



US006169552B1

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

(10) **Patent No.:** **US 6,169,552 B1**  
(45) **Date of Patent:** **Jan. 2, 2001**

(54) **MAP DISPLAY DEVICE, NAVIGATION  
DEVICE AND MAP DISPLAY METHOD**

0 747 863 12/1996 (EP) .  
0 747 863 A2 12/1996 (EP) .

(75) Inventors: **Yoshinori Endo; Mariko Okude**, both  
of Ibaraki-ken (JP)

**OTHER PUBLICATIONS**

(73) Assignee: **Xanavi Informatics Corporation (JP)**

Fleischman R. N. et al., "A Preliminary Account of Trav Tek  
Route Guidance Use by Rental and Local Drivers", Pro-  
ceedings of the Vehicle Navigation and Informations Sys-  
tems Conference, Ottawa, Oct. 12-15, 1993, No. -, Oct. 12,  
1993, Reekie H. M., pp. 120-125, XP000448513

(\*) Notice: Under 35 U.S.C. 154(b), the term of this  
patent shall be extended for 0 days.

\* cited by examiner

(21) Appl. No.: **08/839,611**

(22) Filed: **Apr. 15, 1997**

*Primary Examiner*—Mark Zimmerman  
*Assistant Examiner*—Kimbinh T. Nguyen  
(74) *Attorney, Agent, or Firm*—Pennie & Edmonds LLP

(30) **Foreign Application Priority Data**

Apr. 16, 1996 (JP) ..... 8-094255  
Apr. 18, 1996 (JP) ..... 8-096932

(57) **ABSTRACT**

(51) **Int. Cl.**<sup>7</sup> ..... **G06T 15/20**

There is provided a map display device and a navigation  
device for displaying a three-dimensional map in which  
information which is originally hidden can be displayed on  
a display frame (screen). The map display device  
(navigation device) includes a map storing unit for storing  
three-dimensional data of each map constituent, and a map  
display unit for forming a three-dimensional bird's-eye view  
map which is obtained by projecting onto the plane from a  
desired view point each map constituent which is specified  
by the three-dimensional data stored in the map storing unit,  
and displaying the three-dimensional bird's-eye view map  
thus formed on a display frame (screen). When information  
which is requested to be displayed by a user is hidden by  
another map constituent located in front of the information  
and thus is not originally displayed on the three-dimensional  
bird's-eye view map, the map display unit changes a pro-  
jection mode for projecting the information or the other map  
constituent on the plane so that the information is displayed  
on the display frame.

(52) **U.S. Cl.** ..... **345/427; 345/421; 345/425;**  
**345/133; 345/139**

(58) **Field of Search** ..... **345/133, 139,**  
**345/419, 421, 425, 427; 701/200**

