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(12) **United States Patent**
Harvey

(10) **Patent No.:** **US 7,196,661 B2**
(45) **Date of Patent:** **Mar. 27, 2007**

(54) **SECURITY SYSTEM INCLUDING A METHOD AND SYSTEM FOR ACQUIRING GPS SATELLITE POSITION**

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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 193 days.

* cited by examiner

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(21) Appl. No.: **10/867,320**

(22) Filed: **Jun. 14, 2004**

(57) **ABSTRACT**

(65) **Prior Publication Data**
US 2004/0252053 A1 Dec. 16, 2004

A security system and a method and apparatus utilize a transmitter and a receiver with a GPS sub-system in a GPS appliance. Ephemeris and almanac data are updated at preprogrammed times within coordinated windows of opportunity. Each GPS receiver is preferably kept in an inactive state to reduce power consumption except at the preprogrammed times and uses time-compressed formats of GPS ephemeris data. An additional receiver makes possible the use of a coordinated window of opportunity whereby the receiver is set to an active state to receive complete ephemeris data sets when transmitted. The security system monitors conditions. Security sensors may respond to a condition to “awaken” a transmitter that may then transmit a report providing the location of the appliance. The report may include manifest information such as the identity of a container to which the GPS system is affixed, the sensor reporting the breach and its location.

Related U.S. Application Data

(60) Provisional application No. 60/478,272, filed on Jun. 13, 2003, provisional application No. 60/478,727, filed on Jun. 13, 2003.

(51) **Int. Cl.**
G01S 1/00 (2006.01)

(52) **U.S. Cl.** **342/357.15**

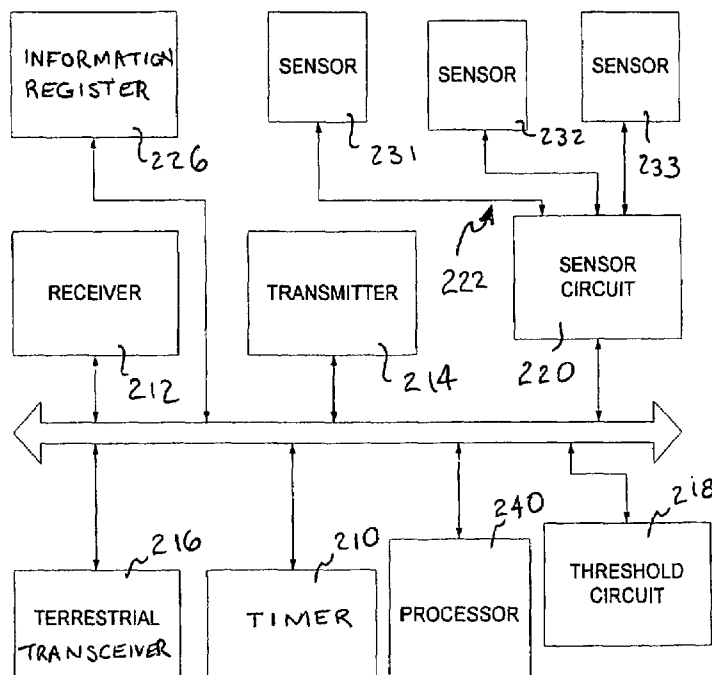
(58) **Field of Classification Search** 342/357.06, 342/357.09, 357.12, 357.15; 701/213, 215
See application file for complete search history.

