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**United States Patent** [19]  
**Morris, III**

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[54] **METHOD AND APPARATUS FOR A FIRST DEVICE ACCESSING COMPUTER MEMORY AND A SECOND DEVICE DETECTING THE ACCESS AND RESPONDING BY PERFORMING SEQUENCE OF ACTIONS**

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*Attorney, Agent, or Firm*—Gates & Cooper

[21] Appl. No.: **08/778,938**  
[22] Filed: **Jan. 3, 1997**

[57] **ABSTRACT**

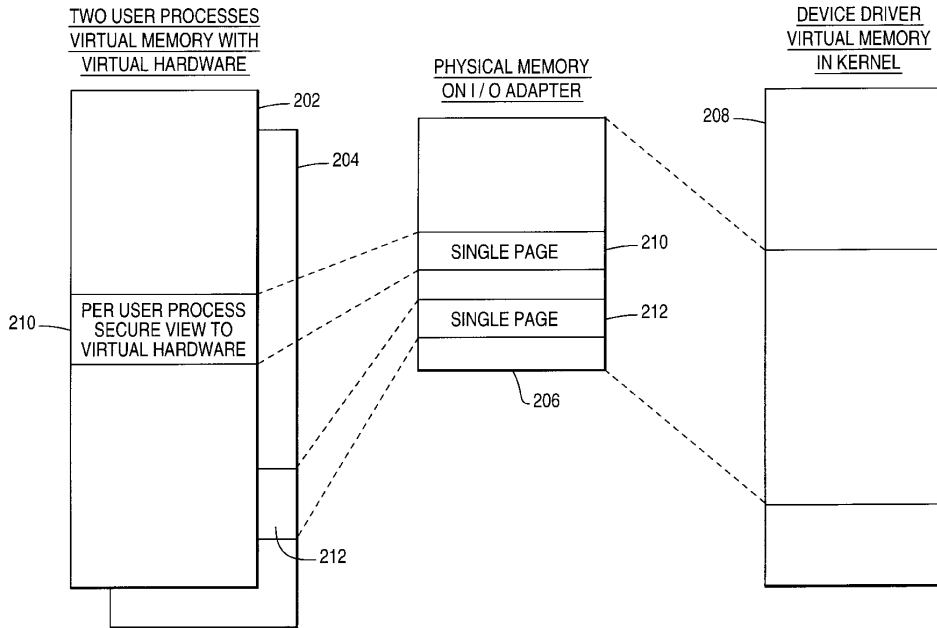
[51] **Int. Cl.**<sup>6</sup> ..... **G06F 13/00**  
[52] **U.S. Cl.** ..... **395/829**; 395/826; 395/836;  
395/856; 711/146  
[58] **Field of Search** ..... 370/218; 395/520,  
395/872, 828, 847, 836, 842, 829, 473;  
707/201; 364/578, 528.21

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 devices 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.

[56] **References Cited**  
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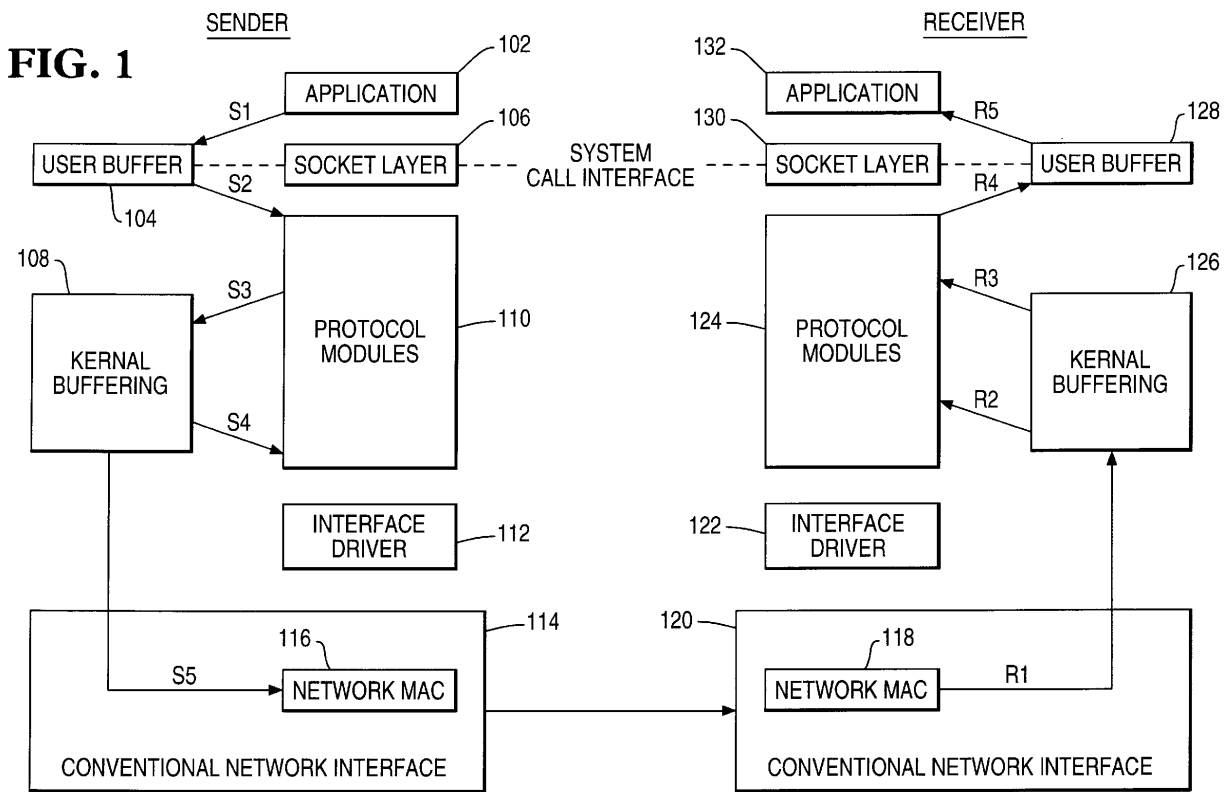
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**27 Claims, 8 Drawing Sheets**

