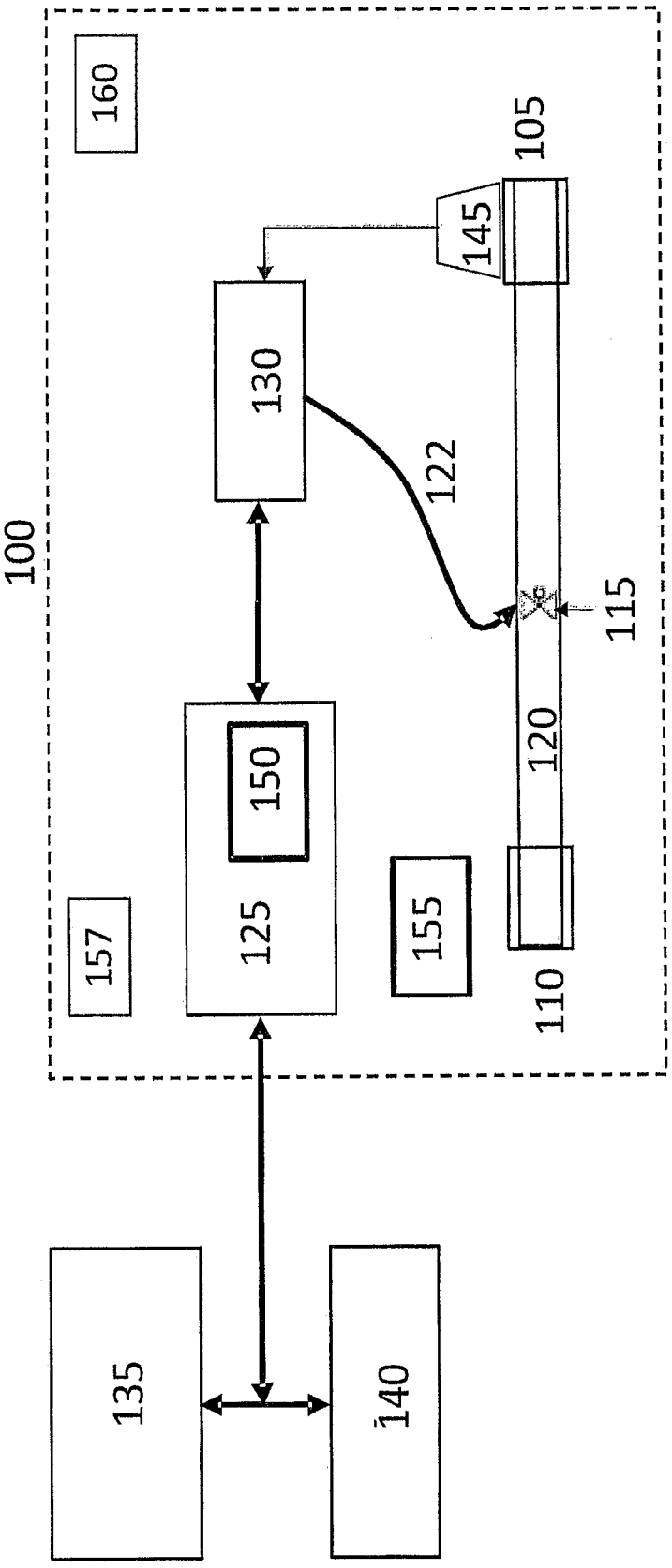



FIG. 1

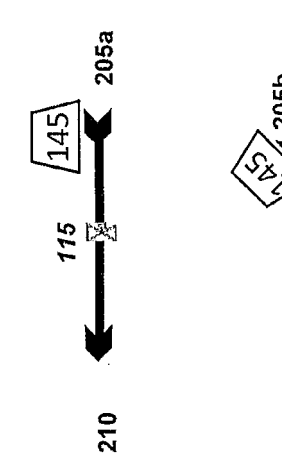



FIG. 2A

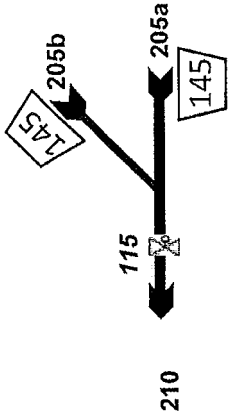



FIG. 2B

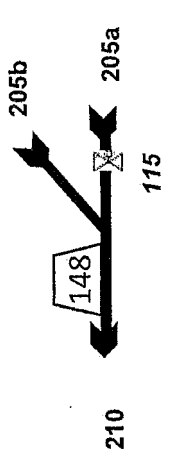



FIG. 2C

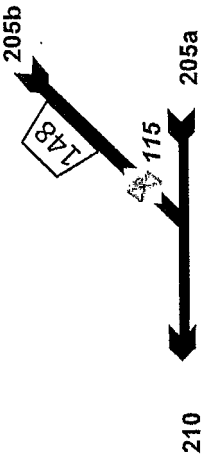



FIG. 2D

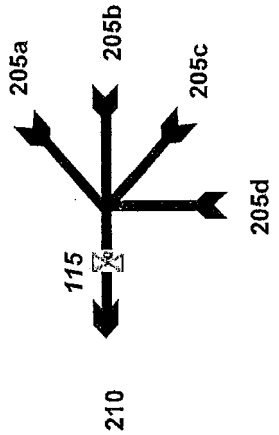



FIG. 2E

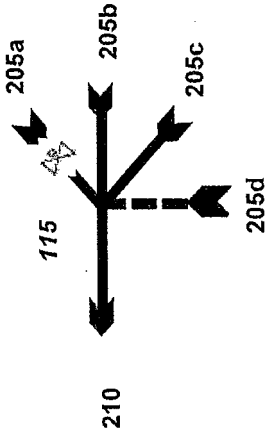



FIG. 2F

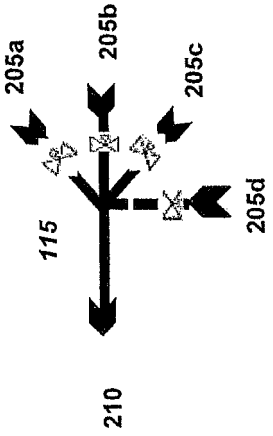



FIG. 2G

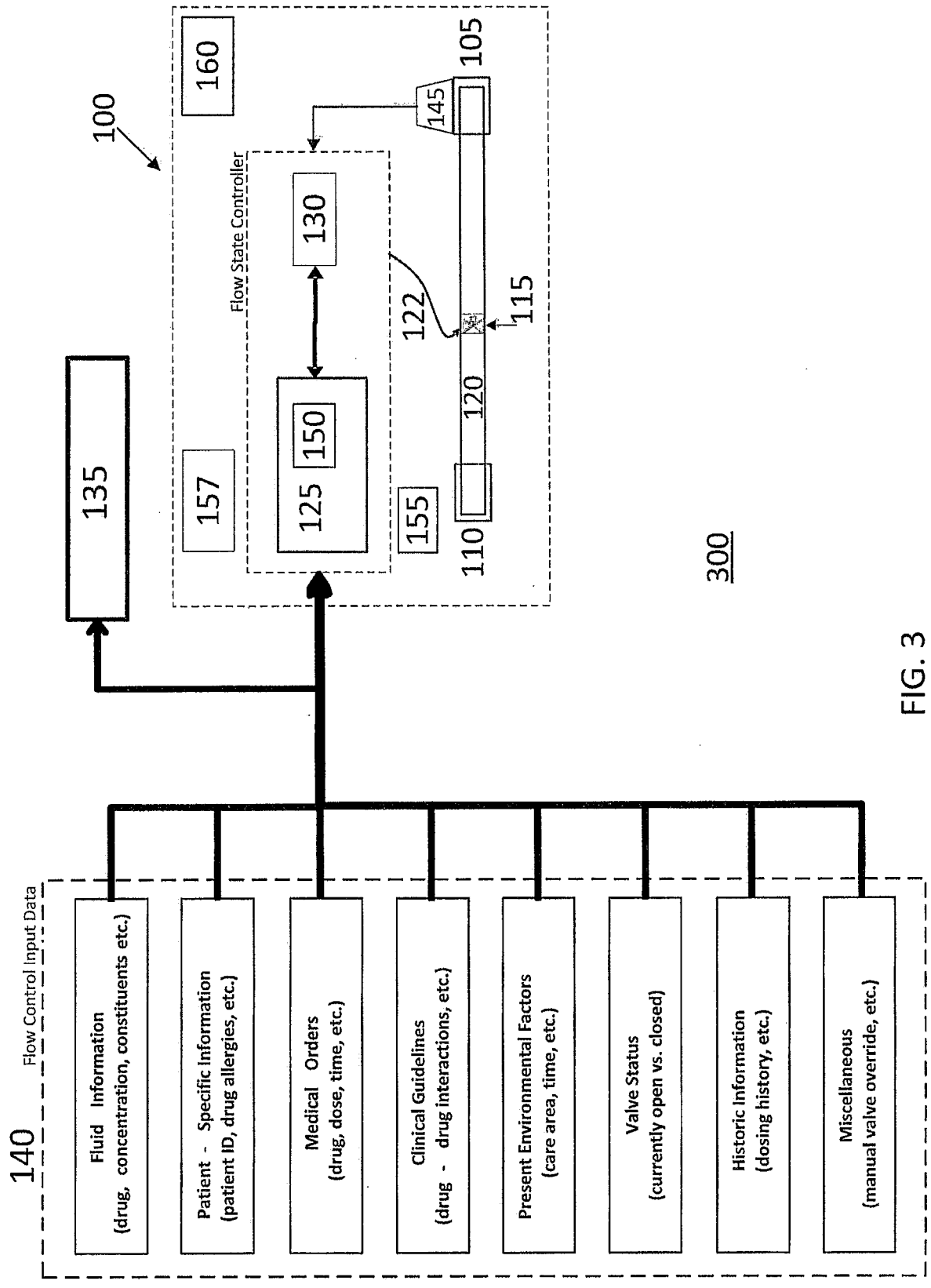

100
160
105
145
130
Flow State Controller
122
115
120
135
157
125
150
155
110
300
140
Flow Control Input Data
Fluid Information
(drug, concentration, constituents etc.)
Patient - Specific Information
(patient ID, drug allergies, etc.)
Medical Orders
(drug, dose, time, etc.)
Clinical Guidelines
(drug - drug interactions, etc.)
Present Environmental Factors
(care area, time, etc.)
Valve Status
(currently open vs. closed)
Historic Information
(dosing history, etc.)
Miscellaneous
(manual valve override, etc.)

