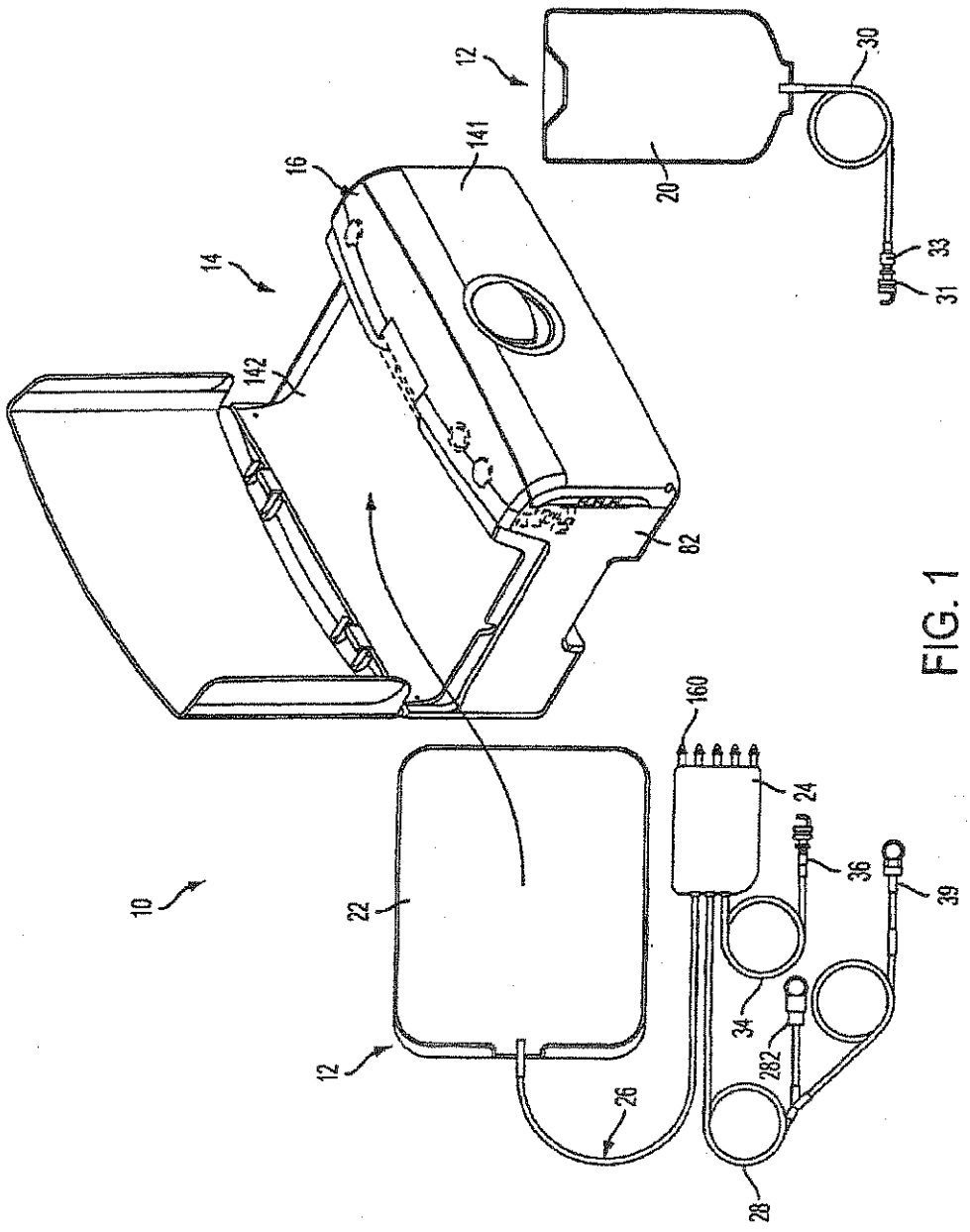


FIG. 1

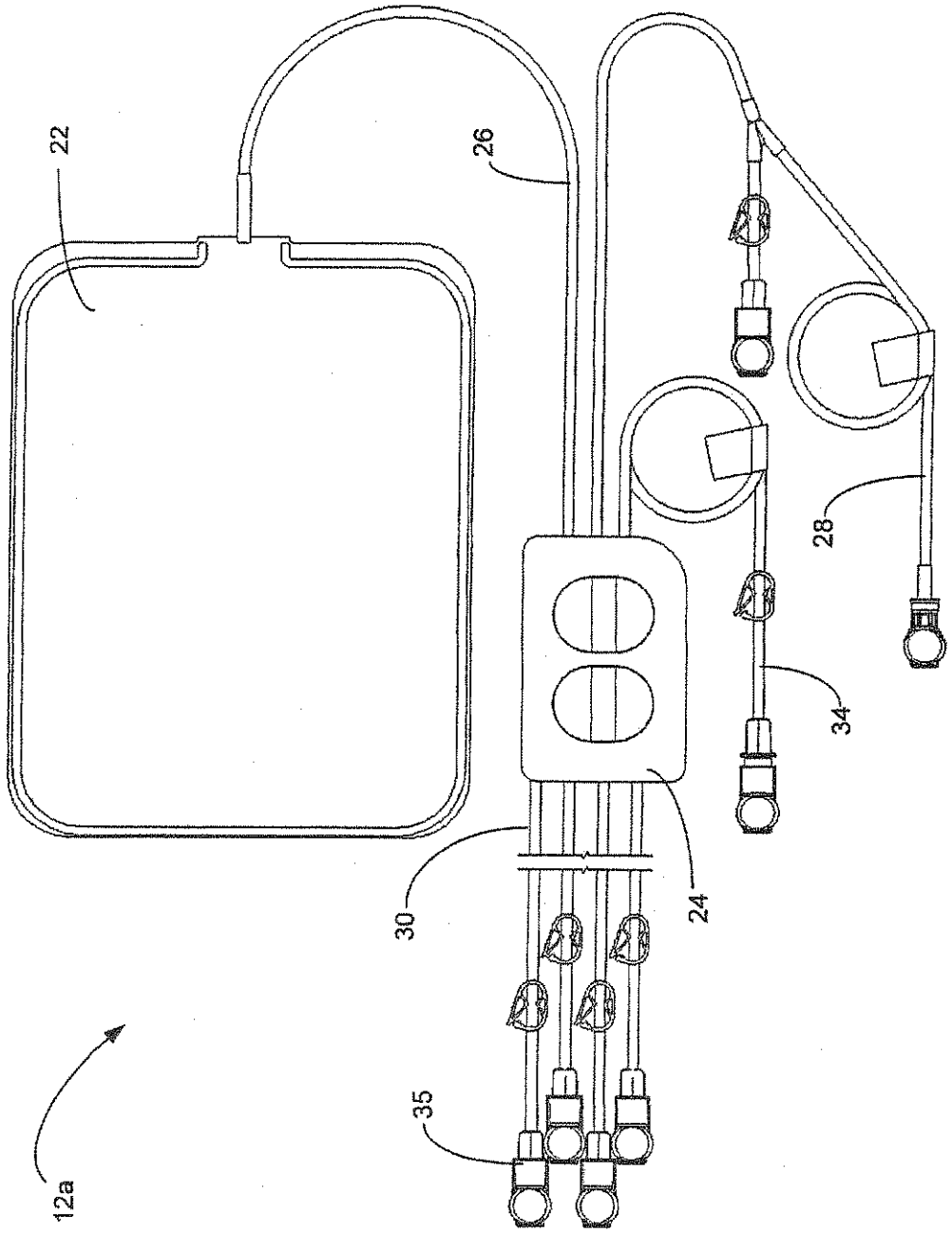


FIG. 1A

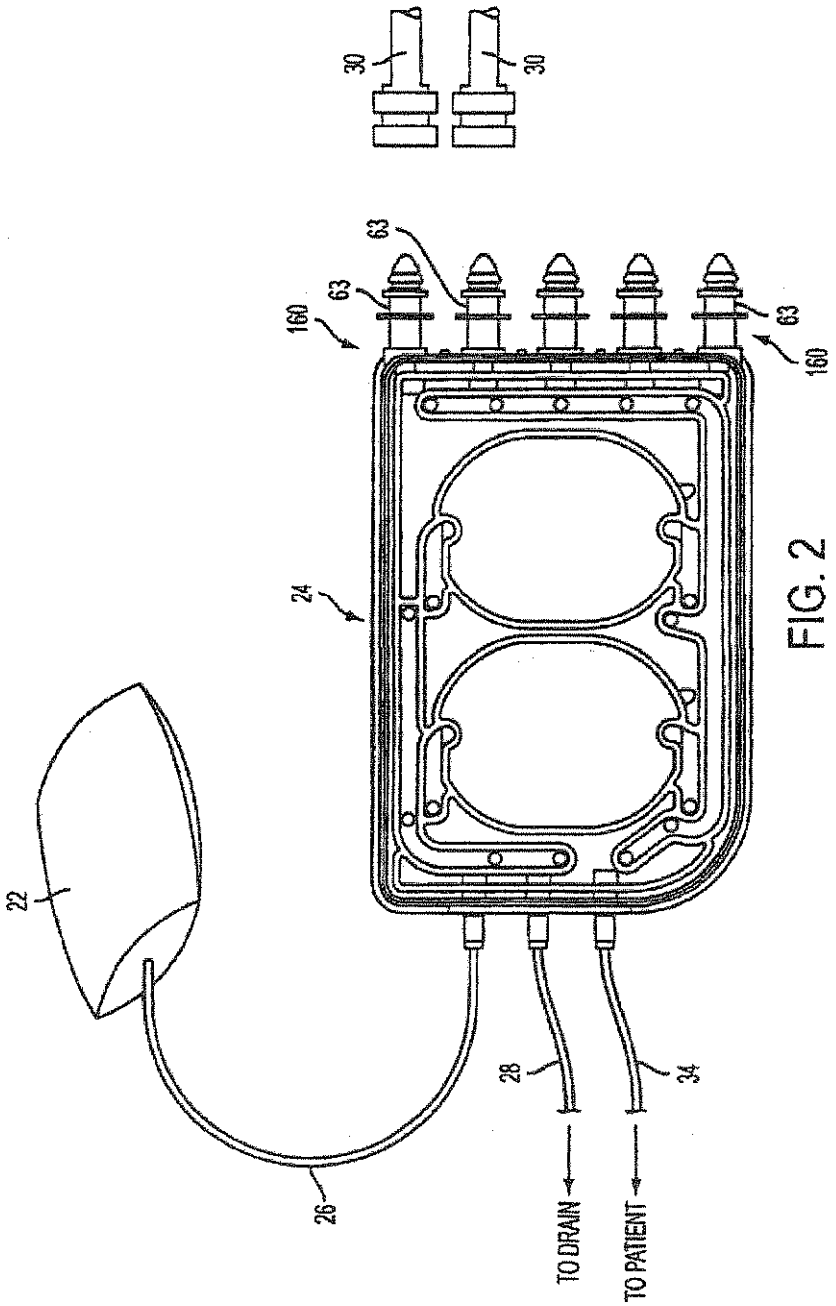


FIG. 2

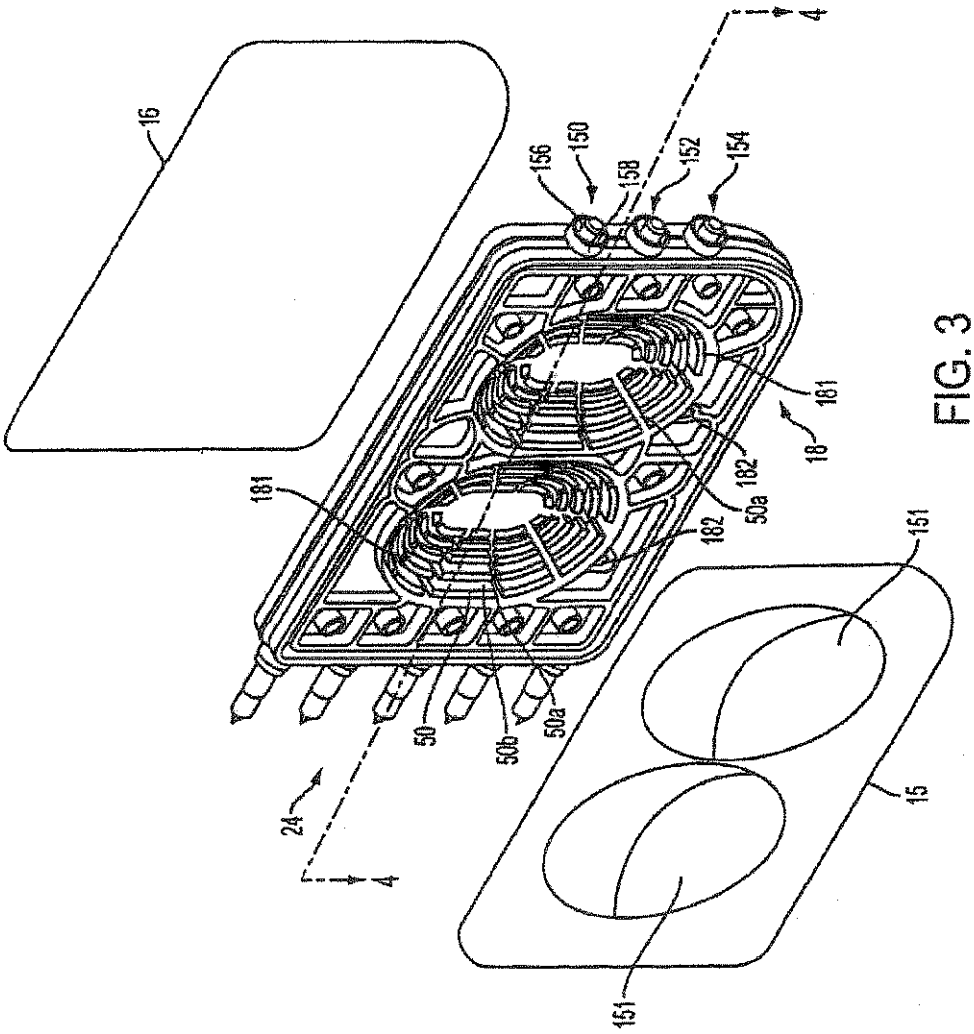

16
156
150
158
152
154
4
181
18
182
50a
181
182
151
151
50
50b
50a
24
4
15

FIG. 3

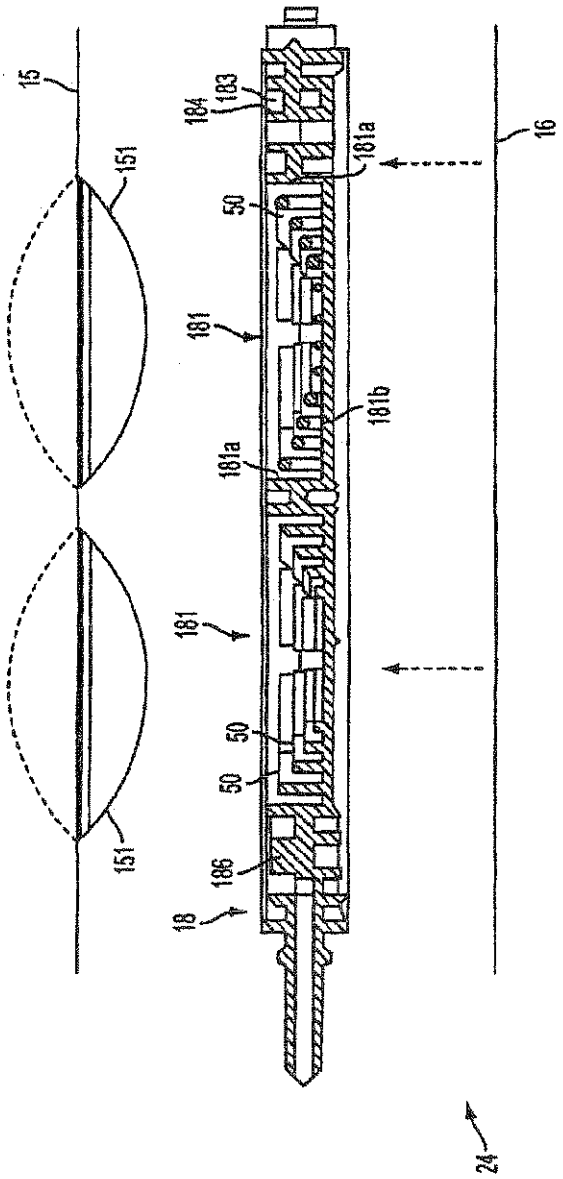


FIG. 4

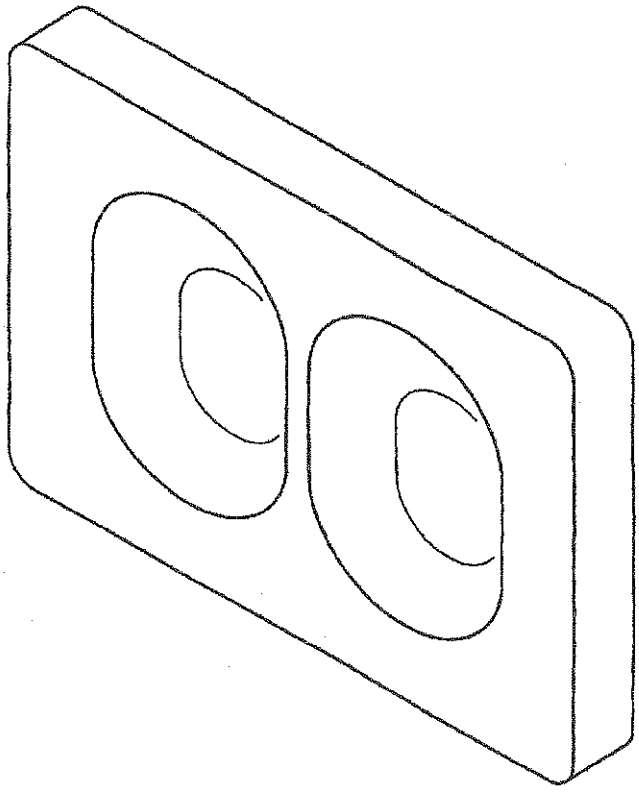


FIG. 5

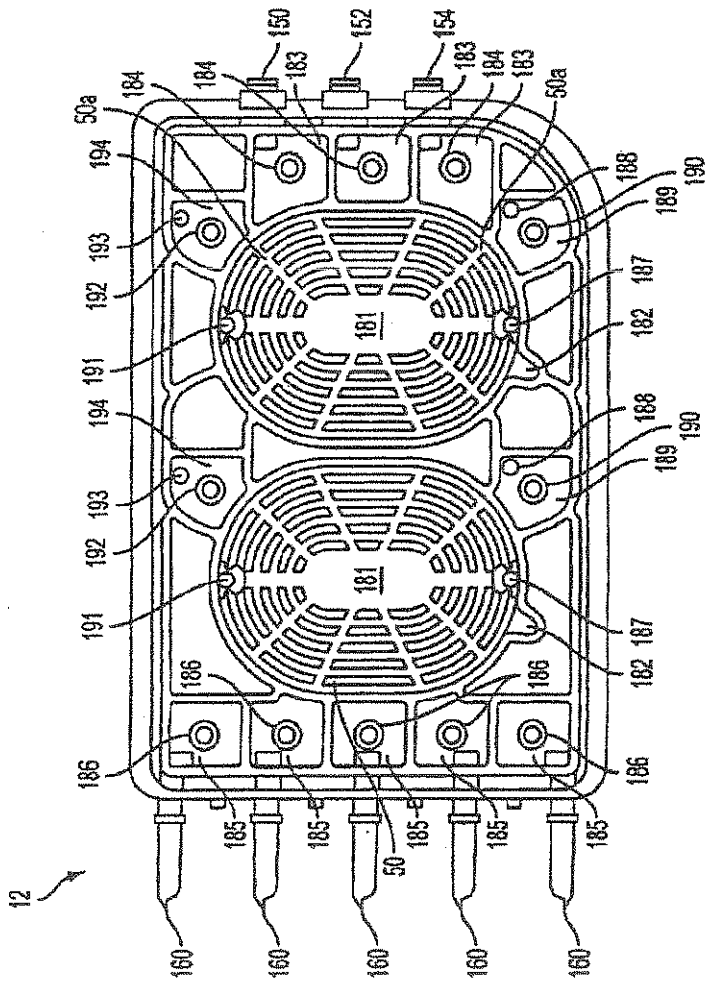

150
152
154
183
184
50a
194
193
192
191
188
189
190
187
182
181
186
185
50
160
12

FIG. 6

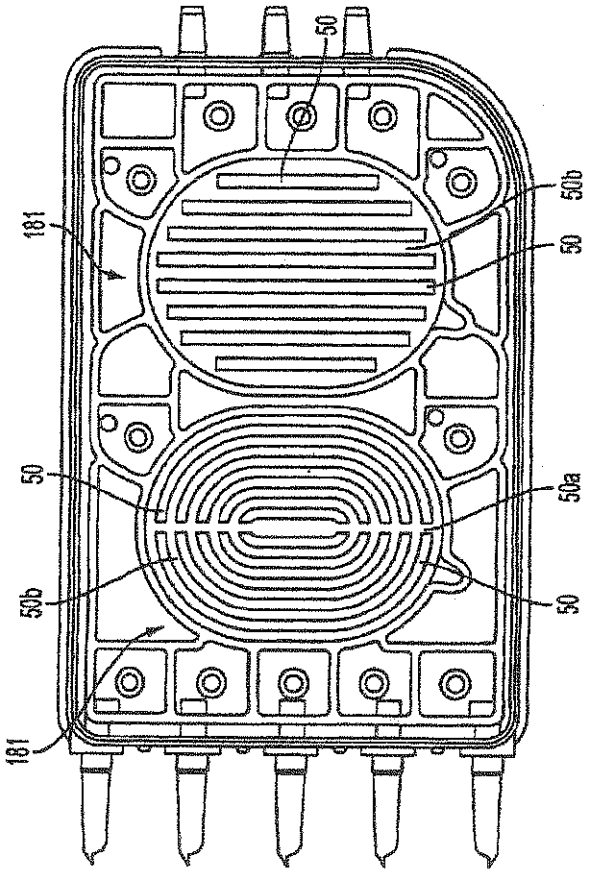


FIG. 7

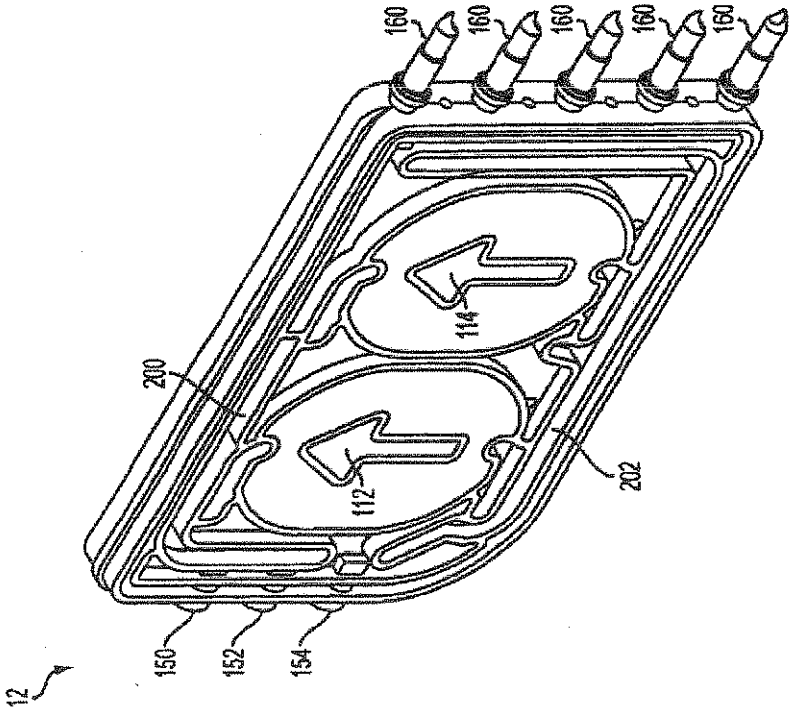


FIG. 8

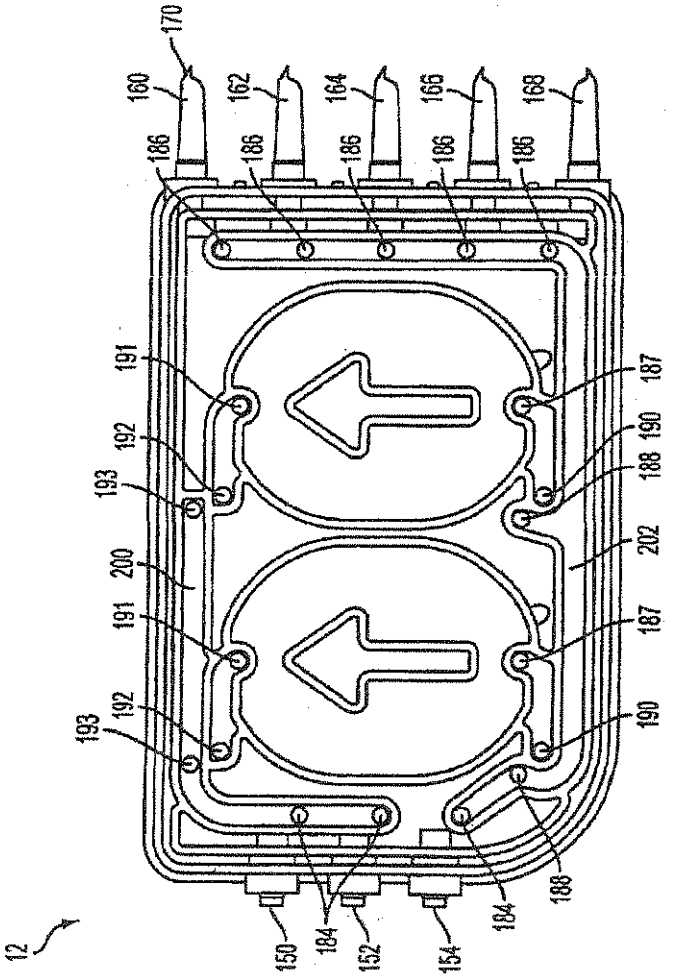

170
160
162
164
166
168
186
186
186
186
186
191
192
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200
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187
190
188
202
187
190
188
184
184
150
152
154
12

