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[54] **METHOD AND APPARATUS FOR GENERATING REPORTS USING DECLARATIVE TOOLS**

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[58] **Field of Search** 395/329, 330, 395/331, 332, 333, 334, 335, 339, 342, 613, 614, 603, 604, 605

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,656,603	4/1987	Dunn	395/348
4,710,885	12/1987	Litteken	395/774
4,723,210	2/1988	Barker et al.	395/776
4,723,211	2/1988	Barker et al.	395/776
4,813,013	3/1989	Dunn	395/333
4,815,029	3/1989	Barker et al.	395/778
4,823,303	4/1989	Terasawa	395/777
5,040,131	8/1991	Torres	395/352
5,134,560	7/1992	Ferriter et al.	364/188
5,241,645	8/1993	Cimral et al.	395/500
5,249,300	9/1993	Bachman et al.	395/800
5,251,294	10/1993	Abelow	395/155
5,353,401	10/1994	Iizawa et al.	395/161
5,418,950	5/1995	Li et al.	395/600
5,418,957	5/1995	Narayan	395/700
5,421,008	5/1995	Banning et al.	395/600
5,434,971	7/1995	Lysakowski, Jr.	395/200
5,446,575	8/1995	Lysakowski, Jr.	395/200.01
5,446,885	8/1995	Moore et al.	395/600

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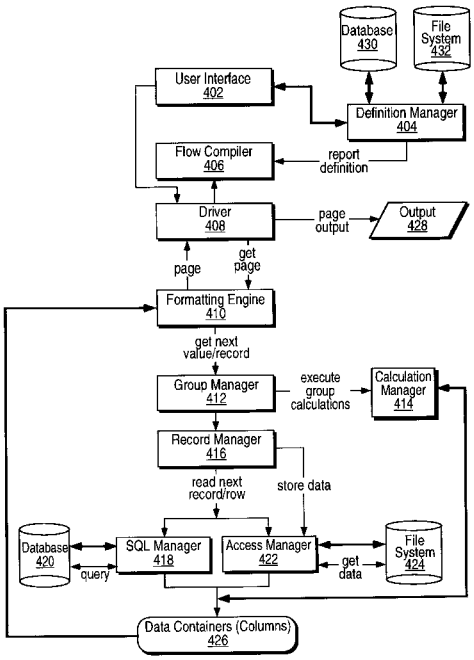
[57] **ABSTRACT**

The present invention is a method and apparatus for declarative report definition and generation using an enhanced, graphical data model and a graphical user interface (GUI) for graphically specifying data items and data computations to be performed on the data is described. It provides a set of data model objects, a data model painter for creating, defining, and visualizing the data model objects, and a data engine that retrieves the data according to the definition of the data objects. That is, the present invention provides a graphical data model allowing a user to graphically specify both the data and computations to be performed on the data and uses the layout metaphor (i.e., "painter") to specify the data. Data model objects include: queries, groups, columns, parameters, cross products, and links. Unlike the prior art, allows the use of multiple queries each containing one or more break groups and cross product groups where groups belonging to two different queries are connected by link objects. The resulting structure is therefore a forest of groups where each group contains one or more columns, thereby enlarging the scope of report definition tools available to users.

28 Claims, 9 Drawing Sheets