

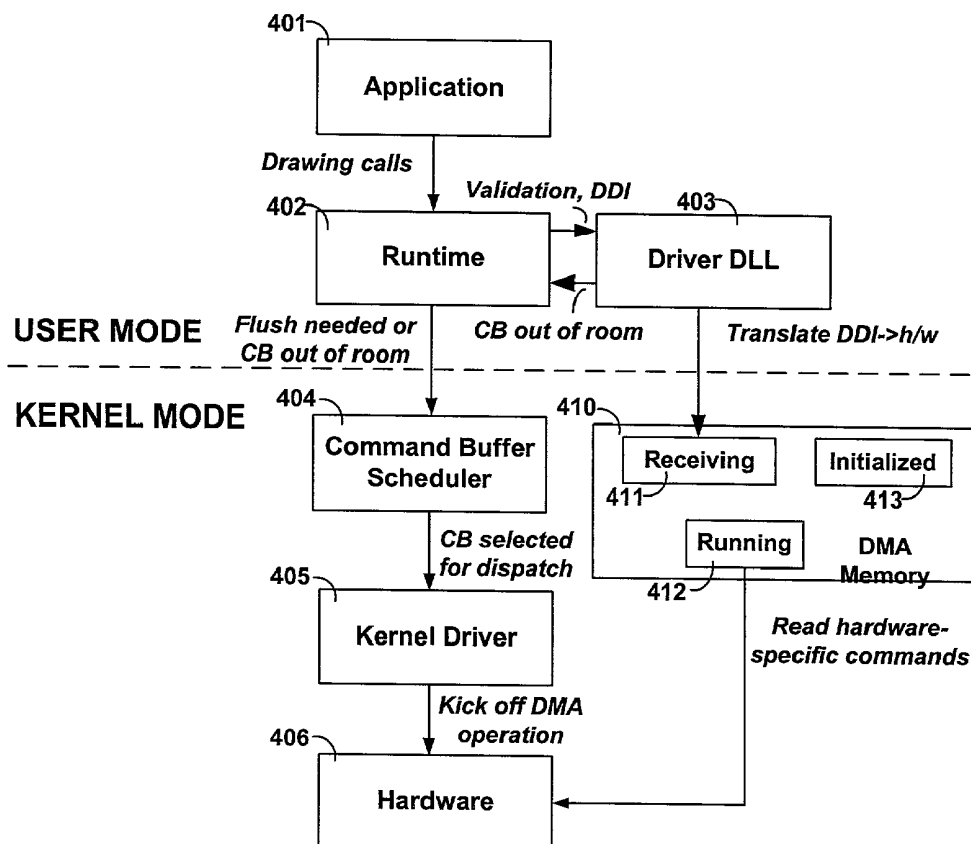


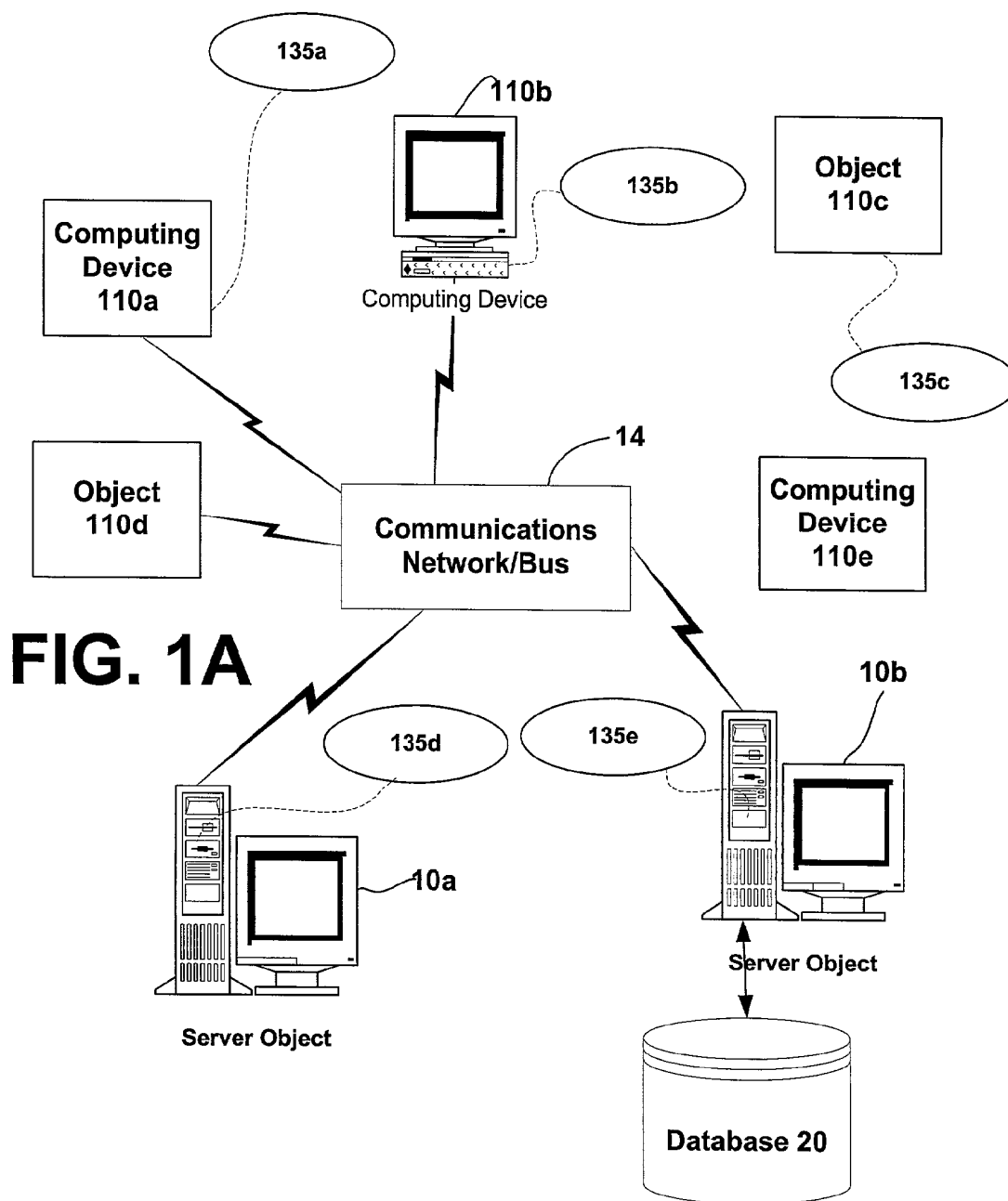
US 20030140179A1

(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2003/0140179 A1****Wilt et al.**(43) **Pub. Date:****Jul. 24, 2003**(54) **METHODS AND SYSTEM FOR MANAGING  
COMPUTATIONAL RESOURCES OF A  
COPROCESSOR IN A COMPUTING SYSTEM****Publication Classification**(51) **Int. Cl.<sup>7</sup>** ..... **G06F 13/10; G06F 9/00**(52) **U.S. Cl.** ..... **709/321; 709/102**(75) **Inventors:** **Nicholas P. Wilt**, Sammamish, WA  
(US); **Sameer A. Nene**, Redmond, WA  
(US); **Joseph S. Beda III**, Seattle, WA  
(US)(57) **ABSTRACT**

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Systems and methods are provided for managing the computational resources of coprocessor(s), such as graphics processor(s), in a computing system. The systems and methods illustrate management of computational resources of coprocessors to facilitate efficient execution of multiple applications in a multitasking environment. By enabling multiple threads of execution to compose command buffers in parallel, submitting those command buffers for scheduling and dispatch by the operating system, and fielding interrupts that notify of completion of command buffers, the system enables multiple applications to efficiently share the computational resources available in the system.

(73) **Assignee:** **Microsoft Corporation**(21) **Appl. No.:** **10/039,036**(22) **Filed:** **Jan. 4, 2002**



