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Marvin

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[54] **METHOD AND SYSTEM FOR RENDERING TWO-DIMENSIONAL VIEWS OF A THREE-DIMENSIONAL SURFACE**

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[58] **Field of Search** 395/357, 358;
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[56] **References Cited**

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[57] **ABSTRACT**

A method and system for rendering a two-dimensional image of a three-dimensional surface in real time directly from surface-feature data stored in computer-readable format. A two-dimensional screen display may therefore be rendered "on the fly" for any view point, altitude, and orientation in three-dimensional space. Changing the view point enables panning, changing the altitude allows zooming, and changing the orientation allows spinning of the image. Successive two-dimensional renderings from an initial field of view are rendered to present a sequence of screen displays that effectively pan, zoom, or spin the image of the three-dimensional surface. The rendering methods are sufficiently fast when implemented on preferred personal computer systems so as to enable panning, zooming, and spinning at a satisfactory rate in response to user commands. To the user, the surface features appears to pan, zoom, or spin in real time. Two-dimensional views may be rendered of any three-dimensional structure such as an airplane, power plant, anatomical organ, atomic particle, etc. In particular, two-dimensional views of maps of the surface of the Earth are rendered in connection with a multimedia world atlas computer program.

20 Claims, 13 Drawing Sheets