FIG. 9

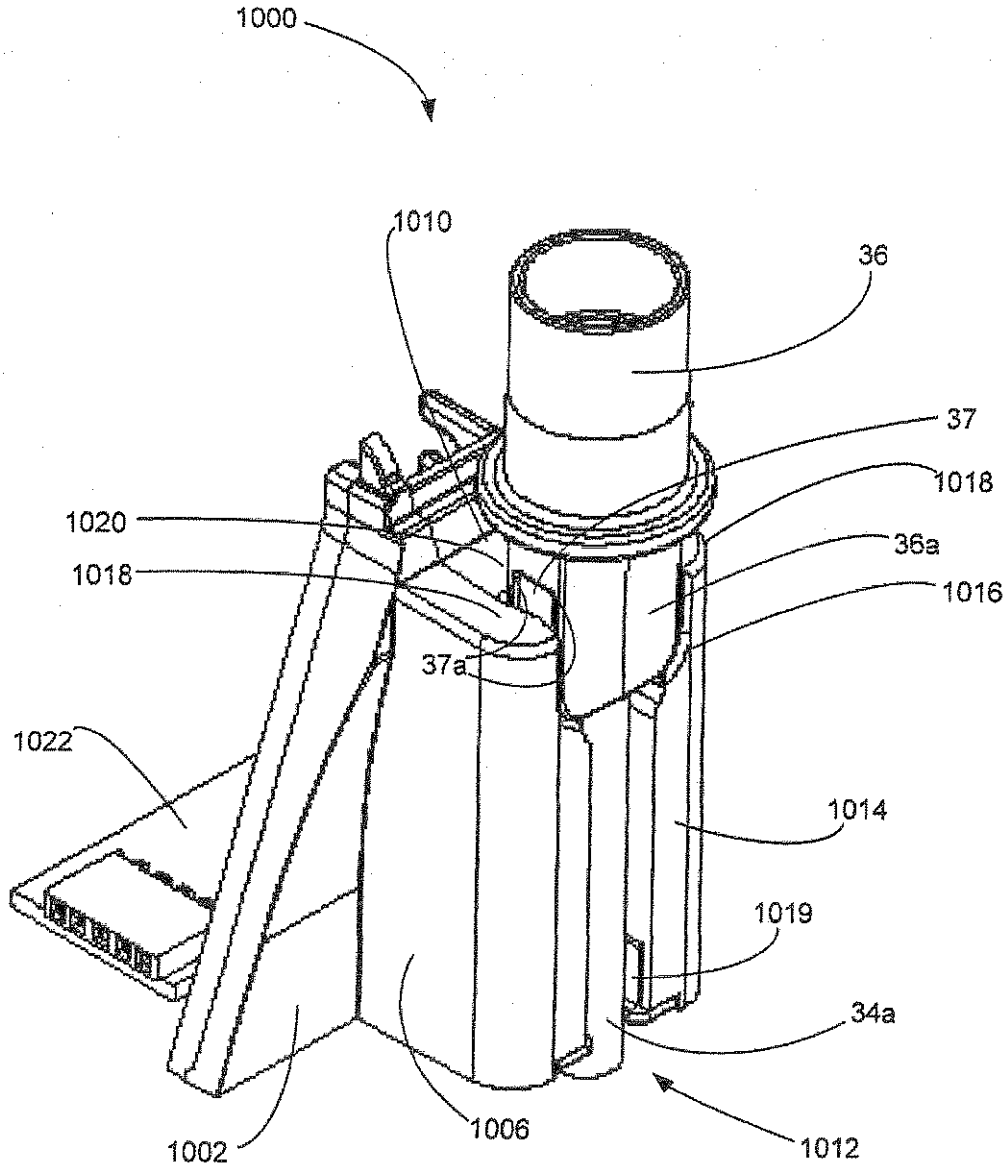

1000
1010
36
37
1018
1020
36a
1018
1016
37a
1022
1014
1019
34a
1002
1006
1012

FIG. 9-1A

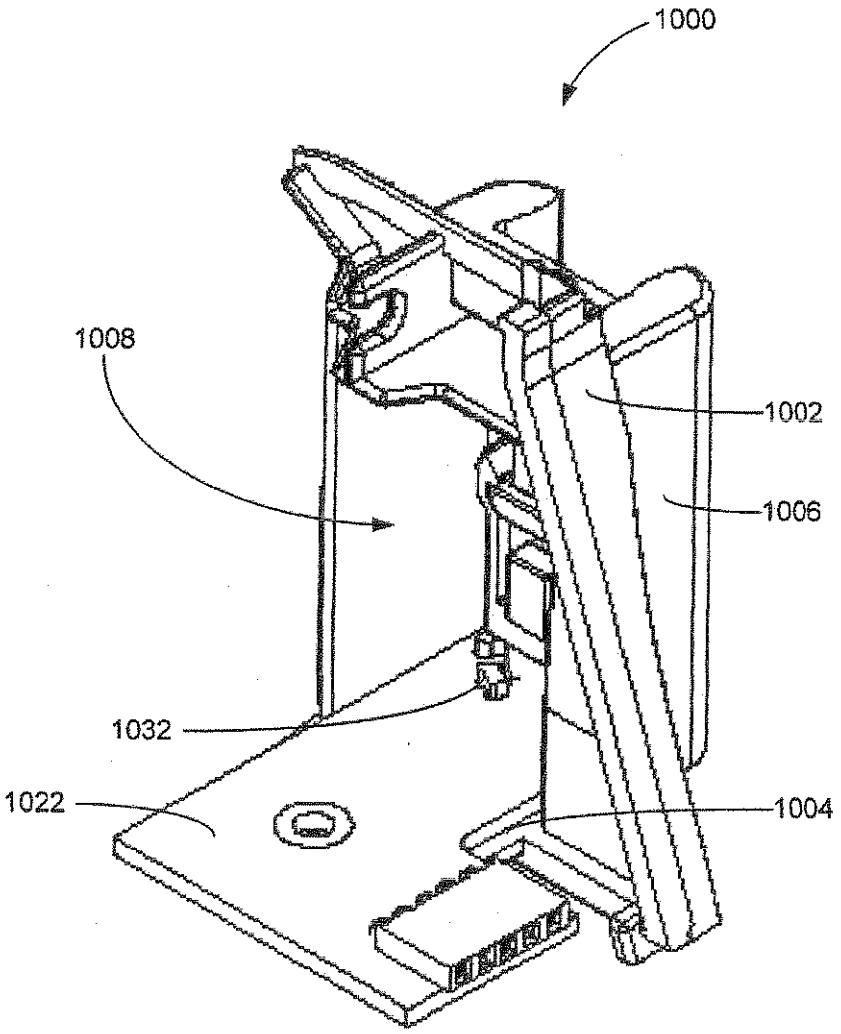


FIG. 9-1B

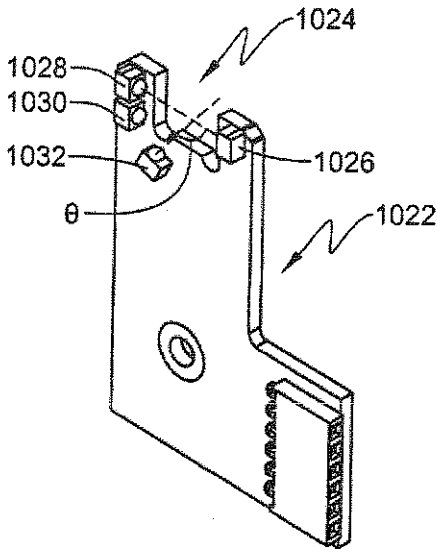

1024
1028
1030
1032
θ
1026
1022

FIG. 9-2

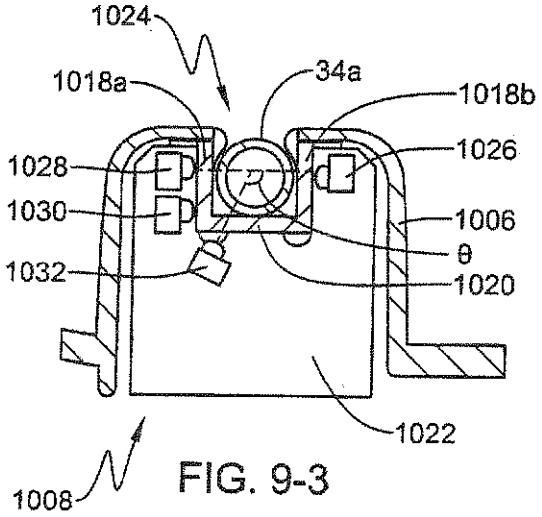

1024
1018a
34a
1018b
1028
1026
1030
1006
θ
1032
1020
1022
1008

FIG. 9-3

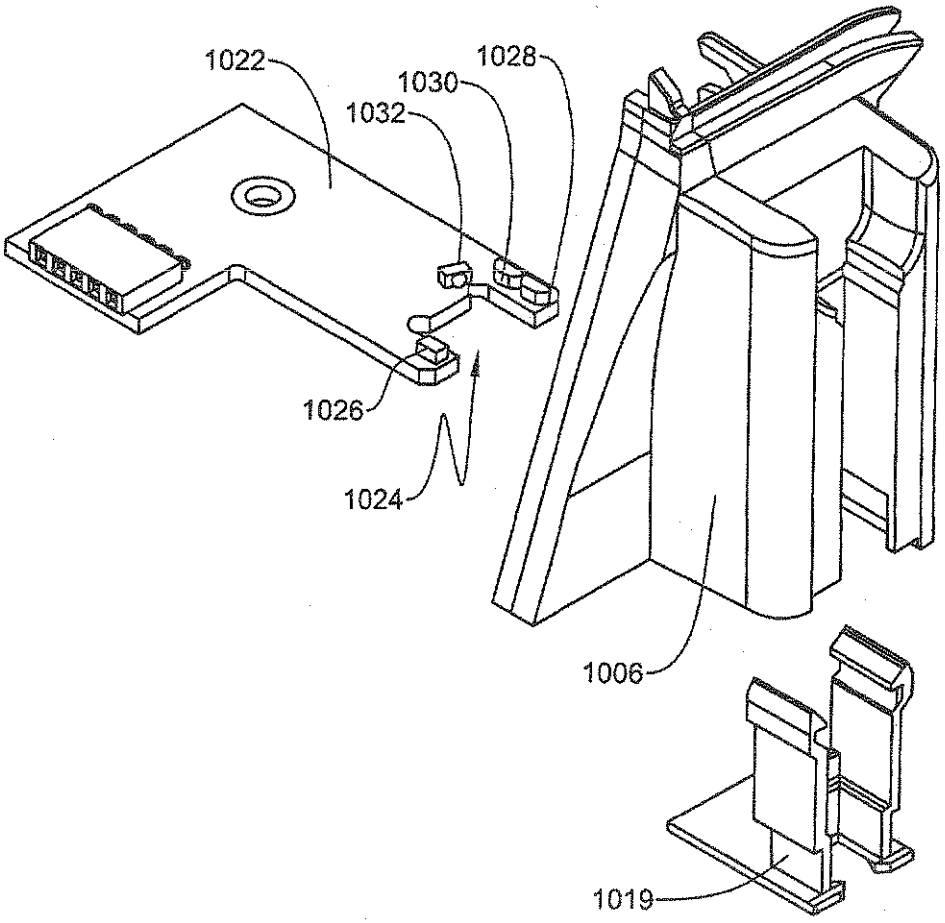


FIG. 9-4

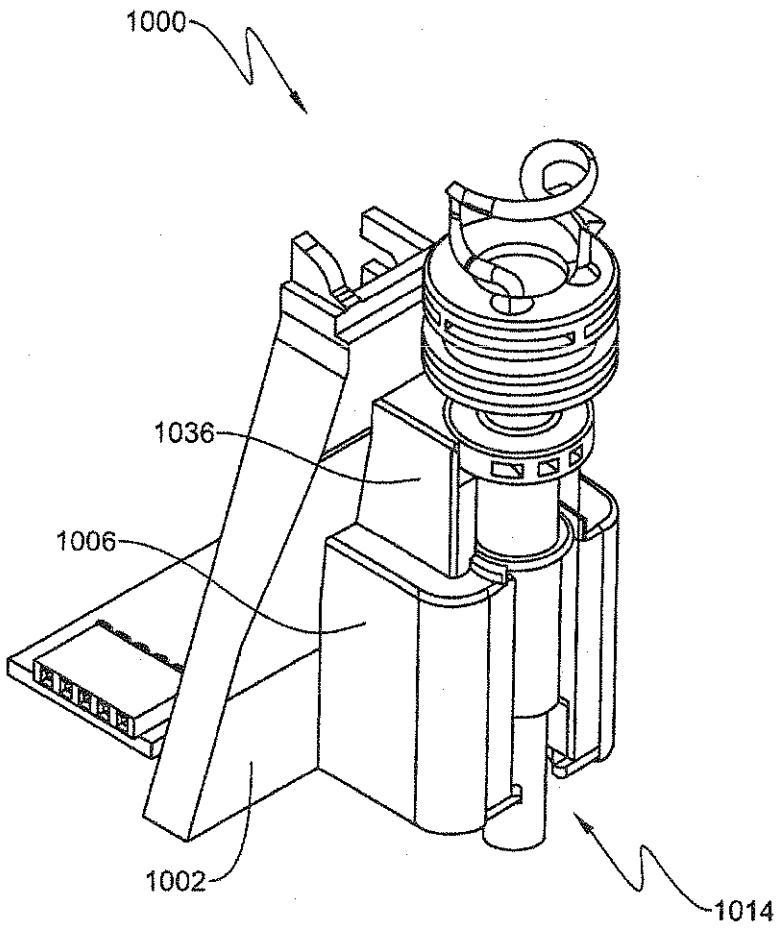


FIG. 9-5

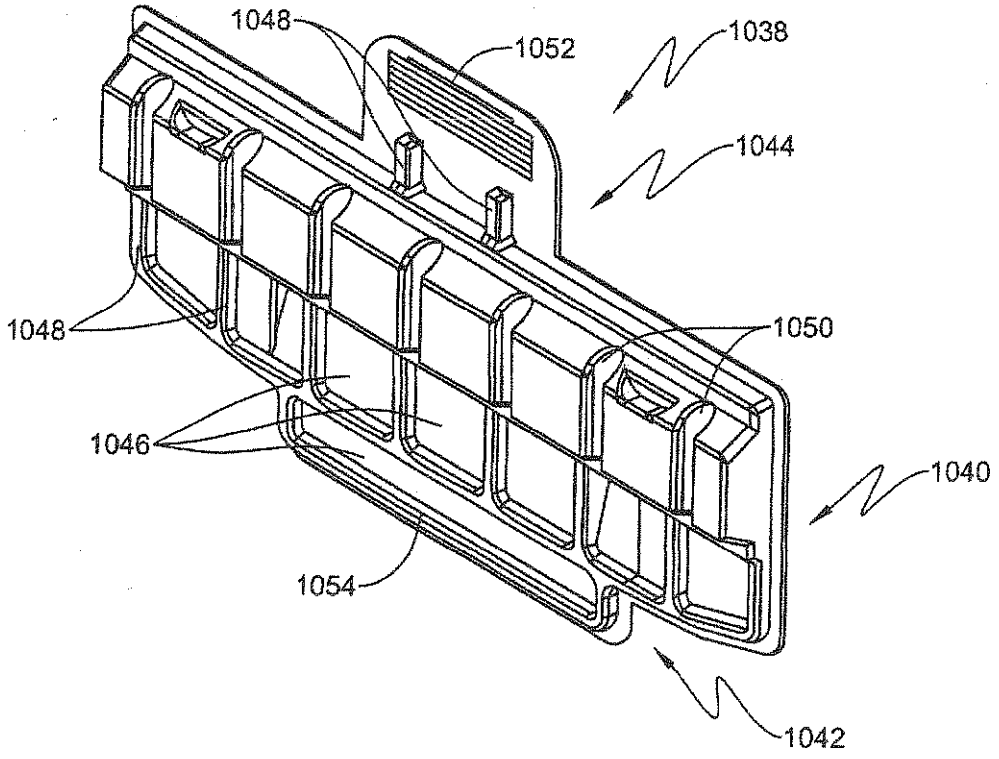


FIG. 9-6

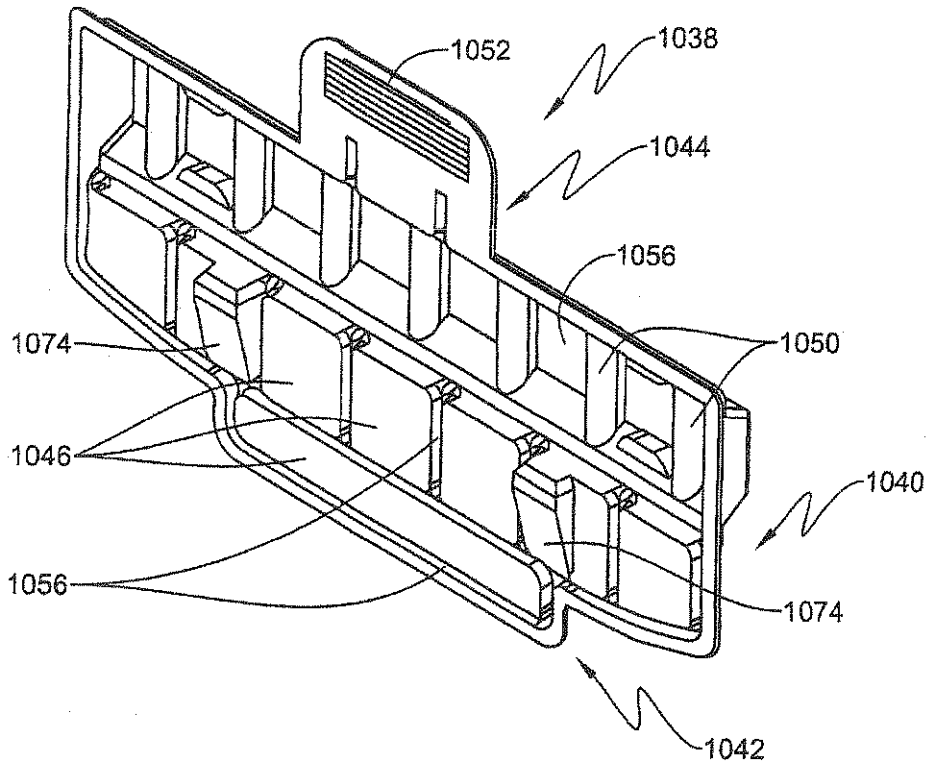


FIG. 9-7

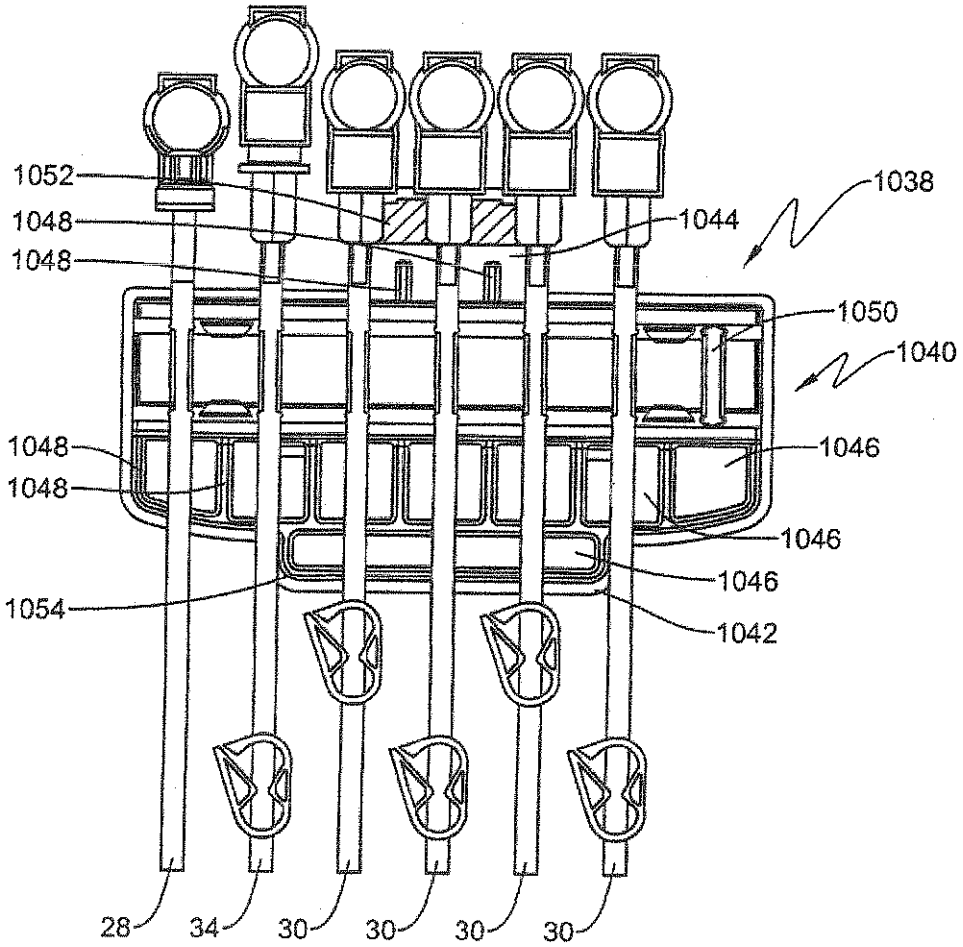

1052
1048
1048
1044
1038
1050
1040
1048
1048
1046
1046
1046
1054
1042
28
34
30
30
30
30

