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Peurach et al.

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[54] **HAPTIC AUTHORING**

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Related U.S. Application Data

[63] Continuation-in-part of application No. 08/543,606, Oct. 16, 1995, Pat. No. 5,629,594, which is a continuation-in-part of application No. 08/257,070, Jun. 9, 1994, Pat. No. 5,459,382, which is a division of application No. 07/984,324, Dec. 2, 1992, Pat. No. 5,389,865, and a continuation of application No. 08/854,375, May 12, 1997.

[60] Provisional application No. 60/018,037, May 21, 1996.

[51] **Int. Cl.⁷** **G06F 17/30**

[52] **U.S. Cl.** **707/102; 707/104**

[58] **Field of Search** **707/102, 104**

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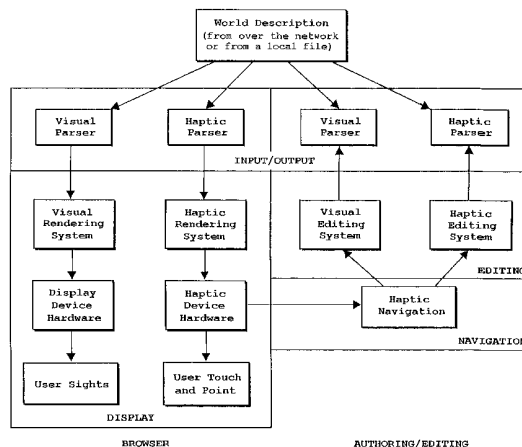
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[57] **ABSTRACT**

Methods are presented for authoring geometrical databases which incorporate touch or haptic feedback. In particular, a database of geometrical elements incorporates attributes necessary to support haptic interactions such as stiffness, hardness, friction, and so forth. Users may instantiate objects designed through CAD/CAM environments or attach haptic or touch attributes to subcomponents such as surfaces or solid sub-objects. The resulting haptic/visual databases or world-describing models can then be viewed and touched using a haptic browser or other appropriate user interface.

58 Claims, 9 Drawing Sheets



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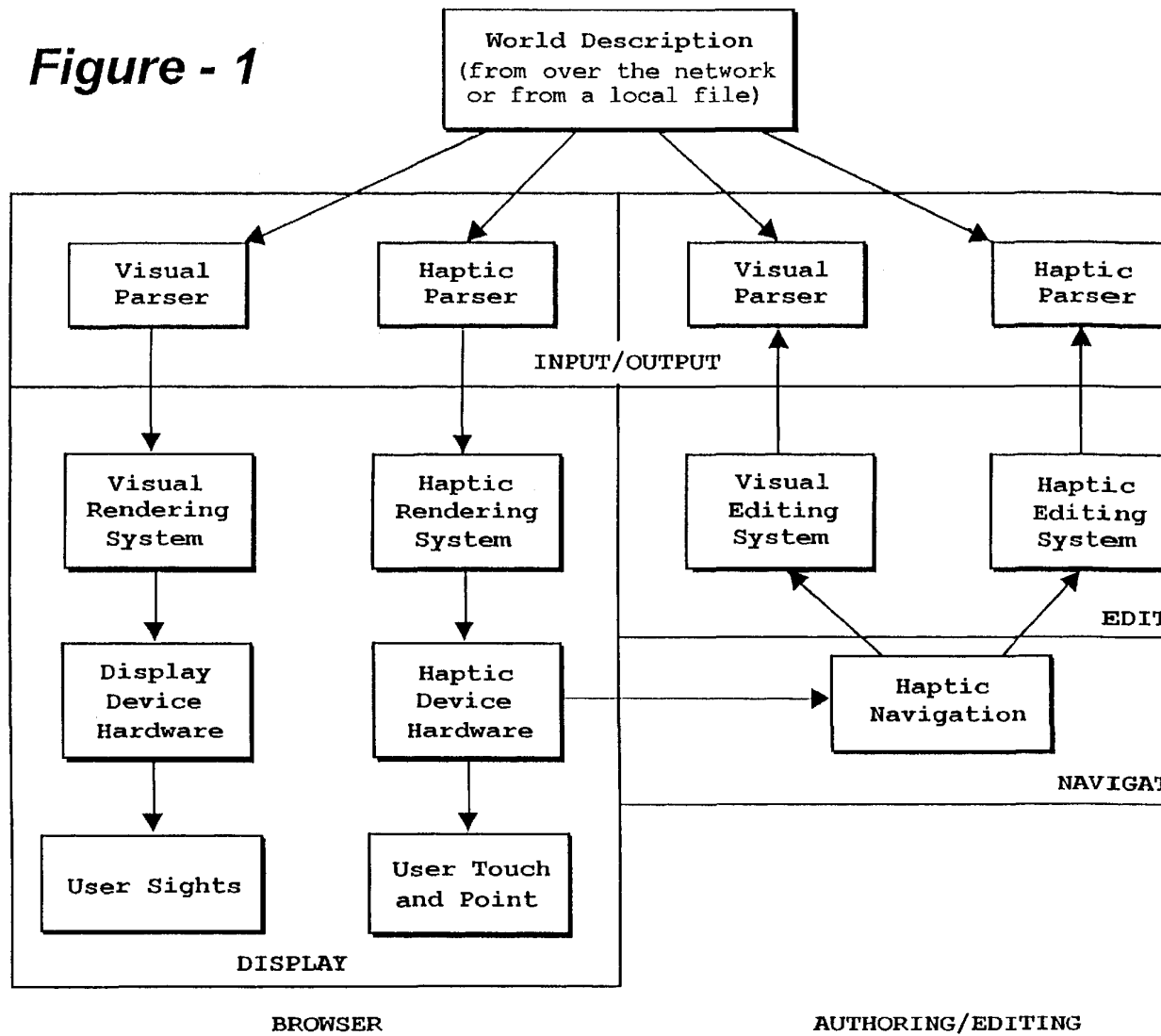
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Figure - 1



