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**Azuma et al.**

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(54) **COMMUNICATION NODE, RESTORATION METHOD AND COMMUNICATION NETWORK**

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(73) Assignee: **Fujitsu Limited, Kawasaki (JP)**

(\* ) 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).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 73 days.

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(30) **Foreign Application Priority Data**

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(51) **Int. Cl.**<sup>7</sup> ..... **H04L 12/407; G01R 31/08**

(52) **U.S. Cl.** ..... **370/218; 370/228; 370/255; 370/400; 340/825.01; 709/239**

(58) **Field of Search** ..... 395/181, 182.02, 395/200.68, 200.69, 200.72, 200.73, 200.52; 370/216, 217, 221, 225, 400, 406, 410, 254, 255-256, 409, 392, 227, 228; 709/239-244; 340/825.01

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(57) **ABSTRACT**

In a telecommunication network, each node is provided with the same physical topology information relating to a physical construction of telecommunication paths included in the telecommunication network and with the same logical topology information relating to routing of telecommunication paths. When a failure occurs, restoration is effected by transmitting information relating to the failure that has occurred in the telecommunication network, throughout the network. Each node that receives the information relating to the failure determines alternative paths for bypassing the failure using the information relating to the failure, the physical topology information, and the logical topology information. Then service is switched to the alternative paths.

**16 Claims, 9 Drawing Sheets**

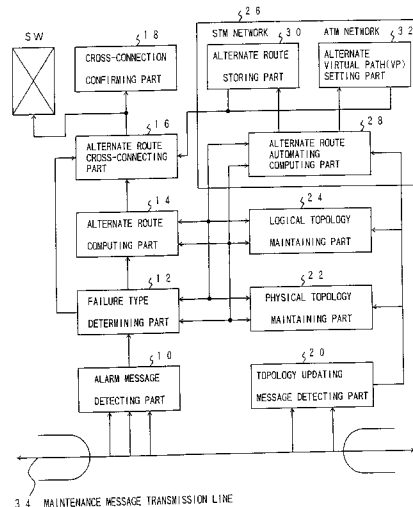
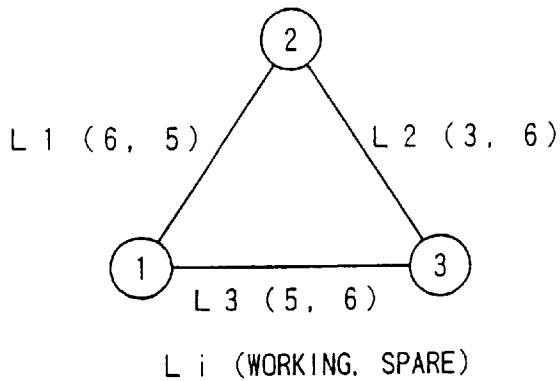


