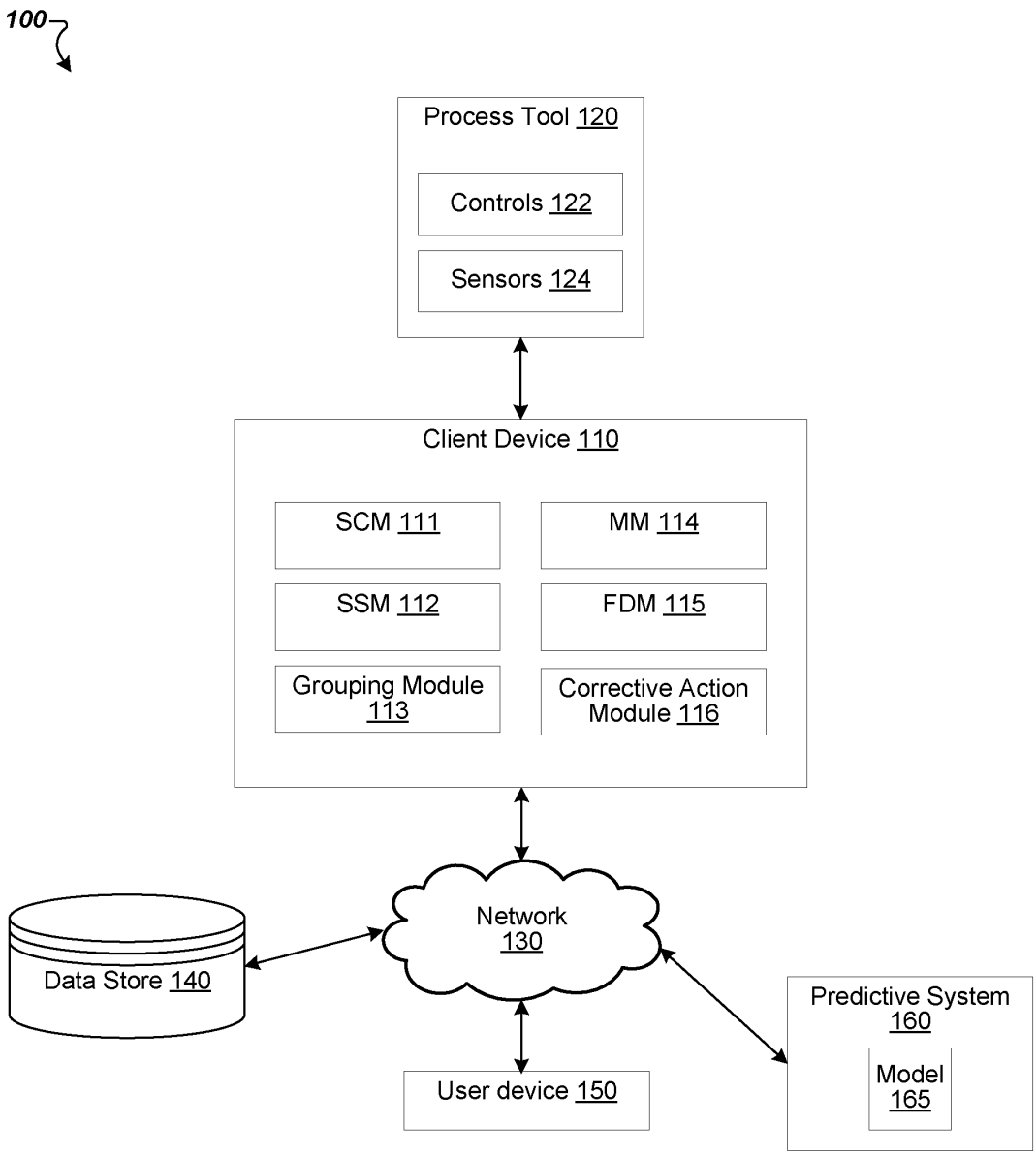