FIG. 9-8

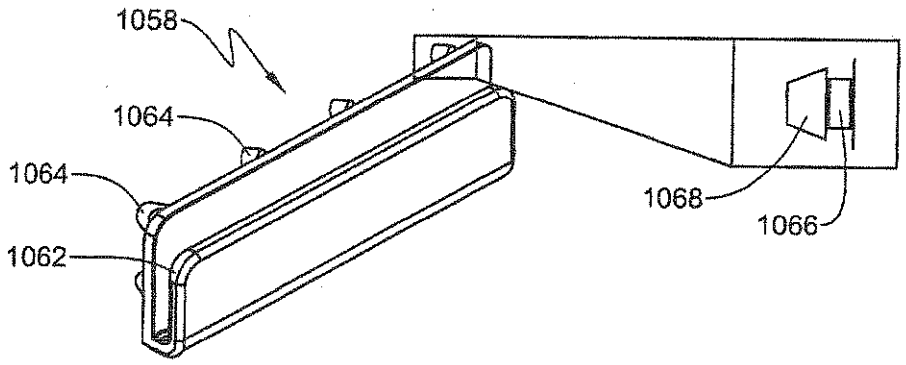


FIG. 9-9

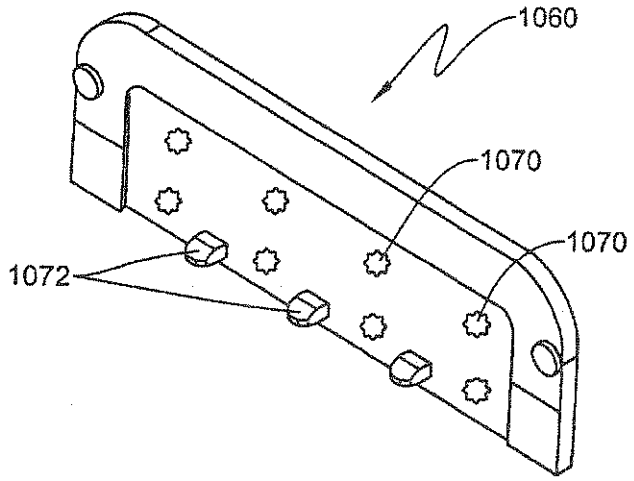


FIG. 9-10

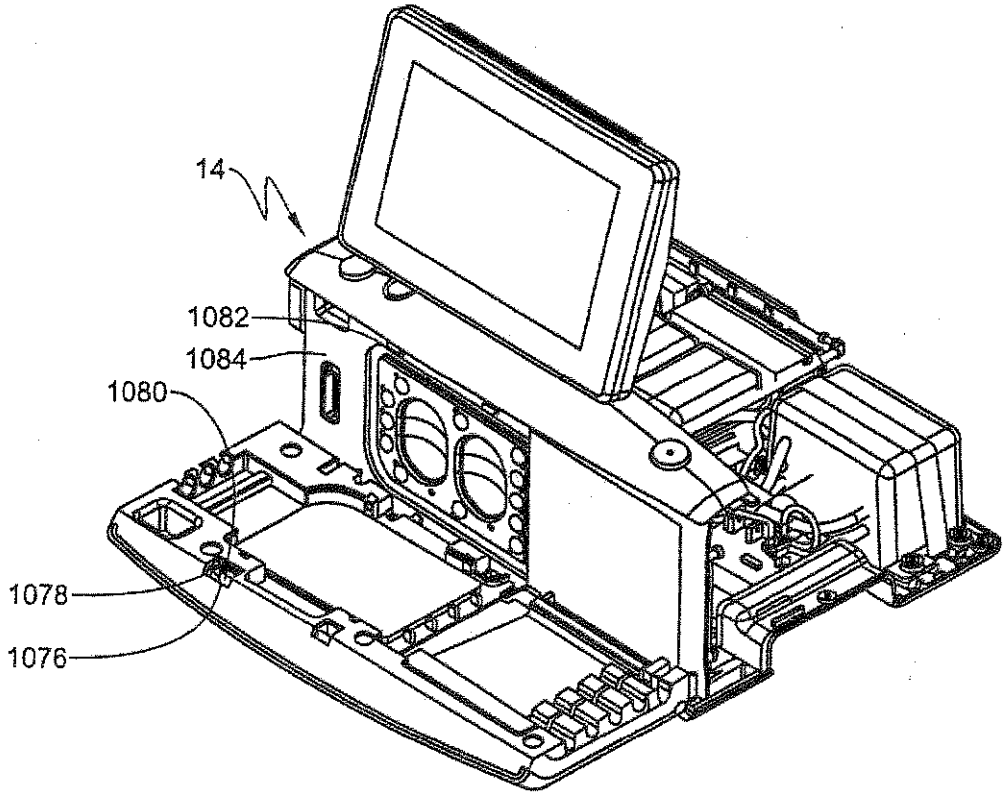


FIG. 9-11

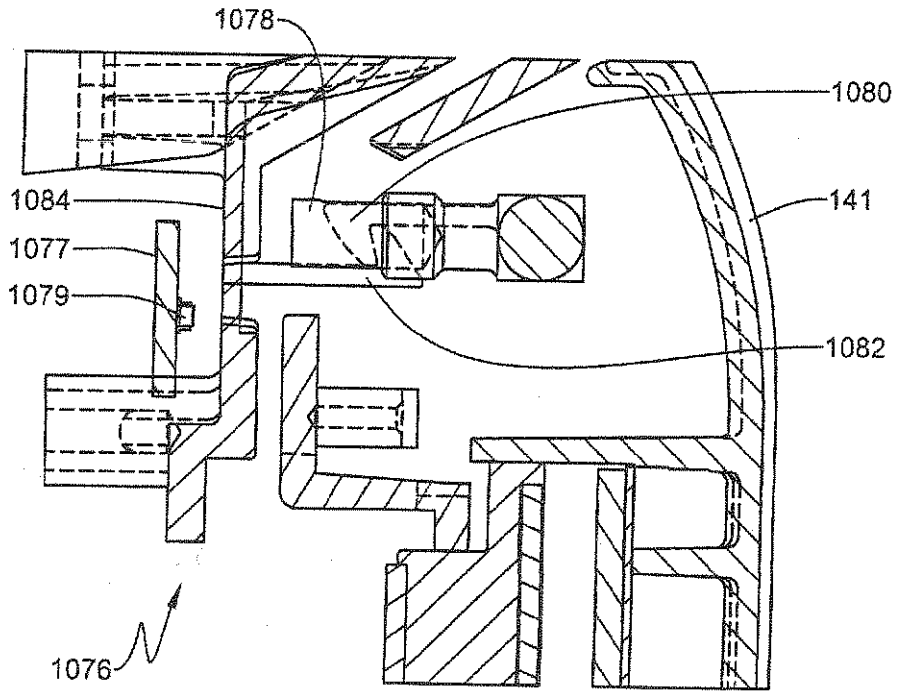


FIG. 9-11a

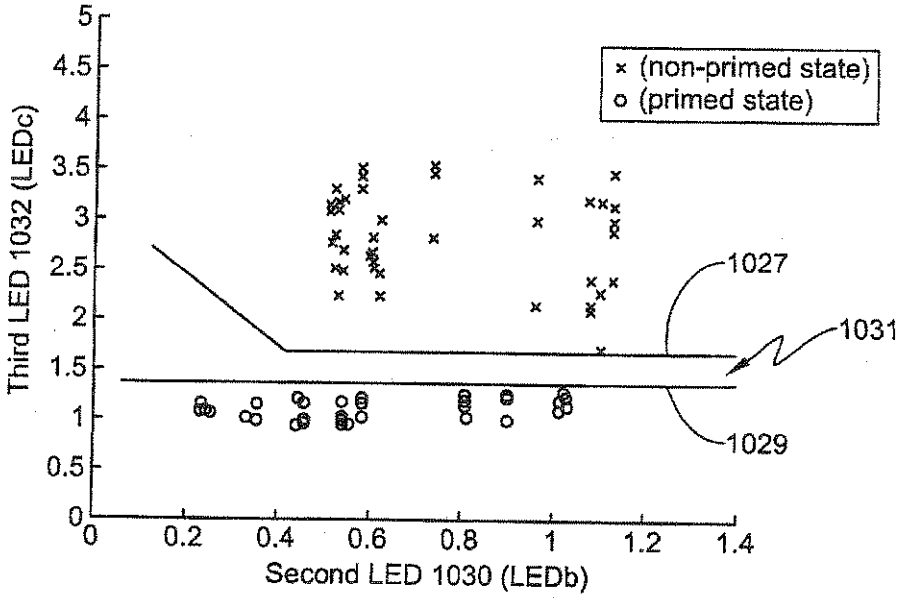

× (non-primed state)
o (primed state)
Third LED 1032 (LEDc)
Second LED 1030 (LEDb)
1027
1031
1029
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
0.2
0.4
0.6
0.8
1.2
1.4

FIG. 9-12

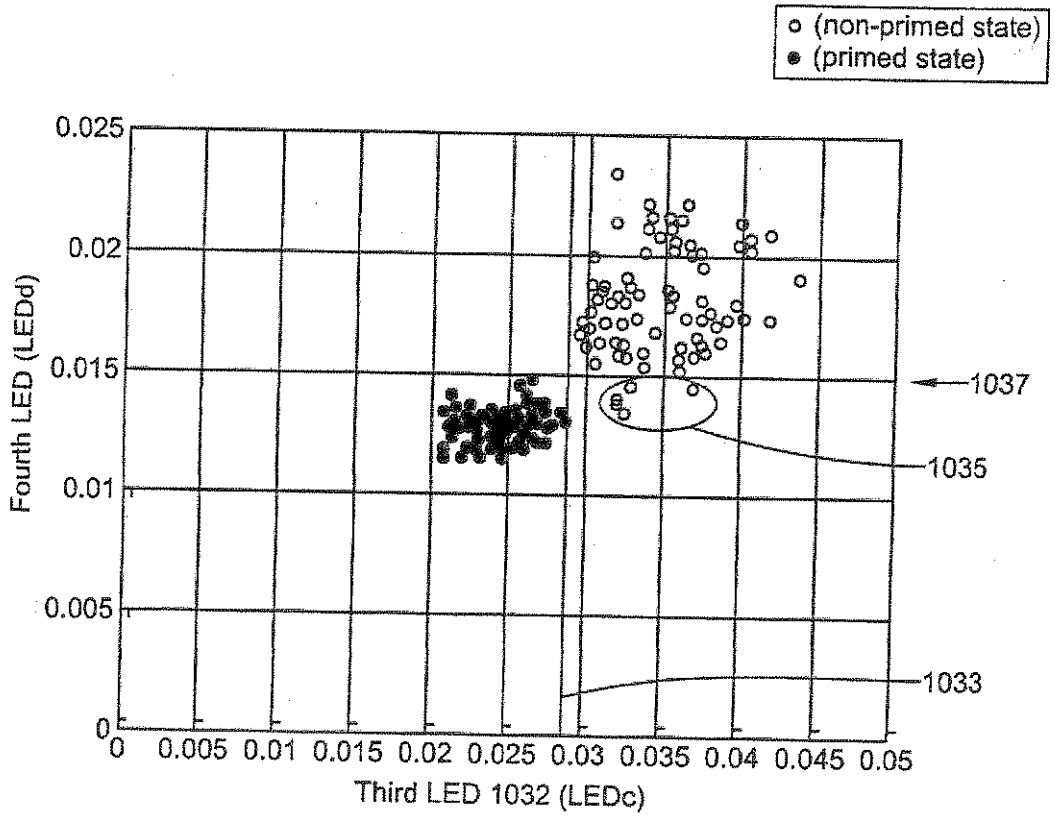

(non-primed state)
(primed state)
0.025
0.02
0.015
0.01
0.005
0
Fourth LED (LEDd)
0 0.005 0.01 0.015 0.02 0.025 0.03 0.035 0.04 0.045 0.05
Third LED 1032 (LEDc)
1037
1035
1033

FIG. 9-13

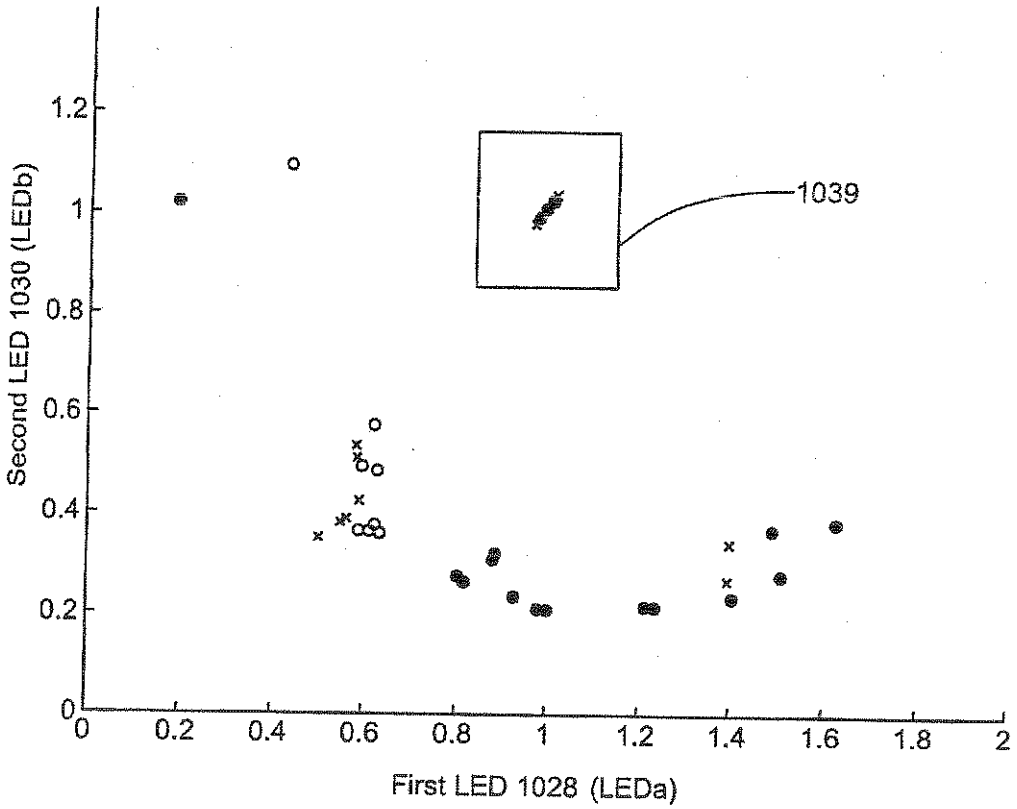

1039
Second LED 1030 (LEDb)
First LED 1028 (LEDa)
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2

FIG. 9-14

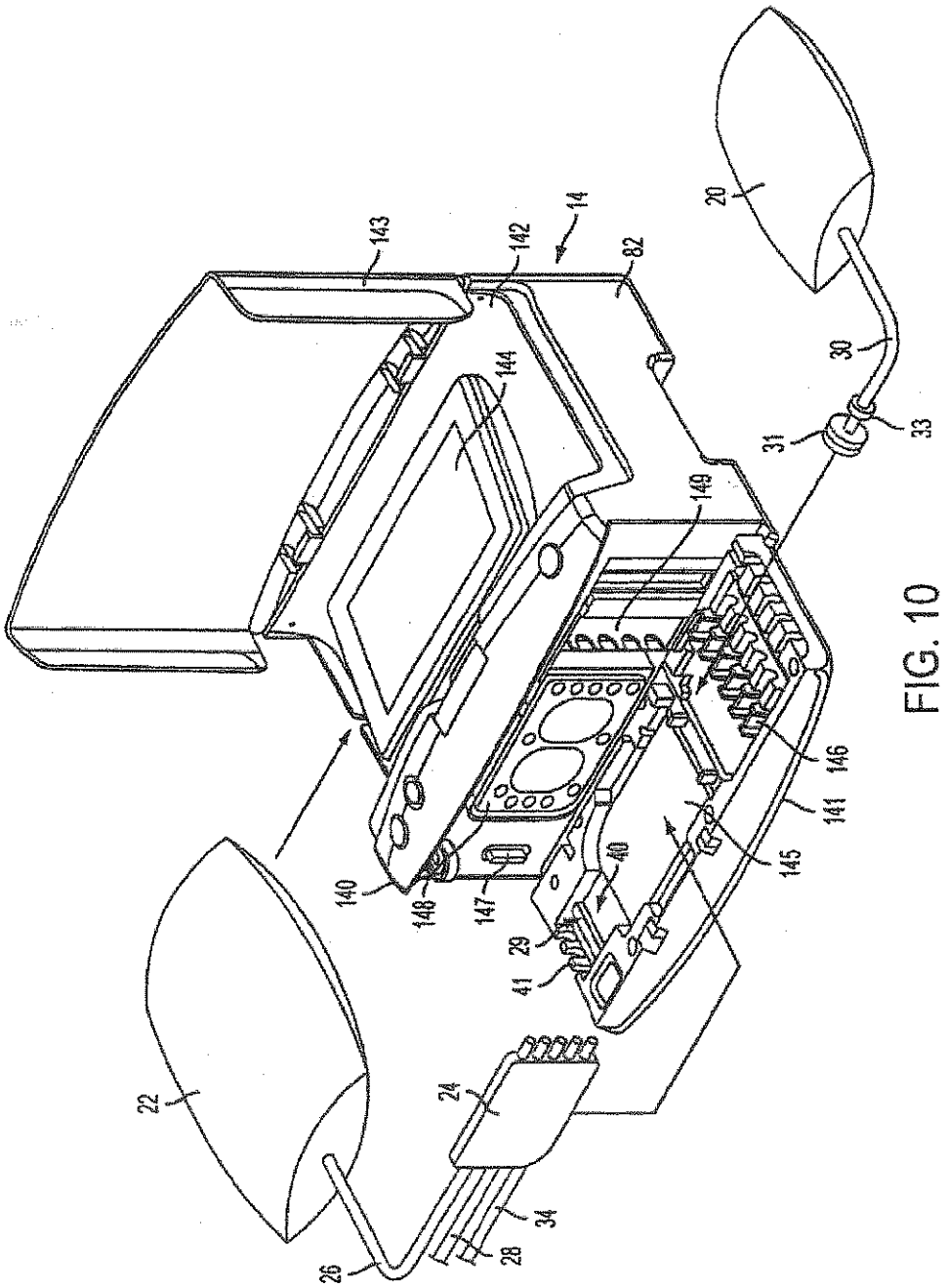

20
14
143
142
82
30
144
31
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149
146
141
145
140
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147
40
29
41
22
24
34
28
26

