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(12) **United States Patent**  
**Baek et al.**

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(45) **Date of Patent:** **Dec. 20, 2005**

(54) **APPARATUS FOR REDUNDANT  
INTERCONNECTION BETWEEN MULTIPLE  
HOSTS AND RAID**

6,609,213 B1 \* 8/2003 Nguyen et al. .... 714/4  
6,820,171 B1 \* 11/2004 Weber et al. .... 711/114

**OTHER PUBLICATIONS**

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patent is extended or adjusted under 35  
U.S.C. 154(b) by 856 days.

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(51) Int. Cl.<sup>7</sup> ..... **G06F 13/00; G06F 12/00**

(52) U.S. Cl. .... **711/114; 709/250**

(58) Field of Search ..... 709/201-203,  
709/217-219, 223-224, 239-240, 244, 250;  
711/114; 710/38; 370/360, 412

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

4,652,536 A 3/1987 Nakajima et al.  
5,251,062 A 10/1993 Snitzer et al.  
5,798,306 A 8/1998 Dickinson, Jr.  
5,812,754 A \* 9/1998 Lui et al. .... 714/6  
6,192,485 B1 \* 2/2001 Takita et al. .... 714/6

Tellurite glass: a new candidate for fiber devices by J.S. Wang: Optical Materials 3 (1994) 187-203.

Structure and optical properties of rare earth doped zinc oxyhalide tellurite glasses by D.L. Sidebottom: Journl of Non-Crystalline Solids 222 (1997), pp. 282-289.

Raman spectra and thermal analysis of a new lead-tellurium-germanate glass system by Z. Pan: Journl of Non-Crystalline Solids 210 (1997), pp. 130-135.

\* cited by examiner

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(57) **ABSTRACT**

The apparatus for a redundant interconnection between multiple hosts and a redundant array of inexpensive disks (hereinafter, referred to as 'RAID'), which is capable of supporting a fault tolerance of RAID controllers and simultaneously heightening a performance, comprises a plurality of RAID controlling units for processing a requirement of numerous host computers connected with one another through the industrial standard communication network and for fault tolerance; a plurality of connecting units for connecting the plurality of RAID controlling units to the numerous host computers; and a plural number of network interface controlling units respectively contained into the plurality of RAID controlling units, for exchanging information directly with an opposite network interface controlling unit provided within an opposite RAID controlling unit and the numerous host computers, through the plurality of connecting units.