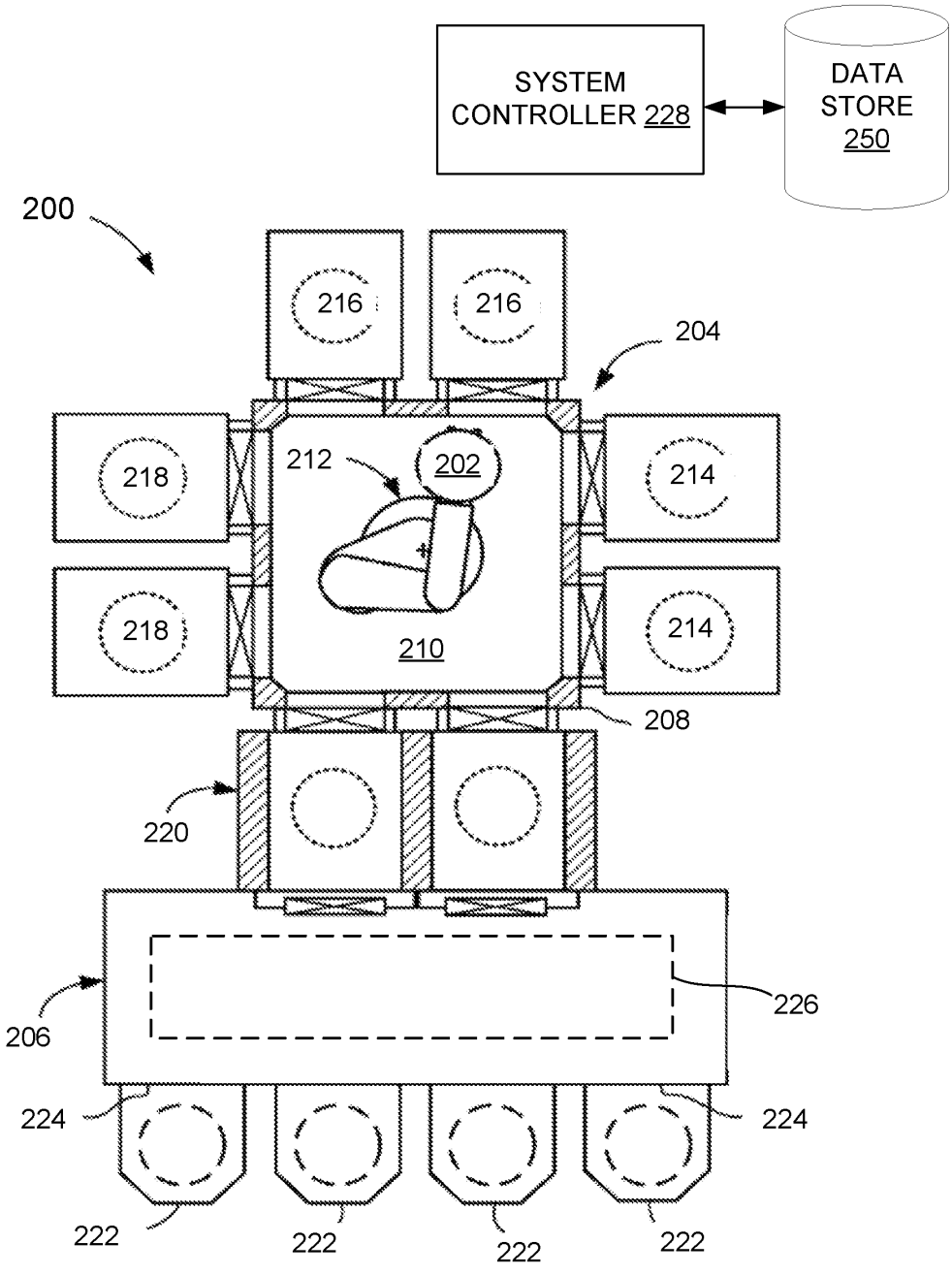

