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(54) **EFFICIENT LARGE-SCALE ACCESS CONTROL FOR INTERNET/INTRANET INFORMATION SYSTEMS**

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(\*) Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

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(52) **U.S. Cl.** ..... **707/9; 707/101; 707/6; 707/8**

(58) **Field of Search** ..... **707/1-206; 702/5; 709/223; 379/201-221**

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(57) **ABSTRACT**

An efficient method and apparatus for regulating access to information objects stored in a database in which there are a large number of users and access groups. The invention uses a representation of a hierarchical access group structure in terms of intervals over a set of integers and a decomposition scheme that reduces any group structure to ones that have interval representation. This representation allows the problem for checking access rights to be reduced to an interval containment problem. An interval tree, a popular data structure in computational geometry, may be implemented to efficiently execute the access-right checking method.

**57 Claims, 15 Drawing Sheets**