FIG. 3

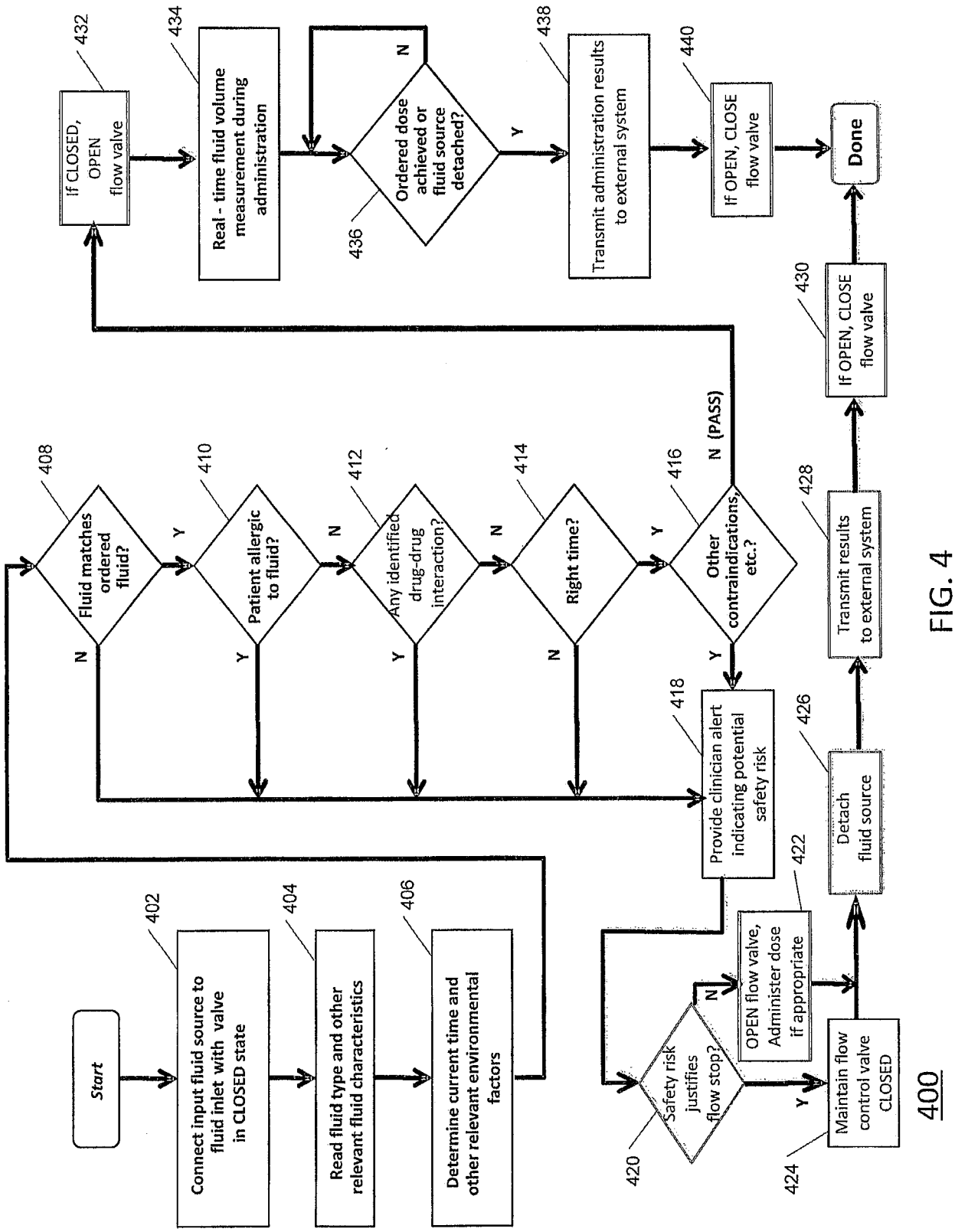

Start
Connect input fluid source to fluid inlet with valve in CLOSED state
402
Read fluid type and other relevant fluid characteristics
404
Determine current time and other relevant environmental factors
406
Fluid matches ordered fluid?
408
Patient allergic to fluid?
410
Any identified drug-drug interaction?
412
Right time?
414
Other contraindications, etc.?
416
N (PASS)
Y
N
Provide clinician alert indicating potential safety risk
418
Safety risk justifies flow stop?
420
OPEN flow valve, Administer dose if appropriate
422
Maintain flow control valve CLOSED
424
Detach fluid source
426
Transmit results to external system
428
If OPEN, CLOSE flow valve
430
If CLOSED, OPEN flow valve
432
Real - time fluid volume measurement during administration
434
Ordered dose achieved or fluid source detached?
436
Transmit administration results to external system
438
If OPEN, CLOSE flow valve
440
Done
400