100
Process Tool 120
Controls 122
Sensors 124
Client Device 110
SCM 111
MM 114
SSM 112
FDM 115
Grouping Module 113
Corrective Action Module 116
Network 130
Data Store 140
User device 150
Predictive System 160
Model 165

FIG. 1


SYSTEM CONTROLLER 228
DATA STORE 250
200
216
216
204
218
212
202
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214
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208
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206
226
224
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222
222
222

FIG. 2

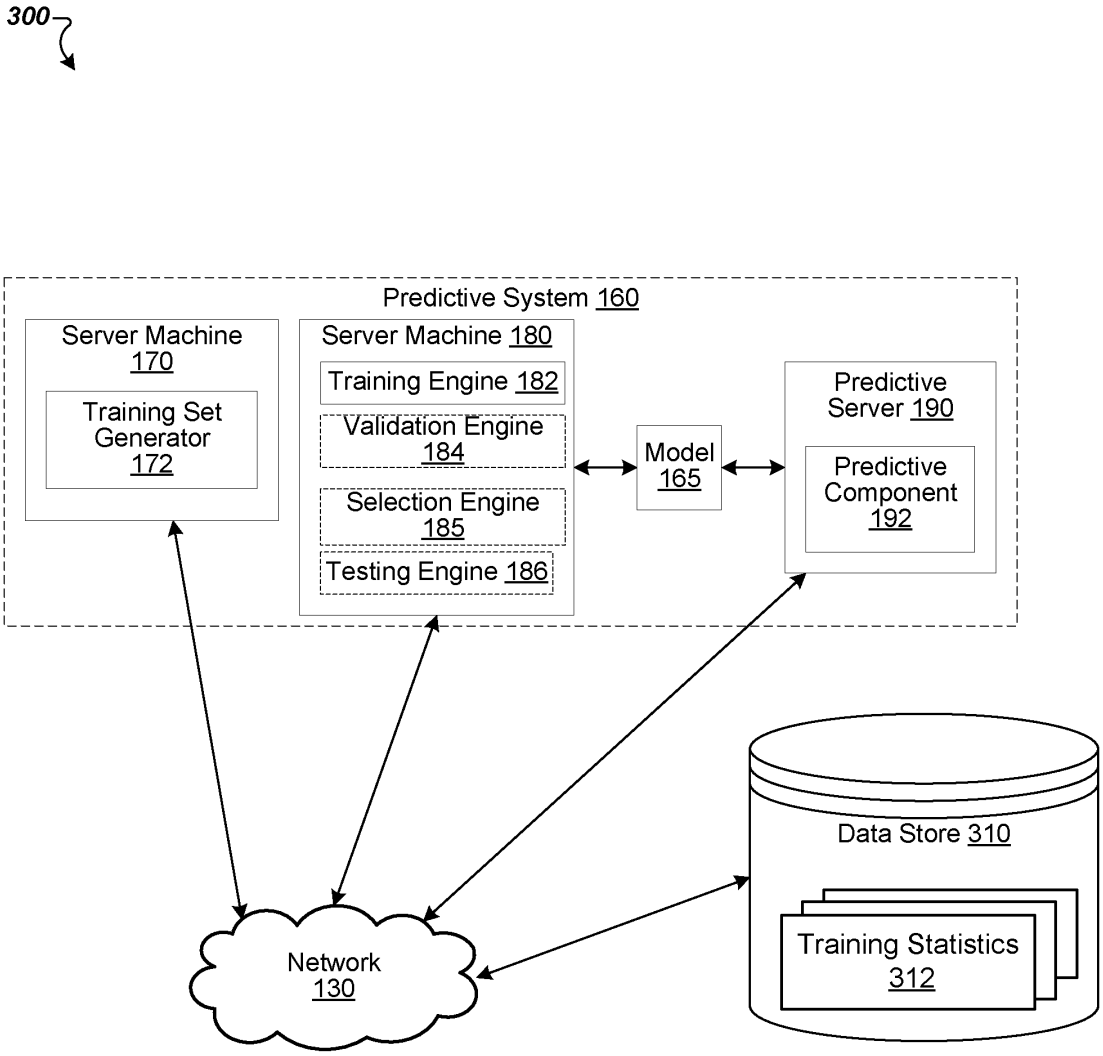
300
Predictive System 160
Server Machine 170
Training Set Generator 172
Server Machine 180
Training Engine 182
Validation Engine 184
Selection Engine 185
Testing Engine 186
Model 165
Predictive Server 190
Predictive Component 192
Data Store 310
Training Statistics 312
Network 130

