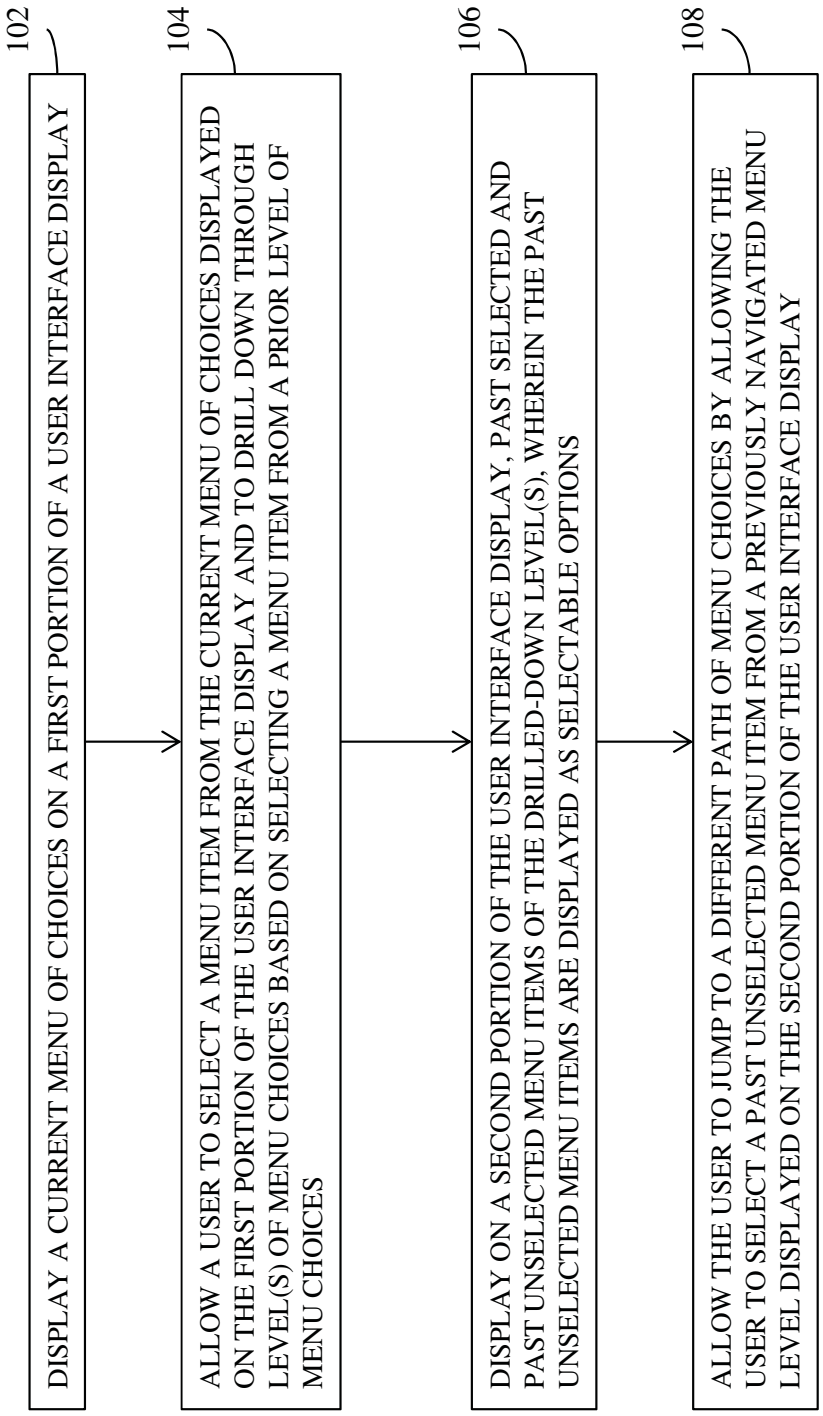

102
DISPLAY A CURRENT MENU OF CHOICES ON A FIRST PORTION OF A USER INTERFACE DISPLAY
104
ALLOW A USER TO SELECT A MENU ITEM FROM THE CURRENT MENU OF CHOICES DISPLAYED ON THE FIRST PORTION OF THE USER INTERFACE DISPLAY AND TO DRILL DOWN THROUGH LEVEL(S) OF MENU CHOICES BASED ON SELECTING A MENU ITEM FROM A PRIOR LEVEL OF MENU CHOICES
106
DISPLAY ON A SECOND PORTION OF THE USER INTERFACE DISPLAY, PAST SELECTED AND PAST UNSELECTED MENU ITEMS OF THE DRILLED-DOWN LEVEL(S), WHEREIN THE PAST UNSELECTED MENU ITEMS ARE DISPLAYED AS SELECTABLE OPTIONS
108
ALLOW THE USER TO JUMP TO A DIFFERENT PATH OF MENU CHOICES BY ALLOWING THE USER TO SELECT A PAST UNSELECTED MENU ITEM FROM A PREVIOUSLY NAVIGATED MENU LEVEL DISPLAYED ON THE SECOND PORTION OF THE USER INTERFACE DISPLAY

FIG. 1

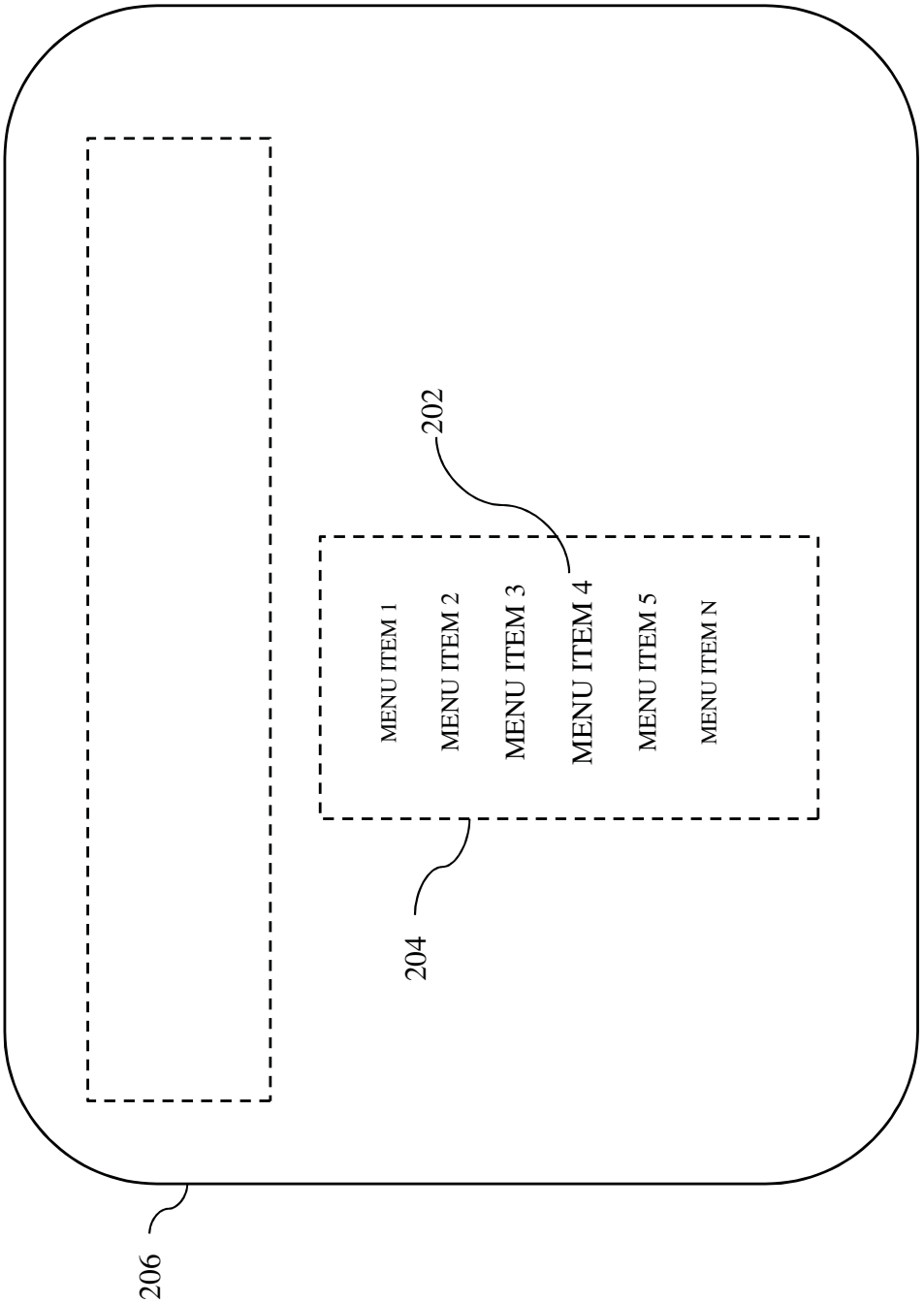

MENU ITEM 1
MENU ITEM 2
MENU ITEM 3
MENU ITEM 4
MENU ITEM 5
MENU ITEM N
202
204
206

FIG. 2A

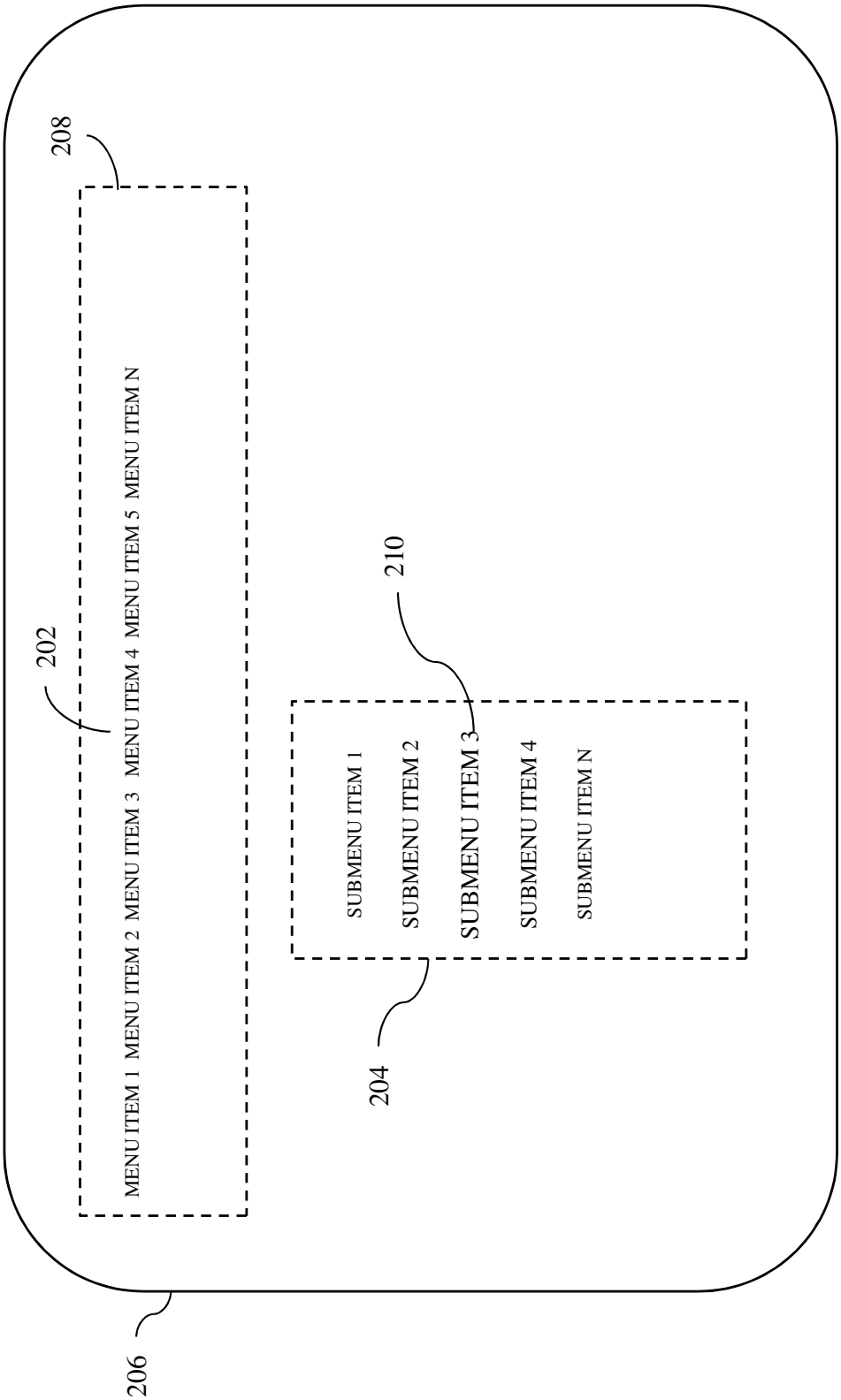

208
202
MENU ITEM 1
MENU ITEM 2
MENU ITEM 3
MENU ITEM 4
MENU ITEM 5
MENU ITEM N
210
SUBMENU ITEM 1
SUBMENU ITEM 2
SUBMENU ITEM 3
SUBMENU ITEM 4
SUBMENU ITEM N
204
206

FIG. 2B

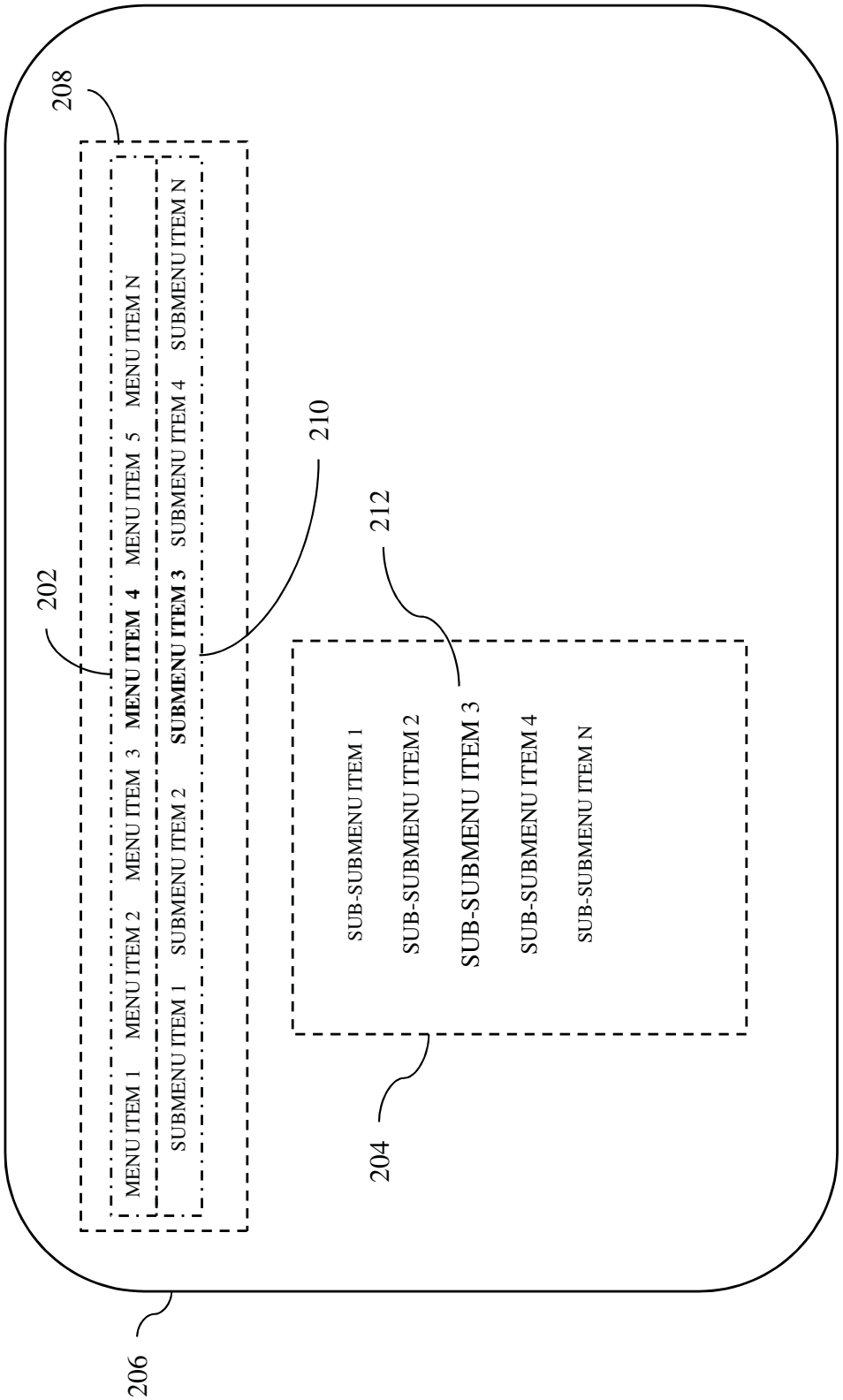

208
MENU ITEM 1
MENU ITEM 2
MENU ITEM 3
MENU ITEM 4
MENU ITEM 5
MENU ITEM N
SUBMENU ITEM 1
SUBMENU ITEM 2
SUBMENU ITEM 3
SUBMENU ITEM 4
SUBMENU ITEM N
202
210
212
SUB-SUBMENU ITEM 1
SUB-SUBMENU ITEM 2
SUB-SUBMENU ITEM 3
SUB-SUBMENU ITEM 4
SUB-SUBMENU ITEM N
204
206

FIG. 2C

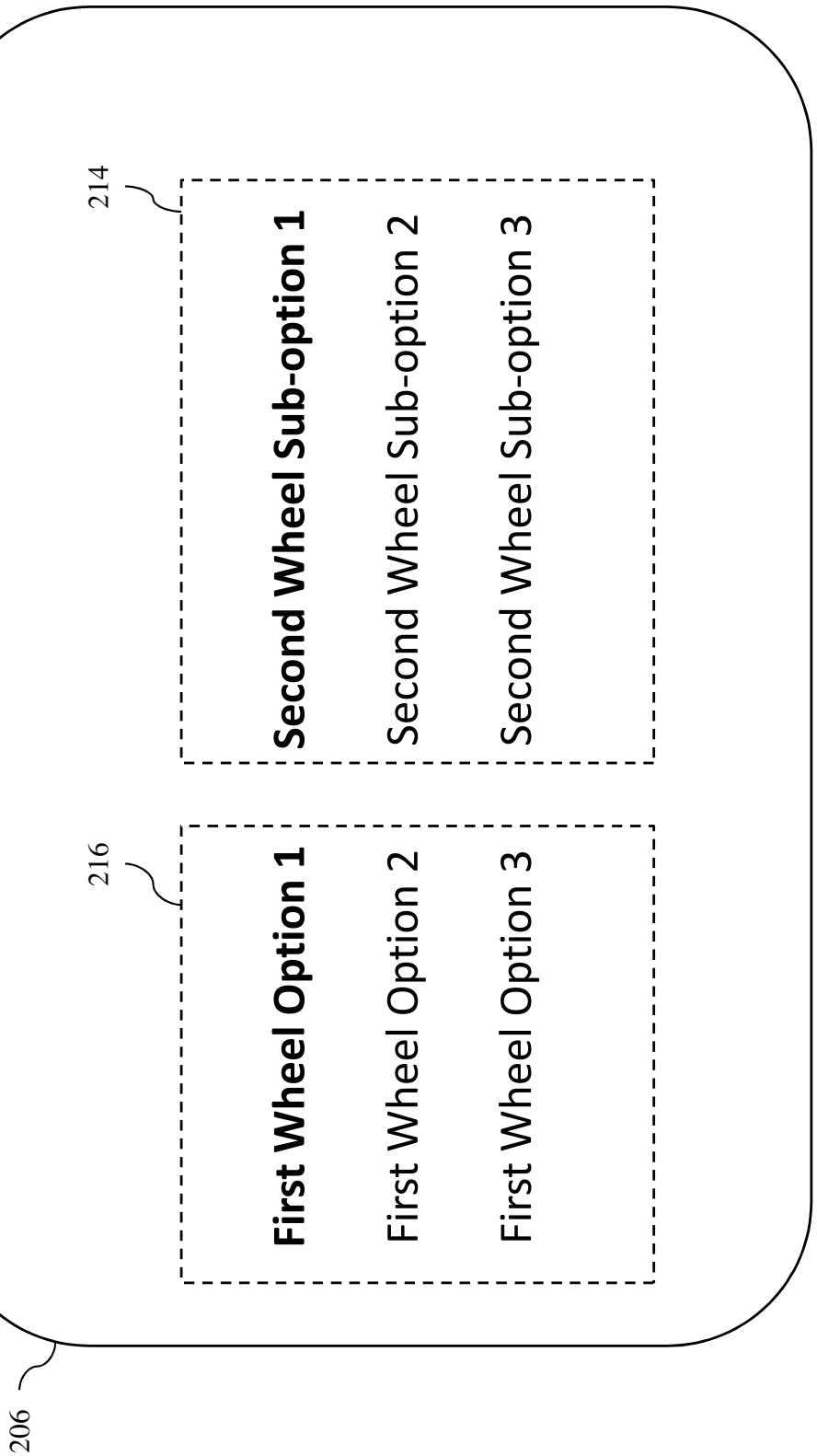

206
216
First Wheel Option 1
First Wheel Option 2
First Wheel Option 3
214
Second Wheel Sub-option 1
Second Wheel Sub-option 2
Second Wheel Sub-option 3

FIG. 2D

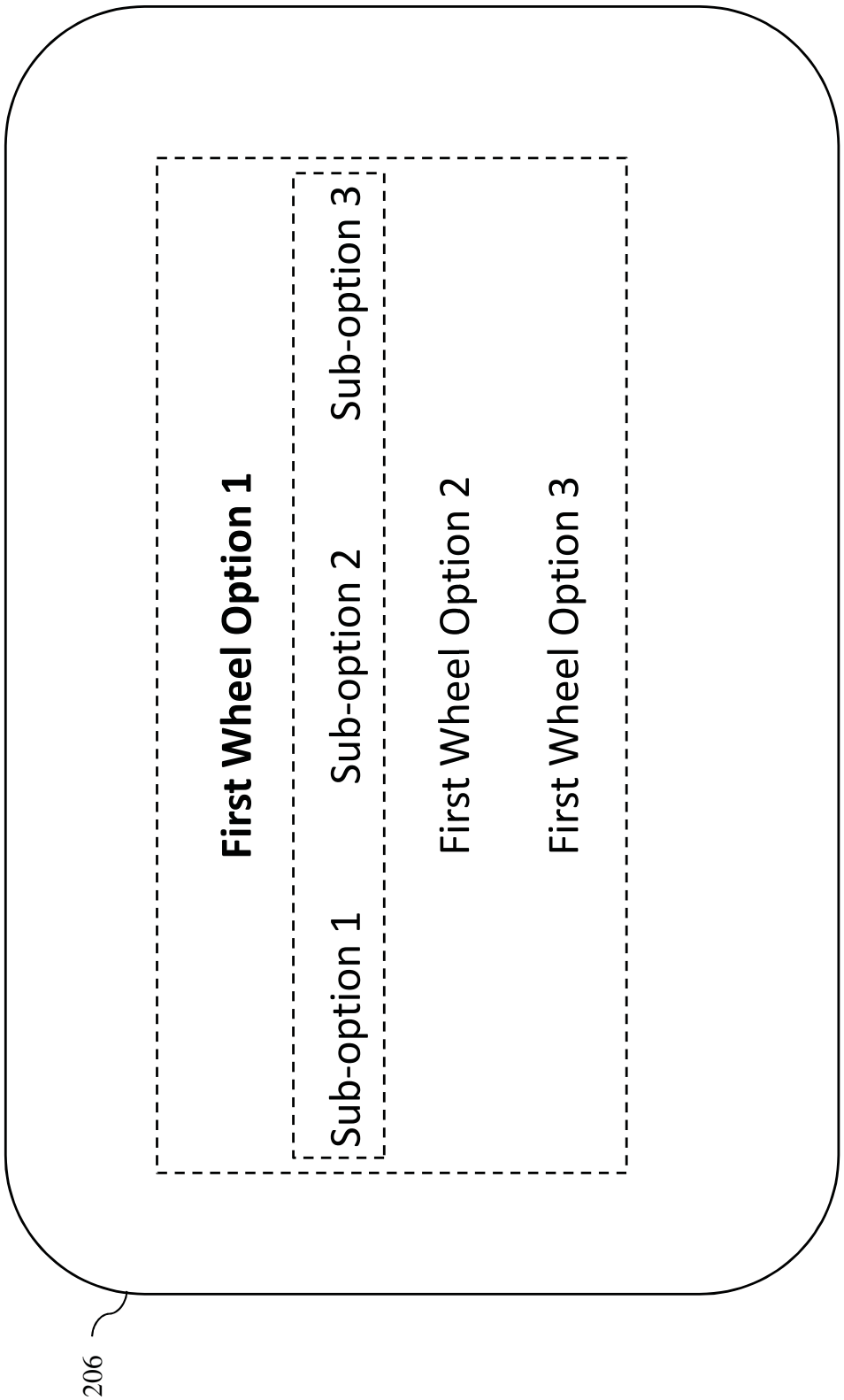

206
First Wheel Option 1
Sub-option 1
Sub-option 2
Sub-option 3
First Wheel Option 2
First Wheel Option 3

FIG. 2E

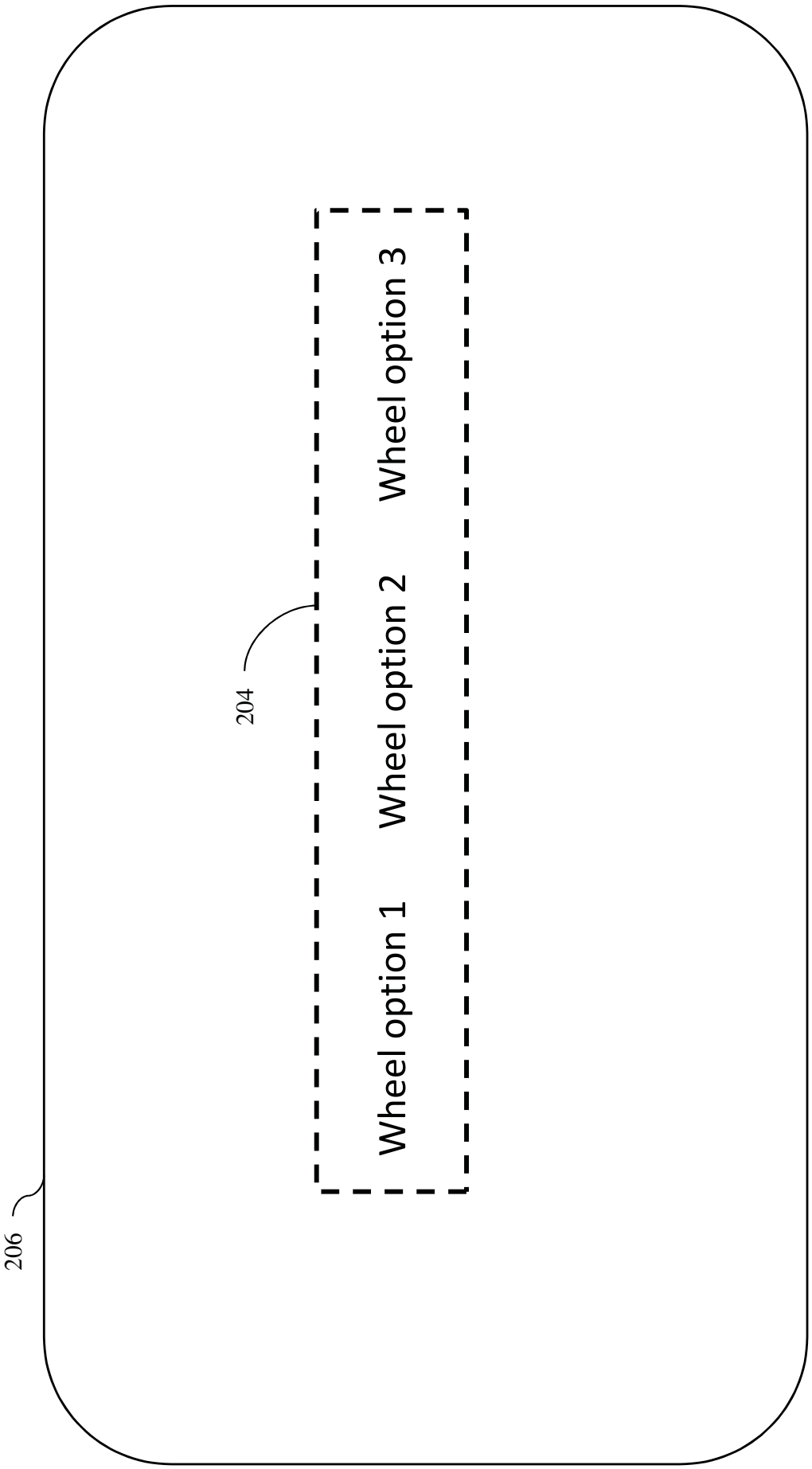


FIG. 2F

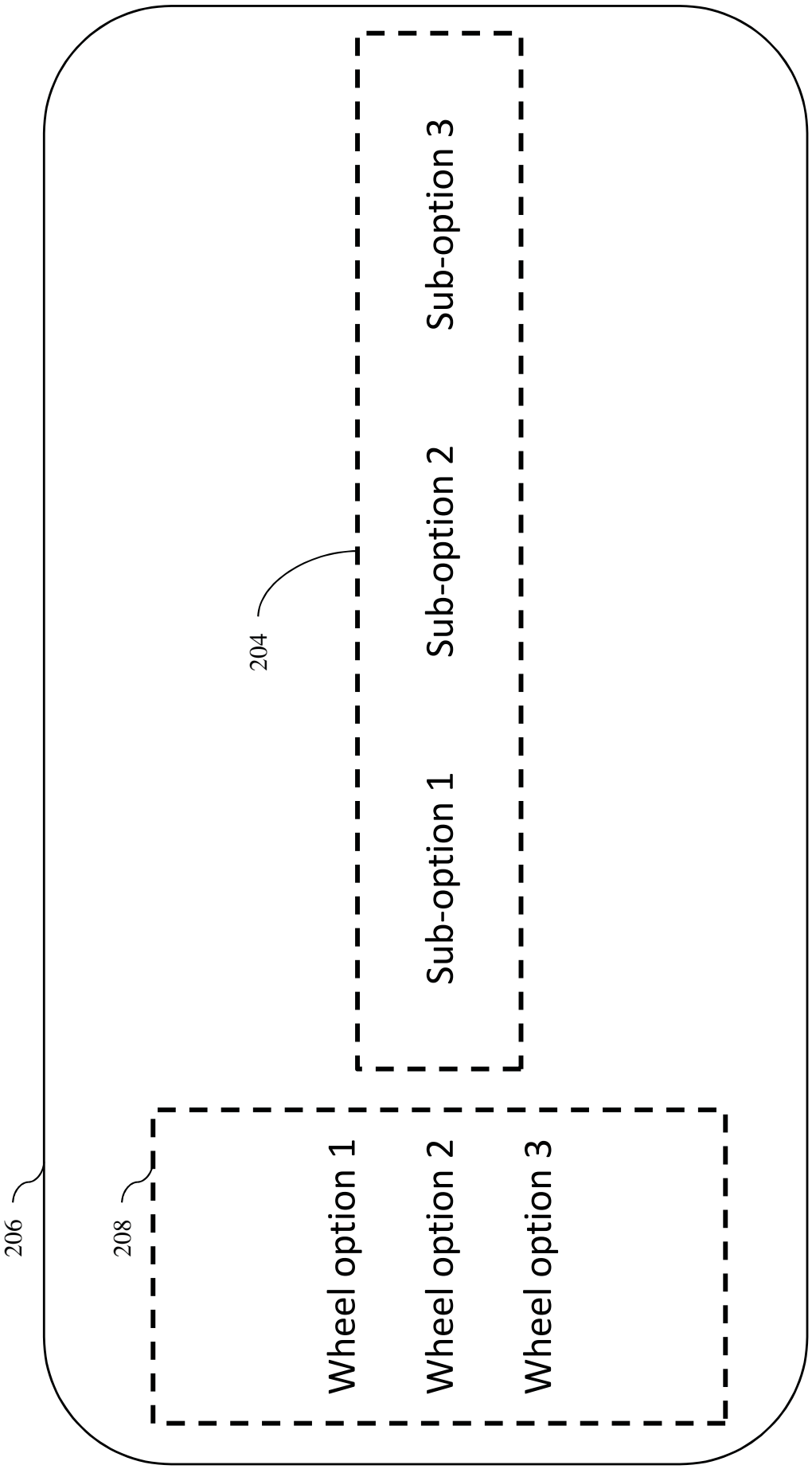

206
208
Wheel option 1
Wheel option 2
Wheel option 3
204
Sub-option 1
Sub-option 2
Sub-option 3

