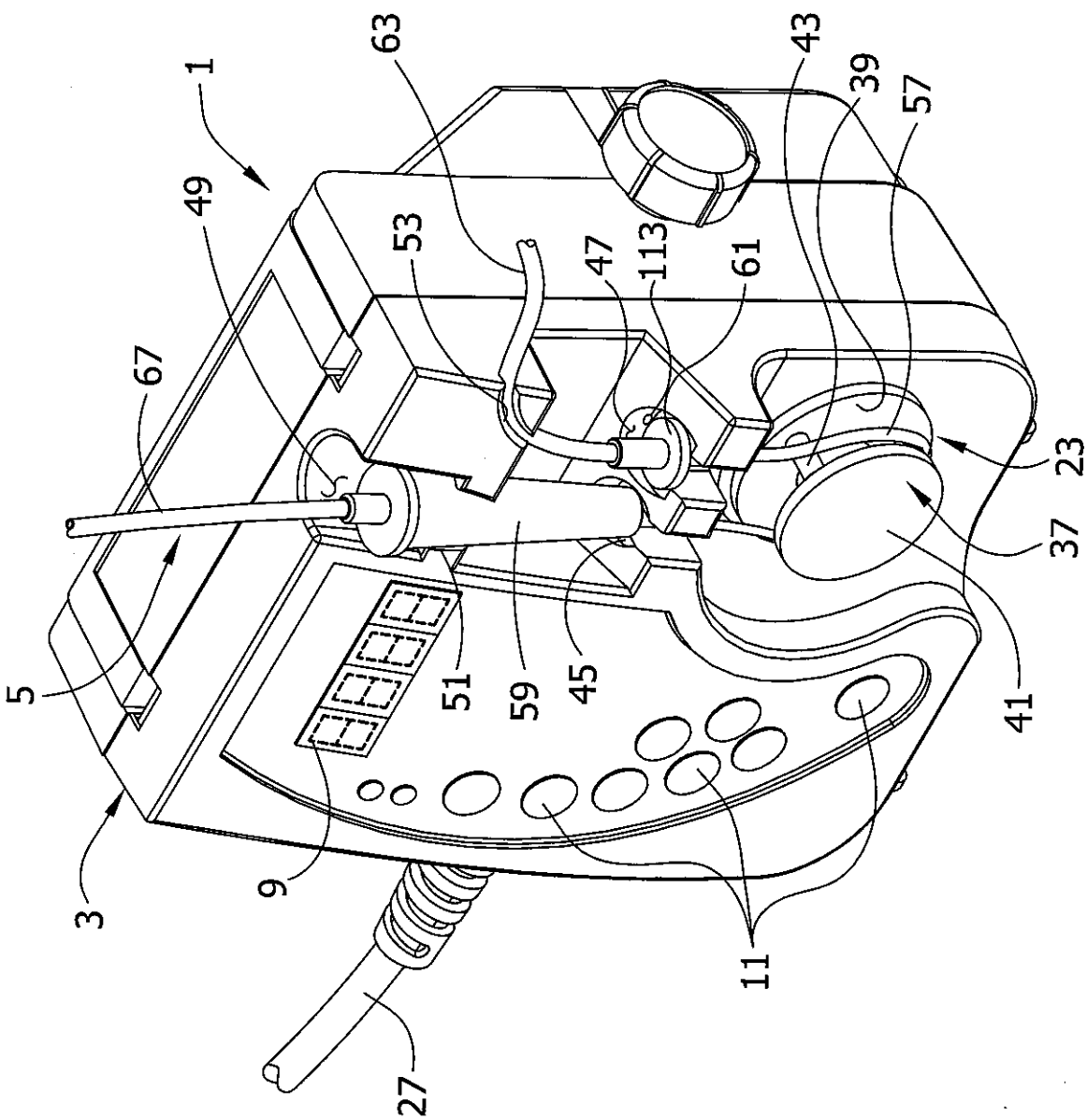
FIG. 1



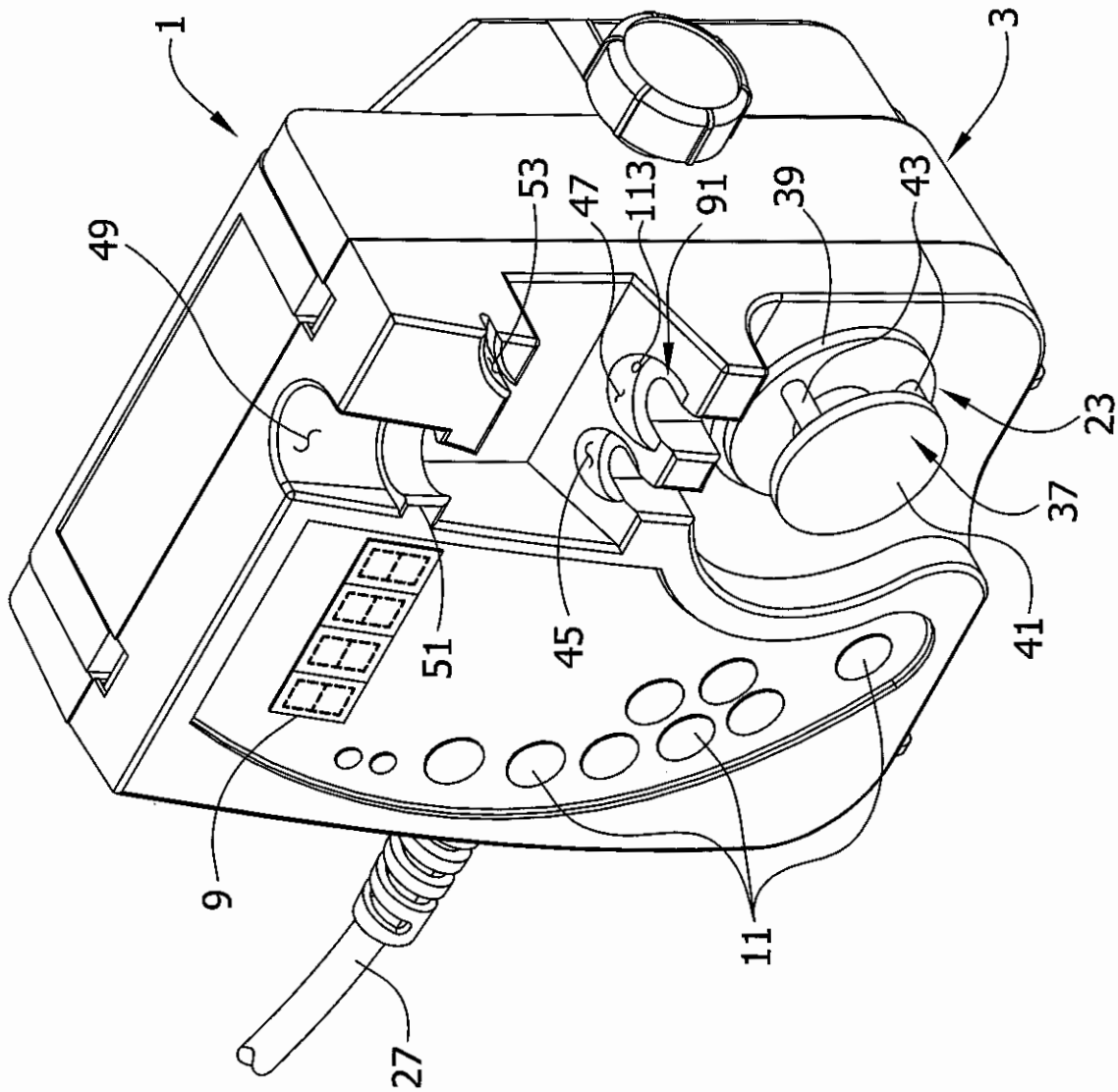



FIG. 2

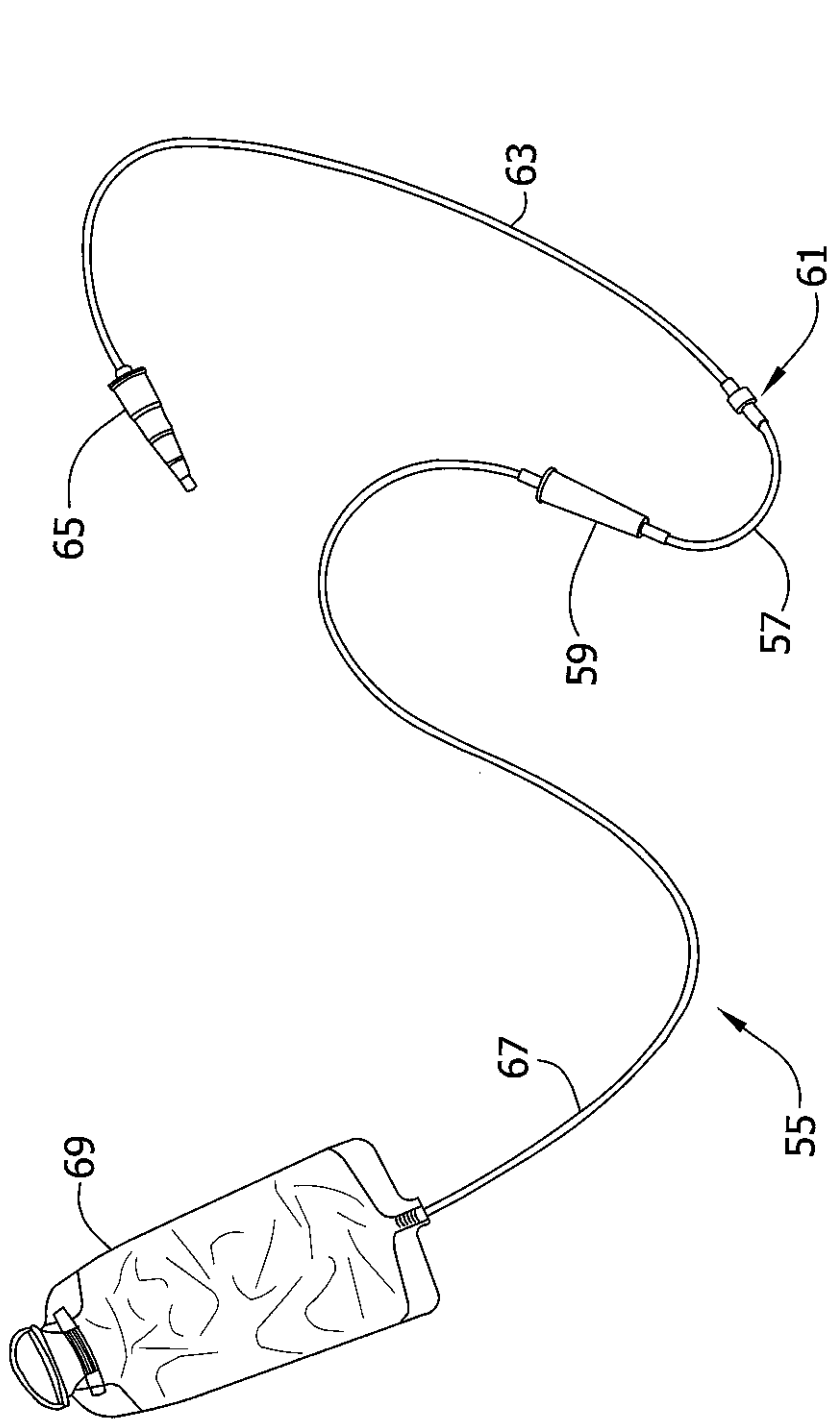
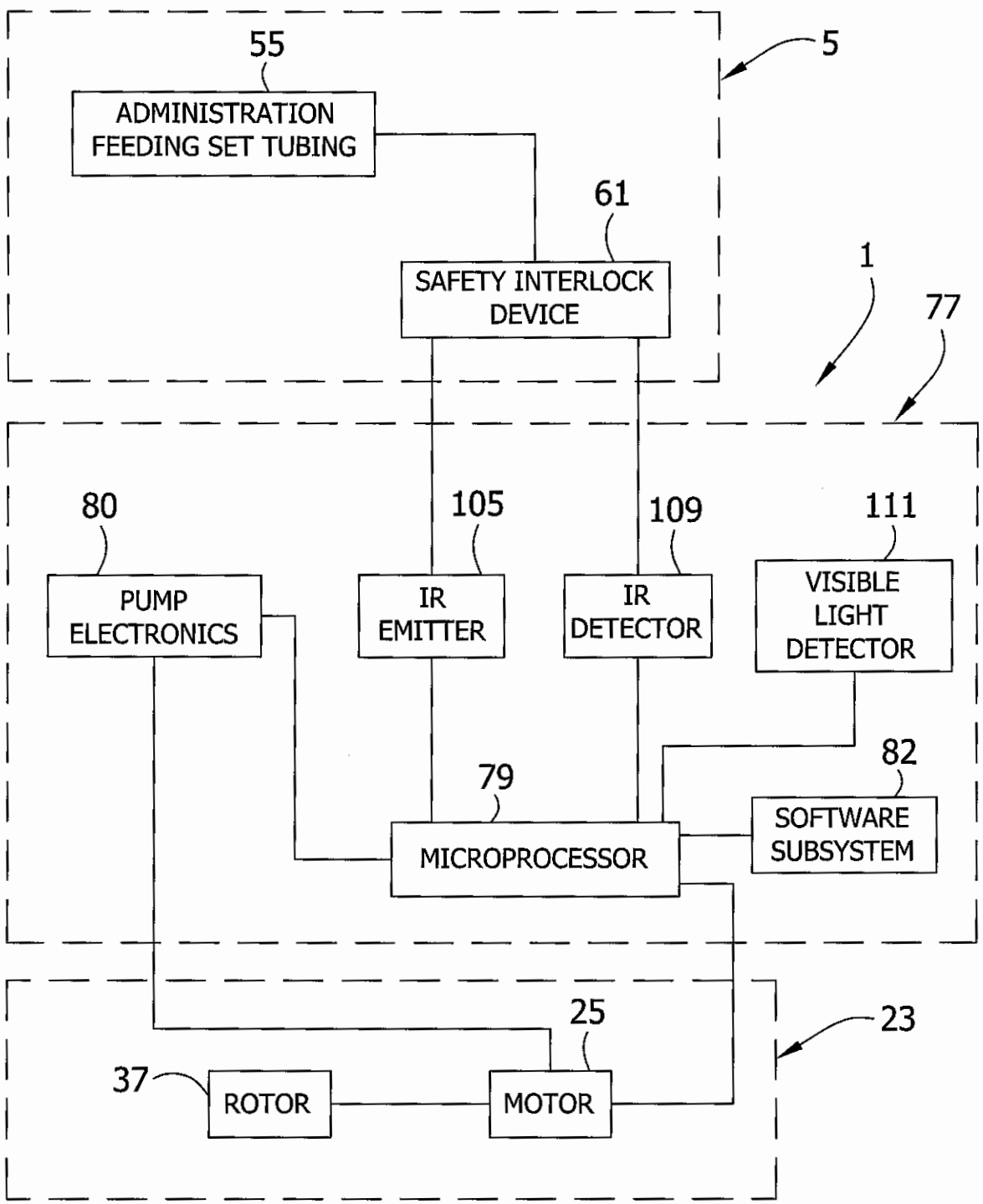



FIG. 3

FIG. 4


55
5
ADMINISTRATION FEEDING SET TUBING
61