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15 Claims, 7 Drawing Sheets



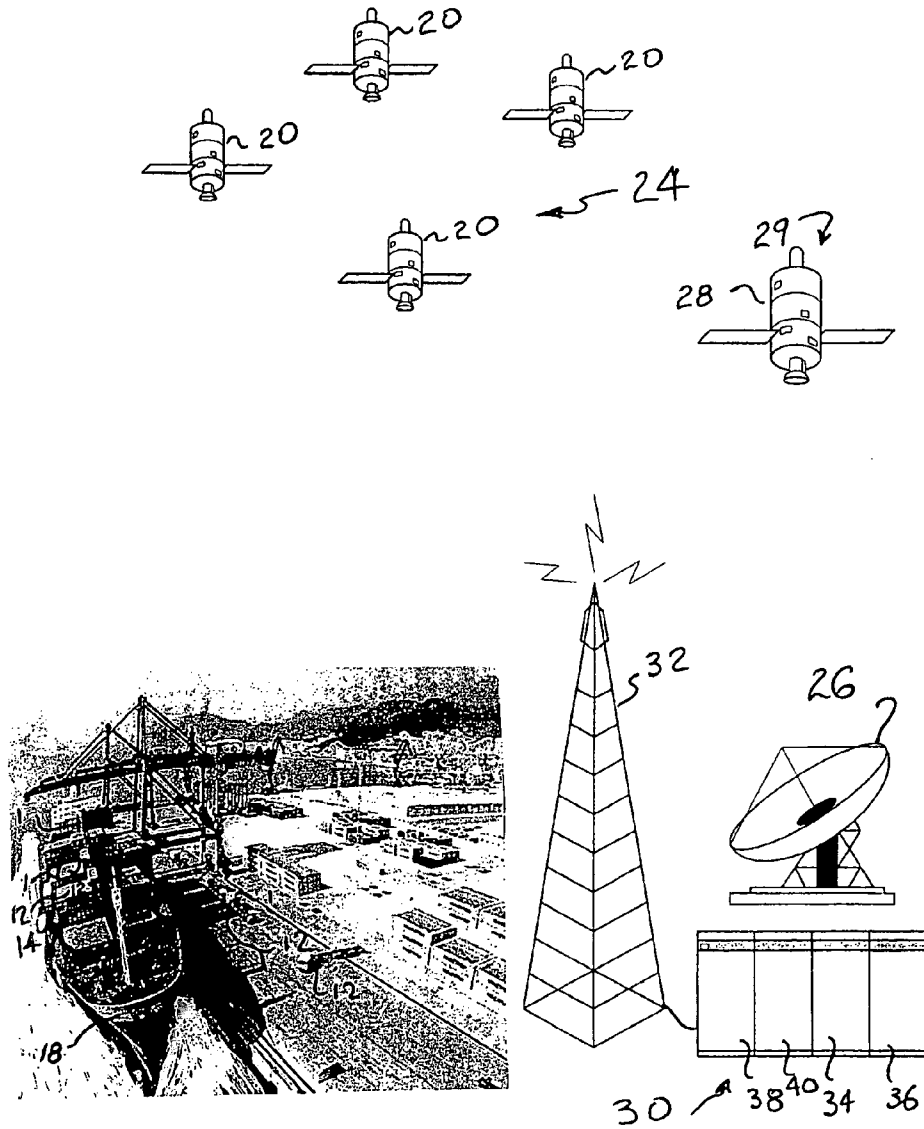


FIG. 1

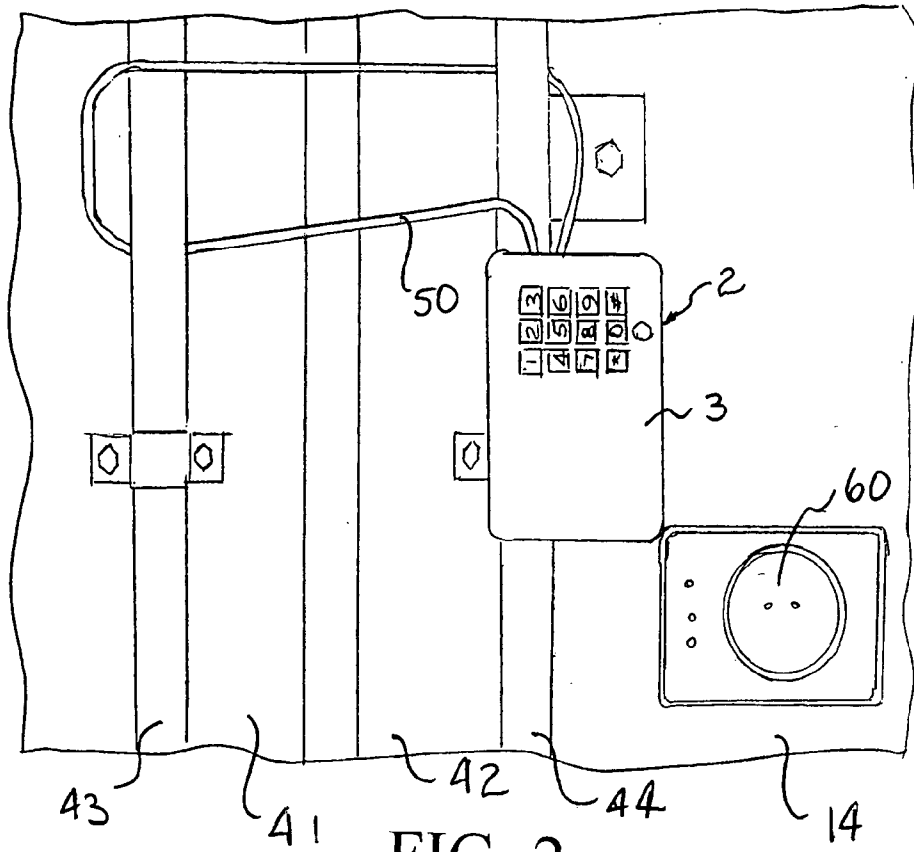


FIG. 2

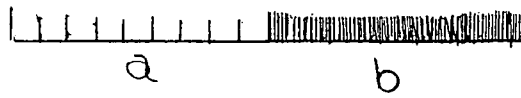