FIG. 10

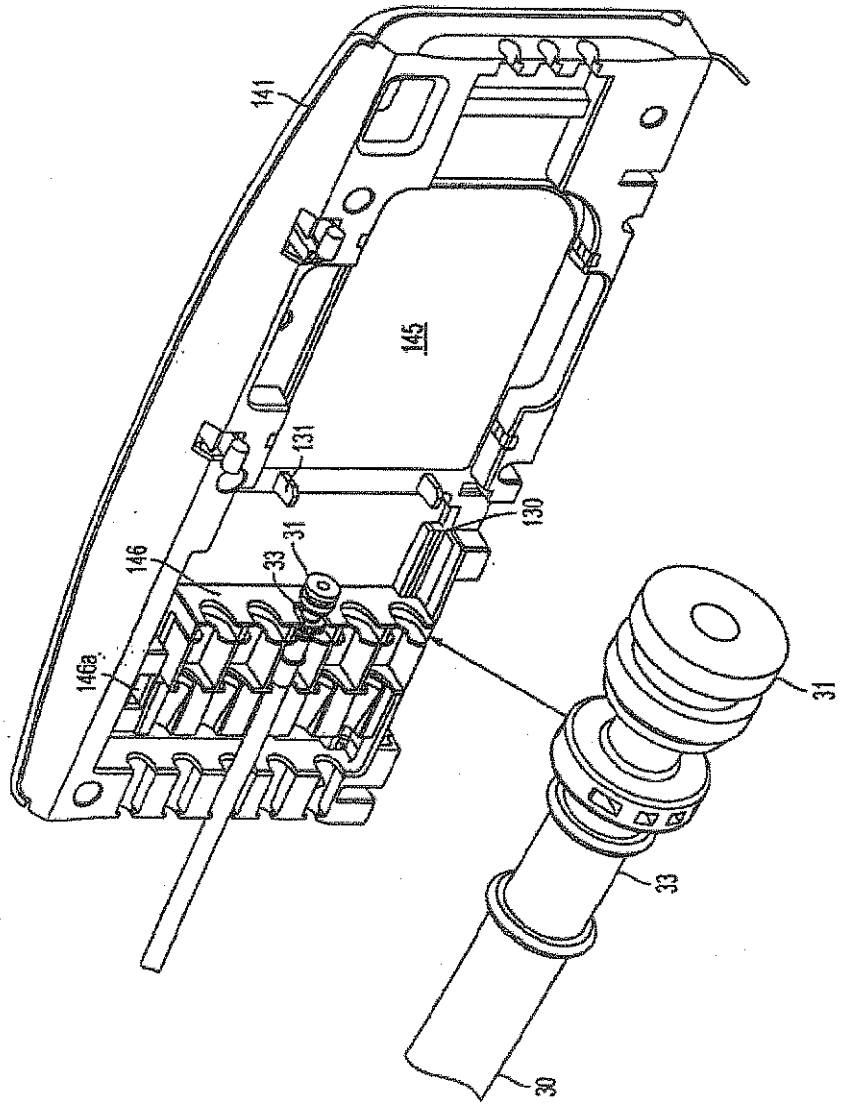


FIG. 11

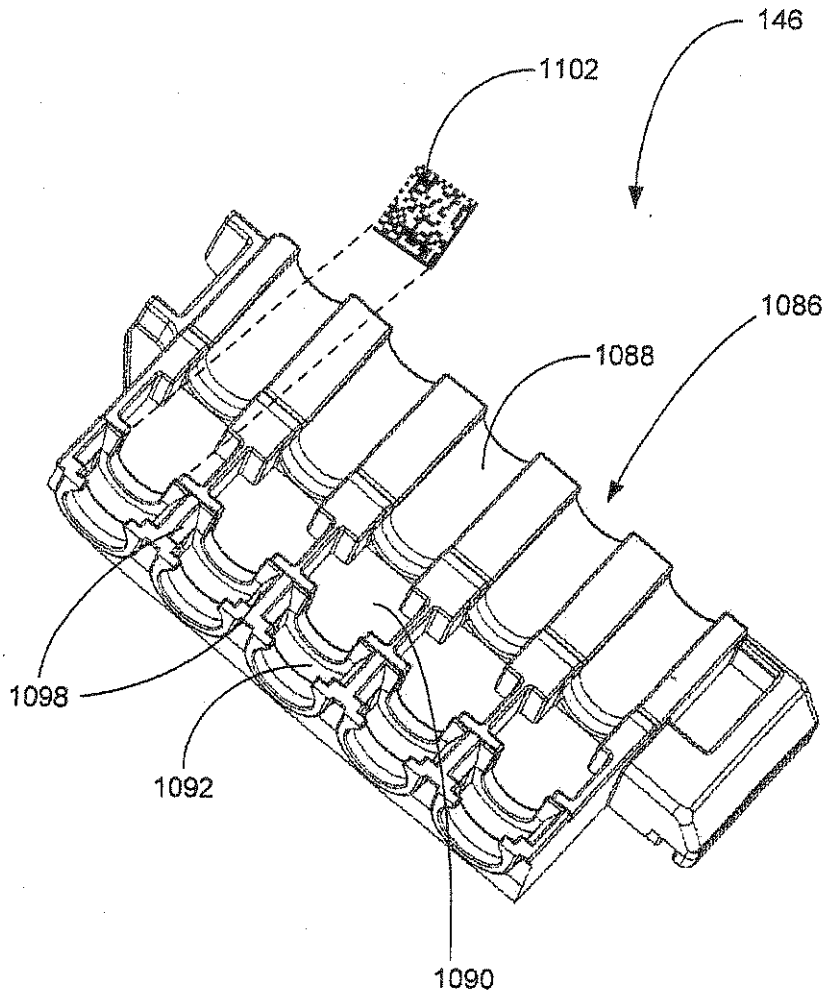


FIG. 11-1

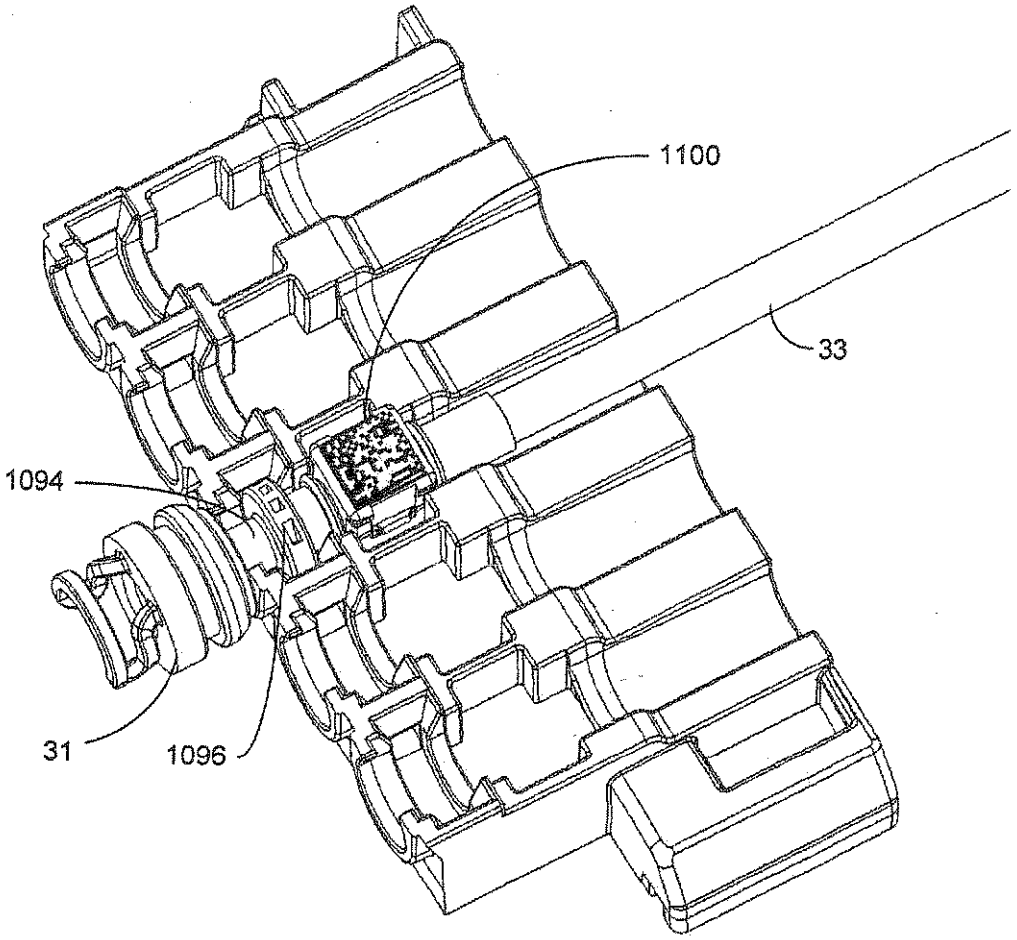


Fig. 11-2

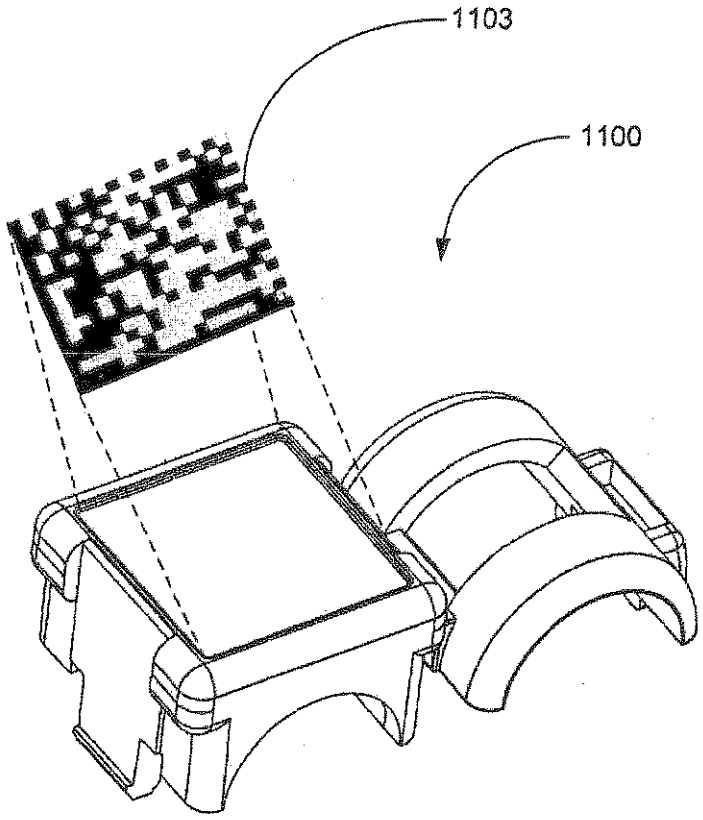


Fig. 11-3

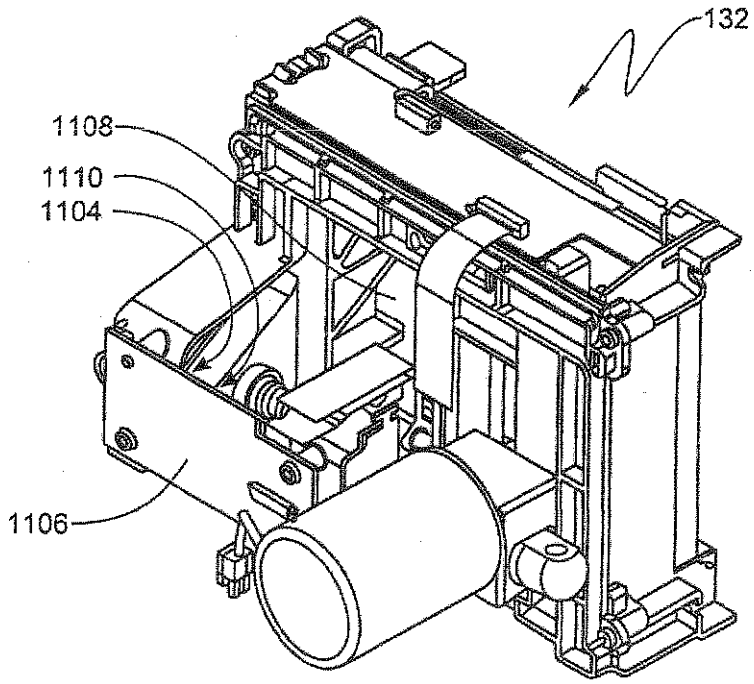


FIG. 11-4

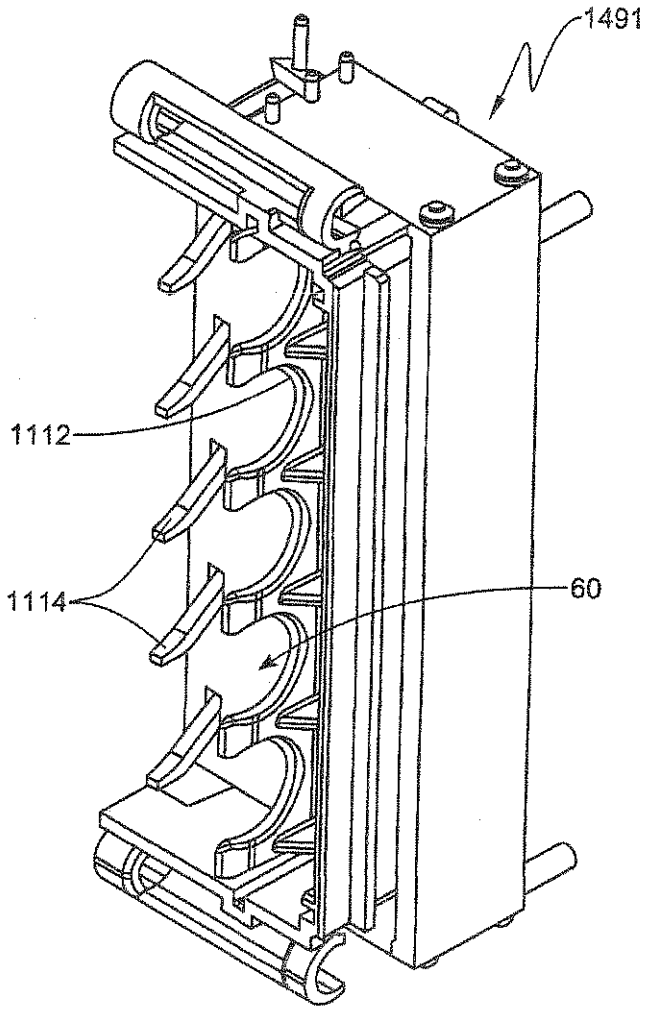


FIG. 11-5

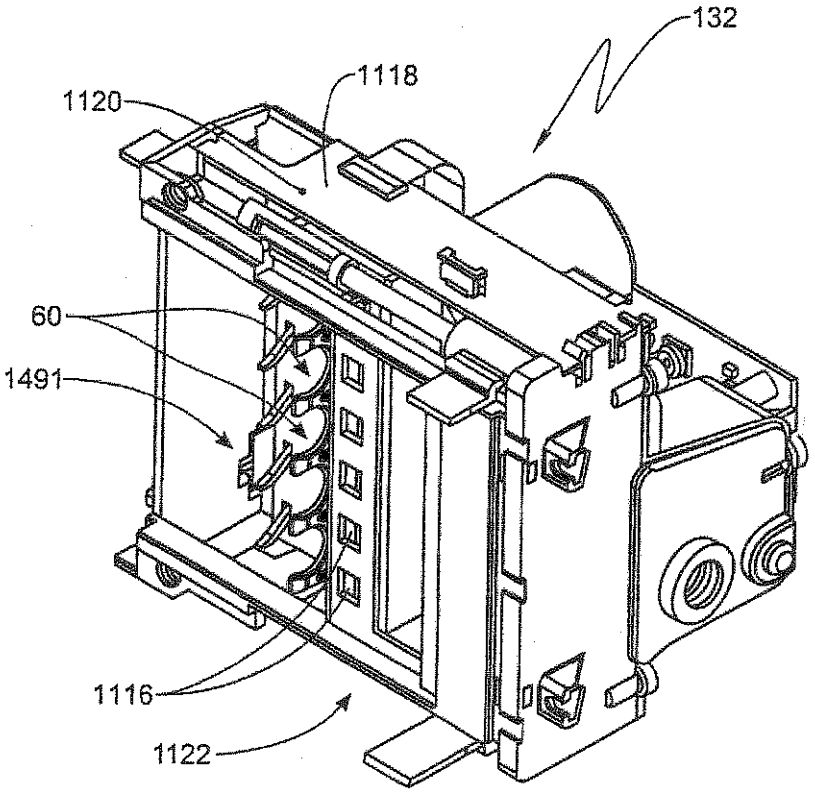
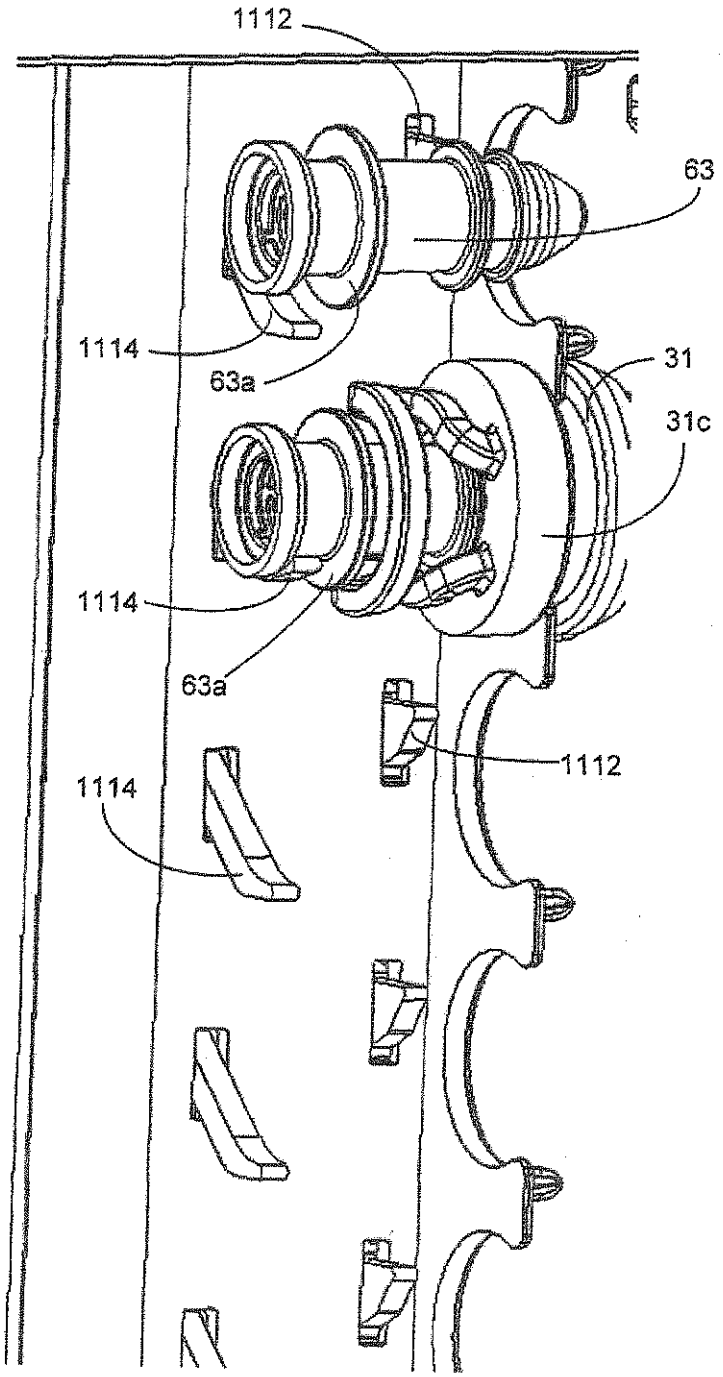