FIG. 3

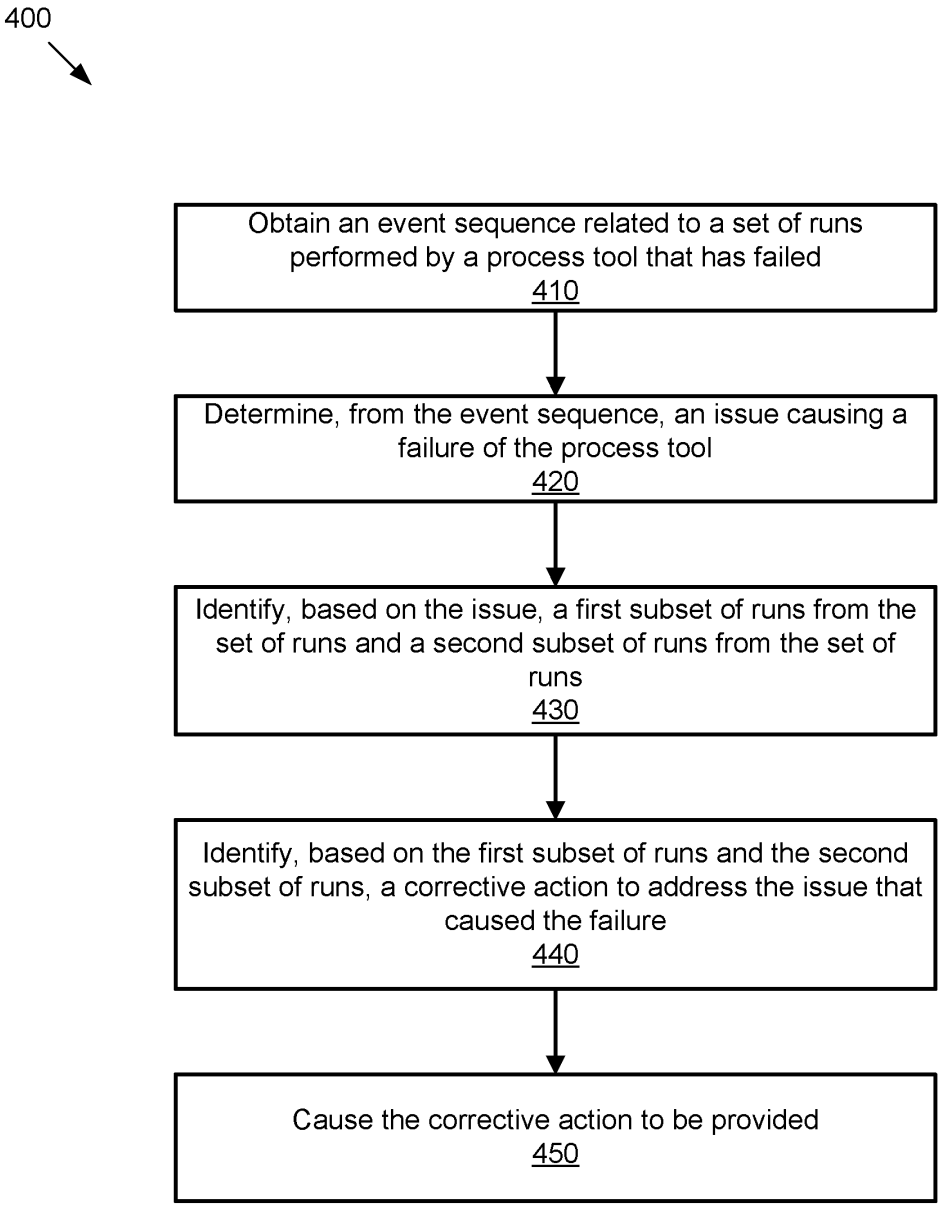
400
Obtain an event sequence related to a set of runs performed by a process tool that has failed
410
Determine, from the event sequence, an issue causing a failure of the process tool
420
Identify, based on the issue, a first subset of runs from the set of runs and a second subset of runs from the set of runs
430
Identify, based on the first subset of runs and the second subset of runs, a corrective action to address the issue that caused the failure
440
Cause the corrective action to be provided
450

