



US006824064B2

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

(10) **Patent No.:** **US 6,824,064 B2**
(45) **Date of Patent:** **Nov. 30, 2004**

(54) **CONCURRENT COMMUNICATION WITH MULTIPLE APPLICATIONS ON A SMART CARD**

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(73) Assignee: **Mobile-Mind, Inc.**, Watertown, MA (US)

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 286 days.

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(21) Appl. No.: **09/730,670**

(22) Filed: **Dec. 6, 2000**

(65) **Prior Publication Data**

US 2002/0066792 A1 Jun. 6, 2002

(51) **Int. Cl.**⁷ **G06K 19/06**

(52) **U.S. Cl.** **235/492; 235/375; 235/380; 235/382; 361/737; 711/102; 711/103; 710/102; 710/301**

(58) **Field of Search** **235/492, 380, 235/382, 486, 379; 361/737; 711/102, 103; 710/102, 301**

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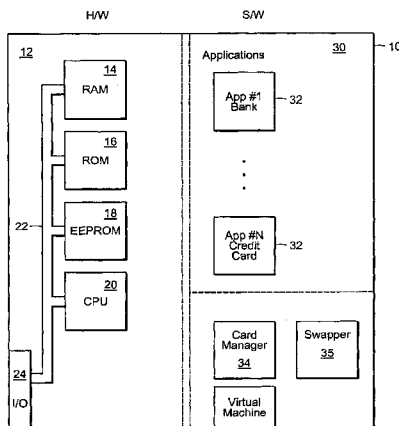
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(57) **ABSTRACT**

A smart card capable of having a plurality of applications has a memory that is logically partitioned into a plurality of memory blocks. A control program allocates one or more blocks to one of the applications, upon a declaration from the application of its memory needs, and schedules the applications for execution. Only those applications whose memory needs have been satisfied are scheduled. The control program receives a permission request packet from a host, addressed to an application, and passes the permission request packet to the application. When the control program receives a permission packet from the addressed application after the addressed application has had its declared memory needs satisfied, the control program sends the permission packet to the host. A virtual machine is used to execute one or more of the applications. The control program communicates with the virtual machine to control scheduling to predetermined time granularity. A swapper swaps data pages between the smart card's memory, i.e., primary storage, and secondary storage in a host.