FIG. 3

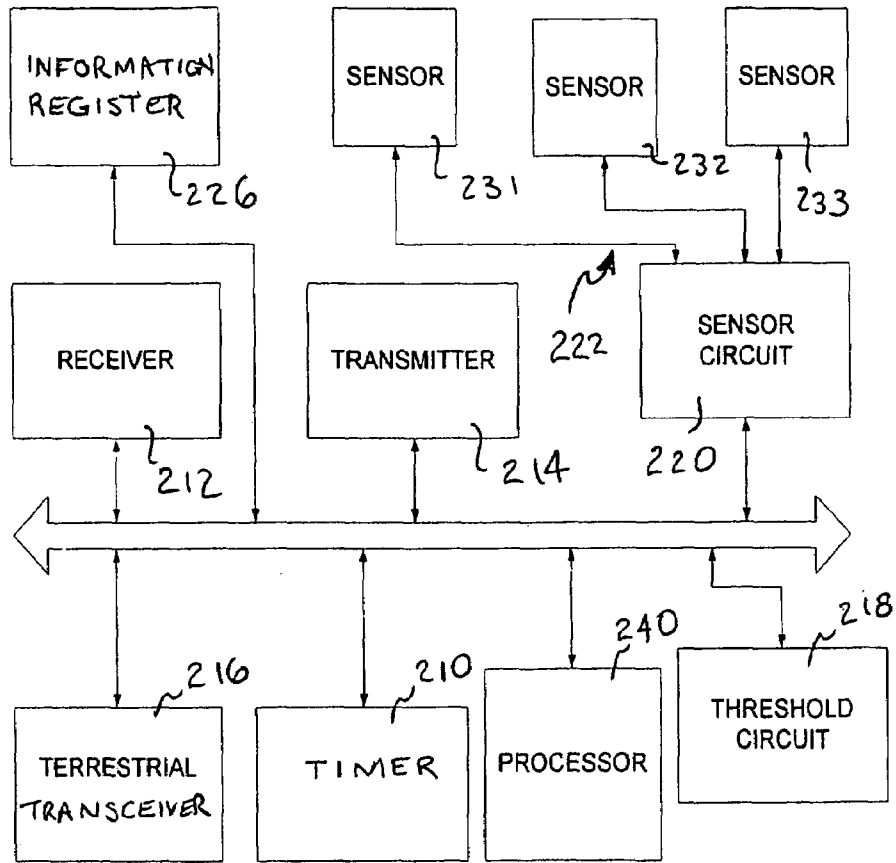


FIG. 4

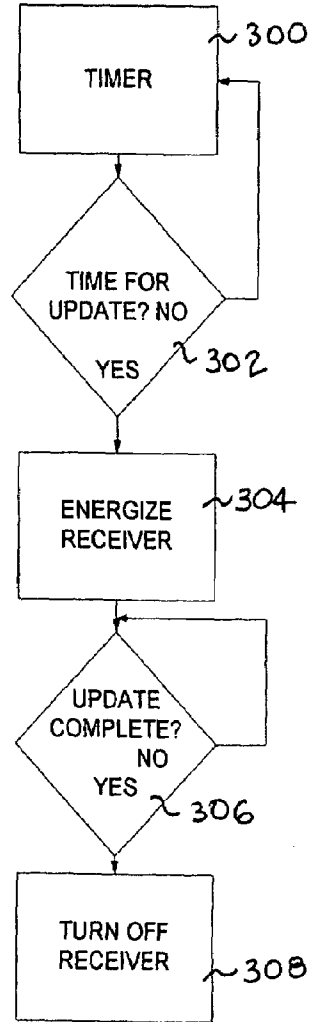


FIG. 5

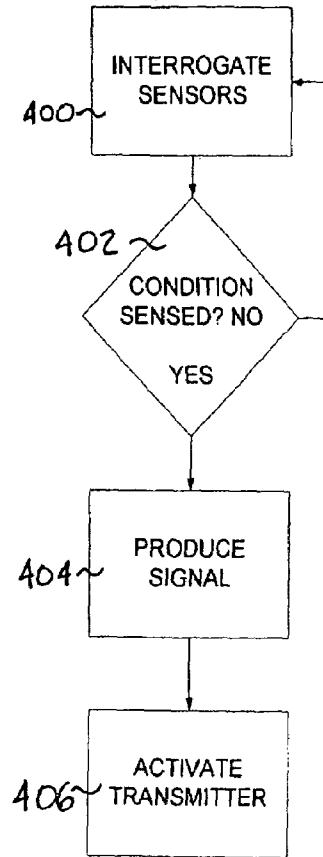


FIG. 6

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