FIG. 2G

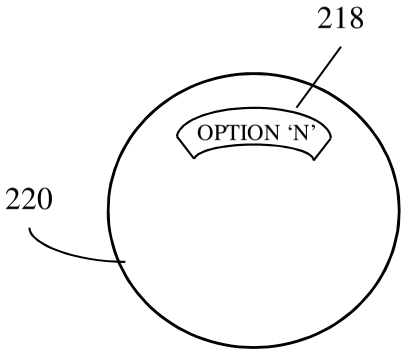


FIG. 2H

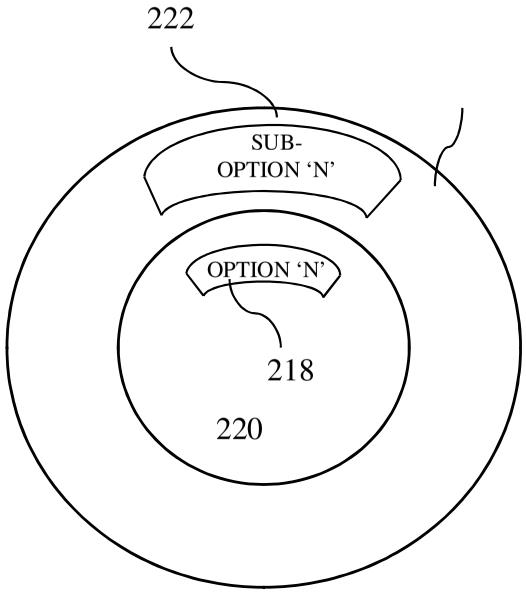


FIG. 2I

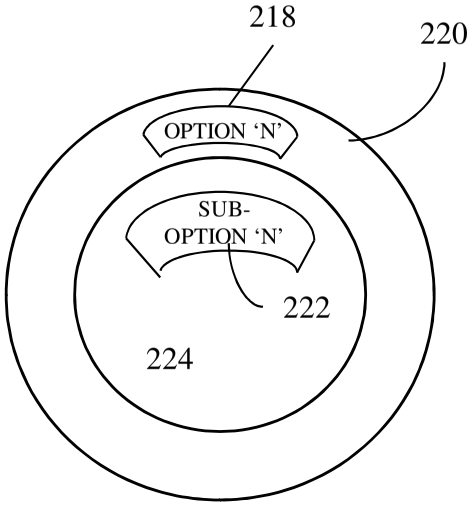


FIG. 2J

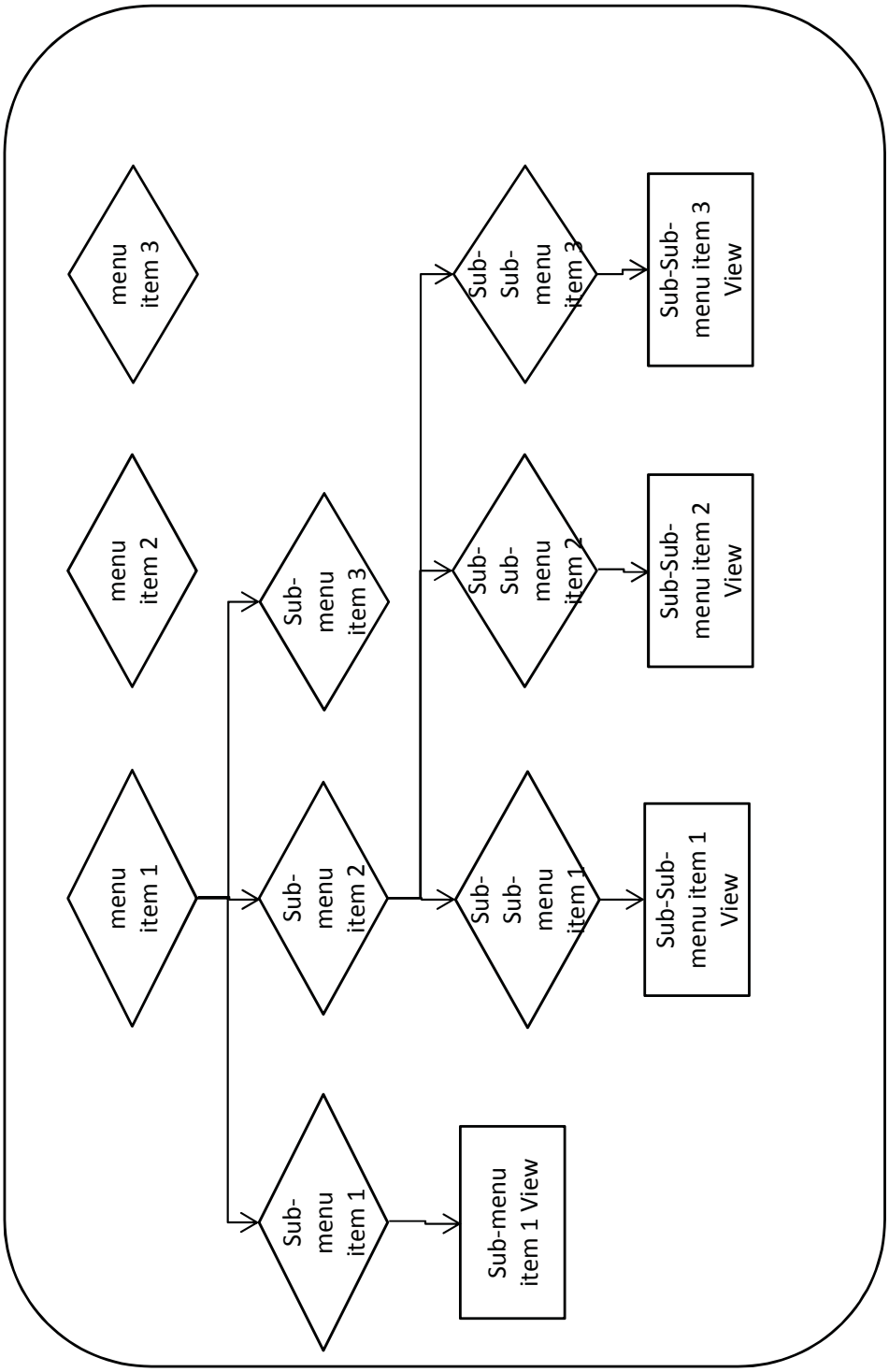

menu item 1
menu item 2
menu item 3
Sub-menu item 1
Sub-menu item 2
Sub-menu item 3
Sub-Sub-menu item 1
Sub-Sub-menu item 2
Sub-Sub-menu item 3
Sub-menu item 1 View
Sub-Sub-menu item 1 View
Sub-Sub-menu item 2 View
Sub-Sub-menu item 3 View

FIG. 2K

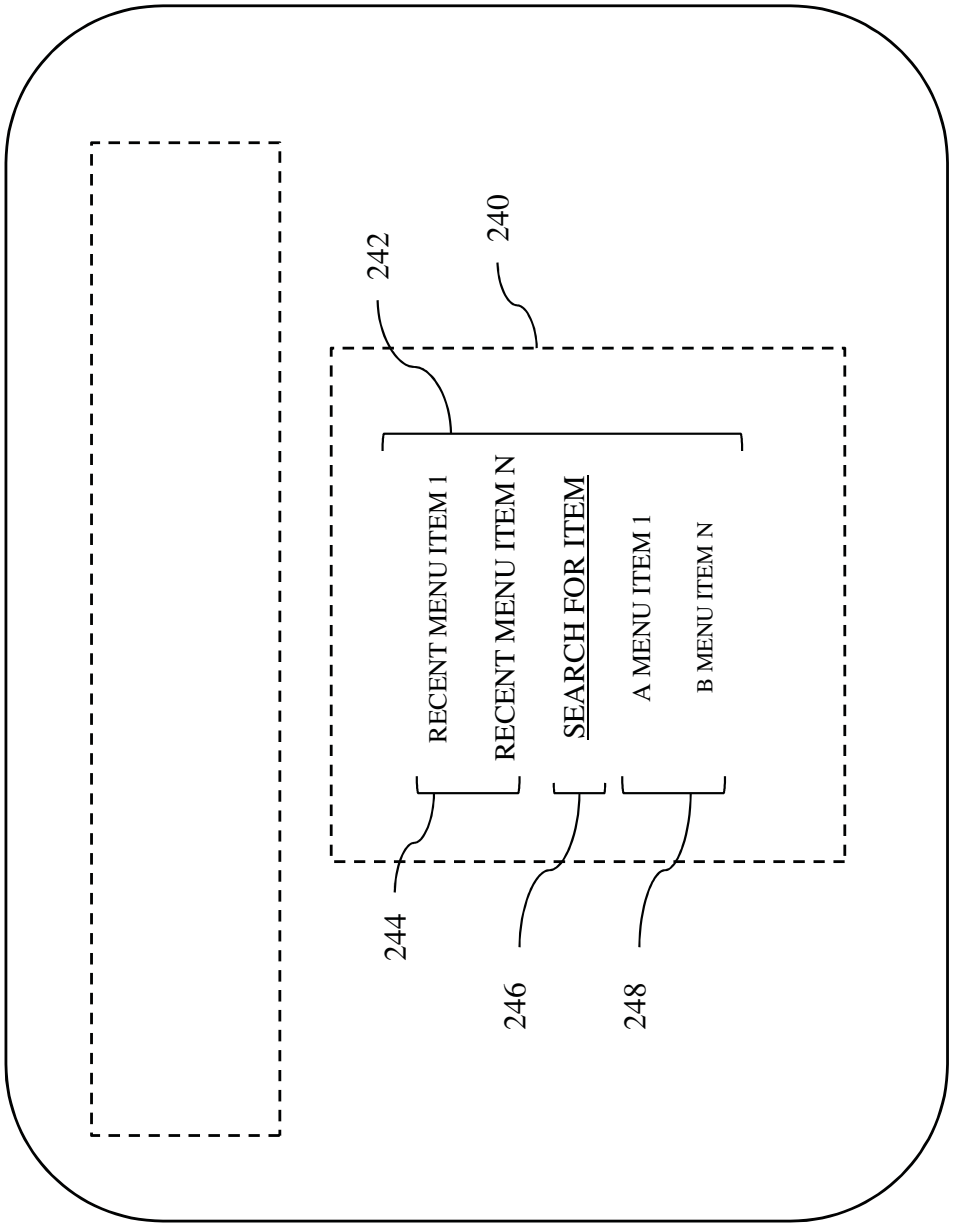

242
240
RECENT MENU ITEM 1
RECENT MENU ITEM N
SEARCH FOR ITEM
A MENU ITEM 1
B MENU ITEM N
244
246
248

FIG. 2L

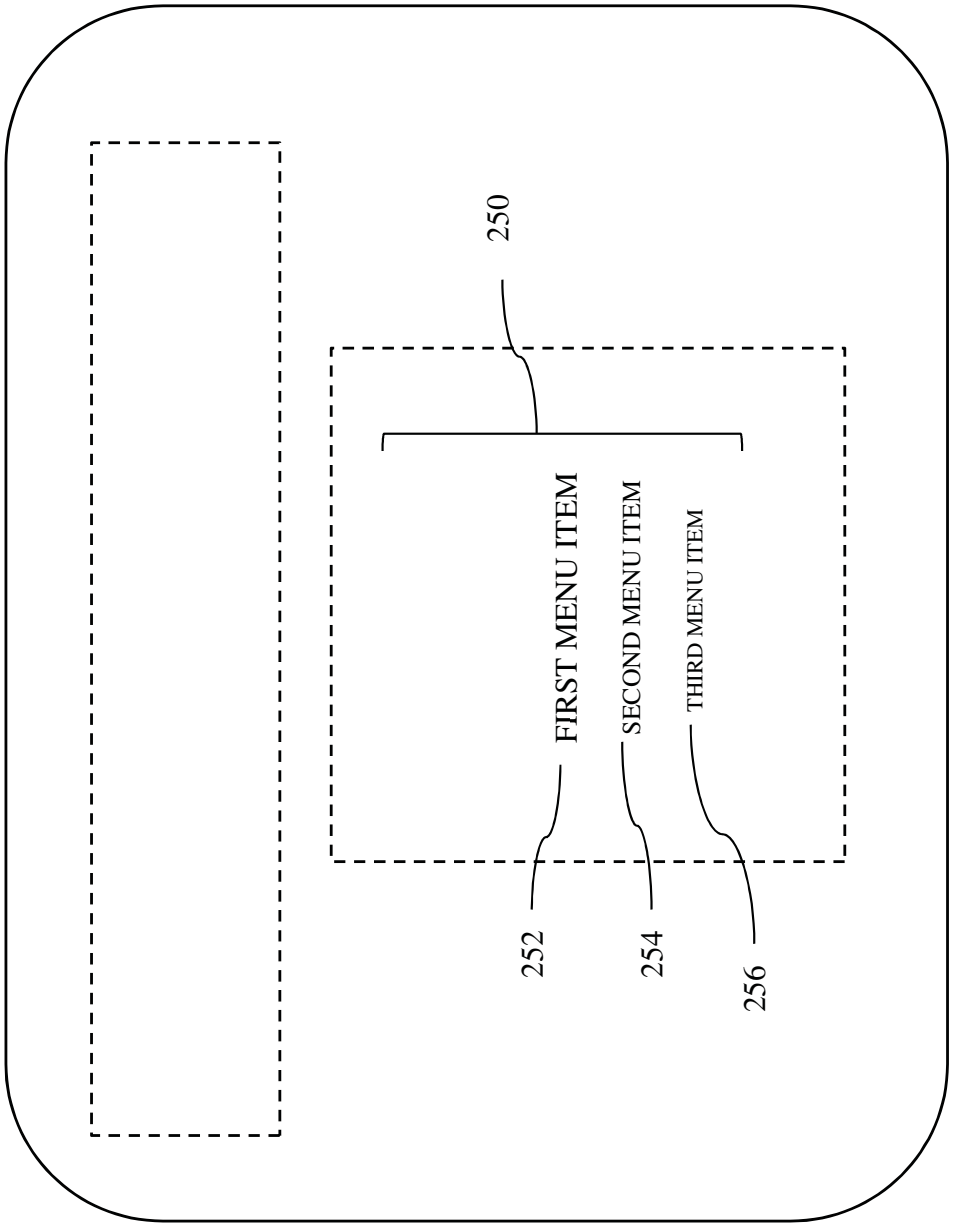

250
FIRST MENU ITEM
SECOND MENU ITEM
THIRD MENU ITEM
252
254
256

FIG. 2M

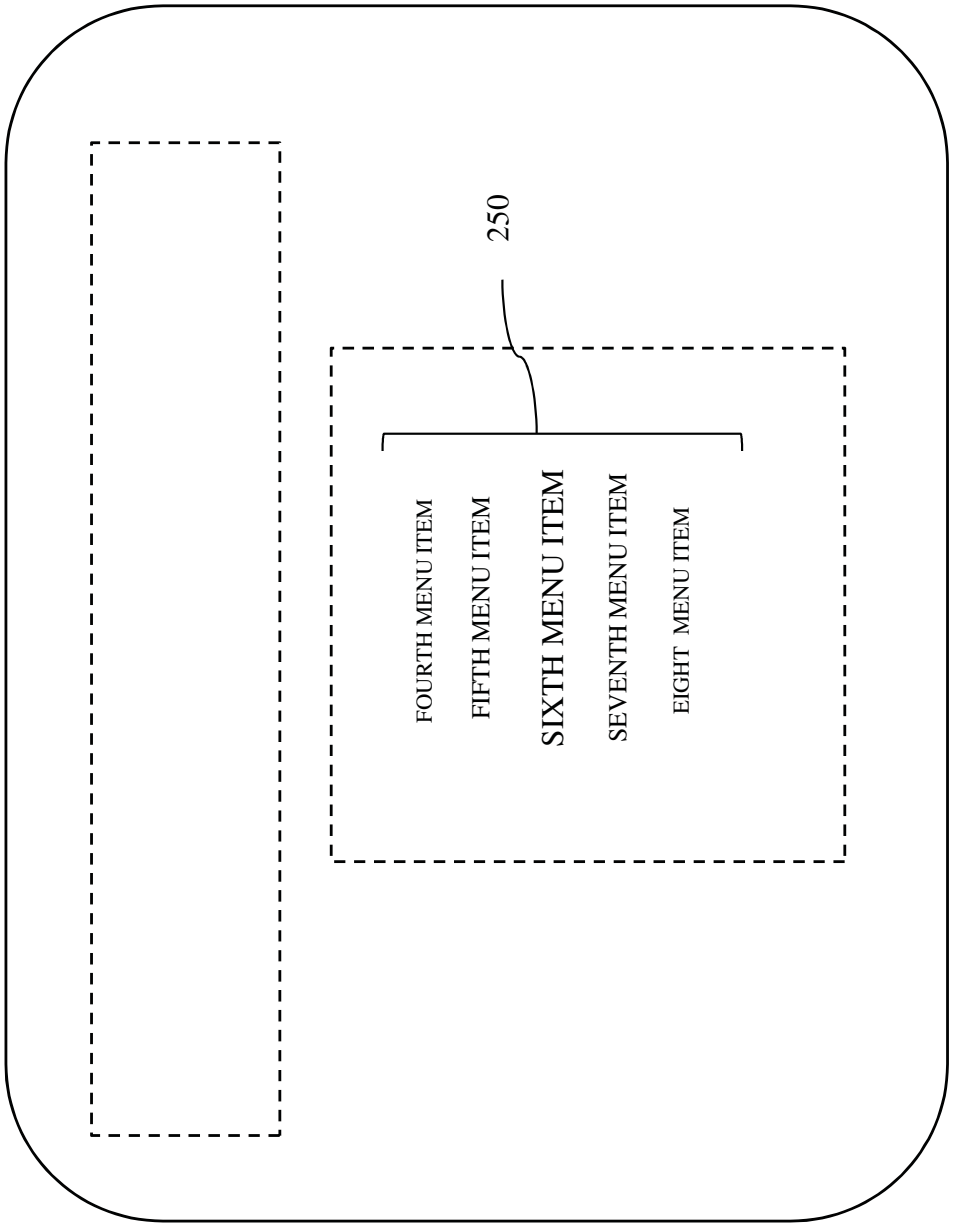

250
FOURTH MENU ITEM
FIFTH MENU ITEM
SIXTH MENU ITEM
SEVENTH MENU ITEM
EIGHT MENU ITEM

FIG. 2N

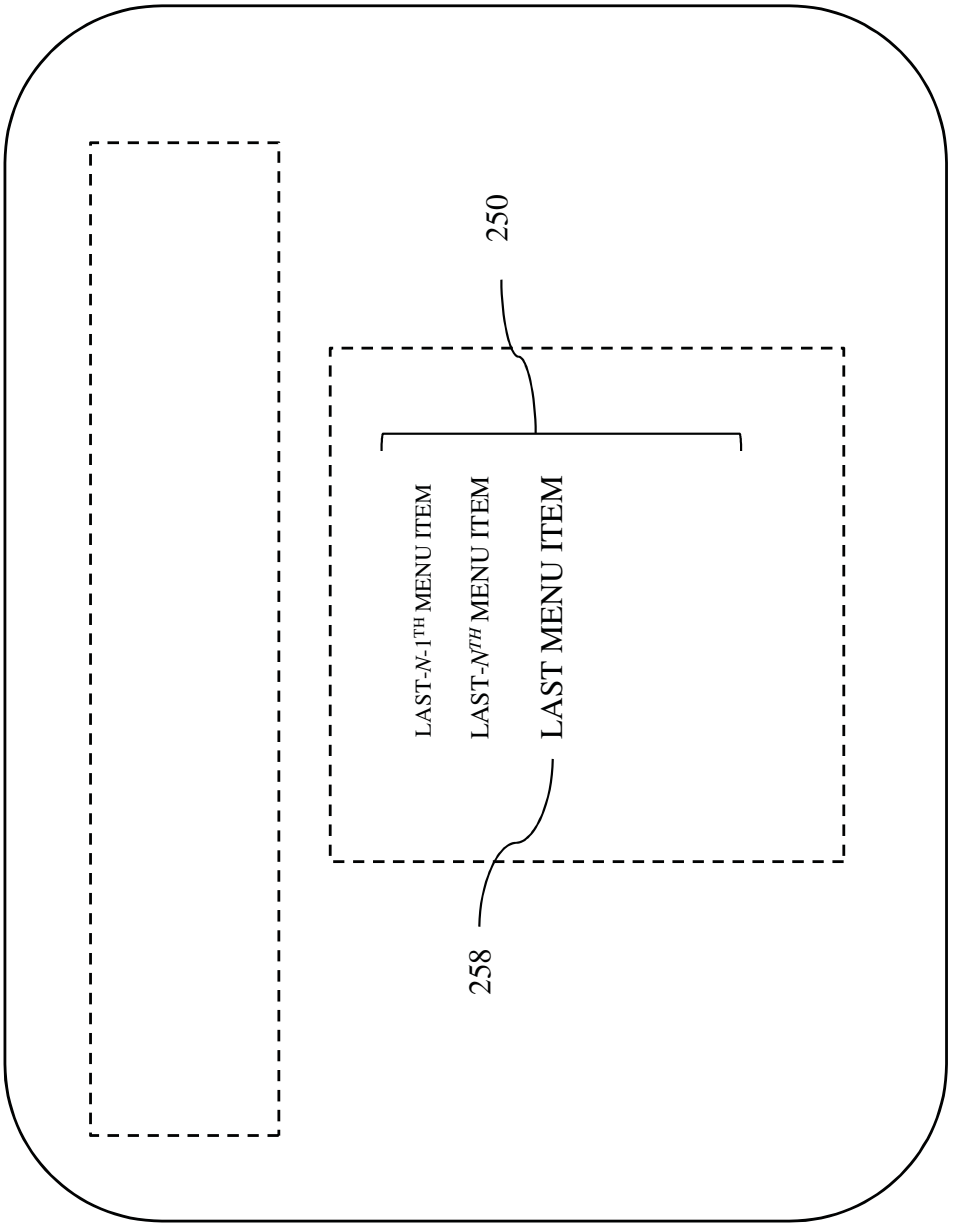


FIG. 2O

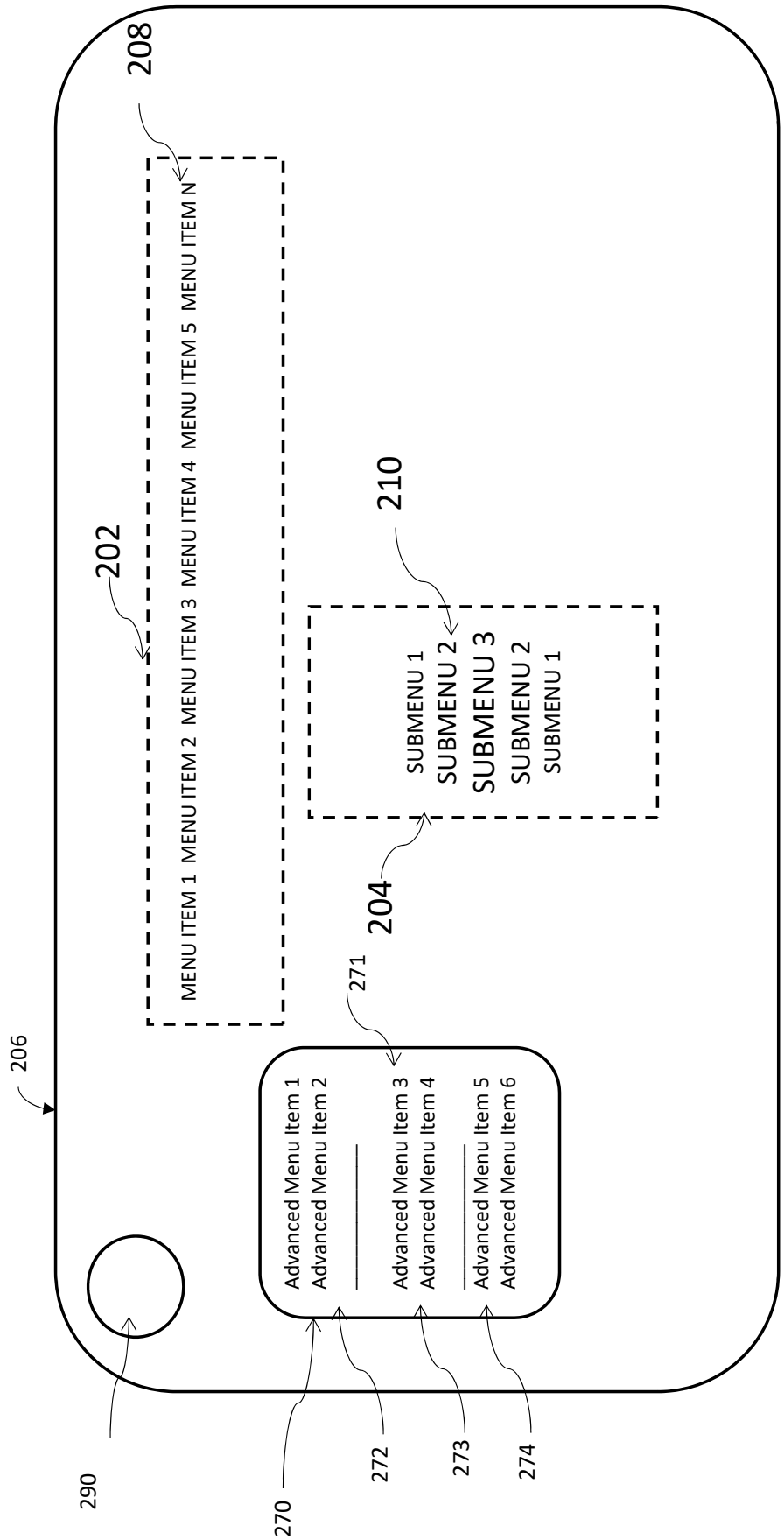

206
208
MENU ITEM 1 MENU ITEM 2 MENU ITEM 3 MENU ITEM 4 MENU ITEM 5 MENU ITEM N
202
210
SUBMENU 1
SUBMENU 2
SUBMENU 3
SUBMENU 2
SUBMENU 1
204
271
Advanced Menu Item 1
Advanced Menu Item 2
Advanced Menu Item 3
Advanced Menu Item 4
Advanced Menu Item 5
Advanced Menu Item 6
290
270
272
273
274

FIG. 2P

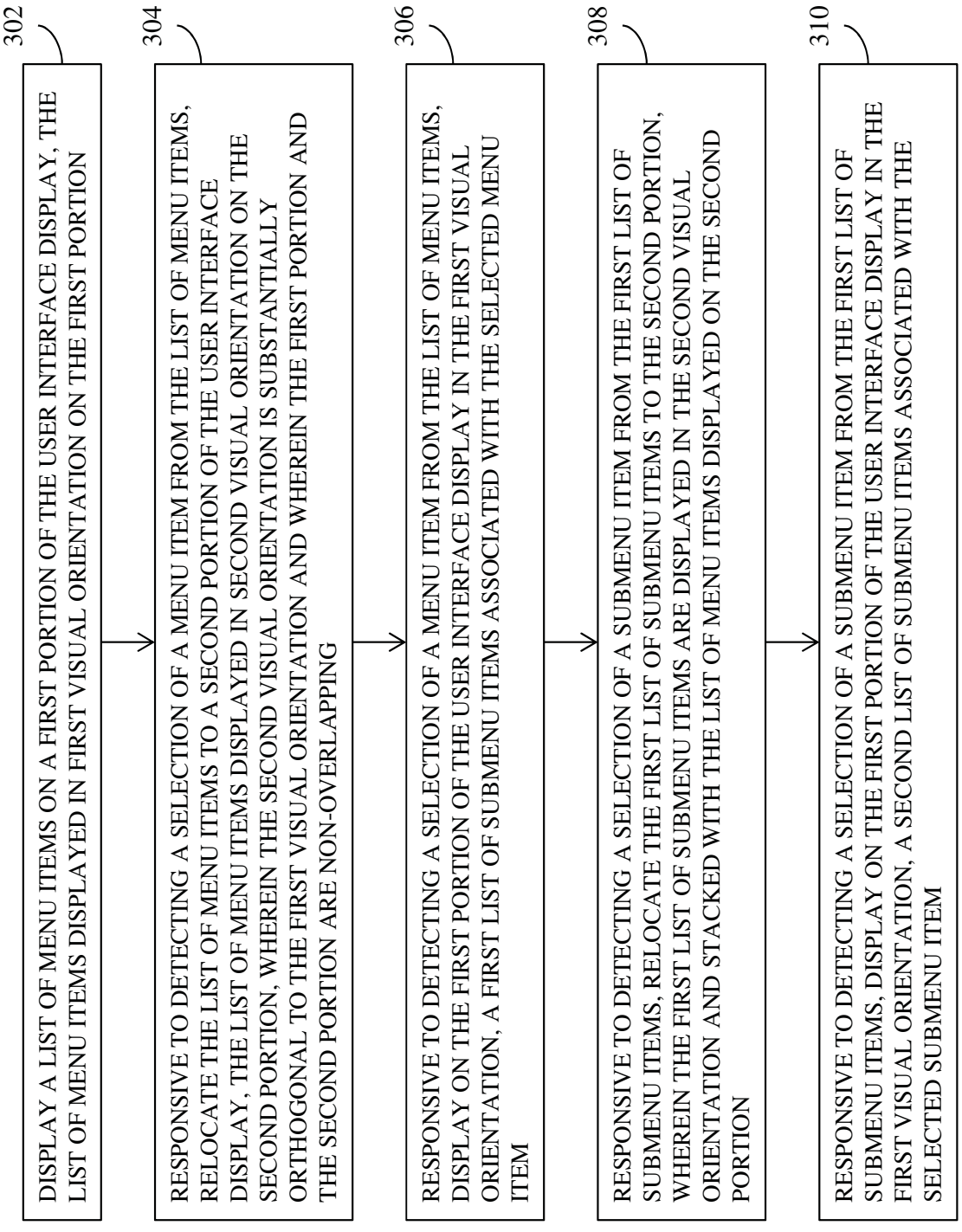

302
DISPLAY A LIST OF MENU ITEMS ON A FIRST PORTION OF THE USER INTERFACE DISPLAY, THE LIST OF MENU ITEMS DISPLAYED IN FIRST VISUAL ORIENTATION ON THE FIRST PORTION
304
RESPONSIVE TO DETECTING A SELECTION OF A MENU ITEM FROM THE LIST OF MENU ITEMS, RELOCATE THE LIST OF MENU ITEMS TO A SECOND PORTION OF THE USER INTERFACE DISPLAY, THE LIST OF MENU ITEMS DISPLAYED IN SECOND VISUAL ORIENTATION ON THE SECOND PORTION, WHEREIN THE SECOND VISUAL ORIENTATION IS SUBSTANTIALLY ORTHOGONAL TO THE FIRST VISUAL ORIENTATION AND WHEREIN THE FIRST PORTION AND THE SECOND PORTION ARE NON-OVERLAPPING
306
RESPONSIVE TO DETECTING A SELECTION OF A MENU ITEM FROM THE LIST OF MENU ITEMS, DISPLAY ON THE FIRST PORTION OF THE USER INTERFACE DISPLAY IN THE FIRST VISUAL ORIENTATION, A FIRST LIST OF SUBMENU ITEMS ASSOCIATED WITH THE SELECTED MENU ITEM
308
RESPONSIVE TO DETECTING A SELECTION OF A SUBMENU ITEM FROM THE FIRST LIST OF SUBMENU ITEMS, RELOCATE THE FIRST LIST OF SUBMENU ITEMS TO THE SECOND PORTION, WHEREIN THE FIRST LIST OF SUBMENU ITEMS ARE DISPLAYED IN THE SECOND VISUAL ORIENTATION AND STACKED WITH THE LIST OF MENU ITEMS DISPLAYED ON THE SECOND PORTION
310
RESPONSIVE TO DETECTING A SELECTION OF A SUBMENU ITEM FROM THE FIRST LIST OF SUBMENU ITEMS, DISPLAY ON THE FIRST PORTION OF THE USER INTERFACE DISPLAY IN THE FIRST VISUAL ORIENTATION, A SECOND LIST OF SUBMENU ITEMS ASSOCIATED WITH THE SELECTED SUBMENU ITEM

FIG. 3

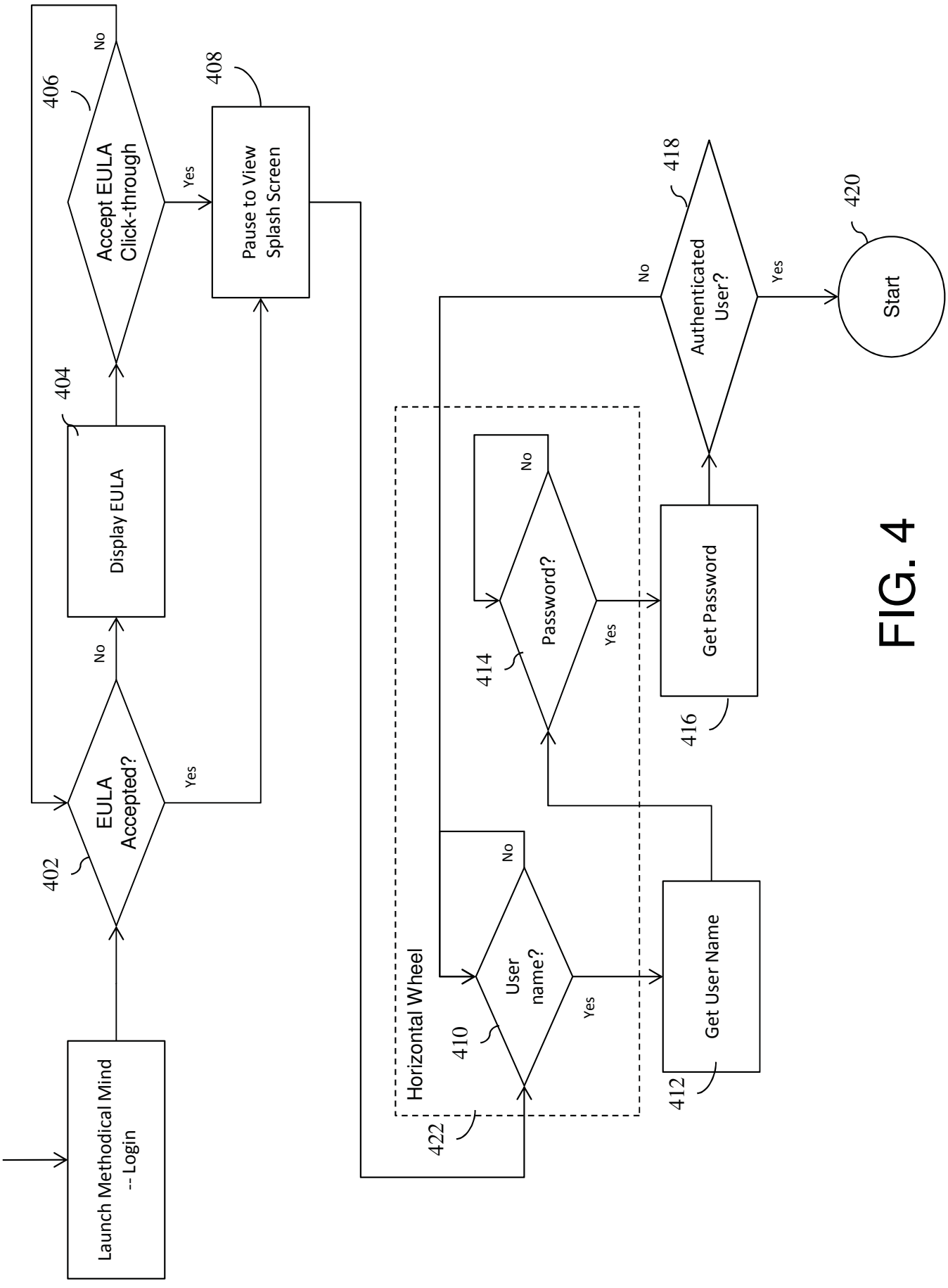

Launch Methodical Mind
-- Login
402
EULA Accepted?
No
Yes
404
Display EULA
406
Accept EULA Click-through
No
Yes
408
Pause to View Splash Screen
Horizontal Wheel
410
User name?
No
Yes
412
Get User Name
414
Password?
No
Yes
416
Get Password
418
Authenticated User?
No
Yes
420
Start
422

