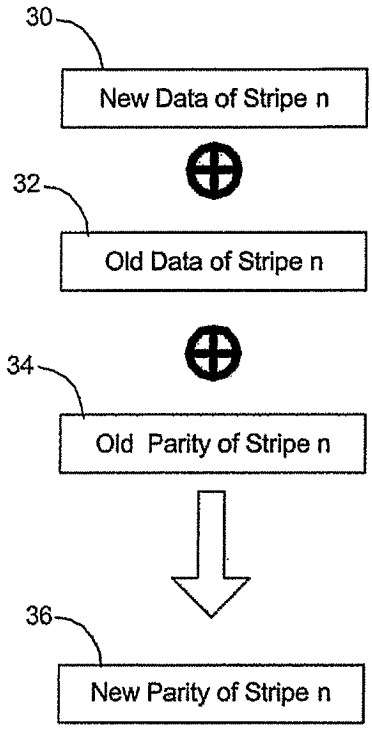


FIG.1
Prior Art

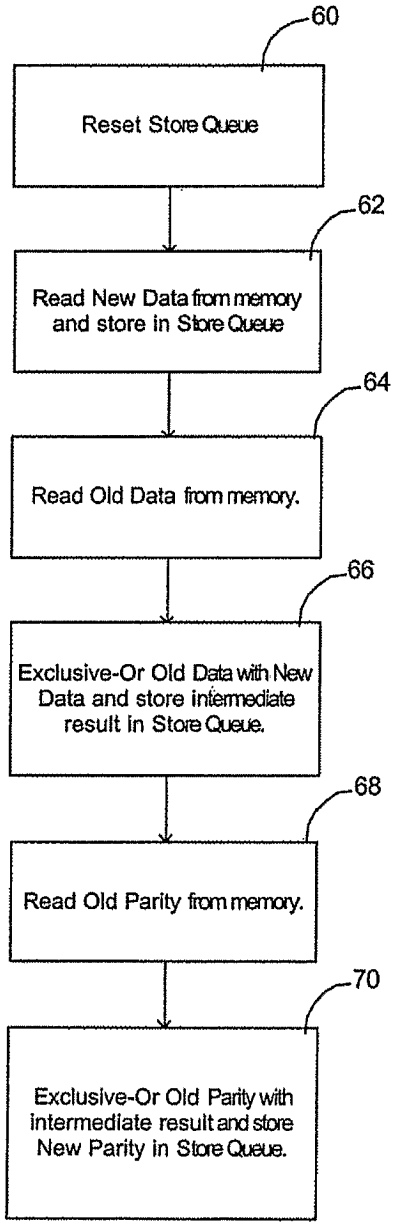


FIG. 3
Prior Art

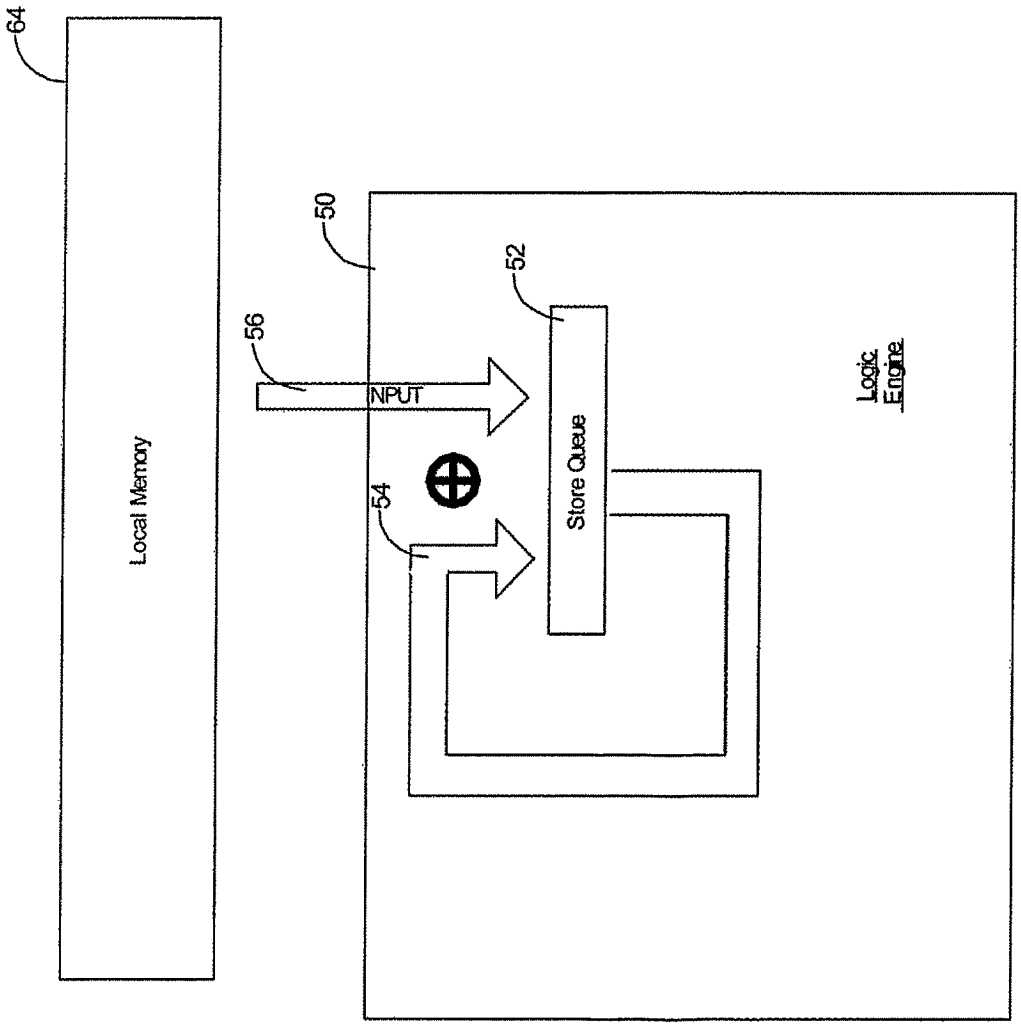


FIG. 2
Prior Art

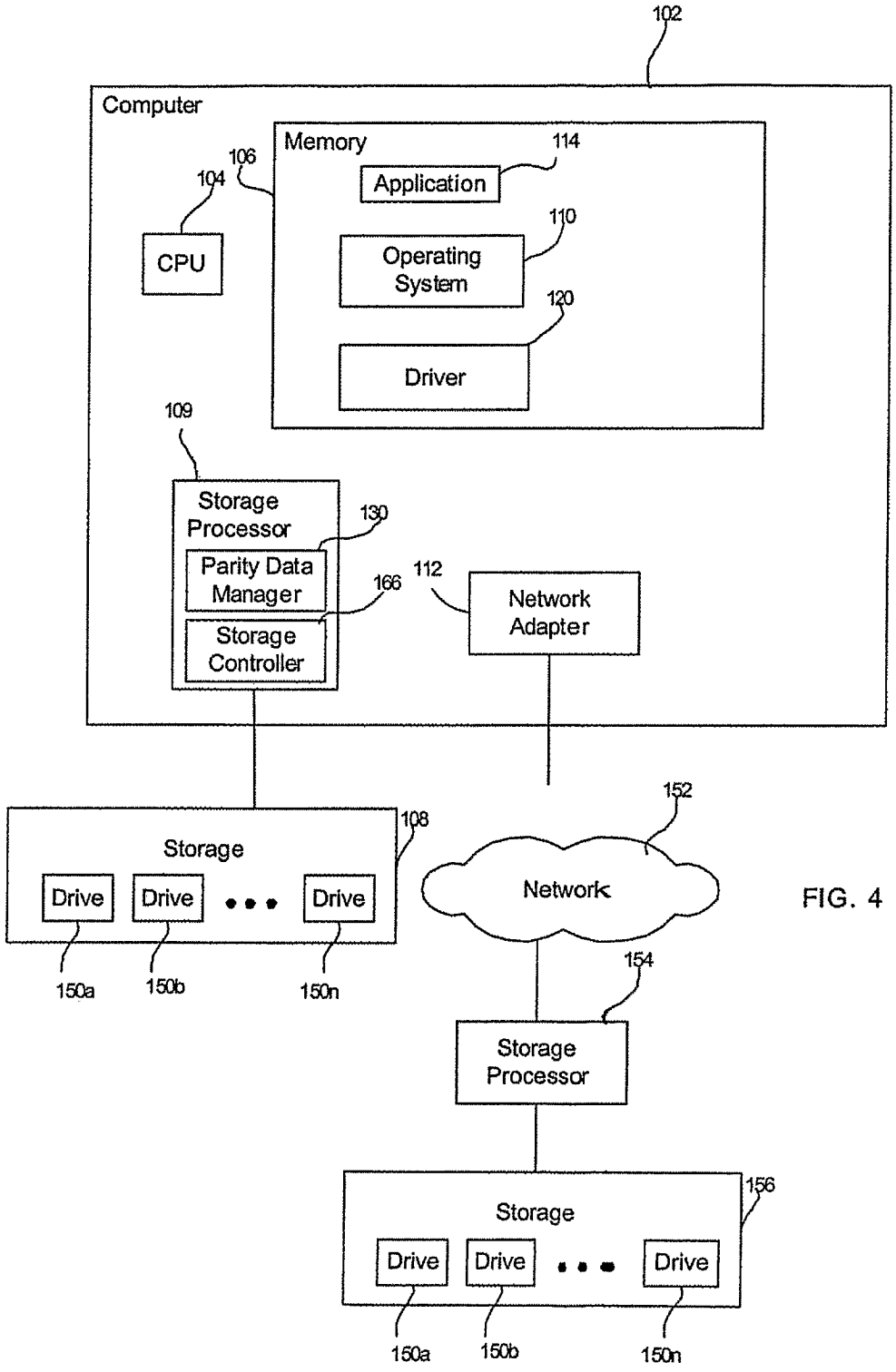

102
Computer
Memory
114
Application
106
104
CPU
110
Operating System
120
Driver
109
Storage Processor
130
Parity Data Manager
166
Storage Controller
112
Network Adapter
152
Storage
108
Drive
Drive
Drive
Network
150a
150b
150n
154
Storage Processor
Storage
156
Drive
Drive
Drive
150a
150b
150n