Computing Environment 100

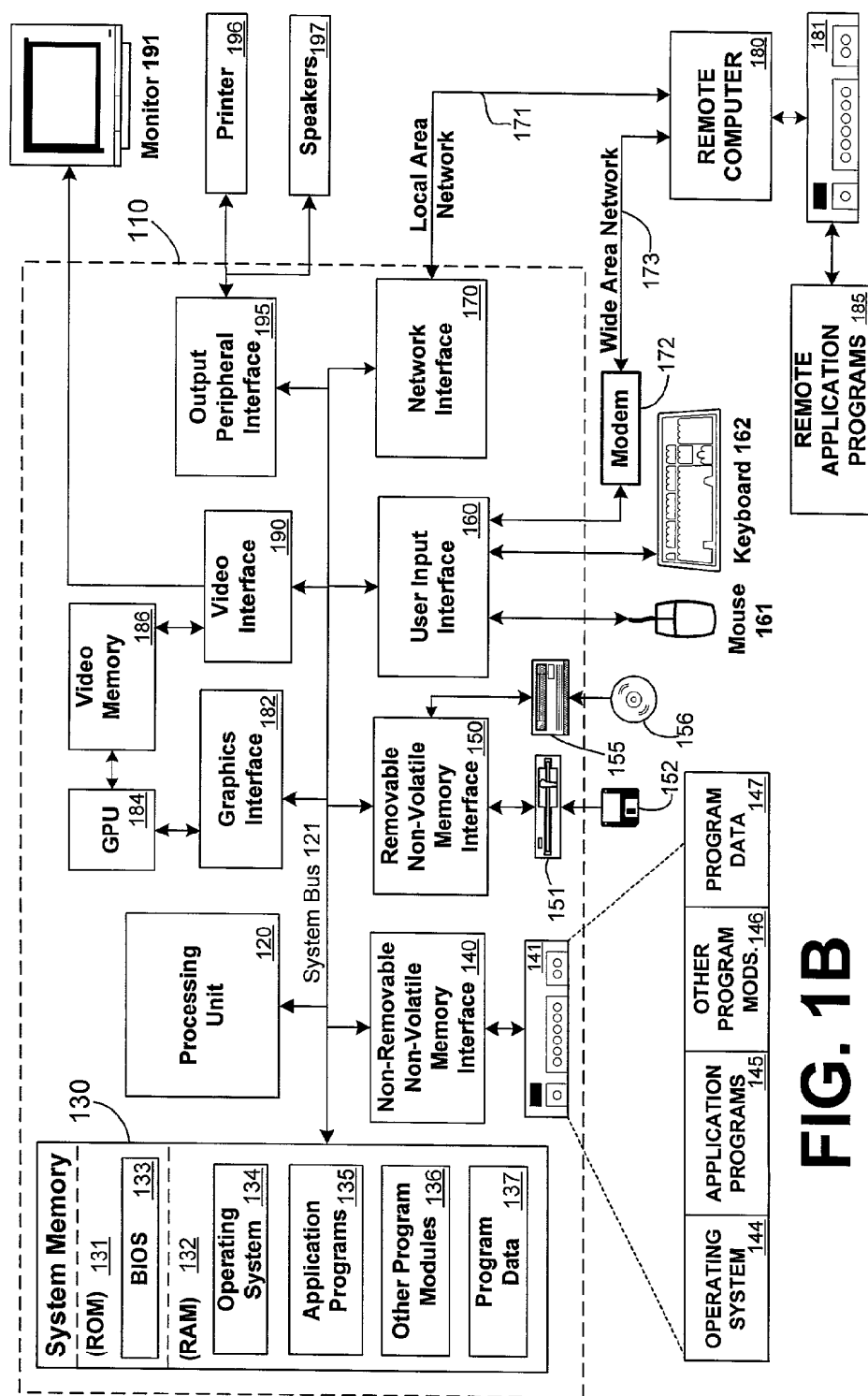
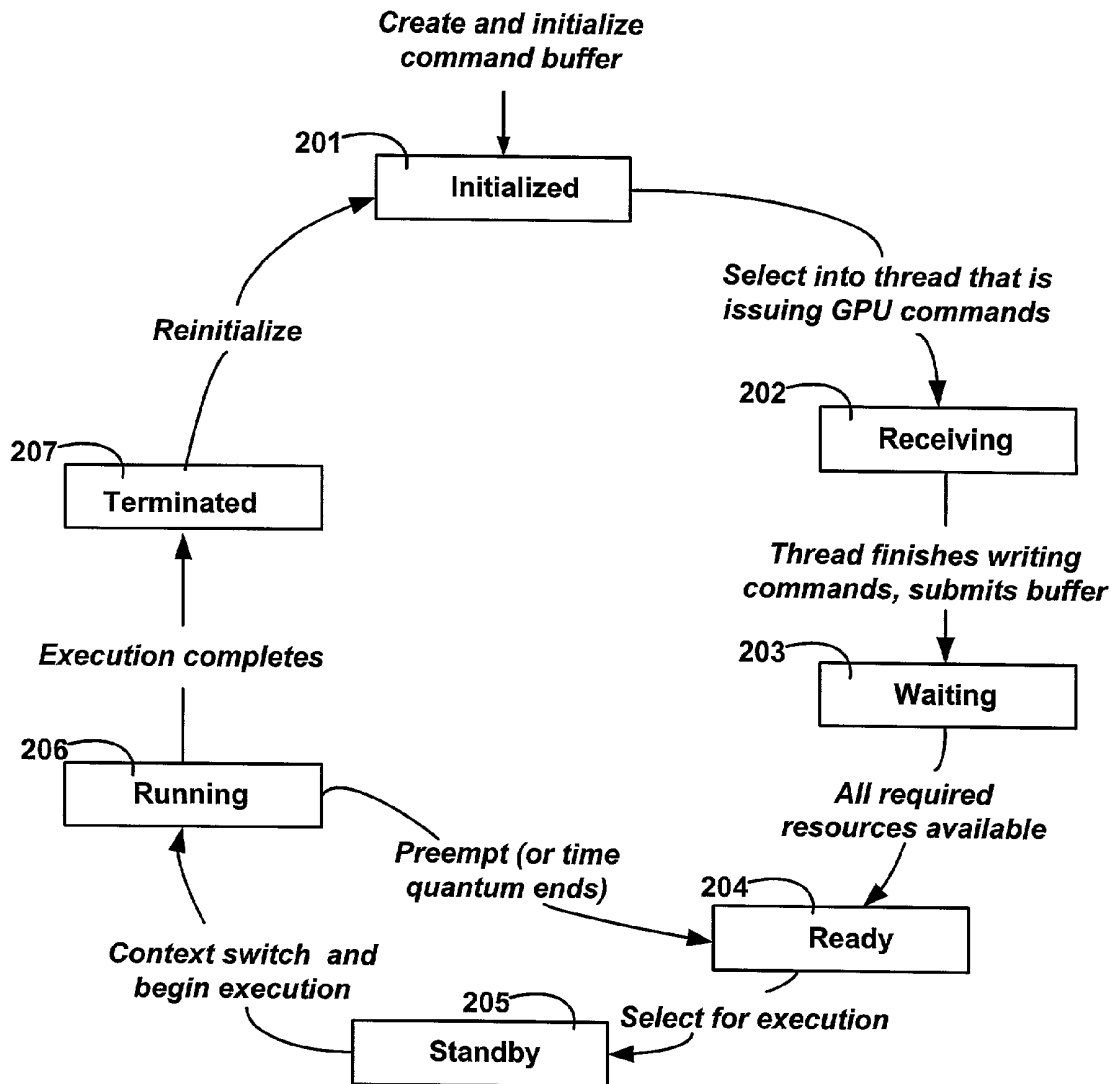