**9 Claims, 6 Drawing Sheets**

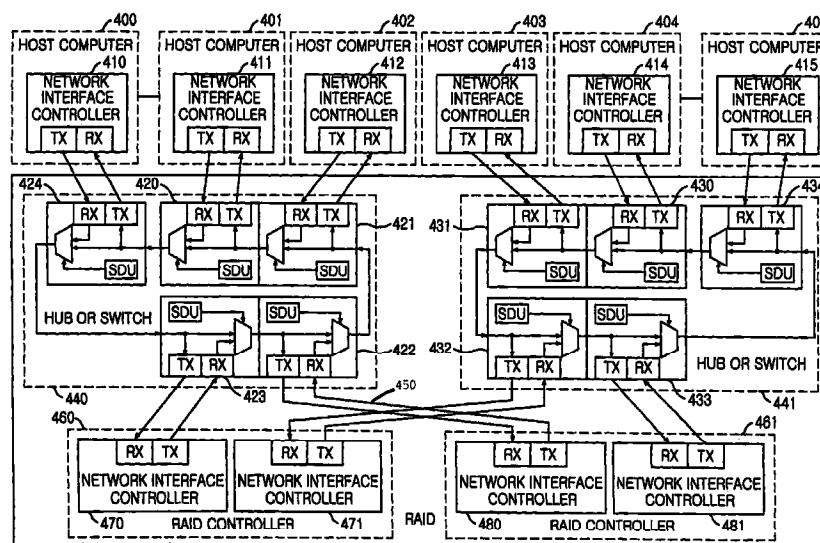


FIG. 1

--PRIOR ART--

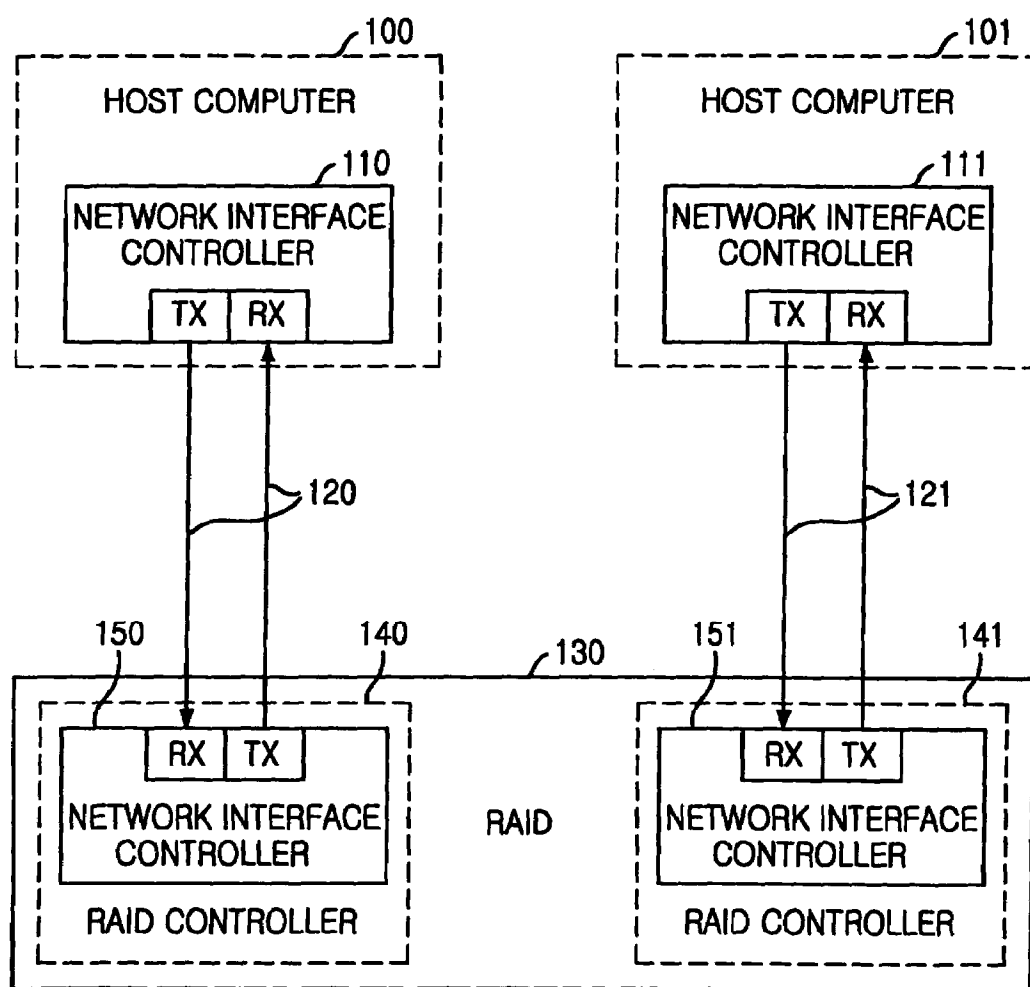


