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# United States Patent [19]

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**Howard**

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[54] **METHOD AND APPARATUS FOR RECONCILING DIFFERENT VERSIONS OF A FILE**

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### Related U.S. Application Data

[63] Continuation of Ser. No. 61,674, May 14, 1993, abandoned.

[51] Int. Cl.<sup>6</sup> ..... **G06F 15/00; G06F 7/00**

[52] U.S. Cl. .... **395/617; 395/200.08; 395/200.19; 364/DIG. 1; 364/282.1; 364/281.5; 364/282.4**

[58] Field of Search ..... **395/600, 200.08, 395/200.19; 364/DIG. 1**

### References Cited

#### U.S. PATENT DOCUMENTS

4,077,059	2/1978	Cordi et al. ....	364/200
4,408,273	10/1983	Plow .....	364/200
4,819,156	4/1989	Delorme et al. ....	364/200
4,823,310	4/1989	Grand .....	364/900
4,875,159	10/1989	Cary et al. ....	364/200
4,914,654	4/1990	Matsuda et al. ....	370/94.1
5,151,988	9/1992	Yamagishi .....	395/600
5,155,849	10/1992	Westfall et al. ....	395/600
5,212,788	5/1993	Lomet et al. ....	395/600

5,247,684	9/1993	Tavares et al. ....	395/700
5,261,094	11/1993	Everson et al. ....	395/600
5,263,155	11/1993	Wang .....	395/600
5,357,631	10/1994	Howell .....	395/600
5,388,255	2/1995	Pytlík et al. ....	395/600

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### [57] ABSTRACT

In a distributed file environment, a system for safely updating a file without risk of losing work performed at one site due to work performed on the file at another site uses a journal or log at each site which is updated after a file is modified. This log is compared with the logs from other sites before a file is used at any one site, so that new versions can be propagated automatically and safely to out-of-date sites, with the user immediately alerted if conflicting versions of the file exist at different sites. The reconciliation can be applied to collections of files, automatically updating only those files for which it is safe to and necessary do so. Since reconciliation occurs at times selected by the user, inconsistent or partially completed versions of files need not be propagated to other sites. Additionally, logs may be built incrementally by occasionally observing the state of the systems in terms of the files and their time stamps and creating additional log entries reflecting appearance, disappearance and changes of files. Furthermore, logs may be purged of obsolete entries by including additional log entries indicating the most recent time each site has participated in a reconciliation and deleting obsolete entries that all sites have seen.

**4 Claims, 5 Drawing Sheets**