SAFETY INTERLOCK DEVICE
1
77
80
105
109
111
PUMP ELECTRONICS
IR EMITTER
IR DETECTOR
VISIBLE LIGHT DETECTOR
82
79
SOFTWARE SUBSYSTEM
MICROPROCESSOR
25
23
37
ROTOR
MOTOR

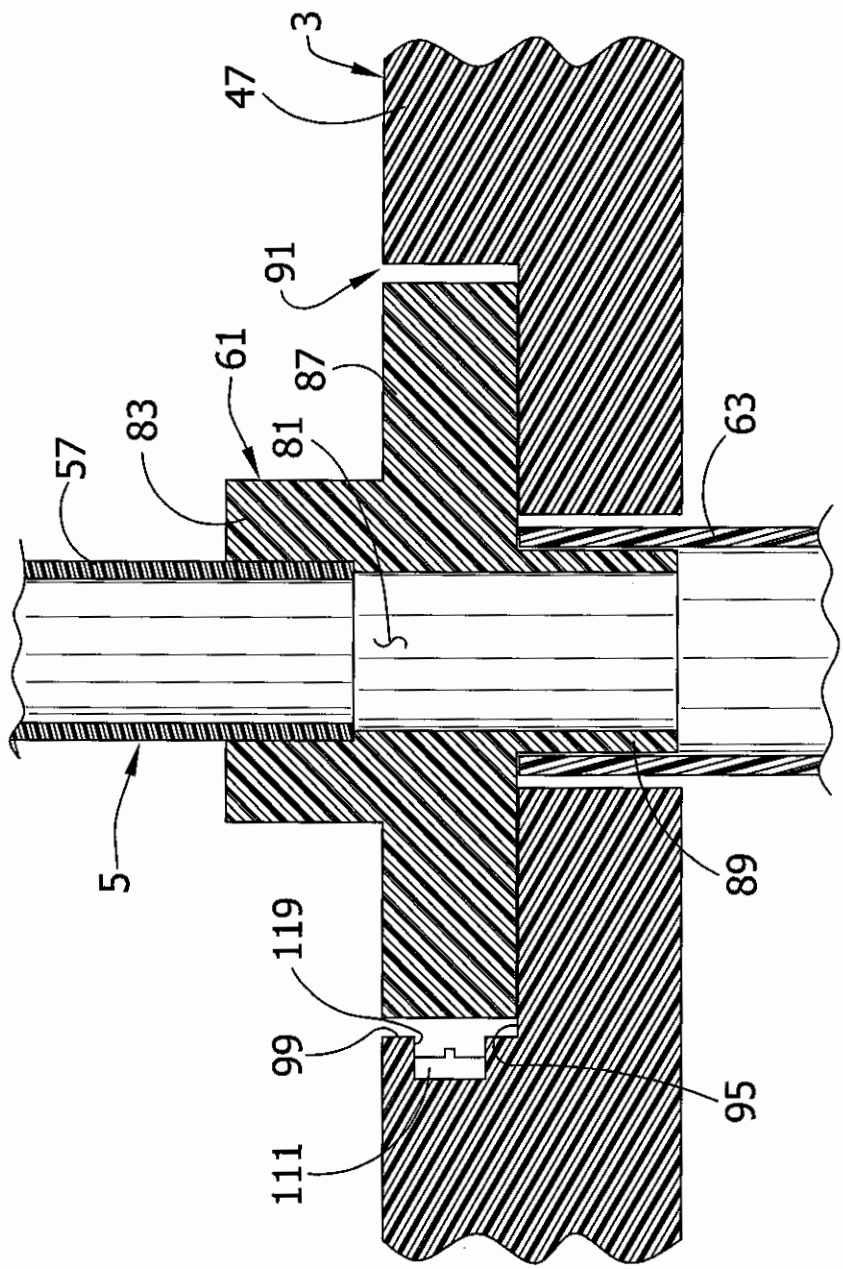
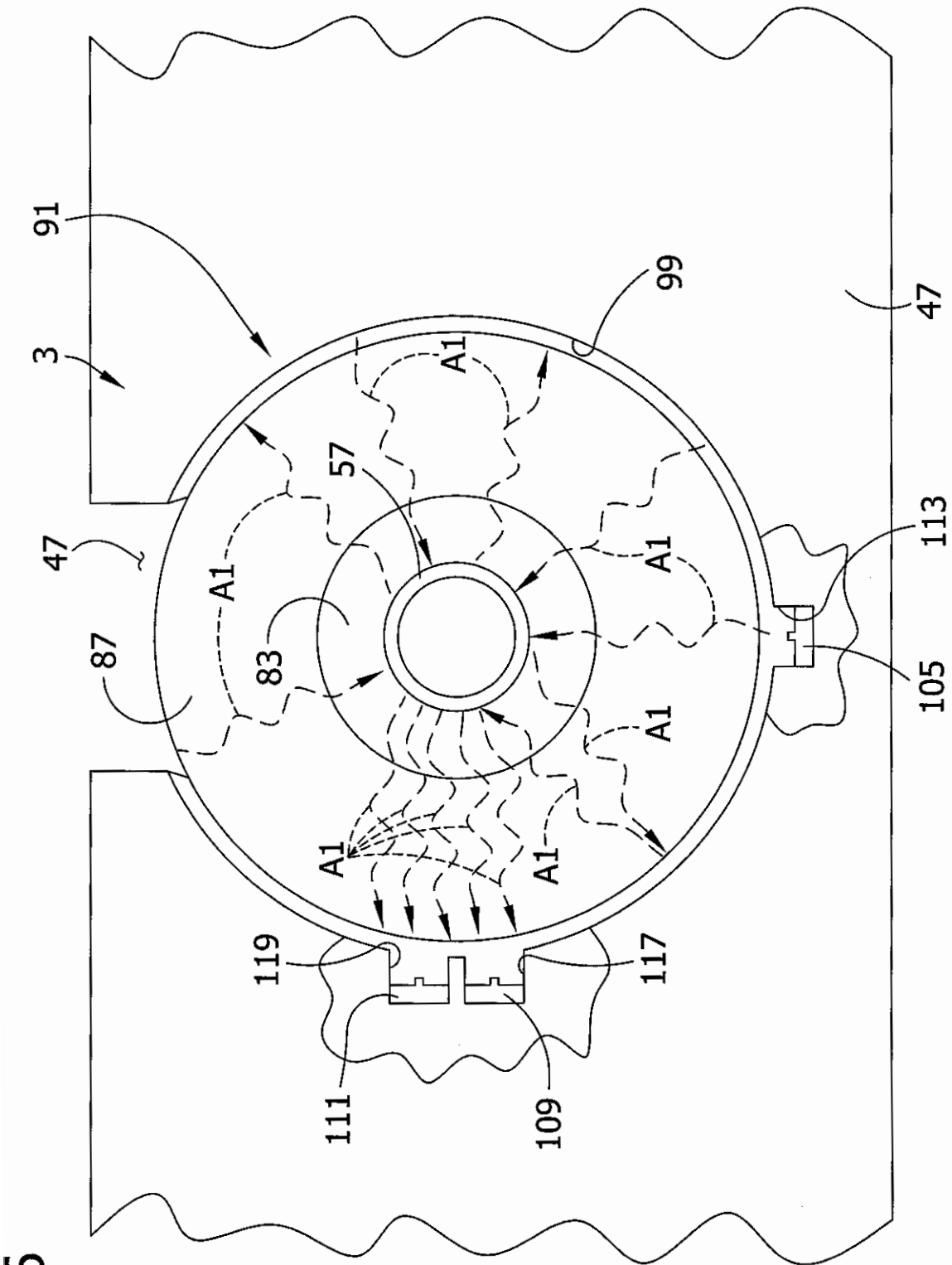