FIG. 2

--PRIOR ART--

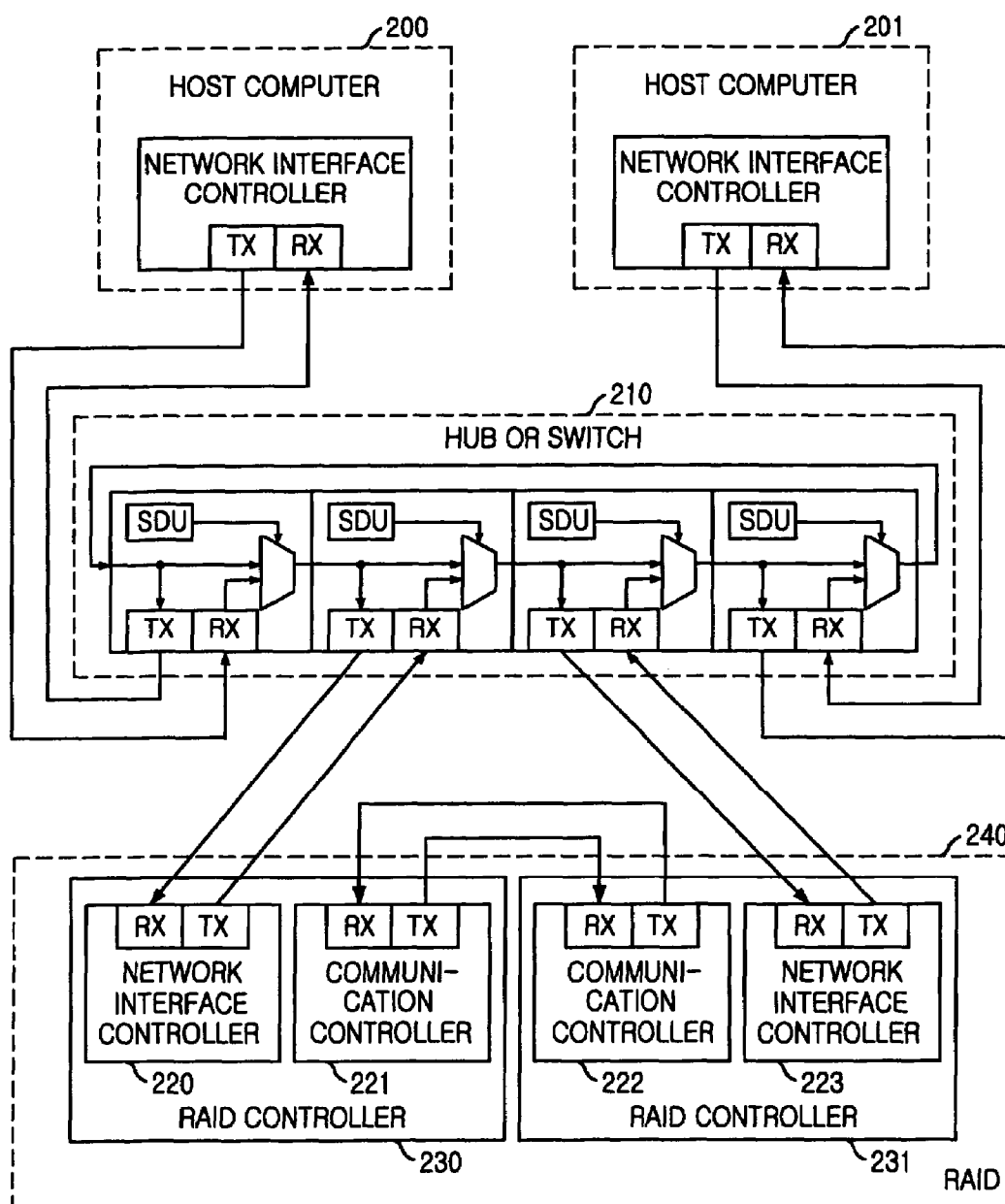
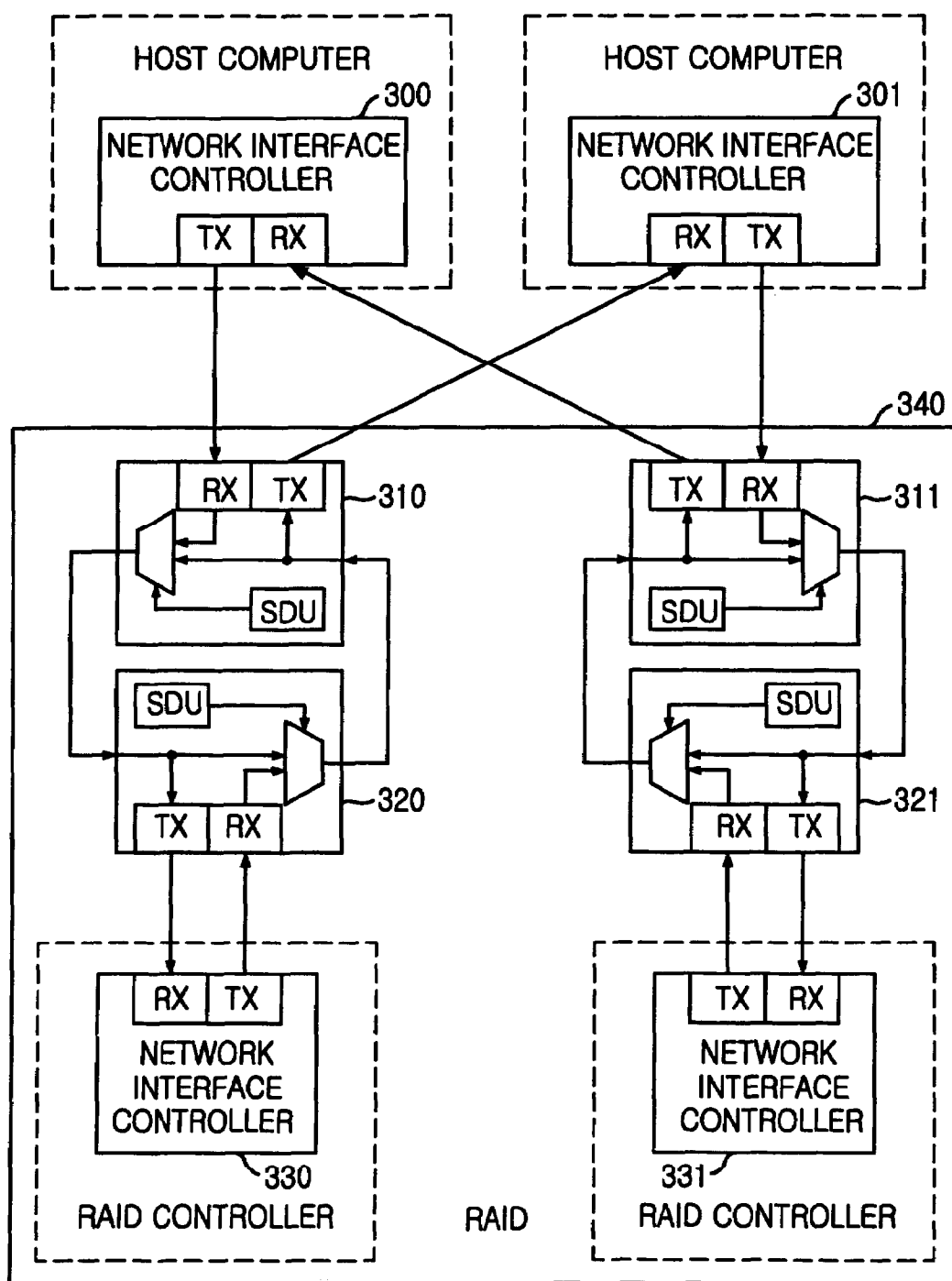
