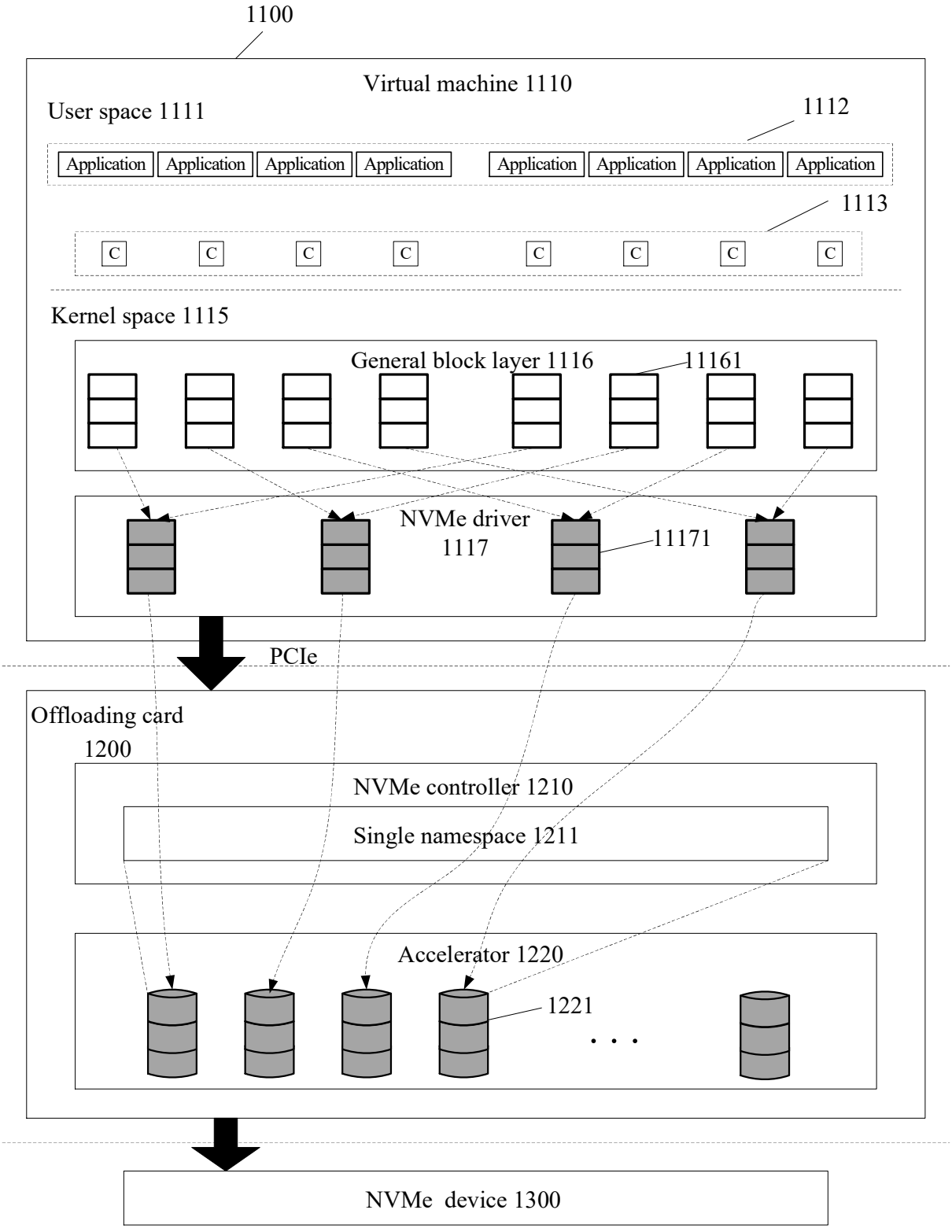

1100
Virtual machine 1110
User space 1111
1112
Application
Application
Application
Application
Application
Application
Application
Application
1113
C
C
C
C
C
C
C
C
Kernel space 1115
General block layer 1116
11161
NVMe driver
1117
11171
PCIe
Offloading card
1200
NVMe controller 1210
Single namespace 1211
Accelerator 1220
1221
NVMe device 1300