FIG. 5

FIG. 6



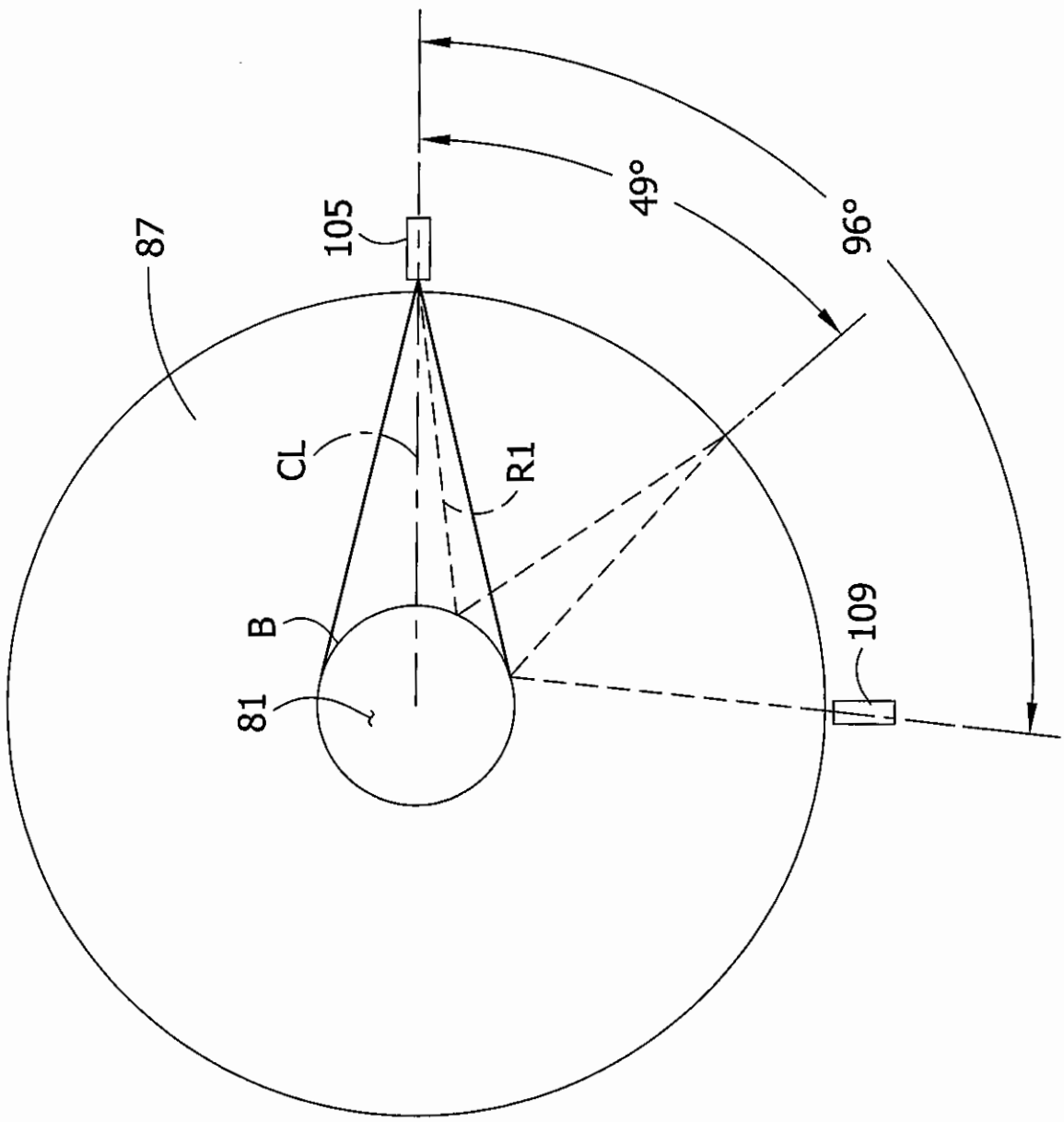



FIG. 6A

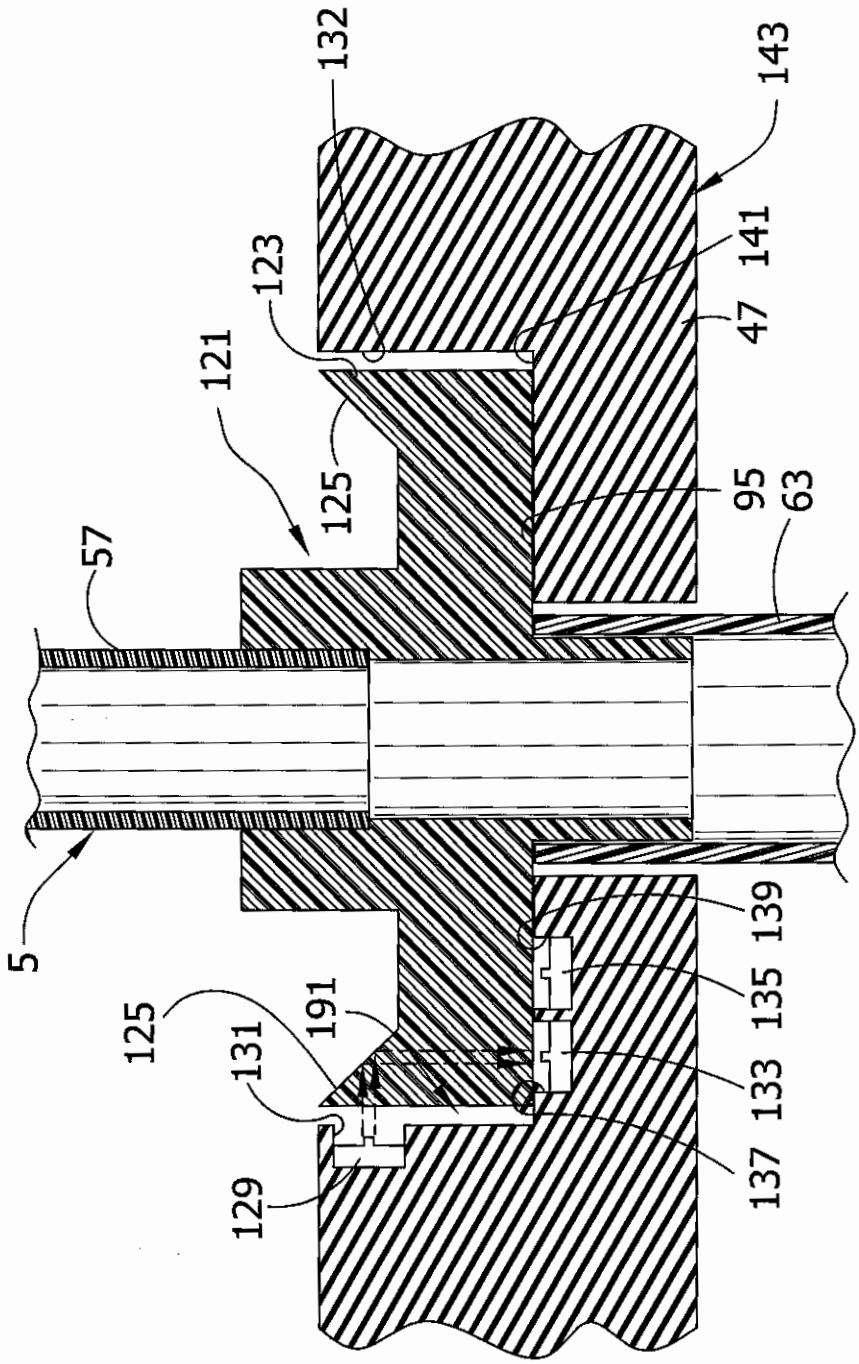

132
143
123
141
121
47
125
95
63
57
5
139
125
191
135
131
133
137
129

FIG. 7

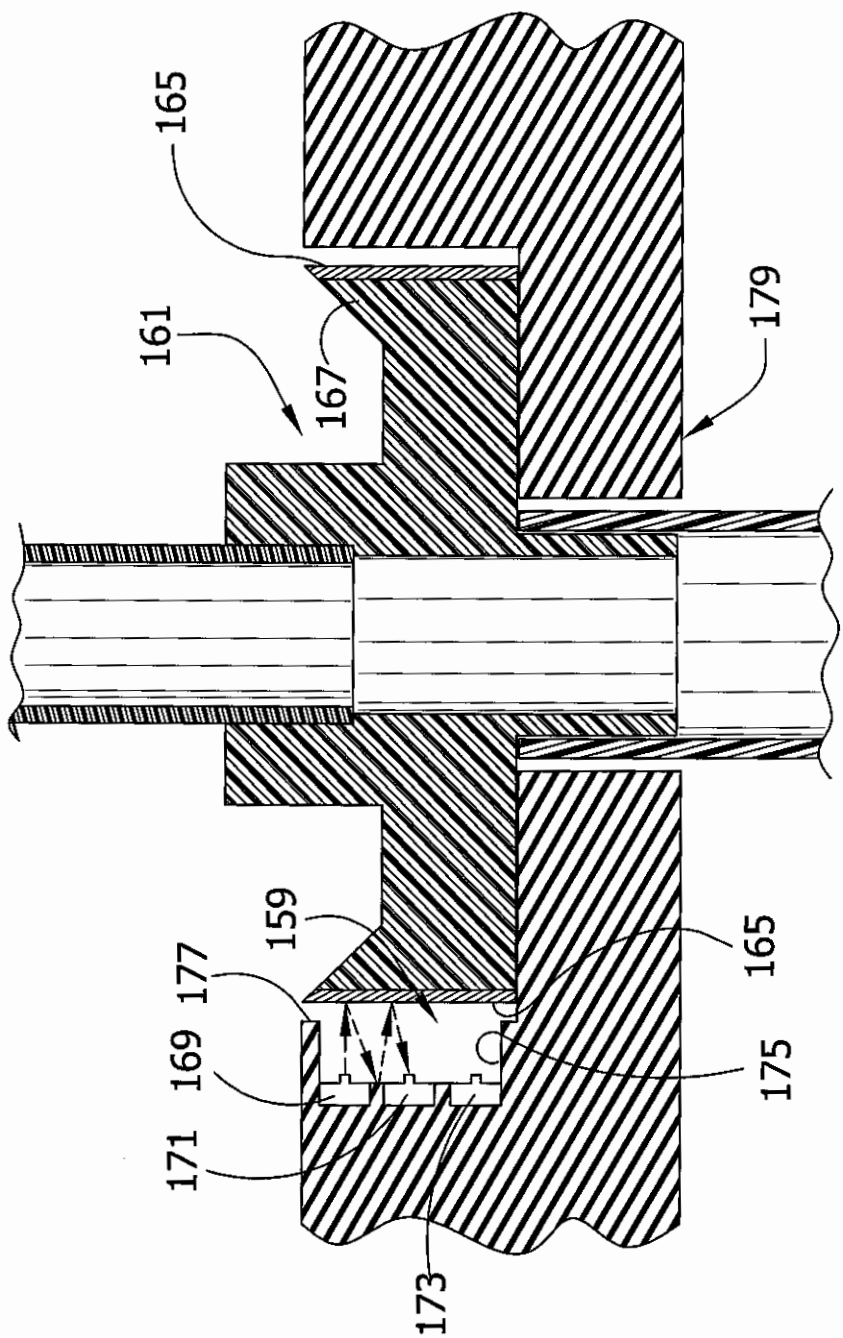



FIG. 7A

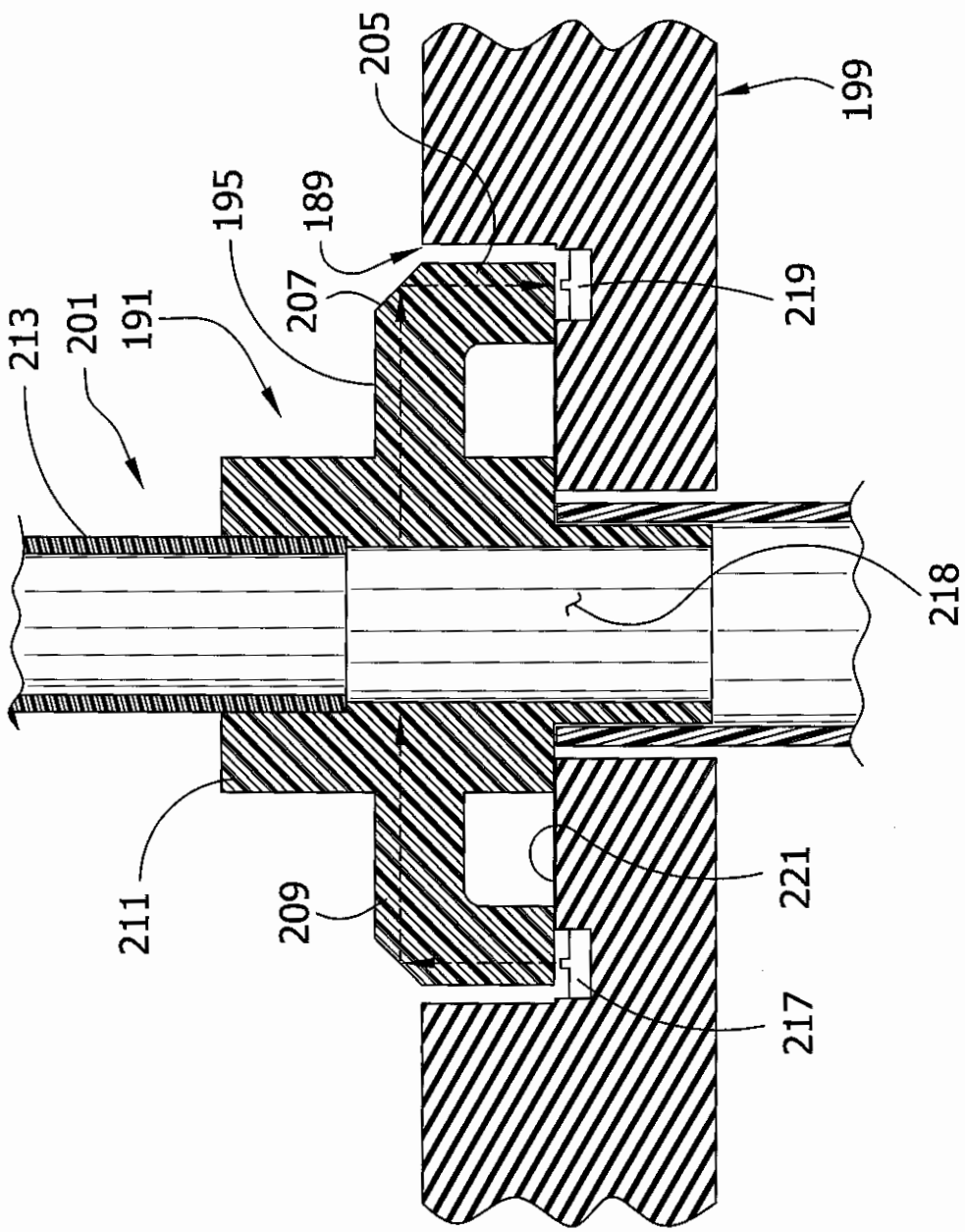



FIG. 8

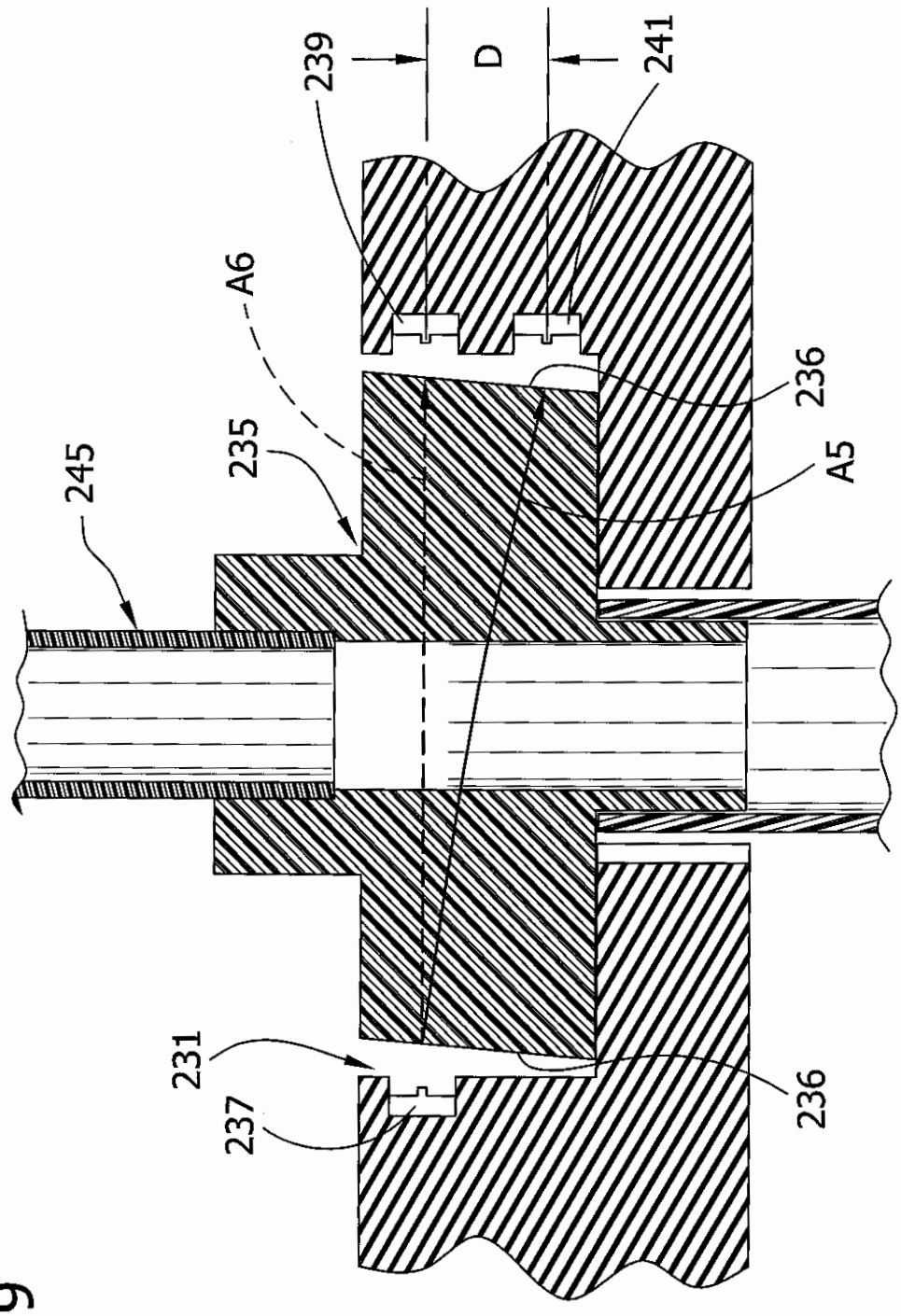



FIG. 9

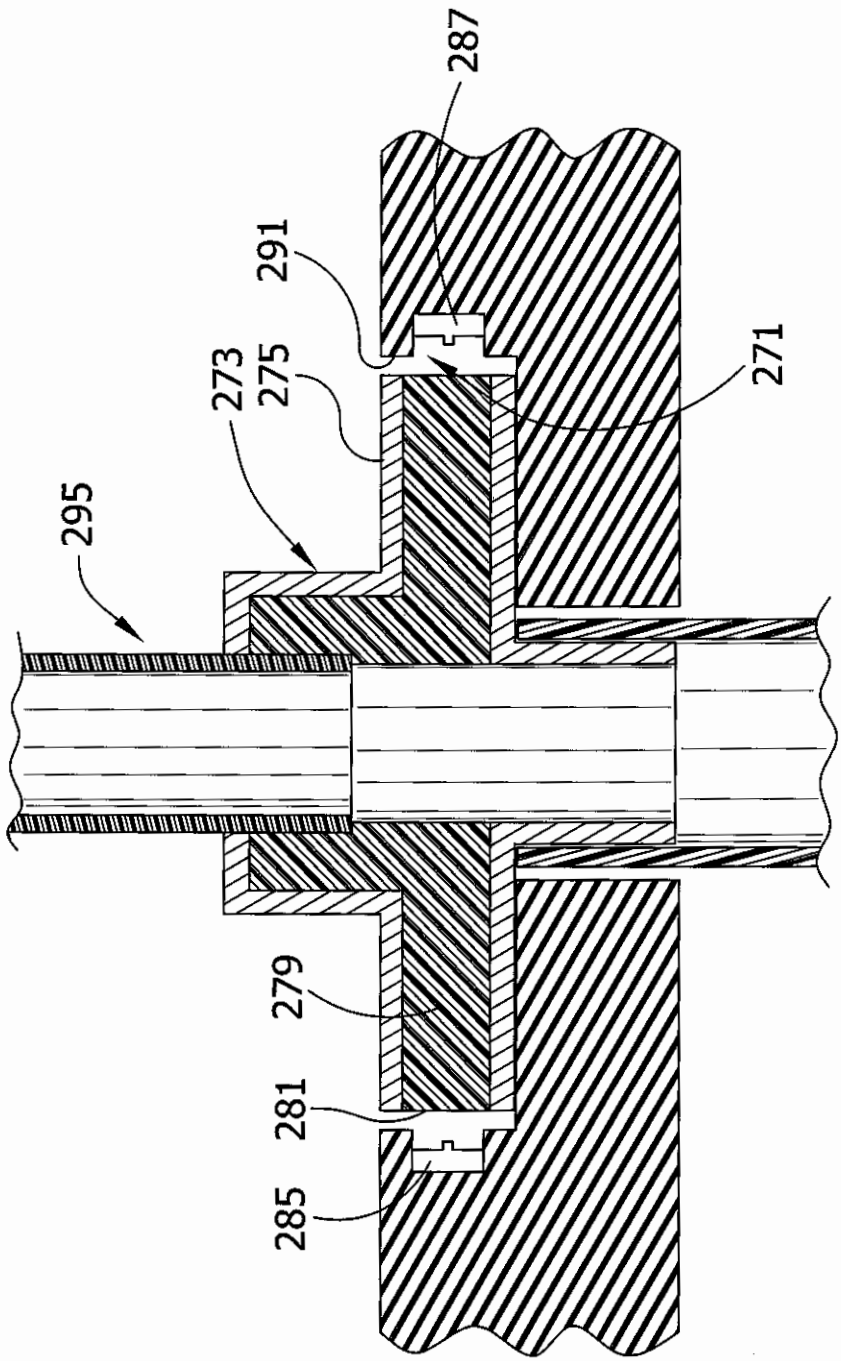
