



US007725253B2

(12) **United States Patent**  
**Foxlin**

(10) **Patent No.:** **US 7,725,253 B2**  
(45) **Date of Patent:** **\*May 25, 2010**

(54) **TRACKING, AUTO-CALIBRATION, AND MAP-BUILDING SYSTEM**

2002/0052674 A1 5/2002 Chang et al.

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(73) Assignee: **InterSense, Inc.**, Billerica, MA (US)

WO WO 01/80736 11/2001

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1293 days.

OTHER PUBLICATIONS

This patent is subject to a terminal disclaimer.

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(21) Appl. No.: **11/147,688**

(22) Filed: **Jun. 8, 2005**

"IEEE Standard for a Smart Transducer Interface for Sensors and Actuators—Transducer to Microprocessor Communication Protocols and Transducer Electronic Data Sheet (TEDS) Format". Institute of Electrical and Electronics Engineers, Inc., New York, NY. Sep. 25, 1998.

(65) **Prior Publication Data**

US 2006/0027404 A1 Feb. 9, 2006

**Related U.S. Application Data**

(Continued)

(63) Continuation of application No. 10/639,242, filed on Aug. 11, 2003, now Pat. No. 6,922,632.

*Primary Examiner*—Gertrude Arthur Jeanglaud  
(74) *Attorney, Agent, or Firm*—Fish & Richardson P.C.

(60) Provisional application No. 60/402,178, filed on Aug. 9, 2002.

(57) **ABSTRACT**

(51) **Int. Cl.**

**G01C 21/00** (2006.01)

A navigation or motion tracking system includes components associated with particular sensors, which are decoupled from a tracking component that takes advantage of information in the sensor measurements. The architecture of this system enables development of sensor-specific components independently of the tracking component, and enables sensors and their associated components to be added or removed without having to re-implement the tracking component. In a software implementation of the system, sensor-specific software components may be dynamically incorporated into the system and the tracking component is then automatically configured to take advantage of measurements from the corresponding sensors without having to modify the tracking component.

(52) **U.S. Cl.** ..... 701/207; 701/36; 701/220; 701/300; 342/357.07

(58) **Field of Classification Search** ..... 701/33, 701/36, 207, 220, 222, 225, 300; 340/357.01, 340/357.08

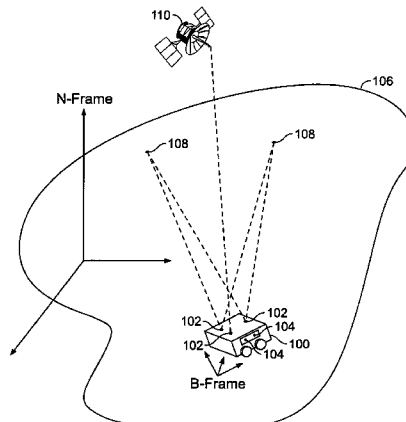
See application file for complete search history.

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**9 Claims, 12 Drawing Sheets**



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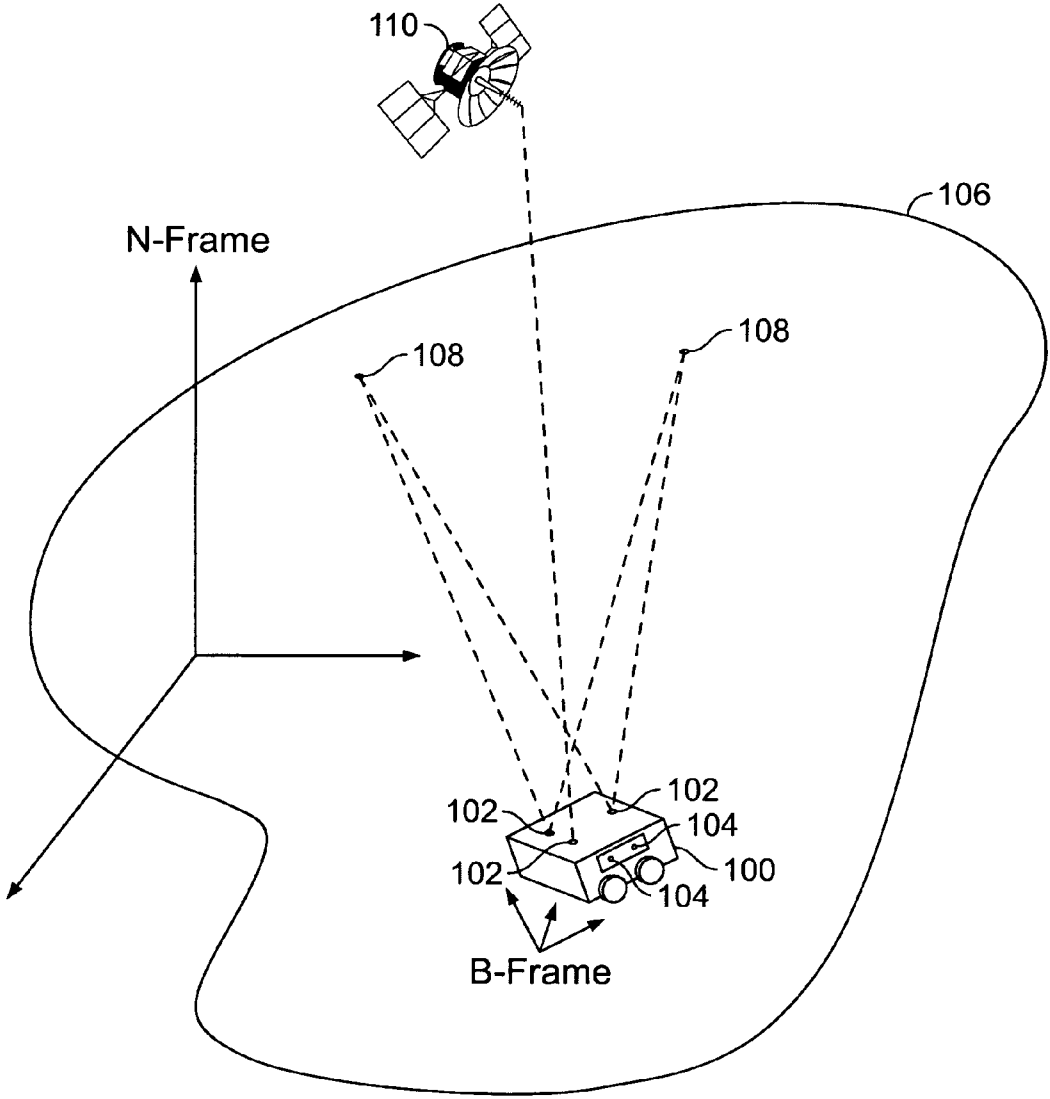


