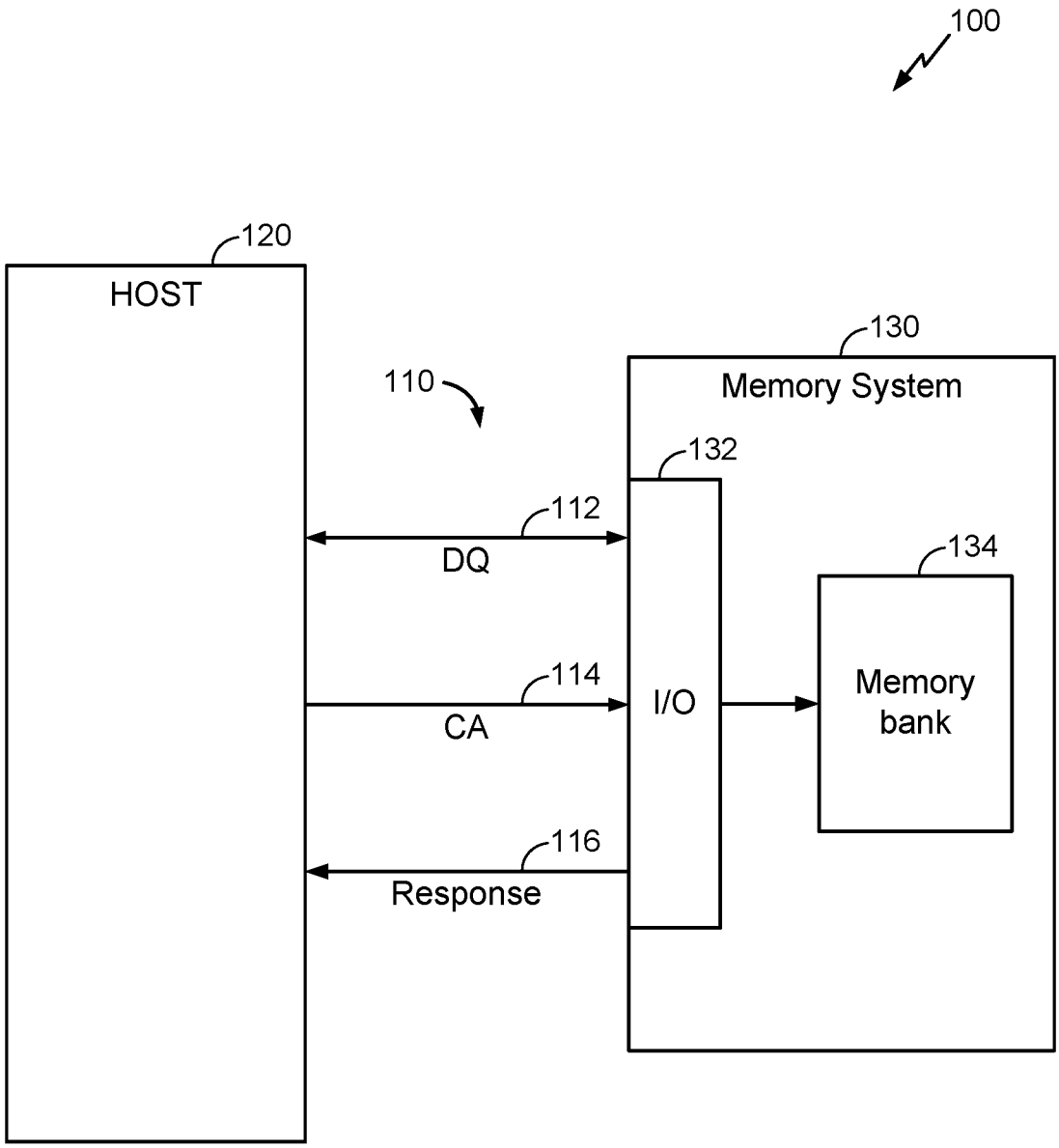