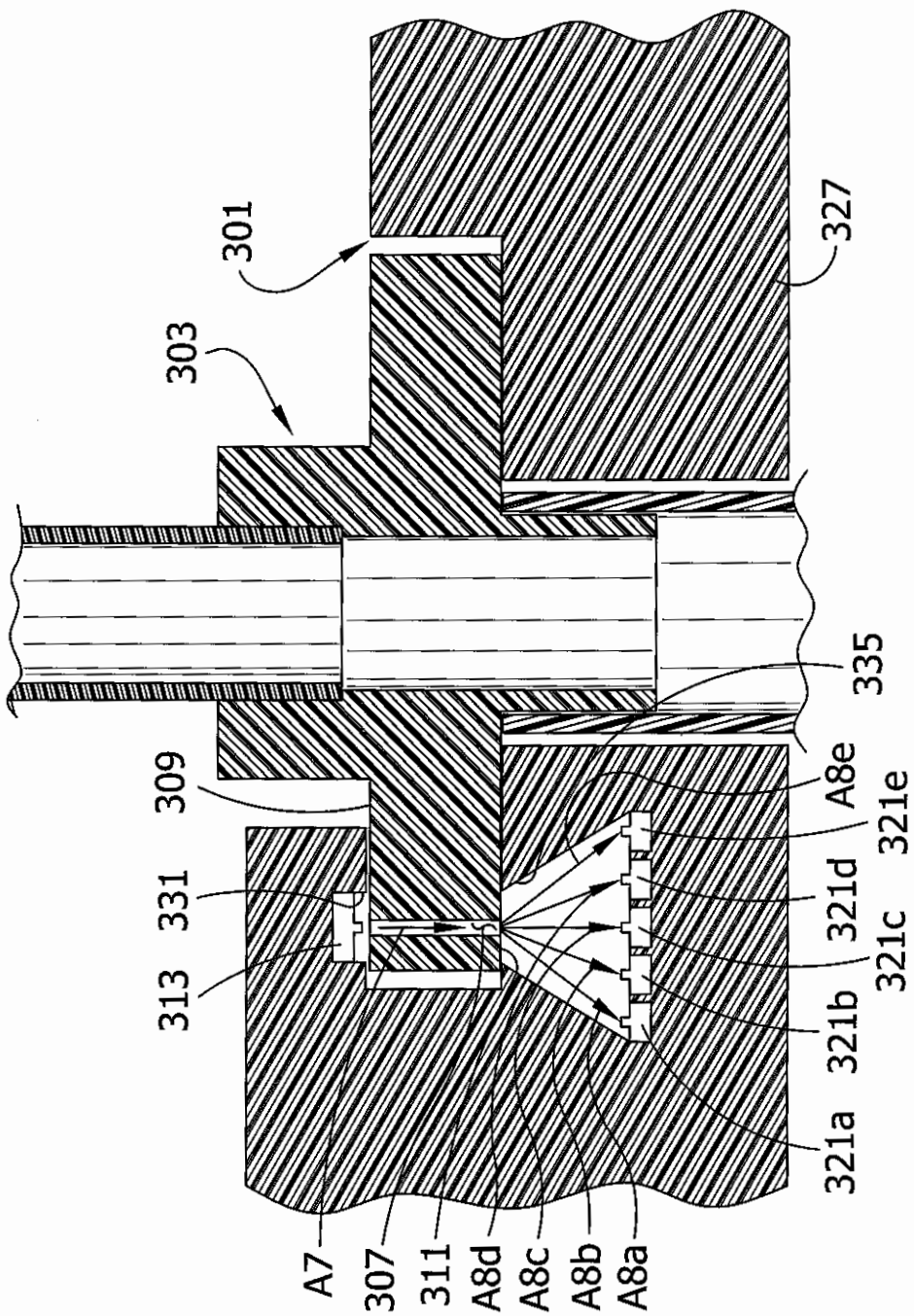



FIG. 10

FIG. 11

| CONDITION # | STATE | IR EMITTER | IR DETECTOR | VISIBLE DETECTOR | STATUS |
|---|---|---|---|---|---|
| 1 | HIGH AMBIENT LIGHT SET NOT LOADED | OFF | ON (ACTIVATED) | ON (ACTIVATED) | FAULT |
| 2 | HIGH AMBIENT LIGHT SET LOADED | ON | ON | OFF | SET LOADED |
| 3 | DARK AMBIENT CONDITION SET NOT LOADED | ON | OFF | OFF | FAULT |
| 4 | DARK AMBIENT CONDITION SET LOADED | ON | ON | OFF | SET LOADED |
| 5 | HIGH AMBIENT LIGHT SET NOT LOADED | ON | ON | ON | FAULT |
| 6 | HIGH AMBIENT LIGHT SET LOADED | OFF | ON | ON | FAULT |
| 7 | DARK AMBIENT CONDITION SET NOT LOADED | OFF | OFF | OFF | FAULT |
| 8 | DARK AMBIENT CONDITION SET LOADED | OFF | OFF | OFF | FAULT |

FIG. 12


301
303
327
335
309
331
313
A8e
321e
321d
321c
321b
321a
A7
307
311
A8d
A8c
A8b
A8a