(56) **References Cited**

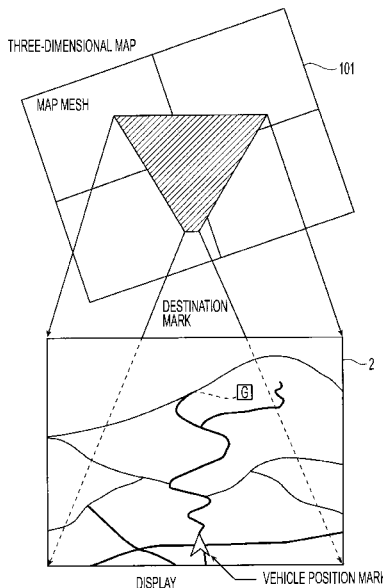
**U.S. PATENT DOCUMENTS**

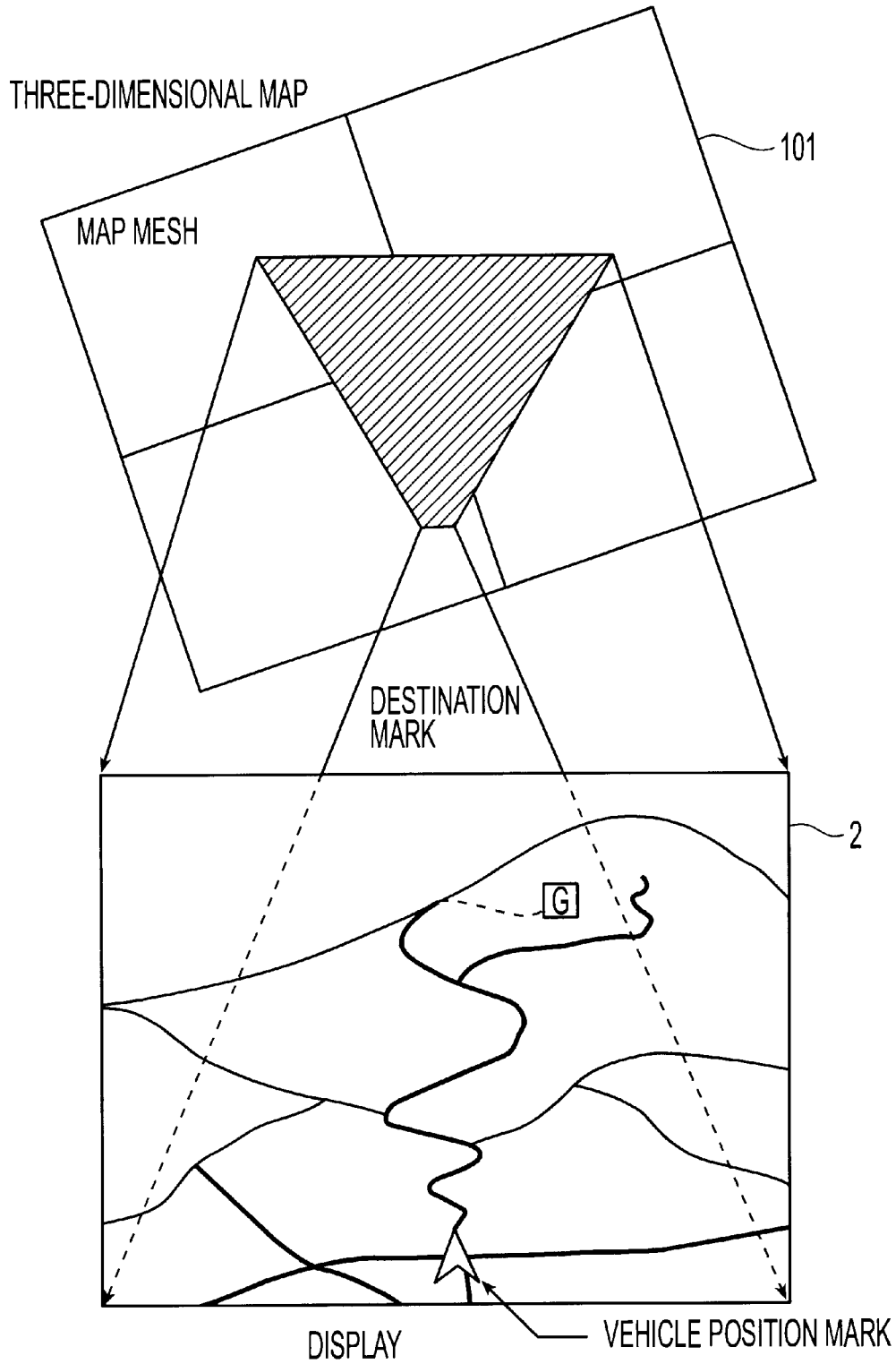
4,812,980 \* 3/1989 Yamada et al. .... 701/200  
5,115,398 \* 5/1992 De Jong ..... 701/200  
5,189,430 2/1993 Yano et al. .  
5,602,564 \* 2/1997 Iwamura et al. .... 345/112  
5,694,530 \* 12/1997 Goto ..... 345/419  
5,748,109 \* 5/1998 Kosaka et al. .... 345/133  
5,764,217 \* 6/1998 Borrel et al. .... 345/156

**FOREIGN PATENT DOCUMENTS**

0 378 271 7/1990 (EP) .  
0 660 290 6/1995 (EP) .  
0 660 290 A1 6/1995 (EP) .