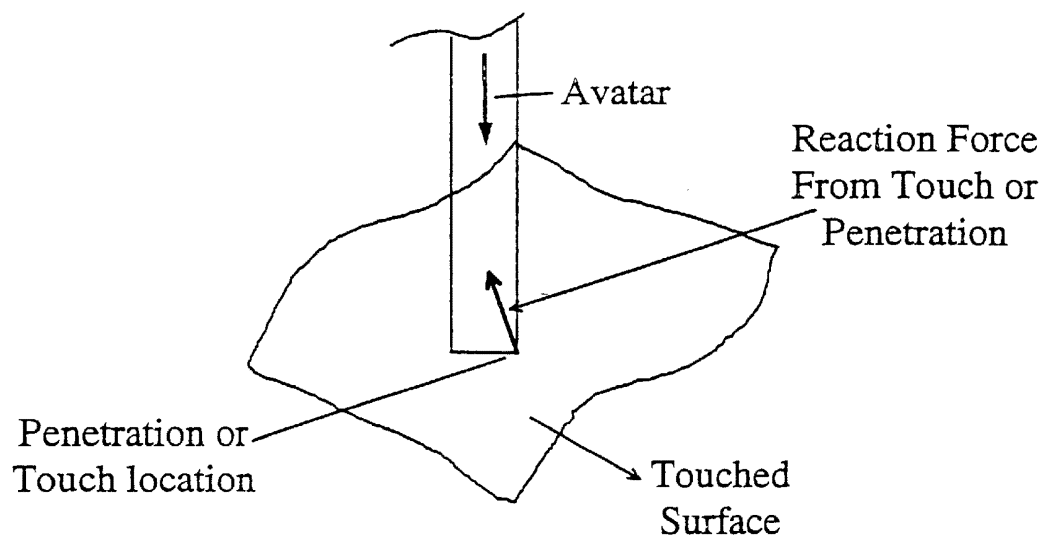
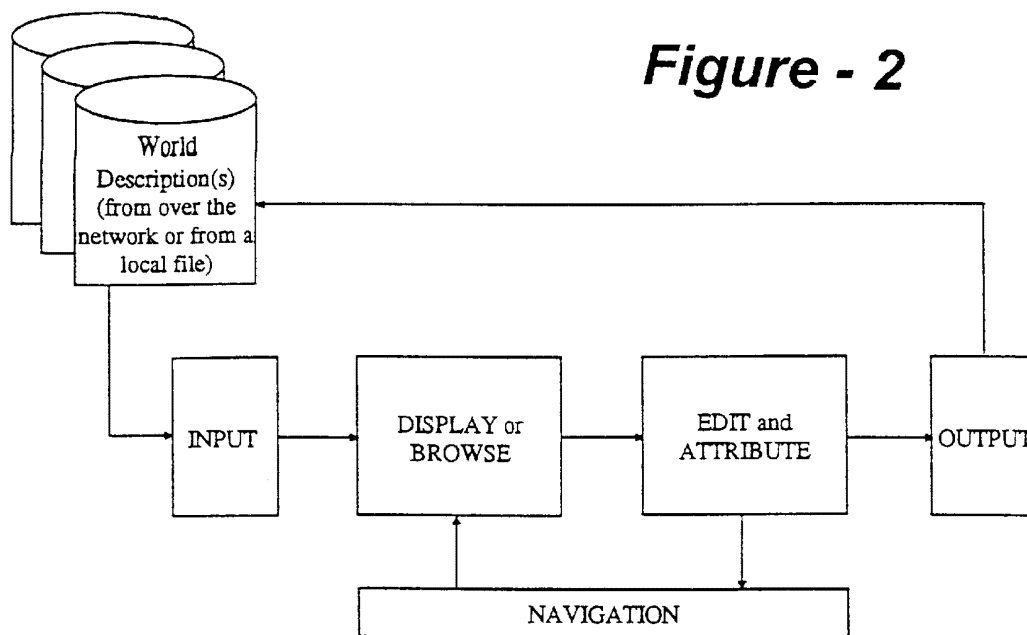


Figure - 3

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