FIG. 1

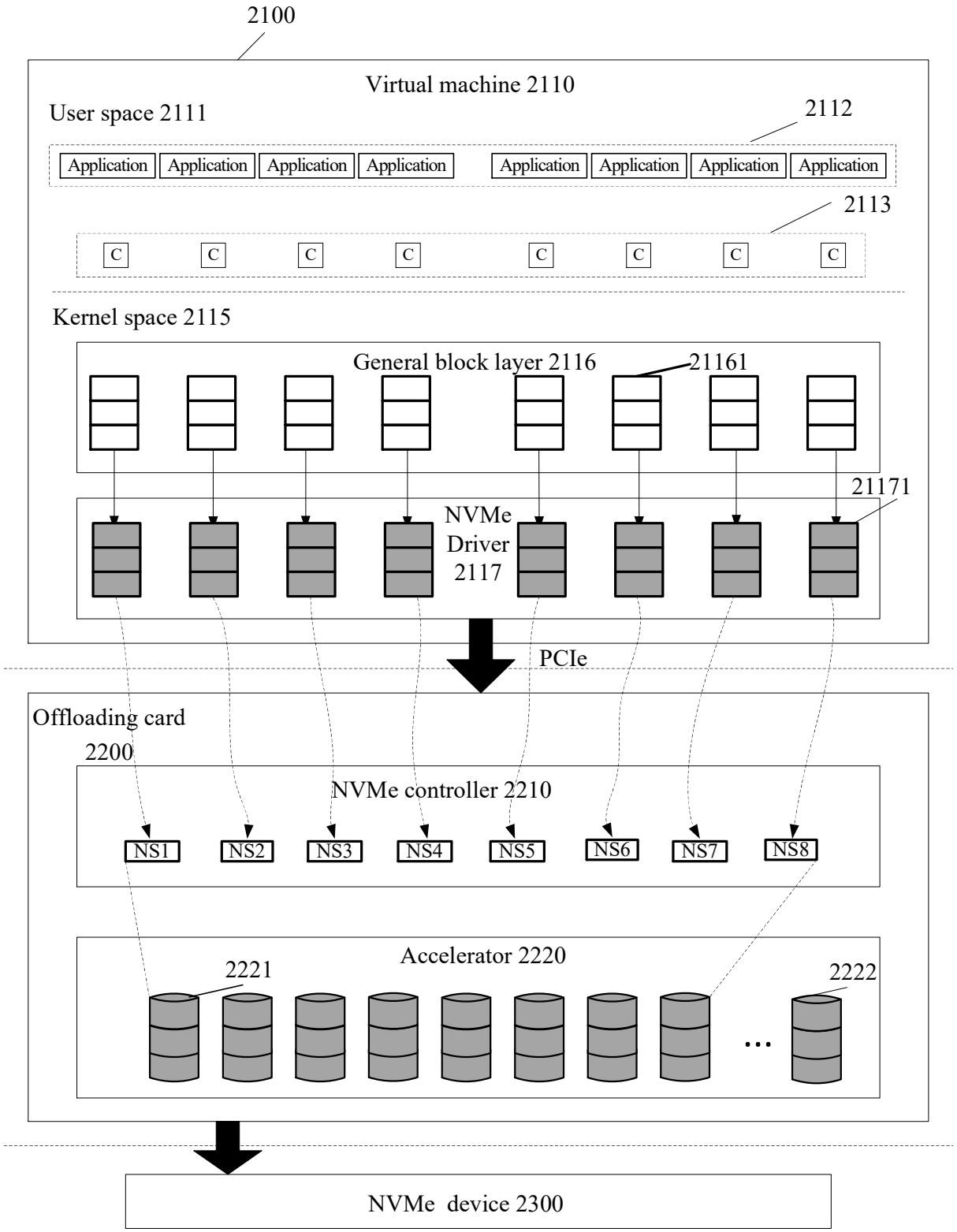

2100
Virtual machine 2110
User space 2111
2112
Application
Application
Application
Application
Application
Application
Application
Application
2113
C
C
C
C
C
C
C
C
Kernel space 2115
General block layer 2116
21161
21171
NVMe
Driver
2117
PCIe
Offloading card
2200
NVMe controller 2210
NS1
NS2
NS3
NS4
NS5
NS6
NS7
NS8
Accelerator 2220
2221
2222
...
NVMe device 2300