FIG. 4

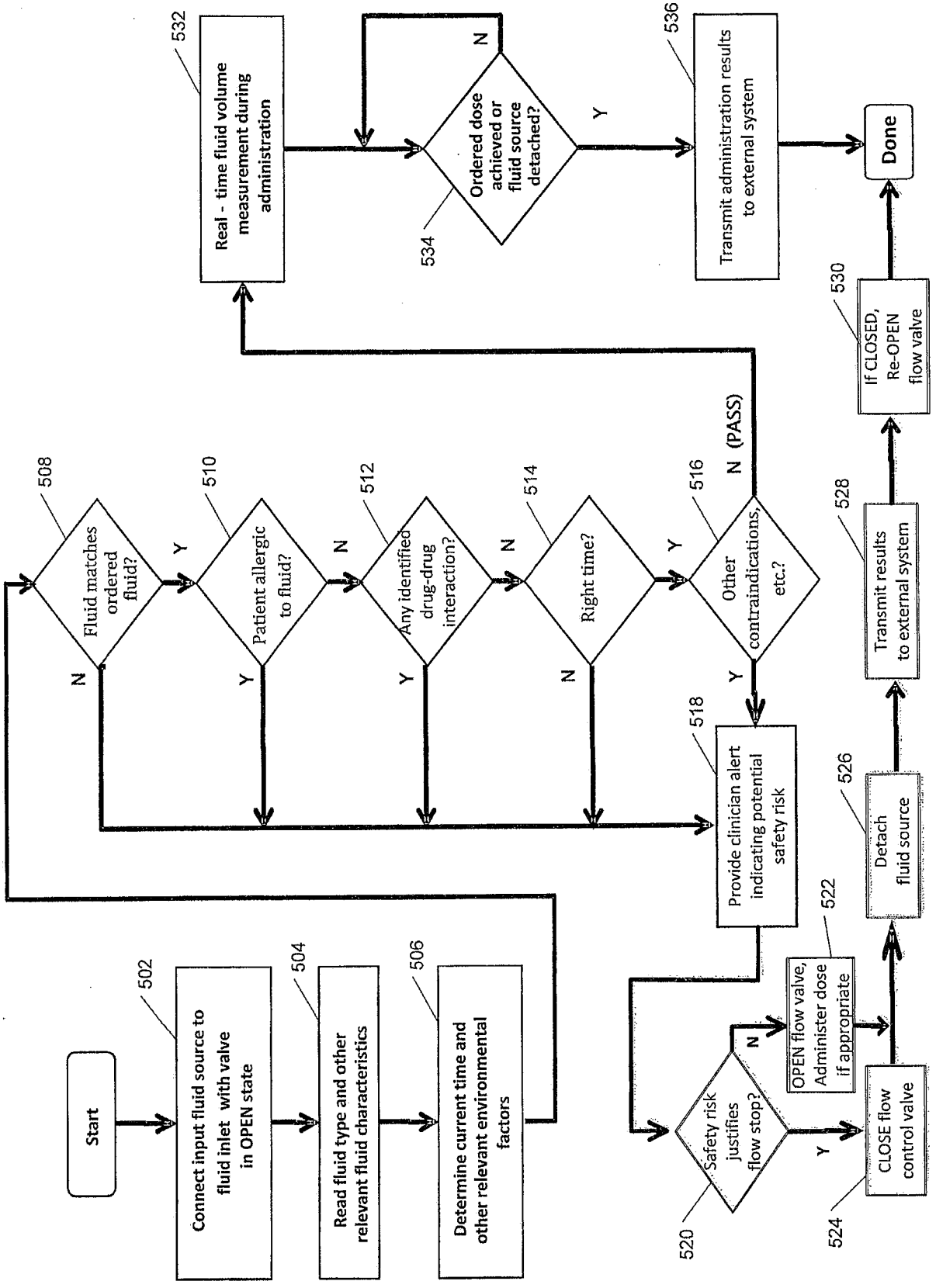

Start
502
Connect input fluid source to fluid inlet with valve in OPEN state
504
Read fluid type and other relevant fluid characteristics
506
Determine current time and other relevant environmental factors
508
Fluid matches ordered fluid?
510
Patient allergic to fluid?
512
Any identified drug-drug interaction?
514
Right time?
516
Other contraindications, etc.?
N (PASS)
518
Provide clinician alert indicating potential safety risk
520
Safety risk justifies flow stop?
522
OPEN flow valve, Administer dose if appropriate
524
CLOSE flow control valve
526
Detach fluid source
528
Transmit results to external system
530
If CLOSED, Re-OPEN flow valve
532
Real - time fluid volume measurement during administration
534
Ordered dose achieved or fluid source detached?
536
Transmit administration results to external system
Done
Y
N
500