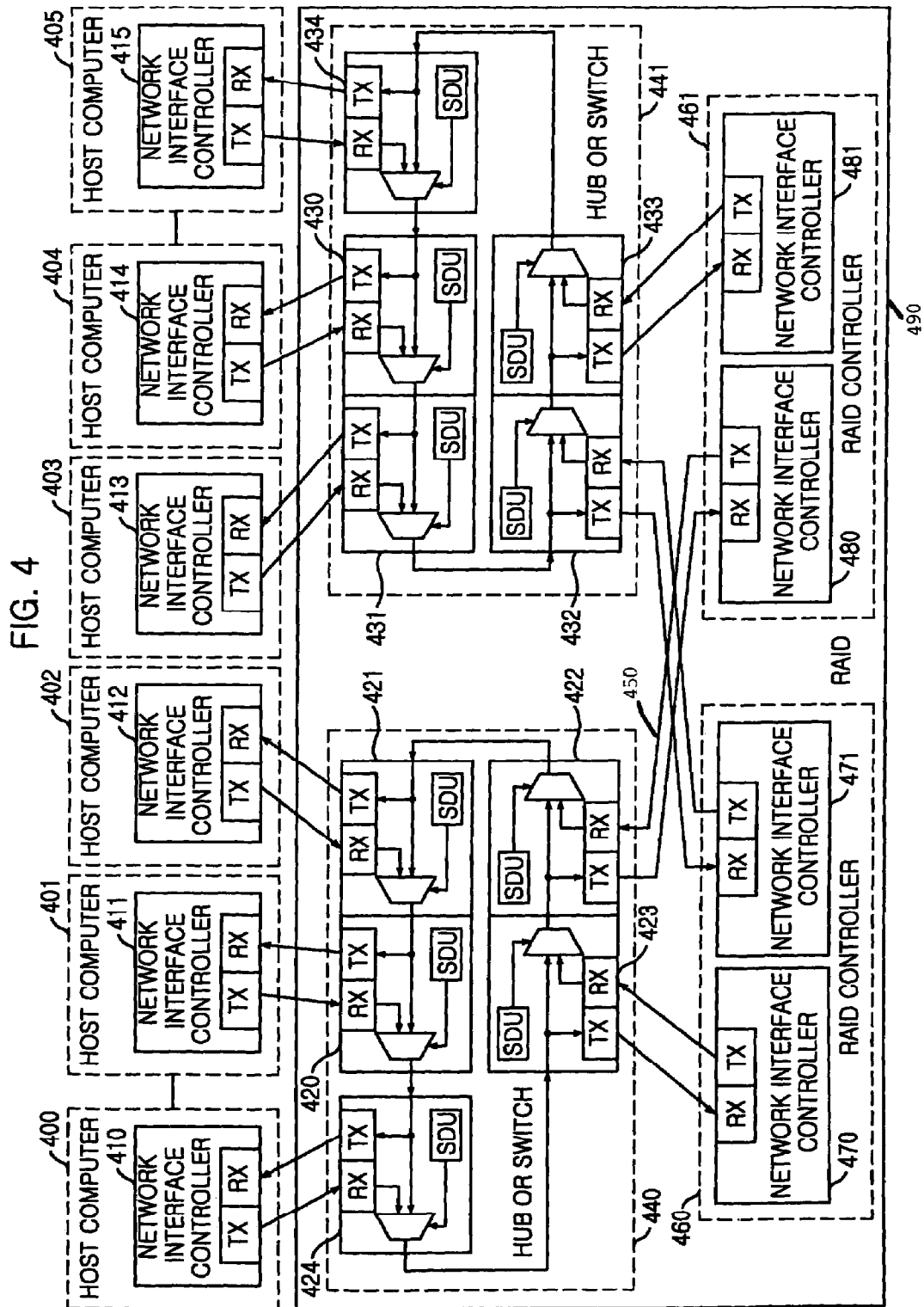


FIG. 3

--PRIOR ART--





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