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United States Patent [19]

Falls et al.

[11] **Patent Number:** **5,991,771**[45] **Date of Patent:** **Nov. 23, 1999**[54] **TRANSACTION SYNCHRONIZATION IN A
DISCONNECTABLE COMPUTER AND
NETWORK**[75] Inventors: **Patrick T. Falls**, Newbury; **Brian J. Collins**, New Malden; **Stephen P. W. Draper**, Basingstoke, all of United Kingdom[73] Assignee: **Novell, Inc.**, Provo, Utah[21] Appl. No.: **08/700,487**[22] PCT Filed: **Jul. 18, 1996**[86] PCT No.: **PCT/US96/11901**§ 371 Date: **Jul. 3, 1997**§ 102(e) Date: **Jul. 3, 1997**[87] PCT Pub. No.: **WO97/04389**PCT Pub. Date: **Feb. 6, 1997****Related U.S. Application Data**

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[51] **Int. Cl.⁶** **G06F 17/00**[52] **U.S. Cl.** **707/202; 707/201; 395/182.1; 395/182.13**[58] **Field of Search** 707/8, 10, 201, 707/203, 200, 202; 395/180, 182.1, 182.13[56] **References Cited****U.S. PATENT DOCUMENTS**

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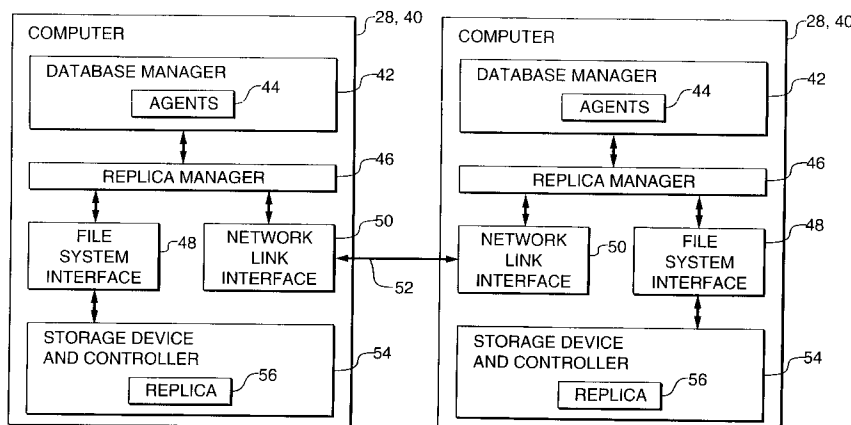
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Primary Examiner—Paul V. Kulik*Attorney, Agent, or Firm*—Computer Law[57] **ABSTRACT**

A method and apparatus are disclosed for synchronizing transactions in a disconnectable network. Each transaction includes operations that were performed on a database replica on one computer while that computer was disconnected from another computer and hence from that other computer's replica. Transaction synchronization, which occurs after the computers are reconnected, transfers information from each computer to the other computer and applies updates to both replicas as appropriate. Transaction logs and clash handling tools may be used with the invention.