FIG. 1

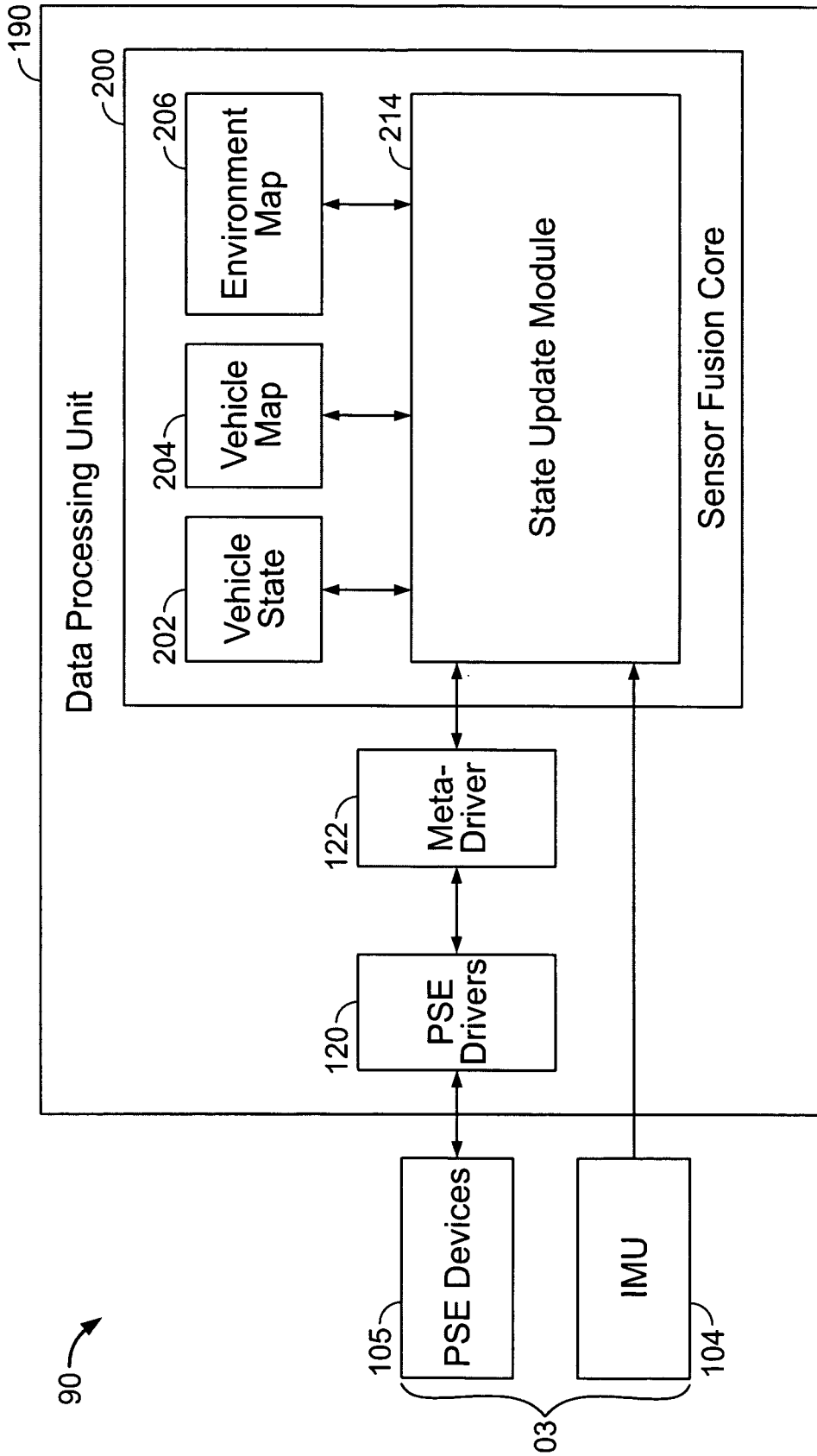


FIG. 2

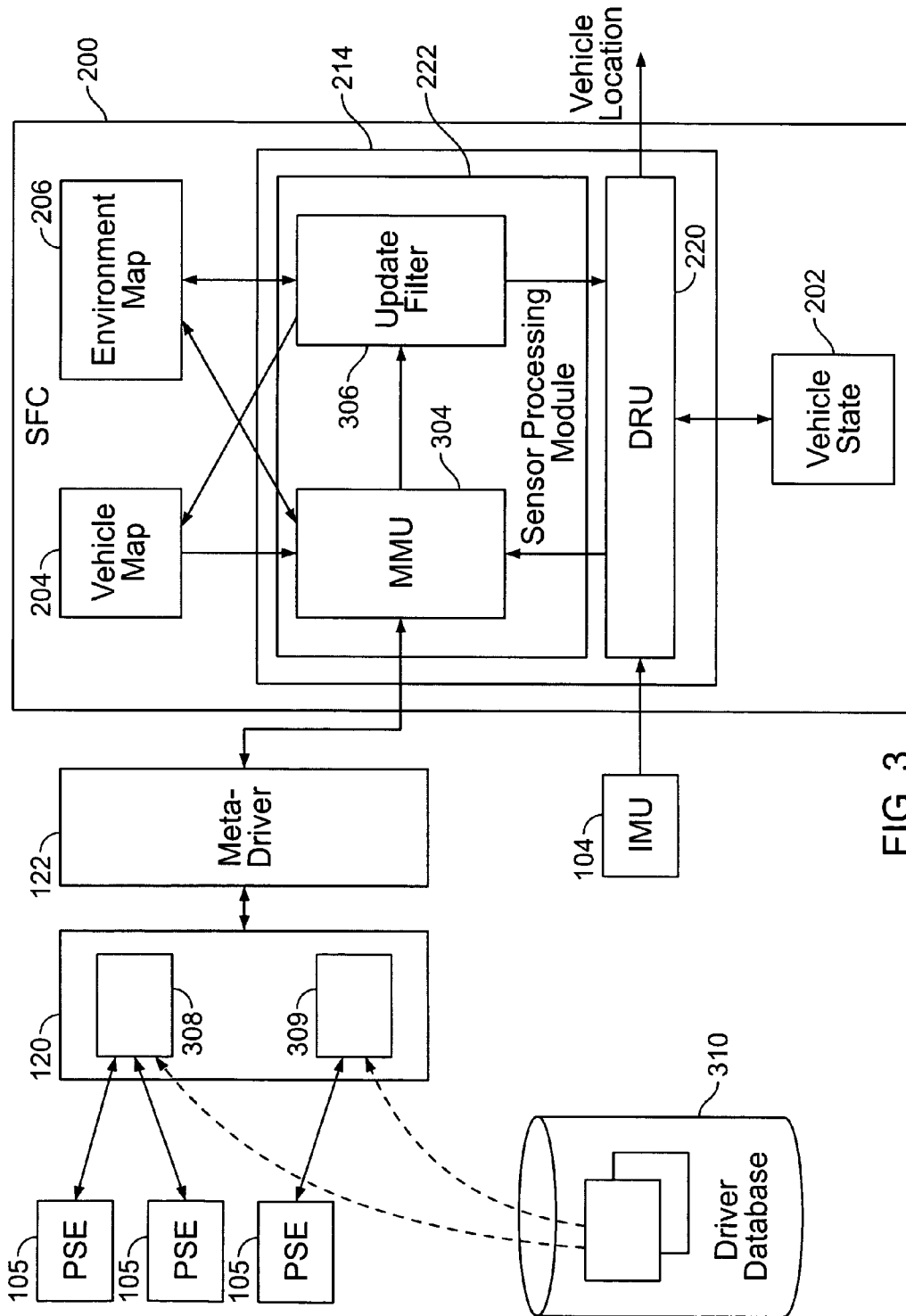


FIG. 3

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