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Yamaguchi et al.

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(54) **MAP 3D-CONVERTER SYSTEM**

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(56) **References Cited**

U.S. PATENT DOCUMENTS

5,561,748 A	*	10/1996	Niu et al.	345/420
5,668,939 A	*	9/1997	Numao et al.	345/427
6,169,552 B1	*	1/2001	Endo et al.	345/427
6,215,493 B1	*	4/2001	Fujita	345/418
6,295,066 B1	*	9/2001	Tanizaki et al.	345/419

FOREIGN PATENT DOCUMENTS

JP	4-149681	5/1992
JP	4-293078	10/1992
JP	9-54544	2/1997
JP	9-331440	12/1997
JP	10-111882	4/1998
JP	10-283501	10/1998

* cited by examiner

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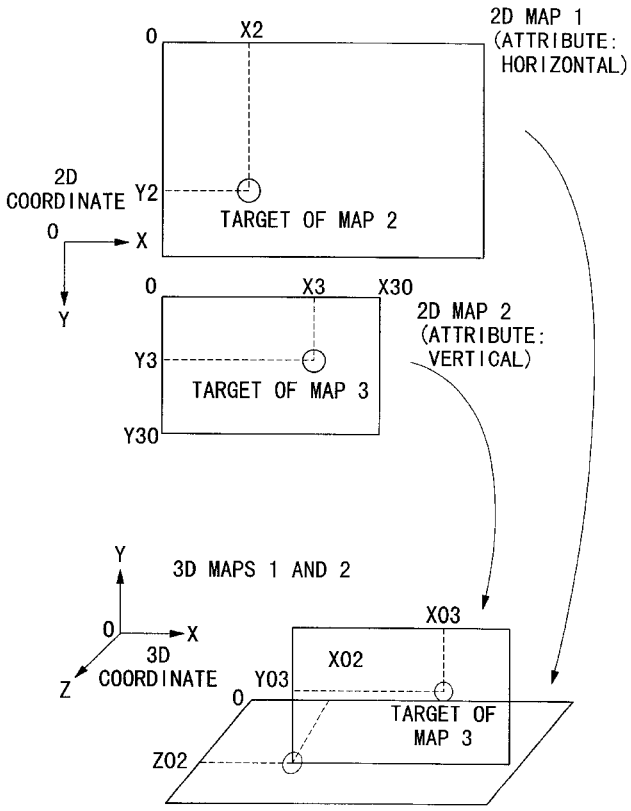
(57) **ABSTRACT**

The map 3D-converter system for converting 2D maps into a 3D map, of the present invention, comprises: a 2D map data storage device for storing 2D map data with an attribute indicating that the 2D map data includes horizontal positions of the top view, or vertical positions of a side view; a 3D conversion instructor for specifying an identification value for identifying a target map and a reference position for developing the target map in a 3D space; a 3D converter for converting the 2D map data, read from the 2D map data storage device, into 3D map data, based on the identification value and the reference position specified by the 3D conversion instructor; and a 3D map data storage device for storing the 3D map data produced by the 3D converter.

17 Claims, 5 Drawing Sheets