FIG. 4

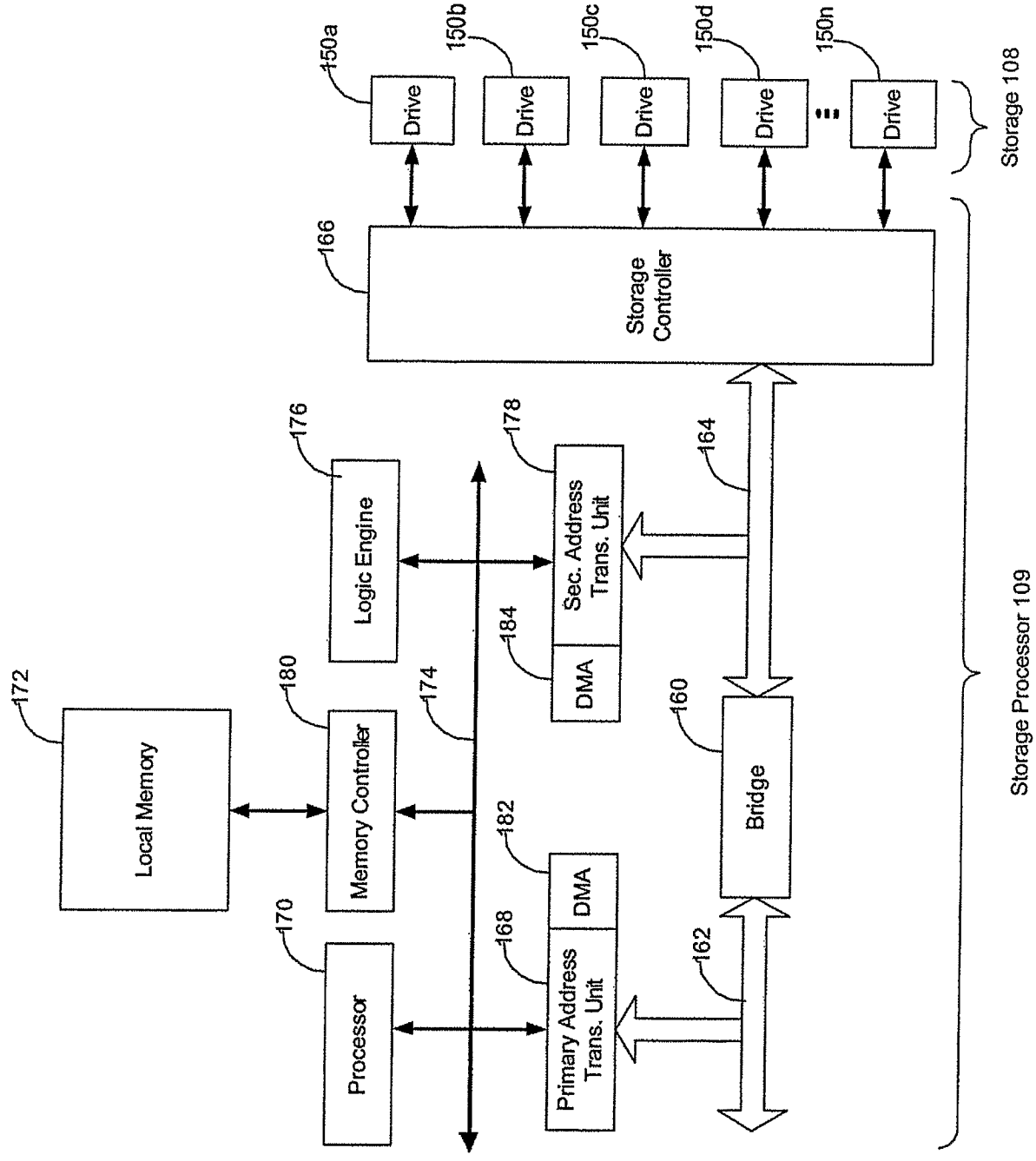

150a
Drive
150b
Drive
150c
Drive
150d
Drive
150n
Drive
Storage 108
166
Storage Controller
164
176
Logic Engine
178
Sec. Address Trans. Unit
184
DMA
172
Local Memory
180
Memory Controller
174
160
Bridge
182
DMA
170
Processor
168
Primary Address Trans. Unit
162
Storage Processor 109