FIG. 4

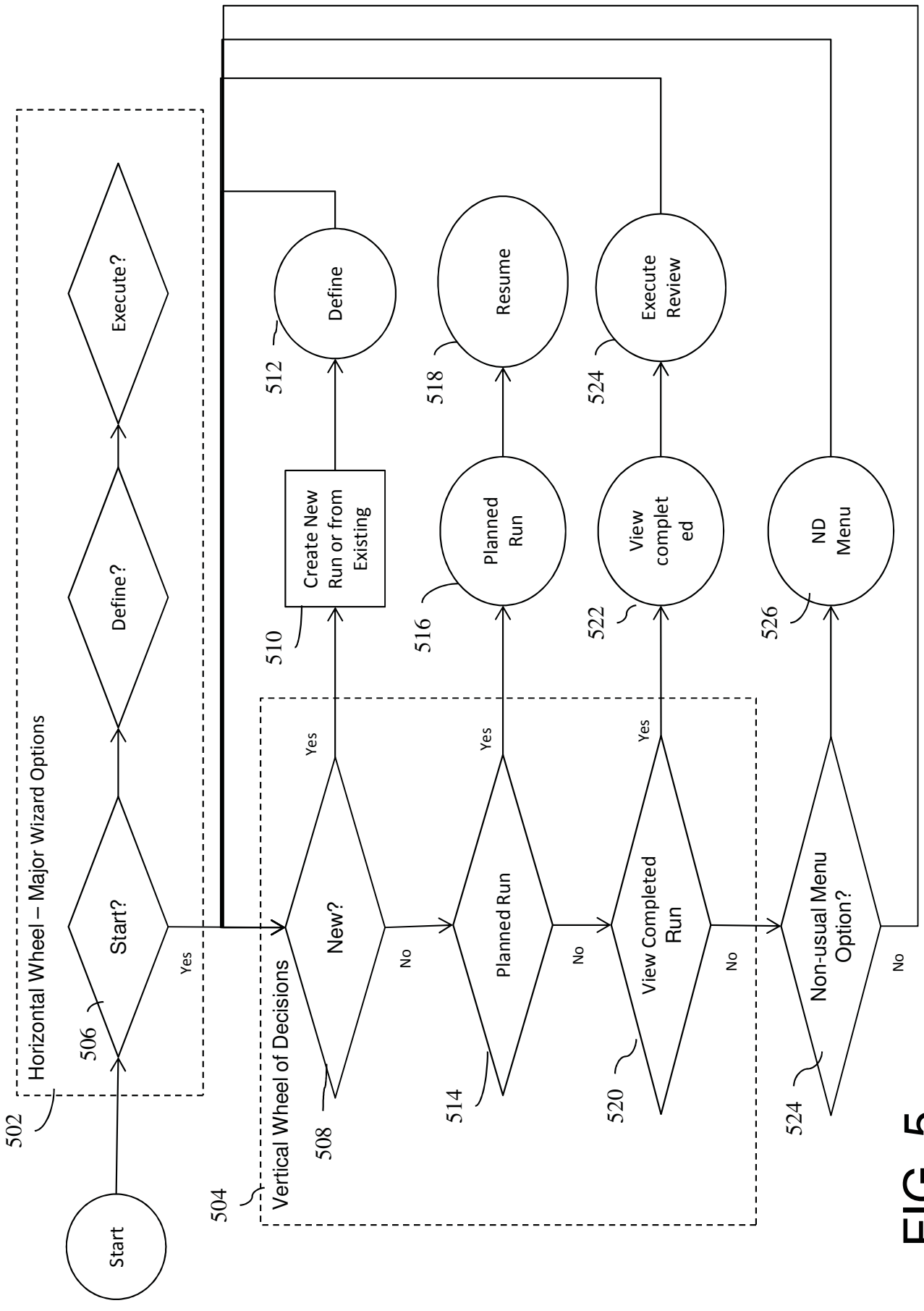

Start
Horizontal Wheel – Major Wizard Options
502
Start?
506
Yes
Define?
Execute?
Vertical Wheel of Decisions
504
New?
508
Yes
No
Create New Run or from Existing
510
Define
512
Planned Run
514
Yes
No
Planned Run
516
Resume
518
View Completed Run
520
Yes
No
View completed
522
Execute Review
524
Non-usual Menu Option?
524
Yes
No
ND Menu
526

FIG. 5

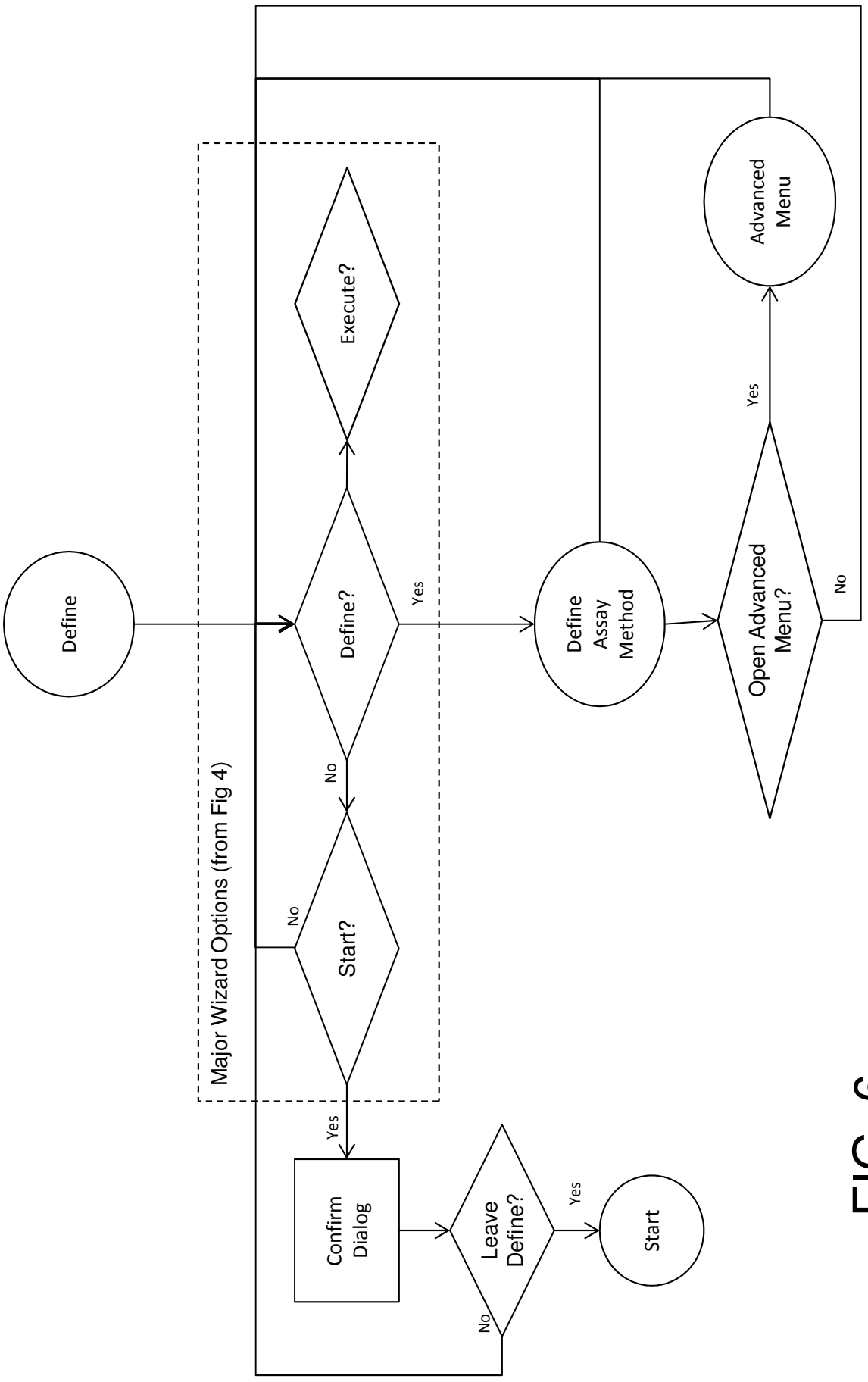

Define
Major Wizard Options (from Fig 4)
Define?
Yes
No
Execute?
Start?
No
Yes
Confirm Dialog
Leave Define?
Yes
No
Start
Define Assay Method
Open Advanced Menu?
Yes
No
Advanced Menu

FIG. 6

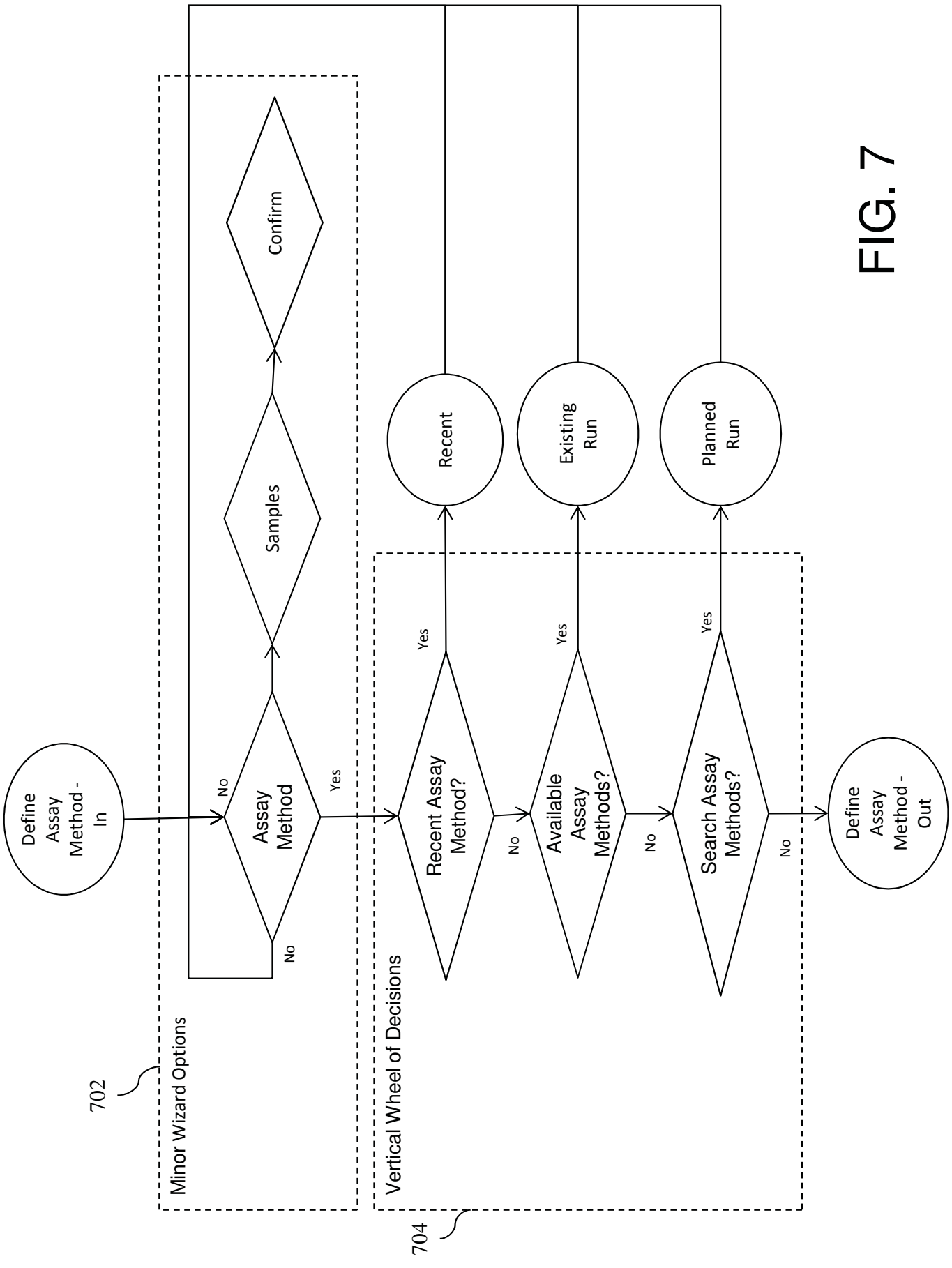

Define Assay Method - In
Assay Method
No
Yes
No
Samples
Confirm
Minor Wizard Options
702
Recent
Existing Run
Planned Run
Recent Assay Method?
Available Assay Methods?
Search Assay Methods?
Yes
Yes
Yes
No
No
No
Vertical Wheel of Decisions
704
Define Assay Method - Out

FIG. 7

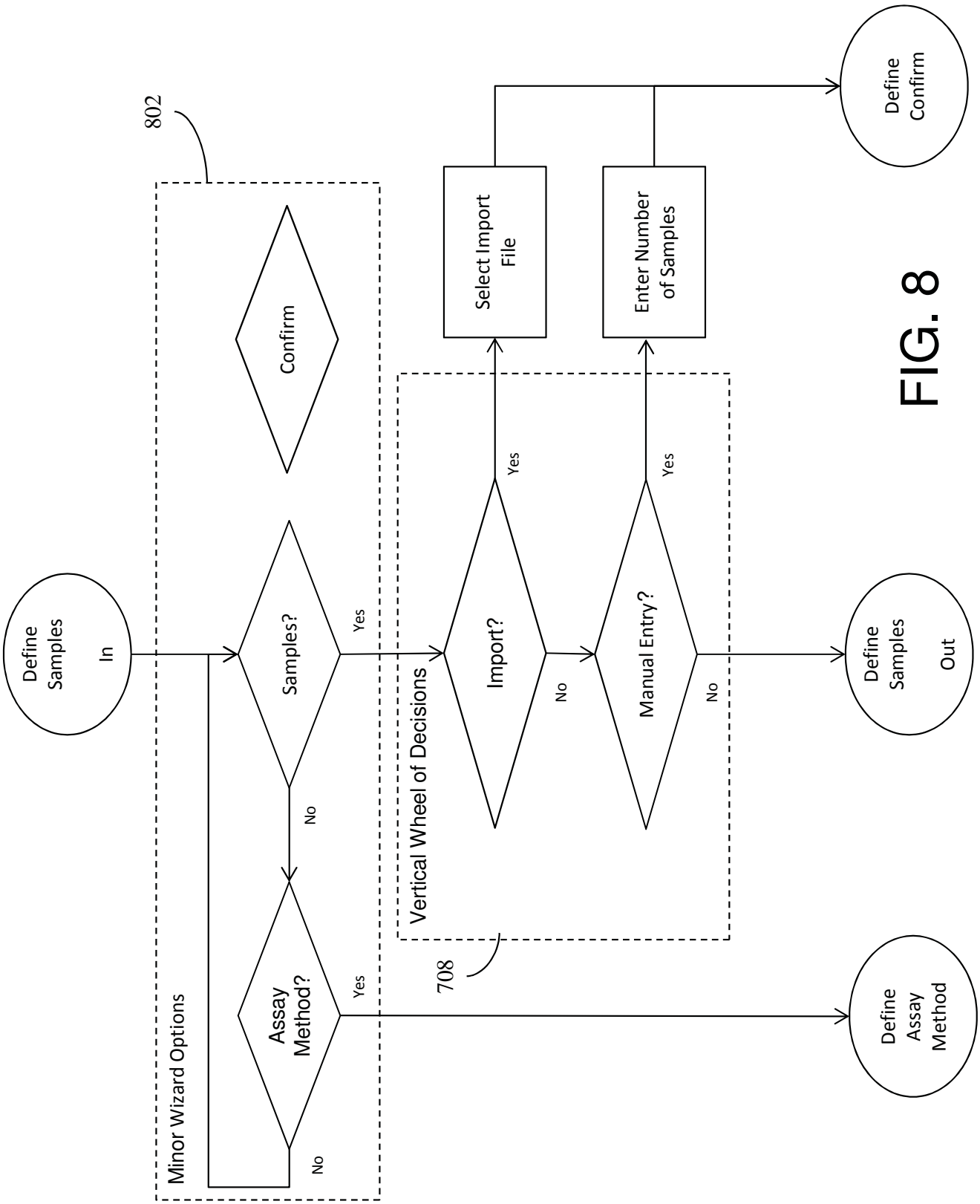

Define Samples In
802
Minor Wizard Options
Samples?
Yes
No
Confirm
Assay Method?
Yes
No
Vertical Wheel of Decisions
708
Import?
Yes
No
Manual Entry?
Yes
No
Select Import File
Enter Number of Samples
Define Confirm
Define Samples Out
Define Assay Method

FIG. 8

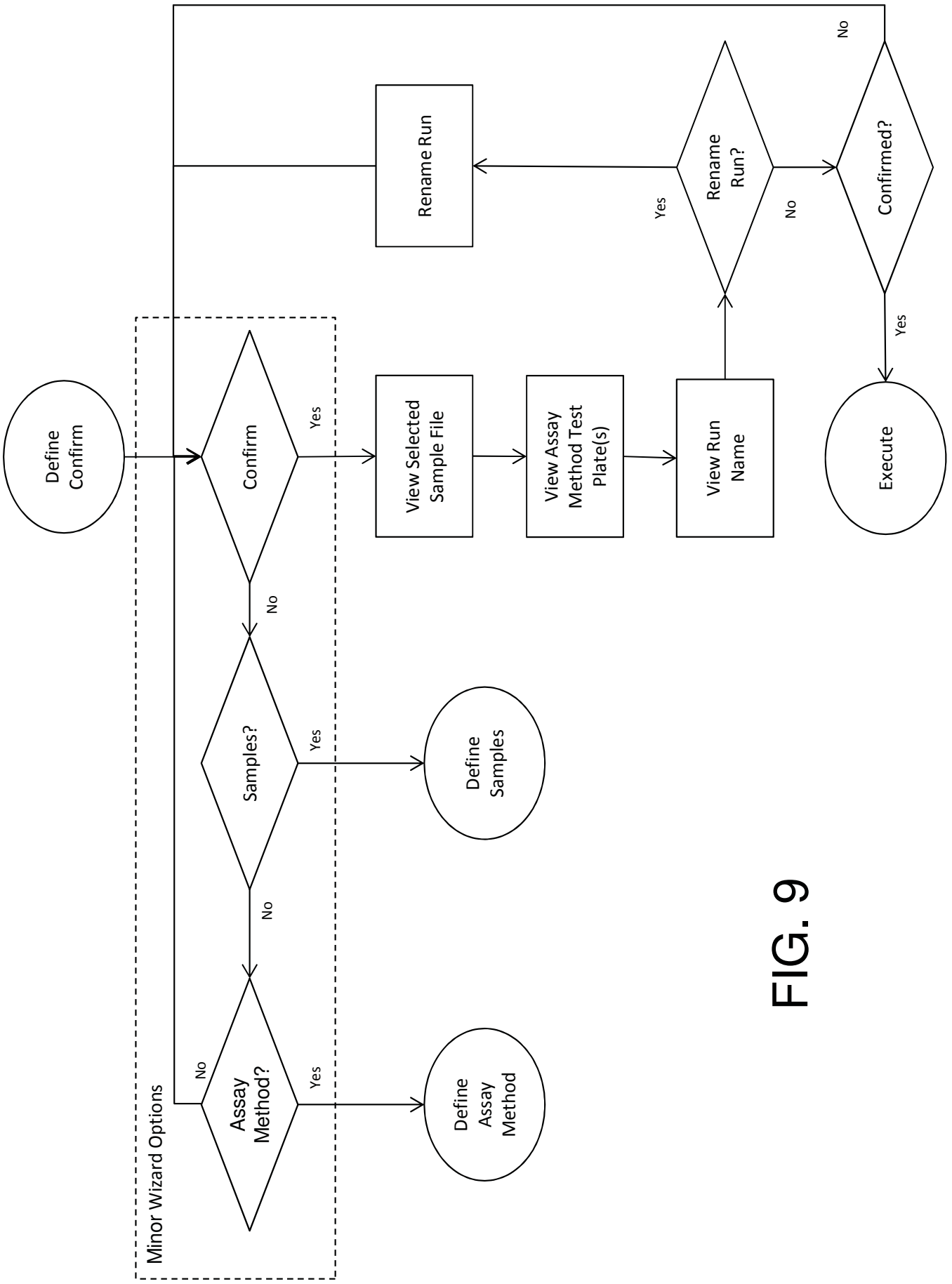

Define Confirm
Confirm
Yes
No
View Selected Sample File
View Assay Method Test Plate(s)
View Run Name
Rename Run?
Yes
No
Rename Run
Confirmed?
No
Yes
Execute
Samples?
Yes
No
Define Samples
Assay Method?
No
Yes
Define Assay Method
Minor Wizard Options

FIG. 9

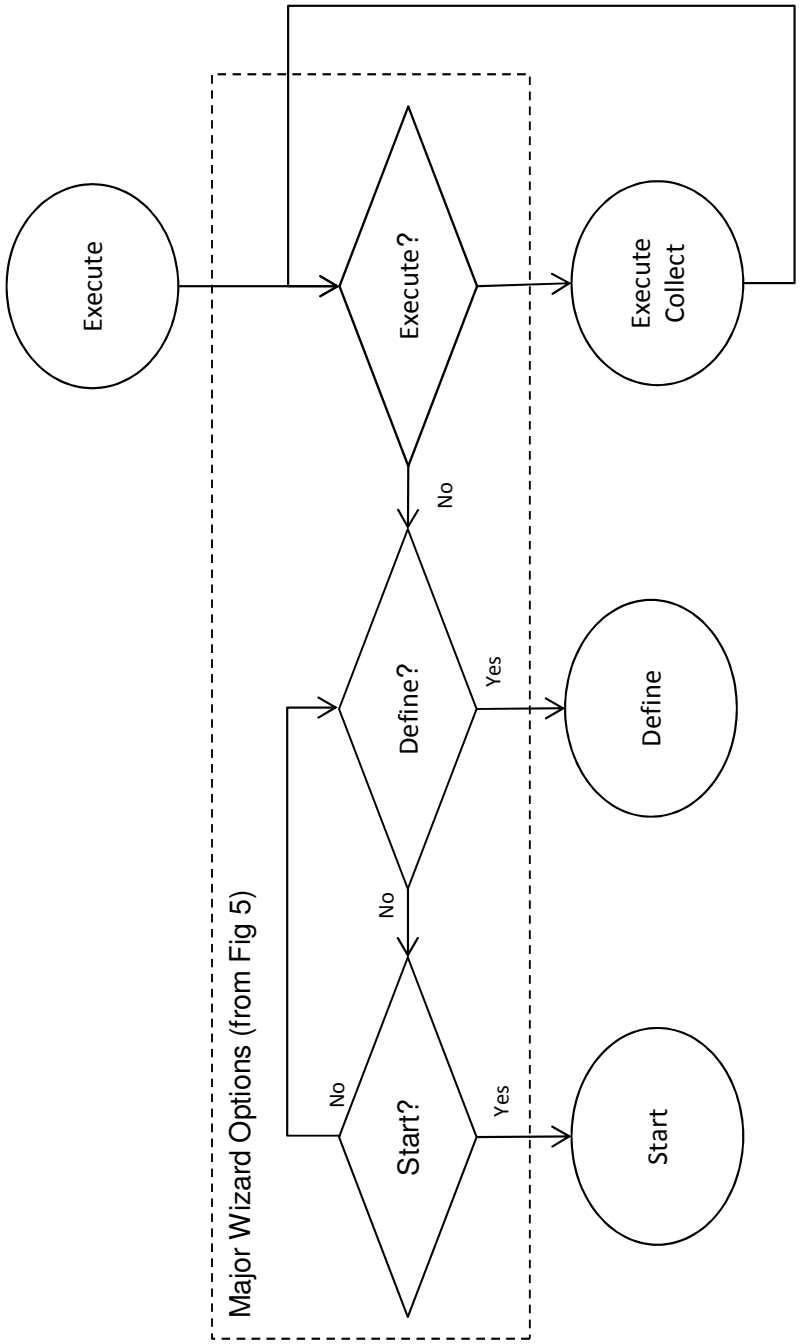

Execute
Execute?
Execute Collect
No
Define?
Yes
Define
No
Start?
No
Yes
Start
Major Wizard Options (from Fig 5)

FIG. 10

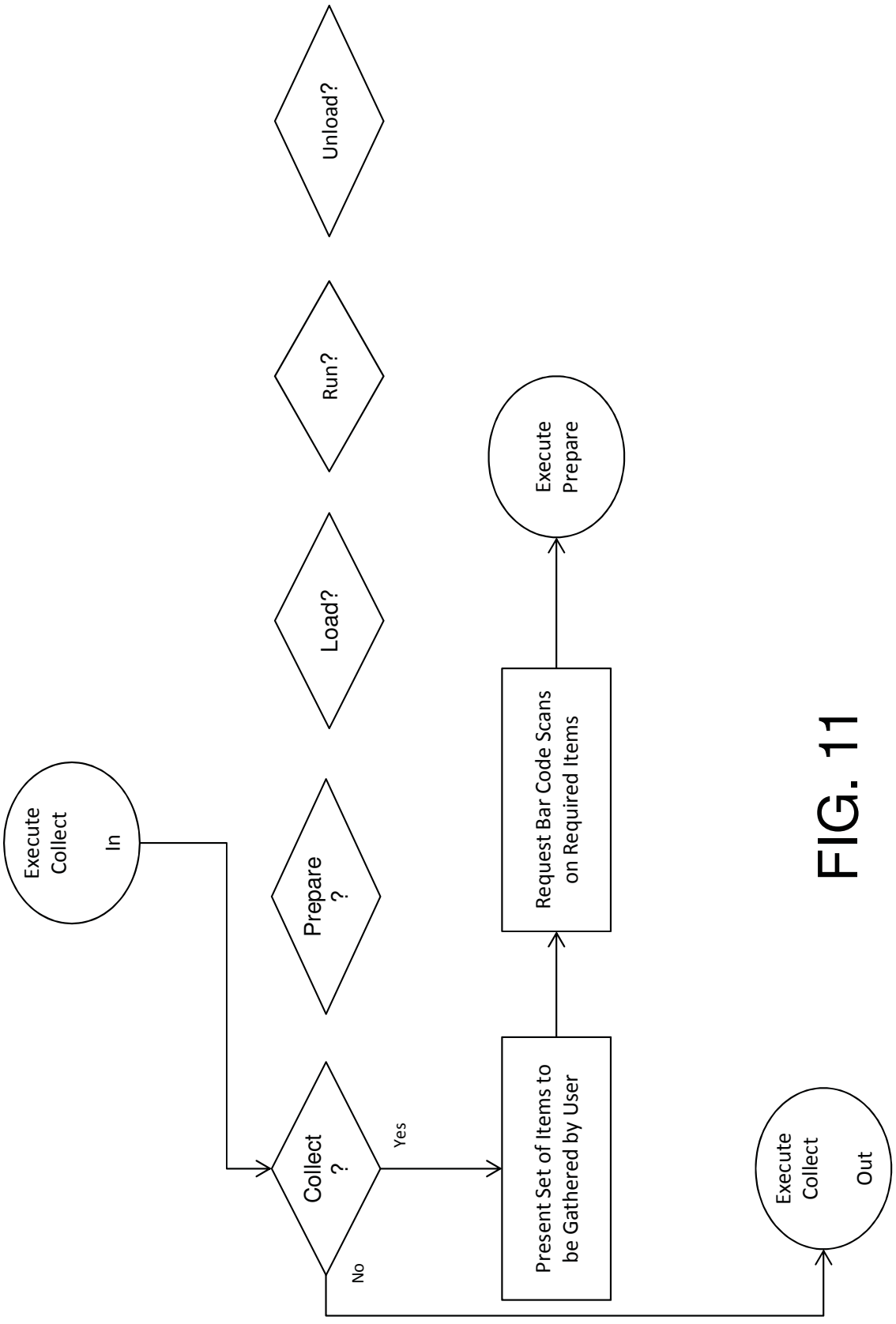

Execute Collect In
Collect ?
Yes
No
Present Set of Items to be Gathered by User
Request Bar Code Scans on Required Items
Execute Prepare
Execute Collect Out
Prepare ?
Load?
Run?
Unload?

FIG. 11

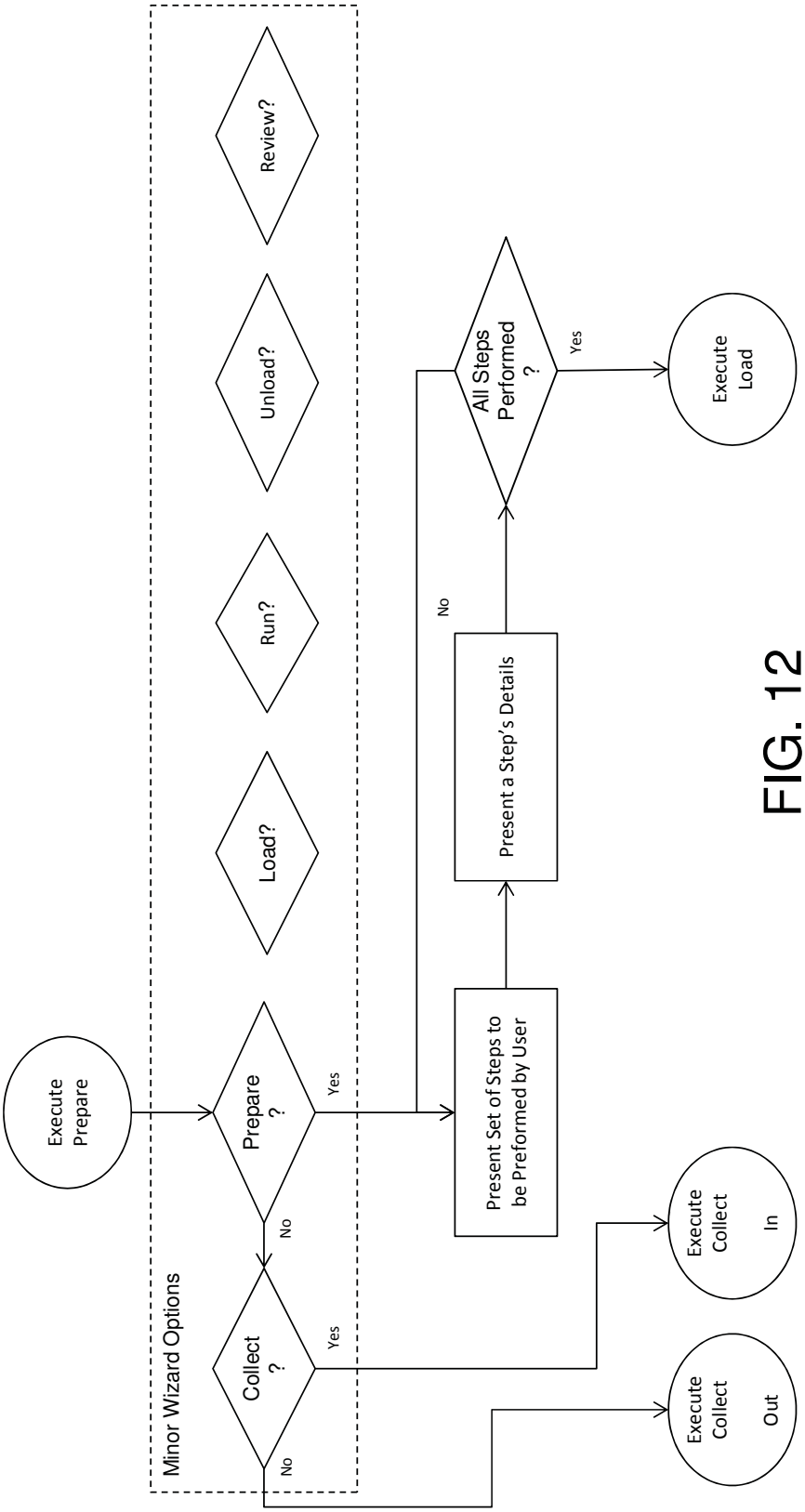

Execute Prepare
Minor Wizard Options
Prepare ?
Yes
No
Load?
Run?
Unload?
Review?
Present Set of Steps to be Preformed by User
Present a Step's Details
All Steps Performed ?
No
Yes
Execute Load
Collect ?
Yes
No
Execute Collect In
Execute Collect Out

FIG. 12

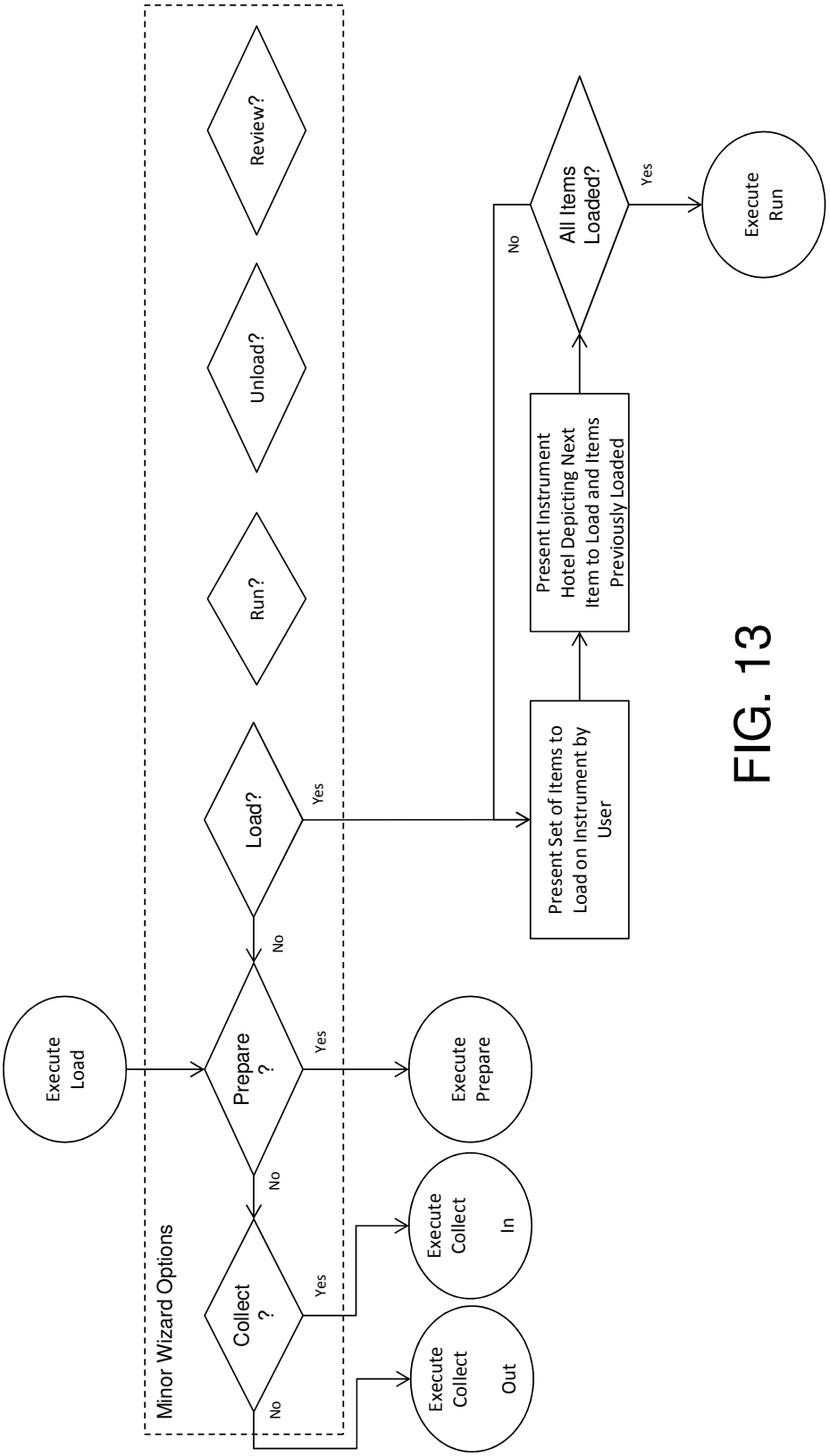

Execute Load
Minor Wizard Options
Review?
Unload?
Run?
Load?
Yes
No
Present Set of Items to Load on Instrument by User
Present Instrument Hotel Depicting Next Item to Load and Items Previously Loaded
All Items Loaded?
Yes
No
Execute Run
Prepare ?
Yes
No
Execute Prepare
Collect ?
Yes
No
Execute Collect In
Execute Collect Out