FIG. 11-6

FIG. 11-7a

FIG. 11-7b

FIG. 11-7c



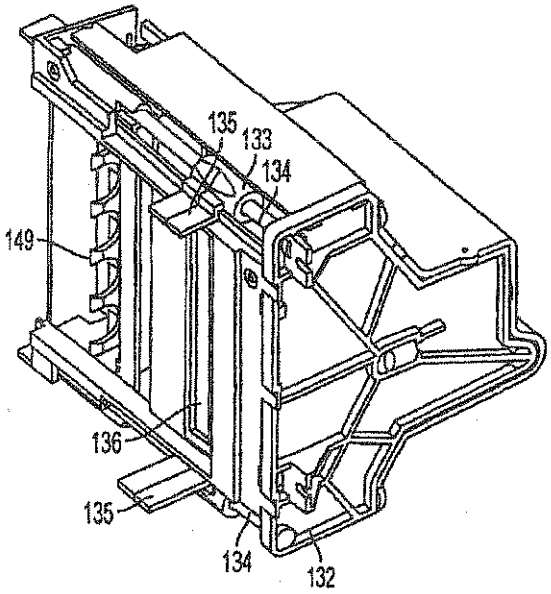


FIG. 12

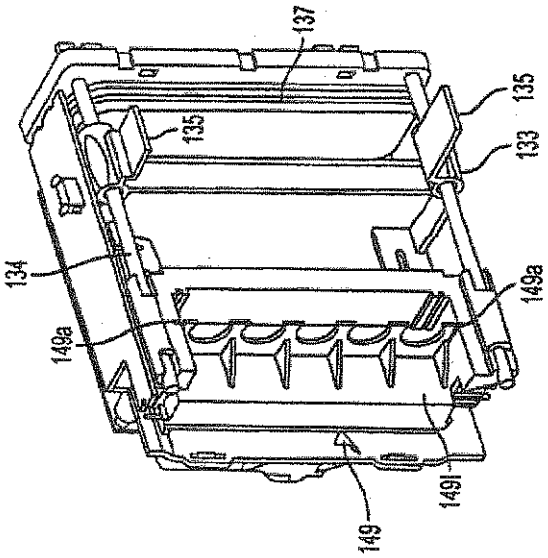


FIG. 13

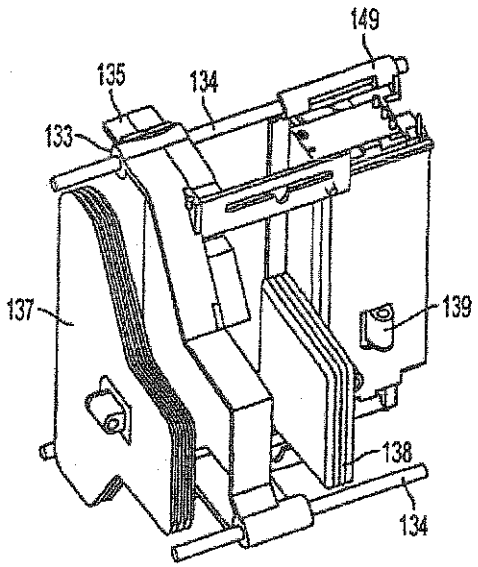


FIG. 14

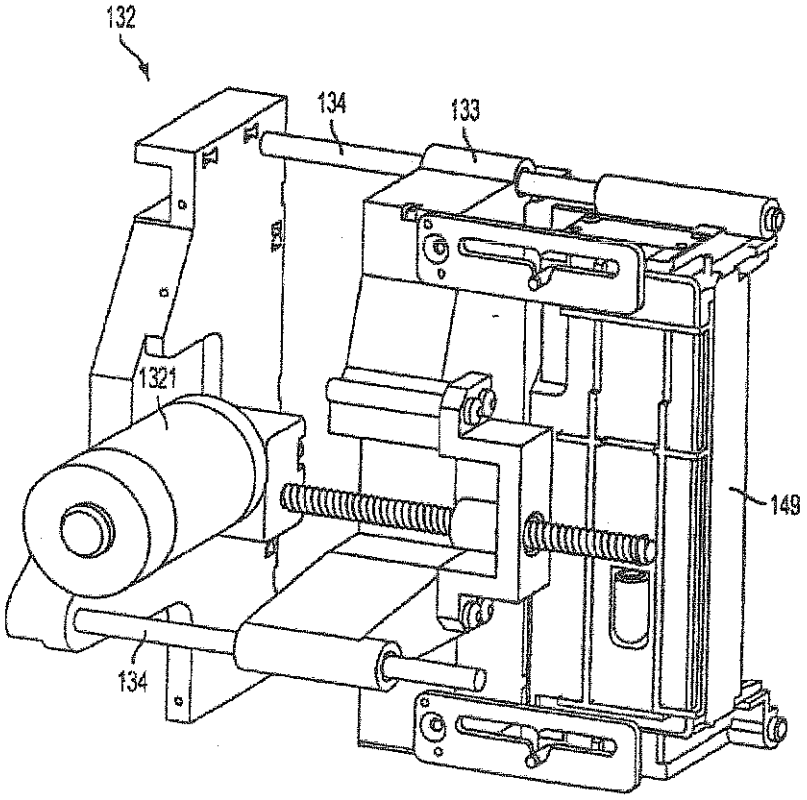


FIG. 15

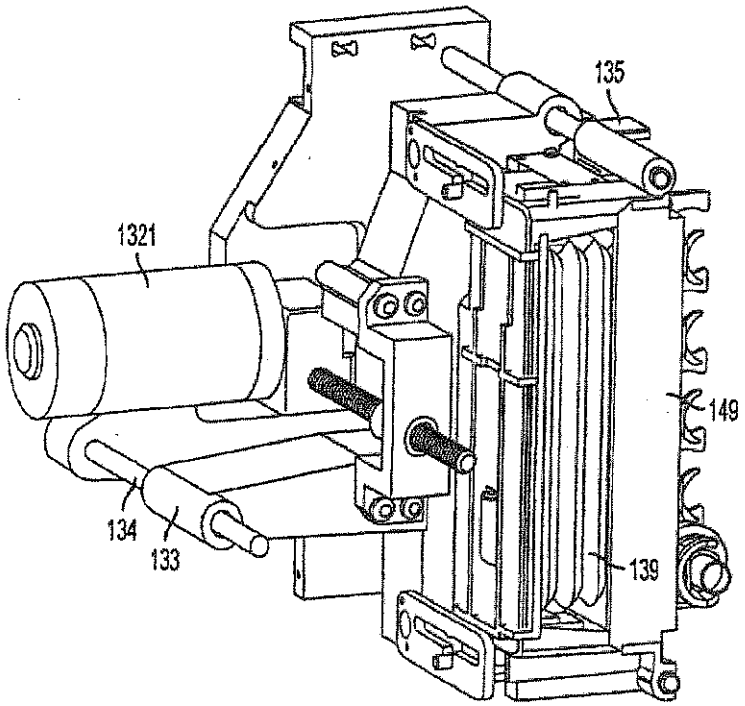


FIG. 16

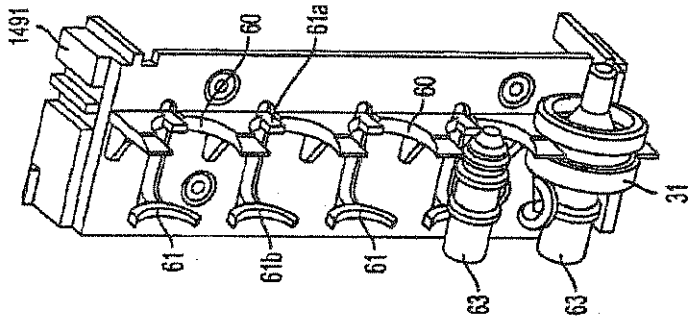

1491
60
61a
60
31
61
61b
61
63
63

FIG. 18

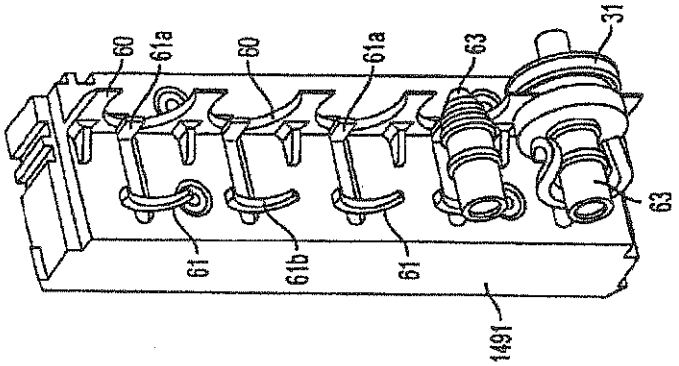

60
61a
60
61a
63
31
63
61
61b
61
1491

FIG. 17

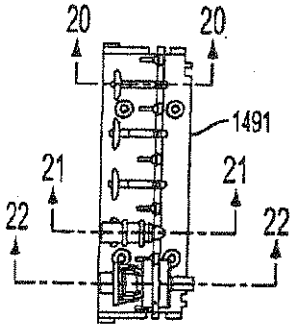


FIG. 19

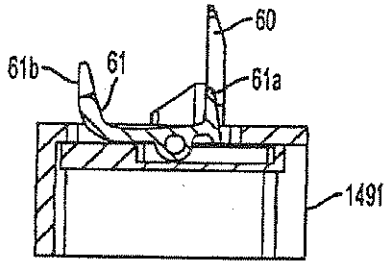


FIG. 20

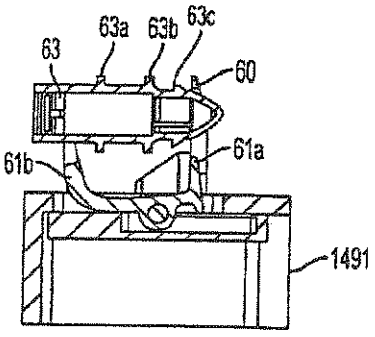


FIG. 21

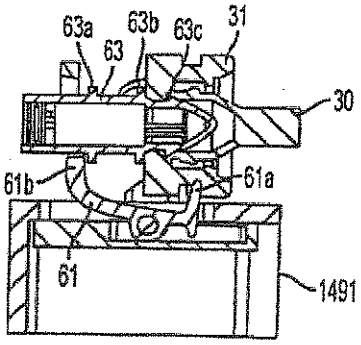


FIG. 22

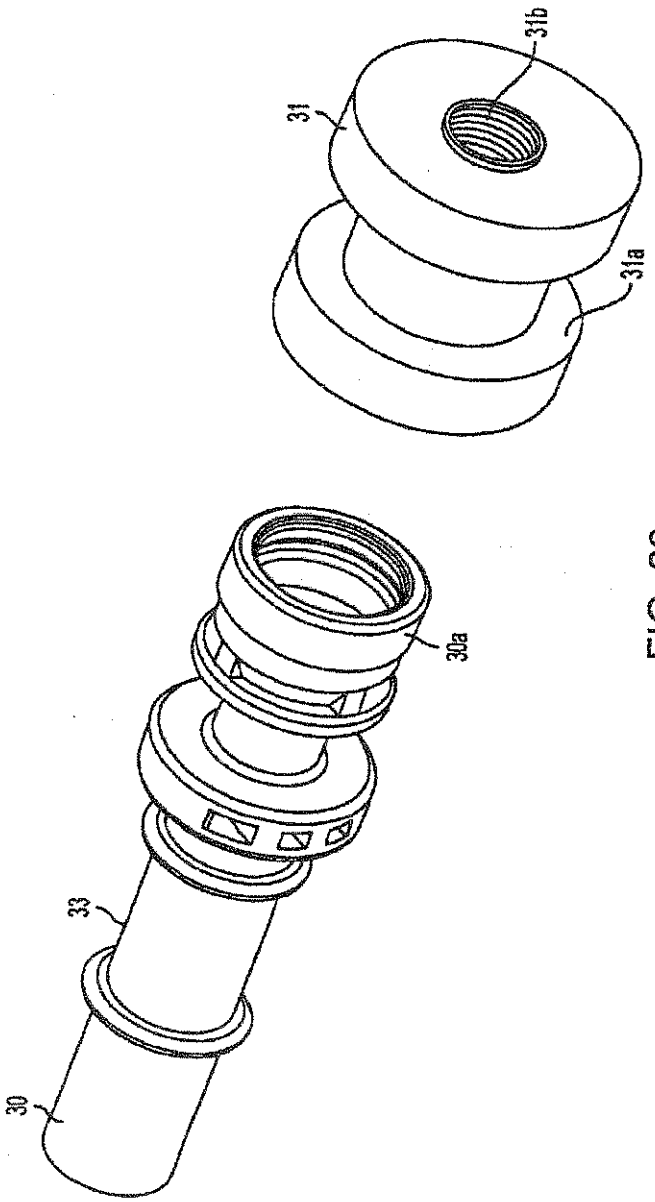


FIG. 23

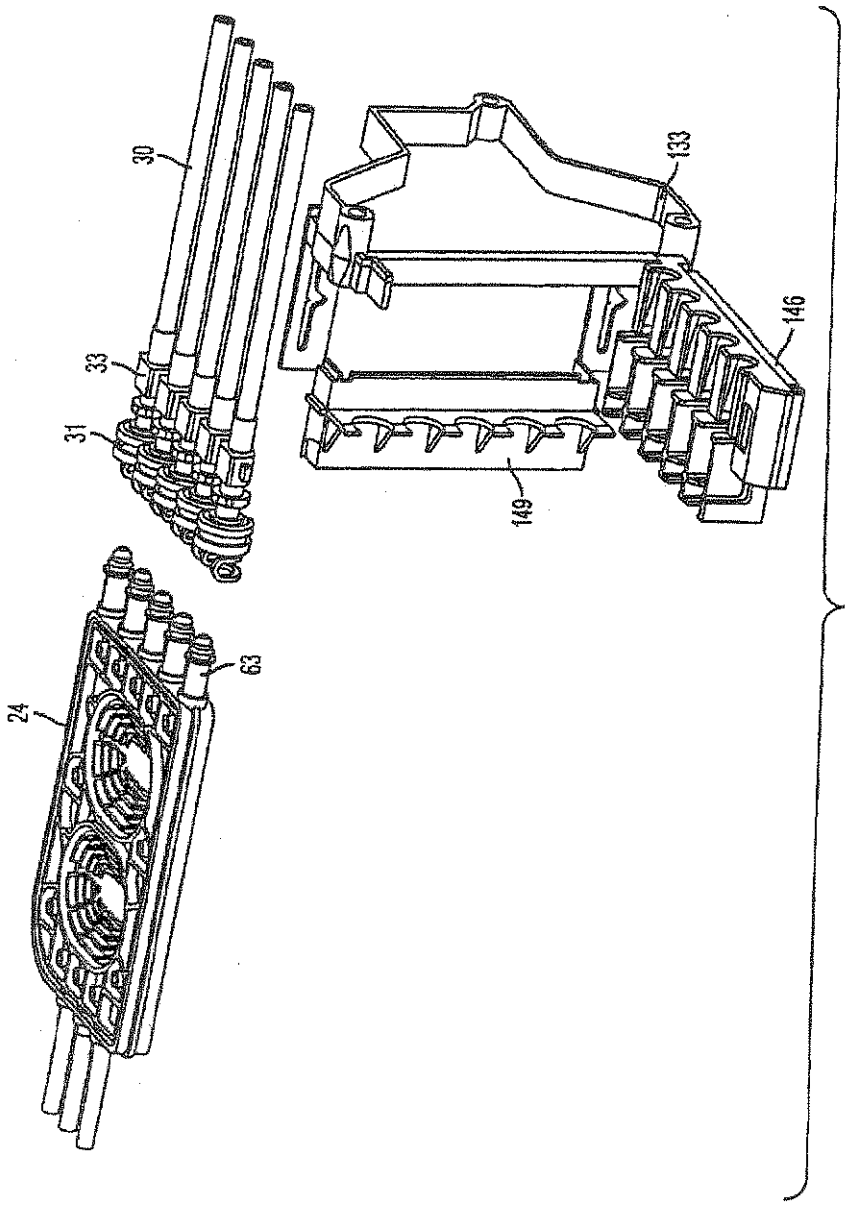


FIG. 24

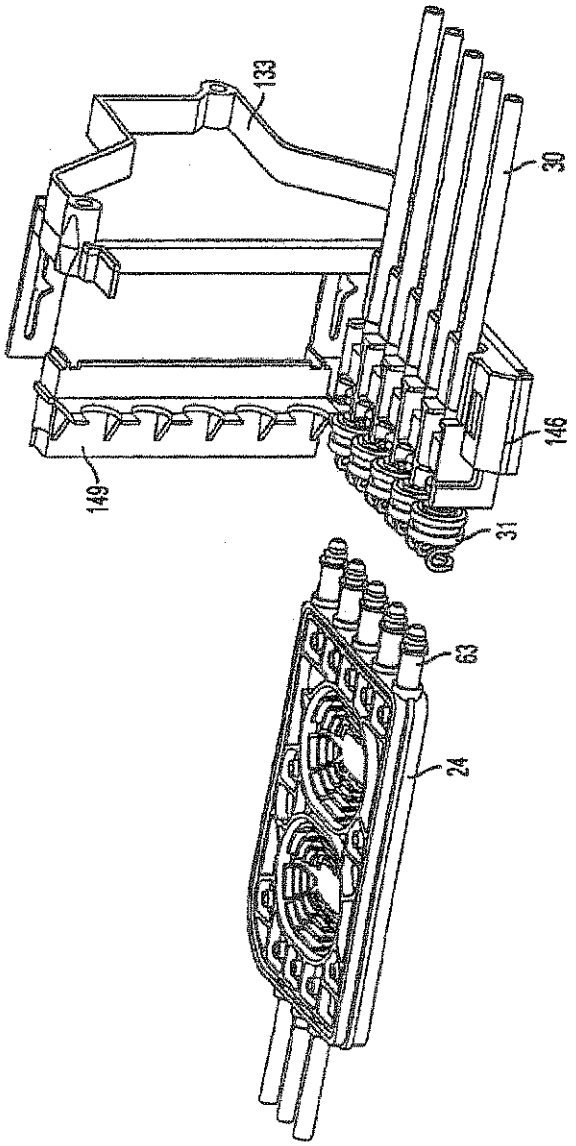


FIG. 25

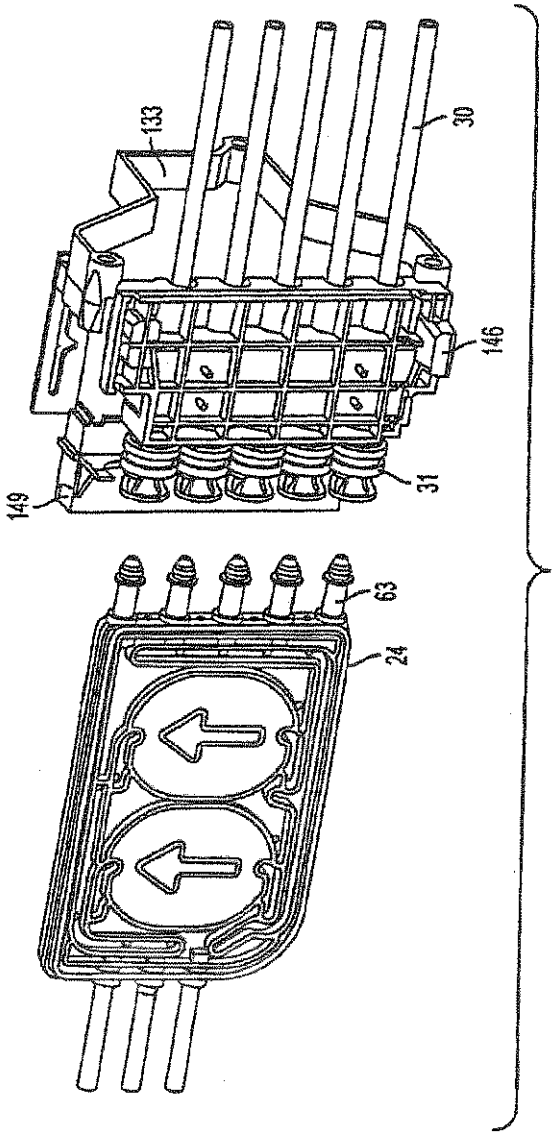


FIG. 26

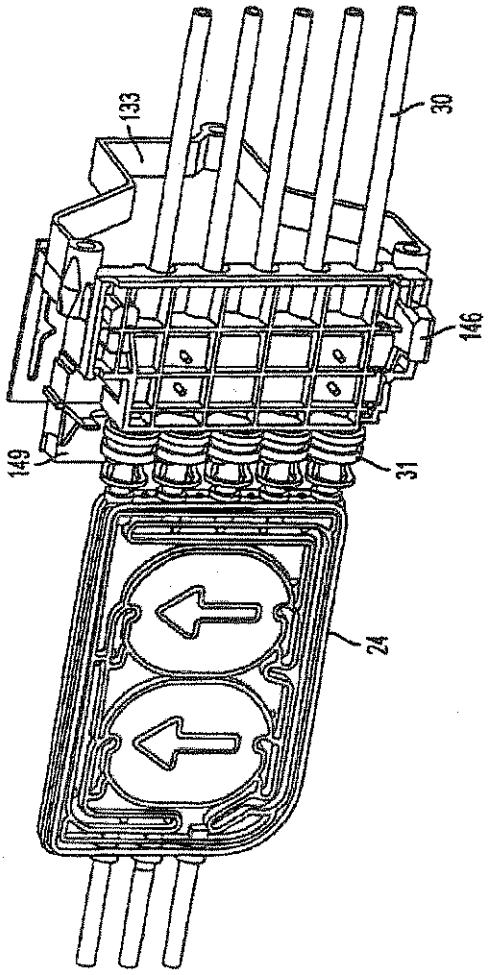


FIG. 27

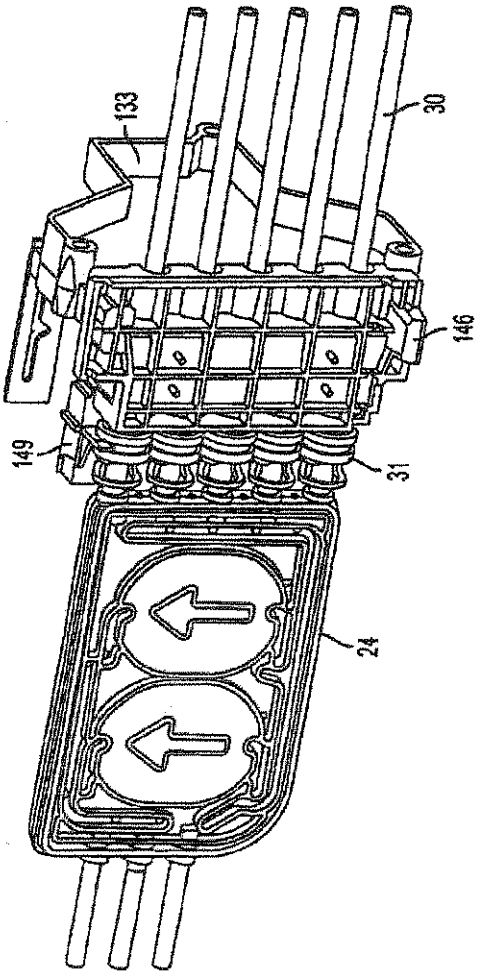


FIG. 28

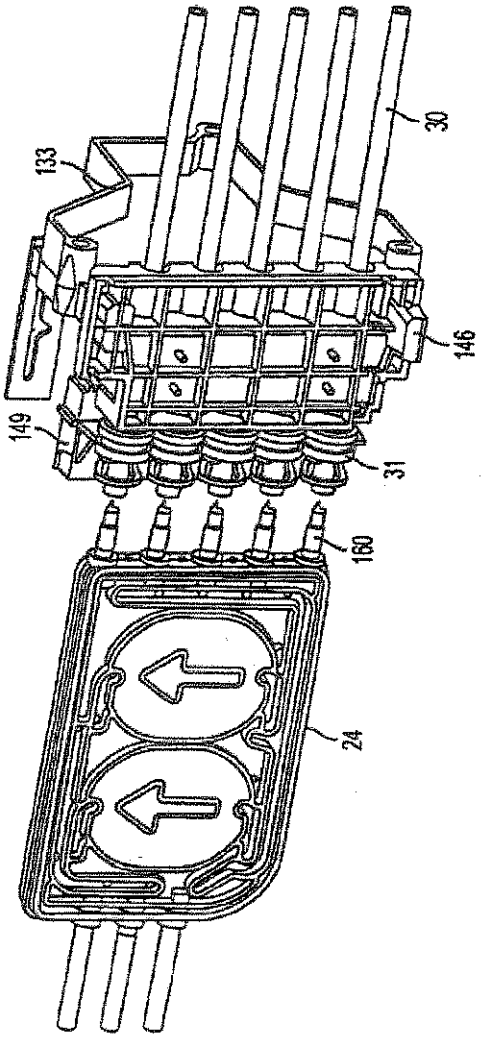


FIG. 29

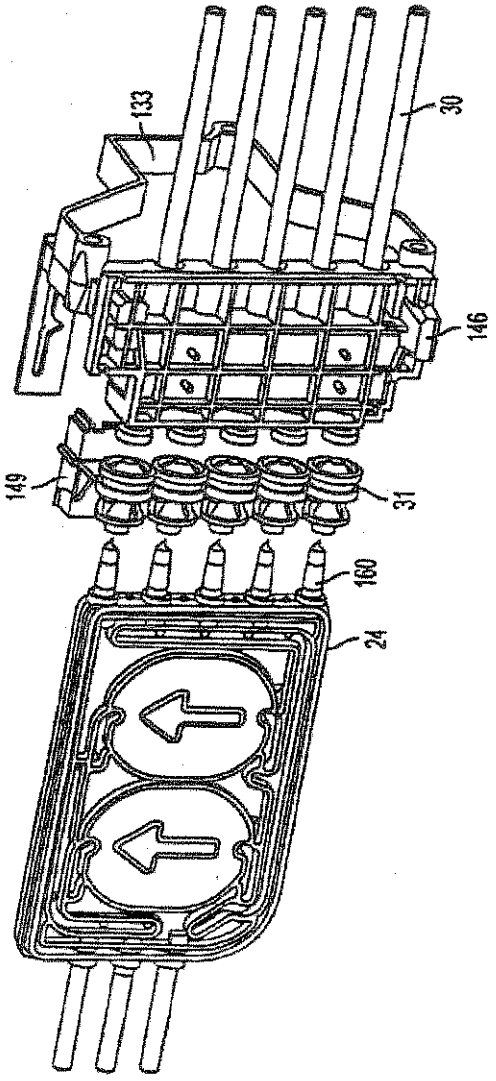


FIG. 30

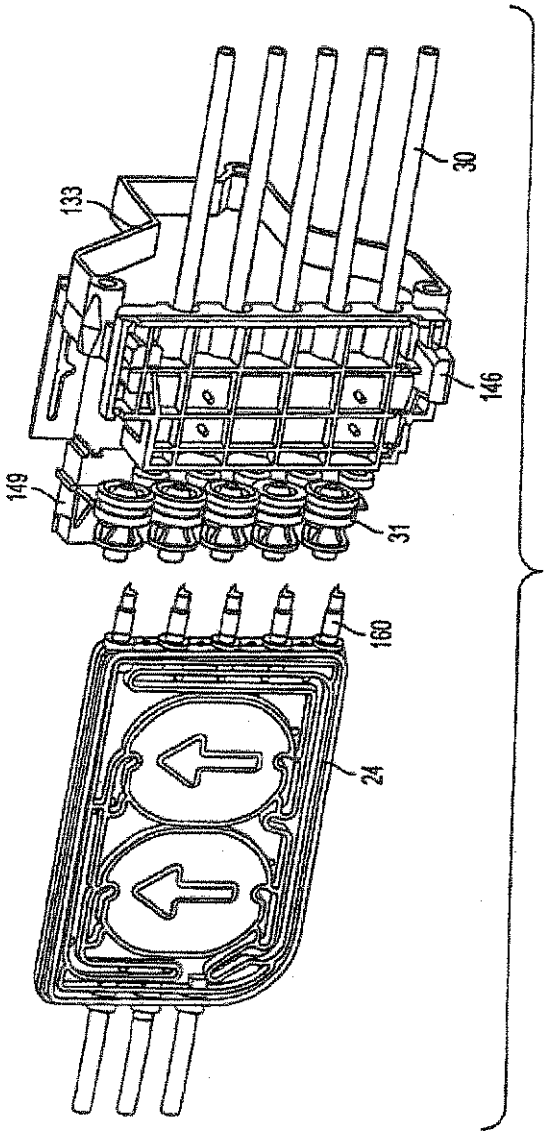


FIG. 31

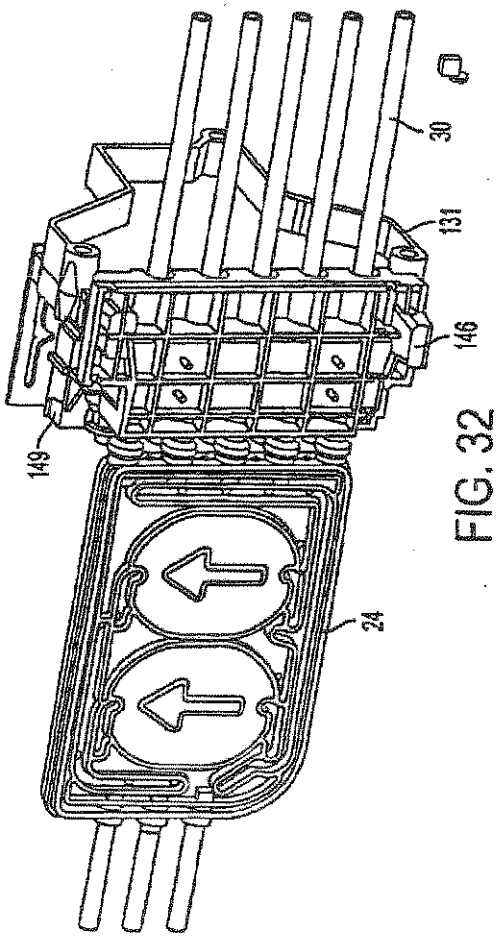


FIG. 32

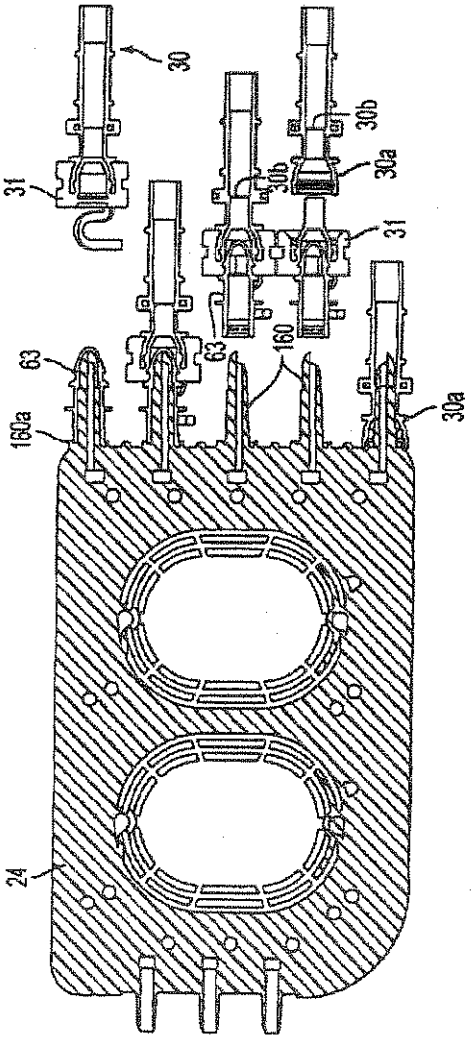


FIG. 33

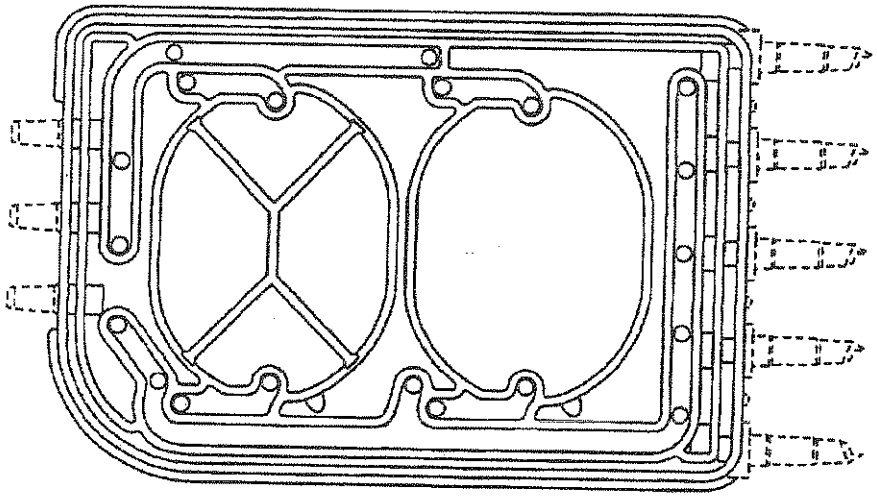


FIG. 34

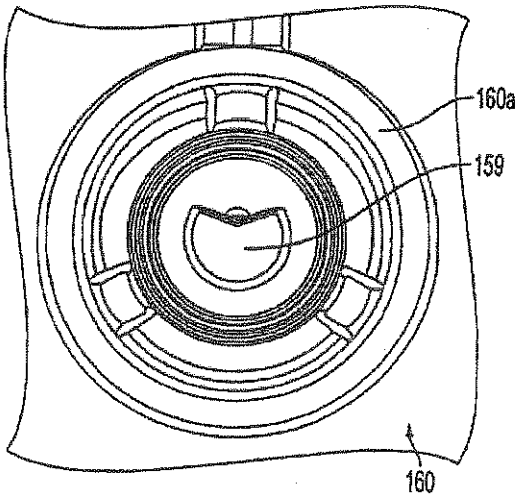


FIG. 35

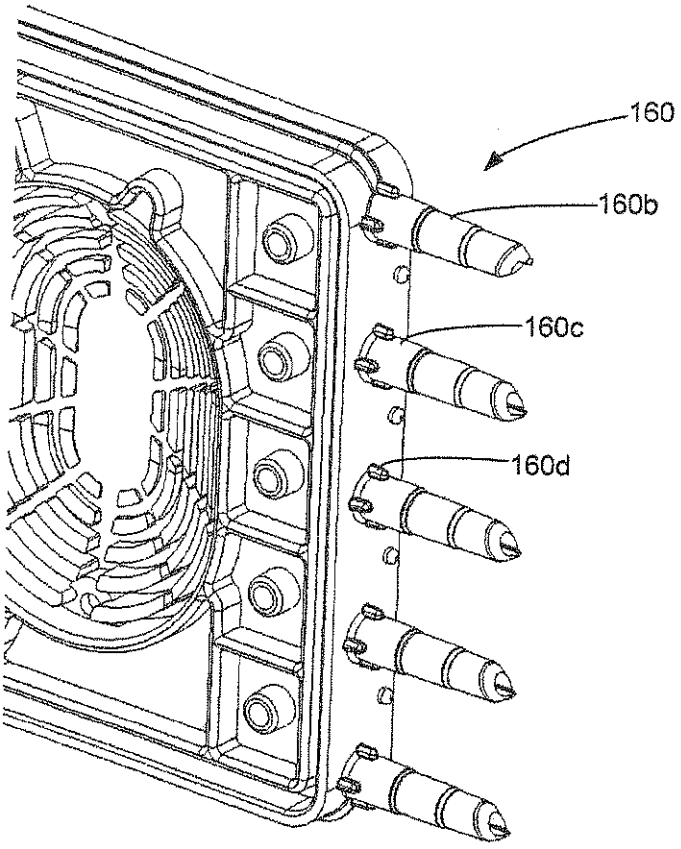


FIG. 35A

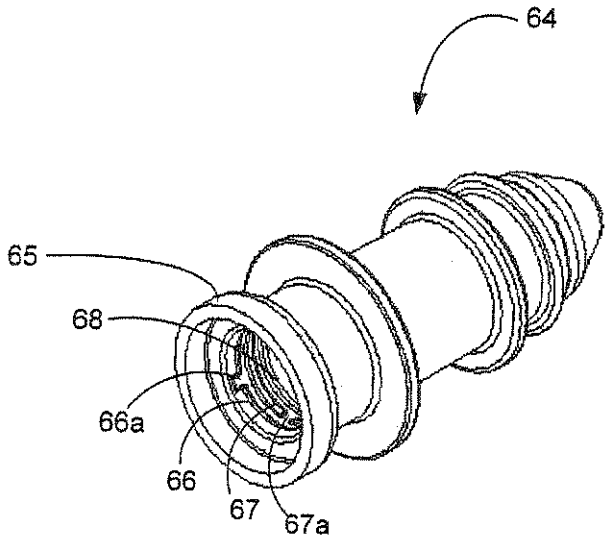


FIG. 35B

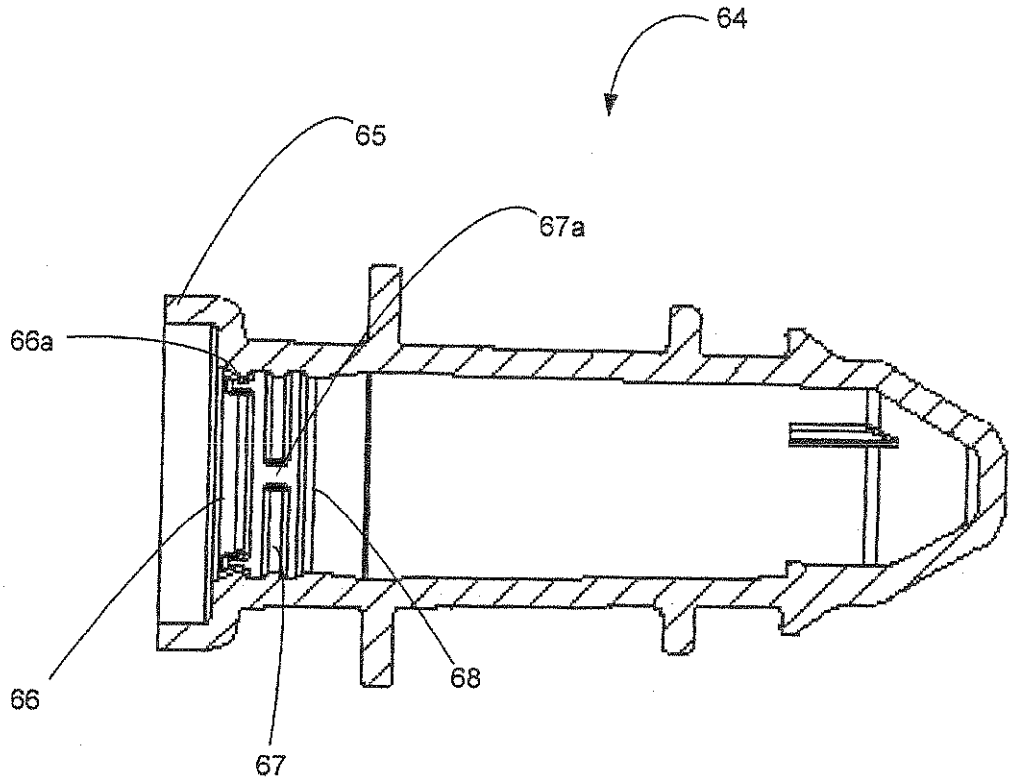


FIG. 35C

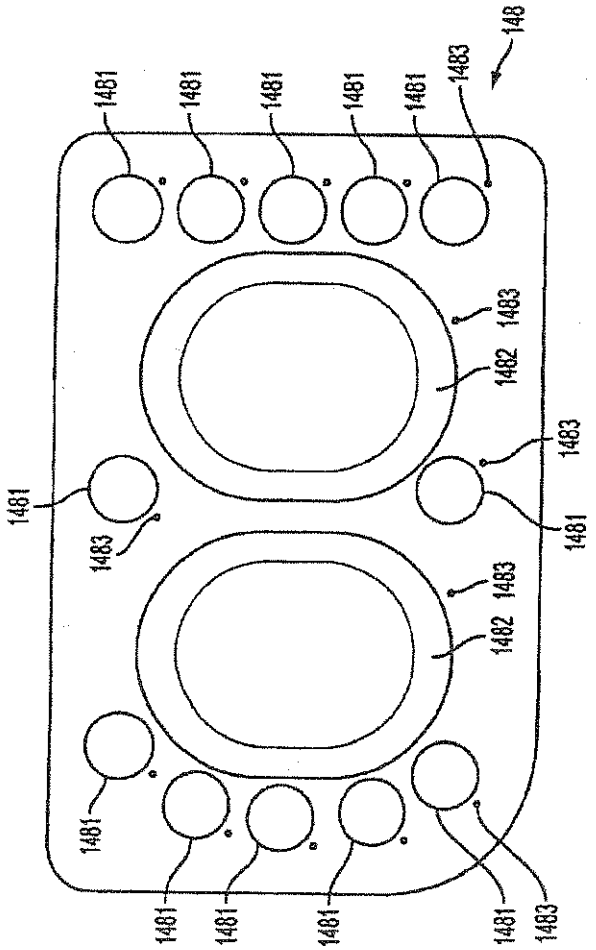


FIG. 36

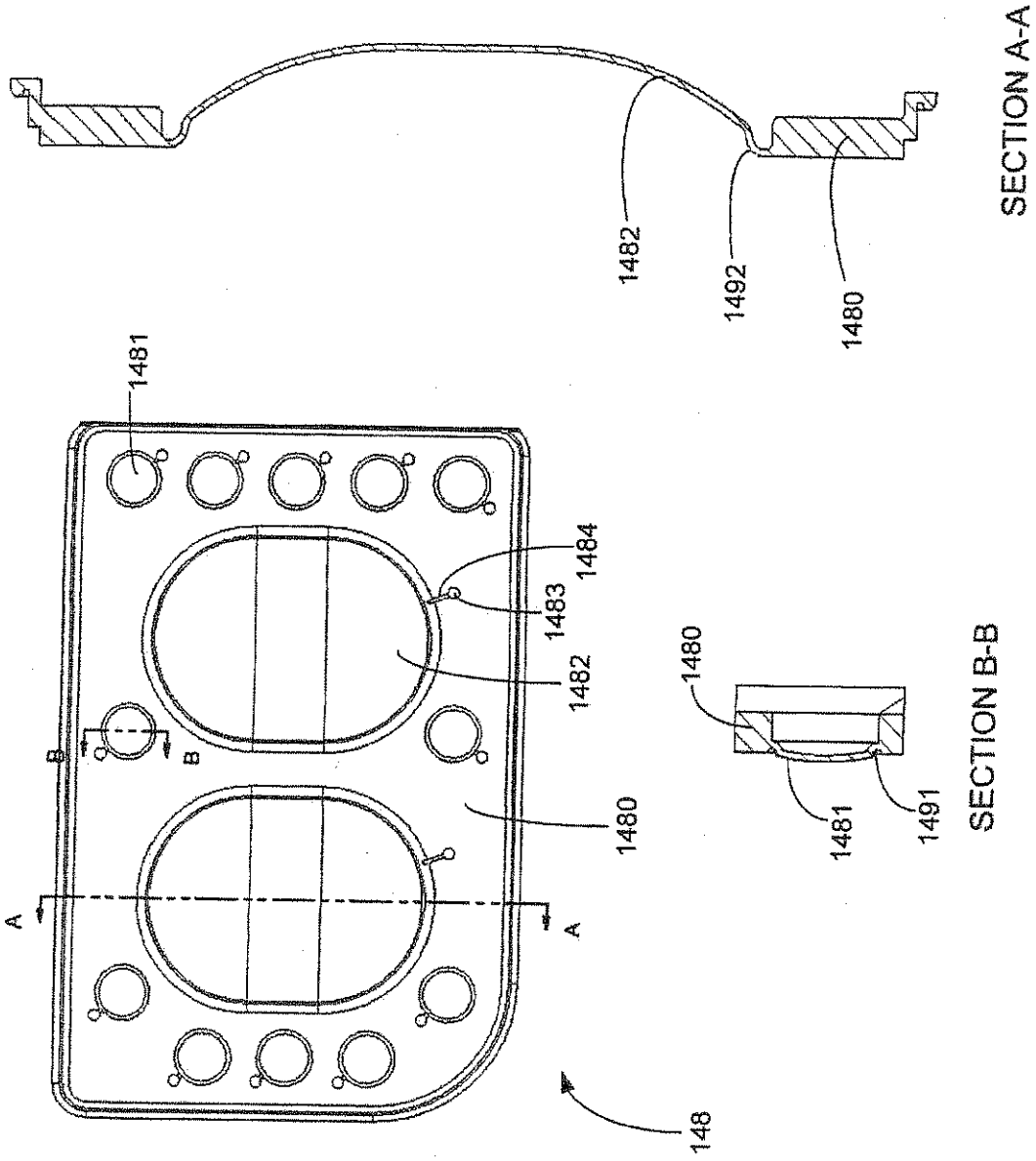

SECTION A-A
1482
1492
1480
1481
1484
