

EXHIBIT B

United States Patent [19]

[11] **Patent Number:** **5,940,822**

Haderle et al.

[45] **Date of Patent:** **Aug. 17, 1999**

[54] **ENCODING METHOD OF MEMBERS RELATED BY MULTIPLE CONCEPT OR GROUP HIERARCHIES AND IDENTIFICATION OF MEMBERS IN A CORPUS OR A DATABASE THAT ARE DESCENDANTS OF ONE OR MORE SELECTED CONCEPTS OR GROUPS FROM THE ENCODING**

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[75] Inventors: **Donald J. Haderle**, Los Gatos;
Balakrishna Raghavendra Iyer, San Jose, both of Calif.

Klug, Anthony, "Access Paths in the 'Abe' Statistical Query Facility", Proceedings of the International Conference on Management of Data, Jun. 2-4, 1982, Orlando, Florida, ACM SIGMOD Association for Computing Machinery, pp. 161-173.

[73] Assignee: **International Business Machines Corporation**, Armonk, N.Y.

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[21] Appl. No.: **08/921,197**

[22] Filed: **Aug. 29, 1997**

[51] **Int. Cl.**⁶ **G06F 17/30**

[52] **U.S. Cl.** **707/3; 707/2; 707/4; 707/101**

[58] **Field of Search** **707/2, 3, 4, 101**

Primary Examiner—Paul V. Kulik
Assistant Examiner—Jean R. Homere
Attorney, Agent, or Firm—Merchant, Gould, Smith, Edell, Welter, & Schmidt

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[57] **ABSTRACT**

A method, apparatus, and article of manufacture for an encoder for encoding members in a concept hierarchy. A query is executed in a computer. The query is performed by the computer to retrieve data from a database stored on a data storage device connected to the computer. Members in the database that are related by one or more concept hierarchies are encoded. Then, members in one of the concept hierarchies that are descendants of one or more selected concepts are identified based on the encoding.