FIG. 13

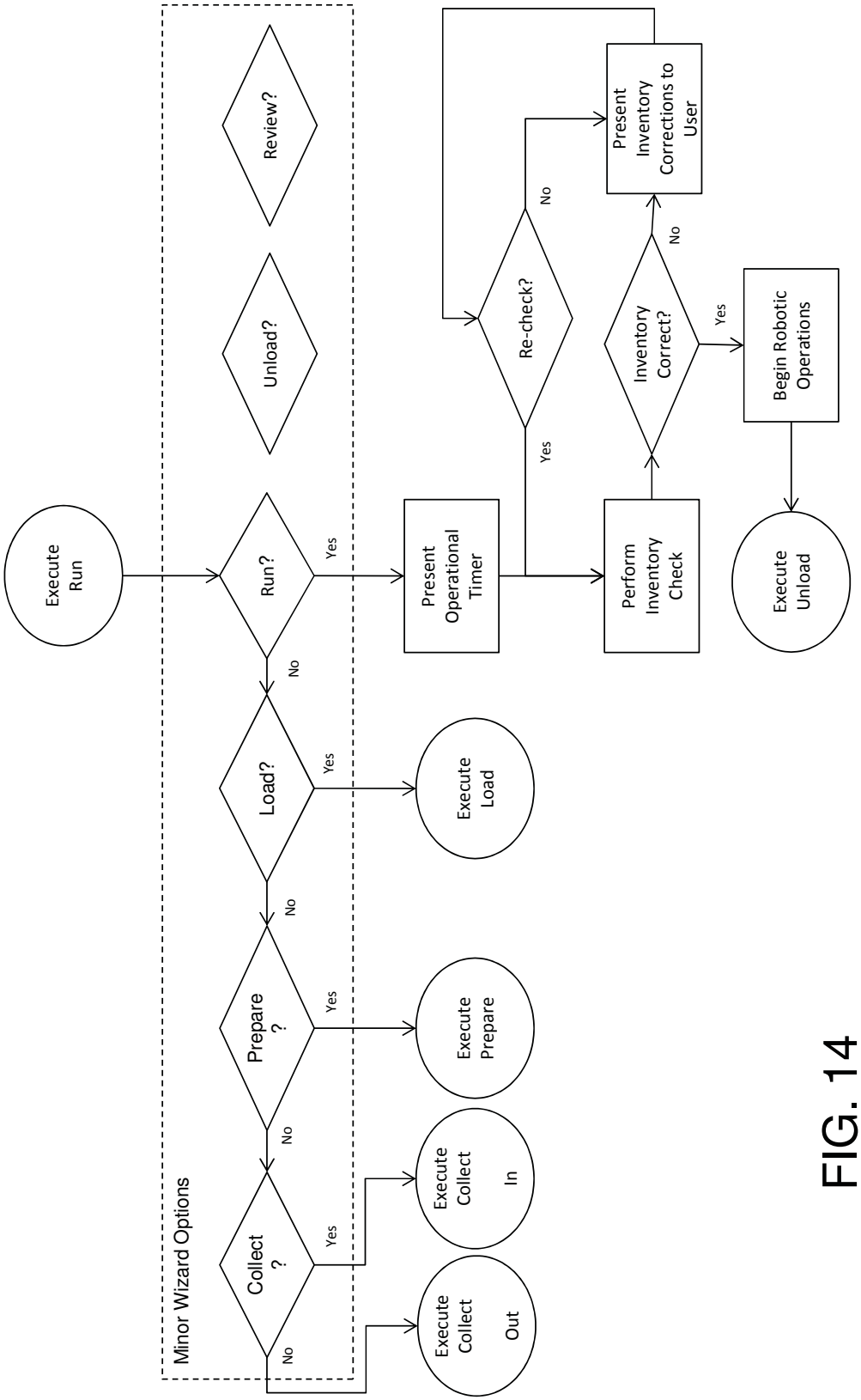

Execute Run
Run?
Yes
No
Review?
Unload?
Load?
Yes
No
Execute Load
Prepare ?
Yes
No
Execute Prepare
Collect ?
Yes
No
Execute Collect In
Execute Collect Out
Minor Wizard Options
Present Operational Timer
Perform Inventory Check
Re-check?
No
Yes
Present Inventory Corrections to User
Inventory Correct?
No
Yes
Begin Robotic Operations
Execute Unload

FIG. 14

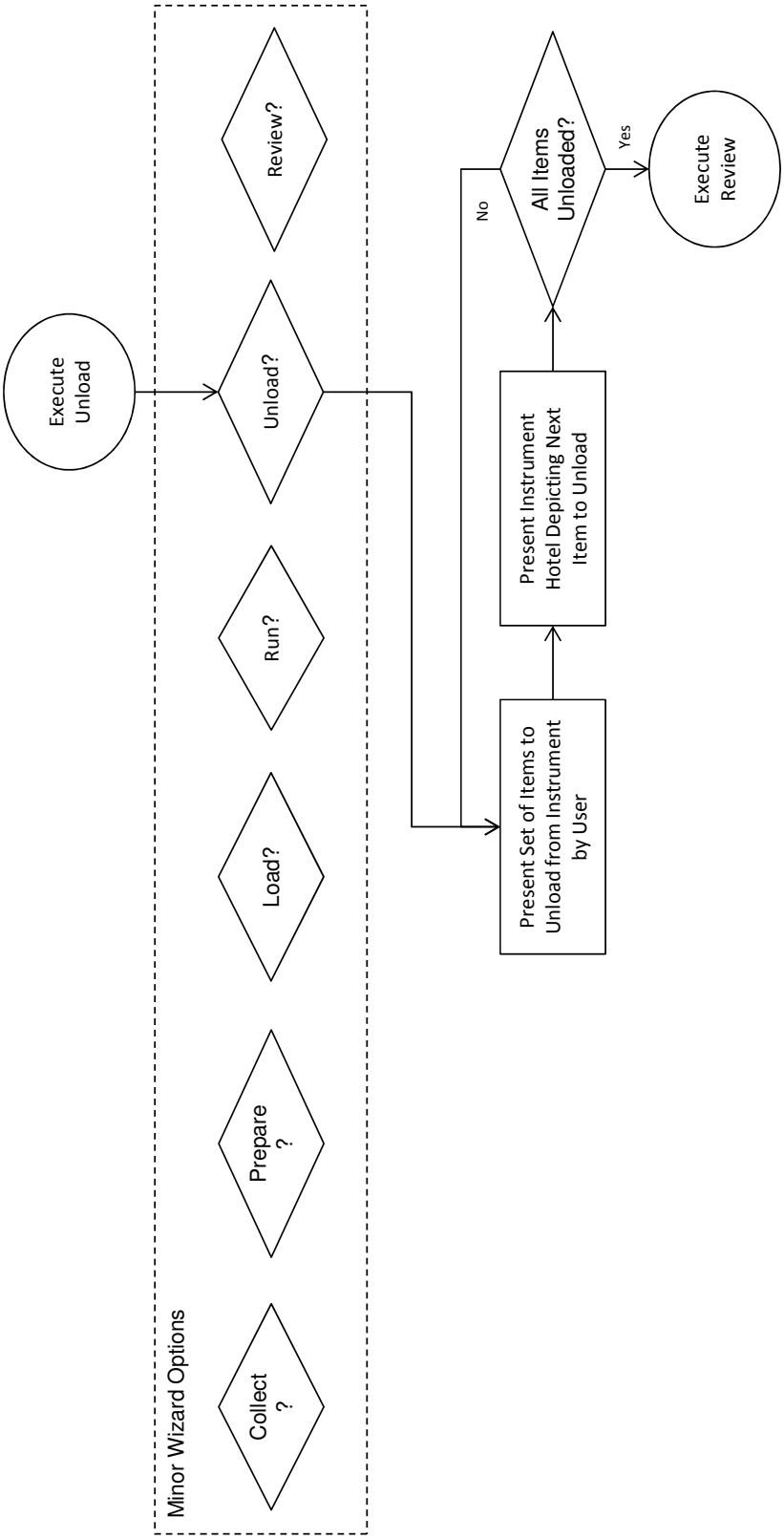

Execute Unload
Unload?
Review?
Run?
Load?
Prepare ?
Collect ?
Minor Wizard Options
Present Set of Items to Unload from Instrument by User
Present Instrument Hotel Depicting Next Item to Unload
All Items Unloaded?
No
Yes
Execute Review

FIG. 15

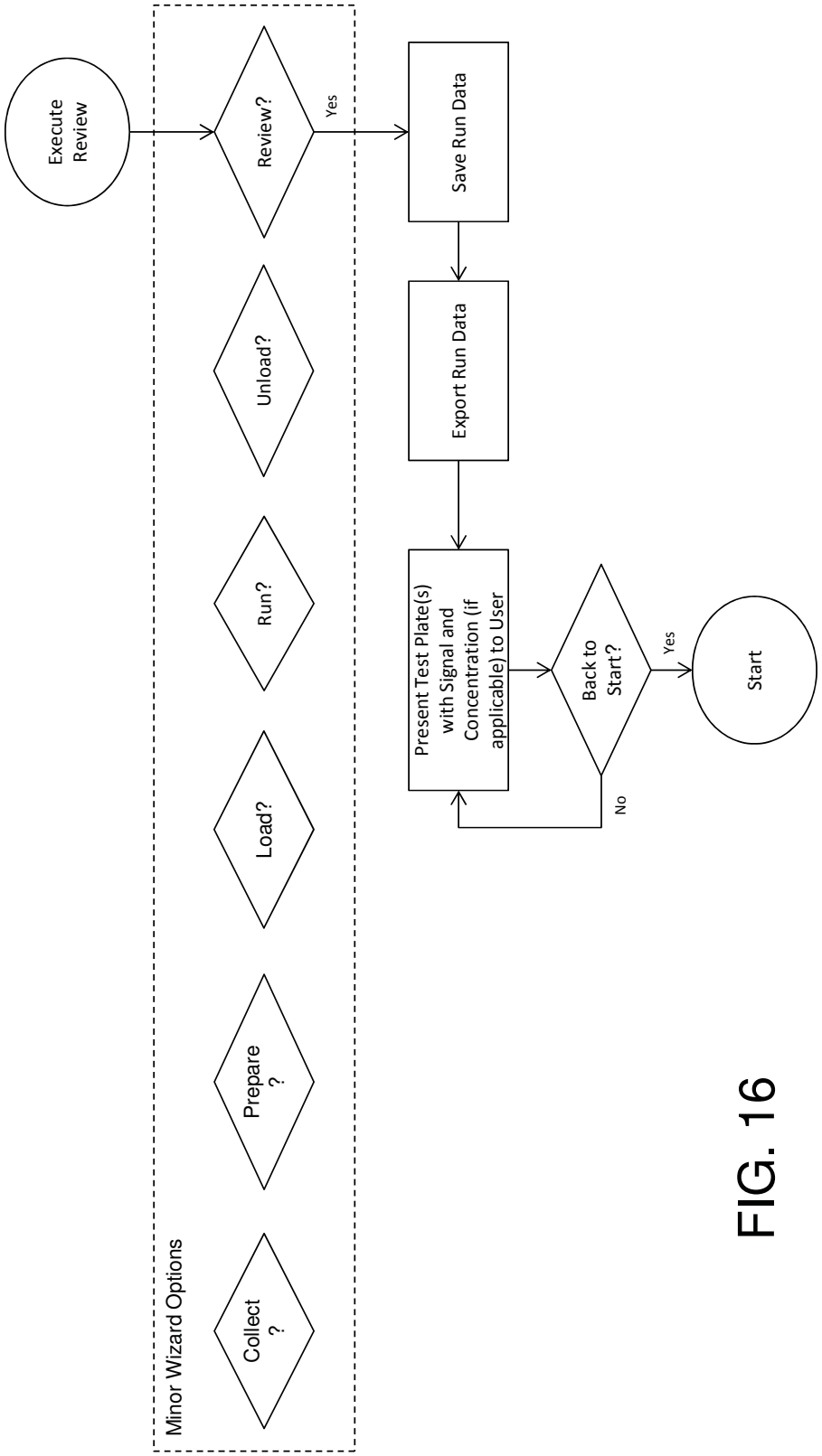

Execute Review
Review?
Yes
Save Run Data
Export Run Data
Present Test Plate(s) with Signal and Concentration (if applicable) to User
Back to Start?
Yes
No
Start
Minor Wizard Options
Unload?
Run?
Load?
Prepare ?
Collect ?

FIG. 16

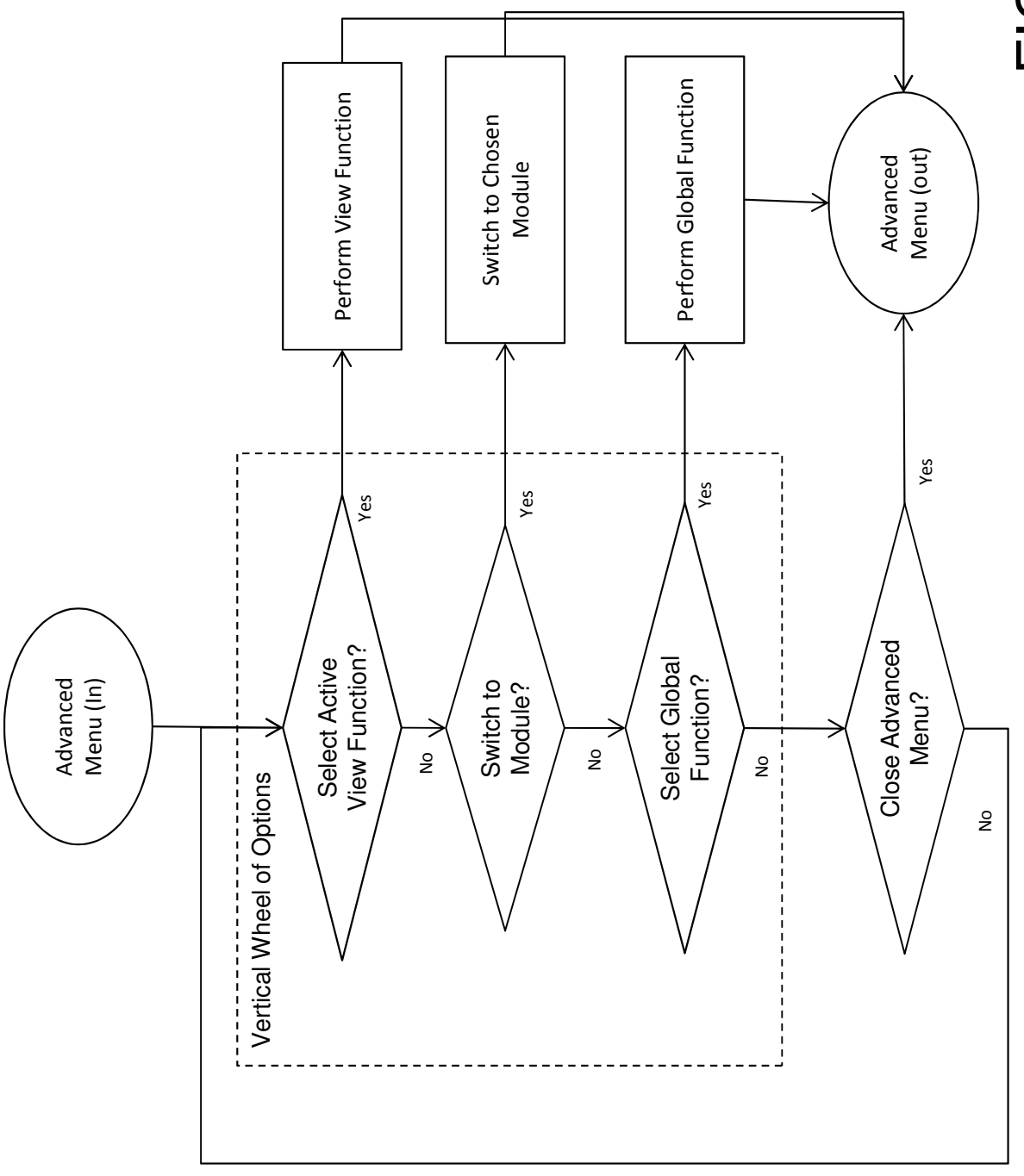

Advanced Menu (In)
Vertical Wheel of Options
Select Active View Function?
Yes
No
Perform View Function
Switch to Module?
Yes
No
Switch to Chosen Module
Select Global Function?
Yes
No
Perform Global Function
Close Advanced Menu?
Yes
No
Advanced Menu (out)

FIG. 17

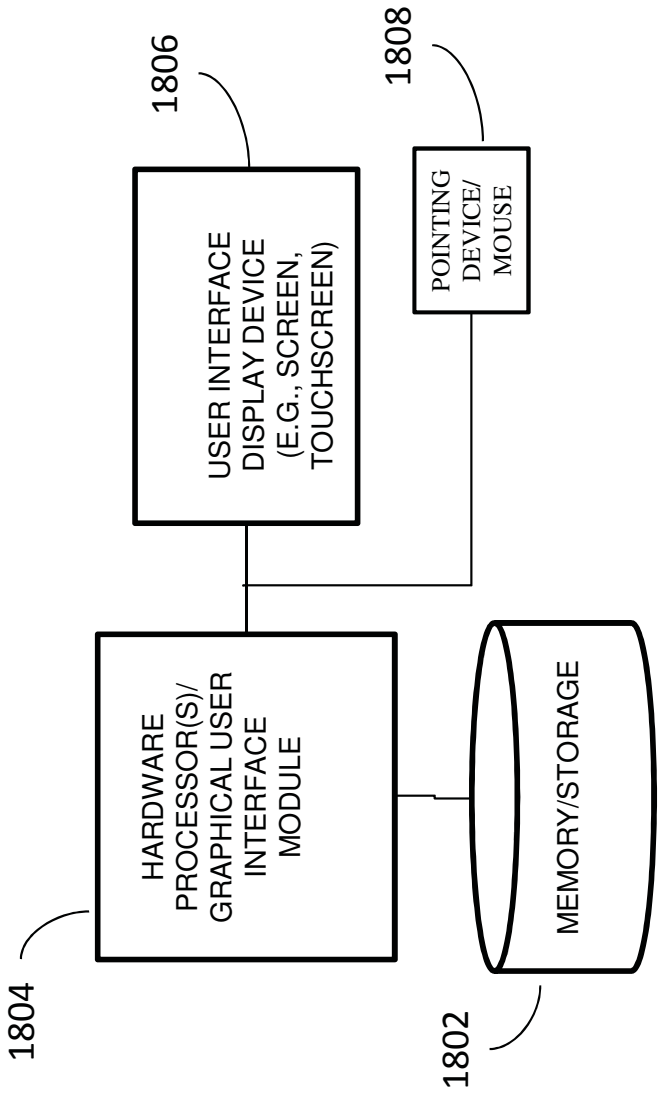

1806
1808
USER INTERFACE DISPLAY DEVICE (E.G., SCREEN, TOUCHSCREEN)
POINTING DEVICE/ MOUSE
HARDWARE PROCESSOR(S)/ GRAPHICAL USER INTERFACE MODULE
MEMORY/STORAGE
1804
1802

FIG. 18

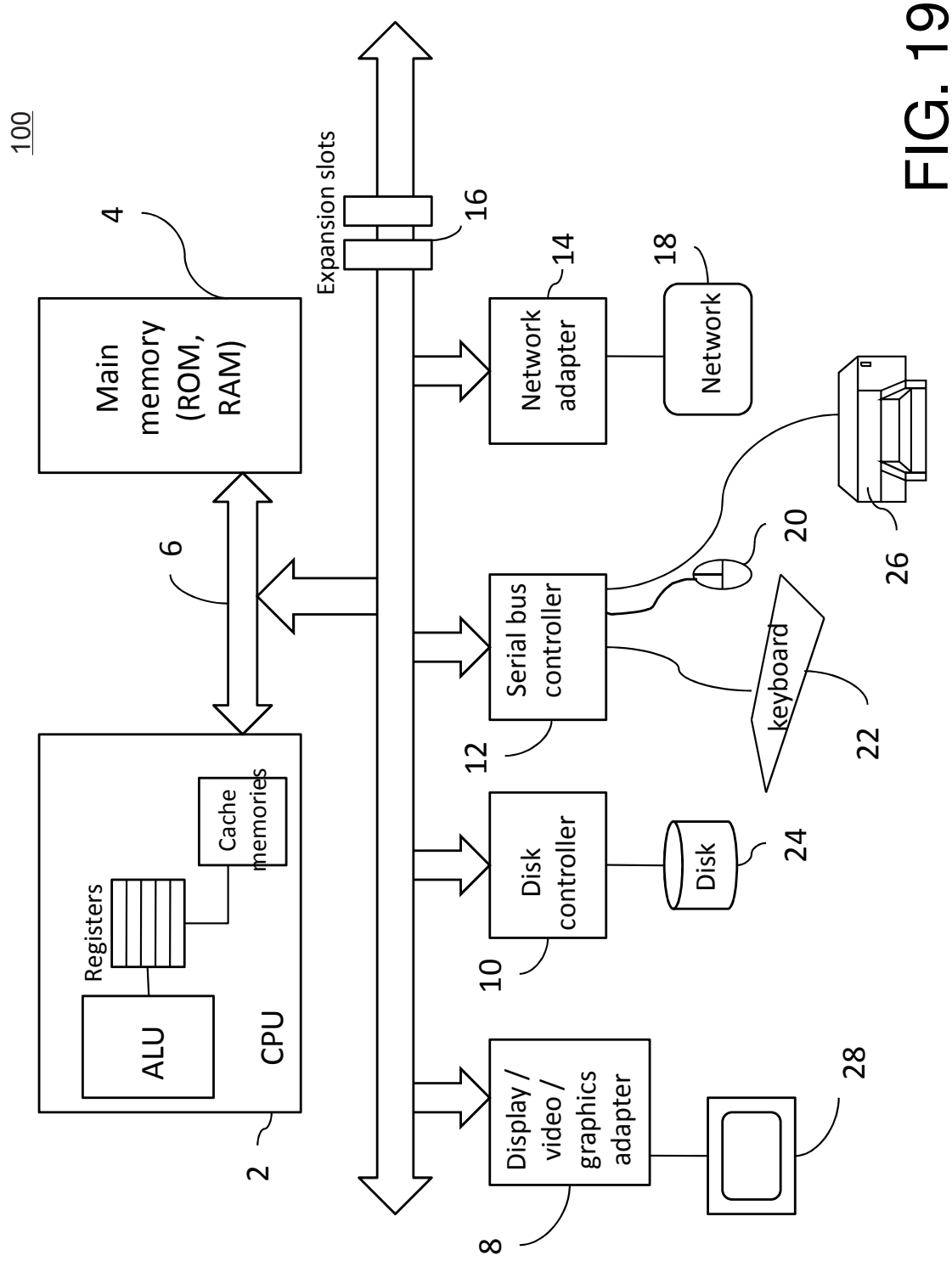

100
Main memory (ROM, RAM)
4
Expansion slots
16
Network adapter
14
Network
18
6
Serial bus controller
12
20
26
keyboard
22
Disk controller
10
Disk
24
Display / video / graphics adapter
8
28
CPU
ALU
Registers
Cache memories
2

FIG. 19

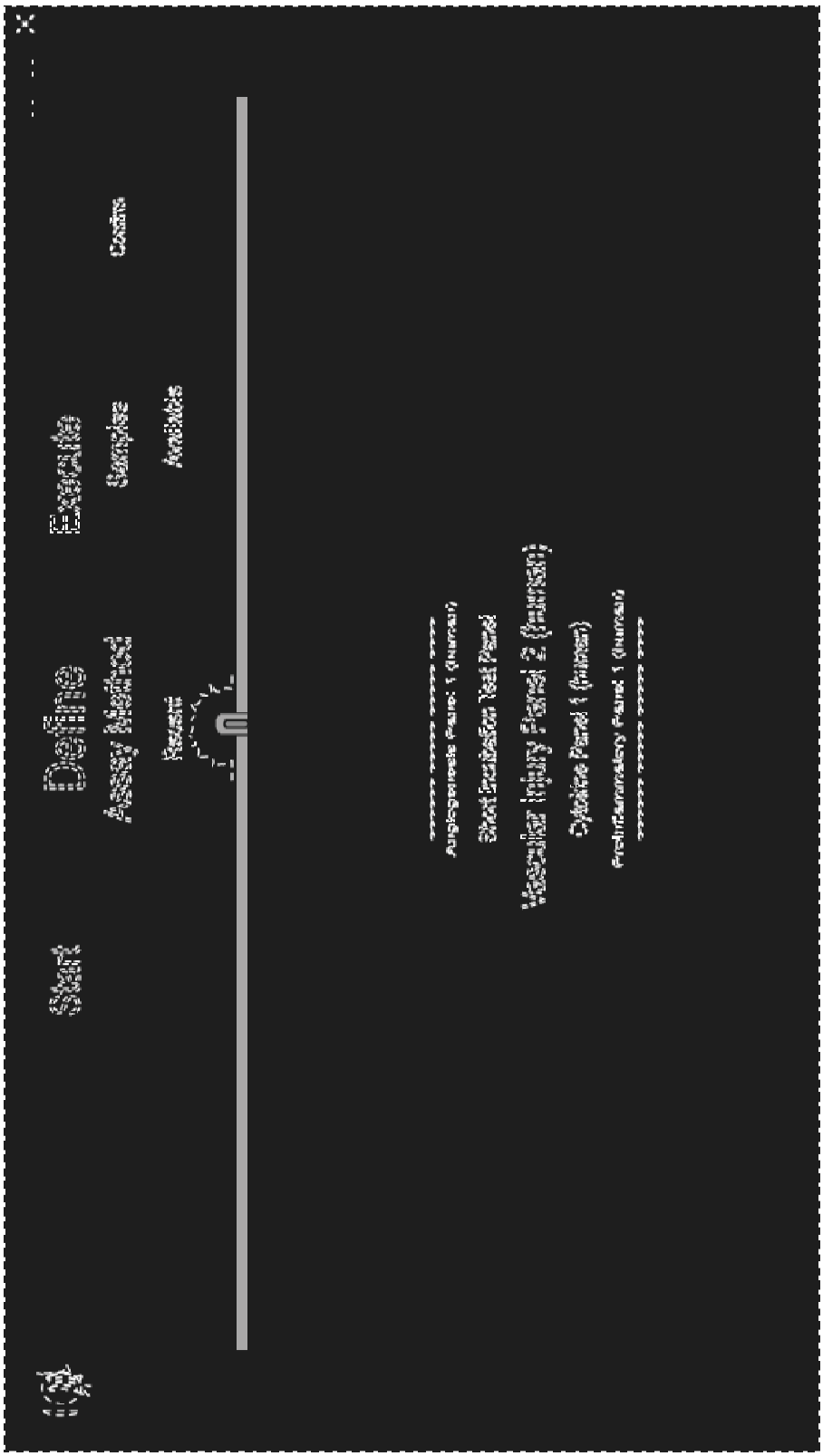

Start
Define
Assay Method
Execute
Sample
Available
Vascular Injury Panel 2 (human)
Cytokine Panel 1 (human)

FIG. 20

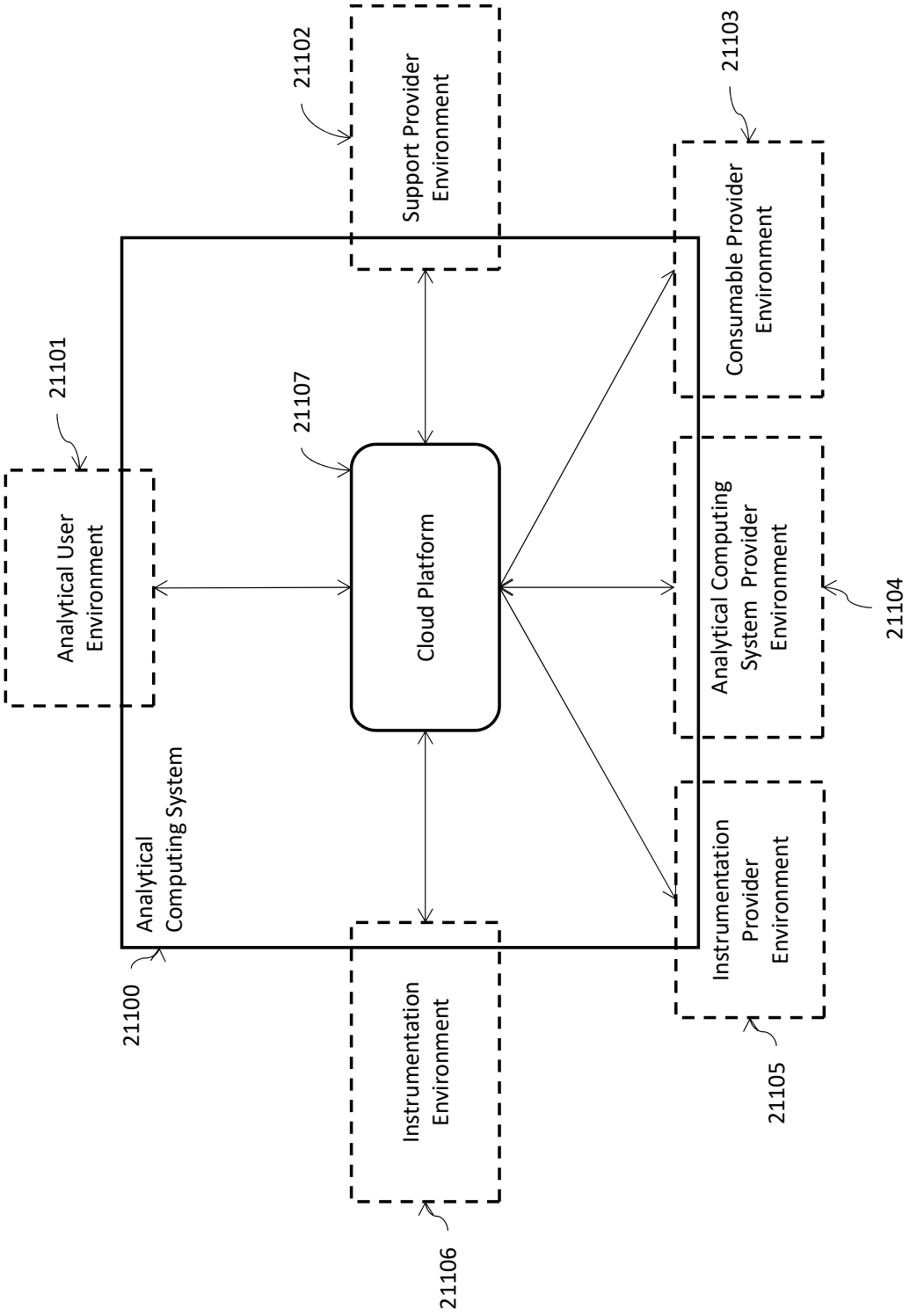

21102
Support Provider Environment
21103
Consumable Provider Environment
21101
Analytical User Environment
21107
Cloud Platform
Analytical Computing System Provider Environment
21104
Analytical Computing System
Instrumentation Provider Environment
21100
Instrumentation Environment
21105
21106

FIG. 21

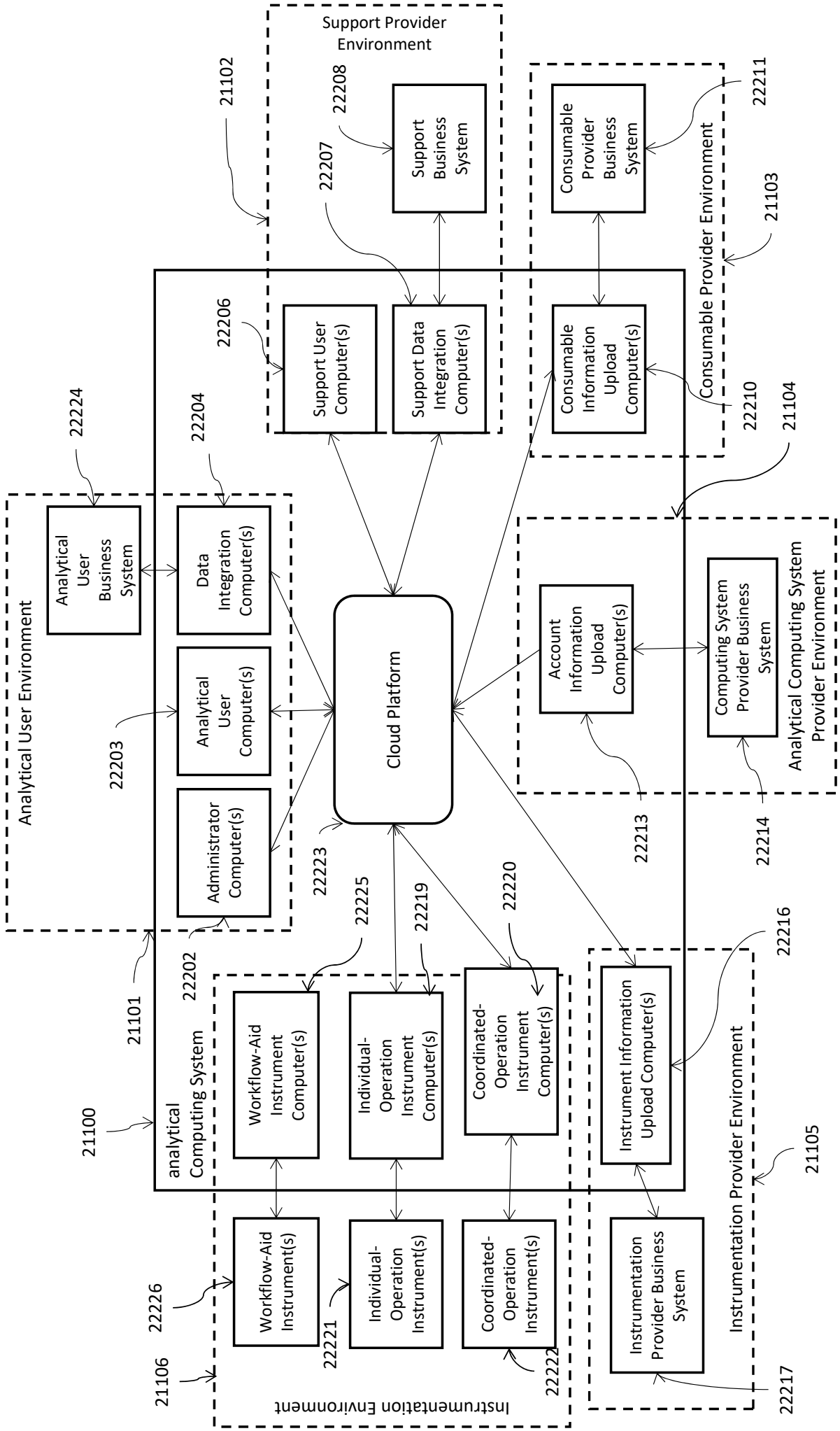

Support Provider Environment
21102
22208
Support Business System
22207
Consumable Provider Business System
22211
Consumable Provider Environment
21103
22206
Support User Computer(s)
Support Data Integration Computer(s)
Consumable Information Upload Computer(s)
22210
21104
22224
22204
Analytical User Business System
Data Integration Computer(s)
Analytical User Environment
Analytical User Computer(s)
22203
Administrator Computer(s)
22223
Cloud Platform
Account Information Upload Computer(s)
Computing System Provider Business System
Analytical Computing System Provider Environment
22213
22214
21101
22202
22225
22219
22220
22216
21100
analytical Computing System
Workflow-Aid Instrument Computer(s)
Individual-Operation Instrument Computer(s)
Coordinated-Operation Instrument Computer(s)
Instrument Information Upload Computer(s)
21105
22226
Workflow-Aid Instrument(s)
Individual-Operation Instrument(s)
22221
Coordinated-Operation Instrument(s)
22222
Instrumentation Provider Business System
Instrumentation Provider Environment
21106
Instrumentation Environment
22217

