

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

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- (54) **METHOD AND APPARATUS FOR PROVIDING AN EXPANDABLE, HIERARCHICAL INDEX IN A HYPERTEXTUAL, CLIENT-SERVER ENVIRONMENT**
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- (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.
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- (22) Filed: **Feb. 23, 1996**
- (51) **Int. Cl.⁷** **G06F 15/163**
- (52) **U.S. Cl.** **709/203; 709/310; 707/501; 707/513; 707/514**
- (58) **Field of Search** **395/200.01, 776; 707/501, 513, 514; 709/203, 310**

(57) **ABSTRACT**

A method and apparatus are provided for navigating through electronically stored information using an expandable, hierarchical index or TOC, in a hypertextual client-server network environment such as the World Wide Web. The client-server network comprises at least one client computer coupled by network link to at least one server computer. In accordance with the invention, a publisher of the TOC provides to the server a digital specification of the TOC, defining the TOC as a plurality of hierarchically related nodes. In a preferred feature of the invention, the digital specification includes a unique name, a display label, and a hierarchical level for each node of the TOC, and an optional target URL for each leaf node of the TOC. Using a browser program or the like at the client computer, an end-user transmits a network request including an address path to the server. Upon receiving the network request, and based upon the address path and the digital specification, the server dynamically generates a network page specifying display of a hierarchical portion of the TOC entries. This network page is transmitted from the server to the client, for display to the end-user. In another feature of the present invention, when the server dynamically generates the network page, it assigns a path address as a hypertextual link for one or more of the TOC nodes in the hierarchical portion of the TOC to be displayed. The path address specifies a modified display status for the TOC entries that are hierarchical descendants of the at least one TOC entry. In this way, the present invention can preferably be used to provide an interactively expandable TOC in a client-server environment. When an end-user, utilizing a browser of the client, interactively selects one of the currently displayed TOC nodes, the assigned hypertextual link will automatically be transmitted to the server as part of a new network request, and will cause the server to dynamically generate a new network page specifying a modified display status for TOC nodes that are hierarchical descendants of the selected node, thus effectively expanding or contracting the TOC hierarchy beneath the selected node. In this way, the TOC hierarchy can interactively be expanded or contracted in an incremental fashion, with the current display state of the TOC being represented in portions of each hypertext path address.

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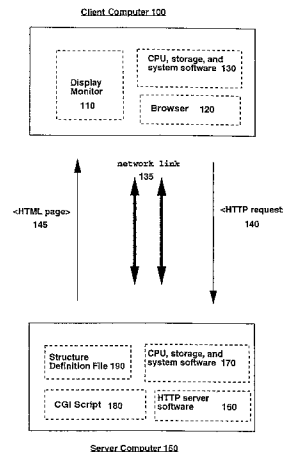
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11 Claims, 8 Drawing Sheets