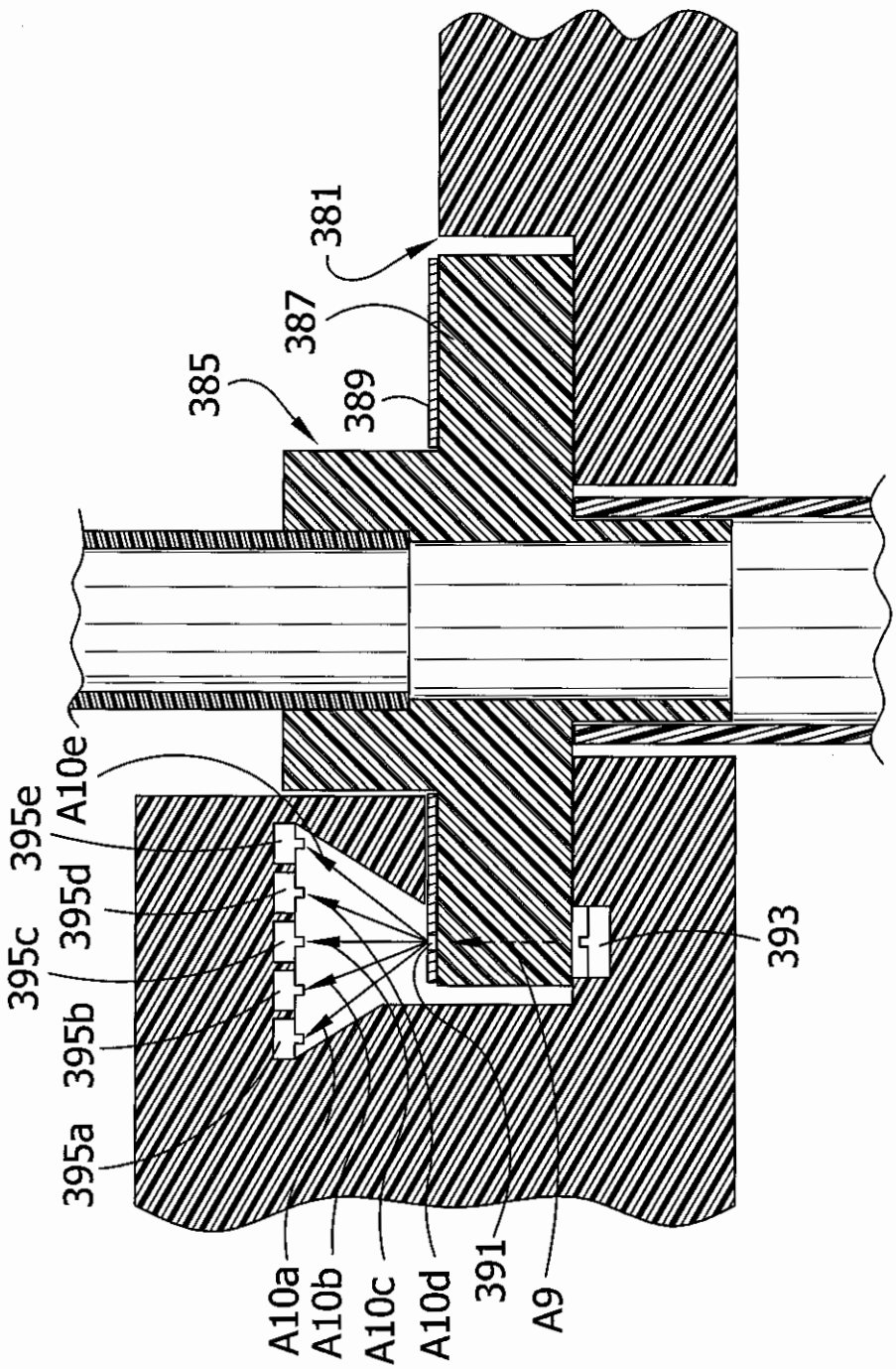

381
387
385
389
A10e
395e
395d
395c
395b
395a
393
A10a
A10b
A10c
A10d
391
A9

FIG. 13

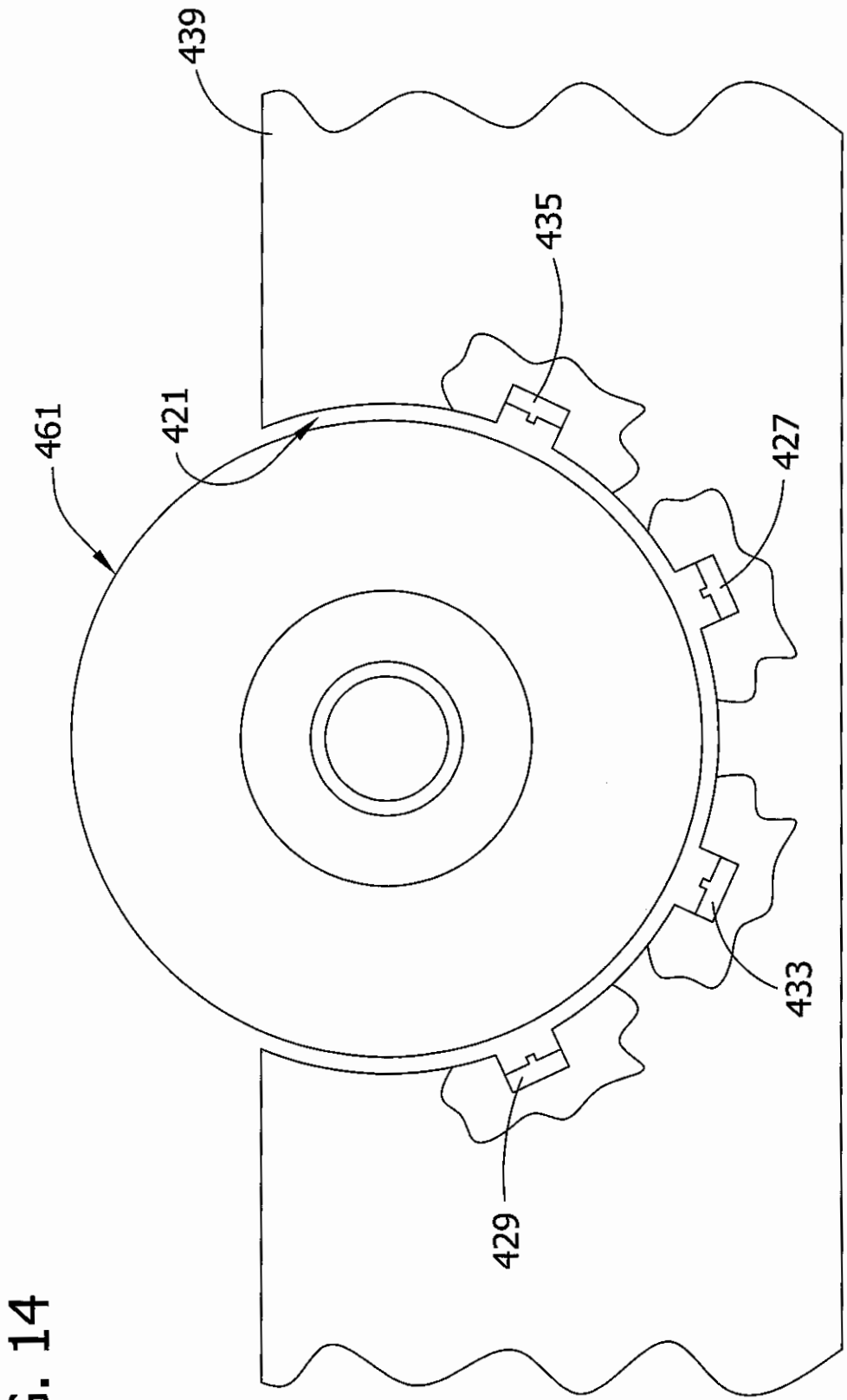



FIG. 14

FIG. 15

| CONDITION | IR EMITTER | IR DETECTOR | VISIBLE EMITTER | AMBIENT LIGHT | VISIBLE DETECTOR | STATUS |
|---|---|---|---|---|---|---|
| 1 | OFF | OFF | OFF | XX | OFF | FAULT |
| 2 | OFF | OFF | ON | XX | OFF | SET LOADED |
| 3 | OFF | OFF | ON | XX | ON | FAULT |
| 4 | OFF | ON | XX | BRIGHT | XX | FAULT |
| 5 | ON | OFF | XX | XX | XX | FAULT |
| 6 | ON | ON | OFF | XX | OFF | FAULT |
| 7 | ON | ON | OFF | BRIGHT | ON | FAULT |
| 8 | ON | ON | ON | XX | OFF | SET LOADED |
| 9 | ON | ON | ON | XX | ON | FAULT |

FIG. 16

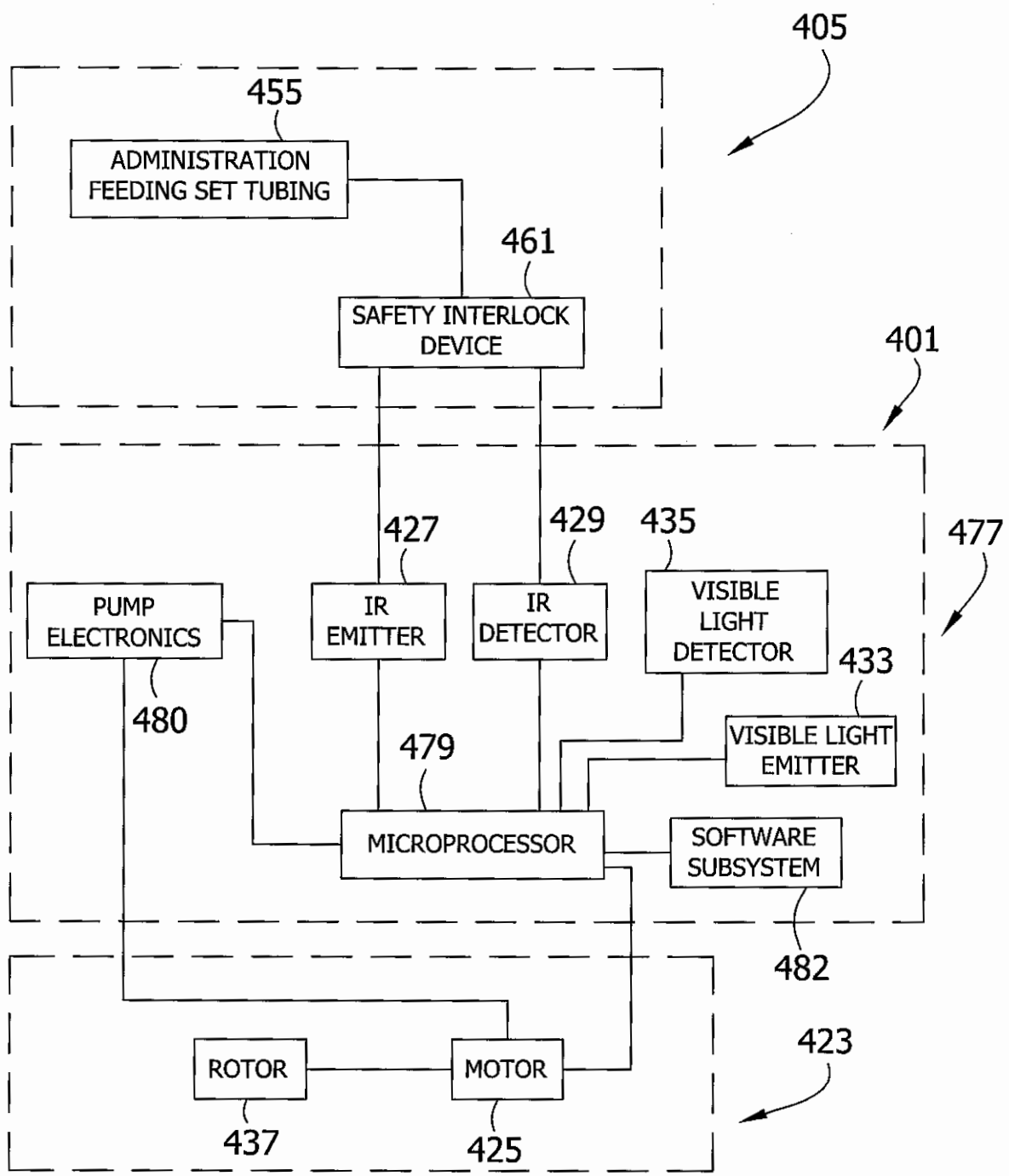

405
455
ADMINISTRATION FEEDING SET TUBING
461
SAFETY INTERLOCK DEVICE
401
427
429
435
477
PUMP ELECTRONICS
IR EMITTER
IR DETECTOR
VISIBLE LIGHT DETECTOR
433
480
479
VISIBLE LIGHT EMITTER
MICROPROCESSOR
SOFTWARE SUBSYSTEM
482
423
ROTOR
MOTOR
437
425