FIG. 22

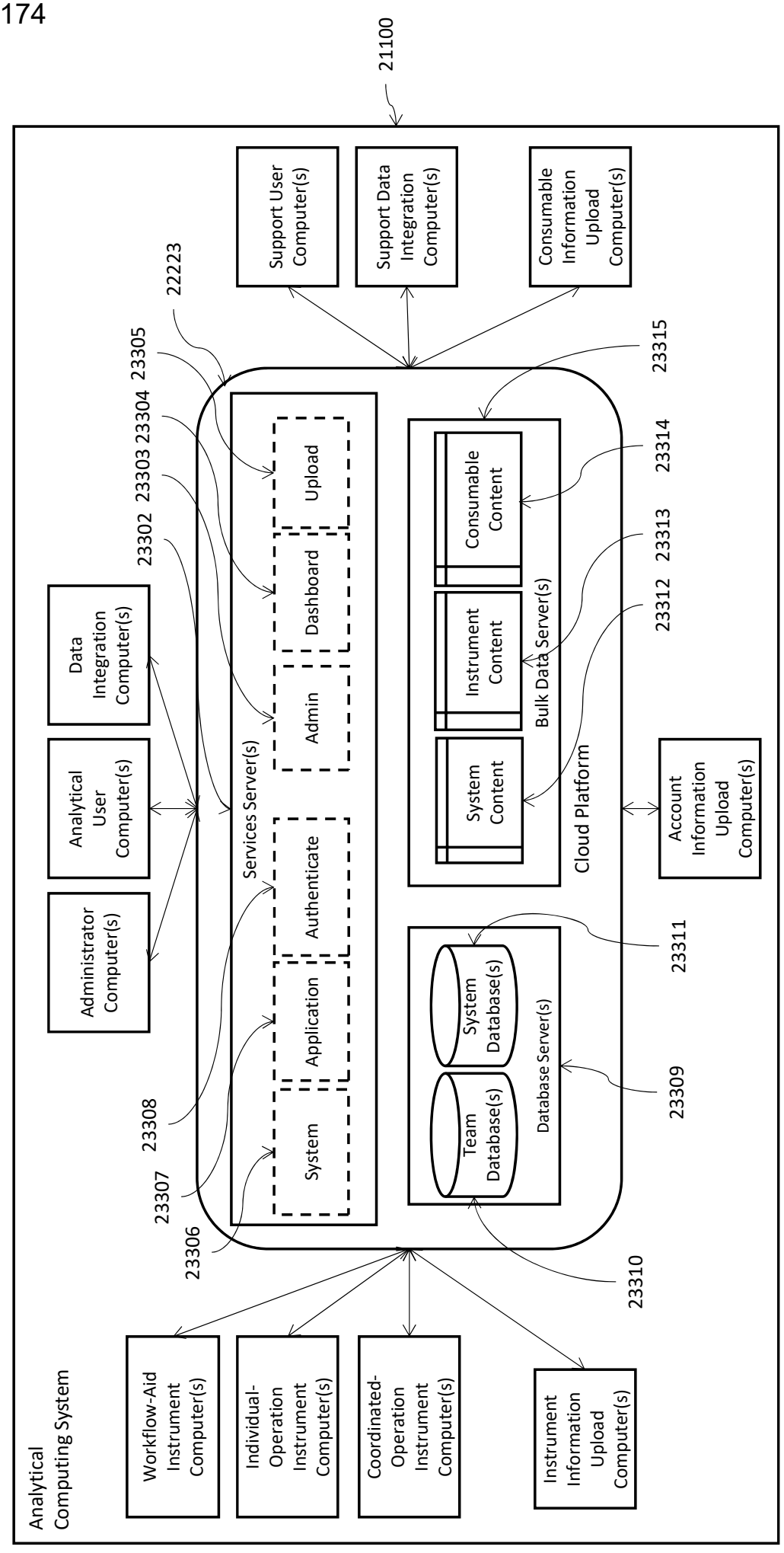

21100
Analytical Computing System
Support User Computer(s)
Support Data Integration Computer(s)
Consumable Information Upload Computer(s)
22223
23305
23304
23303
23302
23315
23314
23313
23312
Data Integration Computer(s)
Analytical User Computer(s)
Administrator Computer(s)
Services Server(s)
Upload
Dashboard
Admin
Authenticate
Application
System
Consumable Content
Instrument Content
System Content
Bulk Data Server(s)
Cloud Platform
Account Information Upload Computer(s)
23308
23307
23306
23311
23309
23310
System Database(s)
Team Database(s)
Database Server(s)
Workflow-Aid Instrument Computer(s)
Individual-Operation Instrument Computer(s)
Coordinated-Operation Instrument Computer(s)
Instrument Information Upload Computer(s)

FIG. 23

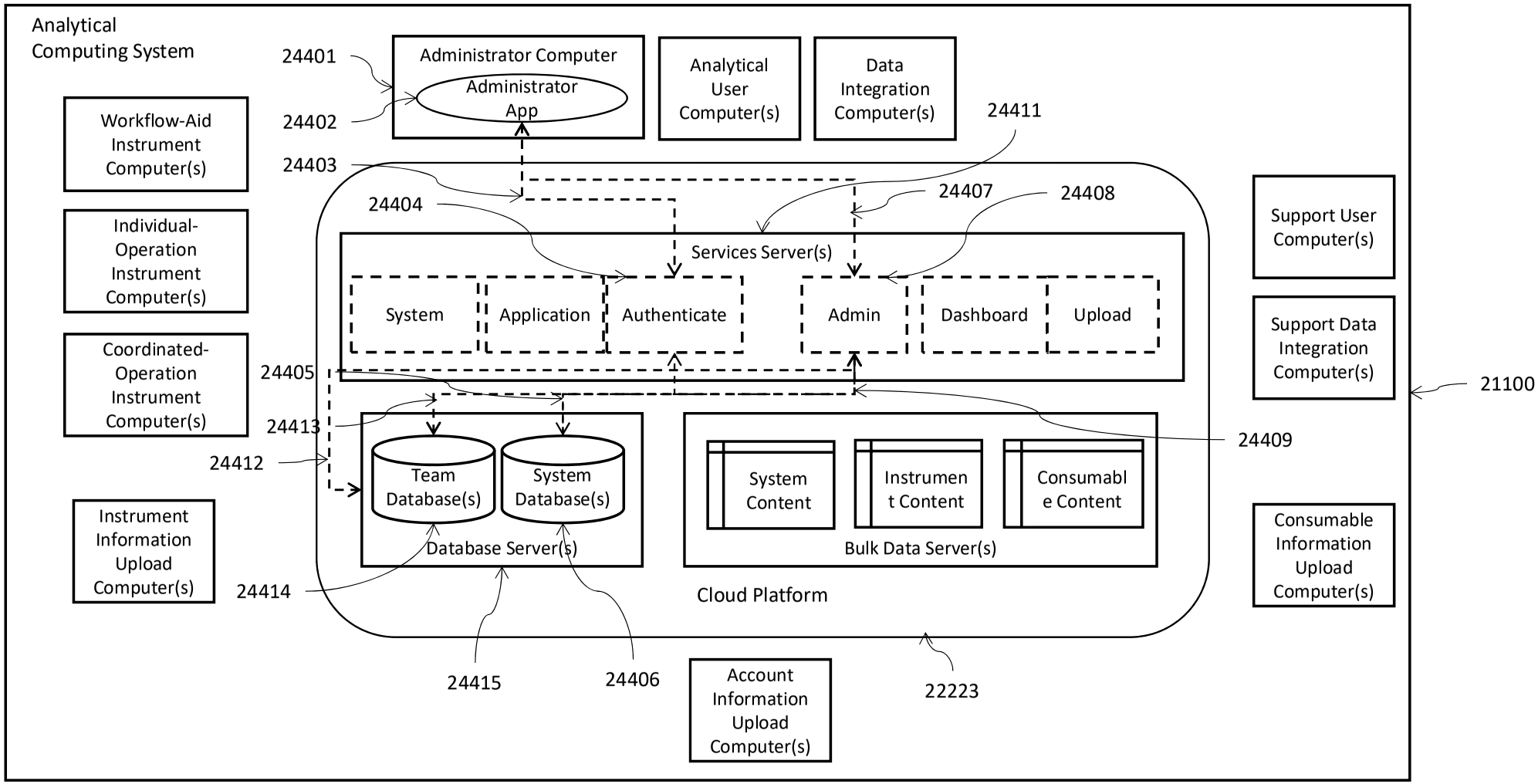

Analytical Computing System
24401
Administrator Computer
Administrator App
Analytical User Computer(s)
Data Integration Computer(s)
24402
24411
Workflow-Aid Instrument Computer(s)
24403
24404
24407
24408
Support User Computer(s)
Individual-Operation Instrument Computer(s)
Services Server(s)
System
Application
Authenticate
Admin
Dashboard
Upload
Support Data Integration Computer(s)
Coordinated-Operation Instrument Computer(s)
24405
21100
24413
24409
24412
Team Database(s)
System Database(s)
System Content
Instrument Content
Consumable Content
Instrument Information Upload Computer(s)
Database Server(s)
Bulk Data Server(s)
Consumable Information Upload Computer(s)
24414
Cloud Platform
24415
24406
Account Information Upload Computer(s)
22223

FIG. 24

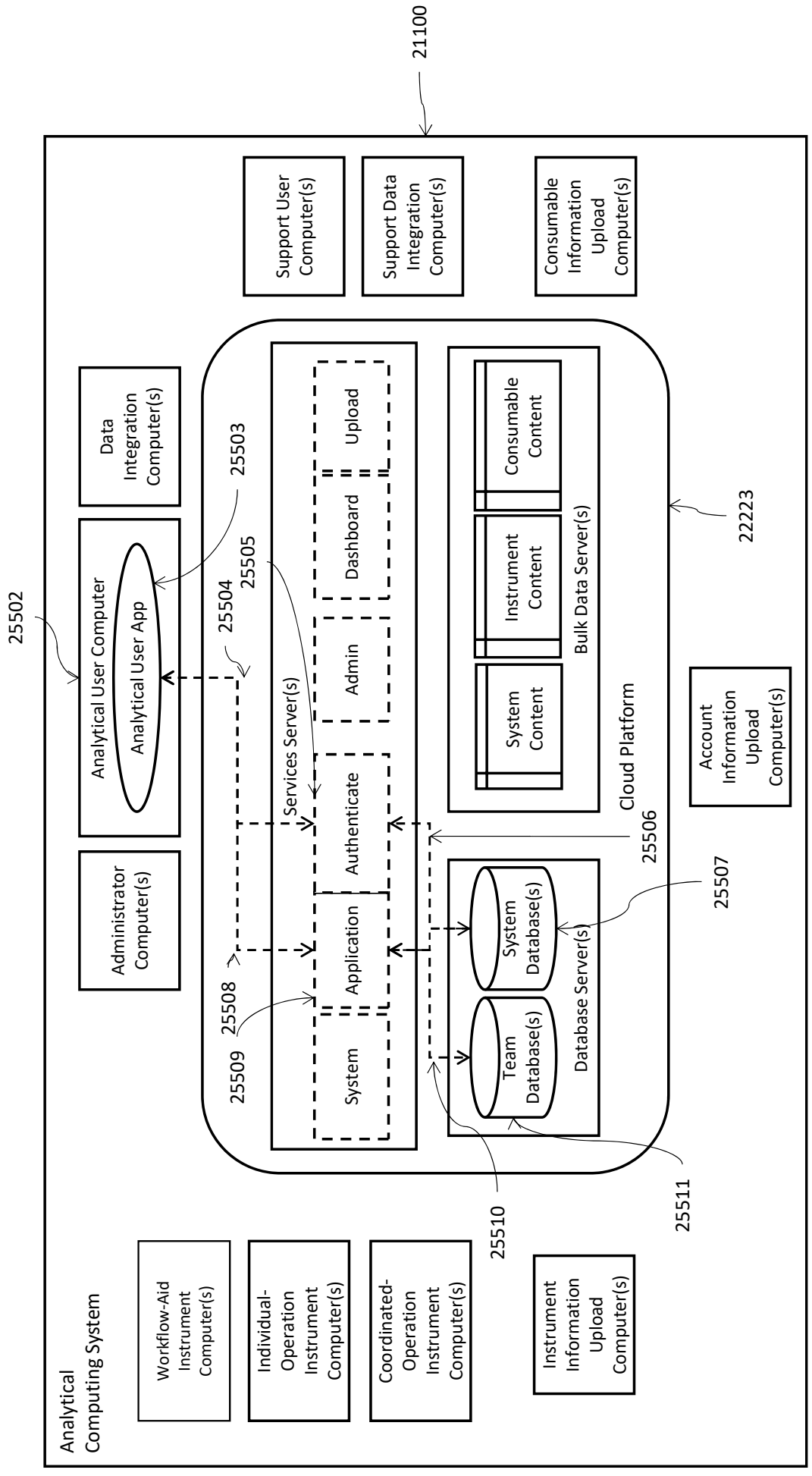

21100
Analytical Computing System
Support User Computer(s)
Support Data Integration Computer(s)
Consumable Information Upload Computer(s)
Data Integration Computer(s)
Analytical User Computer
Analytical User App
25502
25503
25504
25505
Administrator Computer(s)
Services Server(s)
System
Application
Authenticate
Admin
Dashboard
Upload
25508
25509
Cloud Platform
22223
Bulk Data Server(s)
System Content
Instrument Content
Consumable Content
Account Information Upload Computer(s)
25506
25507
Database Server(s)
Team Database(s)
System Database(s)
25510
25511
Workflow-Aid Instrument Computer(s)
Individual-Operation Instrument Computer(s)
Coordinated-Operation Instrument Computer(s)
Instrument Information Upload Computer(s)

FIG. 25

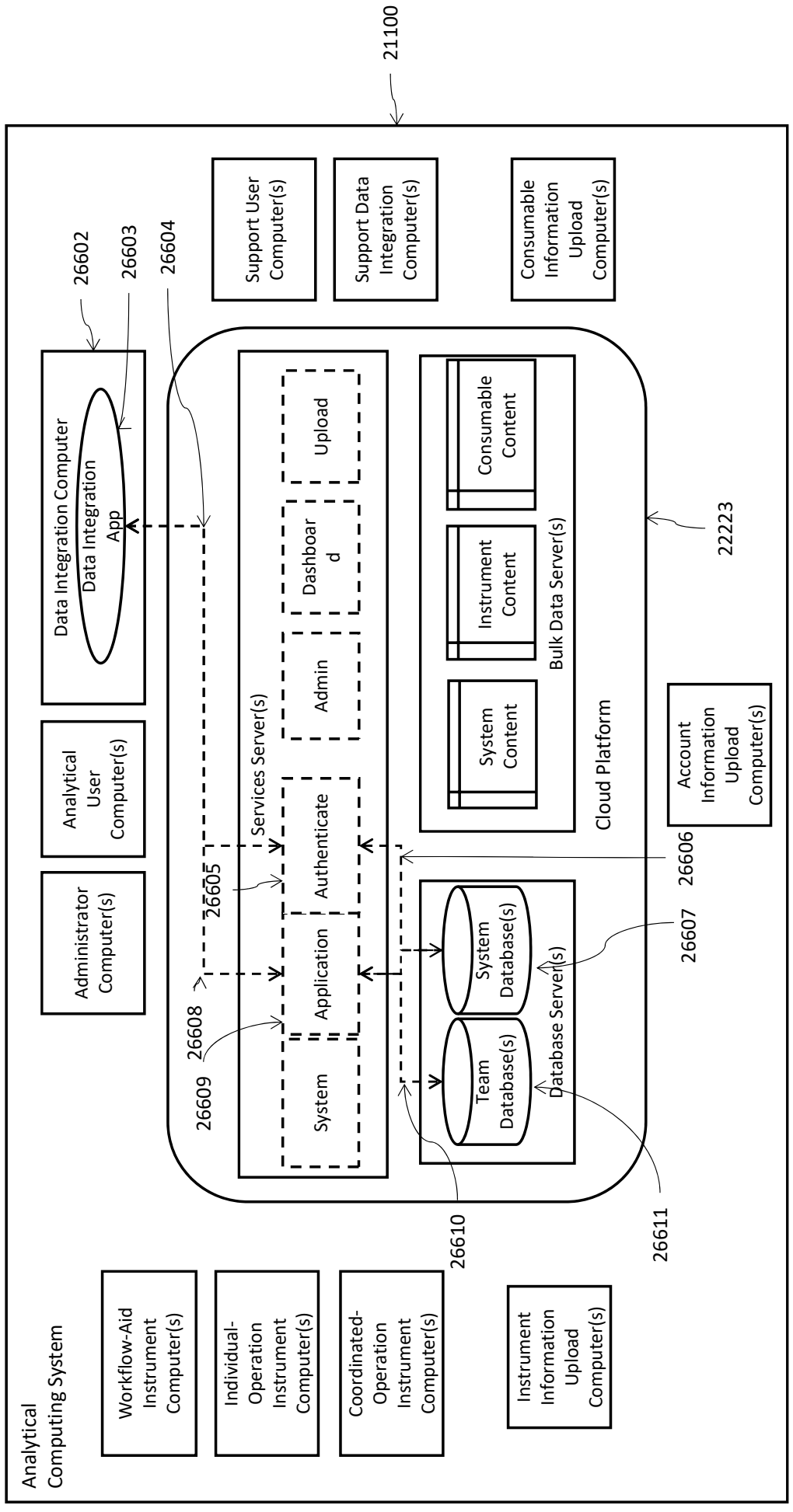

21100
Analytical Computing System
Workflow-Aid Instrument Computer(s)
Individual-Operation Instrument Computer(s)
Coordinated-Operation Instrument Computer(s)
Instrument Information Upload Computer(s)
Administrator Computer(s)
Analytical User Computer(s)
Data Integration Computer
Data Integration App
26602
26603
26604
Support User Computer(s)
Support Data Integration Computer(s)
Consumable Information Upload Computer(s)
Account Information Upload Computer(s)
Cloud Platform
22223
Services Server(s)
System Application
Authenticate
Admin
Dashboard
Upload
26605
26608
26609
Bulk Data Server(s)
System Content
Instrument Content
Consumable Content
26606
Database Server(s)
System Database(s)
Team Database(s)
26607
26610
26611

FIG. 26

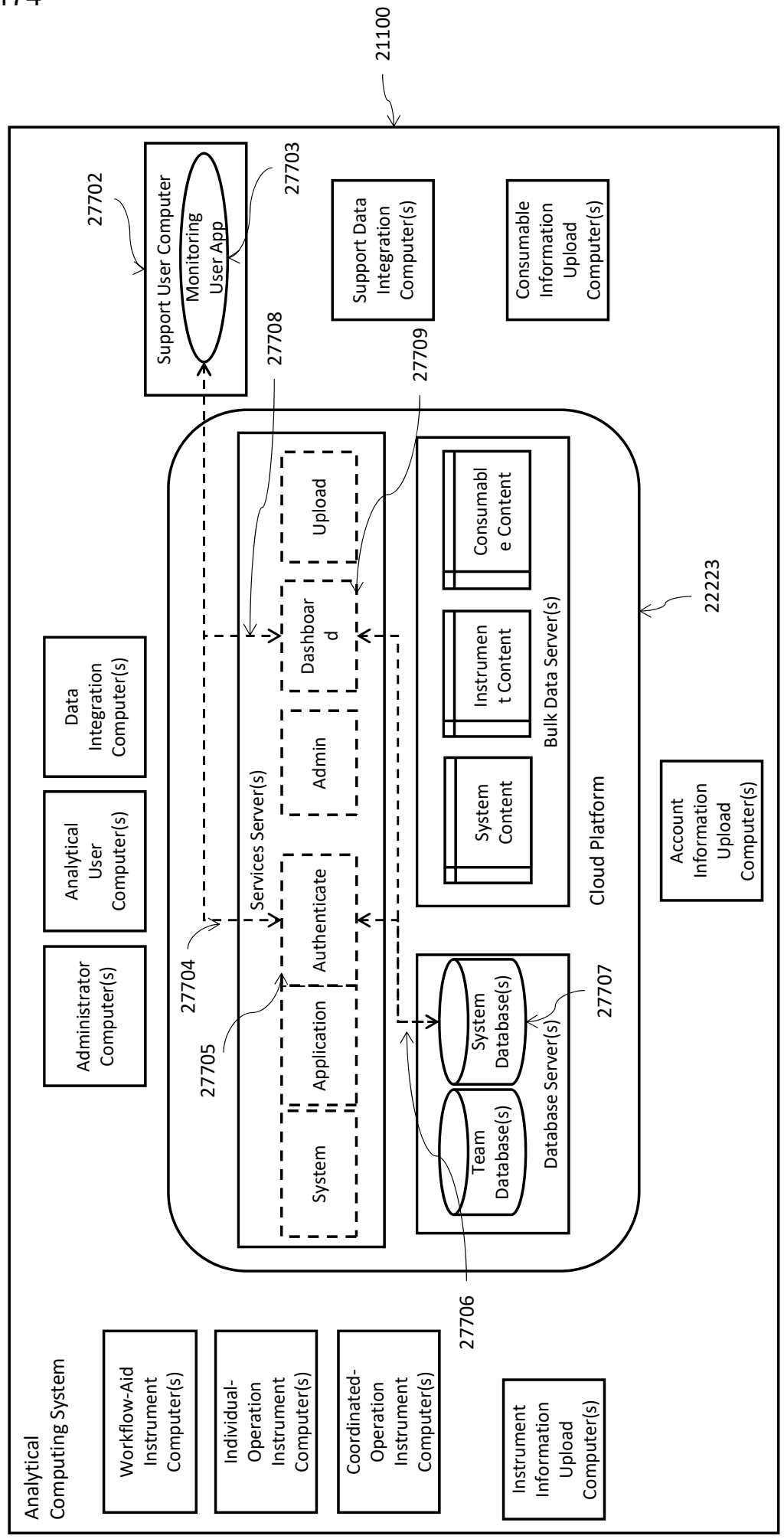

21100
Analytical Computing System
Workflow-Aid Instrument Computer(s)
Individual-Operation Instrument Computer(s)
Coordinated-Operation Instrument Computer(s)
Instrument Information Upload Computer(s)
Administrator Computer(s)
Analytical User Computer(s)
Data Integration Computer(s)
Support User Computer
Monitoring User App
27702
27703
Support Data Integration Computer(s)
Consumable Information Upload Computer(s)
27708
27709
Services Server(s)
System
Application
Authenticate
Admin
Dashboard
Upload
27704
27705
Cloud Platform
22223
Bulk Data Server(s)
System Content
Instrument Content
Consumable Content
Database Server(s)
System Database(s)
Team Database(s)
27706
27707
Account Information Upload Computer(s)

FIG. 27

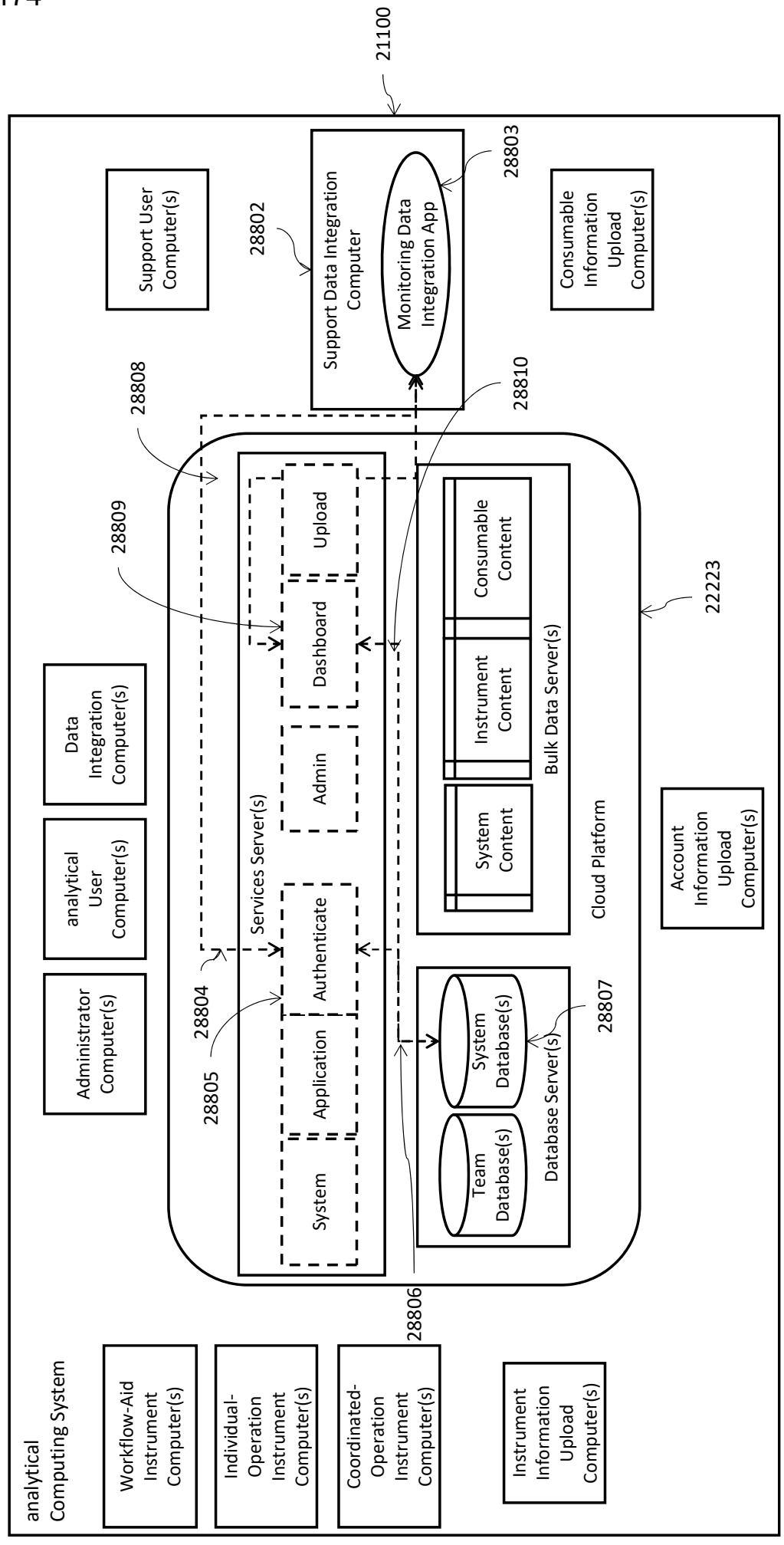

21100
analytical Computing System
Workflow-Aid Instrument Computer(s)
Individual-Operation Instrument Computer(s)
Coordinated-Operation Instrument Computer(s)
Instrument Information Upload Computer(s)
28806
Cloud Platform
22223
Administrator Computer(s)
analytical User Computer(s)
Data Integration Computer(s)
Support User Computer(s)
Account Information Upload Computer(s)
Consumable Information Upload Computer(s)
28802
Support Data Integration Computer
28803
Monitoring Data Integration App
28808
28809
28810
Services Server(s)
System
Application
Authenticate
Admin
Dashboard
Upload
28804
28805
Bulk Data Server(s)
System Content
Instrument Content
Consumable Content
Database Server(s)
Team Database(s)
System Database(s)
28807

FIG. 28

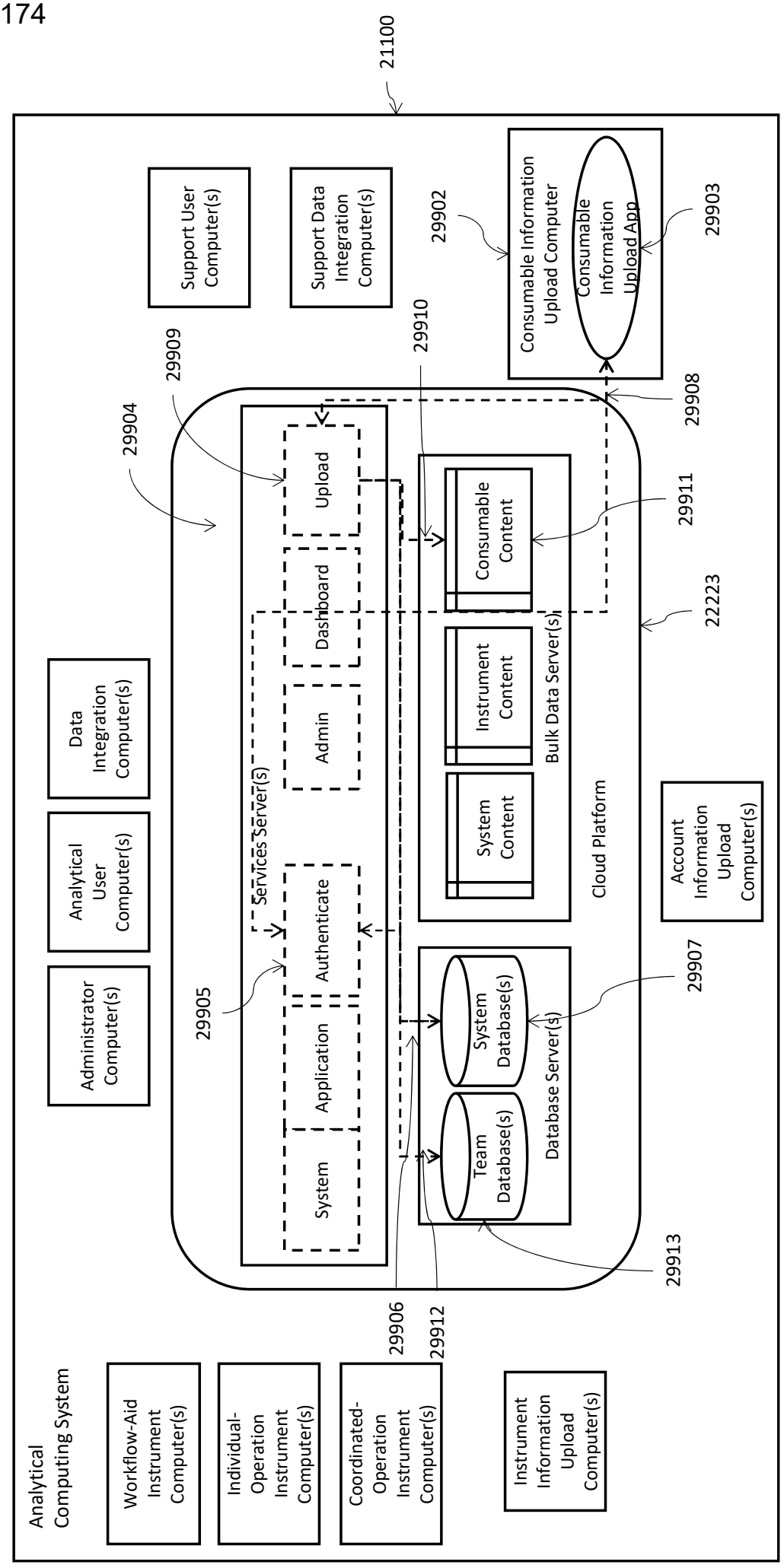

21100
Analytical Computing System
Workflow-Aid Instrument Computer(s)
Individual-Operation Instrument Computer(s)
Coordinated-Operation Instrument Computer(s)
Instrument Information Upload Computer(s)
Administrator Computer(s)
Analytical User Computer(s)
Data Integration Computer(s)
Support User Computer(s)
Support Data Integration Computer(s)
Consumable Information Upload Computer
Consumable Information Upload App
Account Information Upload Computer(s)
Cloud Platform
Services Server(s)
System
Application
Authenticate
Admin
Dashboard
Upload
Bulk Data Server(s)
System Content
Instrument Content
Consumable Content
Database Server(s)
Team Database(s)
System Database(s)
29902
29903
29904
29905
29906
29907
29908
29909
29910
29911
29912
29913
22223