FIG. 5

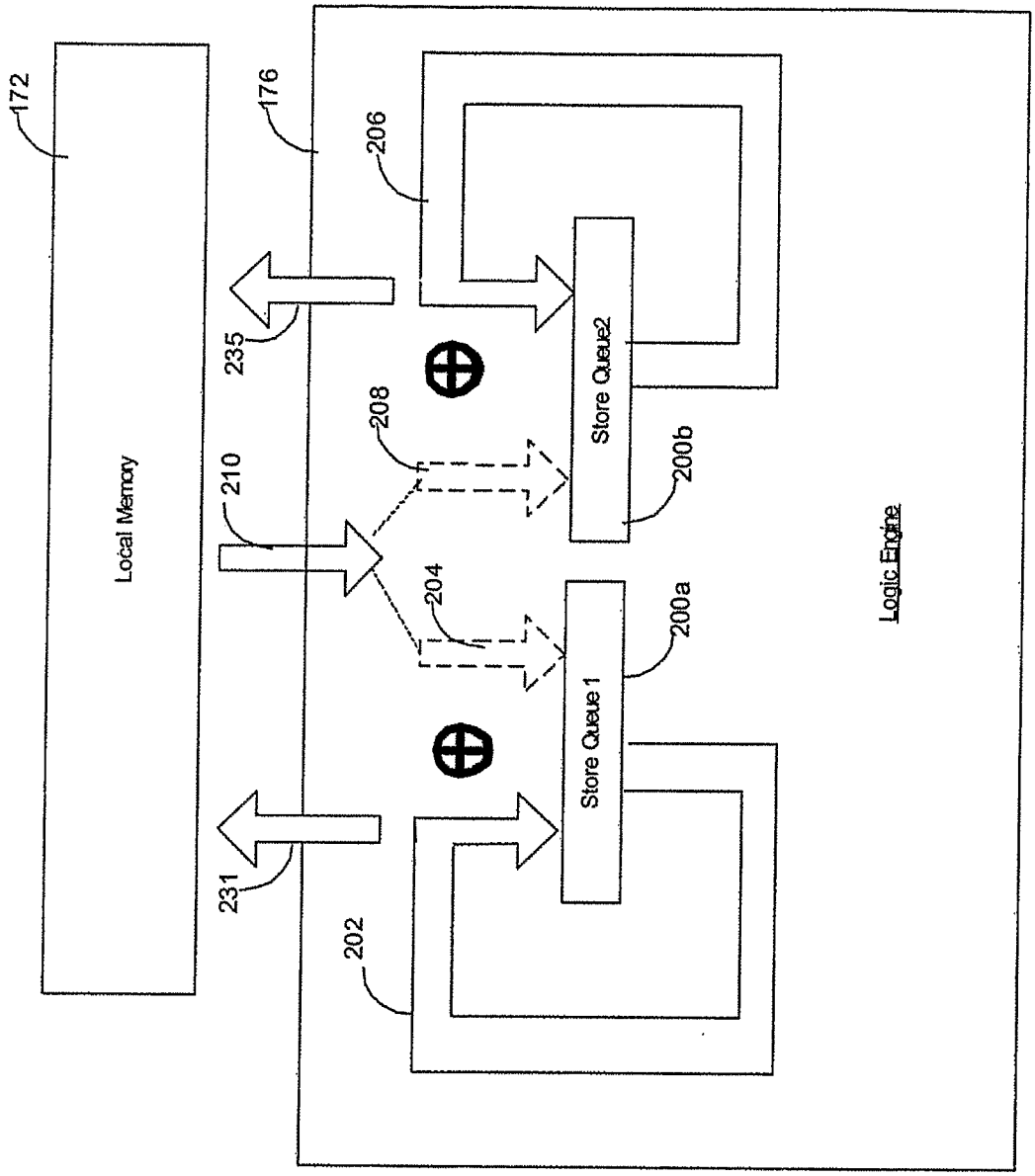

172
176
206
235
208
210
204
200b
200a
231
202
Local Memory
Store Queue2
Store Queue 1
Logic Engine