FIG. 2

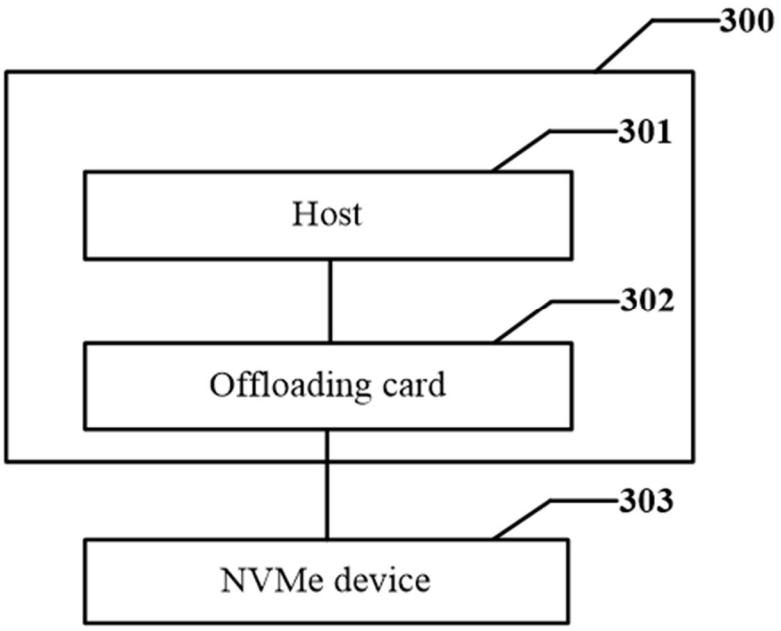

300
301
Host
302
Offloading card
303
NVMe device

FIG. 3

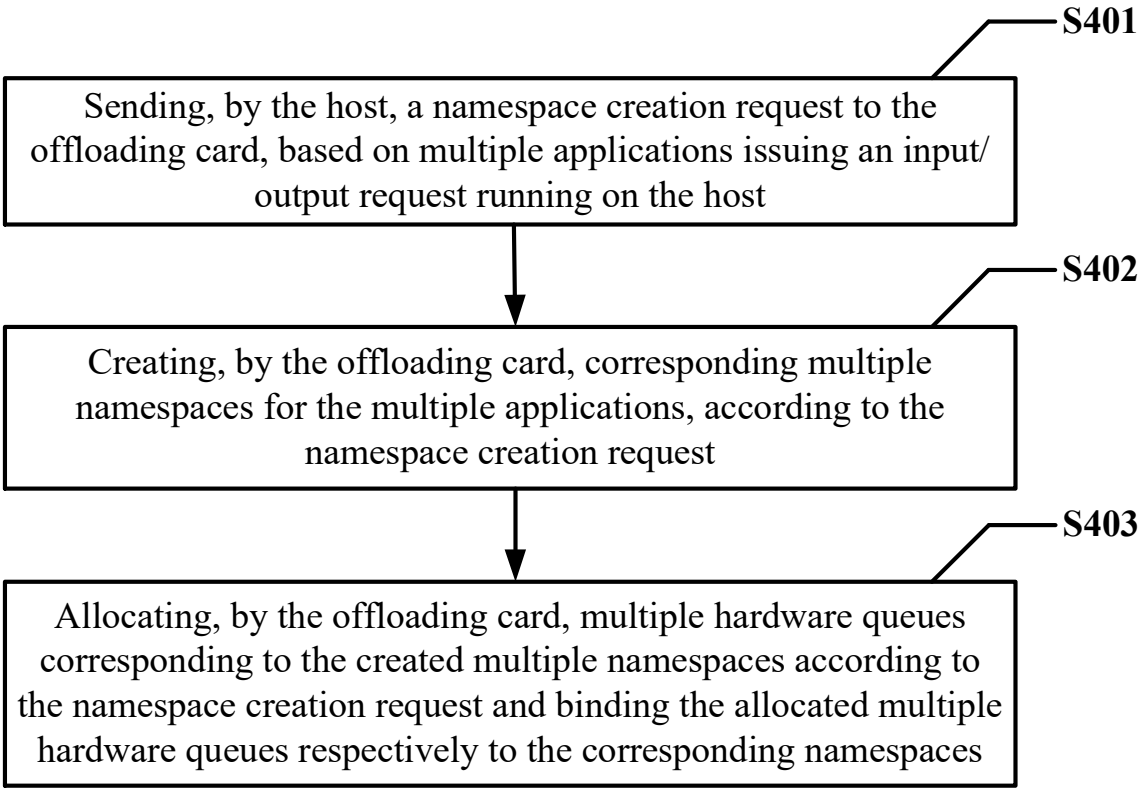

S401
Sending, by the host, a namespace creation request to the offloading card, based on multiple applications issuing an input/output request running on the host
S402
Creating, by the offloading card, corresponding multiple namespaces for the multiple applications, according to the namespace creation request
S403
Allocating, by the offloading card, multiple hardware queues corresponding to the created multiple namespaces according to the namespace creation request and binding the allocated multiple hardware queues respectively to the corresponding namespaces