FIG. 4A

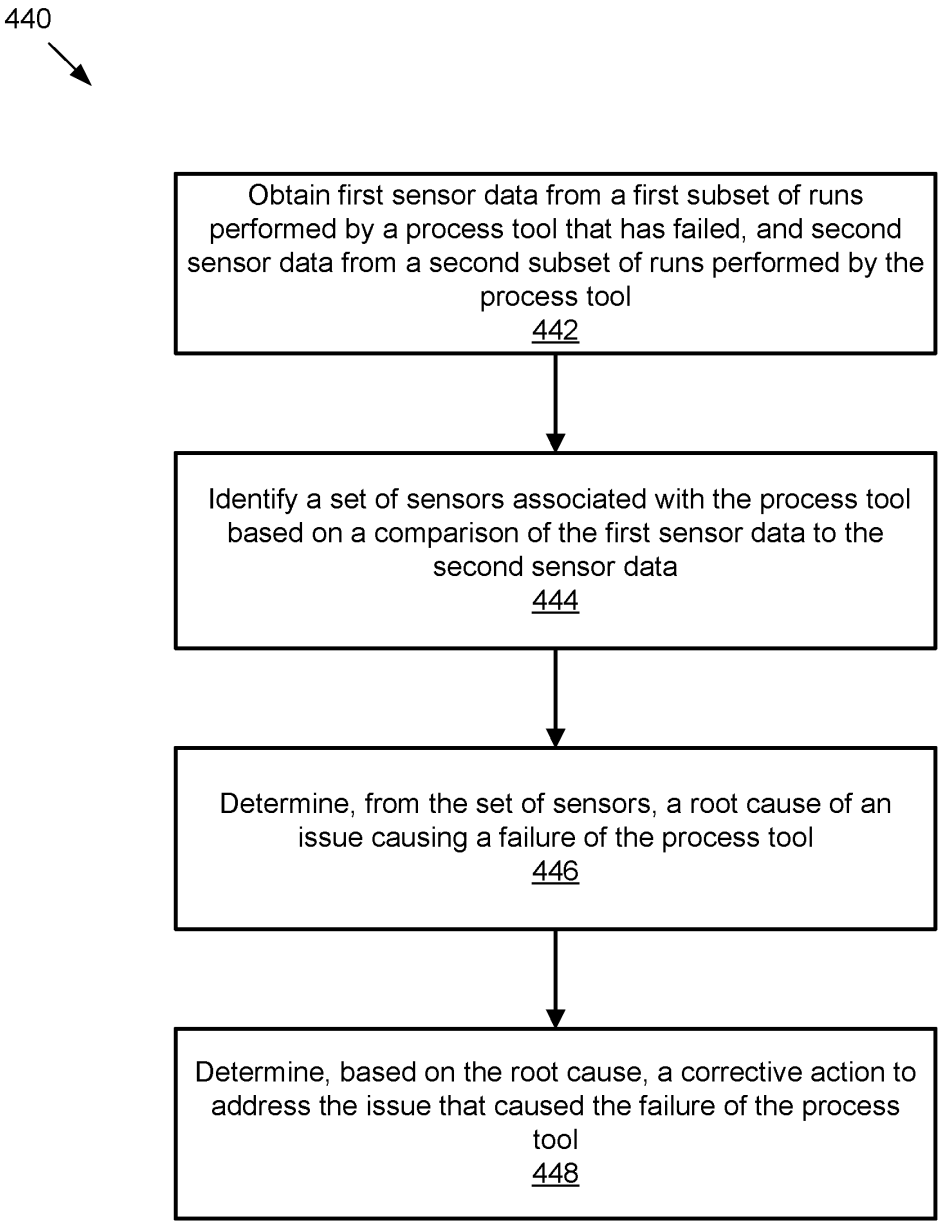
440
Obtain first sensor data from a first subset of runs performed by a process tool that has failed, and second sensor data from a second subset of runs performed by the process tool
442
Identify a set of sensors associated with the process tool based on a comparison of the first sensor data to the second sensor data
444
Determine, from the set of sensors, a root cause of an issue causing a failure of the process tool
446
Determine, based on the root cause, a corrective action to address the issue that caused the failure of the process tool
448