FIG. 5

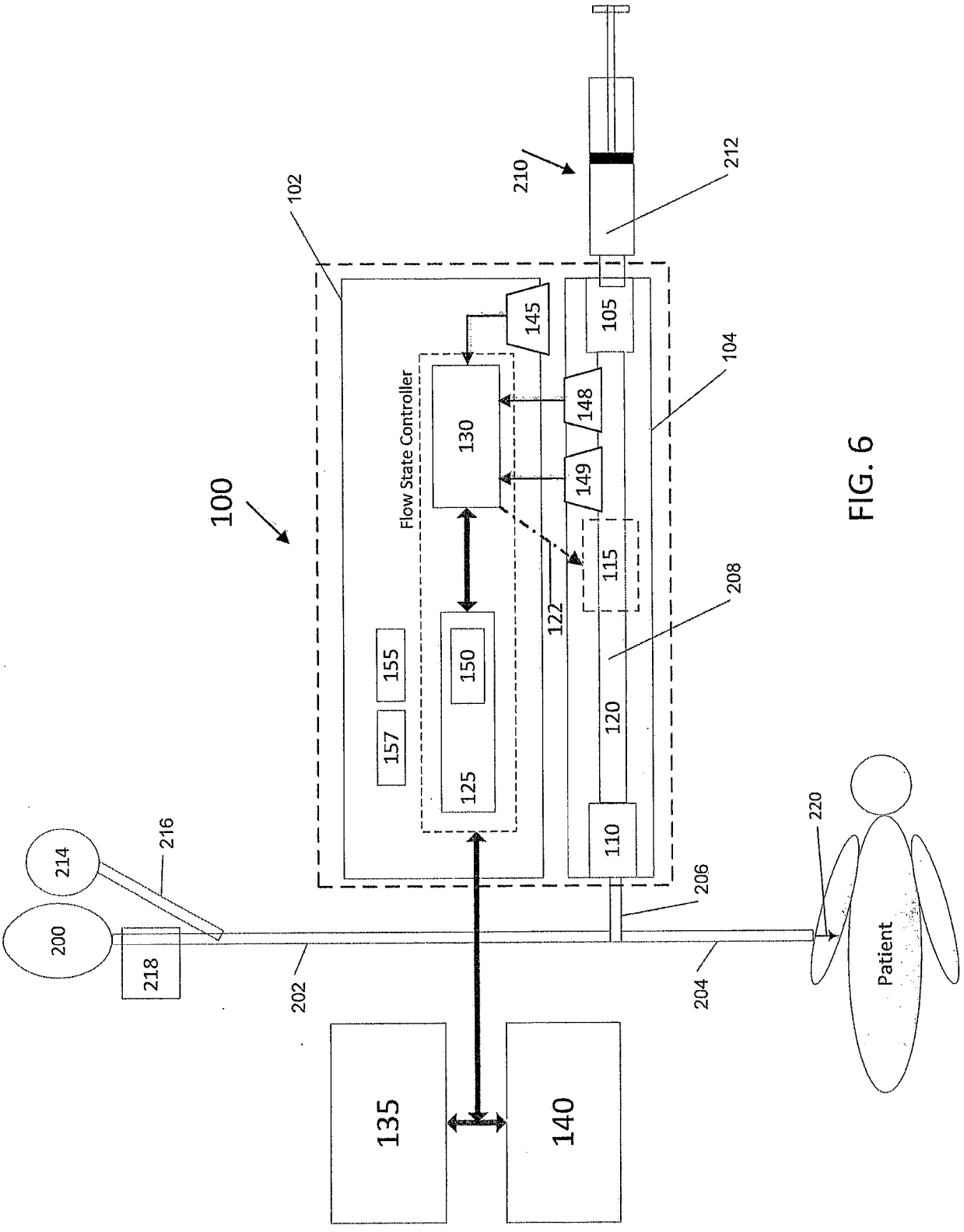

100
102
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105
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115
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122
125
130
135
140
145
148
149
150
155
157
200
202
204
206
208
210
212
214
216
218
220
Flow State Controller
Patient