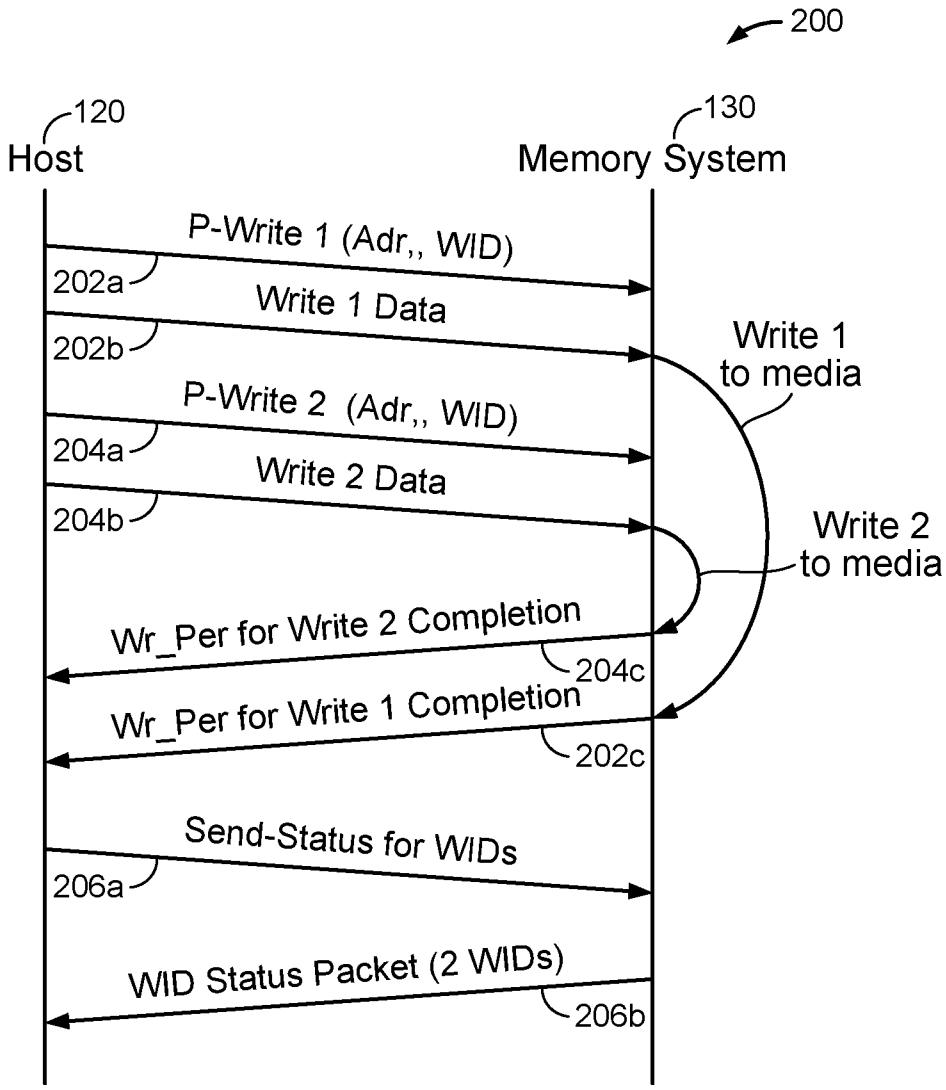