34 Claims, 4 Drawing Sheets

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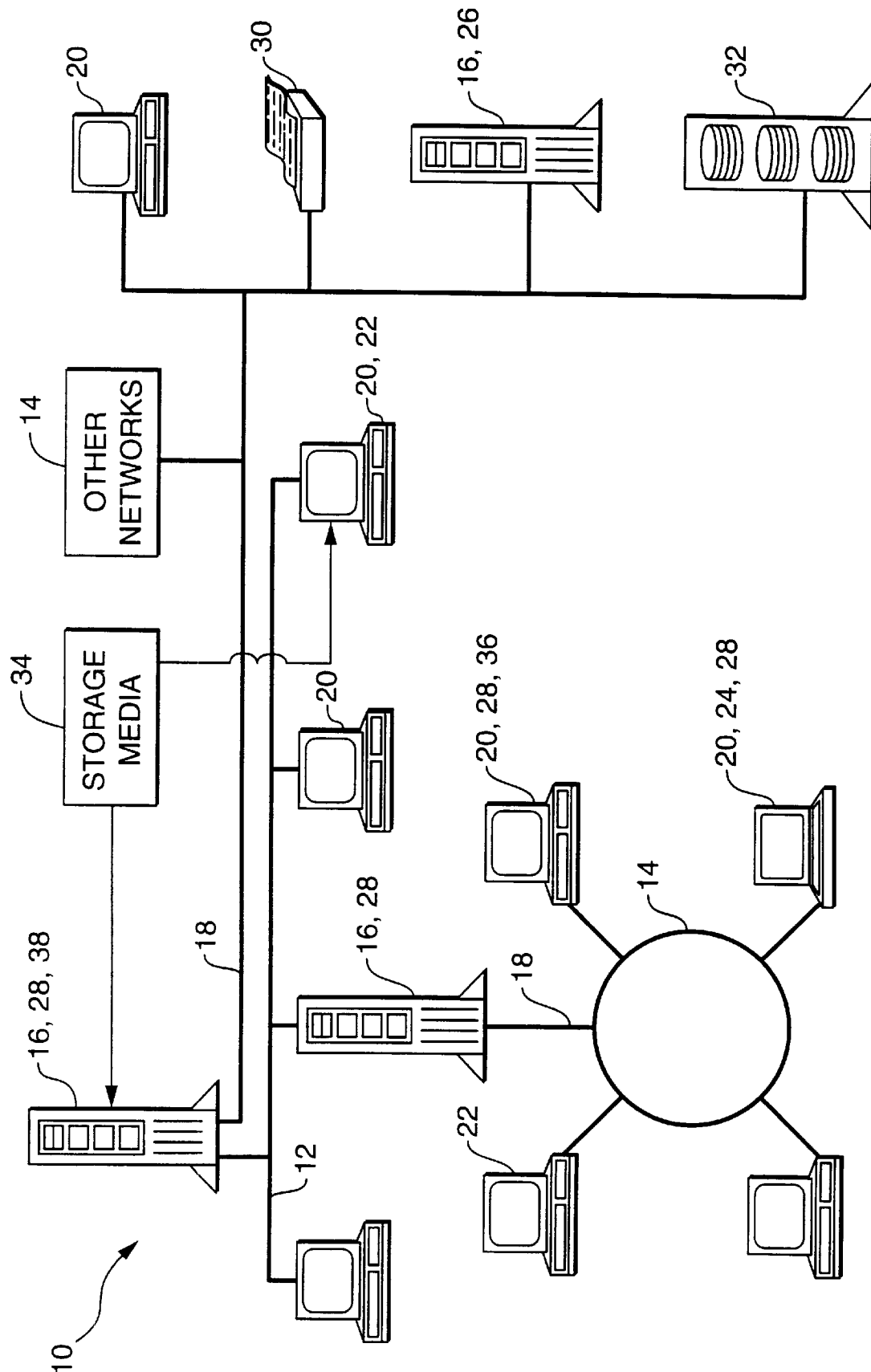
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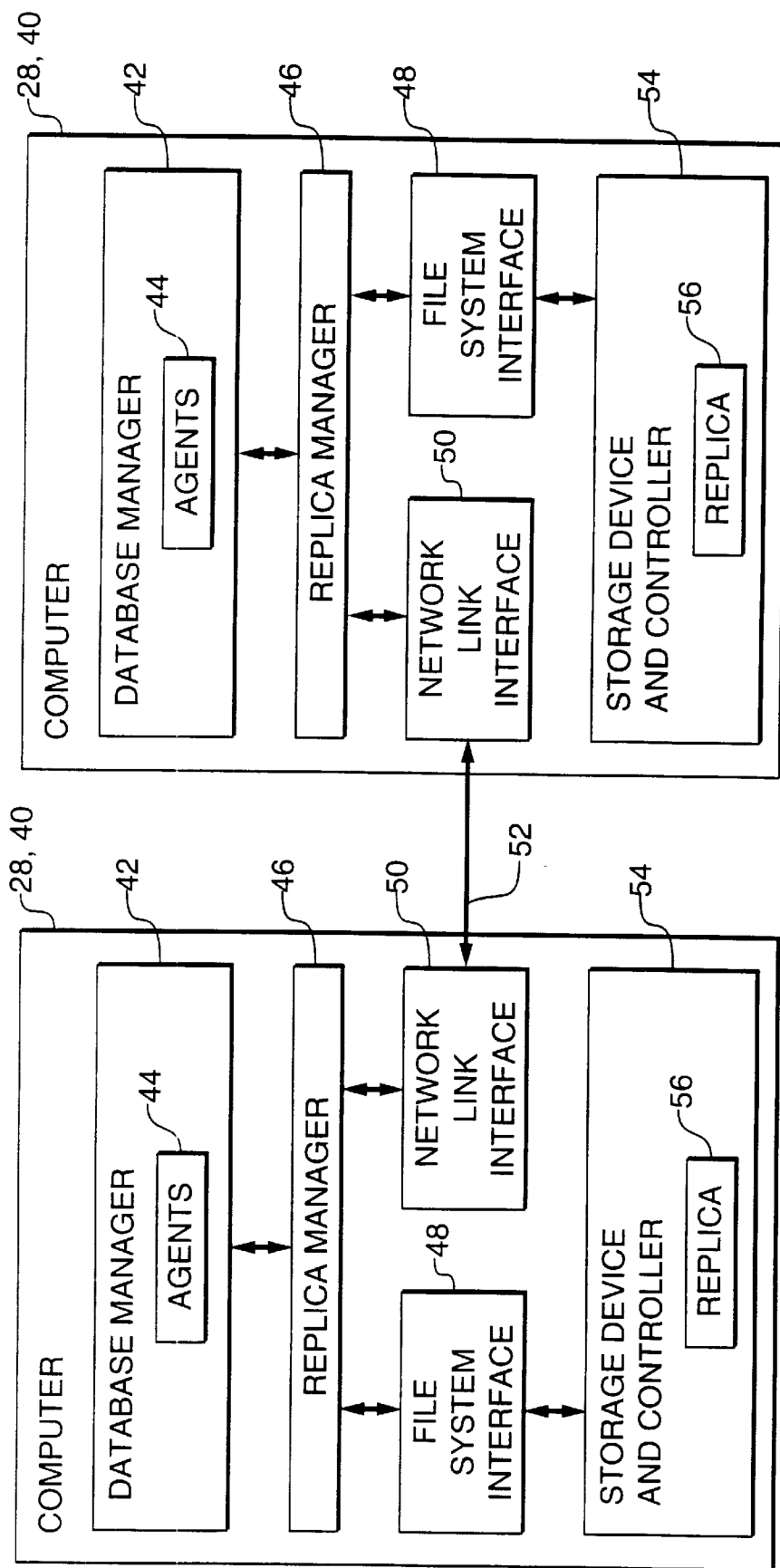
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**FIG. 1**

**FIG. 2**

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