United States Patent [19]

Perlman et al.

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[54] **MECHANISM FOR EFFICIENTLY SYNCHRONIZING INFORMATION OVER A NETWORK**

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[51] Int. Cl.^{6} **G06F 17/30**

[52] U.S. Cl. **395/617**; 395/610; 395/200.03; 395/200.09

[58] Field of Search 395/610, 617, 395/200.03, 200.09

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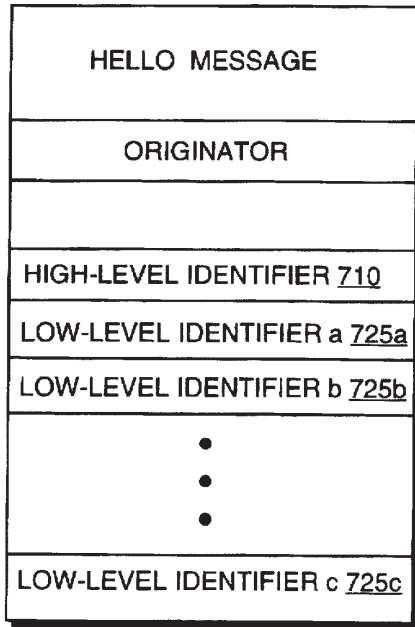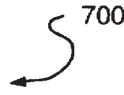
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Primary Examiner—Paul R. Lintz
Attorney, Agent, or Firm—Cesari and McKenna

[57] **ABSTRACT**

A novel mechanism efficiently synchronizes the contents of databases stored on nodes of a computer network to-ensure that those contents are consistent. The mechanism comprises a database identifier generated by a node of the computer network and distributed to other receiving nodes coupled to the network. The database identifier is uniquely representative of the contents of the distributing node's database and the receiving nodes compare this unique identifier with their own generated database identifiers to determine if the identifiers, and thus their databases, are consistent and synchronized.