**38 Claims, 55 Drawing Sheets**





*Fig. 1*

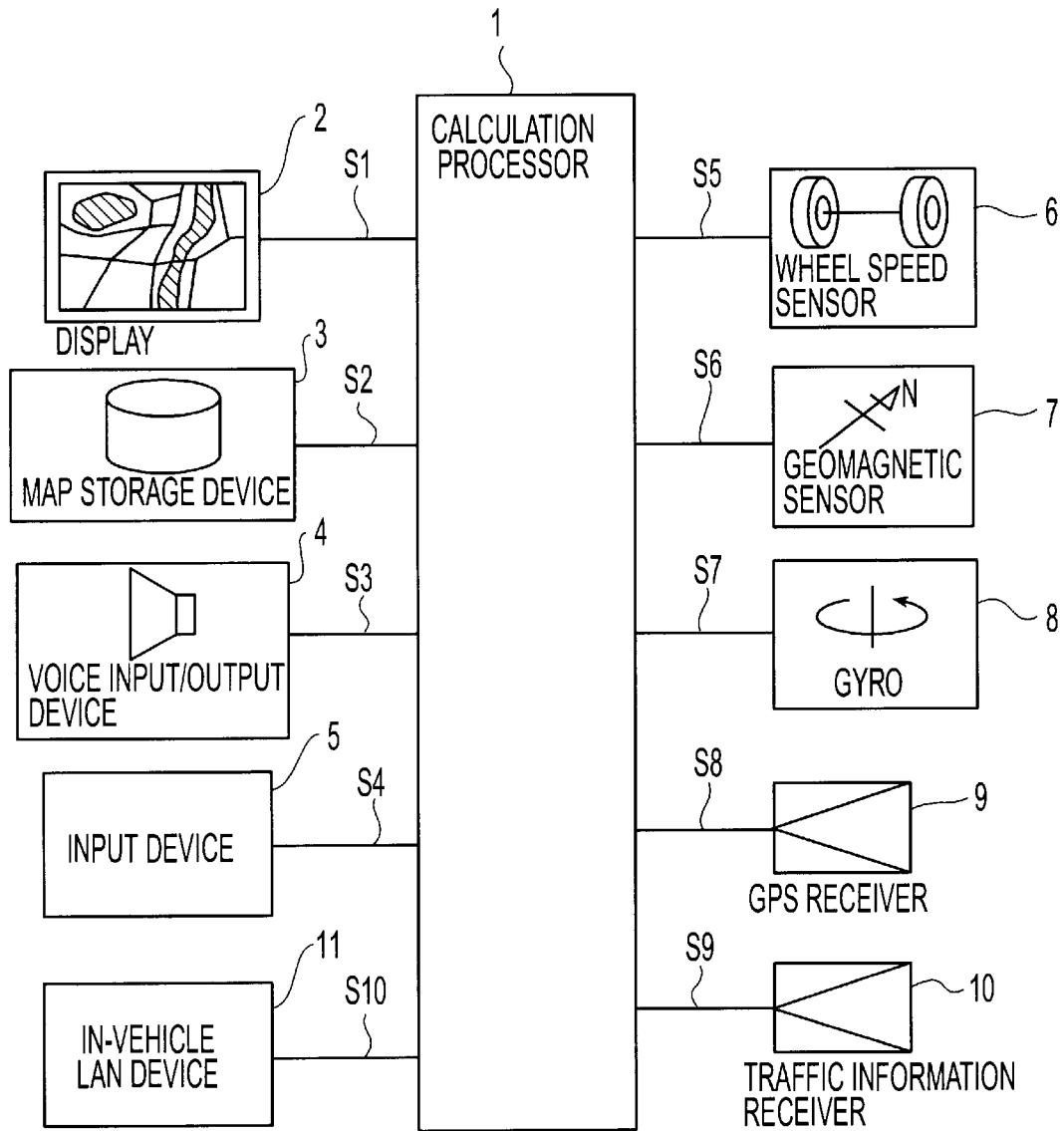