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FIG. 1A

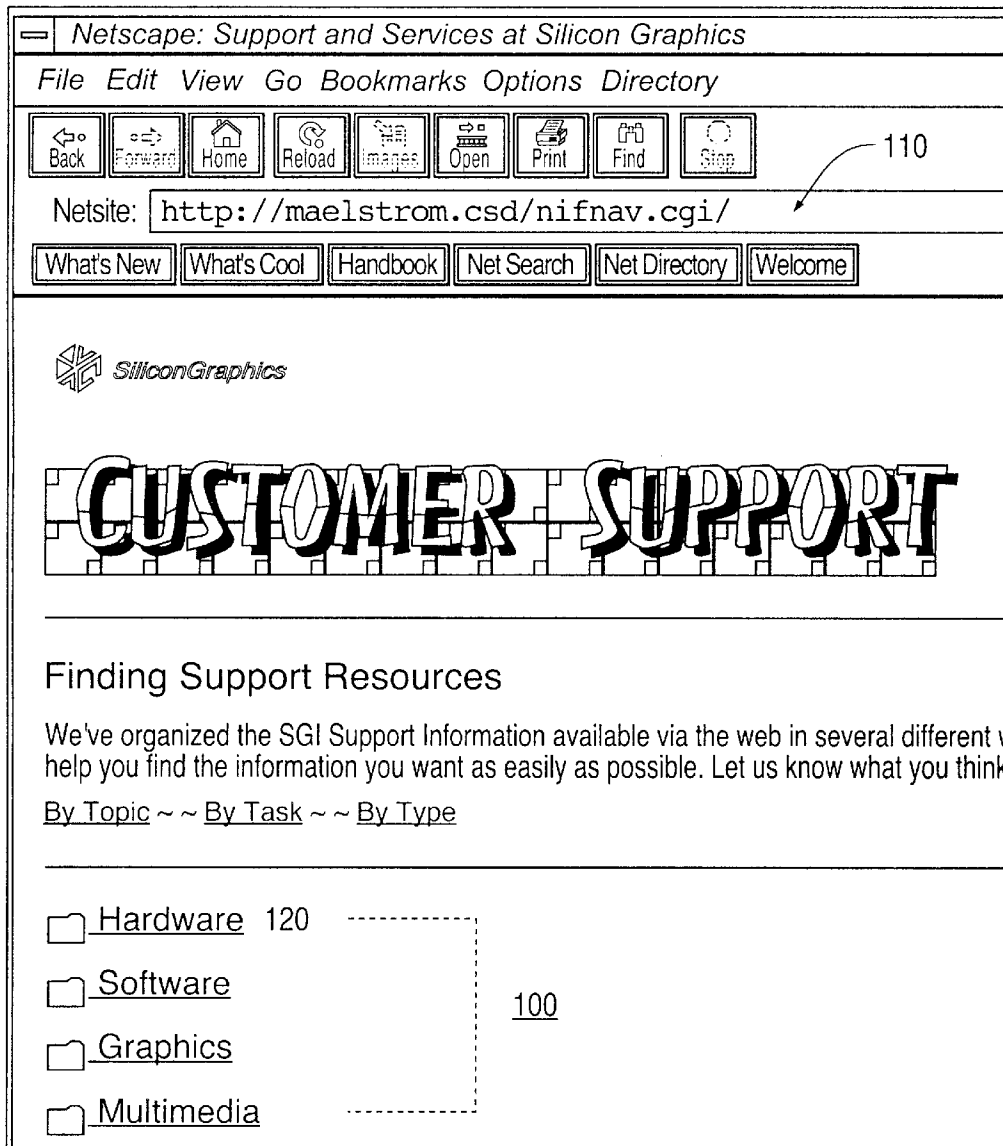


FIG. 1B