100
120
HOST
110
130
Memory System
132
112
DQ
134
114
CA
I/O
Memory bank
116
Response

*FIG. 1*


200
120
Host
130
Memory System
P-Write 1 (Adr,, WID)
202a
Write 1 Data
202b
Write 1
to media
P-Write 2 (Adr,, WID)
204a
Write 2 Data
204b
Write 2
to media
Wr_Per for Write 2 Completion
204c
Wr_Per for Write 1 Completion
202c
Send-Status for WIDs
206a
WID Status Packet (2 WIDs)
206b

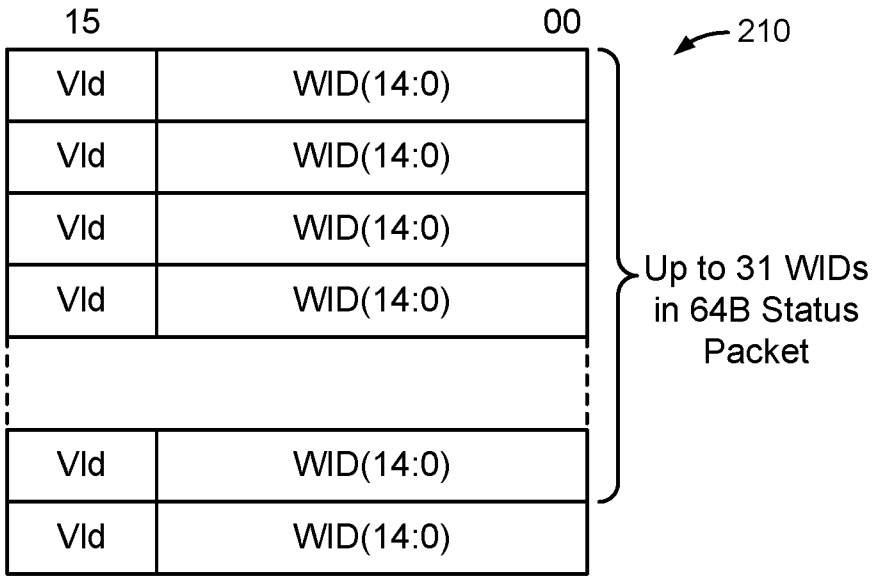

15
00
210
Vld
WID(14:0)
Vld
WID(14:0)
Vld
WID(14:0)
Vld
WID(14:0)
Vld
WID(14:0)
Vld
WID(14:0)
Up to 31 WIDs
in 64B Status
Packet

