



United States Patent [19]

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Erickson et al.

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[54] METHOD FOR PERFORMING SEQUENCE OF ACTIONS IN DEVICE CONNECTED TO COMPUTER IN RESPONSE TO SPECIFIED VALUES BEING WRITTEN INTO SNOOPED SUB PORTIONS OF ADDRESS SPACE

"The DASH Local Kernel Structure" by David P. Anderson and Shin-Yuan Tzou. Report No. UCB/CSD 88/463. Nov. 7, 1988. Computer Science Division (EECS), University of California, Berkeley 94720.

[75] Inventors: Gene R. Erickson; Douglas E. Hundley, both of Poway; P. Keith Muller; Curtis H. Stehley, both of San Diego, all of Calif.

"A Users' Guide to PICL—A Portable Instrumented Communication Library" By G.A. Geist et. al., Oak Ridge National Laboratory, Mathematical Sciences Section, P.O. Box 2009, Bldg. 9207-A, Oak Ridge, TN 37831-8083 (Aug. 1990).

[73] Assignee: NCR Corporation, Dayton, Ohio

"Architecture and Implementation of Vulcan" By Craig B. Stunkel, et. al., IBM Research Division, Yorktown Heights, New York (Sep. 22, 1993).

[21] Appl. No.: 577,678

[22] Filed: Dec. 21, 1995

[51] Int. Cl.⁶ G06F 15/02

[52] U.S. Cl. 395/829

[58] Field of Search 395/821, 823, 395/829, 832, 846, 882, 284, 309, 500, 473

"MPI-F: An MPI Prototype Implementation on IBM SP1" by Hubertus Franke et. al., pub. by IBM, T.J. Watson Research Center, Yorktown Heights, New York 10598.

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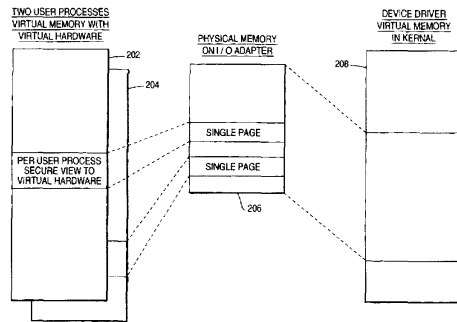
"The Performance of Message-Passing Using Restricted Virtual Memory Remapping", by Shin-Yuan Tzou and David P. Anderson, in *Software-Practice & Experience*, vol. 21(3), 251-267 (Mar. 1991).

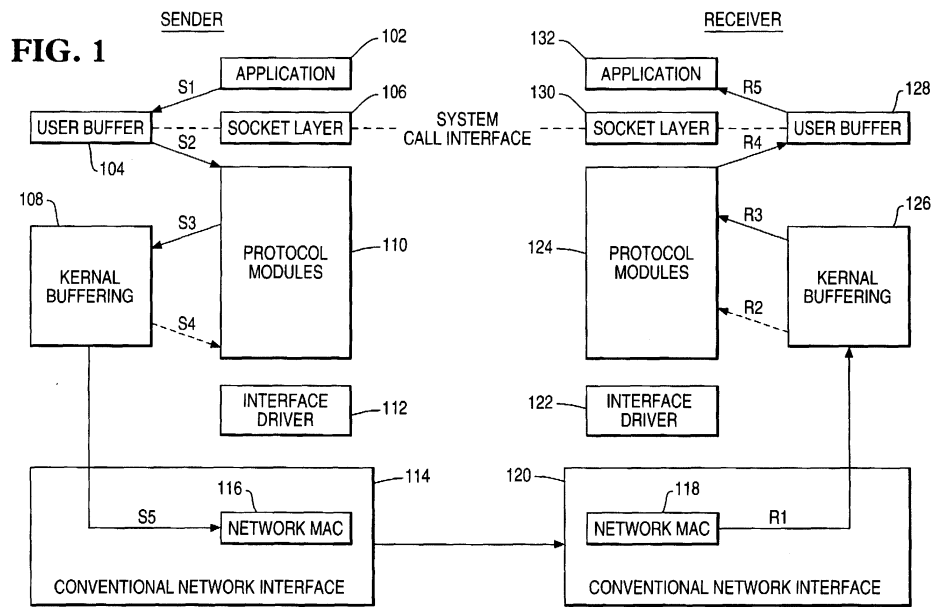
Primary Examiner—Moustafa M. Meky
Attorney, Agent, or Firm—Merchant, Gould, Smith, Edell, Welter & Schmidt

[57] ABSTRACT

A method of controlling an input/output (I/O) device connected to a computer to facilitate fast I/O data transfers. An address space for the I/O device is created in the virtual memory of the computer, wherein the address space comprises virtual registers that are used to directly control the I/O device. In essence, control registers and/or memory of the I/O device are mapped into the virtual address space, and the virtual address space is backed by control registers and/or memory on the I/O device. Thereafter, the I/O device detects writes to the address space. As a result, a pre-defined sequence of actions can be triggered in the I/O device by programming specified values into the data written into the mapped virtual address space.