1483
1482
1480
A
A
B
B
148
SECTION B-B
1480
1481
1491

Fig. 36A

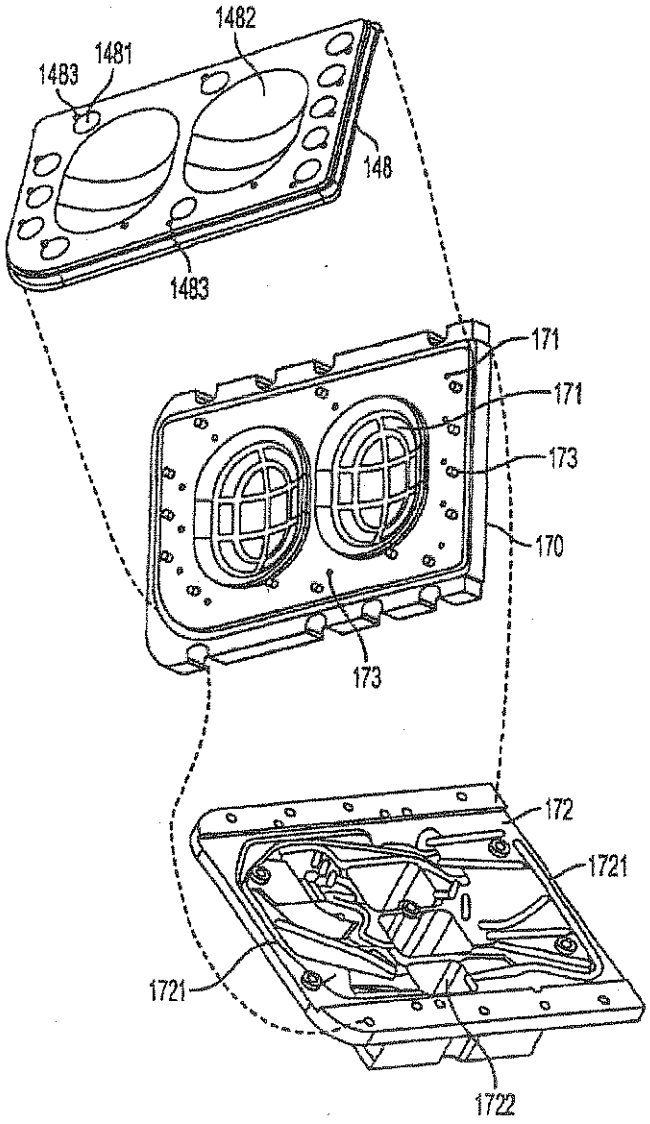


FIG. 37

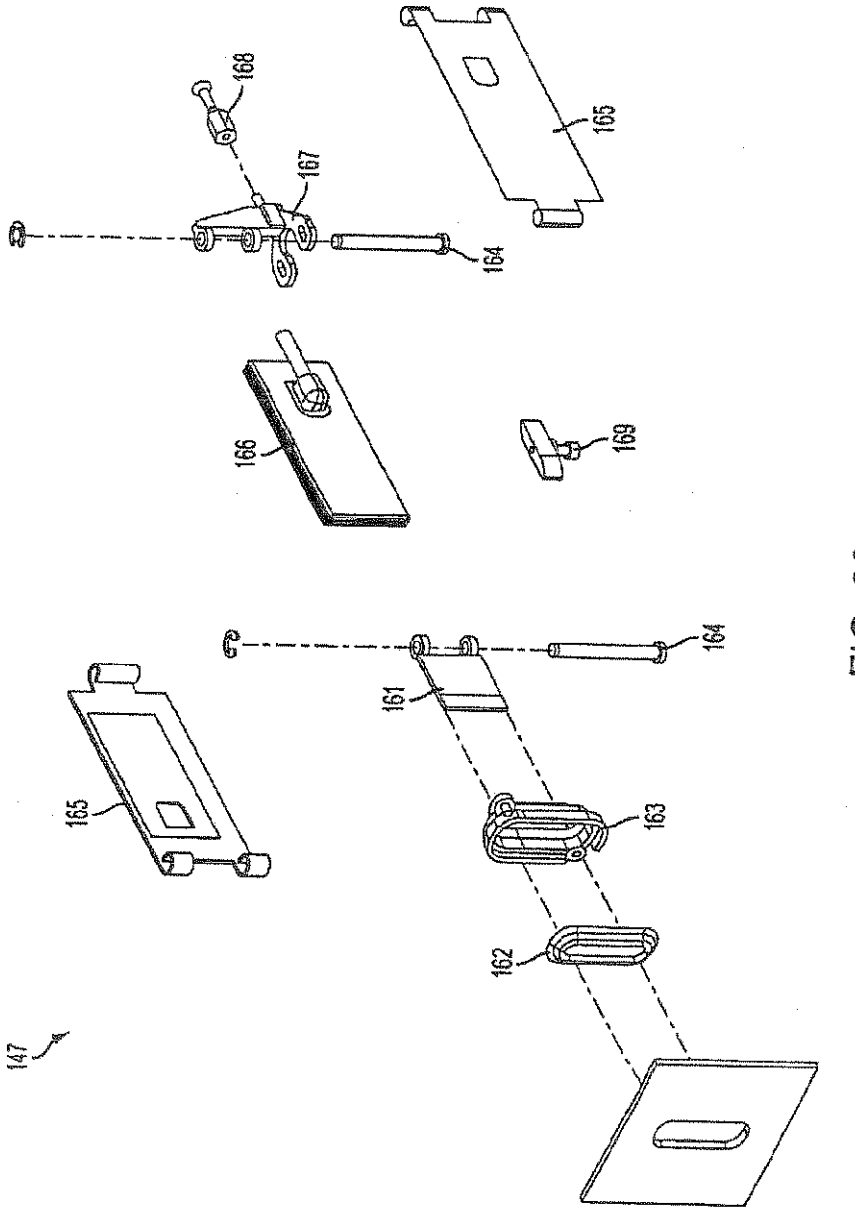


FIG. 38

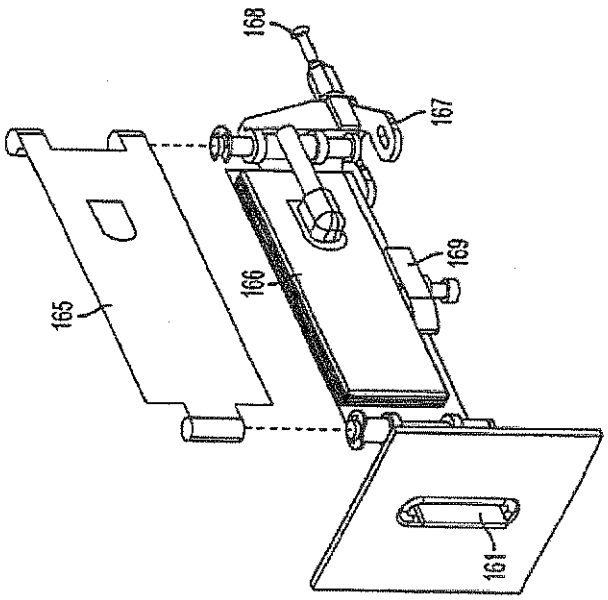


FIG. 39

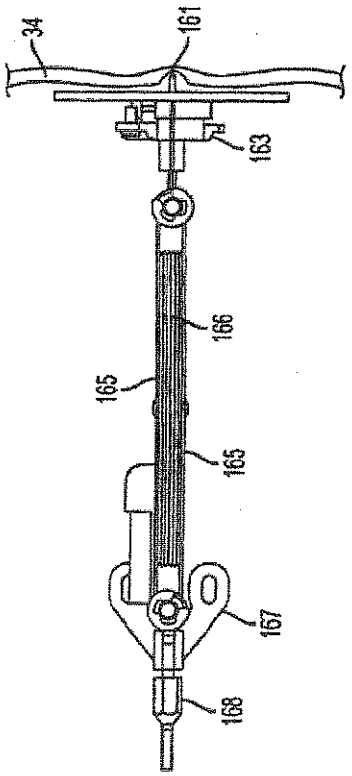


FIG. 40

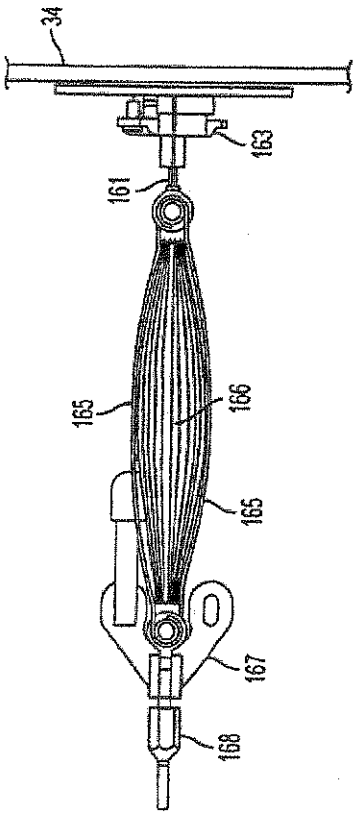


FIG. 41

37/54

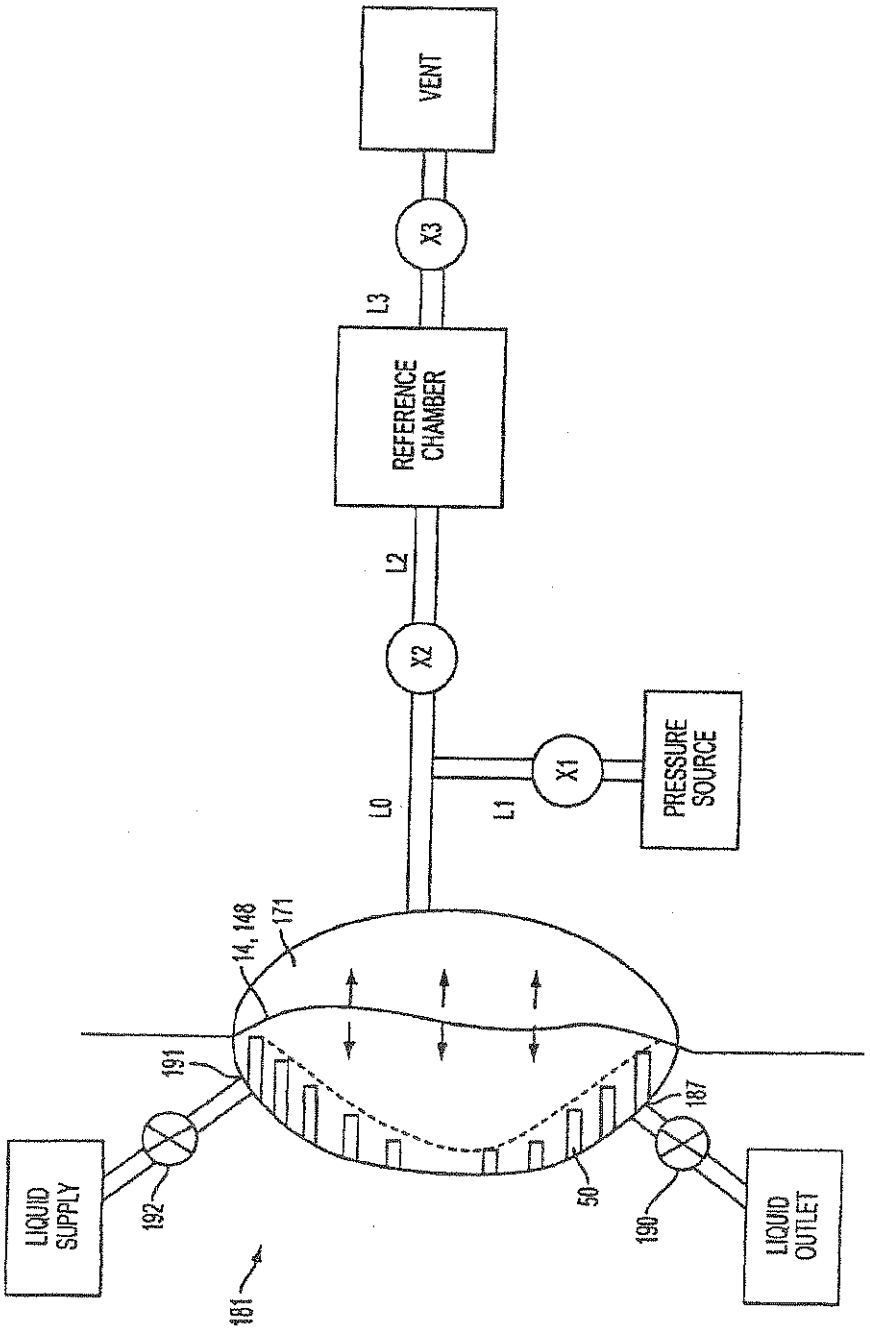

VENT
X3
L3
REFERENCE CHAMBER
L2
X2
L0
X1
L1
PRESSURE SOURCE
14, 148
171
191
192
LIQUID SUPPLY
50
187
190
LIQUID OUTLET
181

FIG. 42

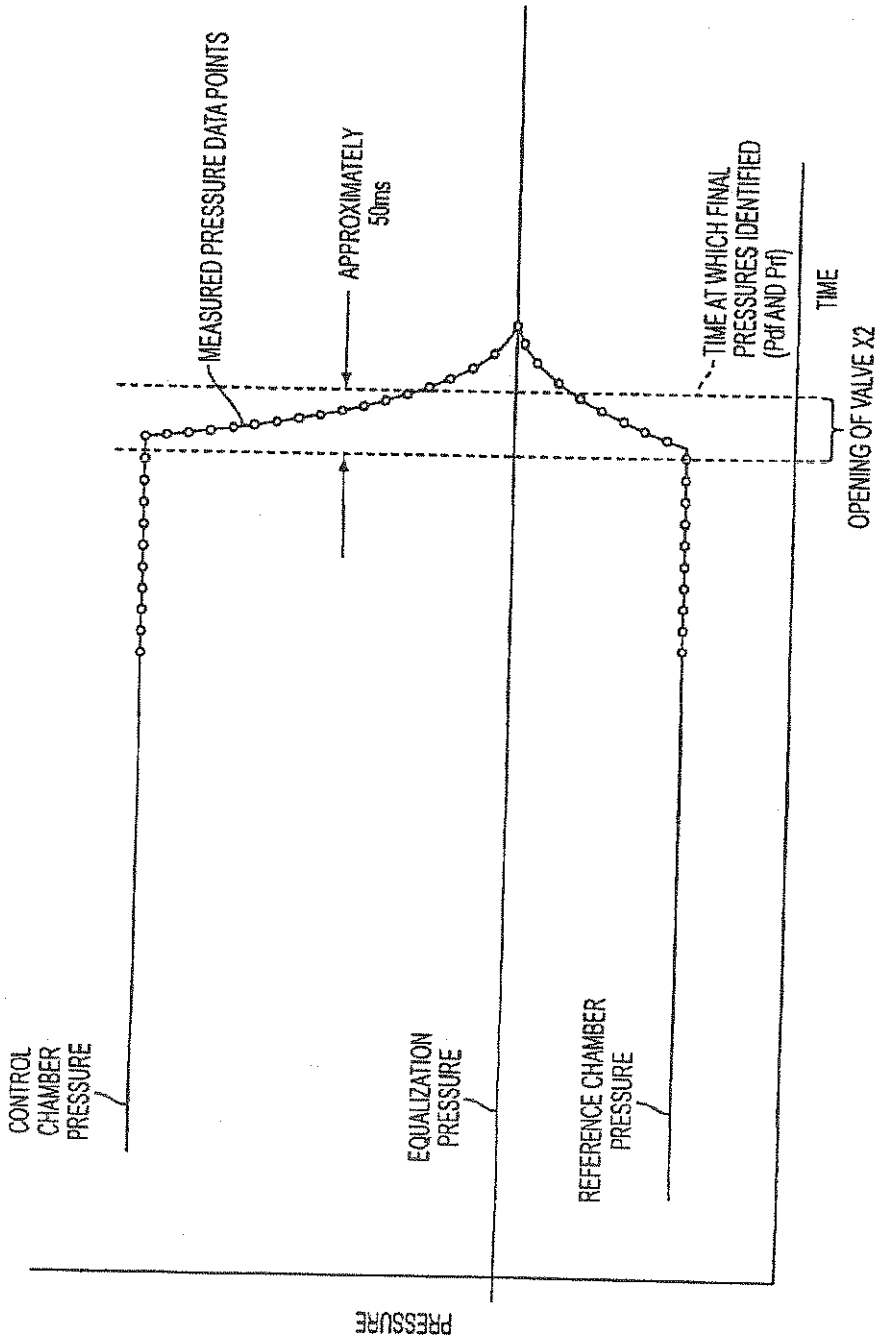

MEASURED PRESSURE DATA POINTS
APPROXIMATELY 50ms
TIME AT WHICH FINAL PRESSURES IDENTIFIED (Pdf AND Pf)
TIME
OPENING OF VALVE X2
CONTROL CHAMBER PRESSURE
EQUALIZATION PRESSURE
REFERENCE CHAMBER PRESSURE
PRESSURE

FIG. 43

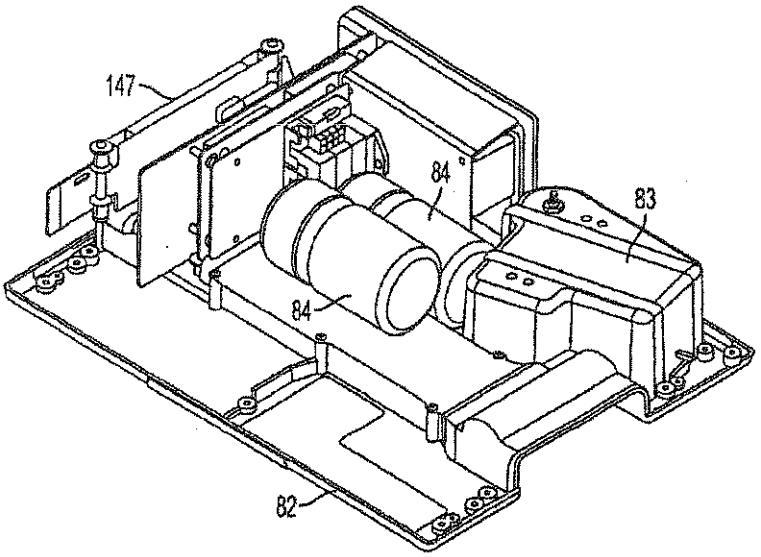


FIG. 44

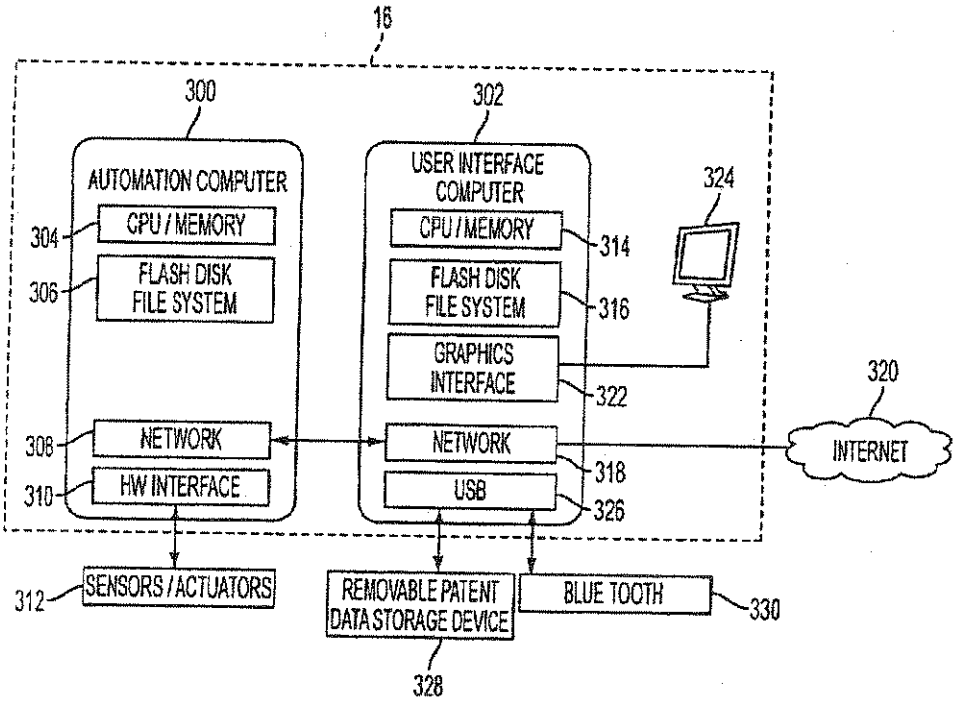

16
300
AUTOMATION COMPUTER
304
CPU / MEMORY
306
FLASH DISK FILE SYSTEM
308
NETWORK
310
HW INTERFACE
312
SENSORS / ACTUATORS
302
USER INTERFACE COMPUTER
CPU / MEMORY
314
FLASH DISK FILE SYSTEM
316
GRAPHICS INTERFACE
322
NETWORK
318
USB
326
324
320
INTERNET
REMOVABLE PATENT DATA STORAGE DEVICE
328
BLUE TOOTH
330

FIG. 45

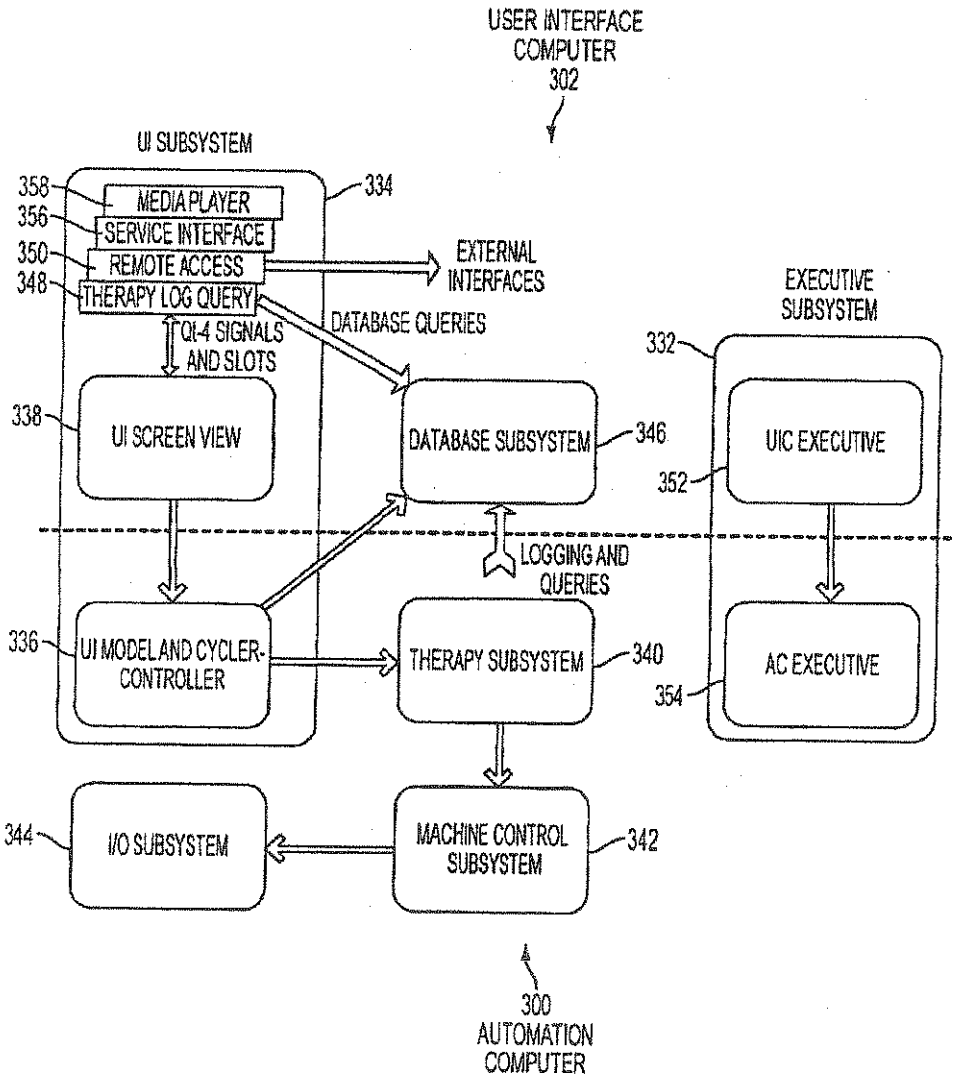

USER INTERFACE COMPUTER
302
UI SUBSYSTEM
334
358
MEDIA PLAYER
356
SERVICE INTERFACE
350
REMOTE ACCESS
348
THERAPY LOG QUERY
EXTERNAL INTERFACES
DATABASE QUERIES
QI-4 SIGNALS AND SLOTS
EXECUTIVE SUBSYSTEM
332
338
UI SCREEN VIEW
DATABASE SUBSYSTEM
346
UIC EXECUTIVE
352
LOGGING AND QUERIES
336
UI MODEL AND CYCLER-CONTROLLER
THERAPY SUBSYSTEM
340
AC EXECUTIVE
354
344
I/O SUBSYSTEM
MACHINE CONTROL SUBSYSTEM
342
300
AUTOMATION COMPUTER