18 Claims, 6 Drawing Sheets

700

HELLO MESSAGE

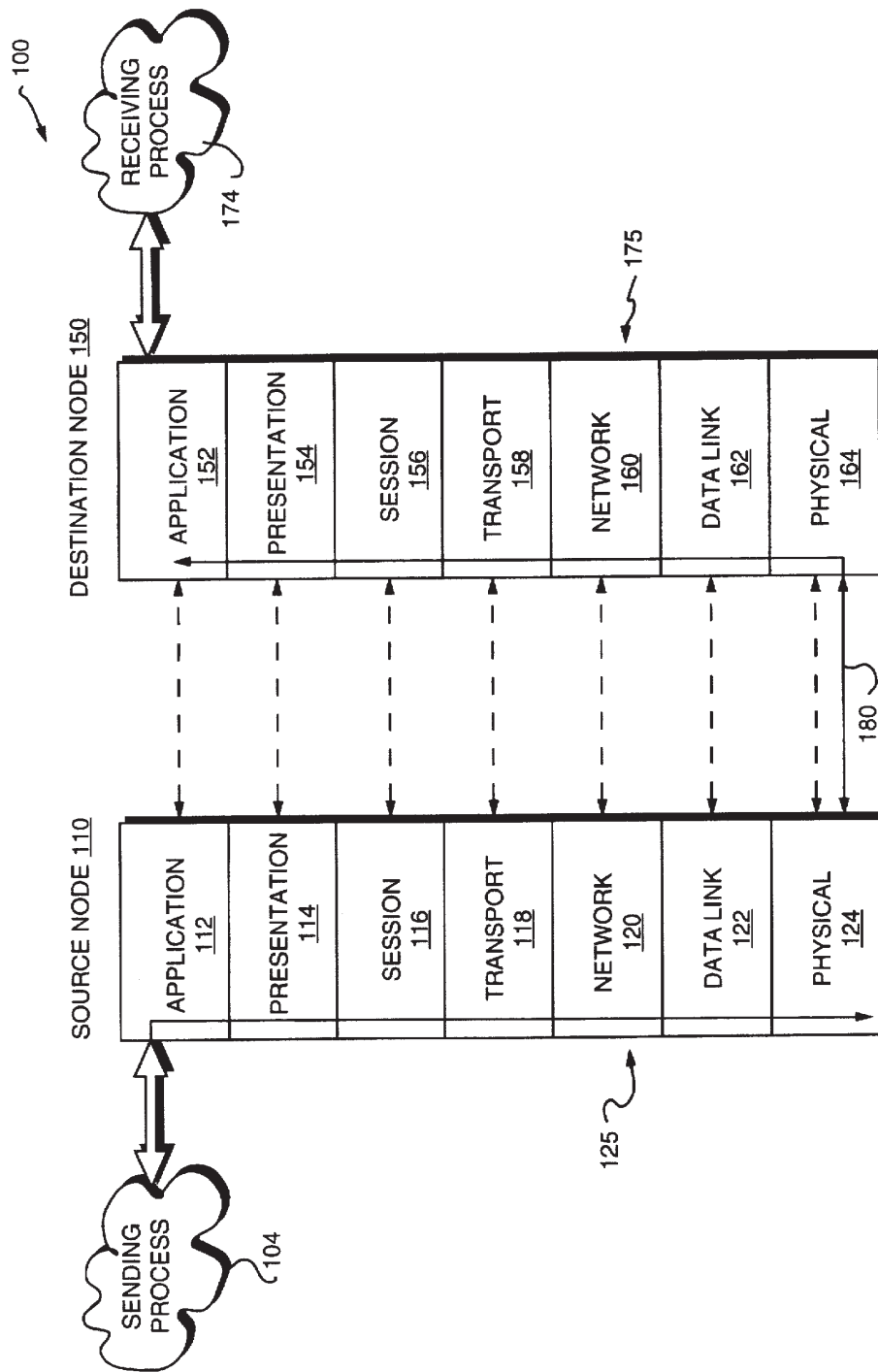ORIGINATOR

HIGH-LEVEL IDENTIFIER 710

LOW-LEVEL IDENTIFIER a 725a

LOW-LEVEL IDENTIFIER b 725b

•
•
•

LOW-LEVEL IDENTIFIER c 725c

FIG. 1
PRIOR ART

FIG. 2

300

| SOURCE 302 |
| SEQUENCE NUMBER 304 |
| |
| NEIGHBORS 306 |

FIG. 3

400

1.0.0	SEQUENCE NUMBER 5
2.1.3	SEQUENCE NUMBER 13
3.1.1	SEQUENCE NUMBER 7
5.2.0	SEQUENCE NUMBER 28
8.3.1	SEQUENCE NUMBER 42
12.1.0	SEQUENCE NUMBER 53
12.3.1	SEQUENCE NUMBER 16
14.2.0	SEQUENCE NUMBER 39
⋮	⋮
16.0.3	SEQUENCE NUMBER 77
16.2.4	SEQUENCE NUMBER 125
17.1.1	SEQUENCE NUMBER 61
19.3.2	SEQUENCE NUMBER 22

410

420

FIG. 4A

ADDRESS RANGE	aa -cc
data items	SEQUENCE NUMBERS

450a

ADDRESS RANGE	dd - ff
data items	SEQUENCE NUMBERS

450b

•

•

•

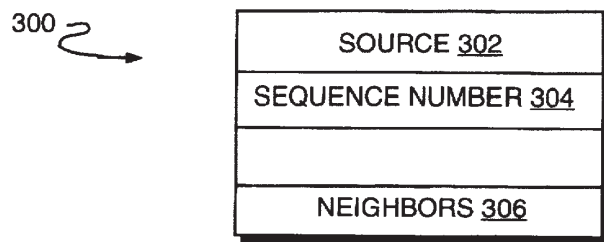| ADDRESS RANGE	XX - ZZ
data items	SEQUENCE NUMBERS