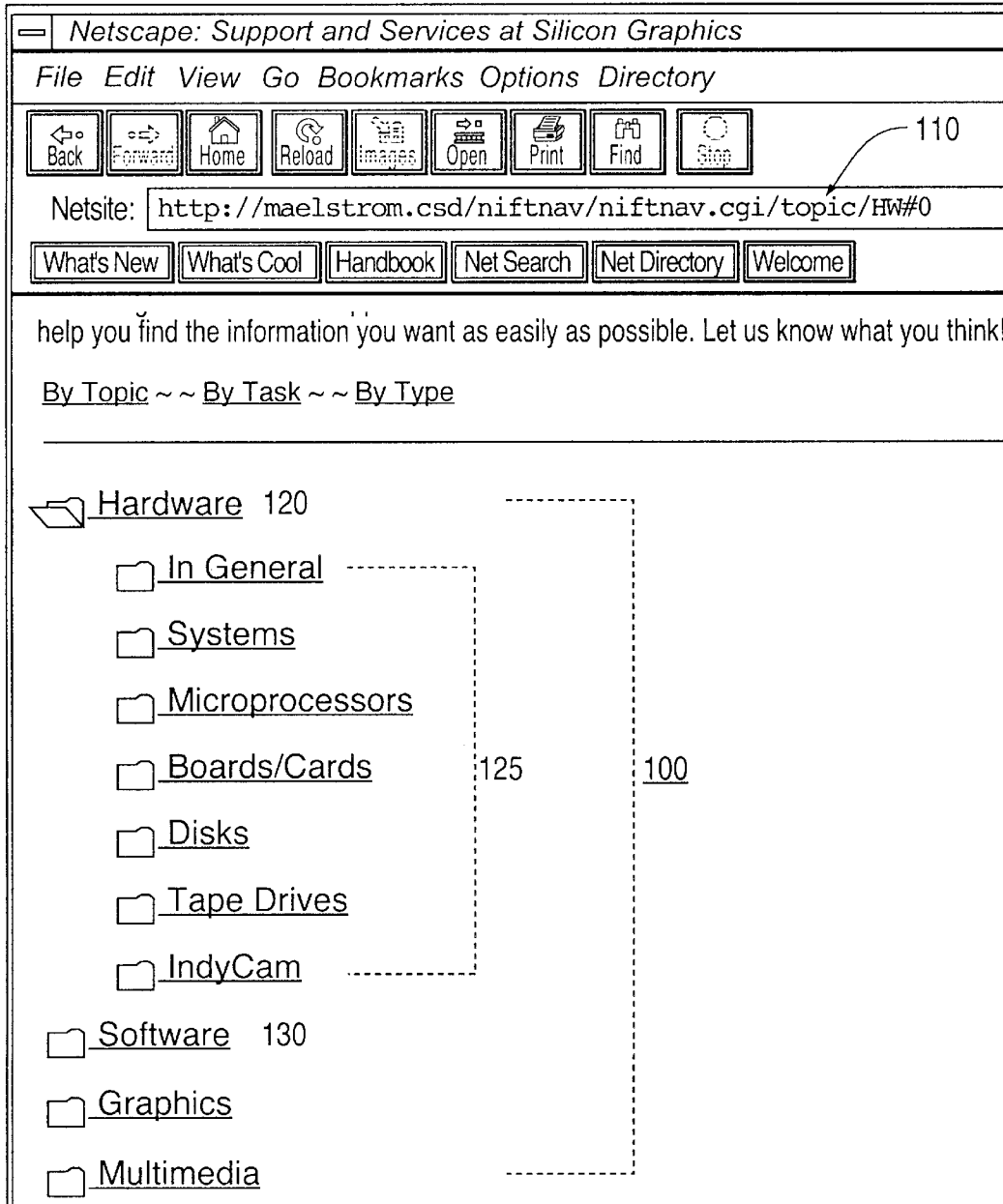
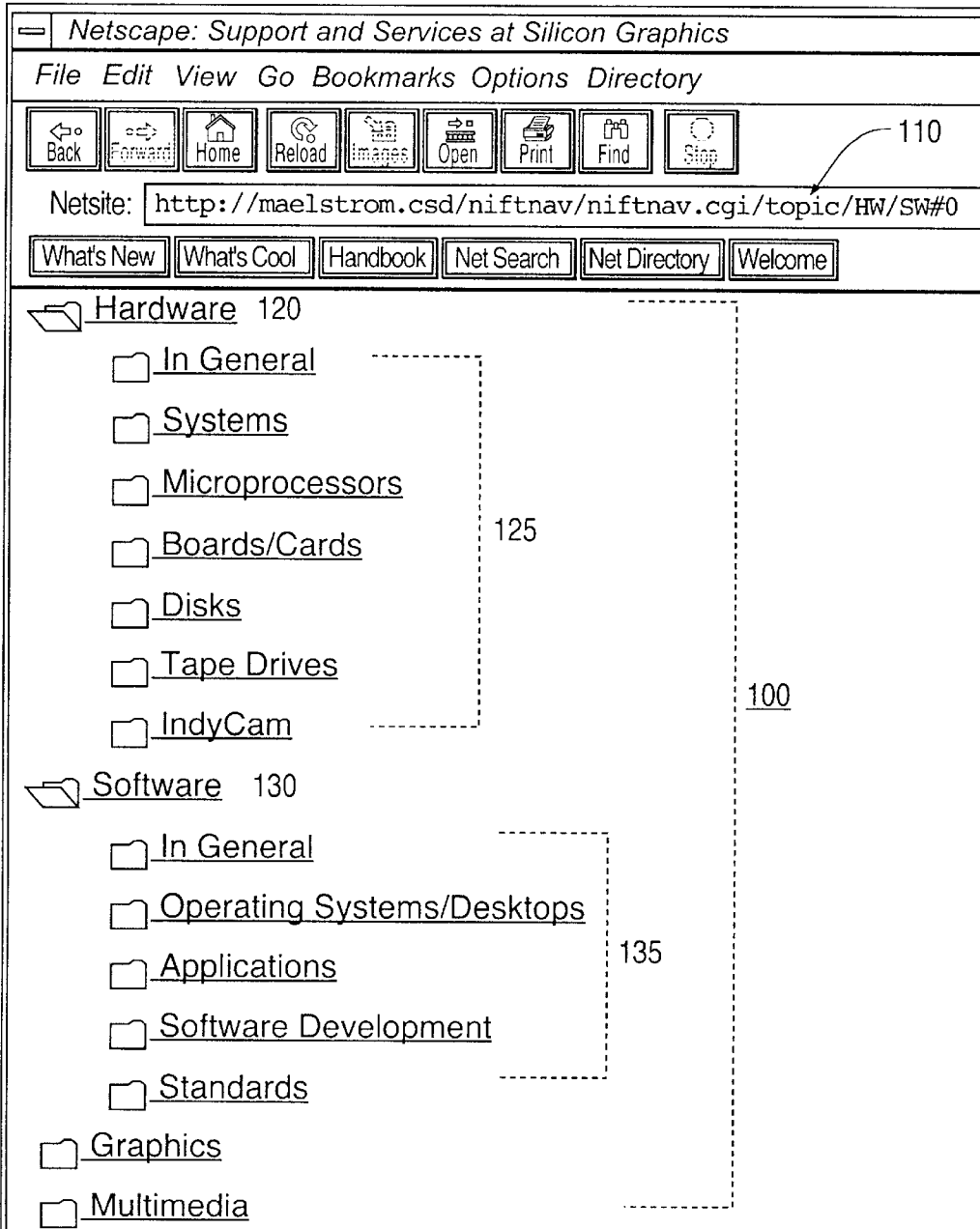


FIG. 1C



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