FIG. 1B

## FIG. 2



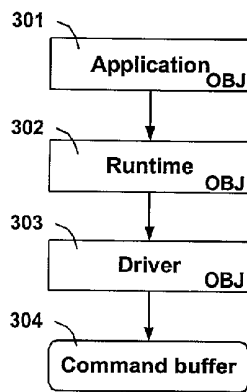


FIG. 3A

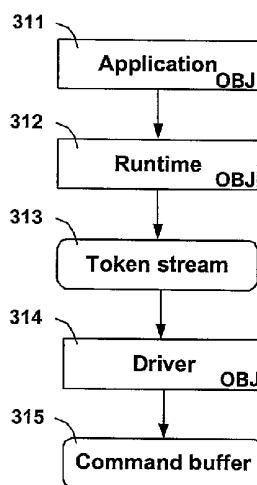


FIG. 3B

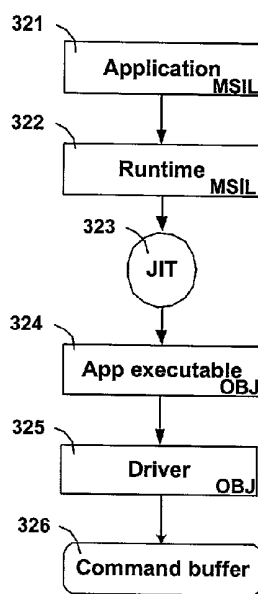


FIG. 3C

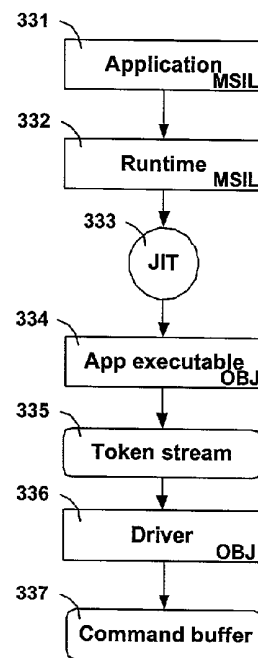


FIG. 3D

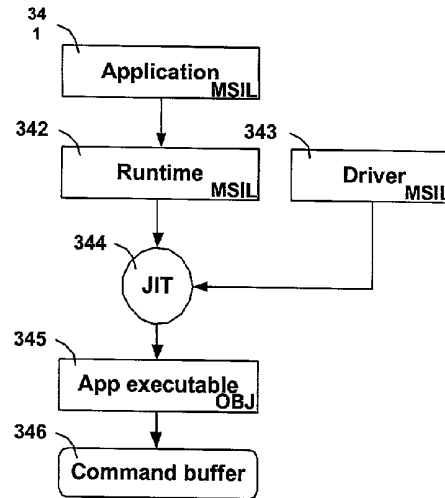


FIG. 3E

**FIGS.  
3A-E**



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