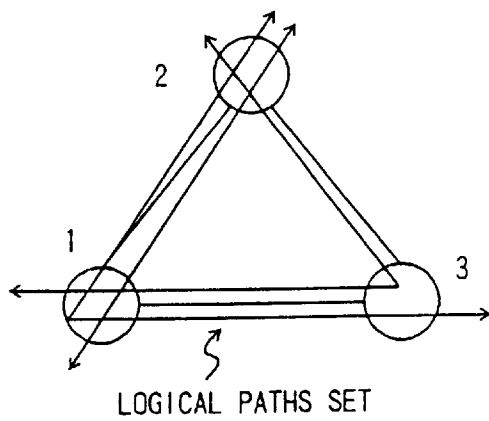
FIG. 1A



PHYSICAL TOPOLOGY TABLE

L	W	S
1	6	5
2	3	6
3	5	6

FIG. 1B



LOGICAL TOPOLOGY TABLE

C	PATHS SET
3	1 ↔ 3 ↔ 2
2	2 ↔ 1 ↔ 3
4	1 ↔ 2

CAPACITY TO BE RESTORED

FIG. 2A

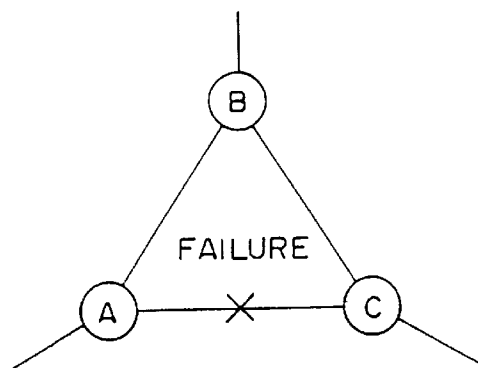


FIG. 2B

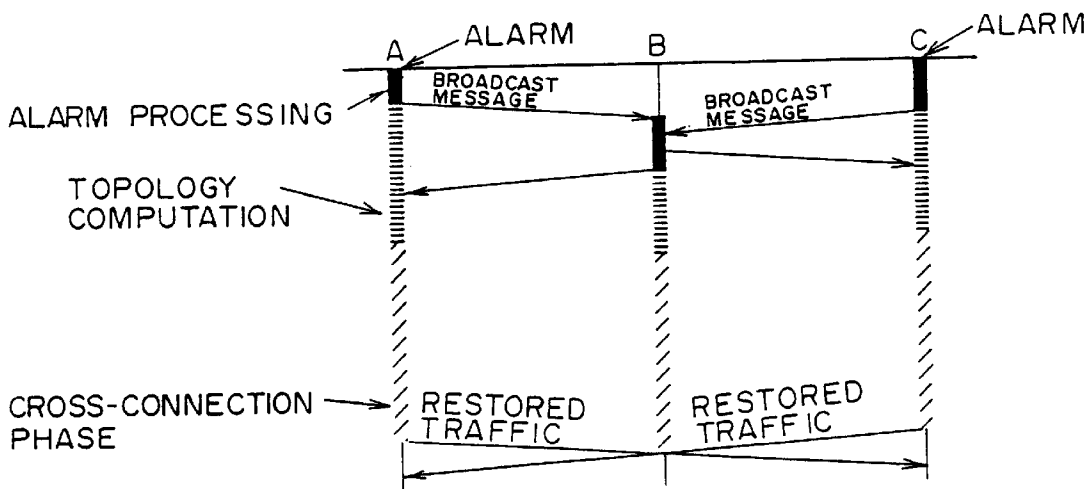