*FIG. 2A*

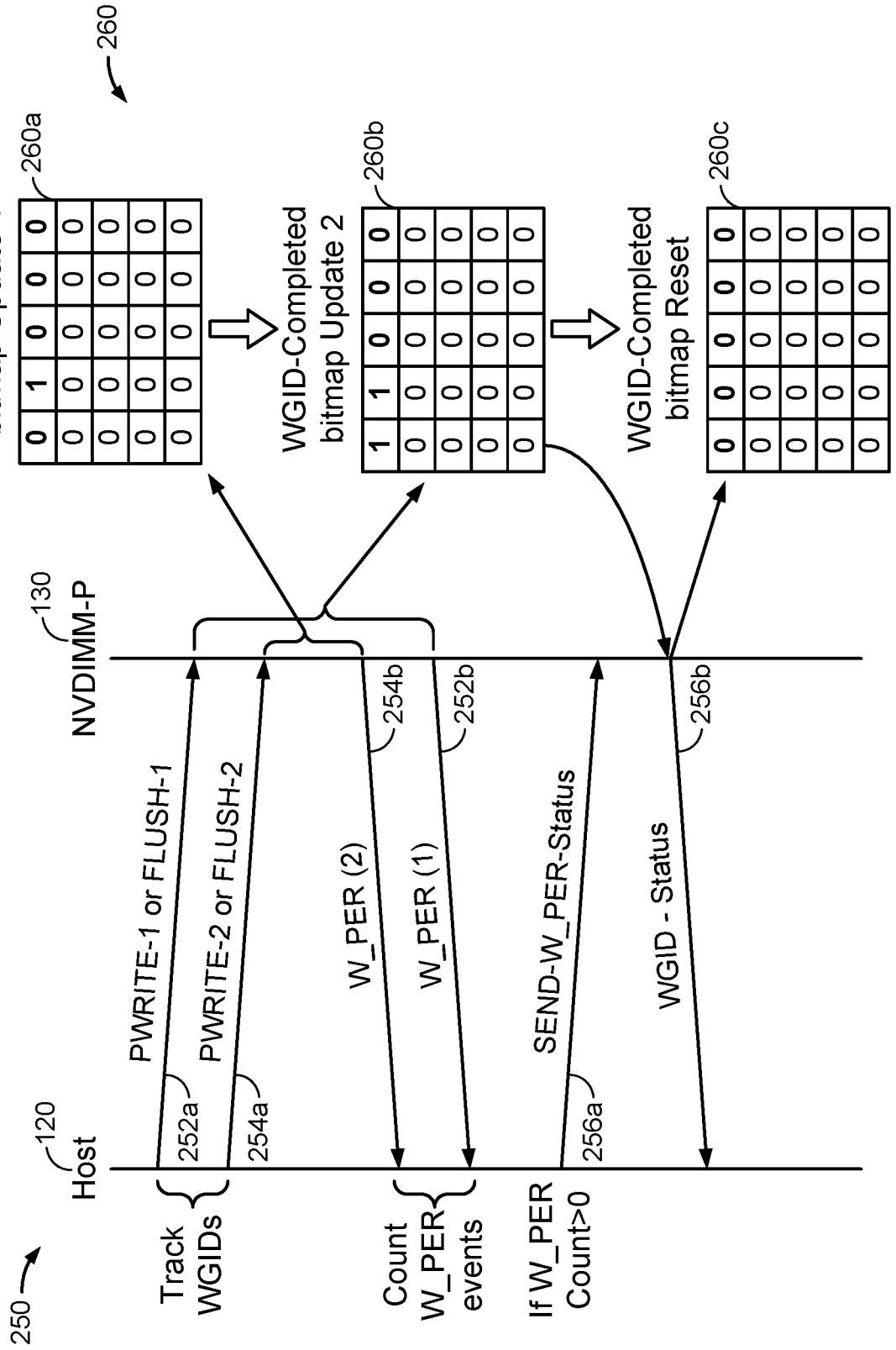

250
120
Host
130
NVDIMM-P
260
260a
WGID-Completed bitmap Update 1
260b
WGID-Completed bitmap Update 2
260c
WGID-Completed bitmap Reset
PWRITE-1 or FLUSH-1
PWRITE-2 or FLUSH-2
W_PER (2)
W_PER (1)
SEND-W_PER-Status
WGID - Status
252a
254a
254b
252b
256a
256b
Track WGIDs
Count W_PER events
If W_PER Count>0