18 Claims, 4 Drawing Sheets

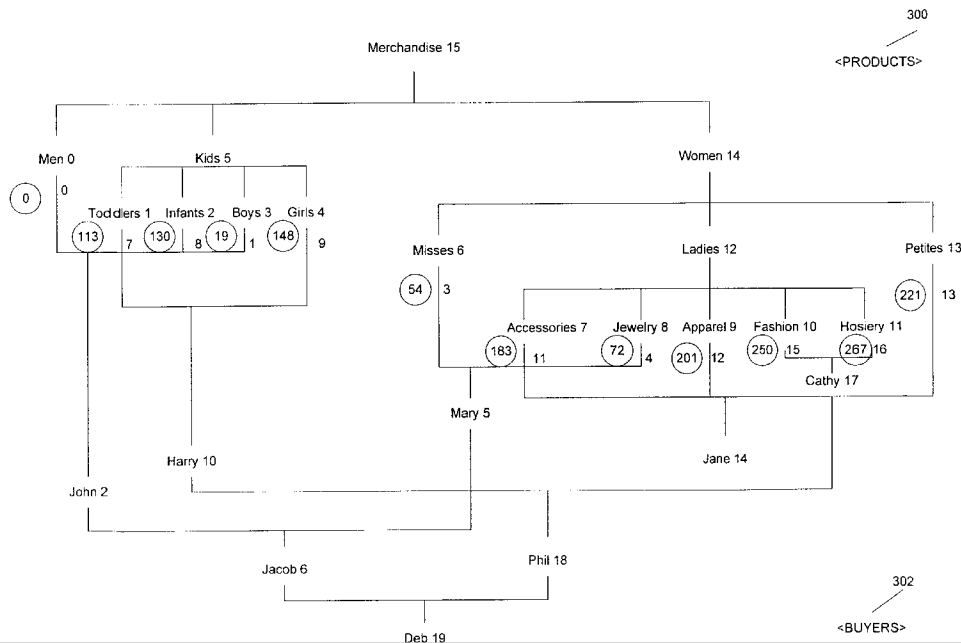
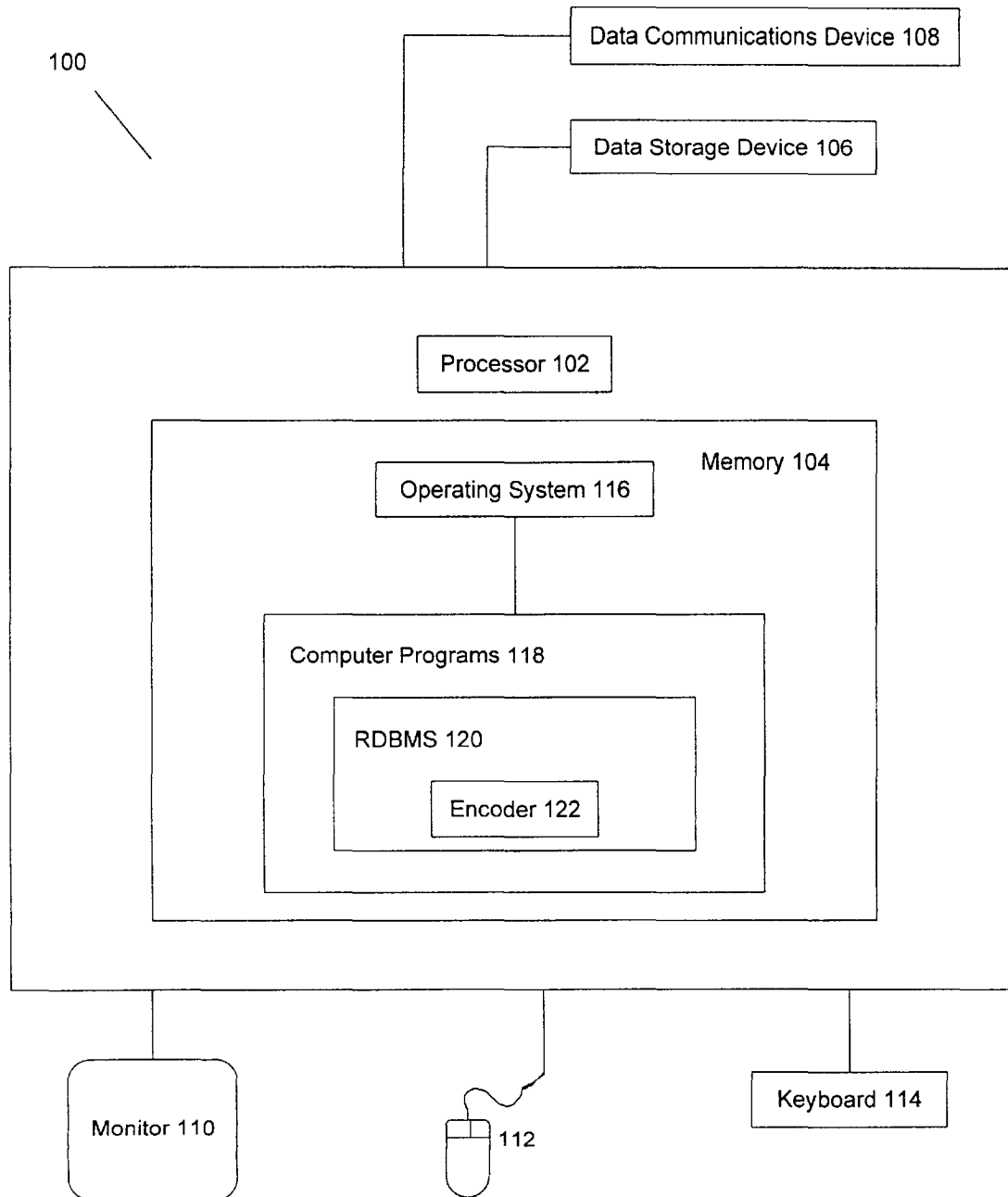