FIG. 17

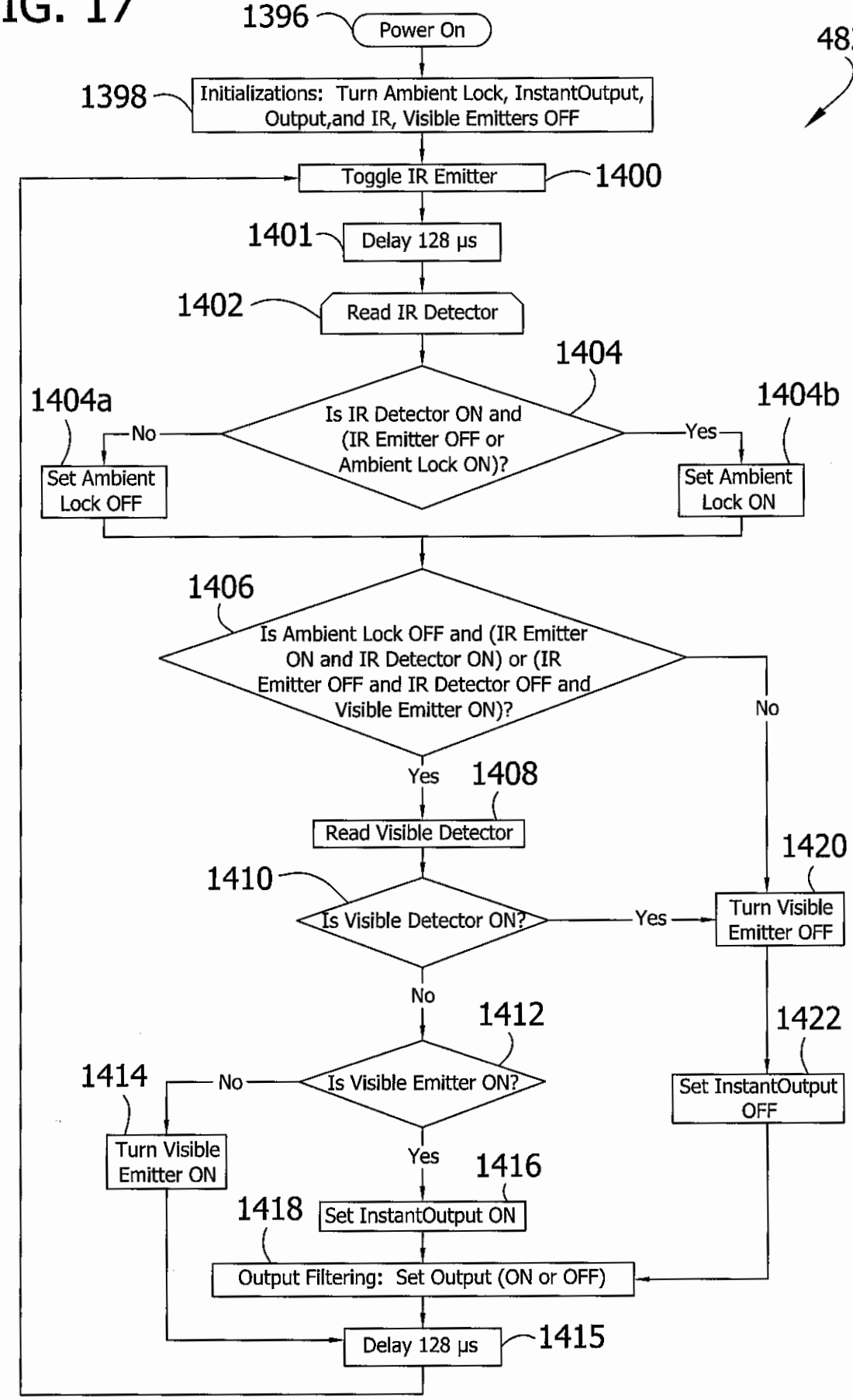

1396
Power On
482
1398
Initializations: Turn Ambient Lock, InstantOutput, Output,and IR, Visible Emitters OFF
Toggle IR Emitter
1400
1401
Delay 128 µs
1402
Read IR Detector
1404
1404a
Is IR Detector ON and (IR Emitter OFF or Ambient Lock ON)?
No
Yes
1404b
Set Ambient Lock OFF
Set Ambient Lock ON
1406
Is Ambient Lock OFF and (IR Emitter ON and IR Detector ON) or (IR Emitter OFF and IR Detector OFF and Visible Emitter ON)?
No
Yes
1408
Read Visible Detector
1420
1410
Is Visible Detector ON?
Yes
Turn Visible Emitter OFF
No
1412
1422
1414
Is Visible Emitter ON?
No
Set InstantOutput OFF
Turn Visible Emitter ON
Yes
1416
1418
Set InstantOutput ON
Output Filtering: Set Output (ON or OFF)
Delay 128 µs
1415

FIG. 18

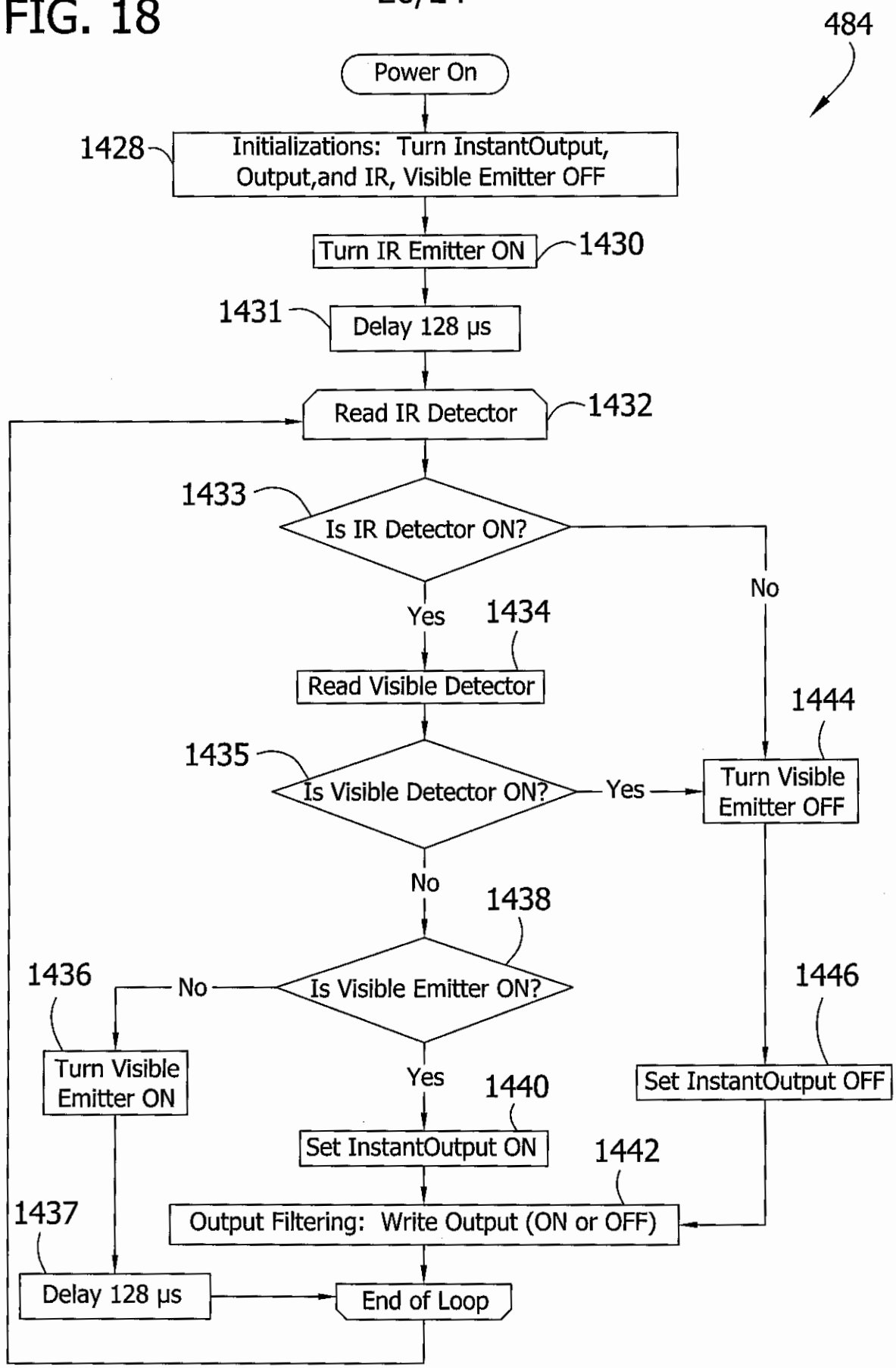

484
Power On
1428
Initializations: Turn InstantOutput, Output,and IR, Visible Emitter OFF
Turn IR Emitter ON
1430
1431
Delay 128 µs
Read IR Detector
1432
1433
Is IR Detector ON?
No
Yes
1434
Read Visible Detector
1444
1435
Is Visible Detector ON?
Yes
Turn Visible Emitter OFF
No
1438
1436
No
Is Visible Emitter ON?
1446
Turn Visible Emitter ON
Yes
1440
Set InstantOutput OFF
Set InstantOutput ON
1442
1437
Output Filtering: Write Output (ON or OFF)
Delay 128 µs
End of Loop

FIG. 19

| CONDITION | IR EMITTER | IR DETECTOR | VISIBLE EMITTER | AMBIENT LIGHT | VISIBLE DETECTOR | STATUS |
|---|---|---|---|---|---|---|
| 1 | OFF | OFF | XX | XX | XX | FAULT |
| 2 | ON | OFF | XX | XX | XX | FAULT |
| 3 | ON | ON | OFF | BRIGHT | ON | FAULT |
| 4 | ON | ON | ON | DARK | OFF | SET LOADED |
| 5 | ON | ON | ON | DARK | ON | FAULT |
| 6 | ON | ON | ON | BRIGHT | OFF | SET LOADED |
| 7 | ON | ON | ON | BRIGHT | ON | FAULT |