FIG. 46

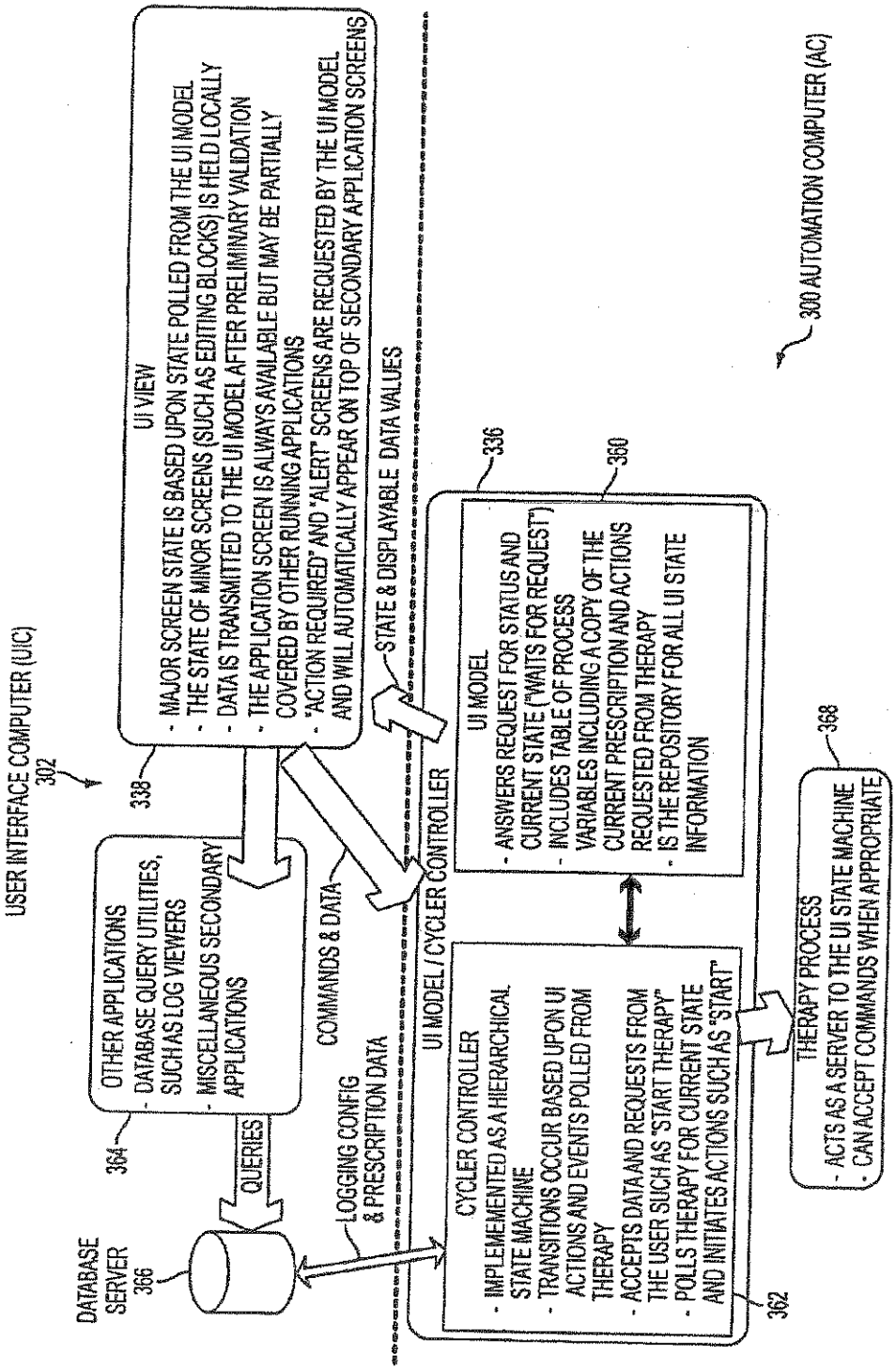

USER INTERFACE COMPUTER (UIC)
302
UI VIEW
- MAJOR SCREEN STATE IS BASED UPON STATE POLLED FROM THE UI MODEL
- THE STATE OF MINOR SCREENS (SUCH AS EDITING BLOCKS) IS HELD LOCALLY
- DATA IS TRANSMITTED TO THE UI MODEL AFTER PRELIMINARY VALIDATION
- THE APPLICATION SCREEN IS ALWAYS AVAILABLE BUT MAY BE PARTIALLY COVERED BY OTHER RUNNING APPLICATIONS
- "ACTION REQUIRED" AND "ALERT" SCREENS ARE REQUESTED BY THE UI MODEL AND WILL AUTOMATICALLY APPEAR ON TOP OF SECONDARY APPLICATION SCREENS
338
STATE & DISPLAYABLE DATA VALUES
OTHER APPLICATIONS
- DATABASE QUERY UTILITIES, SUCH AS LOG VIEWERS
- MISCELLANEOUS SECONDARY APPLICATIONS
364
COMMANDS & DATA
QUERIES
LOGGING CONFIG & PRESCRIPTION DATA
DATABASE SERVER
366
UI MODEL / CYCLER CONTROLLER
UI MODEL
- ANSWERS REQUEST FOR STATUS AND CURRENT STATE ("WAITS FOR REQUEST")
- INCLUDES TABLE OF PROCESS VARIABLES INCLUDING A COPY OF THE CURRENT PRESCRIPTION AND ACTIONS REQUESTED FROM THERAPY
- IS THE REPOSITORY FOR ALL UI STATE INFORMATION
336
360
CYCLER CONTROLLER
- IMPLEMEMENTED AS A HIERARCHICAL STATE MACHINE
- TRANSITIONS OCCUR BASED UPON UI ACTIONS AND EVENTS POLLED FROM THERAPY
- ACCEPTS DATA AND REQUESTS FROM THE USER SUCH AS "START THERAPY"
- POLLS THERAPY FOR CURRENT STATE AND INITIATES ACTIONS SUCH AS "START"
362
THERAPY PROCESS
- ACTS AS A SERVER TO THE UI STATE MACHINE
- CAN ACCEPT COMMANDS WHEN APPROPRIATE
368
300 AUTOMATION COMPUTER (AC)

FIG. 47

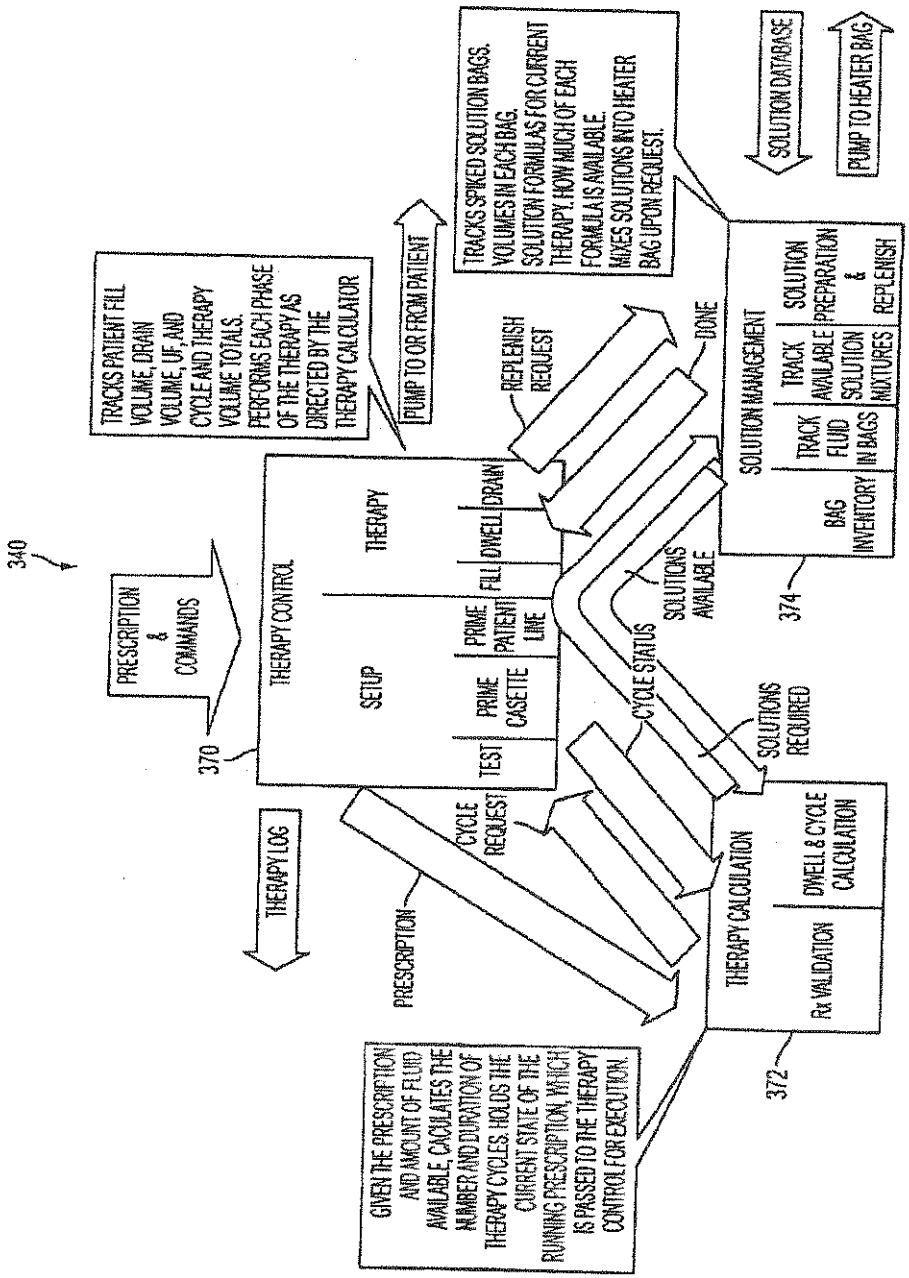

340
PRESCRIPTION & COMMANDS
370
THERAPY CONTROL
SETUP
TEST
PRIME CASETTE
PRIME PATIENT LINE
THERAPY
FILL
DWELL
DRAIN
TRACKS PATIENT FILL VOLUME, DRAIN VOLUME, UF, AND CYCLE AND THERAPY VOLUME TOTALS. PERFORMS EACH PHASE OF THE THERAPY AS DIRECTED BY THE THERAPY CALCULATOR
PUMP TO OR FROM PATIENT
REPLENISH REQUEST
TRACKS SPIKED SOLUTION BAGS. VOLUMES IN EACH BAG. SOLUTION FORMULAS FOR CURRENT THERAPY. HOW MUCH OF EACH FORMULA IS AVAILABLE. MIXES SOLUTIONS INTO HEATER BAG UPON REQUEST.
DONE
SOLUTION DATABASE
PUMP TO HEATER BAG
SOLUTION MANAGEMENT
BAG INVENTORY
TRACK FLUID IN BAGS
TRACK AVAILABLE SOLUTION MIXTURES
SOLUTION PREPARATION & REPLENISH
374
SOLUTIONS AVAILABLE
CYCLE STATUS
SOLUTIONS REQUIRED
CYCLE REQUEST
PRESCRIPTION
THERAPY LOG
THERAPY CALCULATION
Rx VALIDATION
DWELL & CYCLE CALCULATION
372
GIVEN THE PRESCRIPTION AND AMOUNT OF FLUID AVAILABLE, CALCULATES THE NUMBER AND DURATION OF THERAPY CYCLES. HOLDS THE CURRENT STATE OF THE RUNNING PRESCRIPTION, WHICH IS PASSED TO THE THERAPY CONTROL FOR EXECUTION.

FIG. 48

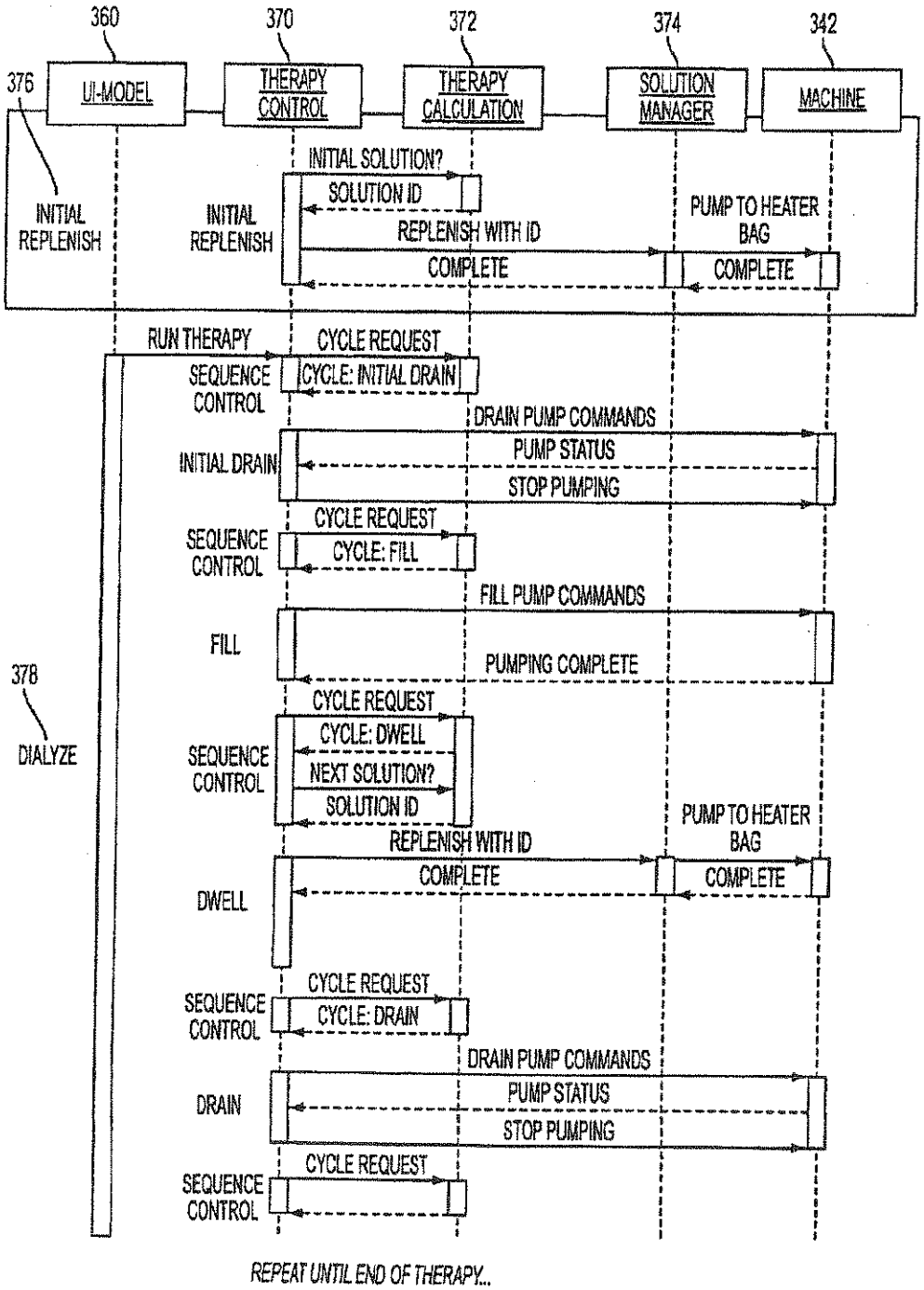

360
370
372
374
342
376
UI-MODEL
THERAPY CONTROL
THERAPY CALCULATION
SOLUTION MANAGER
MACHINE
INITIAL REPLENISH
INITIAL SOLUTION?
SOLUTION ID
INITIAL REPLENISH
REPLENISH WITH ID
PUMP TO HEATER BAG
COMPLETE
COMPLETE
RUN THERAPY
CYCLE REQUEST
SEQUENCE CONTROL
CYCLE: INITIAL DRAIN
DRAIN PUMP COMMANDS
INITIAL DRAIN
PUMP STATUS
STOP PUMPING
CYCLE REQUEST
SEQUENCE CONTROL
CYCLE: FILL
FILL PUMP COMMANDS
FILL
PUMPING COMPLETE
378
DIALYZE
CYCLE REQUEST
CYCLE: DWELL
SEQUENCE CONTROL
NEXT SOLUTION?
SOLUTION ID
PUMP TO HEATER BAG
REPLENISH WITH ID
COMPLETE
COMPLETE
DWELL
CYCLE REQUEST
SEQUENCE CONTROL
CYCLE: DRAIN
DRAIN PUMP COMMANDS
DRAIN
PUMP STATUS
STOP PUMPING
CYCLE REQUEST
SEQUENCE CONTROL
REPEAT UNTIL END OF THERAPY...

FIG. 49

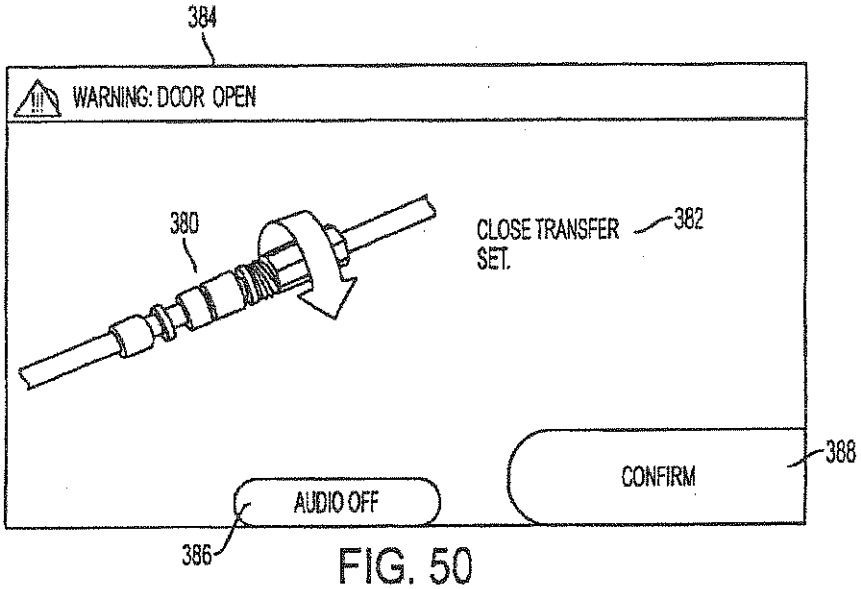

384
WARNING: DOOR OPEN
380
CLOSE TRANSFER SET.
382
388
CONFIRM
AUDIO OFF
386

FIG. 50

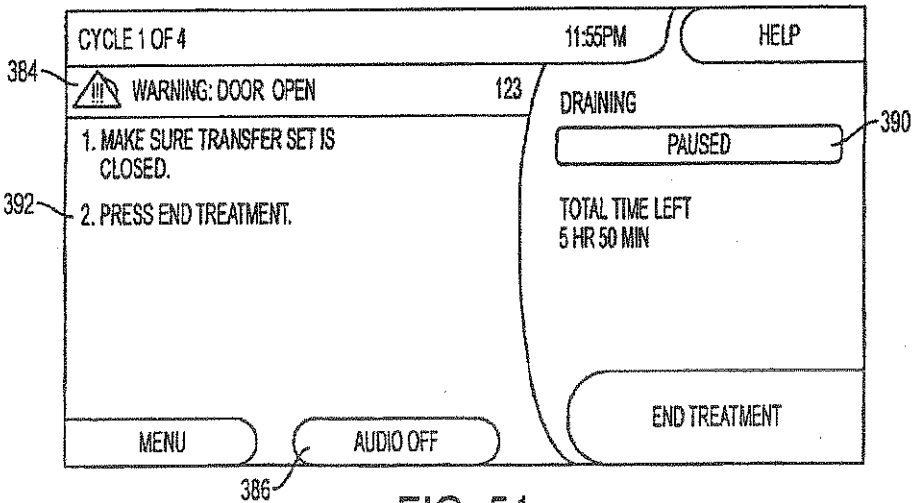

CYCLE 1 OF 4
11:55PM
HELP
384
WARNING: DOOR OPEN
123
DRAINING
390
PAUSED
1. MAKE SURE TRANSFER SET IS CLOSED.
392
2. PRESS END TREATMENT.
TOTAL TIME LEFT
5 HR 50 MIN
END TREATMENT
MENU
AUDIO OFF
386

FIG. 51

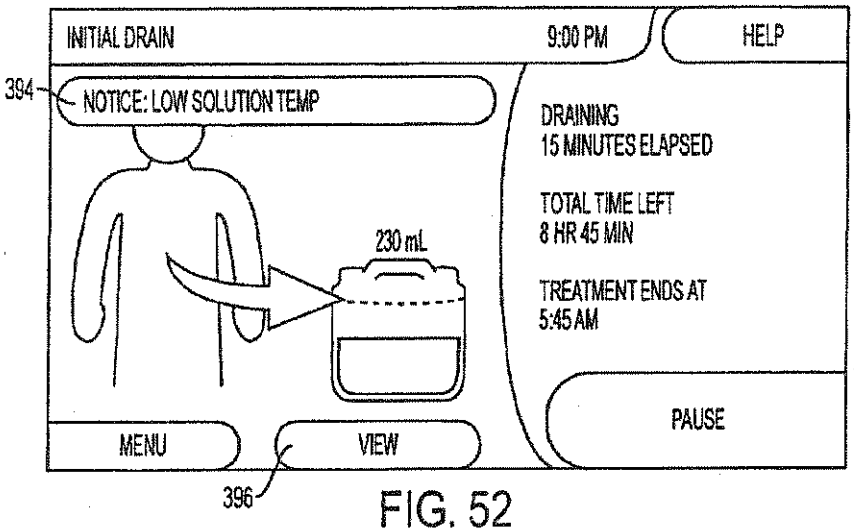

INITIAL DRAIN
9:00 PM
HELP
394
NOTICE: LOW SOLUTION TEMP
230 mL
DRAINING
15 MINUTES ELAPSED
TOTAL TIME LEFT
8 HR 45 MIN
TREATMENT ENDS AT
5:45 AM
PAUSE
MENU
VIEW
396

FIG. 52

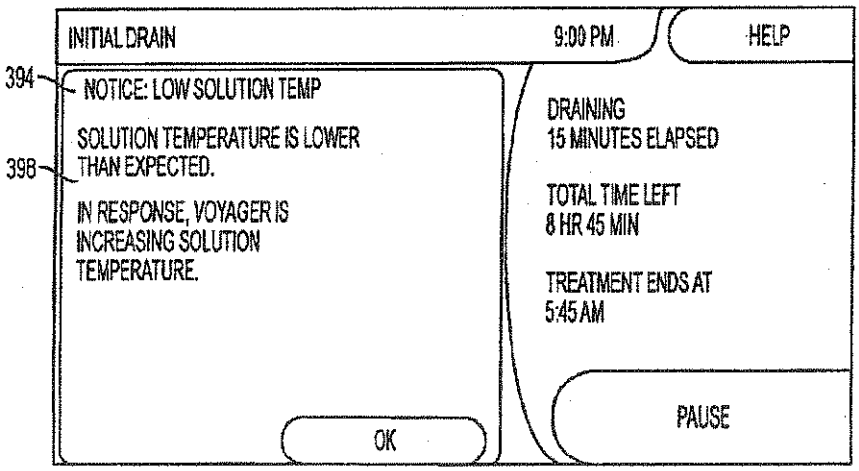

INITIAL DRAIN
9:00 PM
HELP
394
NOTICE: LOW SOLUTION TEMP
SOLUTION TEMPERATURE IS LOWER THAN EXPECTED.
398
IN RESPONSE, VOYAGER IS INCREASING SOLUTION TEMPERATURE.
DRAINING
15 MINUTES ELAPSED
TOTAL TIME LEFT
8 HR 45 MIN
TREATMENT ENDS AT
5:45 AM
PAUSE
OK