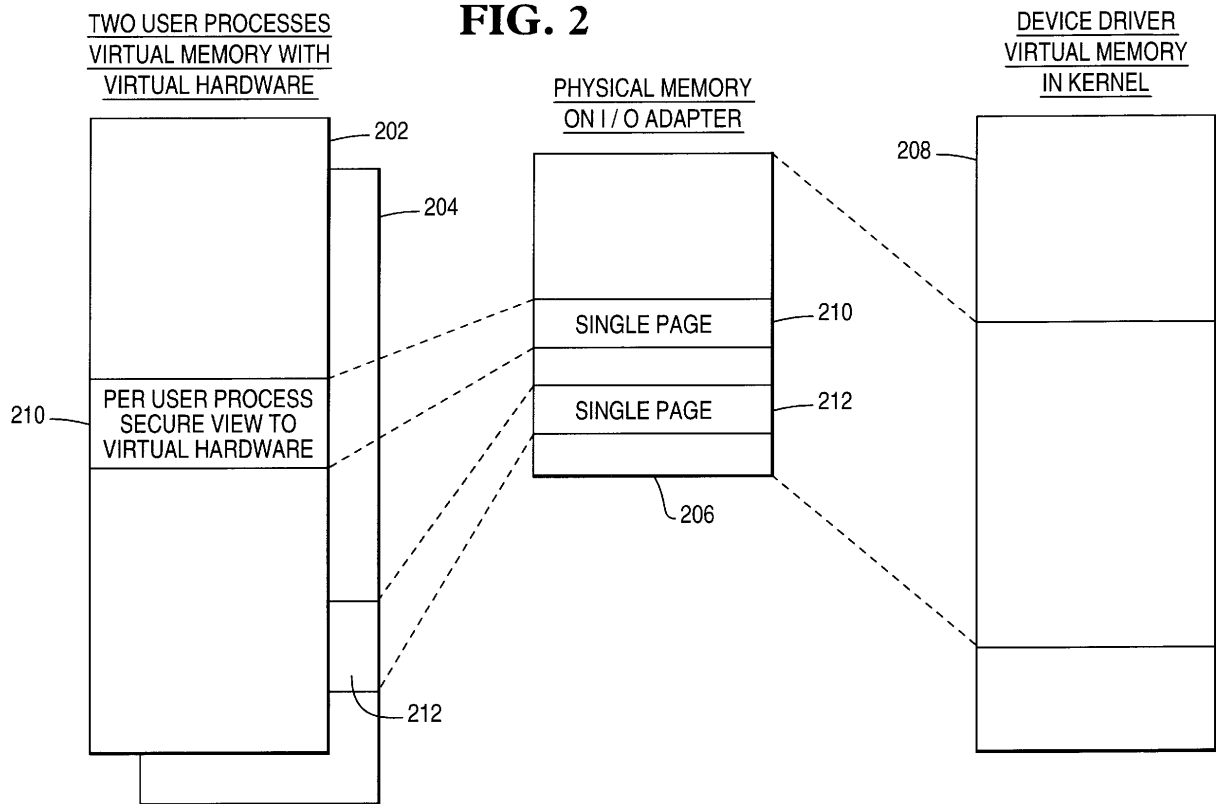


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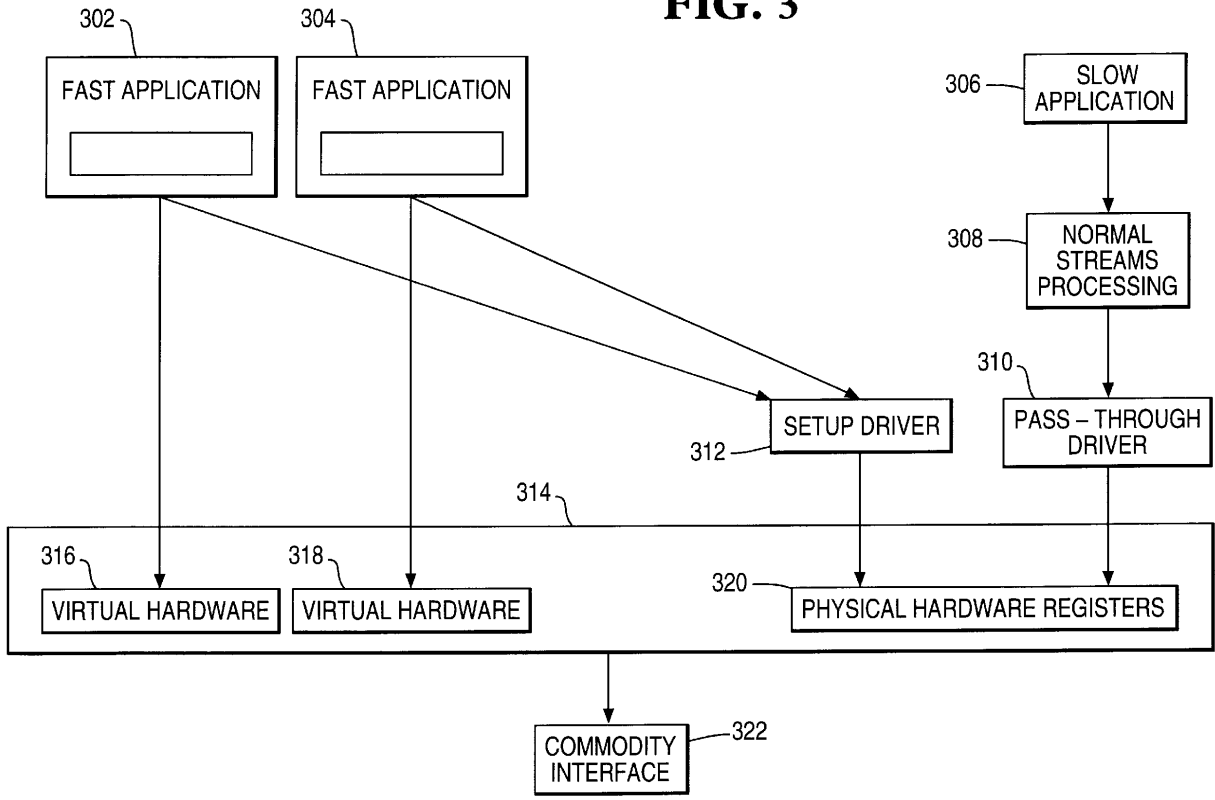


**FIG. 2**



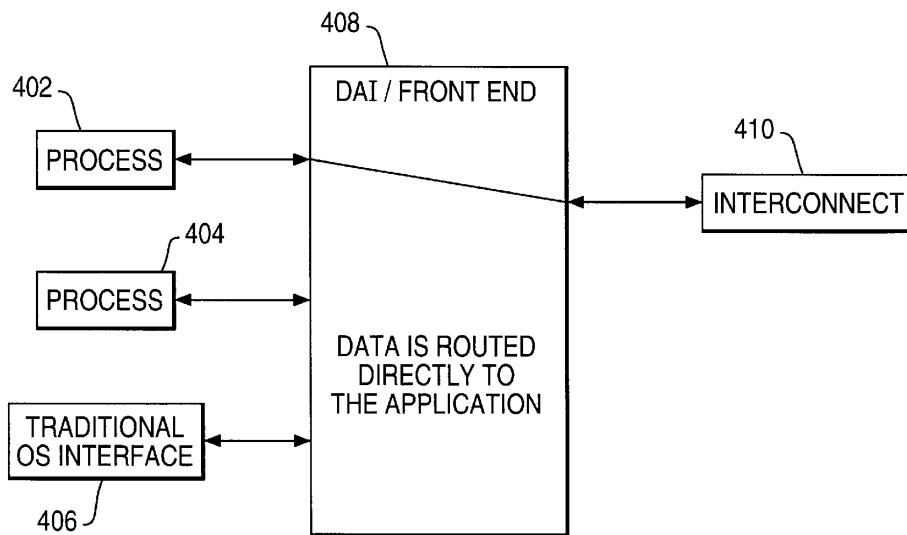
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FIG. 3



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FIG. 4



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