FIG. 6

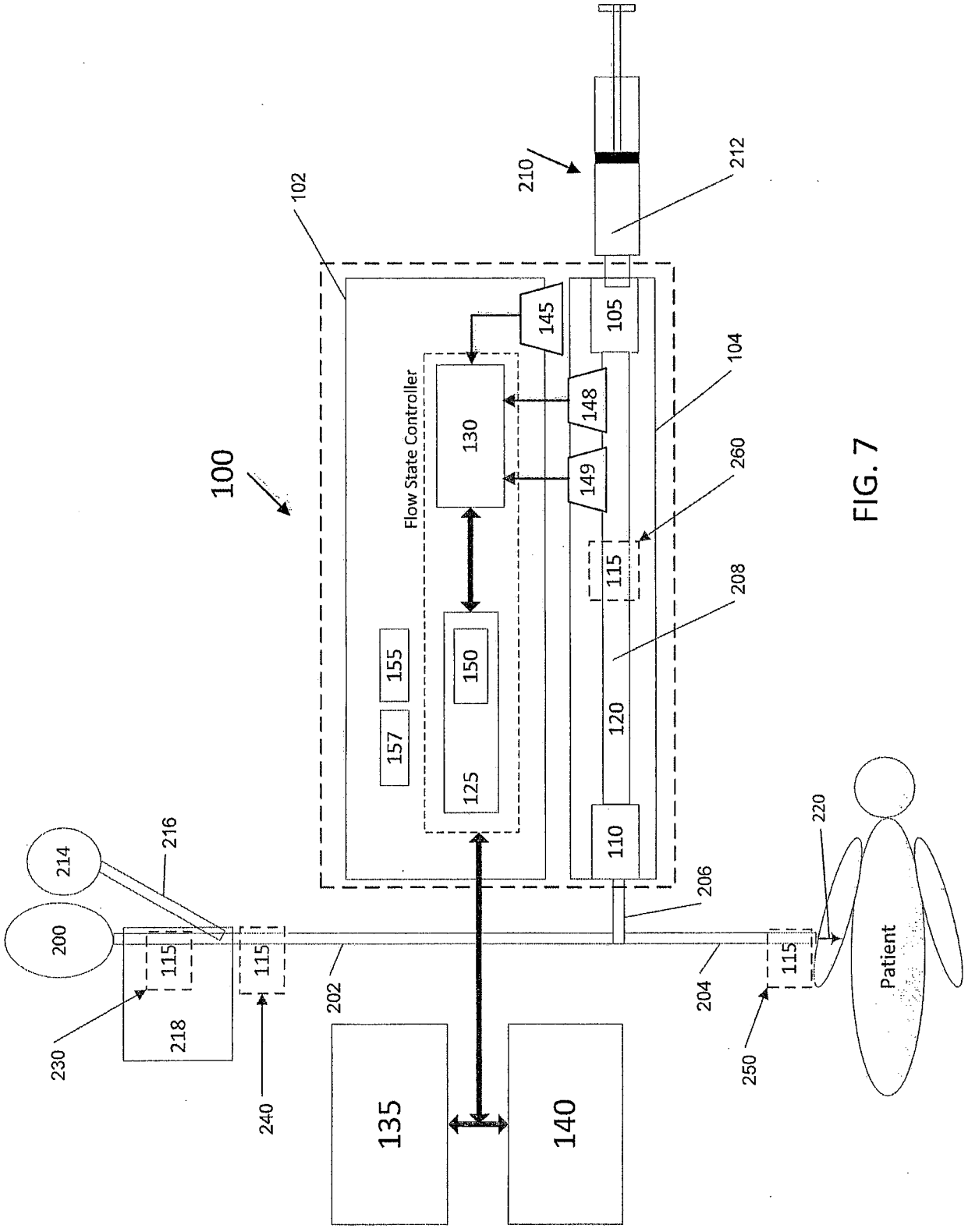

100
102
104
105
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115
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125
130
135
140
145
148
149
150
155
157
200
202
204
206
208
210
212
214
216
218
220
230
240
250
260
Flow State Controller
Patient

