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Ritter

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(54) **METHOD FOR OBTAINING A THREE-DIMENSIONAL MAP REPRESENTATION, AND A NAVIGATION SYSTEM**

4,667,190 A 5/1987 Fant 340/747
4,847,788 A * 7/1989 Shimada 364/522
6,169,552 B1 * 1/2001 Endo et al. 345/427

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FOREIGN PATENT DOCUMENTS

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EP 0378271 A1 7/1990
EP 0579451 A1 1/1994
EP 0752687 A2 1/1997
EP 0841537 A2 5/1998

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* cited by examiner

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(30) **Foreign Application Priority Data**

(57) **ABSTRACT**

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In a method for obtaining a three-dimensional map representation for a navigation system from two-dimensional road map data, road segments to be represented are linked with the aid of three-dimensional topological data. The navigation system has a conversion unit for converting the two-dimensional road map data and the three-dimensional road topological data into a three-dimensional map representation.

(52) **U.S. Cl.** **345/419**

(58) **Field of Search** 345/419, 427, 345/421, 581, 619, 425

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,490,972 A 1/1985 Ellion et al. 60/39

9 Claims, 8 Drawing Sheets