FIG. 53

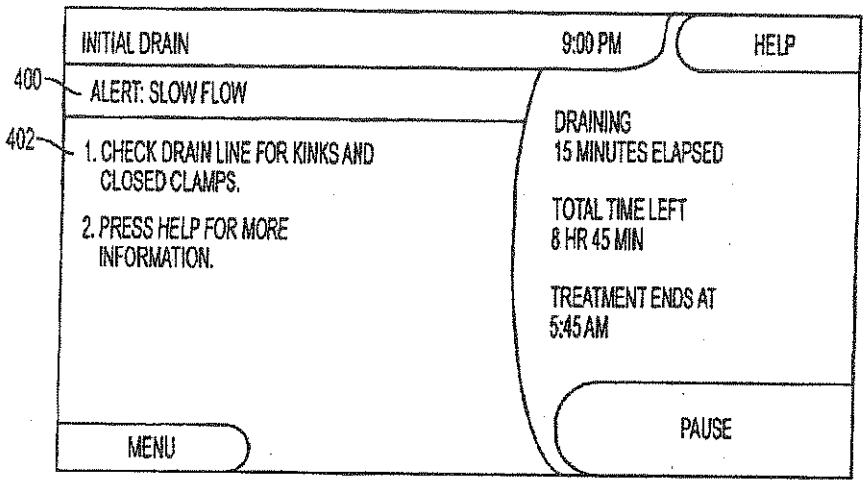

INITIAL DRAIN
9:00 PM
HELP
400
ALERT: SLOW FLOW
402
1. CHECK DRAIN LINE FOR KINKS AND CLOSED CLAMPS.
2. PRESS HELP FOR MORE INFORMATION.
DRAINING
15 MINUTES ELAPSED
TOTAL TIME LEFT
8 HR 45 MIN
TREATMENT ENDS AT
5:45 AM
MENU
PAUSE

FIG. 54

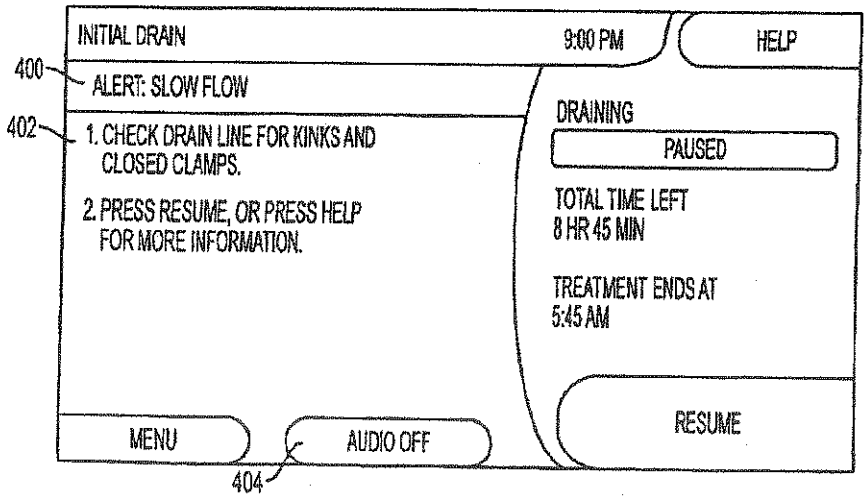

INITIAL DRAIN
9:00 PM
HELP
400
ALERT: SLOW FLOW
402
1. CHECK DRAIN LINE FOR KINKS AND CLOSED CLAMPS.
2. PRESS RESUME, OR PRESS HELP FOR MORE INFORMATION.
DRAINING
PAUSED
TOTAL TIME LEFT
8 HR 45 MIN
TREATMENT ENDS AT
5:45 AM
MENU
AUDIO OFF
404
RESUME

FIG. 55

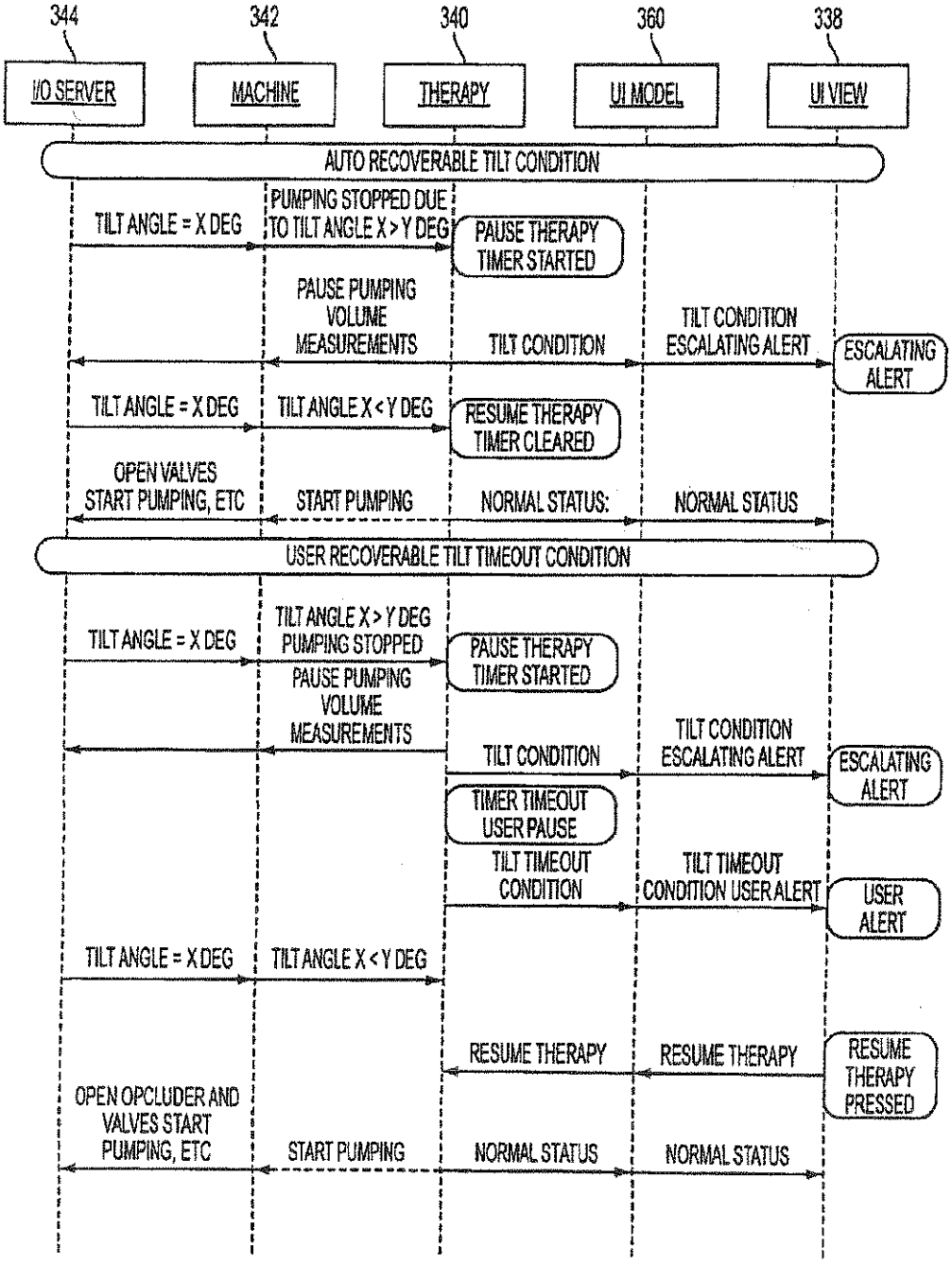

344
342
340
360
338
I/O SERVER
MACHINE
THERAPY
UI MODEL
UI VIEW
AUTO RECOVERABLE TILT CONDITION
TILT ANGLE = X DEG
PUMPING STOPPED DUE TO TILT ANGLE X > Y DEG
PAUSE THERAPY TIMER STARTED
PAUSE PUMPING VOLUME MEASUREMENTS
TILT CONDITION
TILT CONDITION ESCALATING ALERT
ESCALATING ALERT
TILT ANGLE = X DEG
TILT ANGLE X < Y DEG
RESUME THERAPY TIMER CLEARED
OPEN VALVES START PUMPING, ETC
START PUMPING
NORMAL STATUS:
NORMAL STATUS
USER RECOVERABLE TILT TIMEOUT CONDITION
TILT ANGLE = X DEG
TILT ANGLE X > Y DEG PUMPING STOPPED
PAUSE THERAPY TIMER STARTED
PAUSE PUMPING VOLUME MEASUREMENTS
TILT CONDITION
TILT CONDITION ESCALATING ALERT
ESCALATING ALERT
TIMER TIMEOUT USER PAUSE
TILT TIMEOUT CONDITION
TILT TIMEOUT CONDITION USER ALERT
USER ALERT
TILT ANGLE = X DEG
TILT ANGLE X < Y DEG
RESUME THERAPY
RESUME THERAPY
RESUME THERAPY PRESSED
OPEN OPCLUDER AND VALVES START PUMPING, ETC
START PUMPING
NORMAL STATUS
NORMAL STATUS

FIG. 56

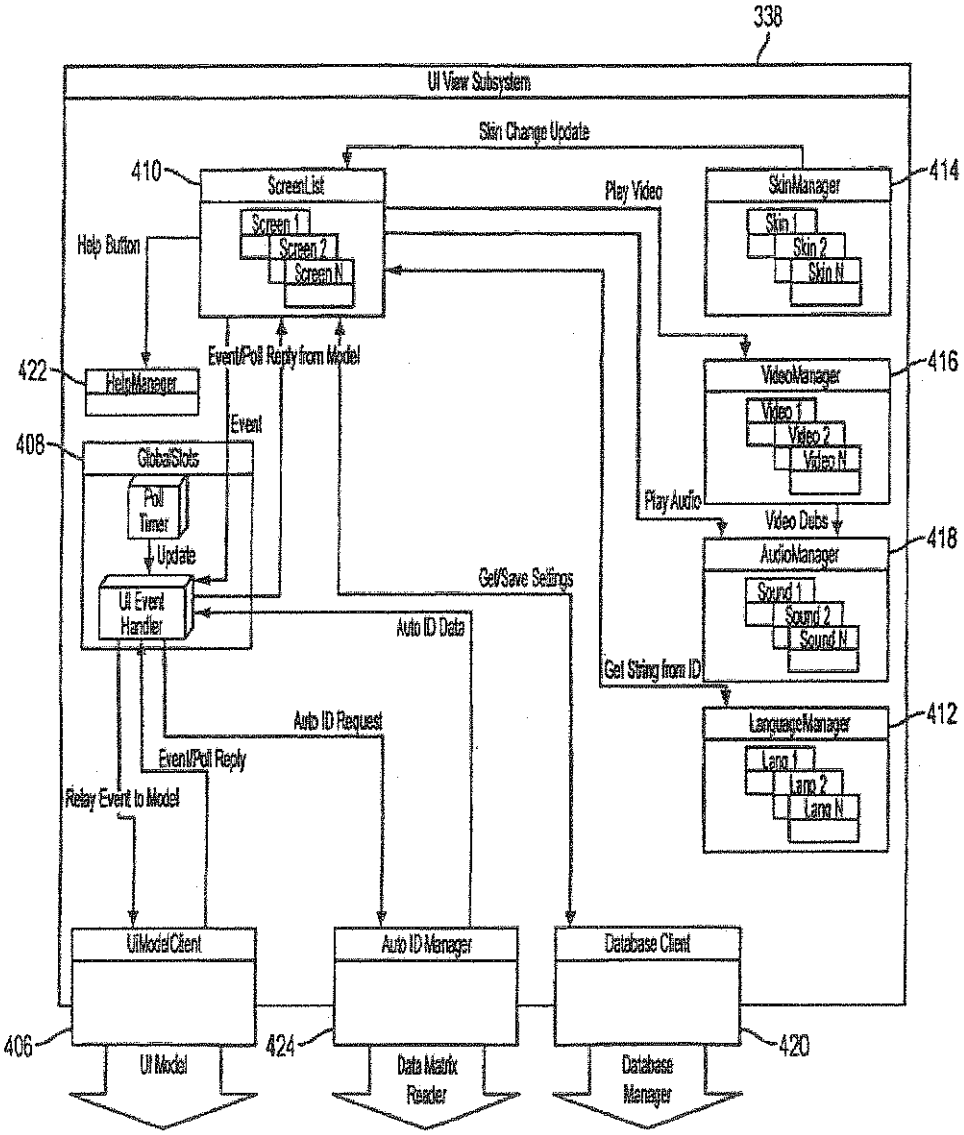

338
UI View Subsystem
Skin Change Update
410
ScreenList
Screen 1
Screen 2
Screen N
Help Button
Play Video
SkinManager
Skin 1
Skin 2
Skin N
414
422
HelpManager
Event/Poll Reply from Model
VideoManager
Video 1
Video 2
Video N
416
408
GlobalSlots
Event
Poll Timer
Update
Play Audio
Video Data
AudioManager
Sound 1
Sound 2
Sound N
418
UI Event Handler
Get/Save Settings
Auto ID Data
Get String from ID
LanguageManager
Lang 1
Lang 2
Lang N
412
Auto ID Request
Event/Poll Reply
Relay Event to Model
UIModelClient
Auto ID Manager
Database Client
406
424
420
UI Model
Data Matrix Reader
Database Manager

FIG. 57

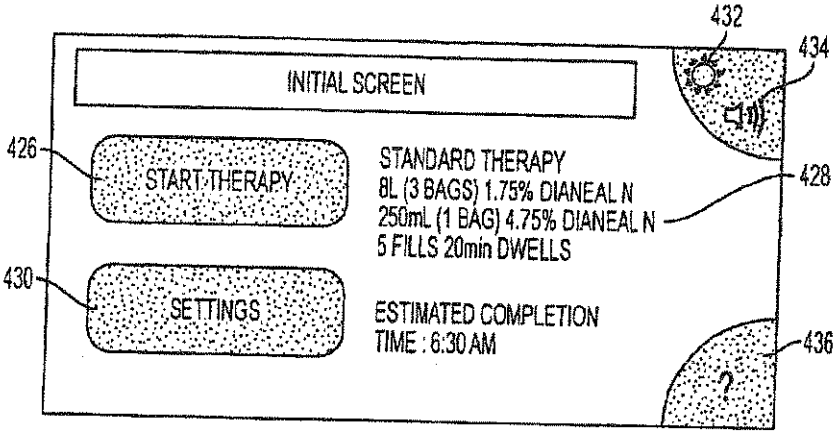

INITIAL SCREEN
START THERAPY
SETTINGS
STANDARD THERAPY
8L (3 BAGS) 1.75% DIANEAL N
250mL (1 BAG) 4.75% DIANEAL N
5 FILLS 20min DWELLS
ESTIMATED COMPLETION
TIME : 6:30 AM
426
428
430
432
434
436
?

FIG. 58

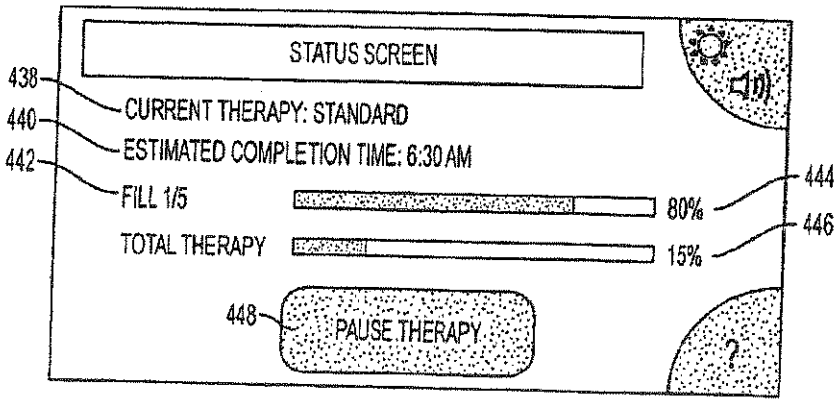

STATUS SCREEN
CURRENT THERAPY: STANDARD
ESTIMATED COMPLETION TIME: 6:30 AM
FILL 1/5
80%
TOTAL THERAPY
15%
PAUSE THERAPY
438
440
442
444
446
448
?

FIG. 59

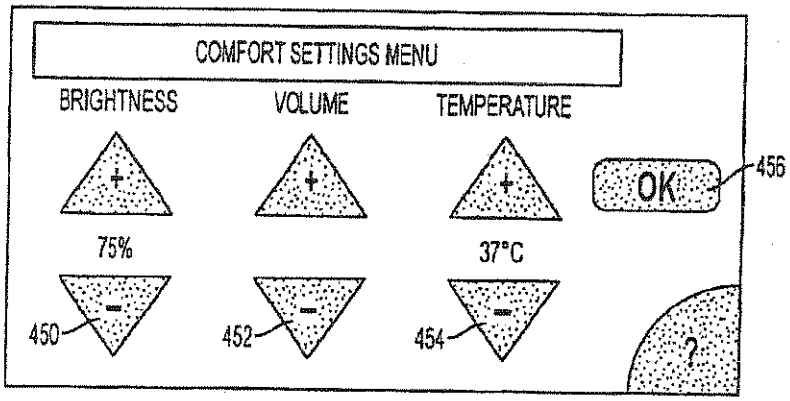

COMFORT SETTINGS MENU
BRIGHTNESS
VOLUME
TEMPERATURE
+
+
+
OK
456
75%
37°C
-
-
-
450
452
454
?

FIG. 60

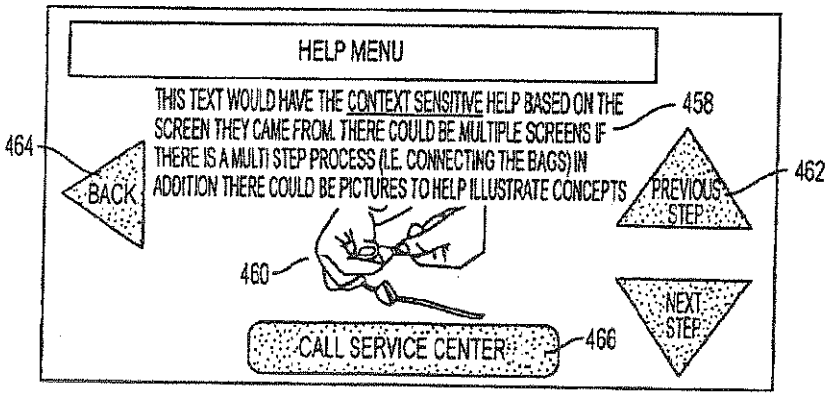

HELP MENU
THIS TEXT WOULD HAVE THE CONTEXT SENSITIVE HELP BASED ON THE SCREEN THEY CAME FROM. THERE COULD BE MULTIPLE SCREENS IF THERE IS A MULTI STEP PROCESS (I.E. CONNECTING THE BAGS) IN ADDITION THERE COULD BE PICTURES TO HELP ILLUSTRATE CONCEPTS
458
464
BACK
PREVIOUS STEP
462
460
NEXT STEP
CALL SERVICE CENTER
466

FIG. 61

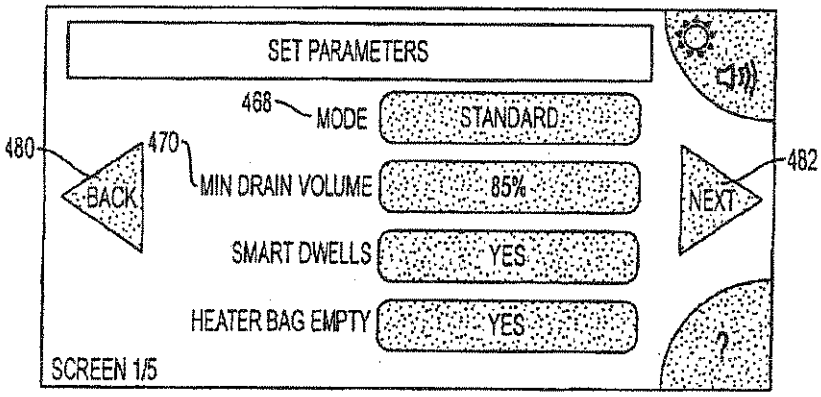

SET PARAMETERS
468
MODE
STANDARD
480
470
BACK
MIN DRAIN VOLUME
85%
482
NEXT
SMART DWELLS
YES
HEATER BAG EMPTY
YES
?
SCREEN 1/5

FIG. 62

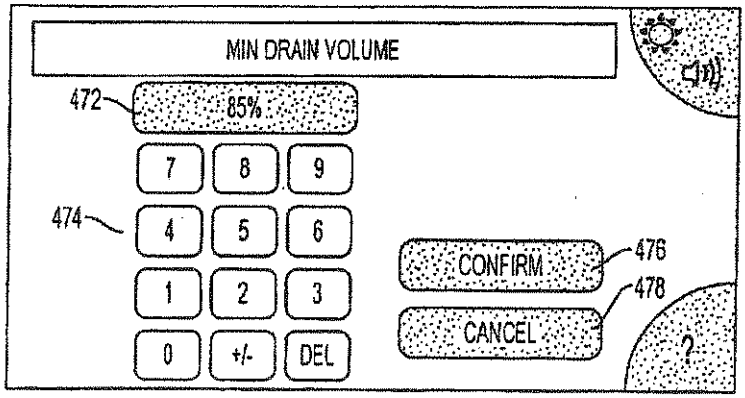

MIN DRAIN VOLUME
472
85%
7
8
9
474
4
5
6
CONFIRM
476
1
2
3
478
CANCEL
0
+/-
DEL
?

FIG. 63

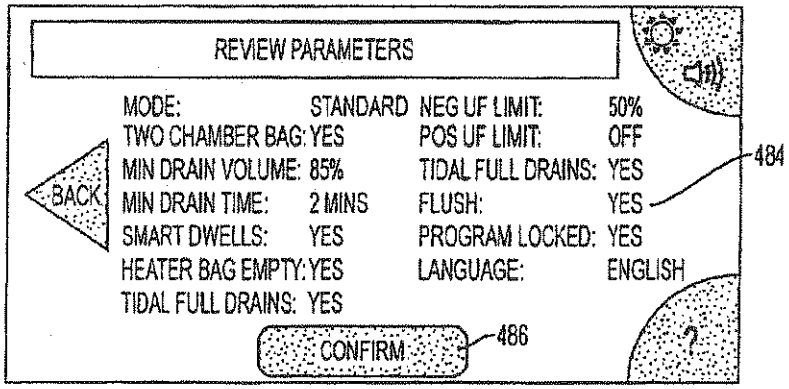

REVIEW PARAMETERS
MODE: STANDARD
TWO CHAMBER BAG: YES
MIN DRAIN VOLUME: 85%
MIN DRAIN TIME: 2 MINS
SMART DWELLS: YES
HEATER BAG EMPTY: YES
TIDAL FULL DRAINS: YES
NEG UF LIMIT: 50%
POS UF LIMIT: OFF
TIDAL FULL DRAINS: YES
FLUSH: YES
PROGRAM LOCKED: YES
LANGUAGE: ENGLISH
BACK
CONFIRM
484
486
?

FIG. 64

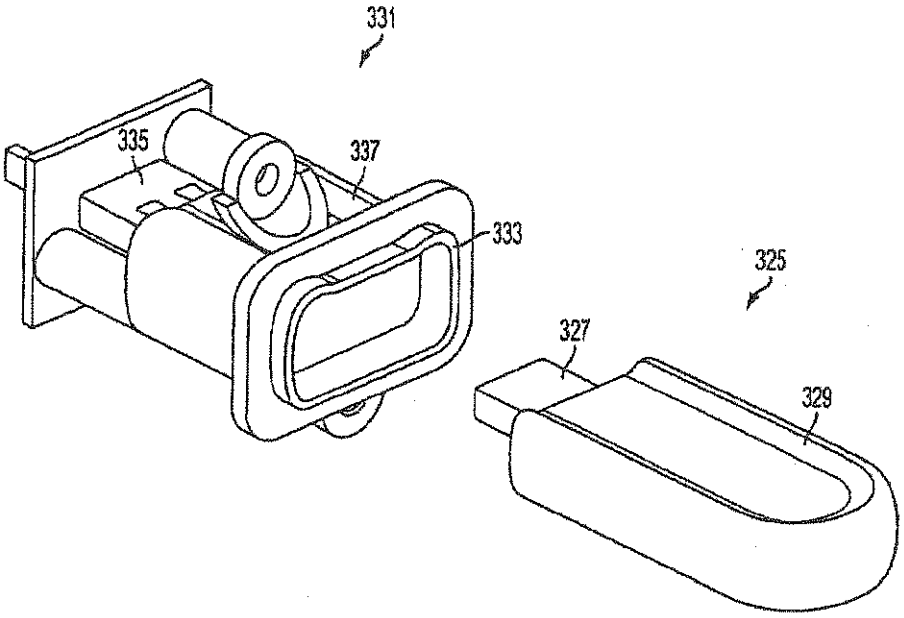


FIG. 65

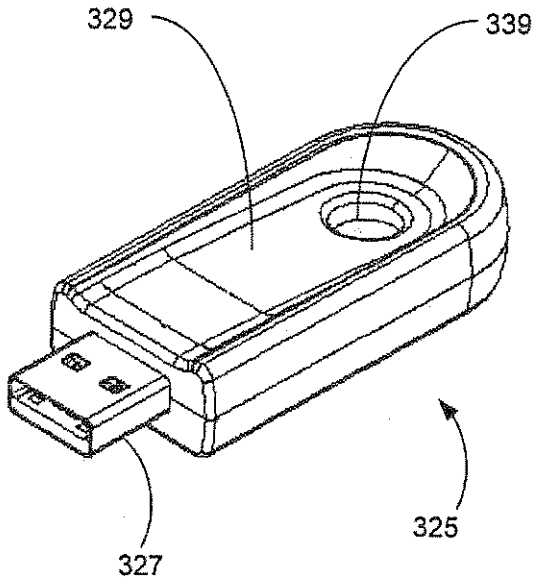


FIG. 65A