19 Claims, 7 Drawing Sheets





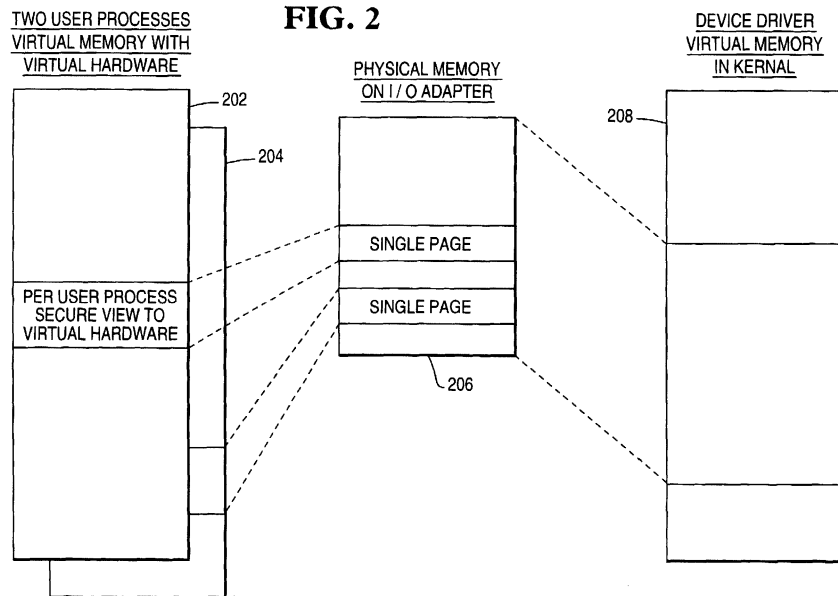


FIG. 3

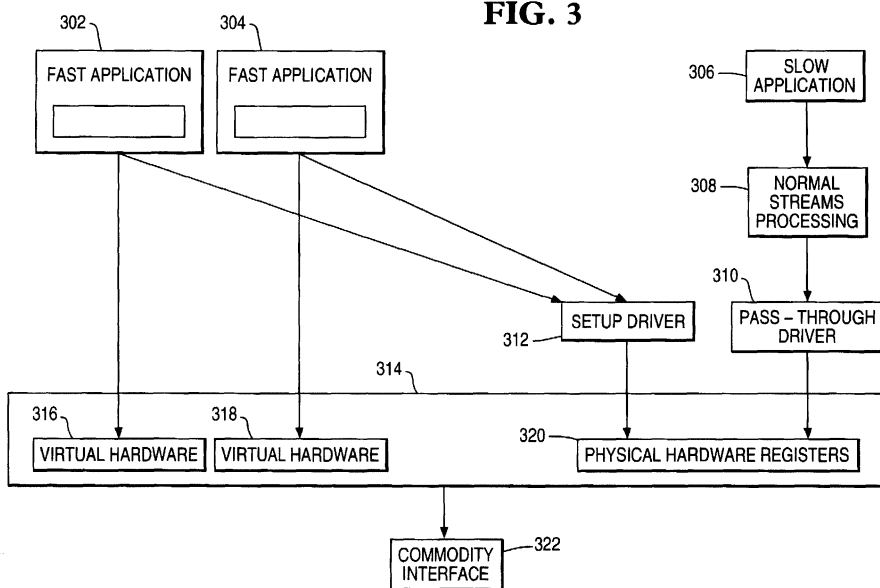
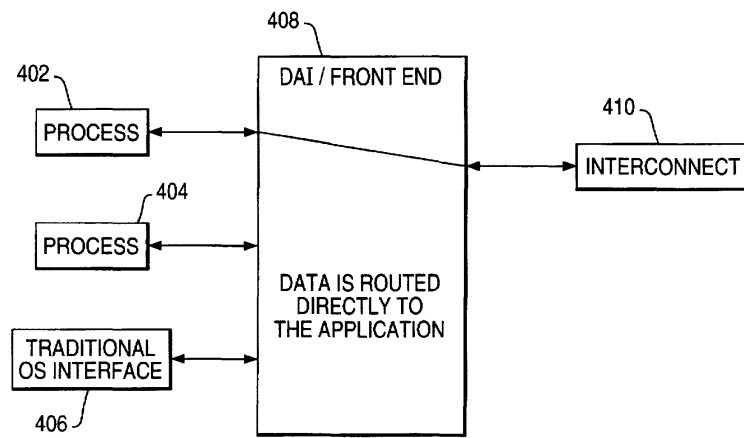


FIG. 4



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