FIG. 4B

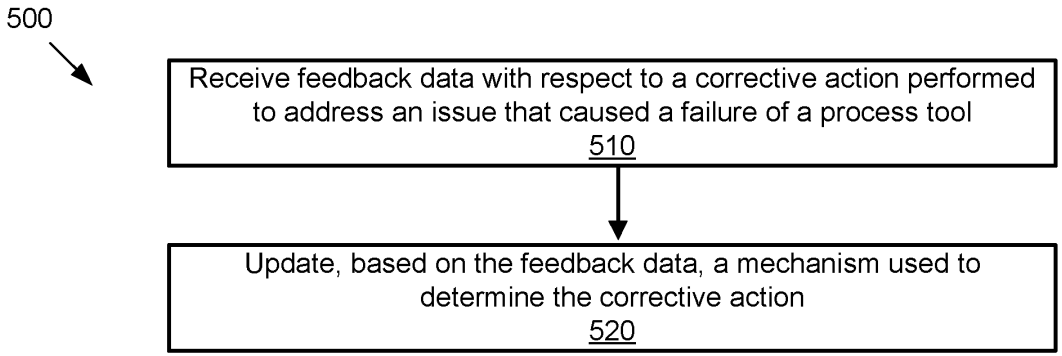

FIG. 5

600

	Event Sequence 610	Issue 620	Run Subsets 630	Set of Sensors 640	Root Cause 650	Corrective Action 660
670-1	QD_{-4}, p, p, QD_{-3}, p, p, p, p, QD_{-2}, QD_{-1}, TD	Defect	Bad runs {QD_{-1}, QD_{-2}} Good runs {QD_{-3}, QD_{-4}}	P, F, T, B	Pressure fluctuation due to foreline clog	Clean the foreline
670-2	QT_{-3}, p, p, p, QT_{-2}, QT_{-1}, TD	Uniformity	Bad runs {QT_{-1}, QT_{-2}} Good runs {QT_{-3}}	MFC_F, MFC_P	Gas flow mismatch	Adjust gas flow
670-3	p_{-11}, p_{-10}, … p_{-2}, p_{-1}, TD	Yield	Bad runs {p_{-1}, p_{-2}} Good run subset {p_{-10}, p_{-11}}	Ped_T, Ped_P	Pedestal temperature not meeting target	Adjust pedestal temperature and/ or power