Fig. 2

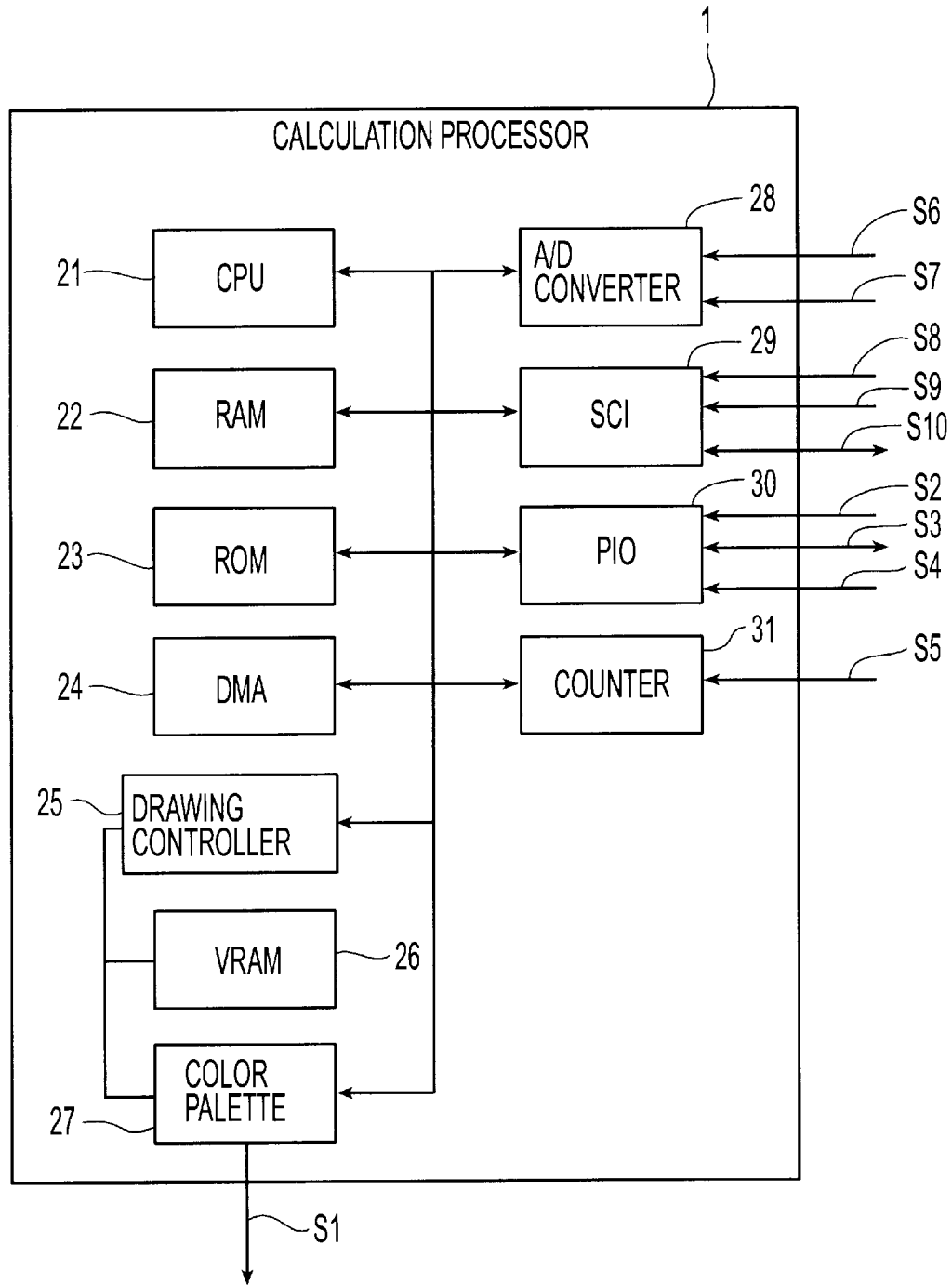


Fig. 3