FIG. 6

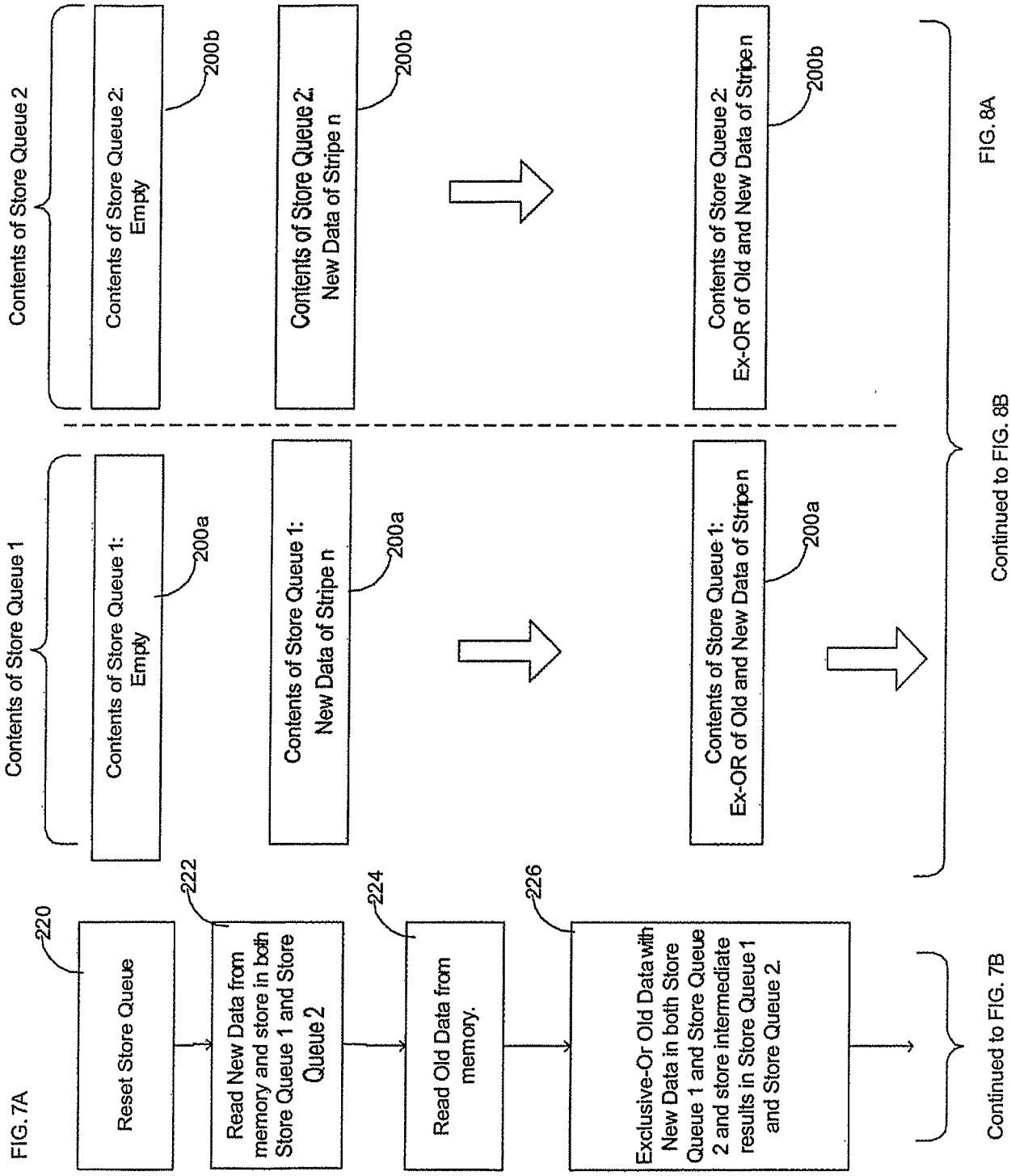

Contents of Store Queue 2
Contents of Store Queue 2: Empty
200b
Contents of Store Queue 2: New Data of Stripe n
200b
Contents of Store Queue 2: Ex-OR of Old and New Data of Stripe n
200b
Contents of Store Queue 1
Contents of Store Queue 1: Empty
200a
Contents of Store Queue 1: New Data of Stripe n
200a
Contents of Store Queue 1: Ex-OR of Old and New Data of Stripe n
200a
220
Reset Store Queue
222
Read New Data from memory and store in both Store Queue 1 and Store Queue 2
224
Read Old Data from memory.
226
Exclusive-Or Old Data with New Data in both Store Queue 1 and Store Queue 2 and store intermediate results in Store Queue 1 and Store Queue 2.
Continued to FIG. 7B
Continued to FIG. 8B