FIG. 6

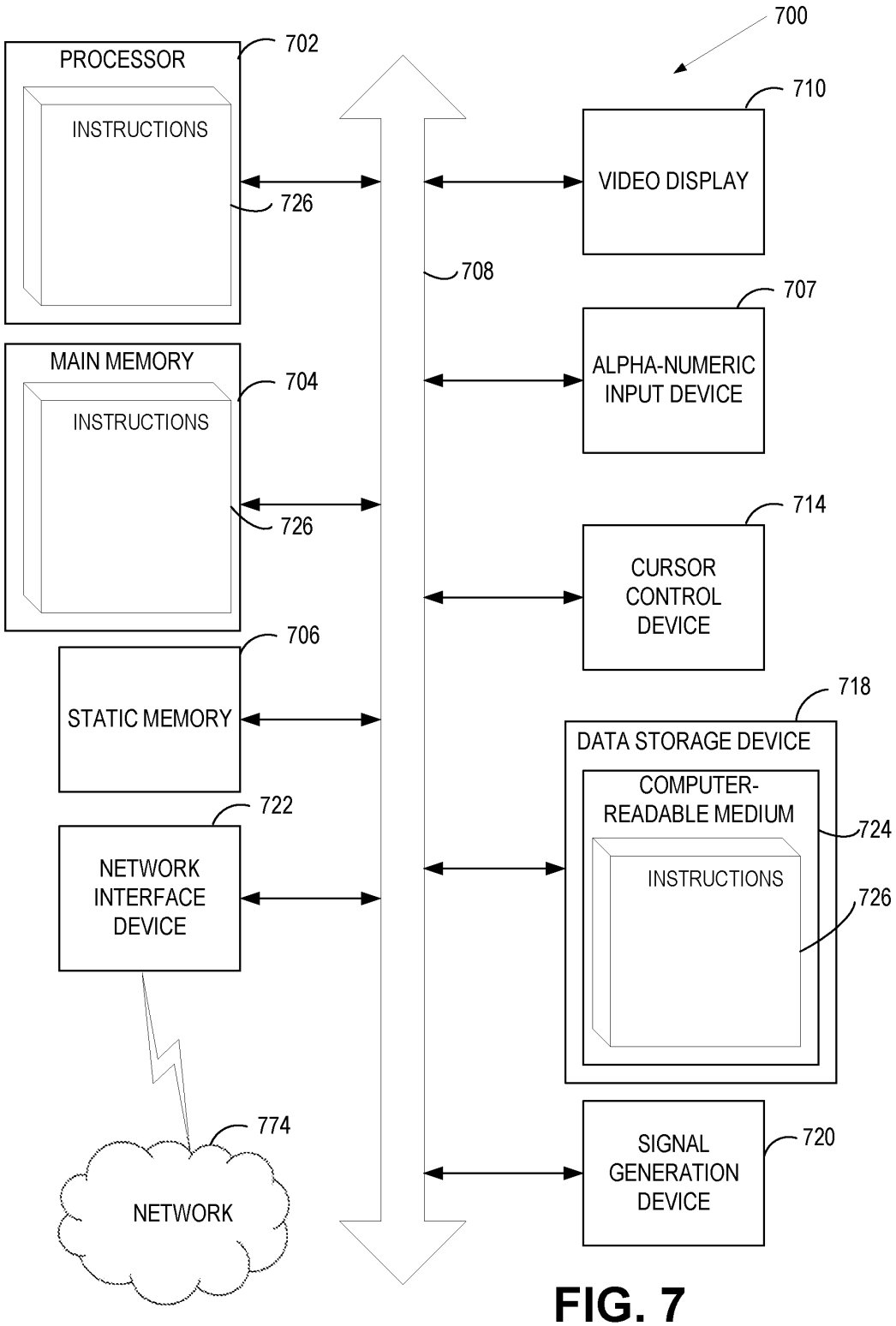
700
PROCESSOR
702
INSTRUCTIONS
726
MAIN MEMORY
704
INSTRUCTIONS
726
STATIC MEMORY
706
NETWORK INTERFACE DEVICE
722
NETWORK
774
708
VIDEO DISPLAY
710
ALPHA-NUMERIC INPUT DEVICE
707
CURSOR CONTROL DEVICE
714
DATA STORAGE DEVICE
718
COMPUTER-READABLE MEDIUM
724
INSTRUCTIONS
726
SIGNAL GENERATION DEVICE
720

FIG. 7