FIG. 29

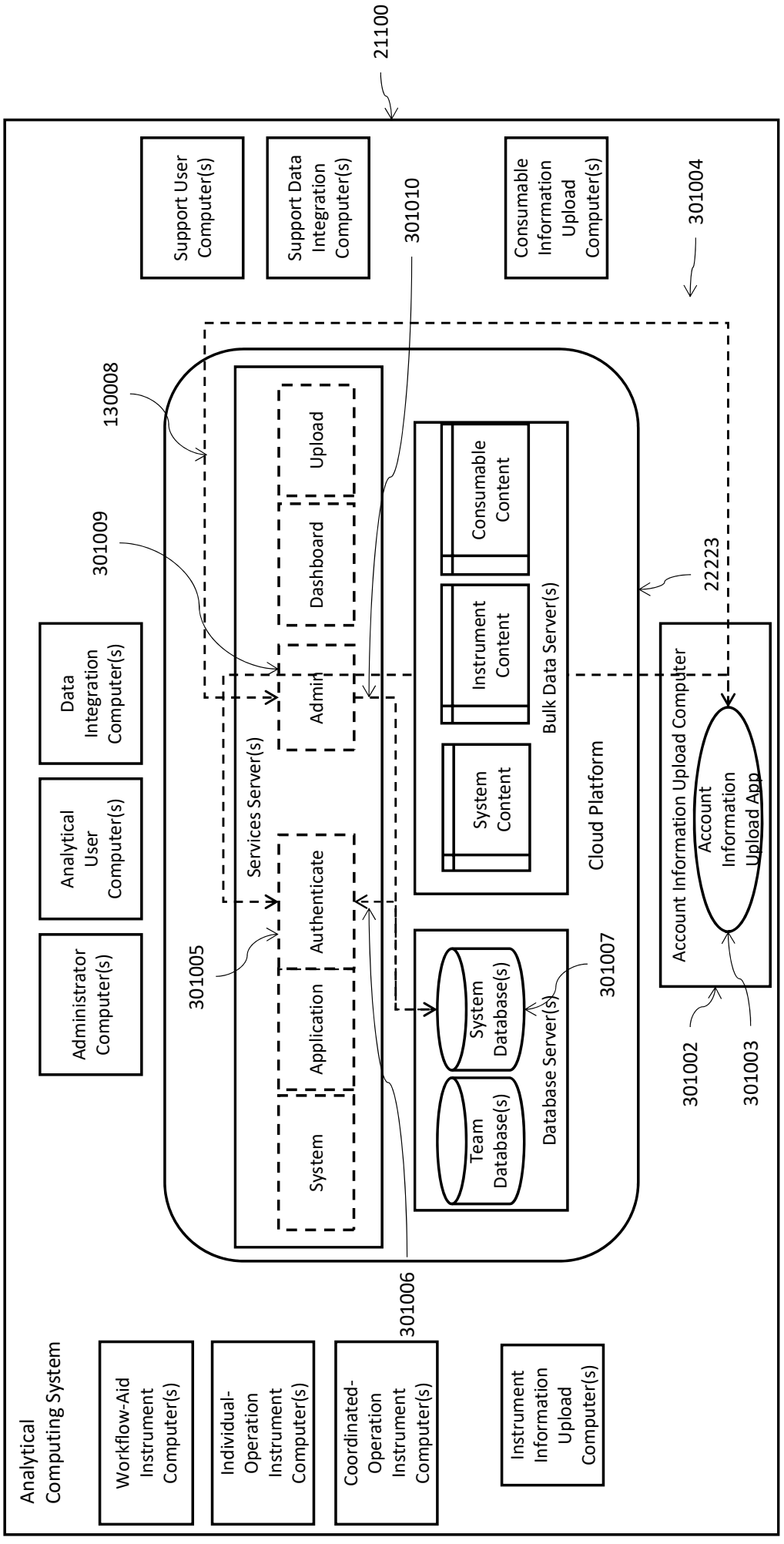

21100
Analytical Computing System
Workflow-Aid Instrument Computer(s)
Individual-Operation Instrument Computer(s)
Coordinated-Operation Instrument Computer(s)
Instrument Information Upload Computer(s)
Administrator Computer(s)
Analytical User Computer(s)
Data Integration Computer(s)
Support User Computer(s)
Support Data Integration Computer(s)
Consumable Information Upload Computer(s)
301004
301010
130008
301009
301005
301006
301007
301002
301003
22223
Services Server(s)
System
Application
Authenticate
Admin
Dashboard
Upload
Database Server(s)
System Database(s)
Team Database(s)
Bulk Data Server(s)
System Content
Instrument Content
Consumable Content
Cloud Platform
Account Information Upload Computer
Account Information Upload App

FIG. 30

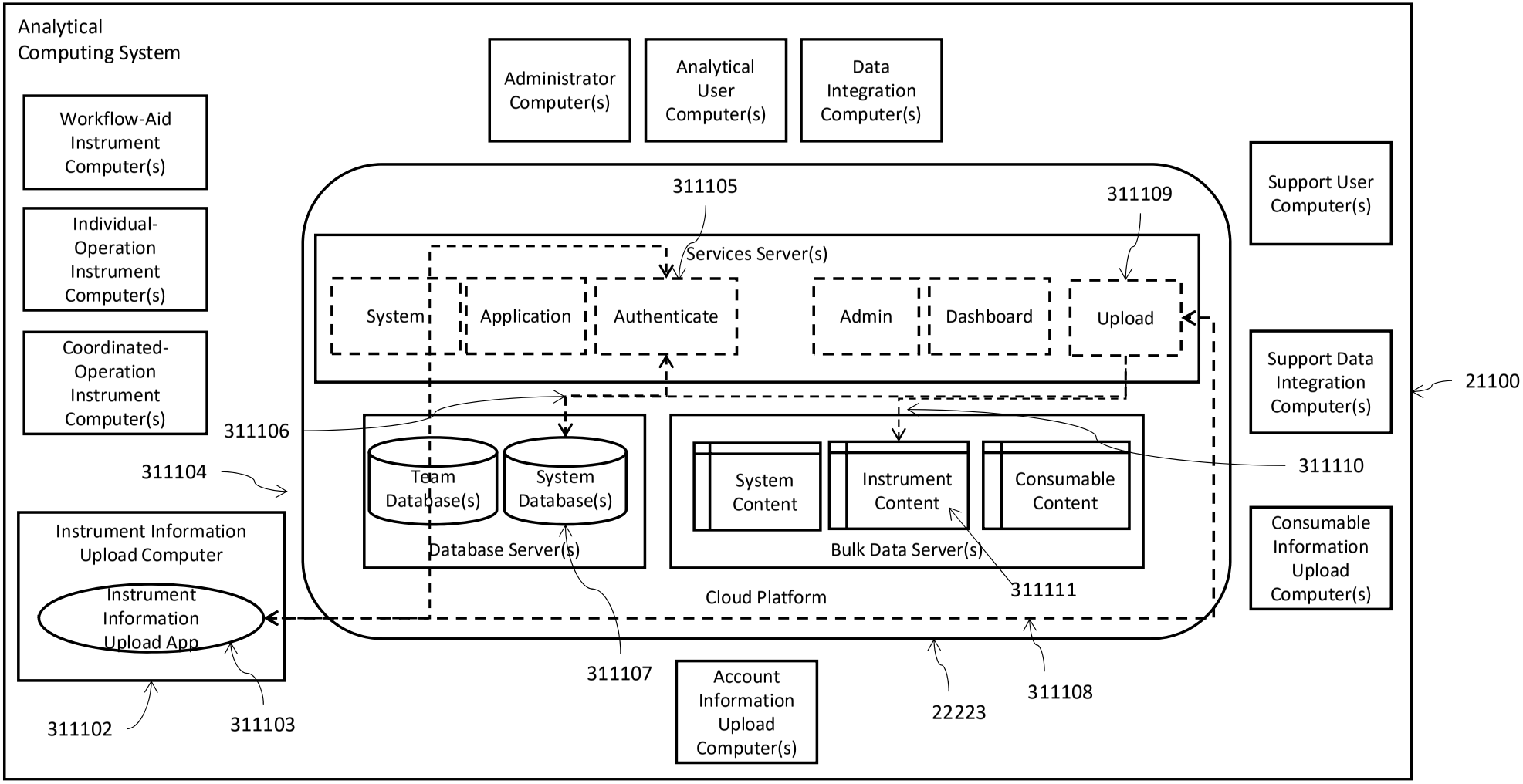

Analytical
Computing System
Workflow-Aid
Instrument
Computer(s)
Individual-
Operation
Instrument
Computer(s)
Coordinated-
Operation
Instrument
Computer(s)
Administrator
Computer(s)
Analytical
User
Computer(s)
Data
Integration
Computer(s)
Support User
Computer(s)
Support Data
Integration
Computer(s)
Consumable
Information
Upload
Computer(s)
Instrument Information
Upload Computer
Instrument
Information
Upload App
Account
Information
Upload
Computer(s)
Services Server(s)
System
Application
Authenticate
Admin
Dashboard
Upload
Team
Database(s)
System
Database(s)
Database Server(s)
System
Content
Instrument
Content
Consumable
Content
Bulk Data Server(s)
Cloud Platform
311102
311103
311104
311105
311106
311107
311108
311109
311110
311111
22223
21100

FIG. 31

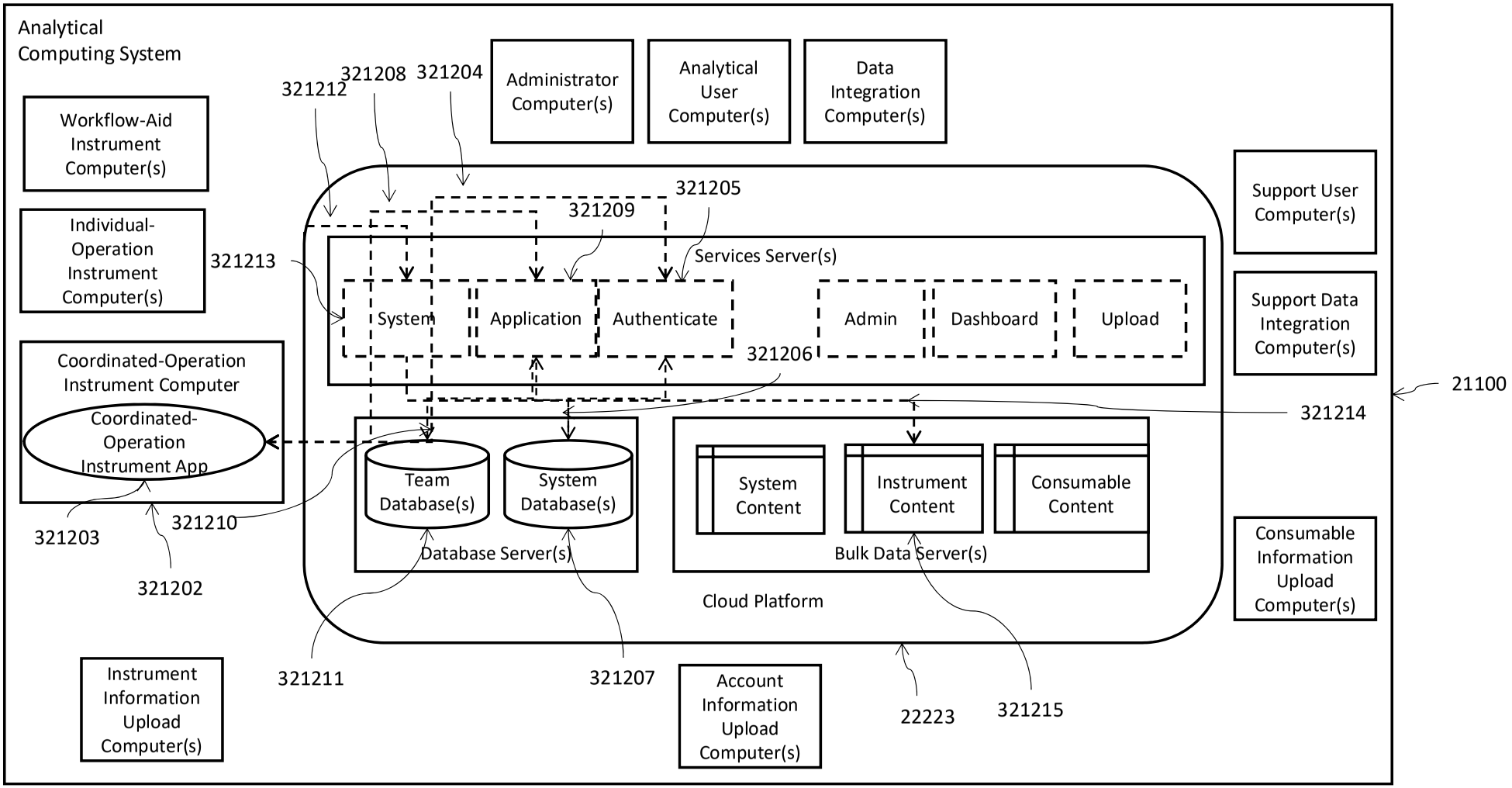

Analytical
Computing System
321212
321208
321204
Administrator
Computer(s)
Analytical
User
Computer(s)
Data
Integration
Computer(s)
Workflow-Aid
Instrument
Computer(s)
321205
321209
Support User
Computer(s)
Individual-
Operation
Instrument
Computer(s)
321213
Services Server(s)
System
Application
Authenticate
Admin
Dashboard
Upload
Support Data
Integration
Computer(s)
Coordinated-Operation
Instrument Computer
321206
21100
Coordinated-
Operation
Instrument App
321214
Team
Database(s)
System
Database(s)
System
Content
Instrument
Content
Consumable
Content
321203
321210
Database Server(s)
Bulk Data Server(s)
321202
Consumable
Information
Upload
Computer(s)
Cloud Platform
Instrument
Information
Upload
Computer(s)
321211
321207
Account
Information
Upload
Computer(s)
22223
321215

FIG. 32

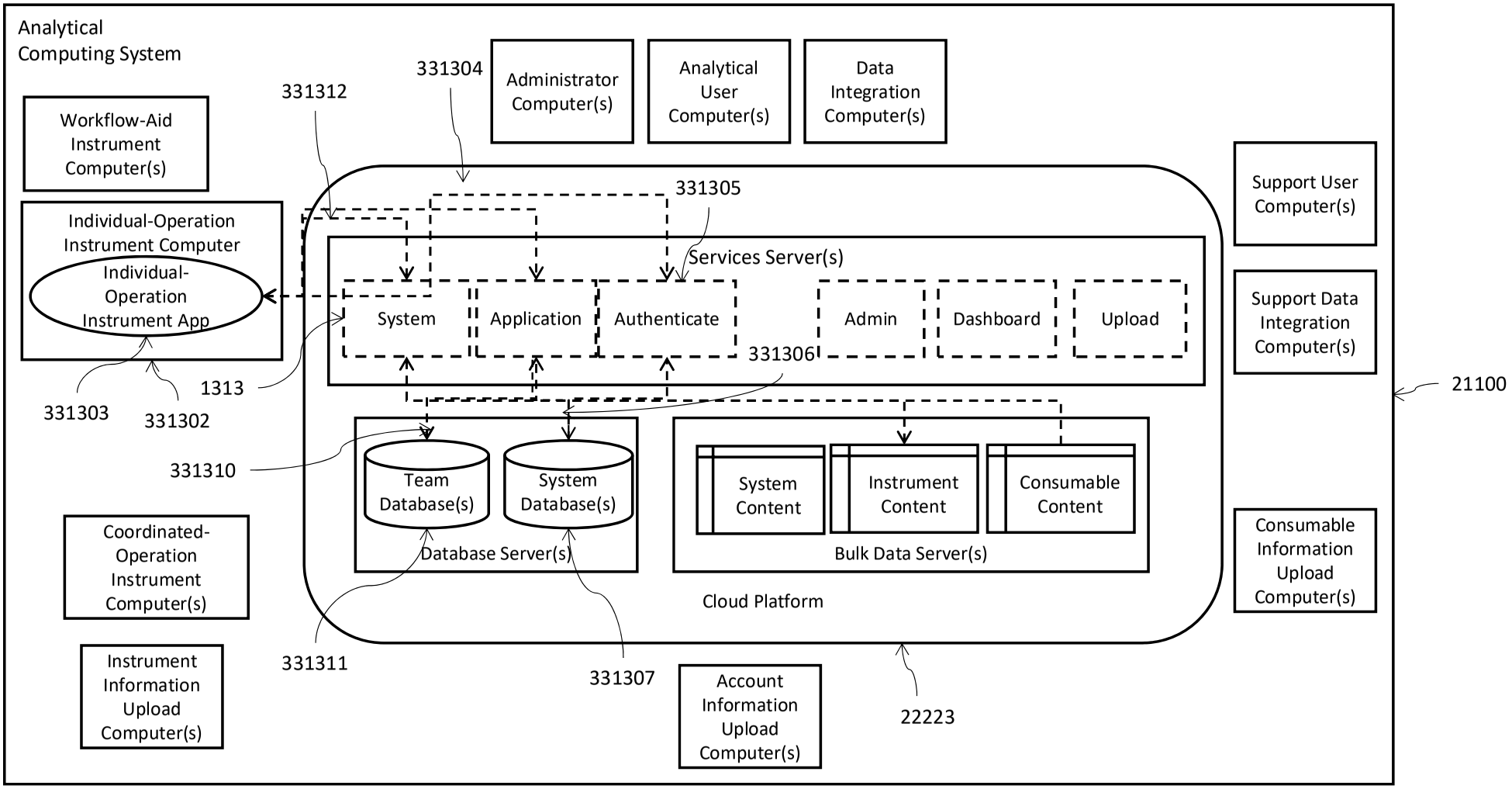

Analytical
Computing System
331304
Administrator
Computer(s)
Analytical
User
Computer(s)
Data
Integration
Computer(s)
331312
Workflow-Aid
Instrument
Computer(s)
331305
Support User
Computer(s)
Individual-Operation
Instrument Computer
Individual-
Operation
Instrument App
Services Server(s)
System
Application
Authenticate
Admin
Dashboard
Upload
Support Data
Integration
Computer(s)
331306
21100
1313
331303
331302
331310
Team
Database(s)
System
Database(s)
System
Content
Instrument
Content
Consumable
Content
Coordinated-
Operation
Instrument
Computer(s)
Database Server(s)
Bulk Data Server(s)
Consumable
Information
Upload
Computer(s)
Cloud Platform
Instrument
Information
Upload
Computer(s)
331311
331307
Account
Information
Upload
Computer(s)
22223

FIG. 33A

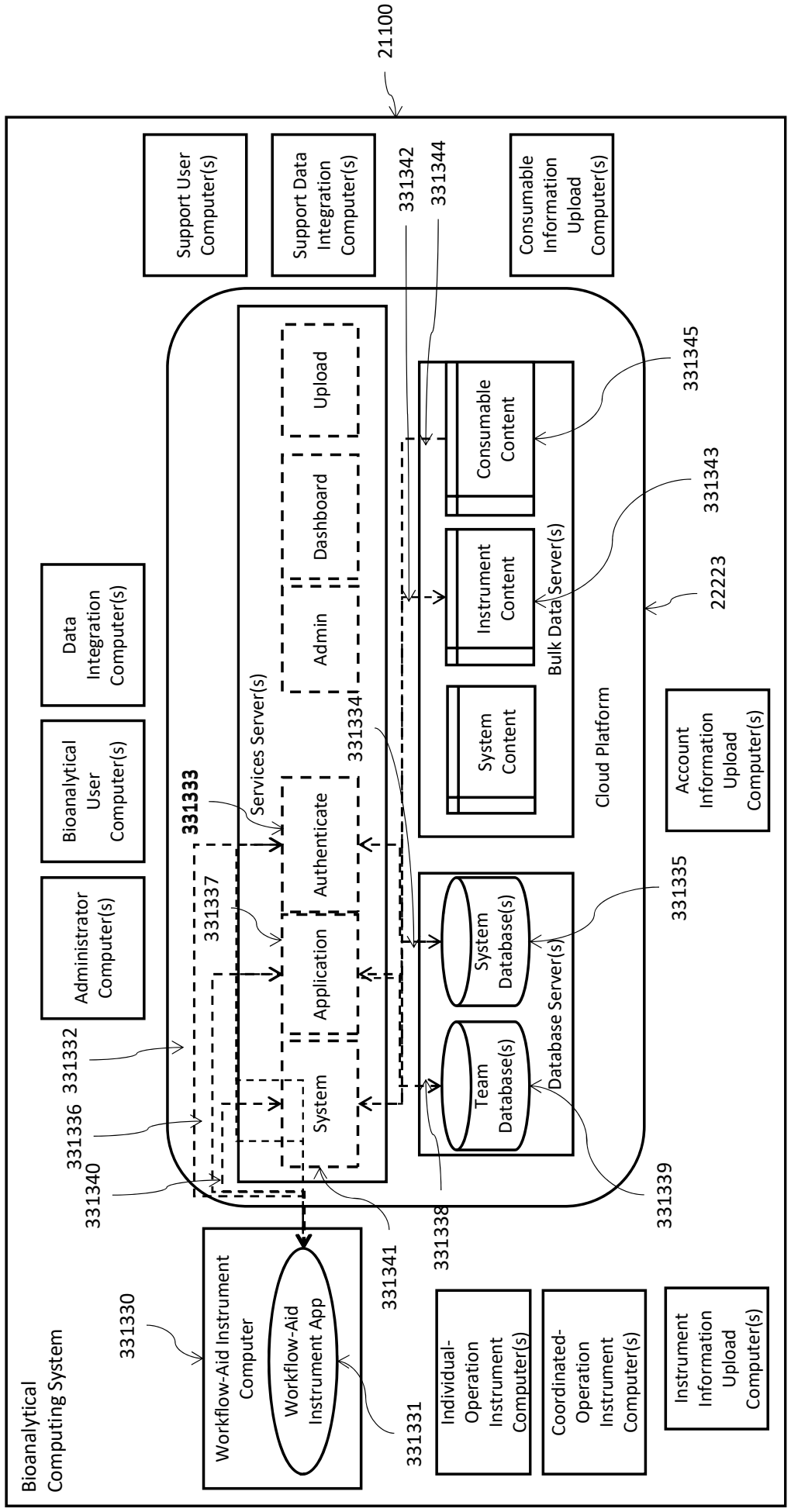

21100
Bioanalytical Computing System
Workflow-Aid Instrument Computer
Workflow-Aid Instrument App
331330
331331
Individual-Operation Instrument Computer(s)
Coordinated-Operation Instrument Computer(s)
Instrument Information Upload Computer(s)
331338
331339
331340
331341
331332
331336
Administrator Computer(s)
Bioanalytical User Computer(s)
Data Integration Computer(s)
Support User Computer(s)
Support Data Integration Computer(s)
Consumable Information Upload Computer(s)
331342
331344
331345
331343
22223
Account Information Upload Computer(s)
331335
331333
Services Server(s)
331337
Application
System
Authenticate
331334
Admin
Dashboard
Upload
Cloud Platform
Bulk Data Server(s)
Consumable Content
Instrument Content
System Content
Database Server(s)
System Database(s)
Team Database(s)

FIG. 33B

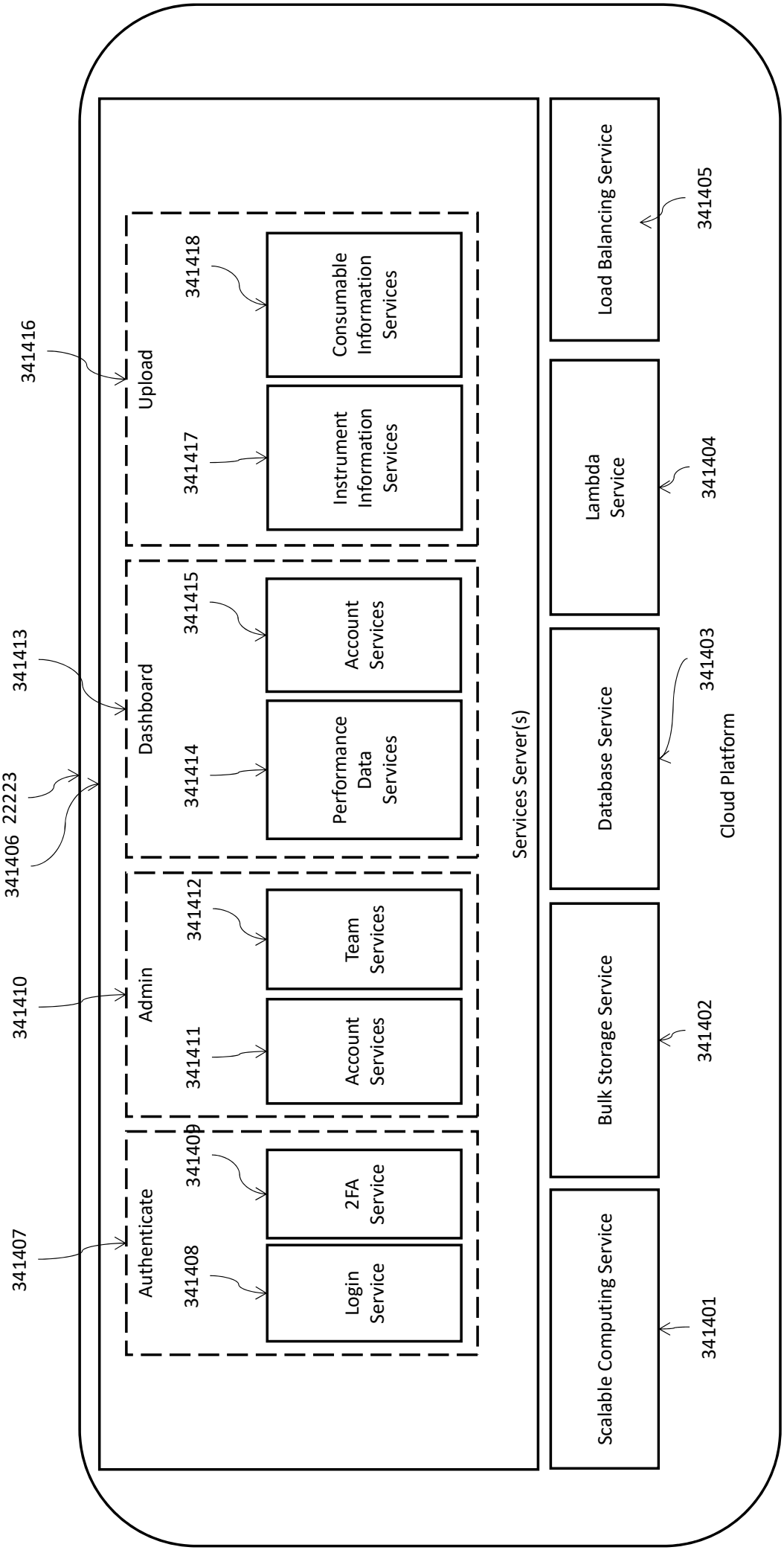

Cloud Platform
Services Server(s)
Scalable Computing Service
341401
Bulk Storage Service
341402
Database Service
341403
Lambda Service
341404
Load Balancing Service
341405
Authenticate
341407
Login Service
341408
2FA Service
341409
Admin
341410
Account Services
341411
Team Services
341412
Dashboard
341413
341406
22223
Performance Data Services
341414
Account Services
341415
Upload
341416
Instrument Information Services
341417
Consumable Information Services
341418

FIG. 34A

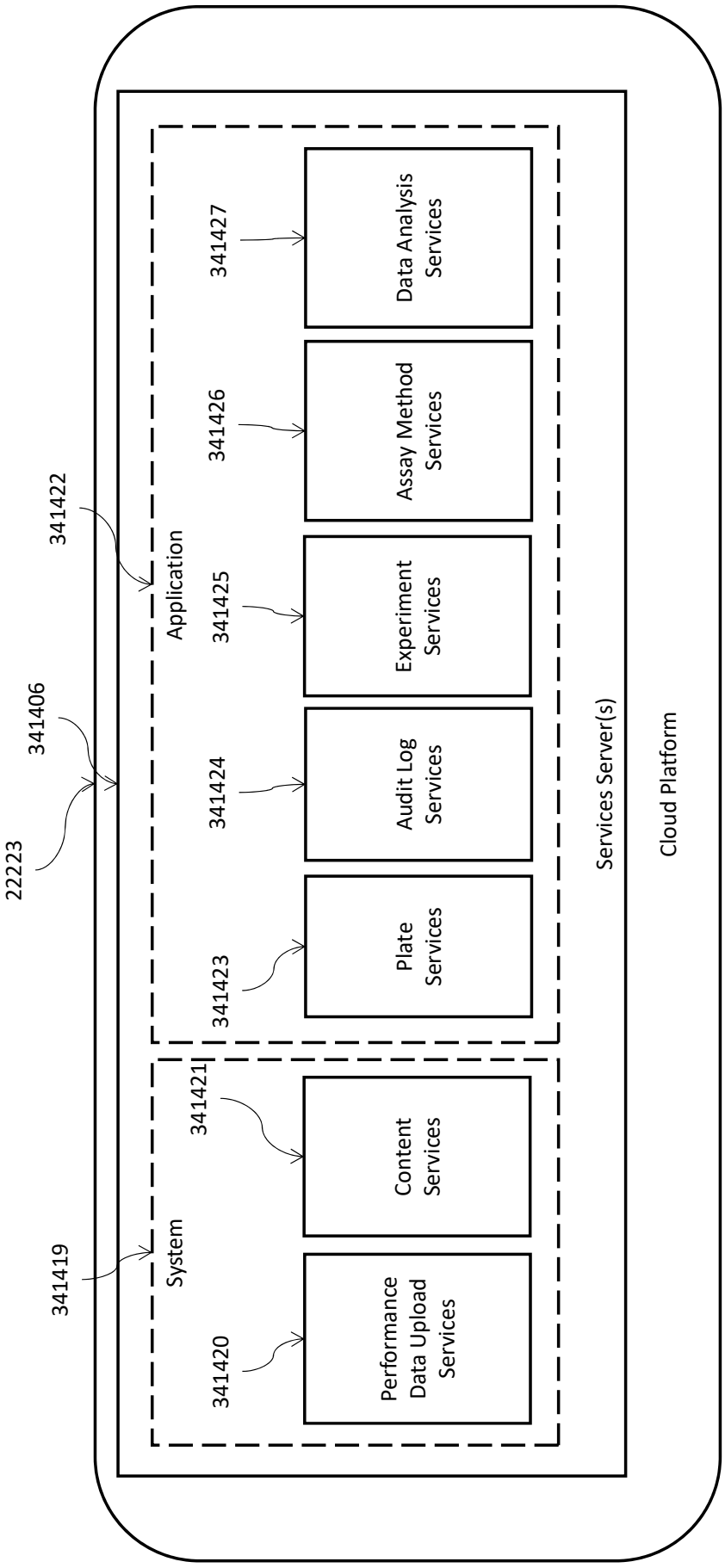

Cloud Platform
Services Server(s)
System
Application
341419
341420
Performance Data Upload Services
341421
Content Services
341423
Plate Services
341424
Audit Log Services
341425
Experiment Services
341426
Assay Method Services
341427
Data Analysis Services
341422
341406
22223

FIG. 34B

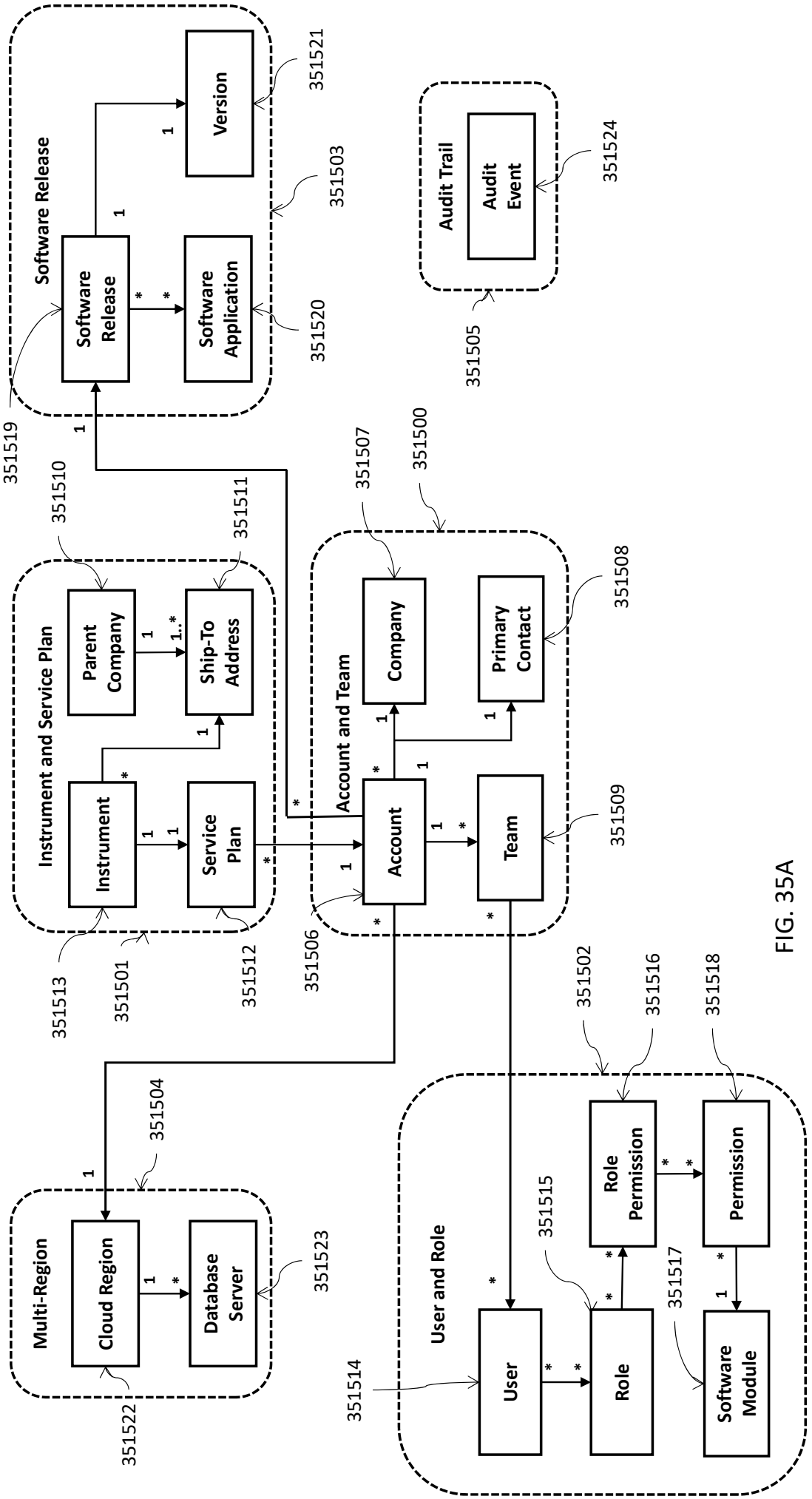

Software Release
Version
Software Release
Software Application
351521
351503
351520
351519
Audit Trail
Audit Event
351524
351505
Instrument and Service Plan
Parent Company
Ship-To Address
Instrument
Service Plan
351510
351511
351513
351501
351512
Account and Team
Company
Primary Contact
Account
Team
351507
351500
351508
351509
351506
Multi-Region
Cloud Region
Database Server
351504
351523
351522
User and Role
User
Role
Role Permission
Permission
Software Module
351502
351516
351518
351515
351517
351514