FIG. 2B

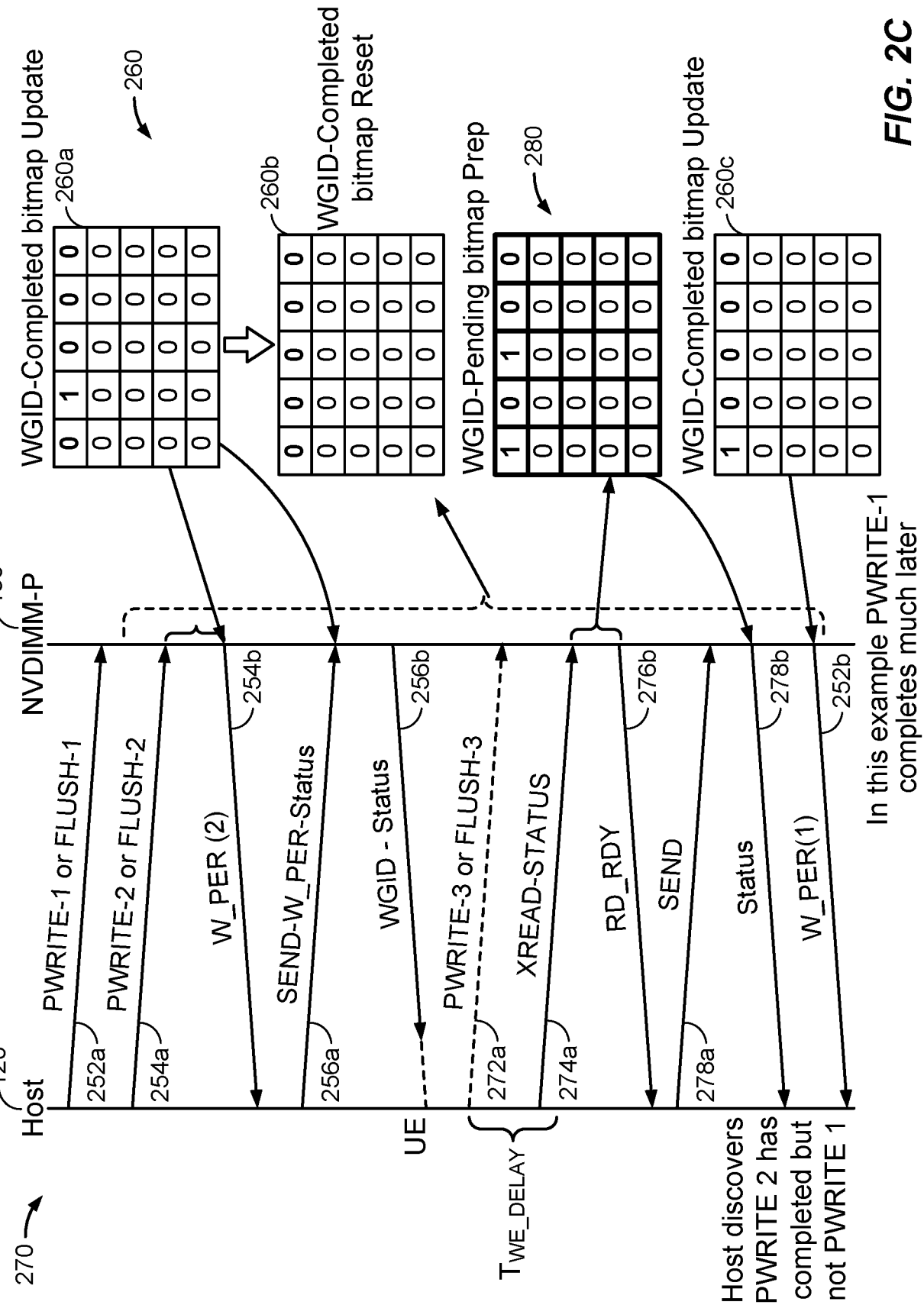

270
120
Host
130
NVDIMM-P
260
WGID-Completed bitmap Update
260a
0 1 0 0 0
0 0 0 0 0
0 0 0 0 0
0 0 0 0 0
0 0 0 0 0
260b
WGID-Completed bitmap Reset
0 0 0 0 0
0 0 0 0 0
0 0 0 0 0
0 0 0 0 0
0 0 0 0 0
280
WGID-Pending bitmap Prep
1 0 1 0 0
0 0 0 0 0
0 0 0 0 0
0 0 0 0 0
0 0 0 0 0
260c
WGID-Completed bitmap Update
1 0 0 0 0
0 0 0 0 0
0 0 0 0 0
0 0 0 0 0
0 0 0 0 0
PWRITE-1 or FLUSH-1
252a
PWRITE-2 or FLUSH-2
254a
W_PER (2)
254b
SEND-W_PER-Status
256a
WGID - Status
256b
UE
PWRITE-3 or FLUSH-3
272a
XREAD-STATUS
274a
RD_RDY
276b
SEND
278a
Status
278b
W_PER(1)
252b
TWE_DELAY
Host discovers PWRITE 2 has completed but not PWRITE 1
In this example PWRITE-1 completes much later