450c

FIG. 4B

DOCKET ALARM
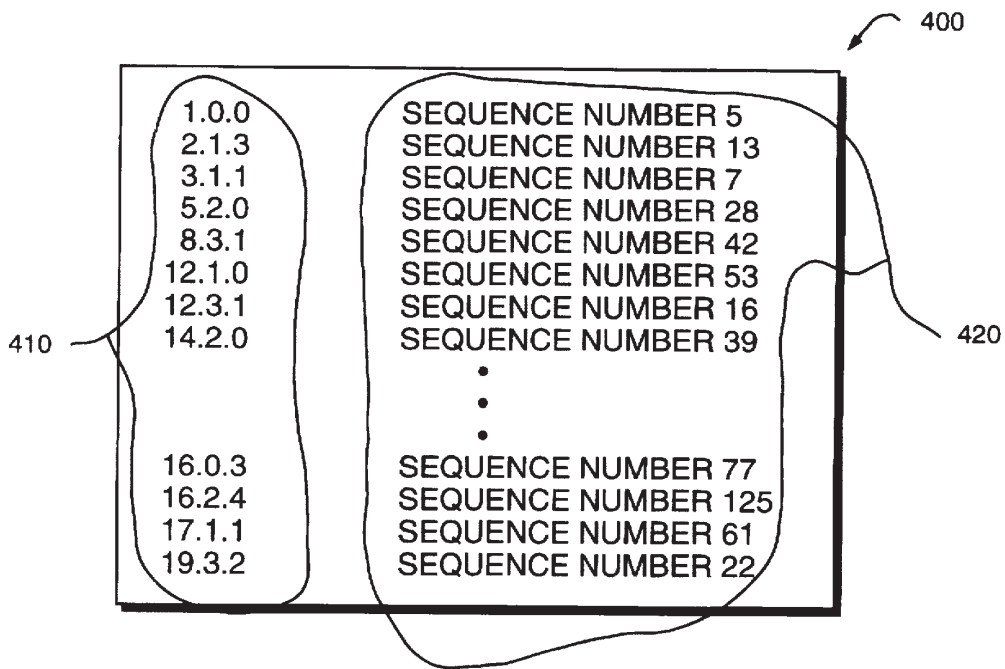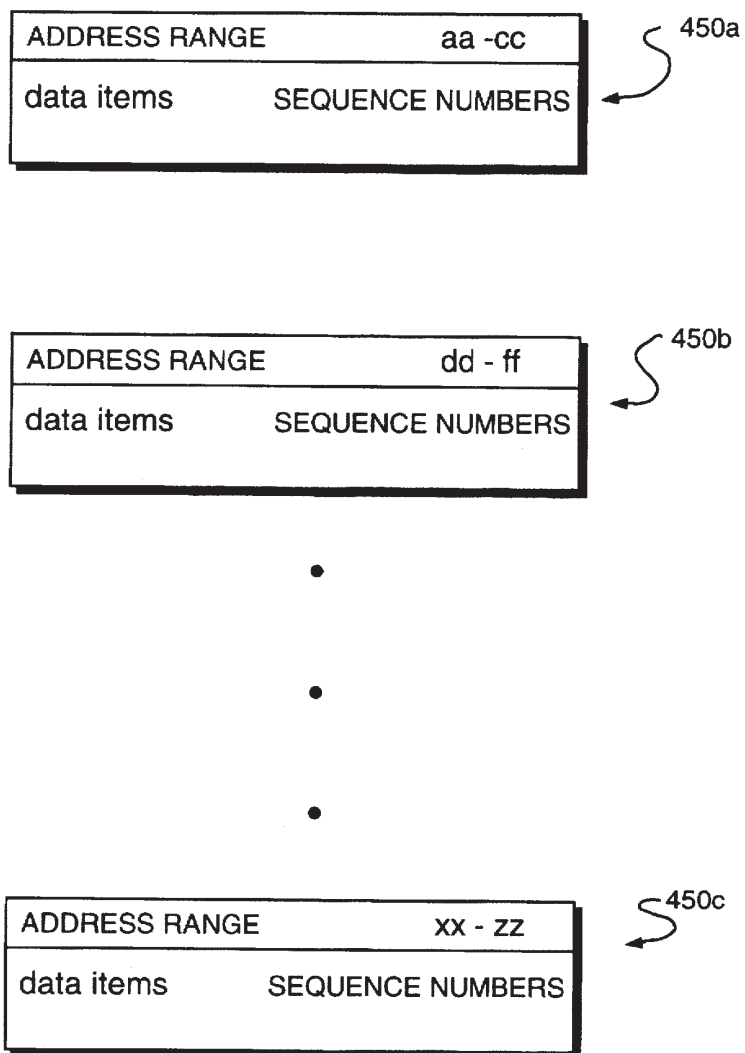
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