FIG. 3A

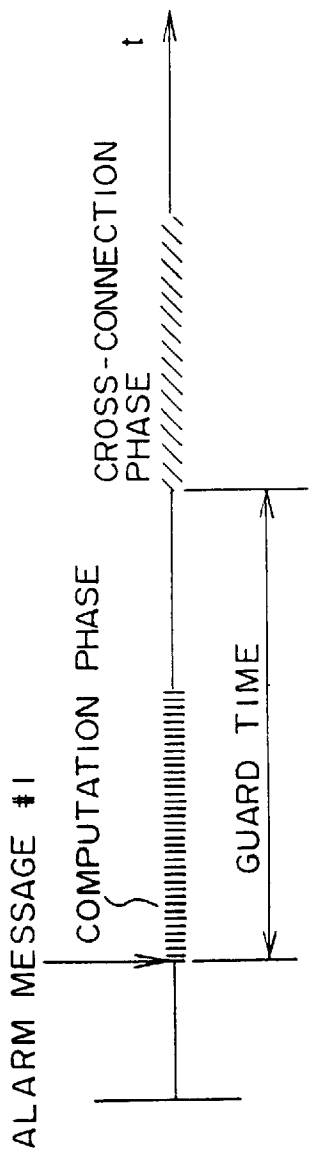


FIG. 3B

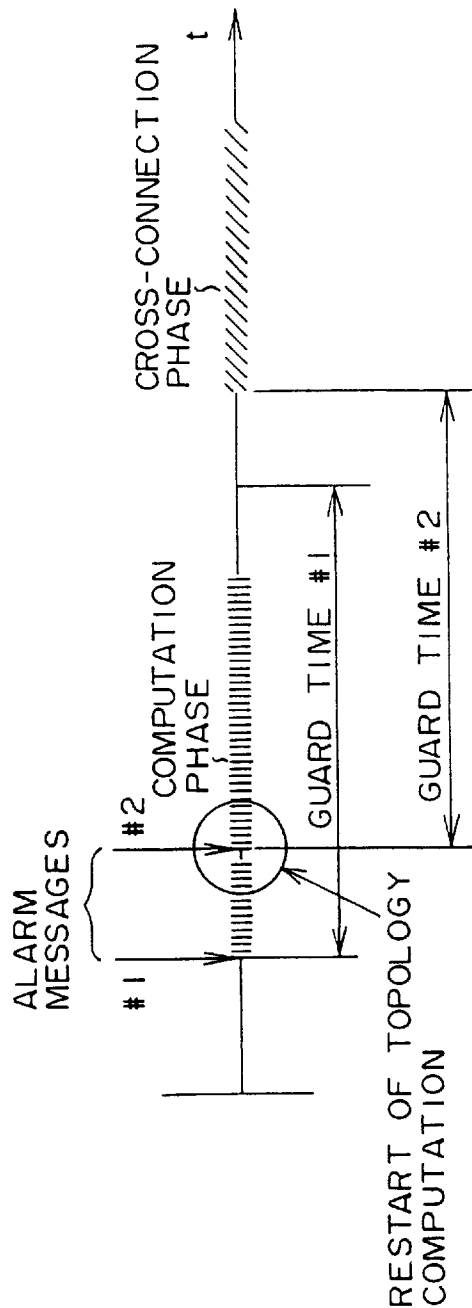


FIG. 4A

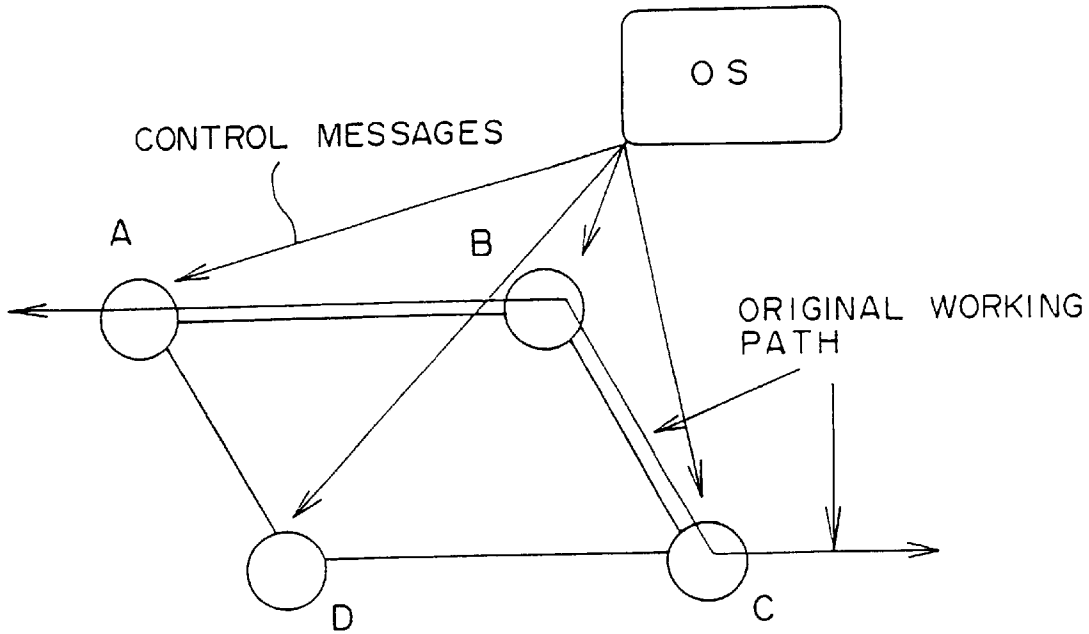
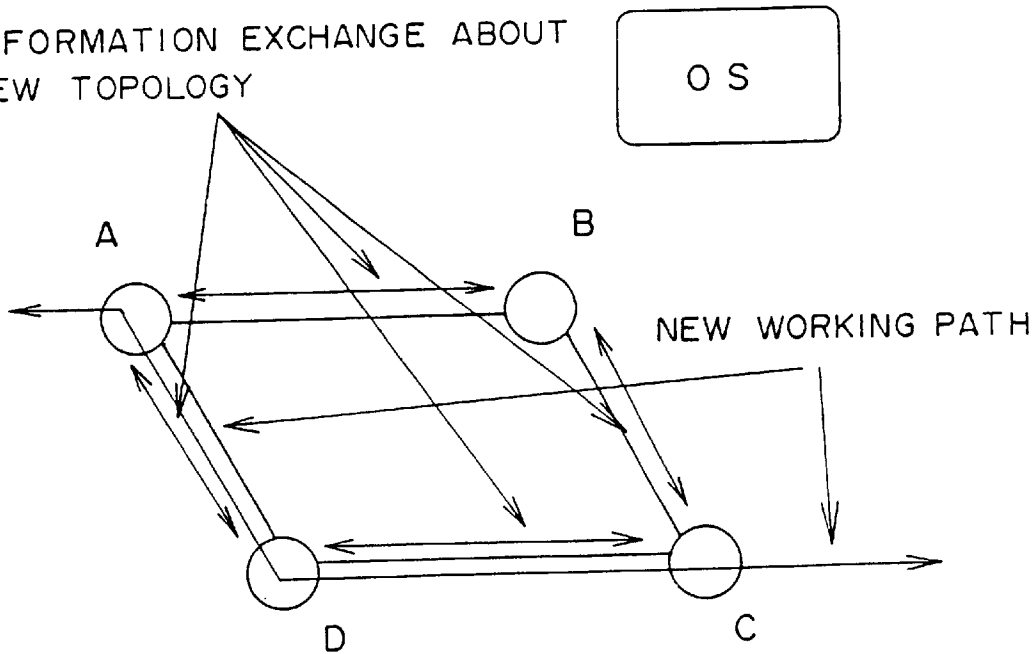


FIG. 4B

INFORMATION EXCHANGE ABOUT  
NEW TOPOLOGY



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