FIG. 7

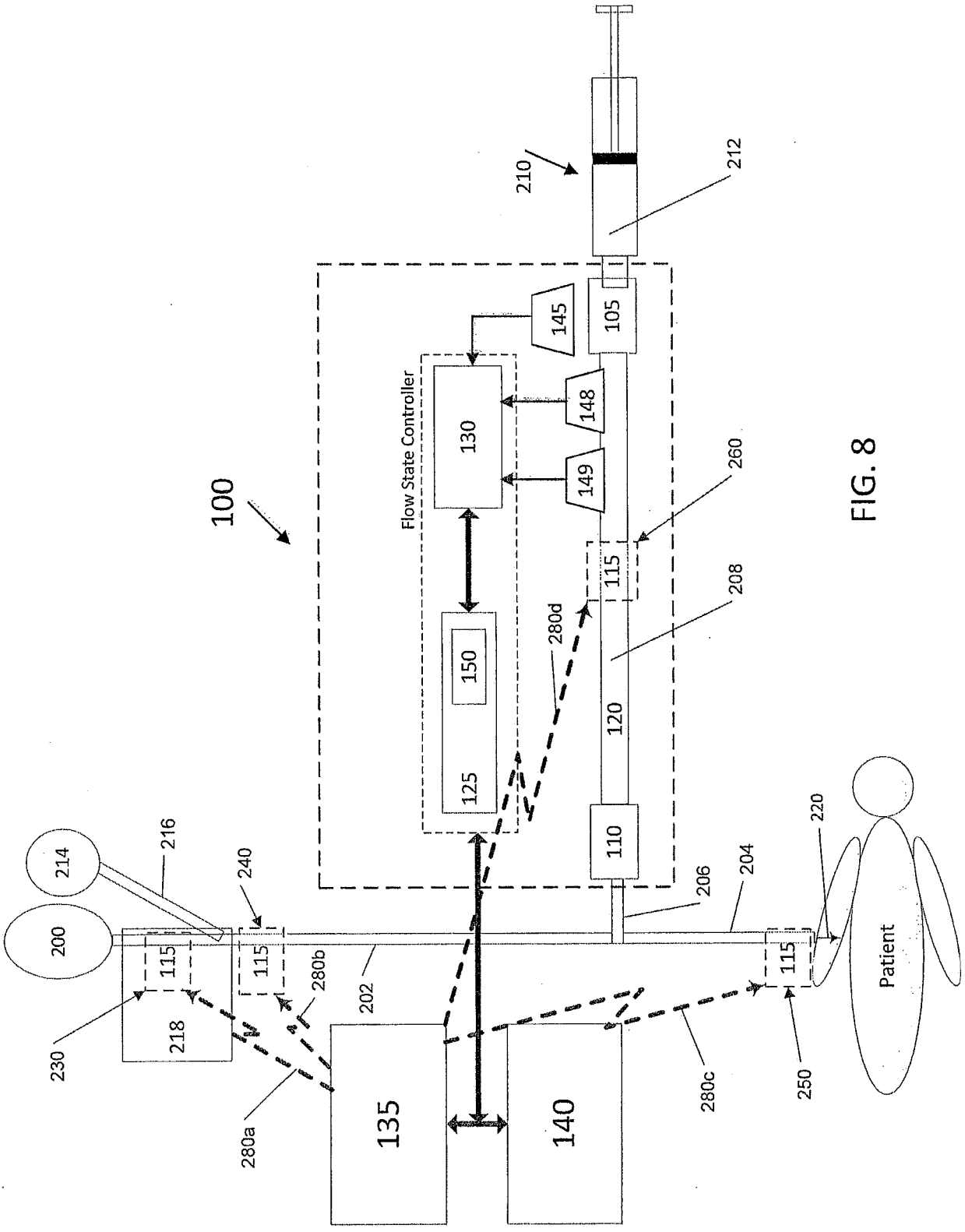

100
Flow State Controller
130
145
148
149
150
125
105
115
120
110
208
260
210
212
280d
280a
280b
280c
135
140
202
204
206
200
214
216
218
230
240
250
220
Patient