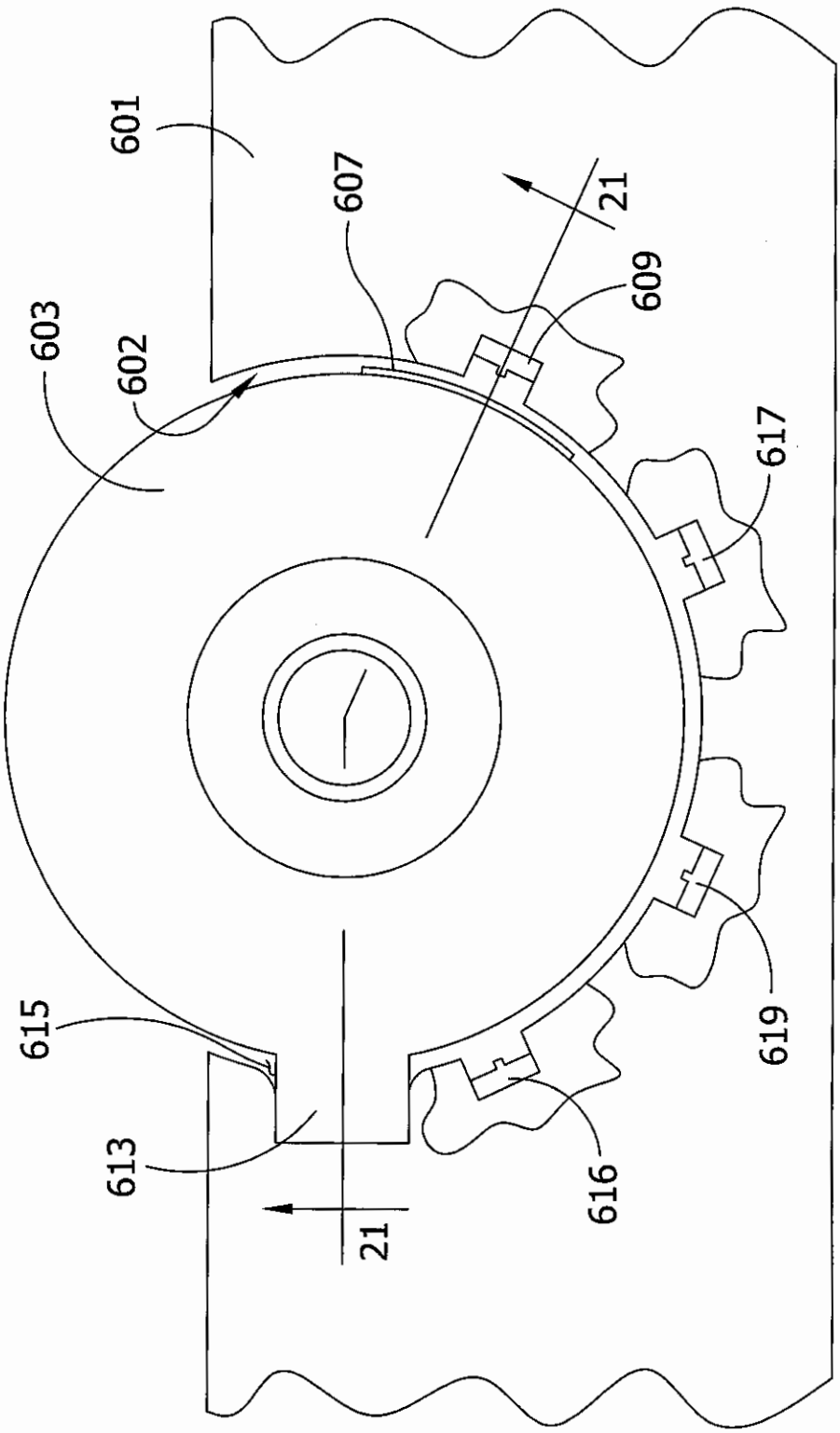



FIG. 20

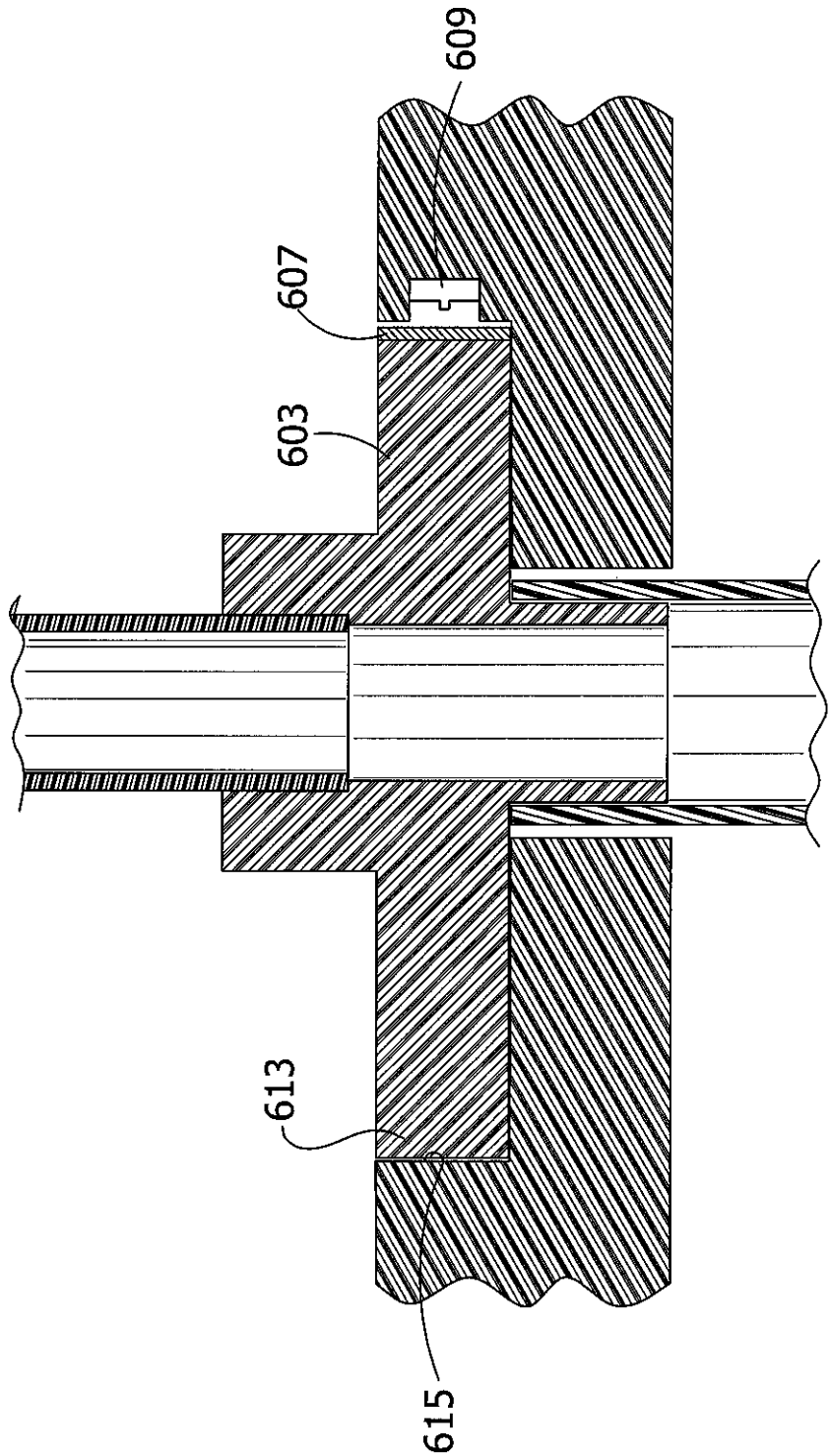



FIG. 21

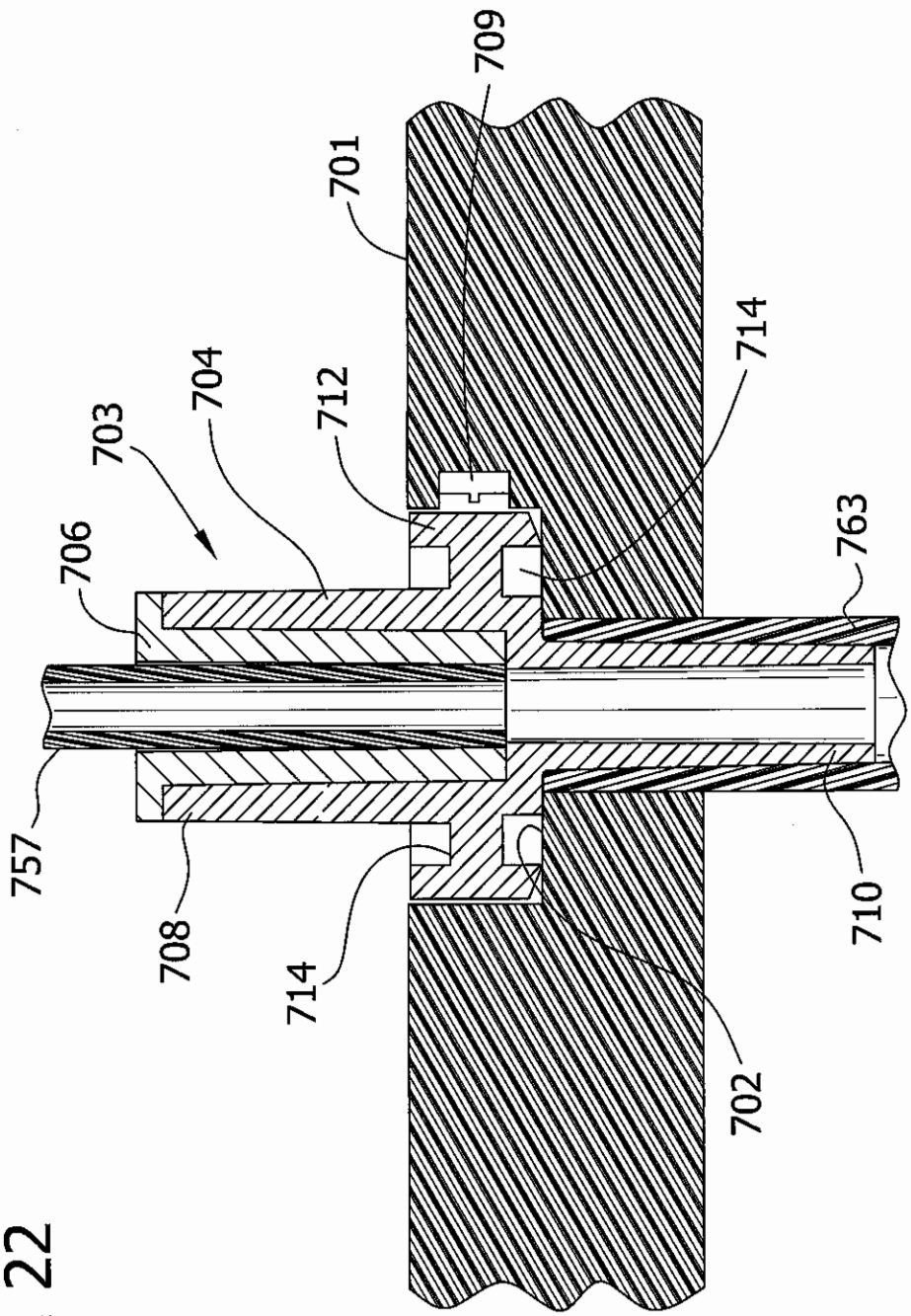



FIG. 22