FIG. 1



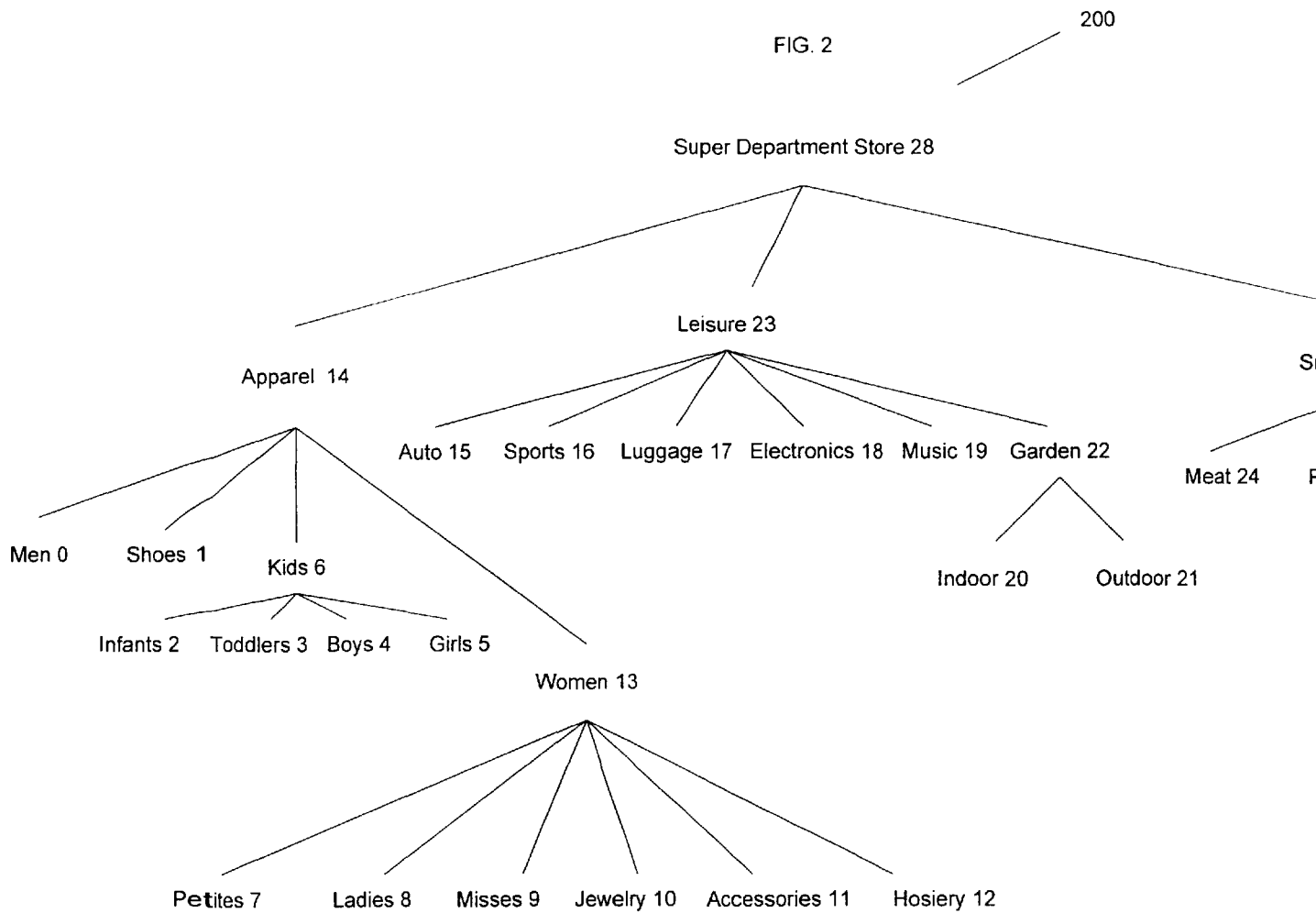
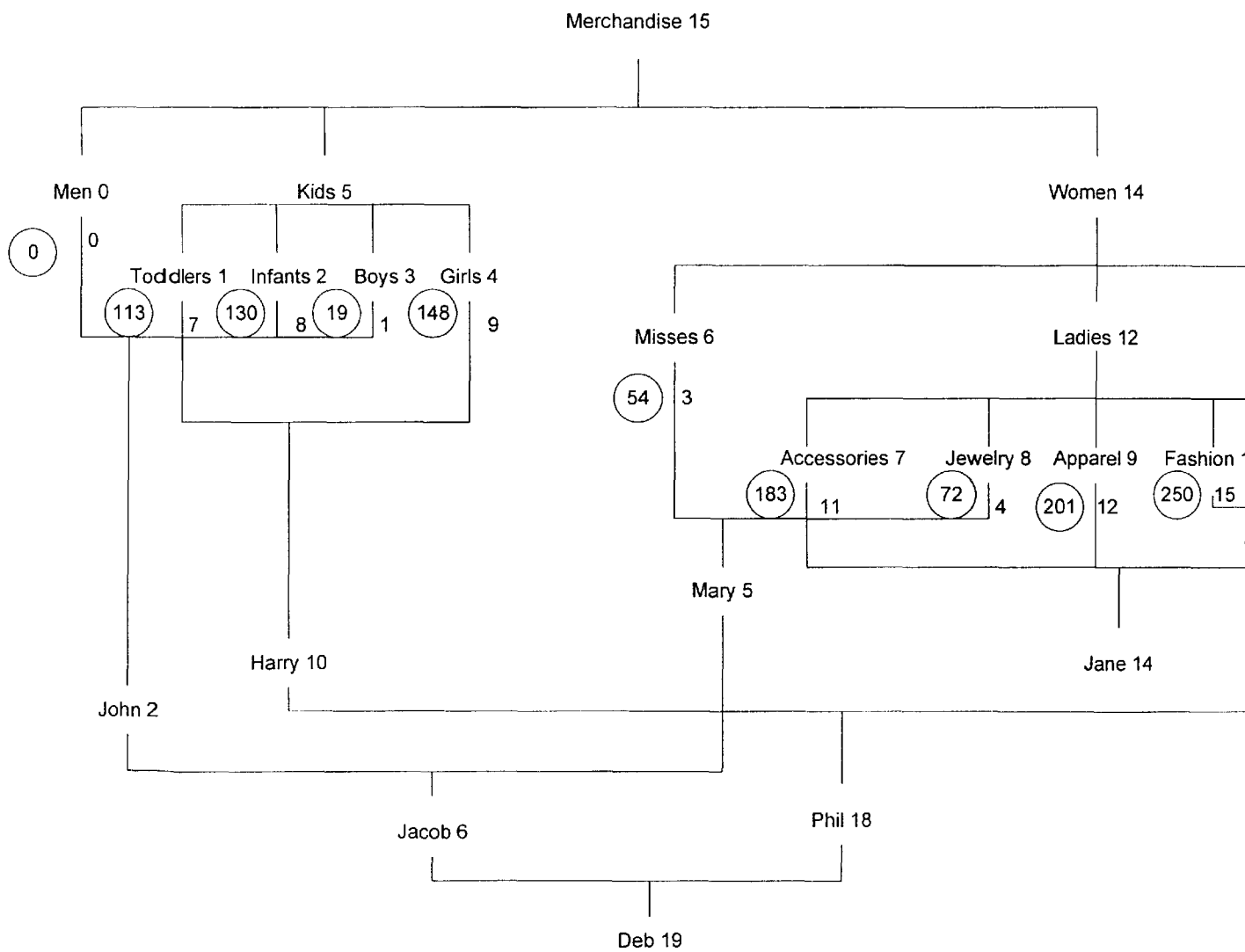


FIG. 3



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