7 Claims, 33 Drawing Sheets



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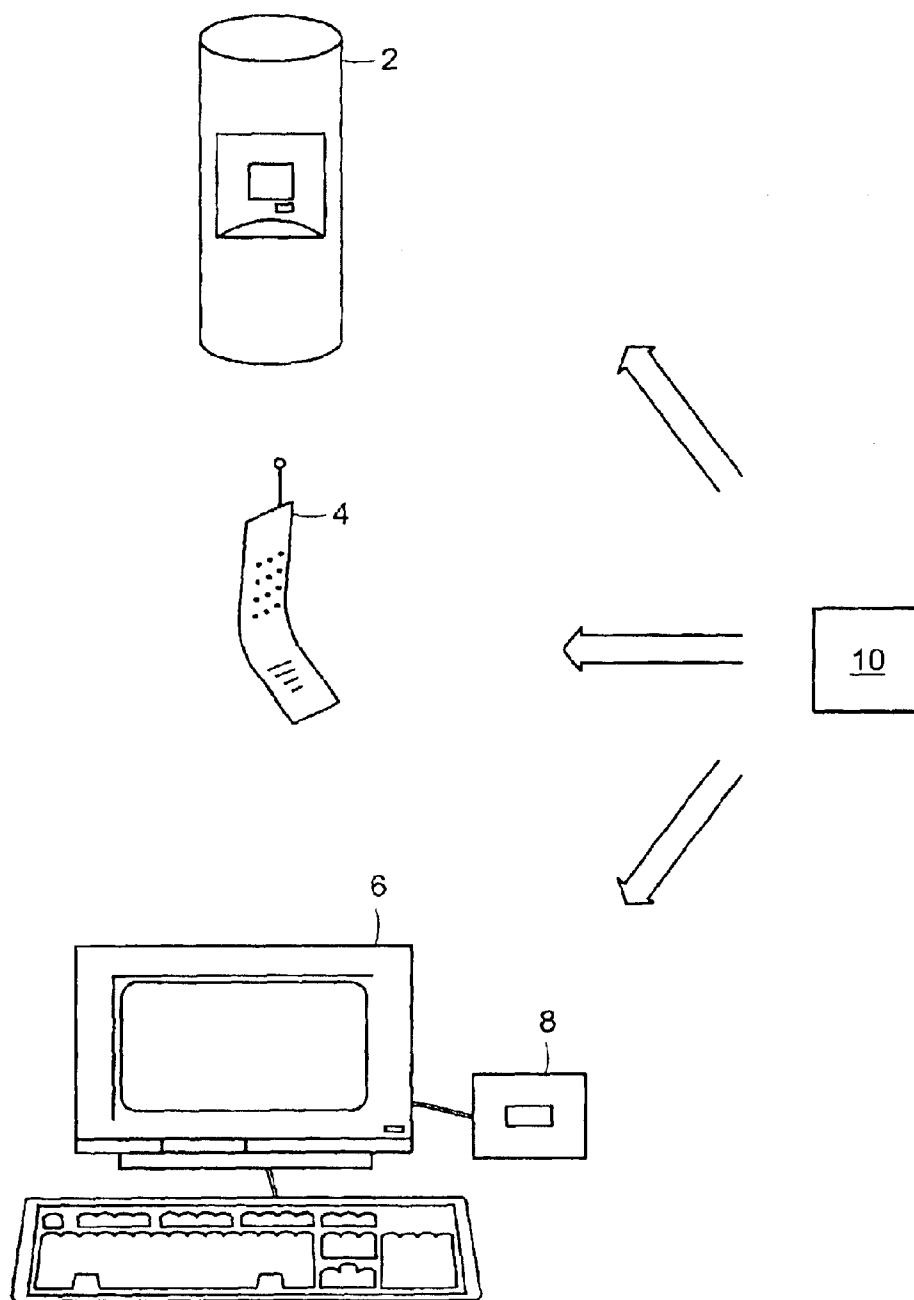