FIG. 35A

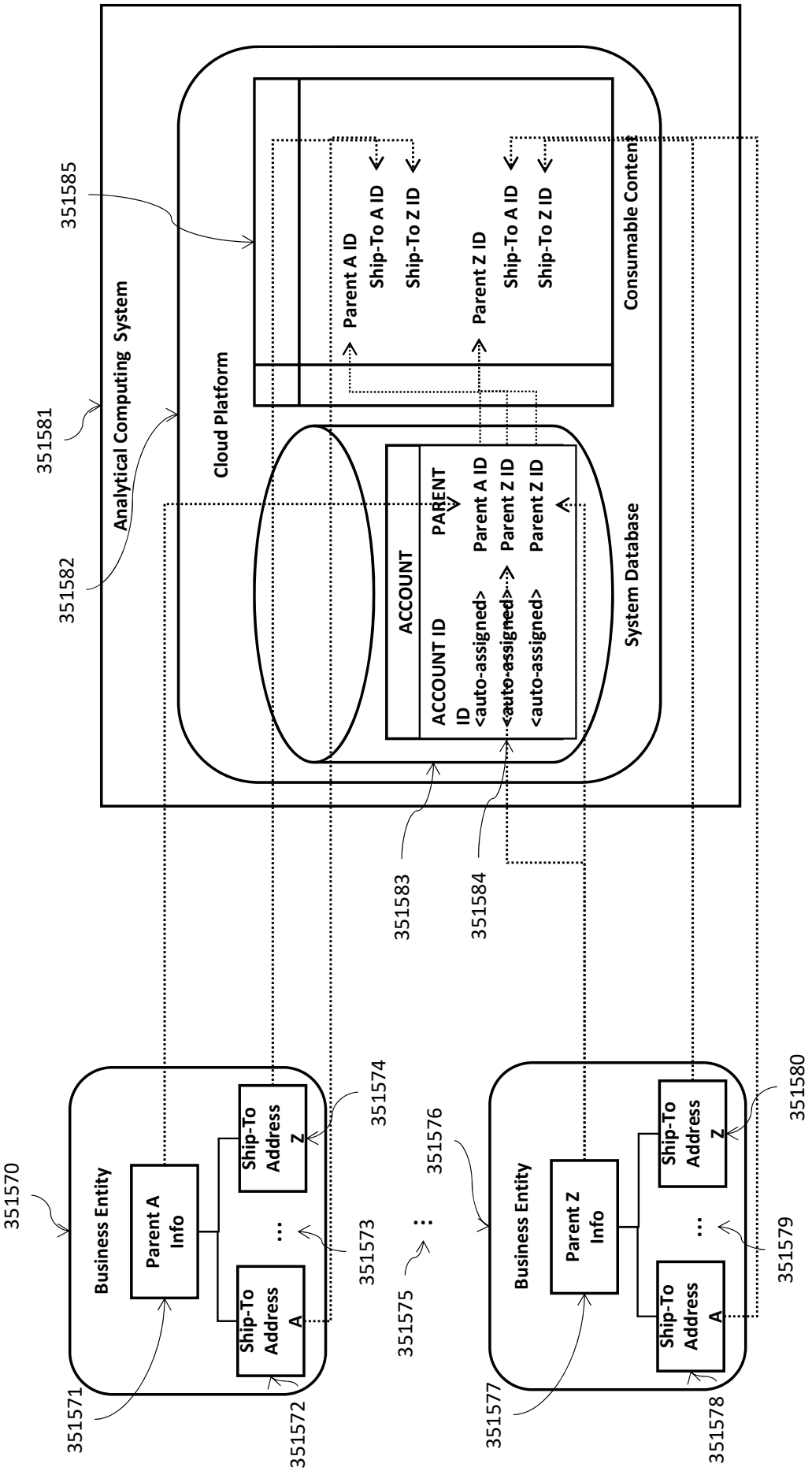

Analytical Computing System
Cloud Platform
Consumable Content
System Database
Parent A ID
Ship-To A ID
Ship-To Z ID
Parent Z ID
Ship-To A ID
Ship-To Z ID
ACCOUNT
ACCOUNT ID
PARENT ID
<auto-assigned>
Parent A ID
Parent Z ID
<auto-assigned>
<auto-assigned>
Parent Z ID
Business Entity
Parent A Info
Ship-To Address A
Ship-To Address Z
Business Entity
Parent Z Info
Ship-To Address A
Ship-To Address Z
351570
351571
351572
351573
351574
351575
351576
351577
351578
351579
351580
351581
351582
351583
351584
351585

FIG. 35B

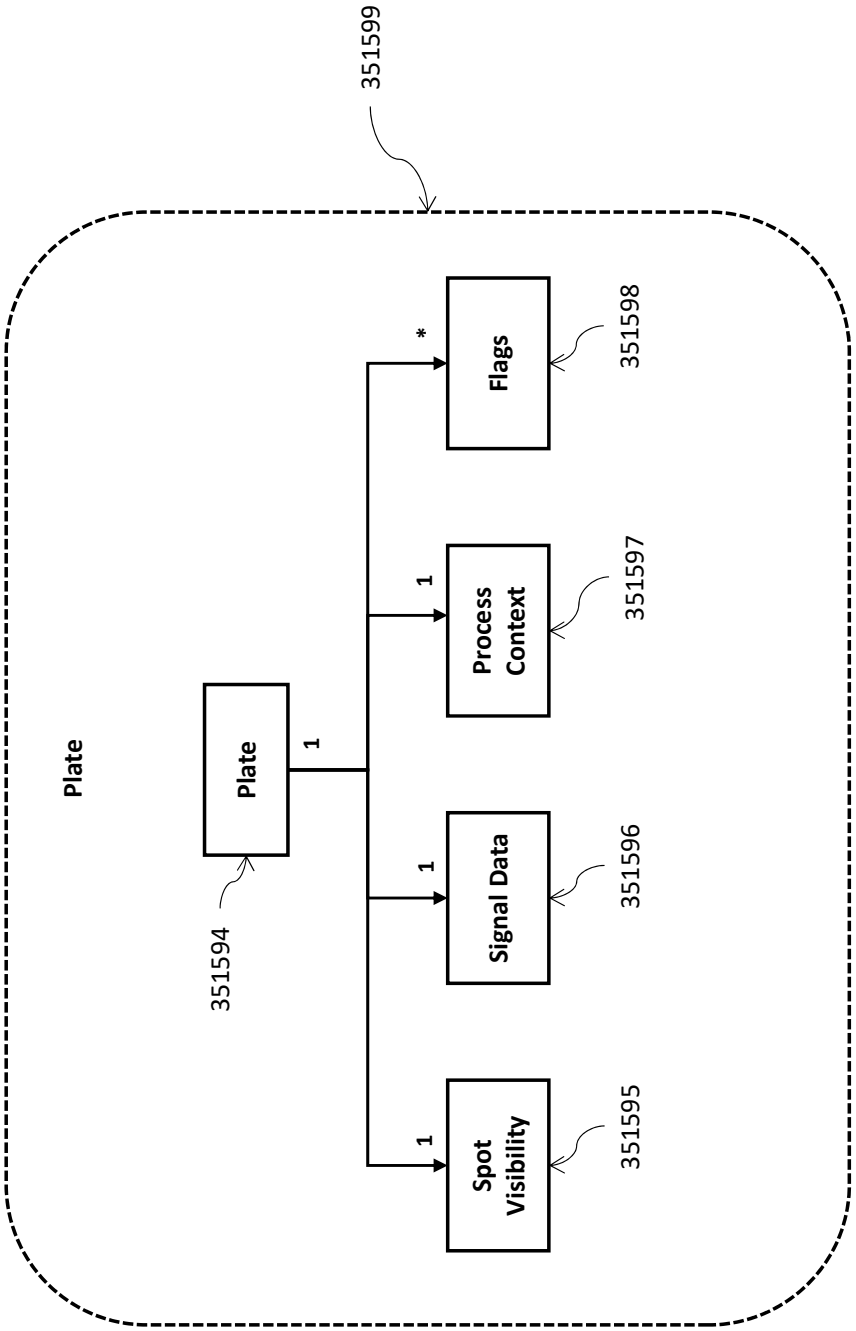

351599
Plate
Plate
1
351594
1
Spot Visibility
351595
1
Signal Data
351596
1
Process Context
351597
*
Flags
351598

FIG. 35C

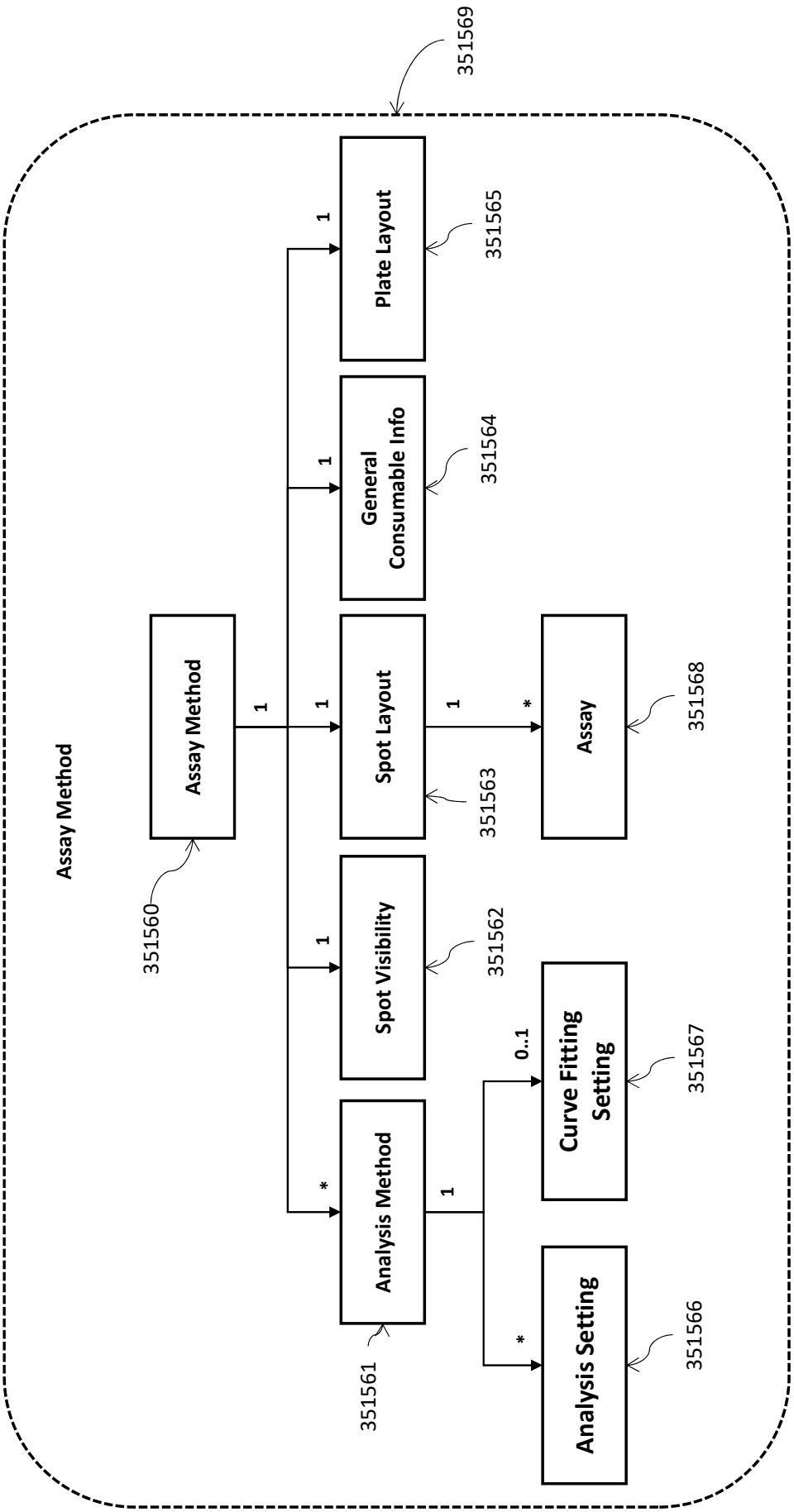

Assay Method
351569
Assay Method
351560
Plate Layout
351565
General Consumable Info
351564
Spot Layout
351563
Assay
351568
Spot Visibility
351562
Analysis Method
351561
Curve Fitting Setting
351567
Analysis Setting
351566
1
1
1
1
1
1
*
*
1
0..1
*

FIG. 35D

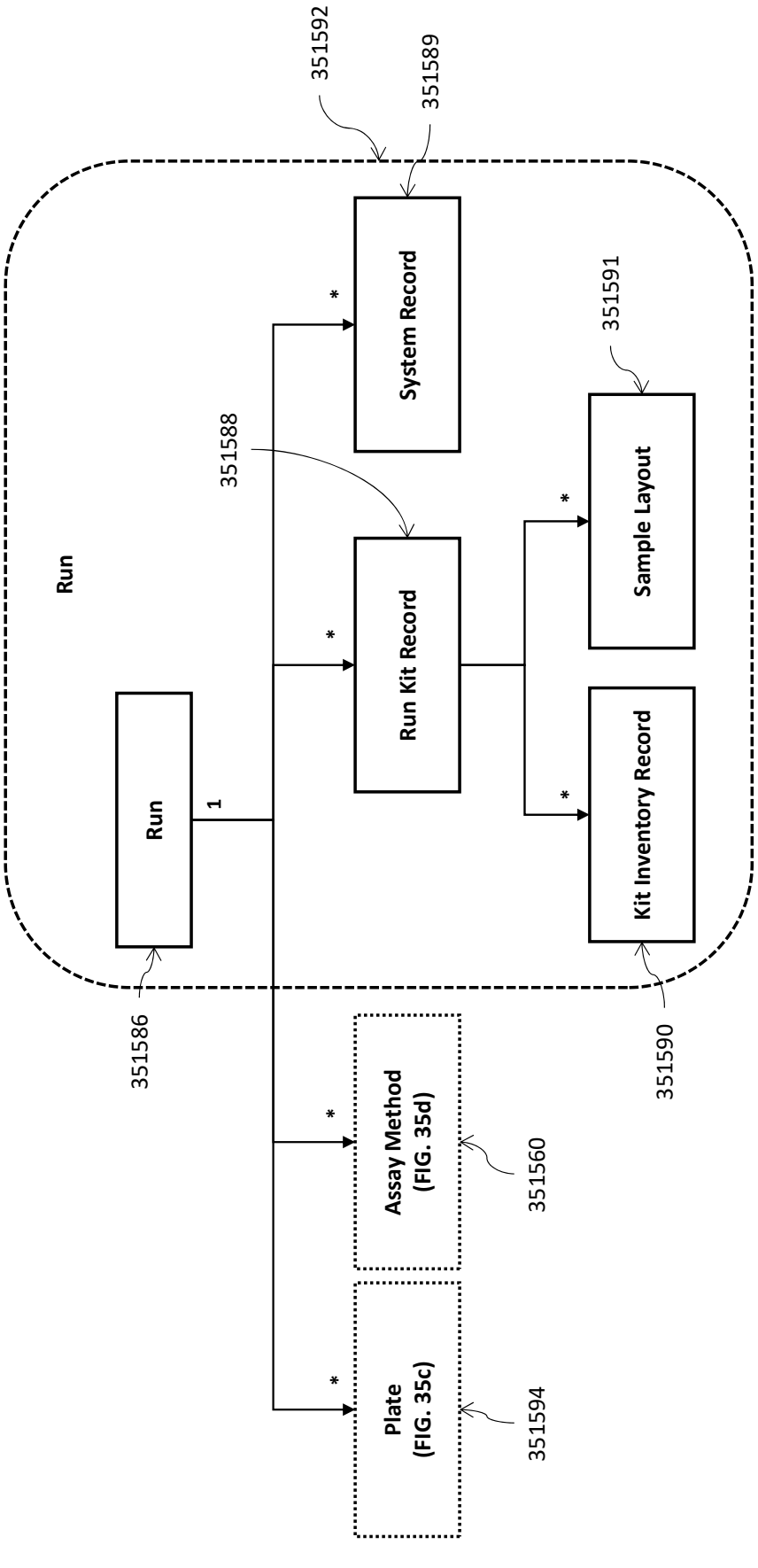

Run
Run
1
Run Kit Record
*
System Record
*
Sample Layout
*
Kit Inventory Record
*
Assay Method
(FIG. 35d)
*
Plate
(FIG. 35c)
*
351586
351588
351589
351590
351591
351592
351560
351594

FIG. 35E

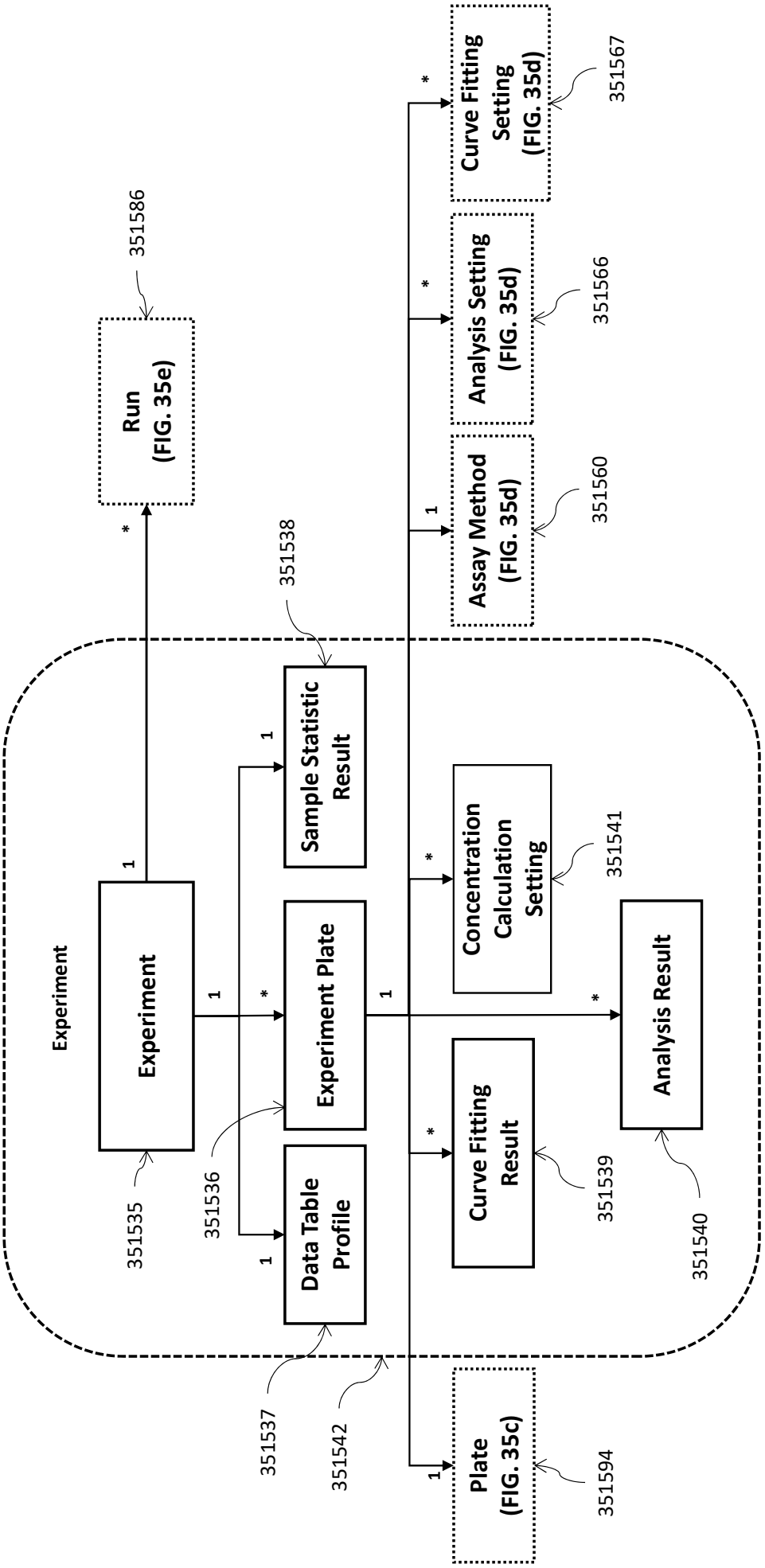

Experiment
Experiment
Run (FIG. 35e)
Sample Statistic Result
Experiment Plate
Data Table Profile
Concentration Calculation Setting
Curve Fitting Result
Analysis Result
Assay Method (FIG. 35d)
Analysis Setting (FIG. 35d)
Curve Fitting Setting (FIG. 35d)
Plate (FIG. 35c)
351535
351536
351537
351538
351539
351540
351541
351542
351560
351566
351567
351586
351594
1
*

FIG. 35F

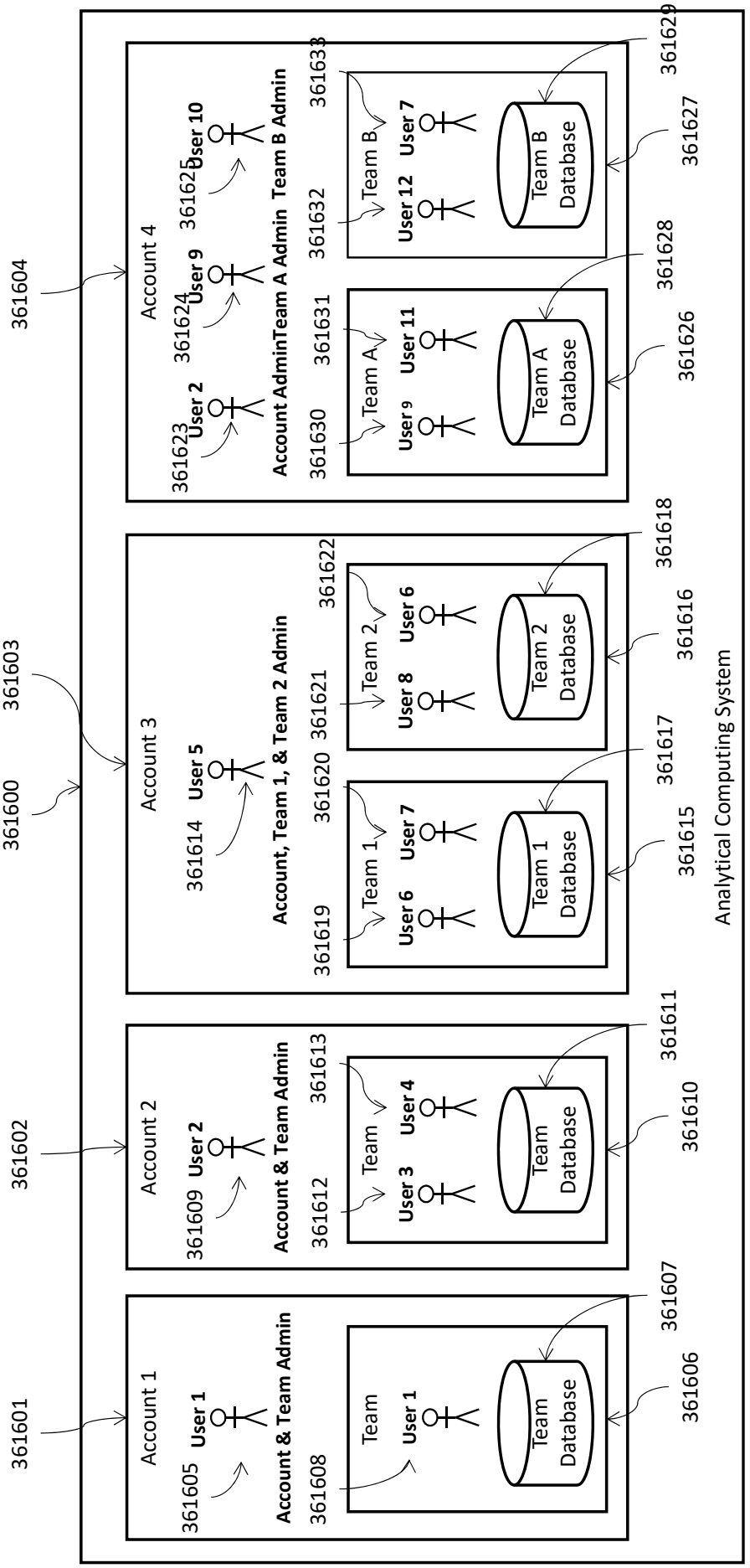

Analytical Computing System
Account 1
Account & Team Admin
User 1
Team
Team Database
Account 2
Account & Team Admin
User 2
Team
User 3
User 4
Team Database
Account 3
Account, Team 1, & Team 2 Admin
User 5
Team 1
User 6
User 7
Team 1 Database
Team 2
User 8
User 6
Team 2 Database
Account 4
Account AdminTeam A Admin Team B Admin
User 2
User 9
User 10
Team A
User 9
User 11
Team A Database
Team B
User 12
User 7
Team B Database
361600
361601
361602
361603
361604
361605
361606
361607
361608
361609
361610
361611
361612
361613
361614
361615
361616
361617
361618
361619
361620
361621
361622
361623
361624
361625
361626
361627
361628
361629
361630
361631
361632
361633

FIG. 36A

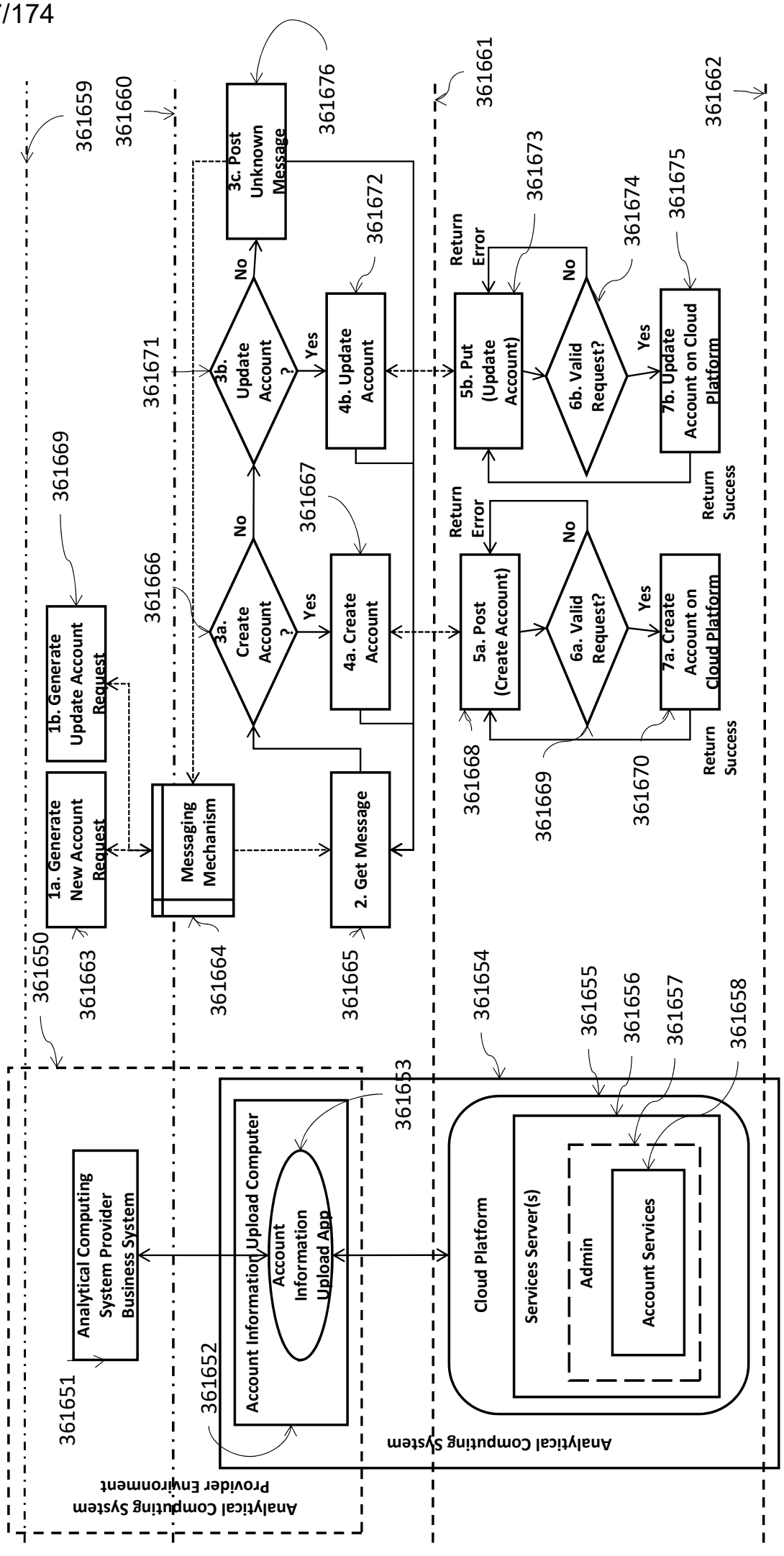

Analytical Computing System Provider Environment
Analytical Computing System
Analytical Computing System Provider Business System
Account Information Upload Computer
Account Information Upload App
Cloud Platform
Services Server(s)
Admin
Account Services
1a. Generate New Account Request
1b. Generate Update Account Request
Messaging Mechanism
2. Get Message
3a. Create Account ?
3b. Update Account ?
3c. Post Unknown Message
4a. Create Account
4b. Update Account
5a. Post (Create Account)
5b. Put (Update Account)
6a. Valid Request?
6b. Valid Request?
7a. Create Account on Cloud Platform
7b. Update Account on Cloud Platform
No
Yes
Return Error
Return Success
361650
361651
361652
361653
361654
361655
361656
361657
361658
361659
361660
361661
361662
361663
361664
361665
361666
361667
361668
361669
361670
361671
361672
361673
361674
361675
361676

FIG. 36B

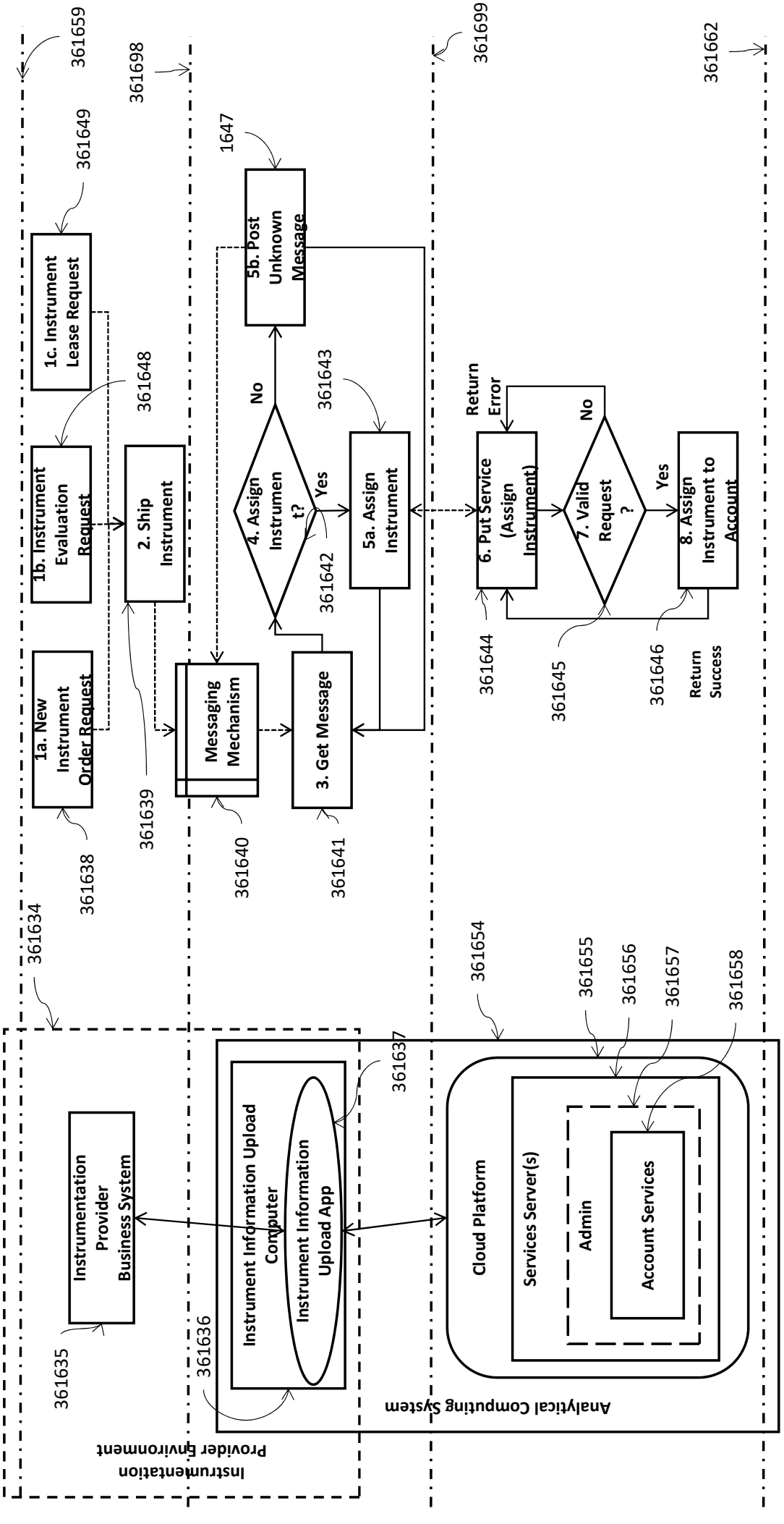

Instrumentation Provider Environment
Analytical Computing System
Instrumentation Provider Business System
Instrument Information Upload Computer
Instrument Information Upload App
Cloud Platform
Services Server(s)
Admin
Account Services
1a. New Instrument Order Request
1b. Instrument Evaluation Request
1c. Instrument Lease Request
2. Ship Instrument
3. Get Message
4. Assign Instrumen t?
5a. Assign Instrument
5b. Post Unknown Message
6. Put Service (Assign Instrument)
7. Valid Request ?
8. Assign Instrument to Account
Messaging Mechanism
No
Yes
Return Error
Return Success
361634
361635
361636
361637
361638
361639
361640
361641
361642
361643
361644
361645
361646
361647
361648
361649
361654
361655
361656
361657
361658
361659
361662
361698
361699