FIG. 2C

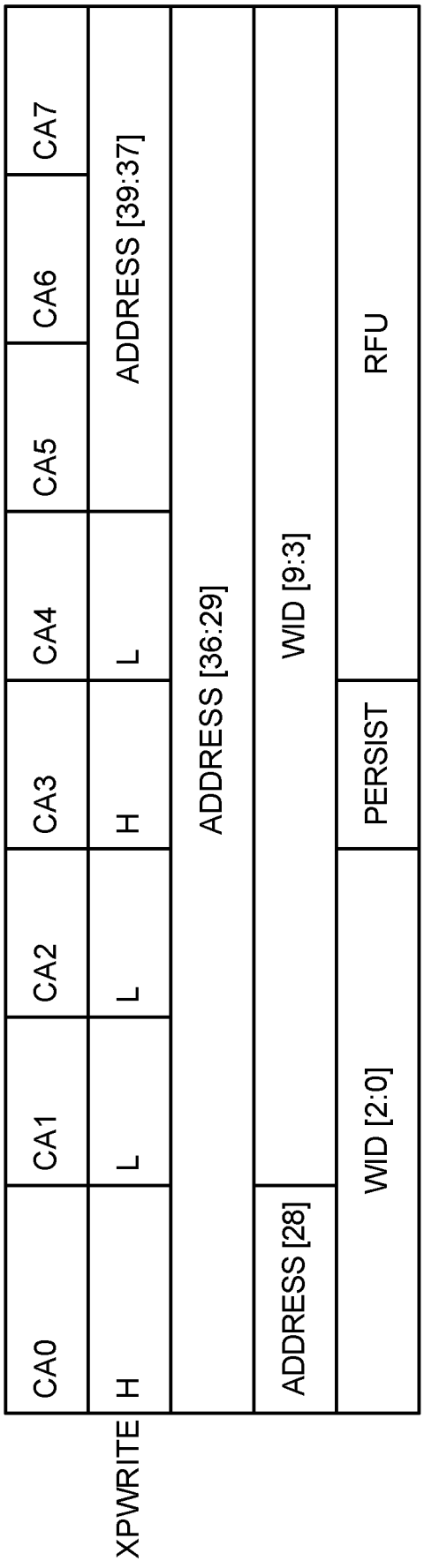

XPWRITE
CA0
CA1
CA2
CA3
CA4
CA5
CA6
CA7
H
L
L
H
L
ADDRESS [39:37]
ADDRESS [36:29]
ADDRESS [28]
WID [9:3]
WID [2:0]
PERSIST
RFU