FIG. 4

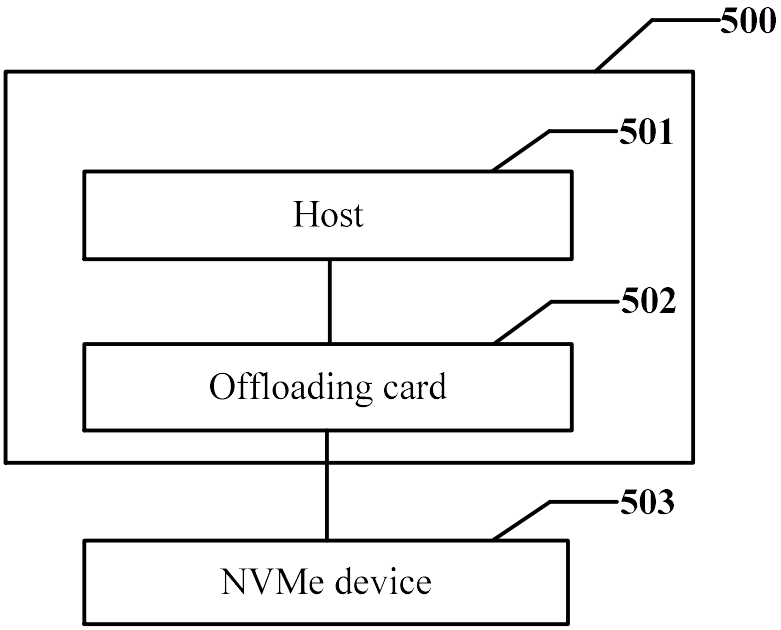

500
501
Host
502
Offloading card
503
NVMe device

FIG. 5

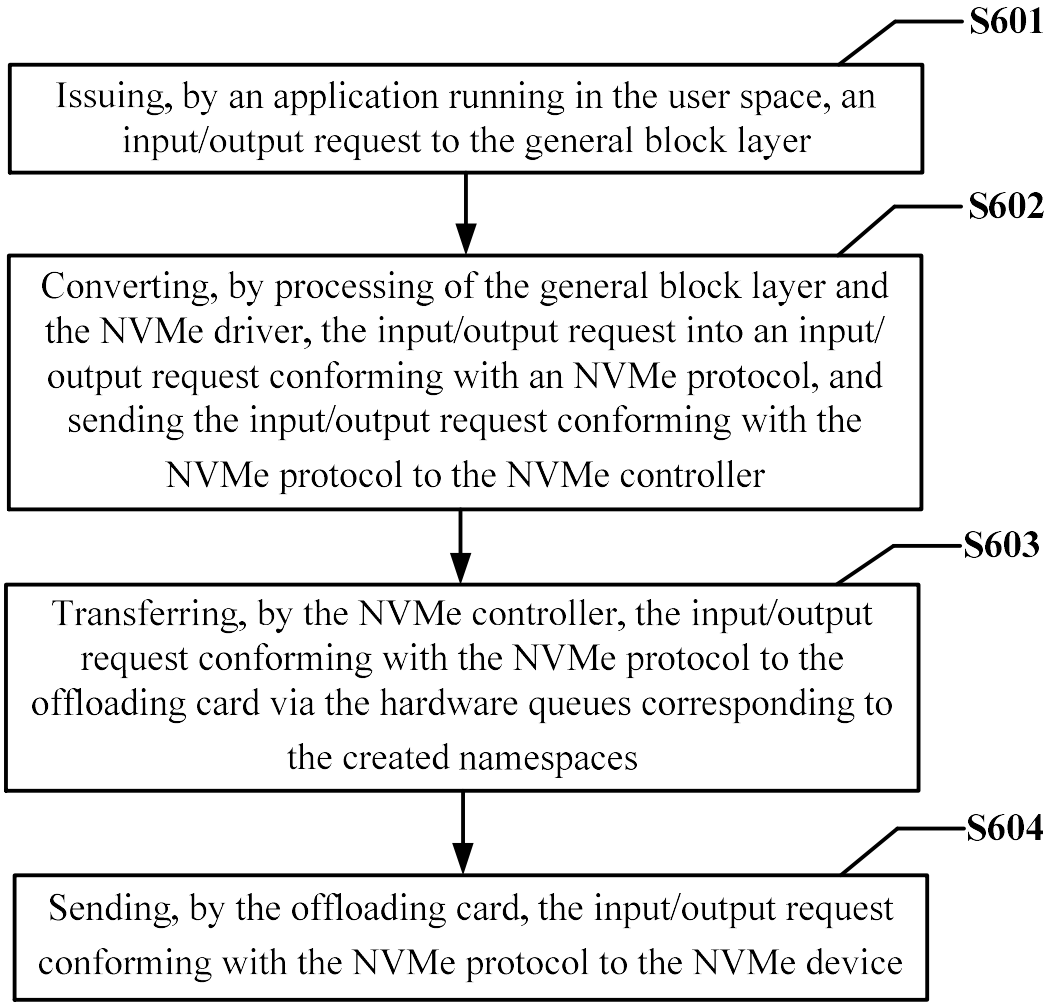

S601
Issuing, by an application running in the user space, an input/output request to the general block layer
S602
Converting, by processing of the general block layer and the NVMe driver, the input/output request into an input/output request conforming with an NVMe protocol, and sending the input/output request conforming with the NVMe protocol to the NVMe controller
S603
Transferring, by the NVMe controller, the input/output request conforming with the NVMe protocol to the offloading card via the hardware queues corresponding to the created namespaces
S604
Sending, by the offloading card, the input/output request conforming with the NVMe protocol to the NVMe device