FIG. 7A

FIG. 8A

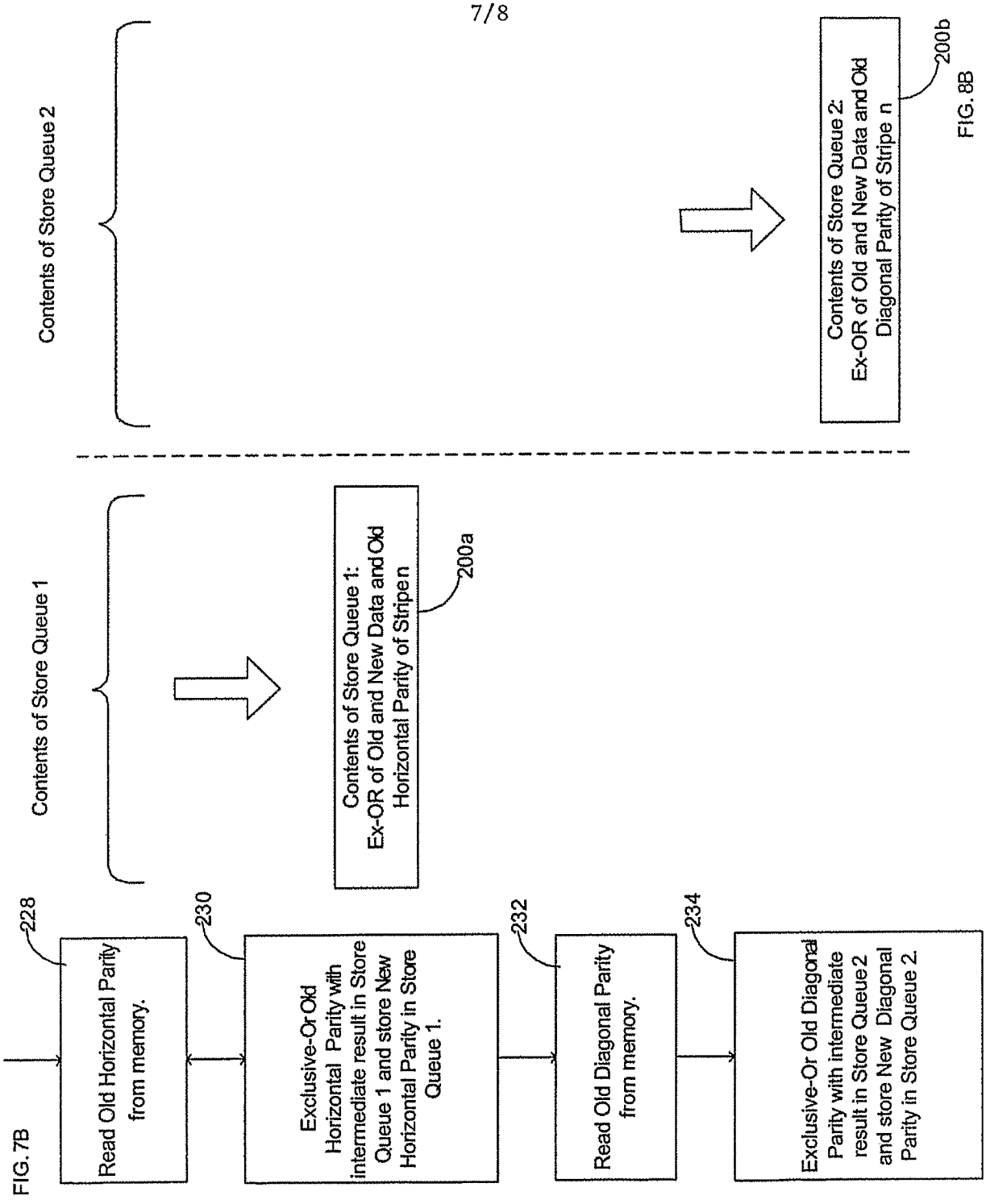
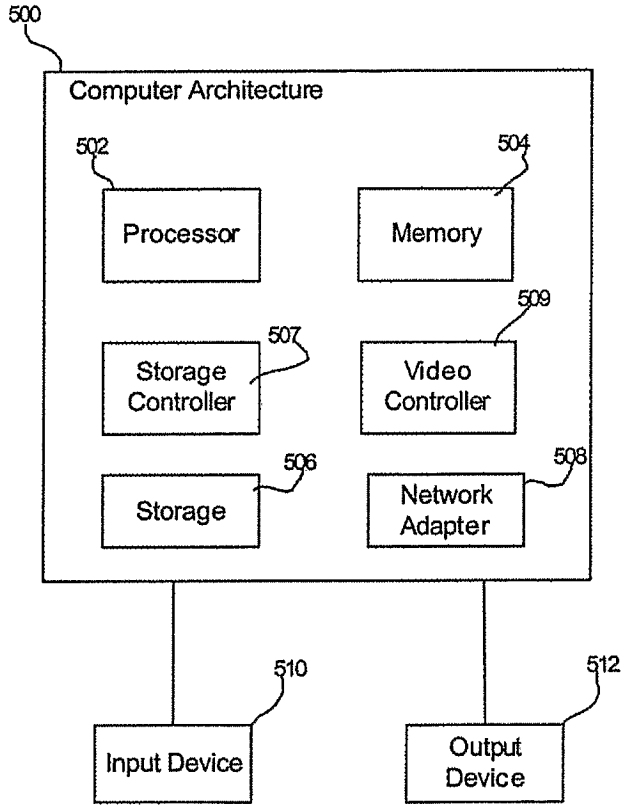

Contents of Store Queue 1
228
Read Old Horizontal Parity from memory.
230
Exclusive-Or Old Horizontal Parity with intermediate result in Store Queue 1 and store New Horizontal Parity in Store Queue 1.
Contents of Store Queue 1: Ex-OR of Old and New Data and Old Horizontal Parity of Stripe n
200a
232
Read Old Diagonal Parity from memory.
234
Exclusive-Or Old Diagonal Parity with intermediate result in Store Queue 2 and store New Diagonal Parity in Store Queue 2.
Contents of Store Queue 2
Contents of Store Queue 2: Ex-OR of Old and New Data and Old Diagonal Parity of Stripe n
200b

FIG. 7B

FIG. 8B

FIG. 9


500
Computer Architecture
502
Processor
504
Memory
507
Storage Controller
509
Video Controller
506
Storage
508
Network Adapter
510
Input Device
512
Output Device