*FIG. 3*

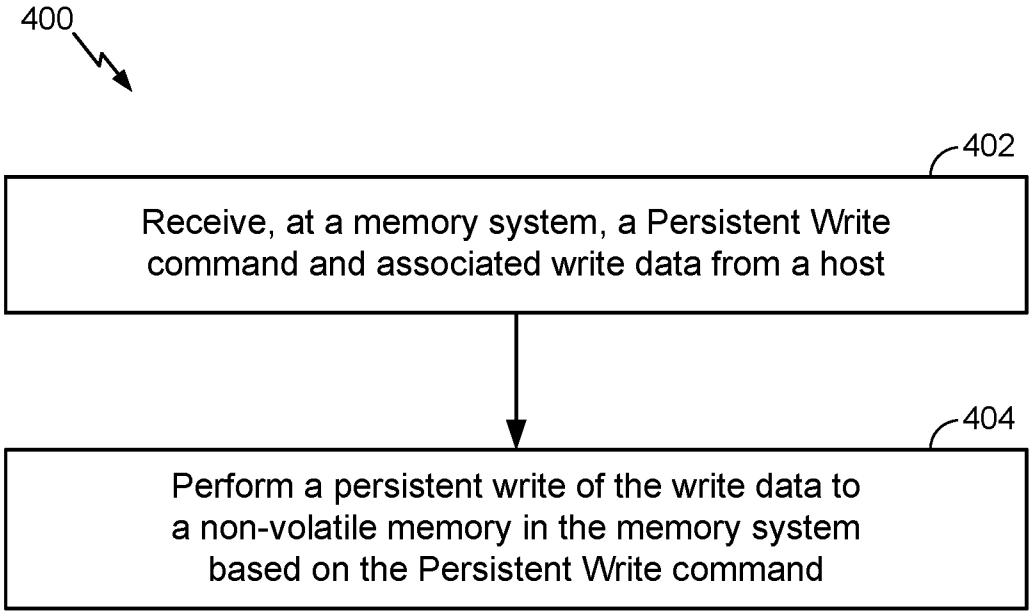

400
402
Receive, at a memory system, a Persistent Write command and associated write data from a host
404
Perform a persistent write of the write data to a non-volatile memory in the memory system based on the Persistent Write command

*FIG. 4A*

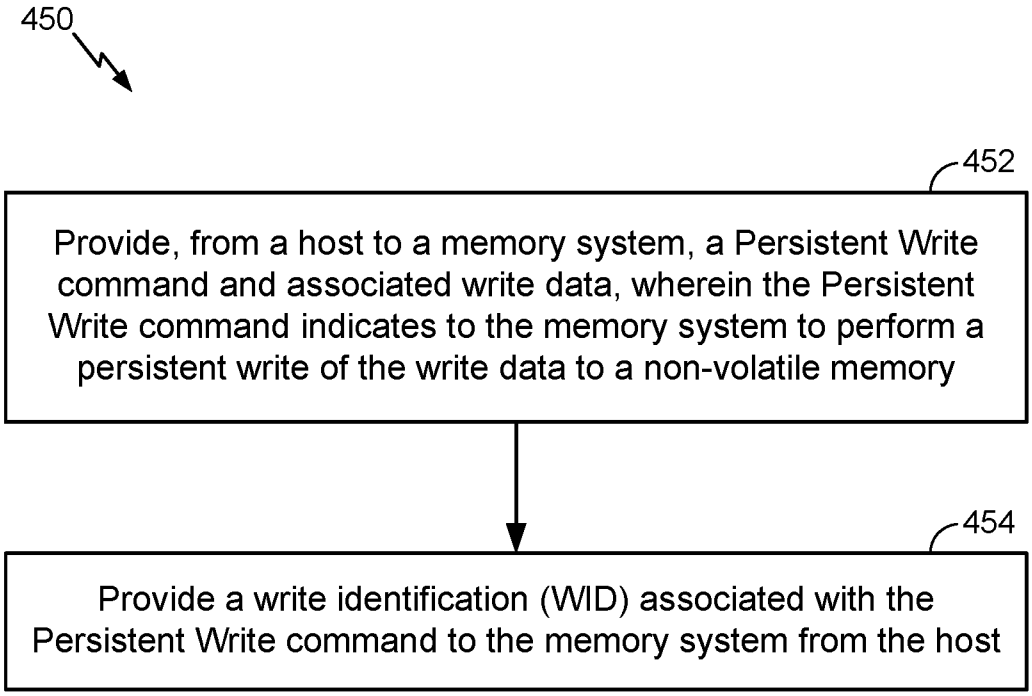

450
452
Provide, from a host to a memory system, a Persistent Write command and associated write data, wherein the Persistent Write command indicates to the memory system to perform a persistent write of the write data to a non-volatile memory
454
Provide a write identification (WID) associated with the Persistent Write command to the memory system from the host