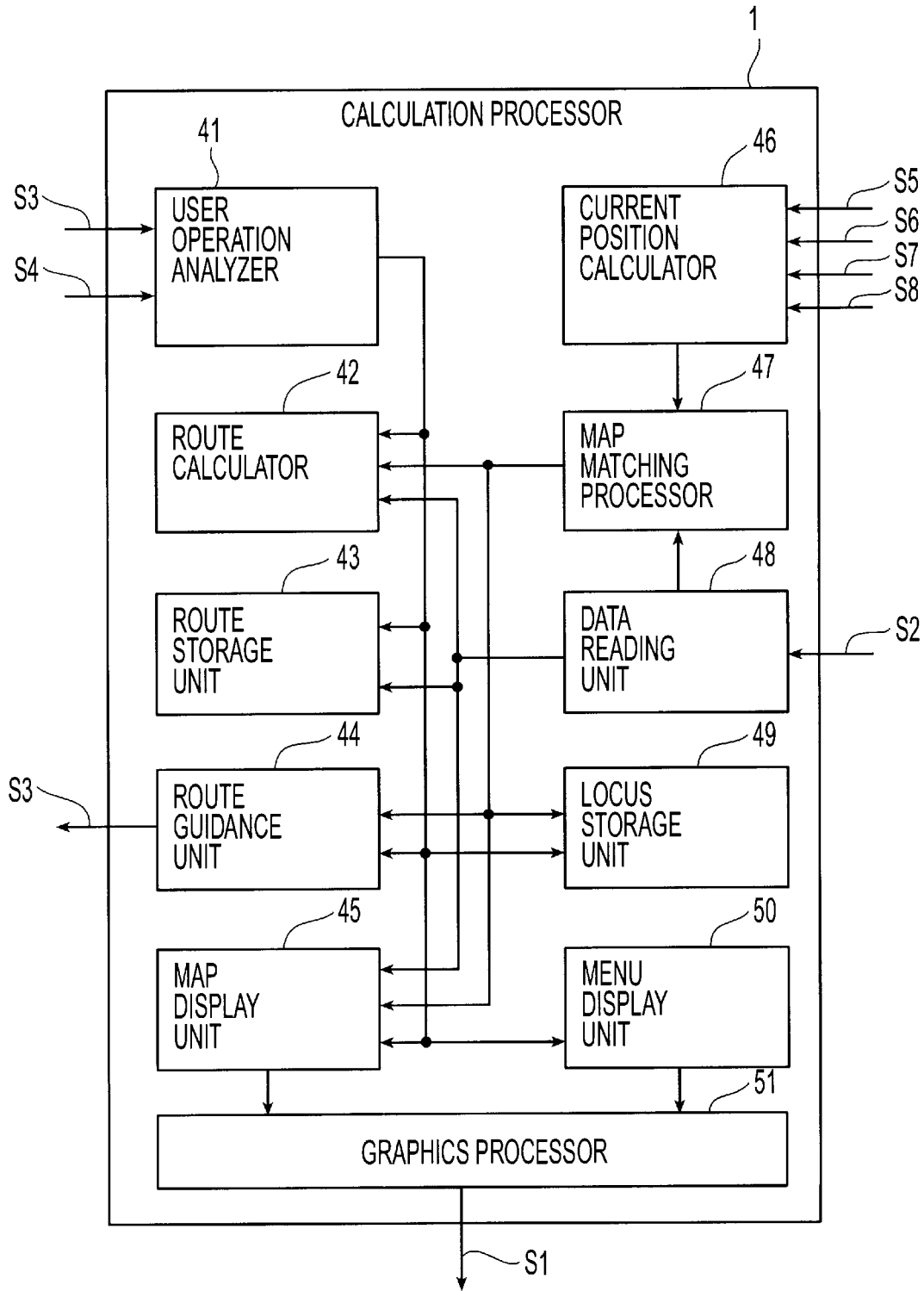


Fig. 4

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.