FIG. 6

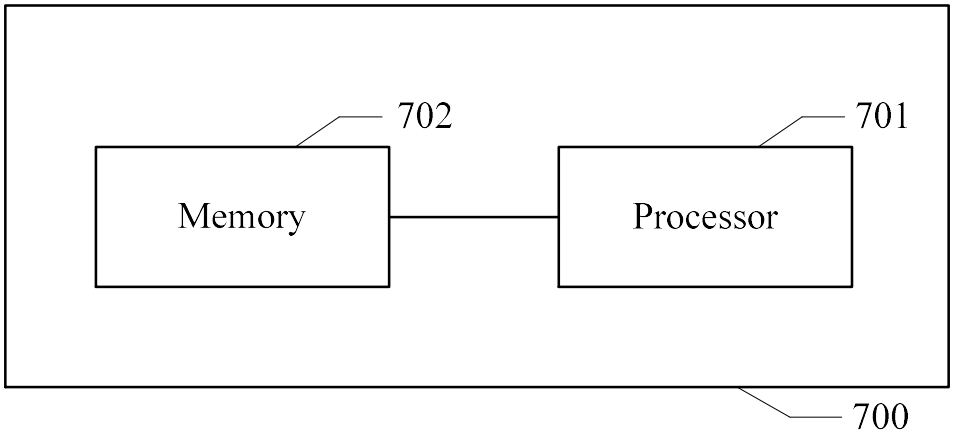

702
701
Memory
Processor
700

FIG. 7

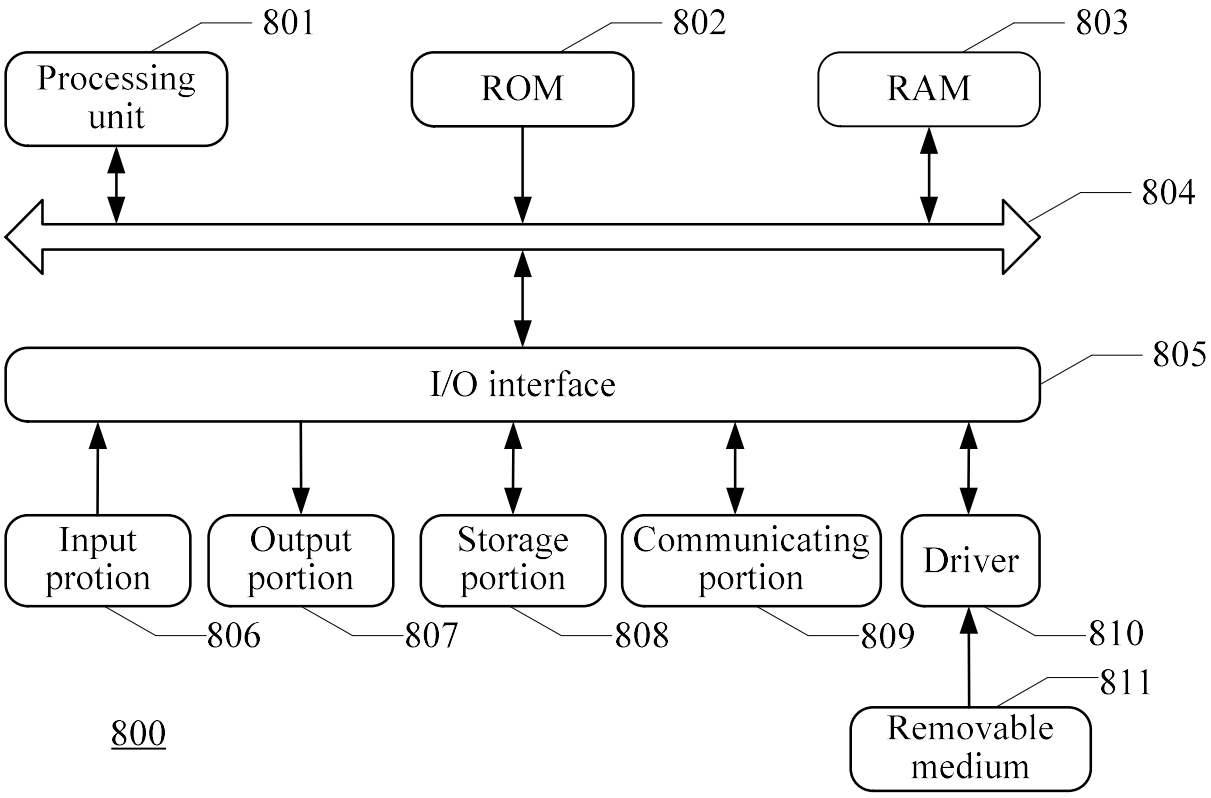

801
802
803
Processing unit
ROM
RAM
804
I/O interface
805
Input protion
Output portion
Storage portion
Communicating portion
Driver
806
807
808
809
810
811
800
Removable medium

FIG. 8