FIG. 1

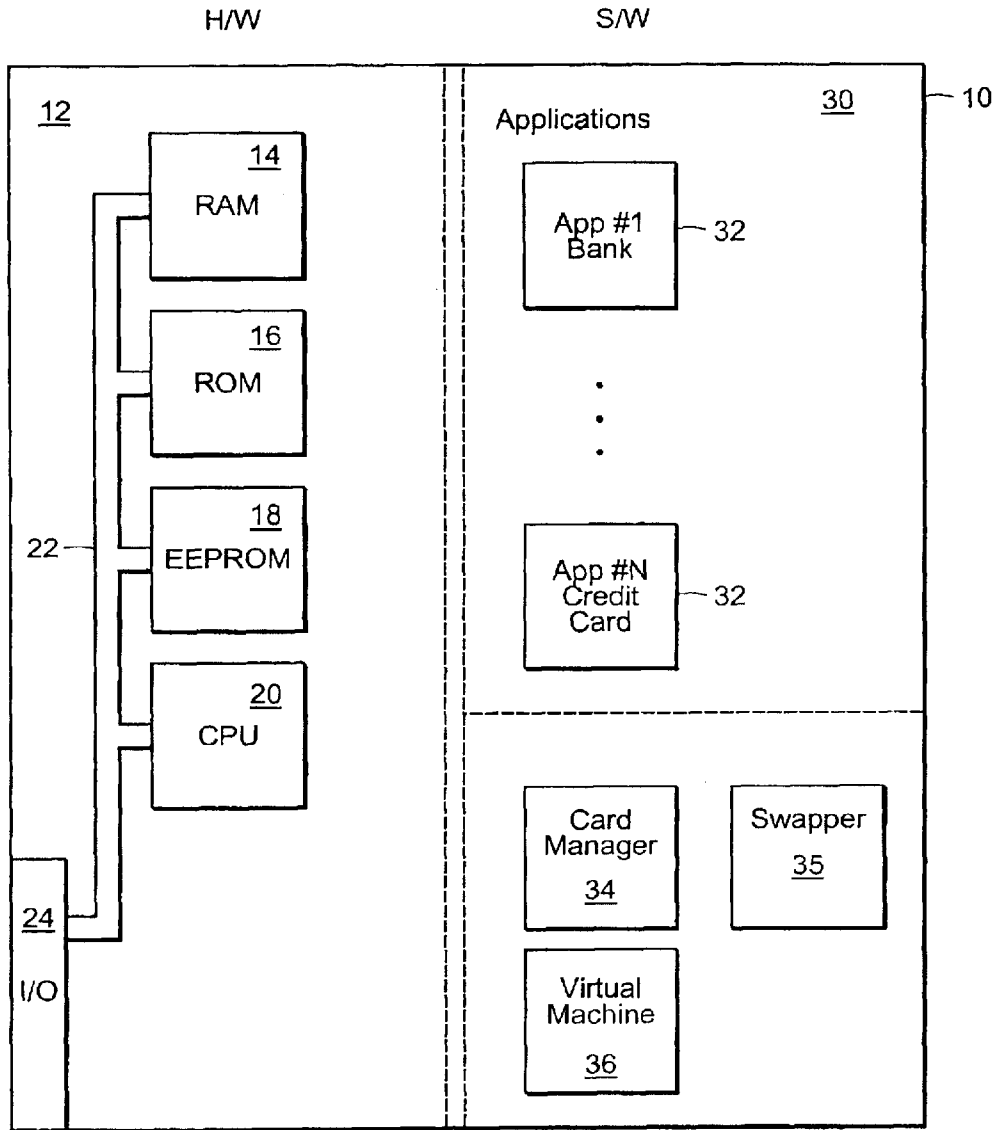


FIG. 2

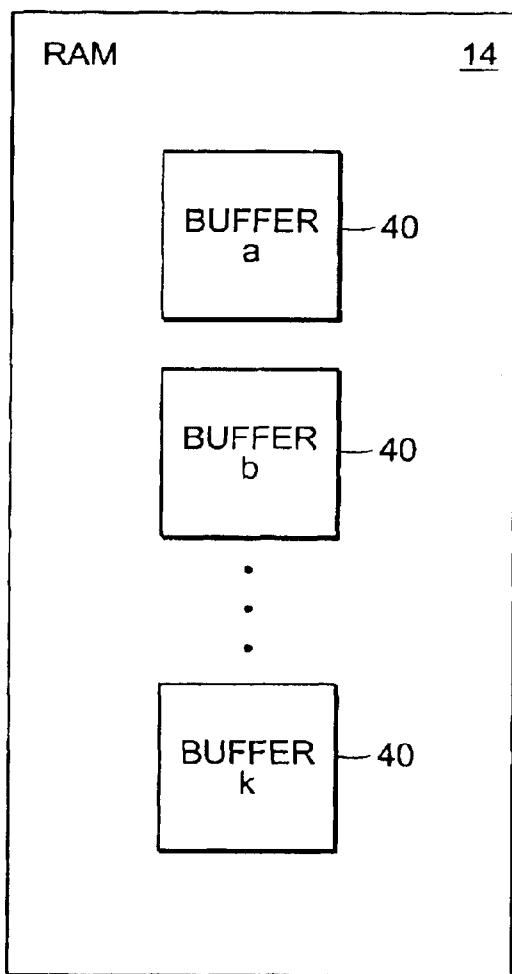


FIG. 3

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