*FIG. 4B*

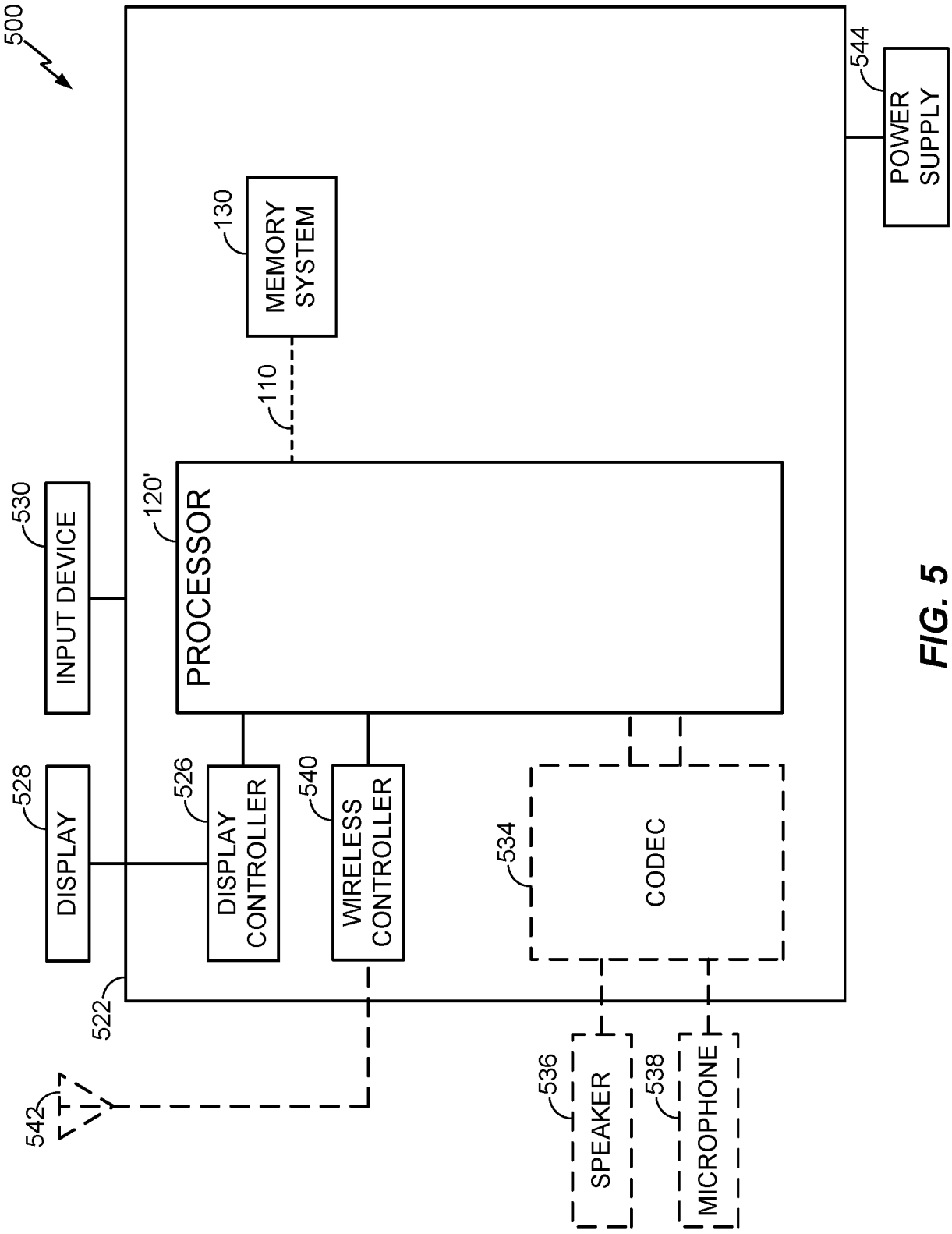

500
544
POWER SUPPLY
130
MEMORY SYSTEM
110
530
INPUT DEVICE
120'
PROCESSOR
528
DISPLAY
526
DISPLAY CONTROLLER
540
WIRELESS CONTROLLER
534
CODEC
522
542
536
SPEAKER
538
MICROPHONE

FIG. 5