FIG. 8

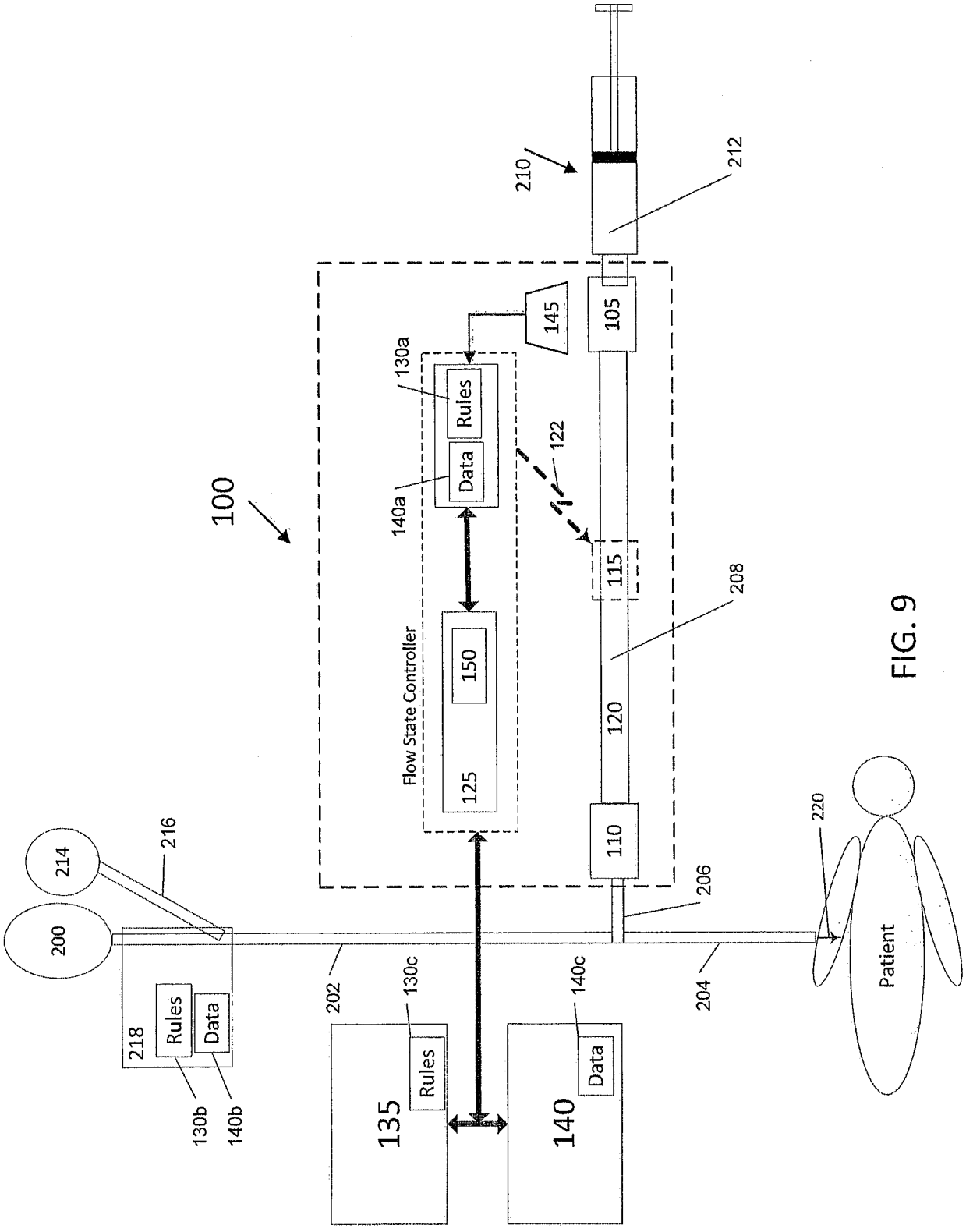

100
210
212
145
105
130a
Rules
Data
140a
122
115
208
Flow State Controller
150
125
120
110
206
216
214
200
218
Rules
Data
130b
140b
202
130c
Rules
135
140c
Data
140
204
220
Patient

FIG. 9

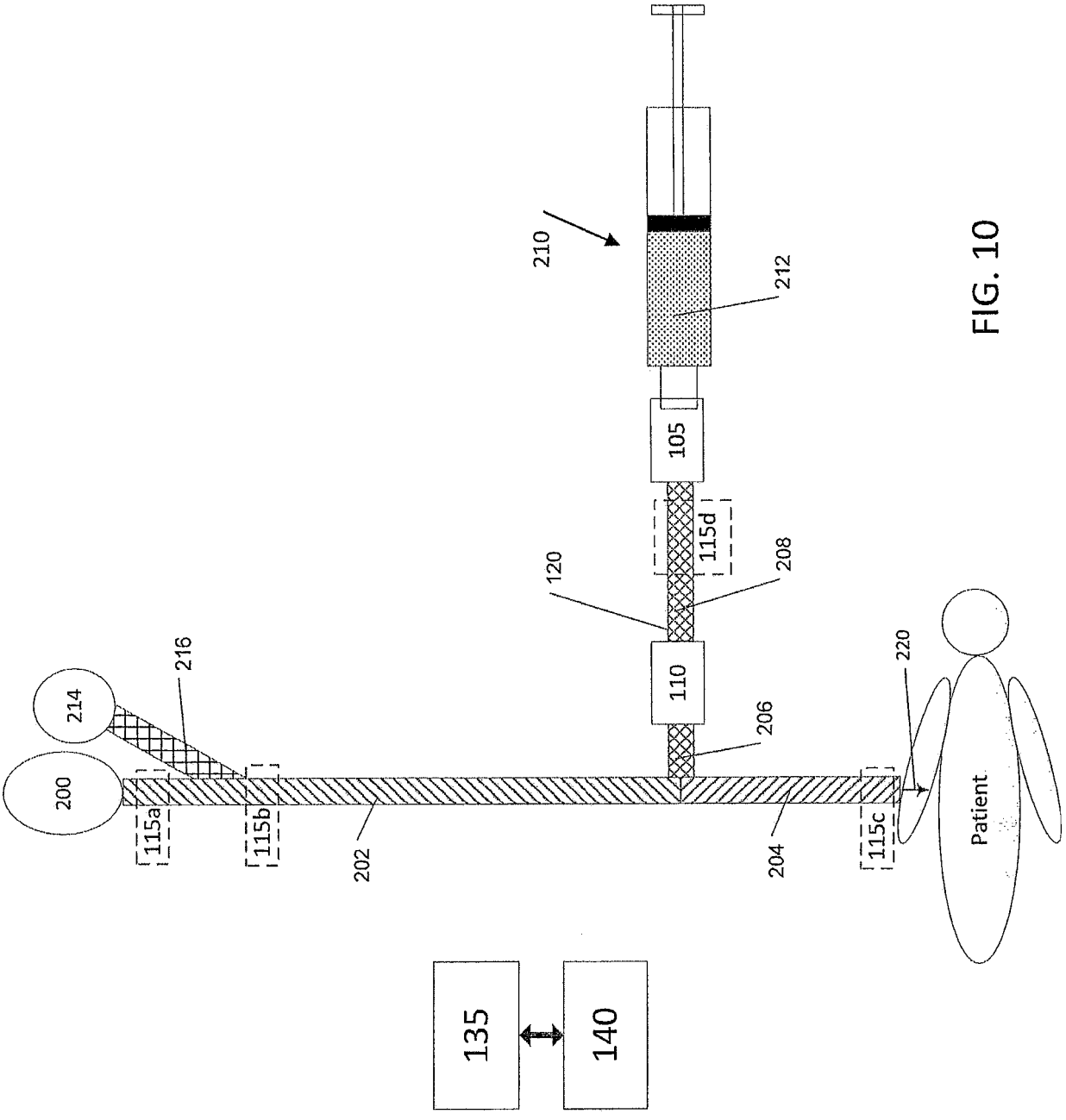

210
212
105
115d
208
120
110
206
216
214
200
115a
115b
202
204
115c
220
Patient
135
140

FIG. 10