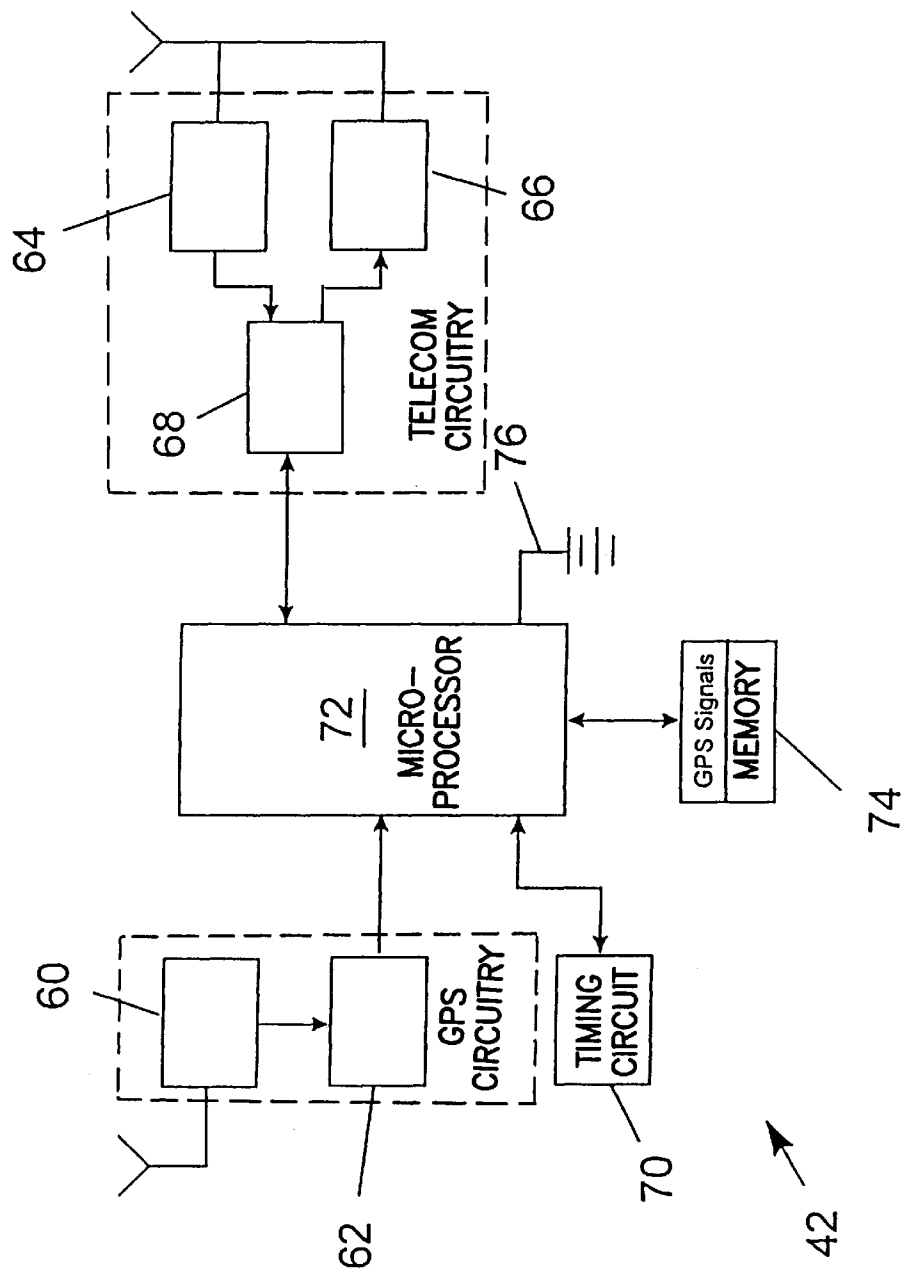
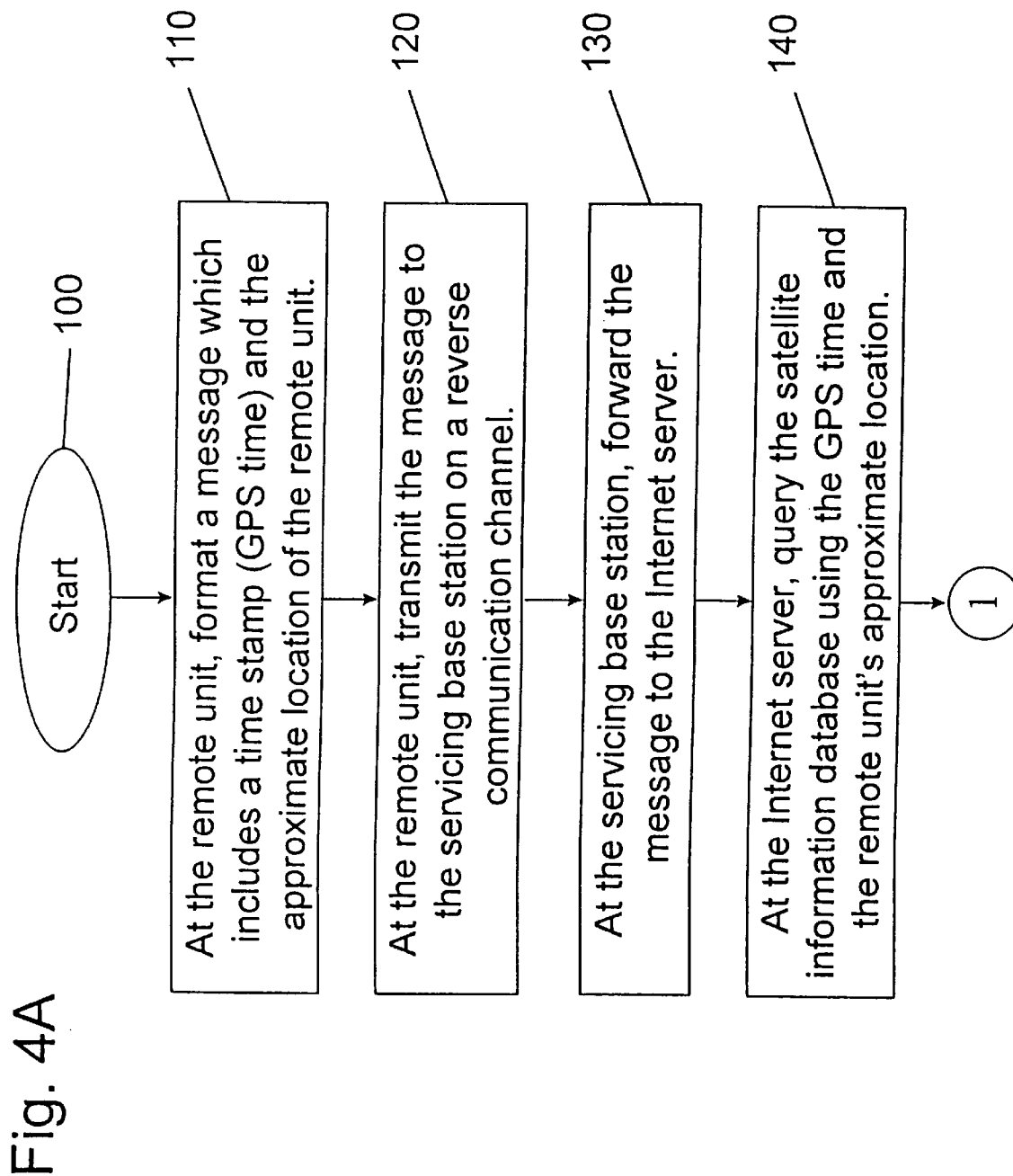


Fig. 3





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