FIG. 36C

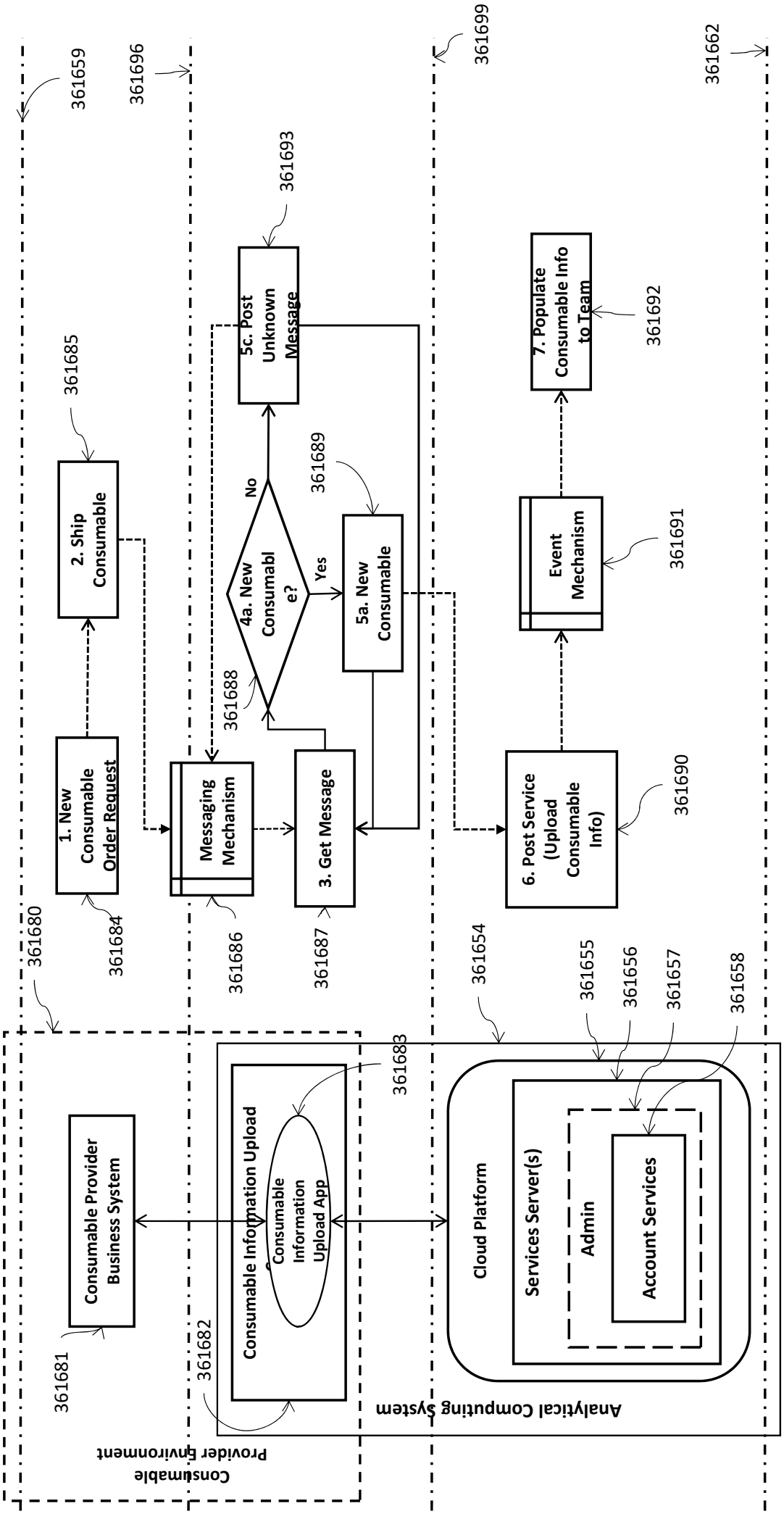

Consumable Provider Environment
Analytical Computing System
Consumable Provider Business System
Consumable Information Upload
Consumable Information Upload App
Cloud Platform
Services Server(s)
Admin
Account Services
1. New Consumable Order Request
2. Ship Consumable
Messaging Mechanism
3. Get Message
4a. New Consumable?
No
Yes
5a. New Consumable
5c. Post Unknown Message
6. Post Service (Upload Consumable Info)
Event Mechanism
7. Populate Consumable Info to Team
361659
361696
361699
361662
361680
361681
361682
361683
361654
361655
361656
361657
361658
361684
361685
361686
361687
361688
361689
361690
361691
361692
361693

FIG. 36D

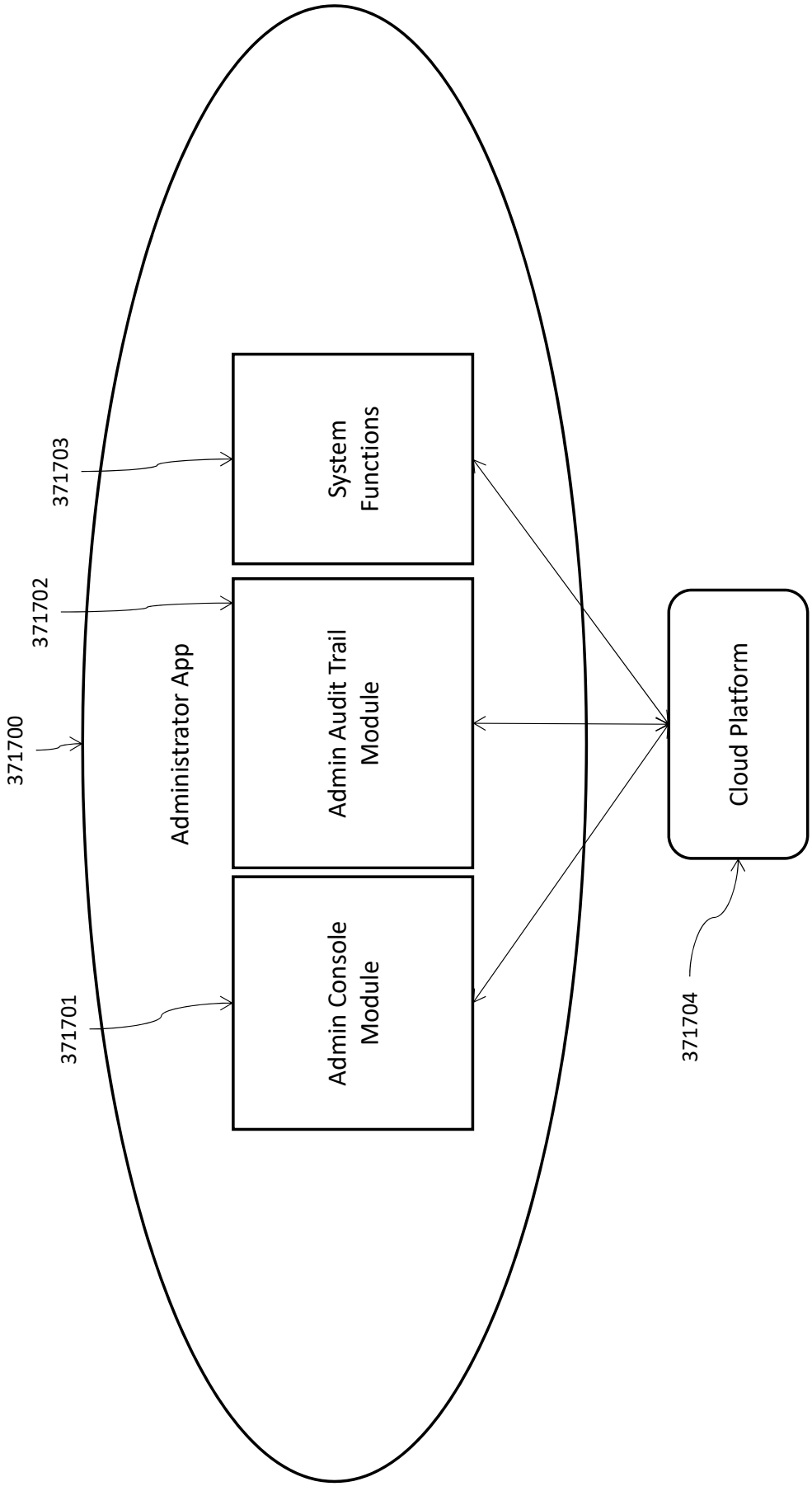

371700
Administrator App
371701
Admin Console Module
371702
Admin Audit Trail Module
371703
System Functions
371704
Cloud Platform

FIG. 37

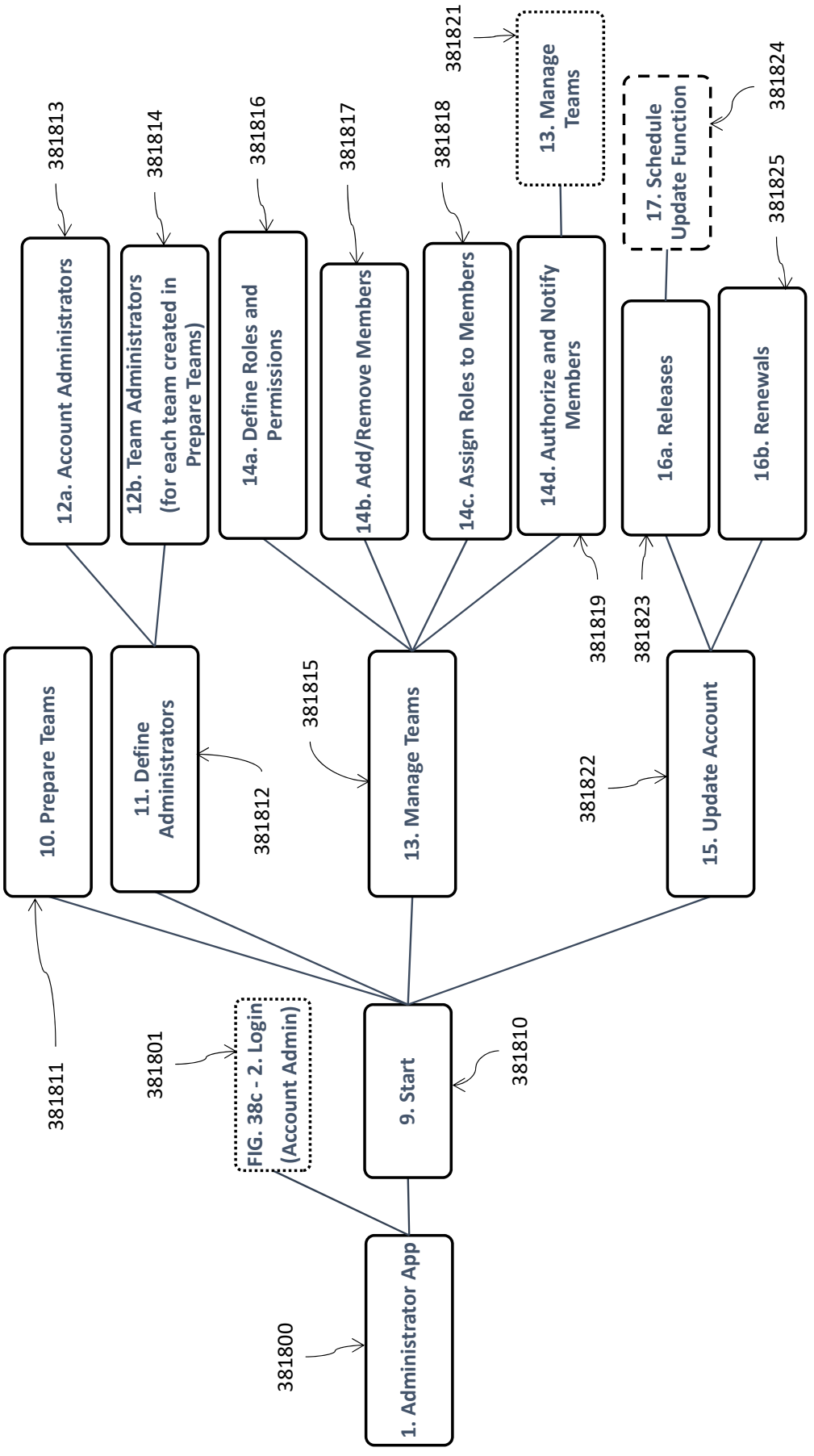

1. Administrator App
381800
9. Start
381810
FIG. 38c - 2. Login (Account Admin)
381801
381811
10. Prepare Teams
11. Define Administrators
381812
13. Manage Teams
381815
15. Update Account
381822
381819
381823
12a. Account Administrators
12b. Team Administrators (for each team created in Prepare Teams)
14a. Define Roles and Permissions
14b. Add/Remove Members
14c. Assign Roles to Members
14d. Authorize and Notify Members
16a. Releases
16b. Renewals
381813
381814
381816
381817
381818
381821
381824
381825
13. Manage Teams
17. Schedule Update Function

FIG. 38A

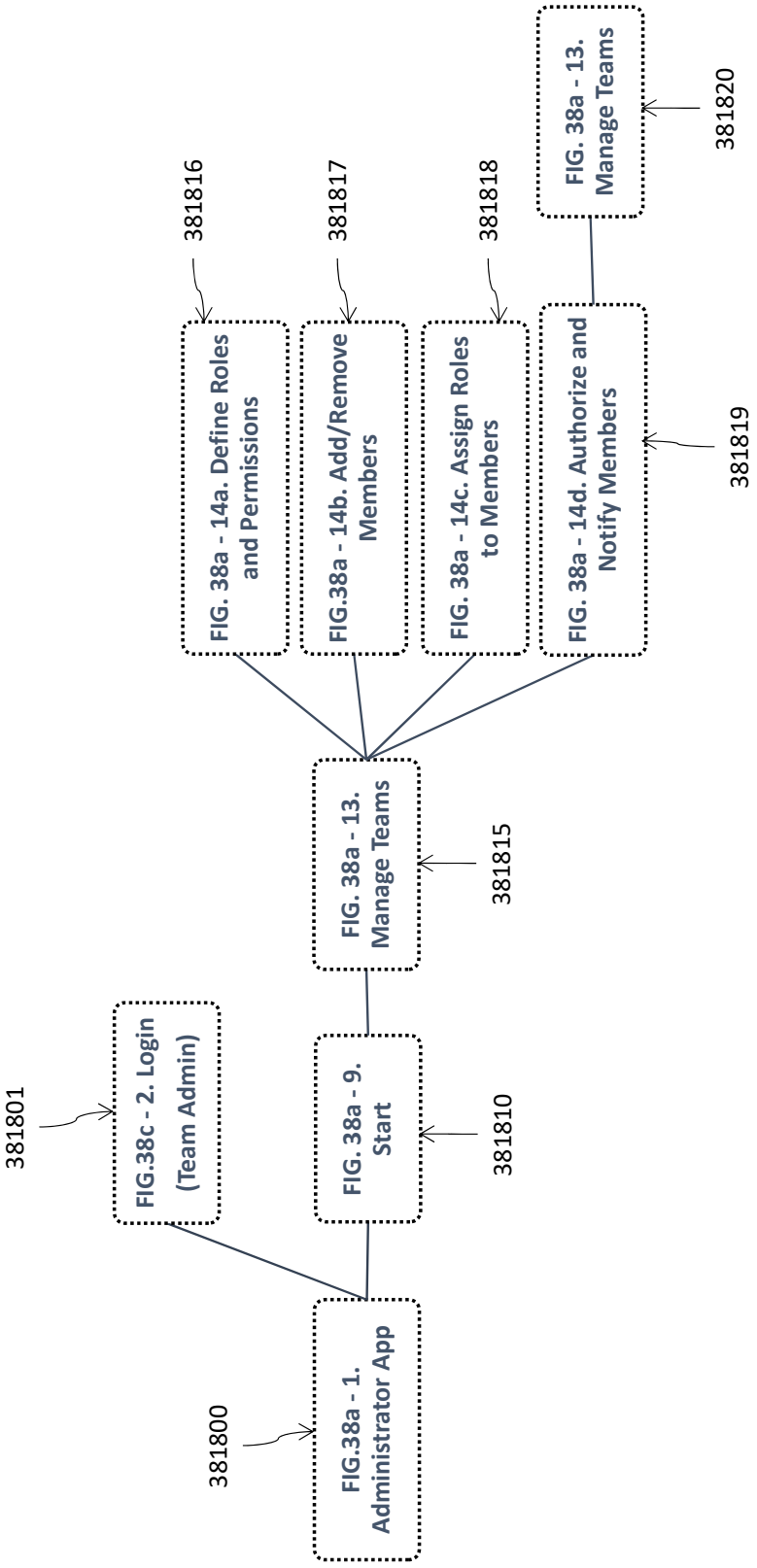


FIG.38a - 1. Administrator App
381800
FIG.38c - 2. Login (Team Admin)
381801
FIG. 38a - 9. Start
381810
FIG. 38a - 13. Manage Teams
381815
FIG. 38a - 14a. Define Roles and Permissions
381816
FIG.38a - 14b. Add/Remove Members
381817
FIG. 38a - 14c. Assign Roles to Members
381818
FIG. 38a - 14d. Authorize and Notify Members
381819
FIG. 38a - 13. Manage Teams
381820

FIG. 38B

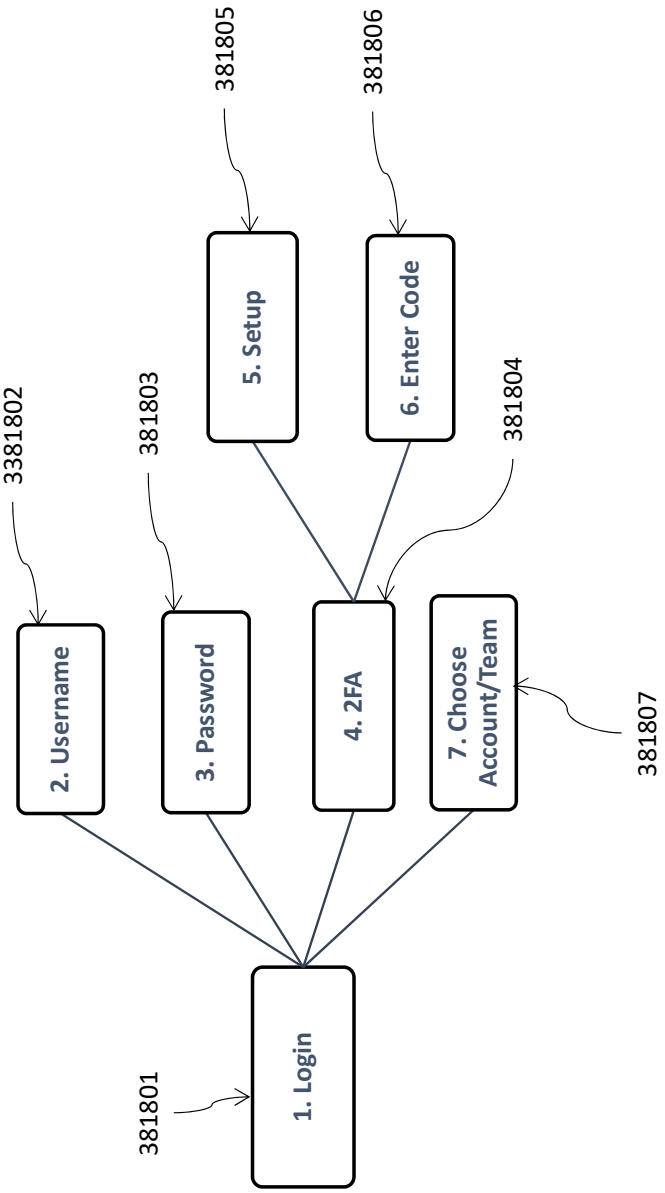

1. Login
2. Username
3. Password
4. 2FA
5. Setup
6. Enter Code
7. Choose Account/Team
381801
3381802
381803
381804
381805
381806
381807

FIG. 38C

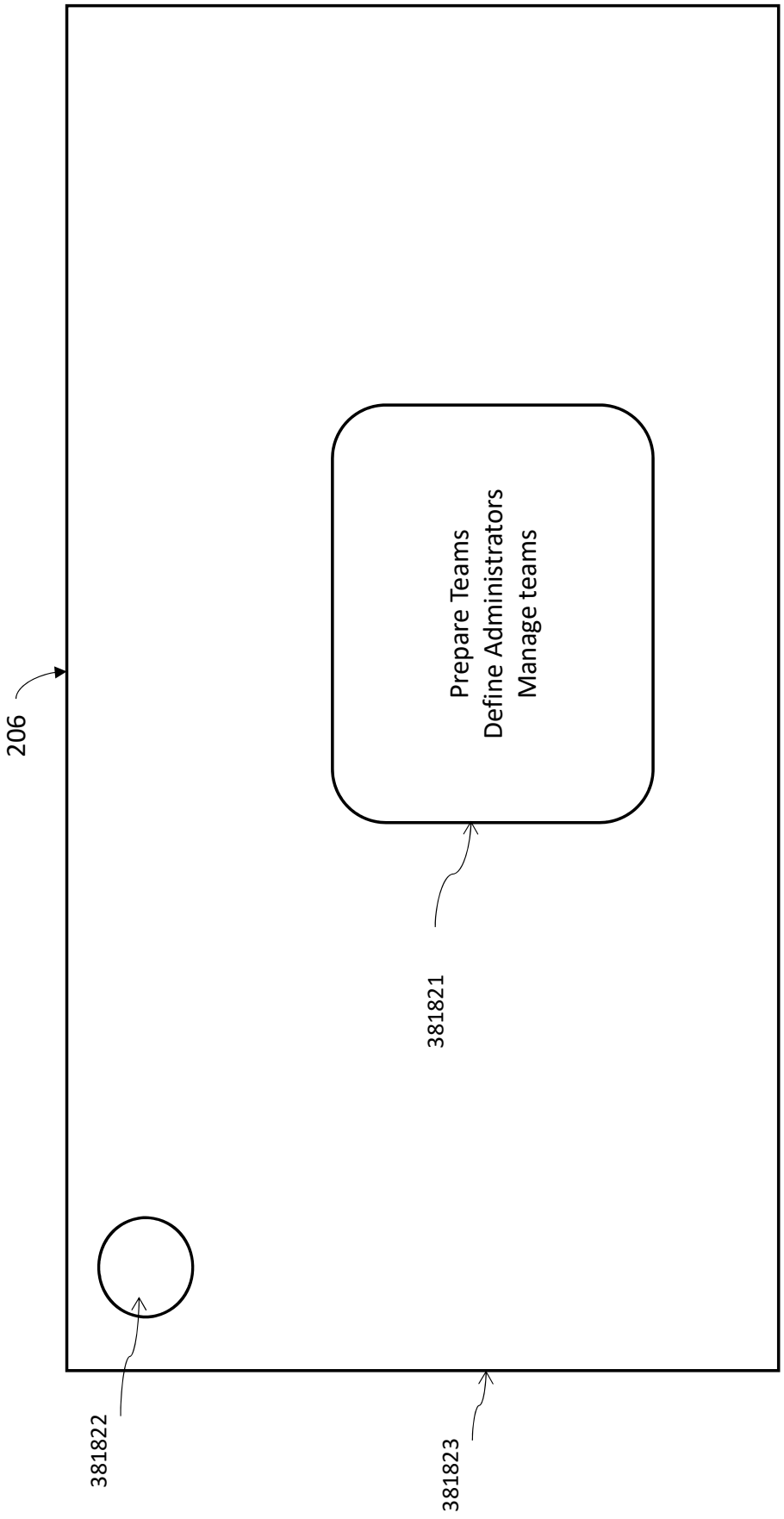

206
Prepare Teams
Define Administrators
Manage teams
381821
381822
381823

FIG. 38D

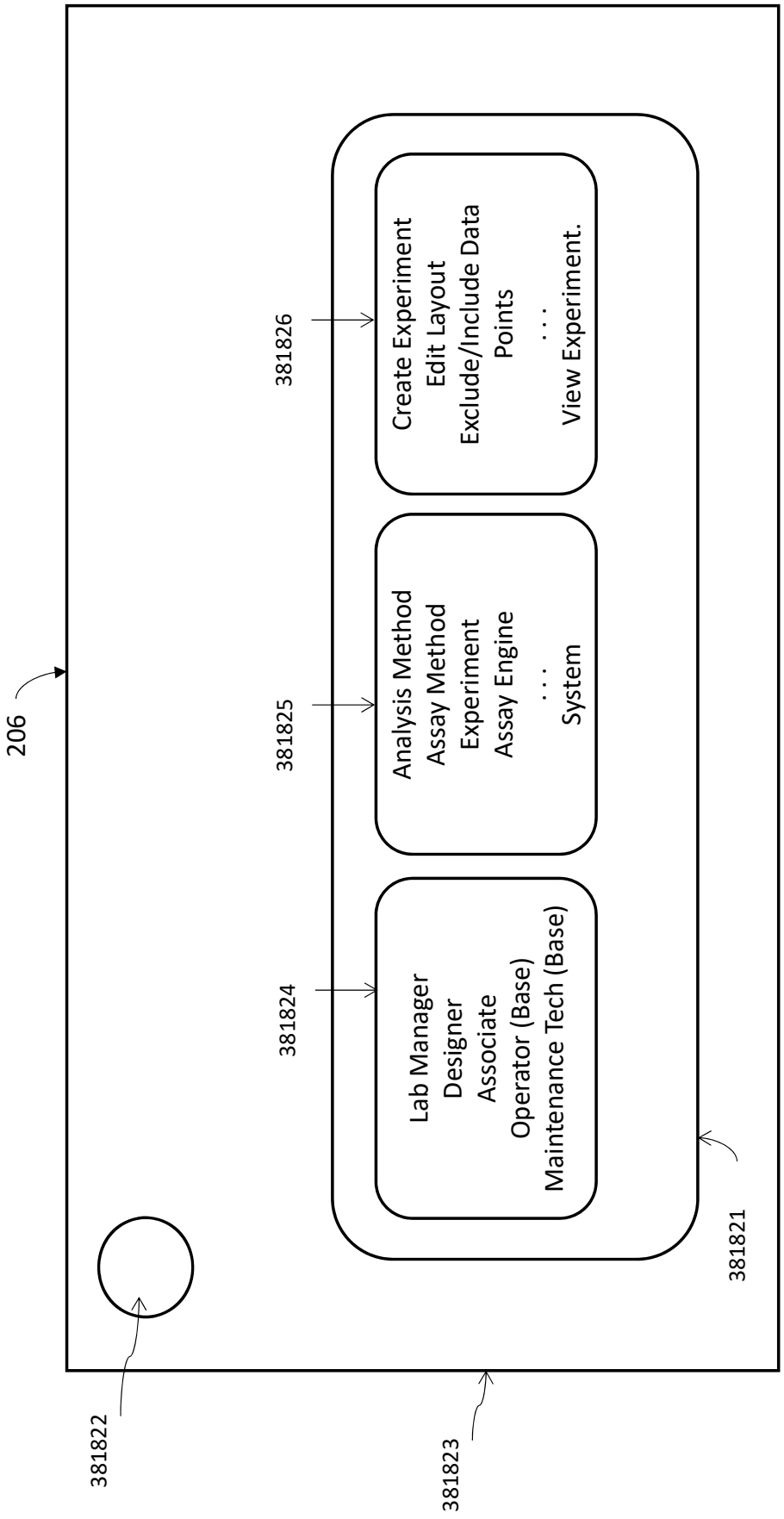

206
381822
381823
381824
Lab Manager
Designer
Associate
Operator (Base)
Maintenance Tech (Base)
381825
Analysis Method
Assay Method
Experiment
Assay Engine
. . .
System
381826
Create Experiment
Edit Layout
Exclude/Include Data Points
. . .
View Experiment.
381821

FIG. 38E

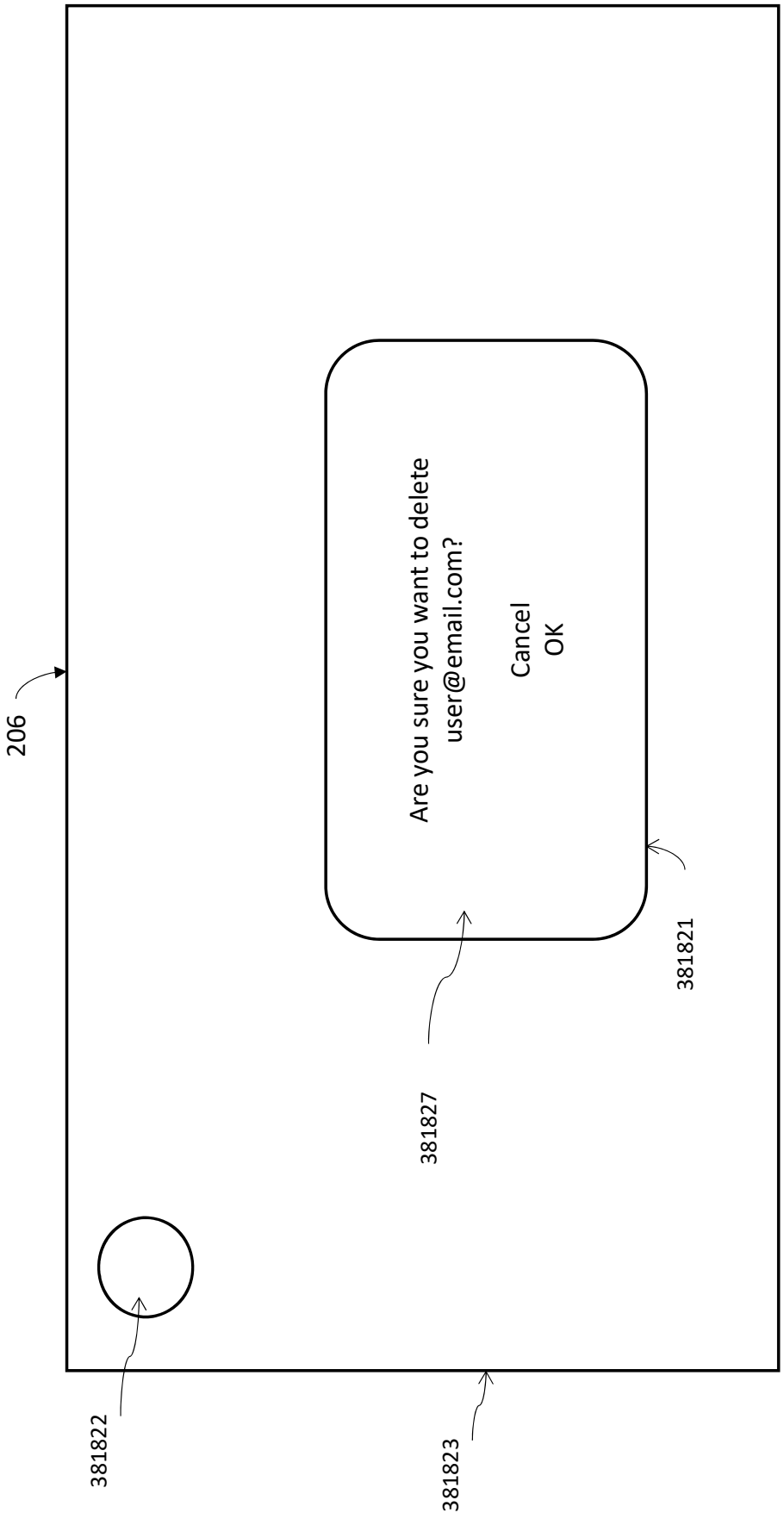

206
Are you sure you want to delete
user@email.com?
Cancel
OK
381821
381827
381822
381823

FIG. 38F

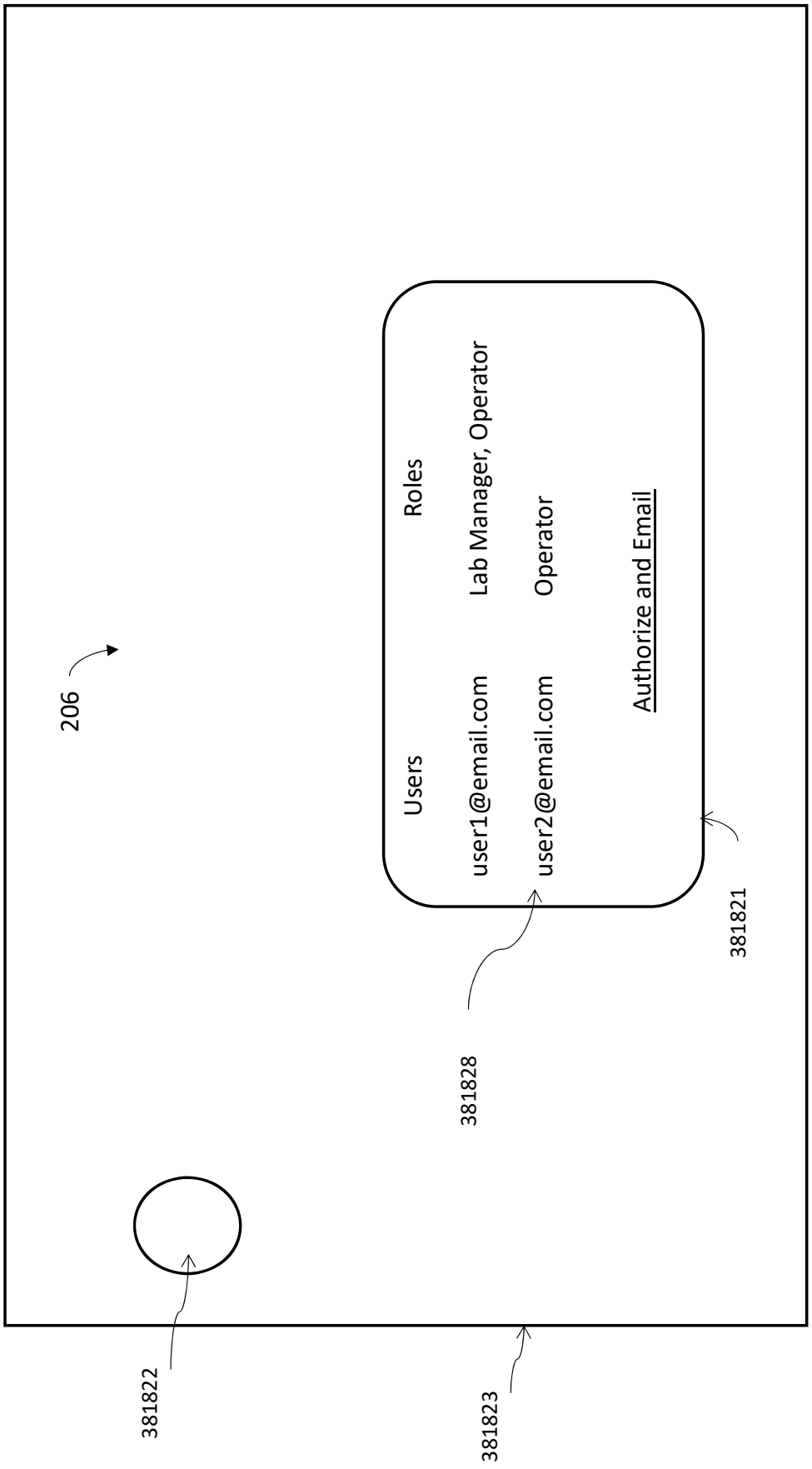

206
Users
Roles
user1@email.com
Lab Manager, Operator
user2@email.com
Operator
Authorize and Email
381821
381828
381822
381823

FIG. 38G

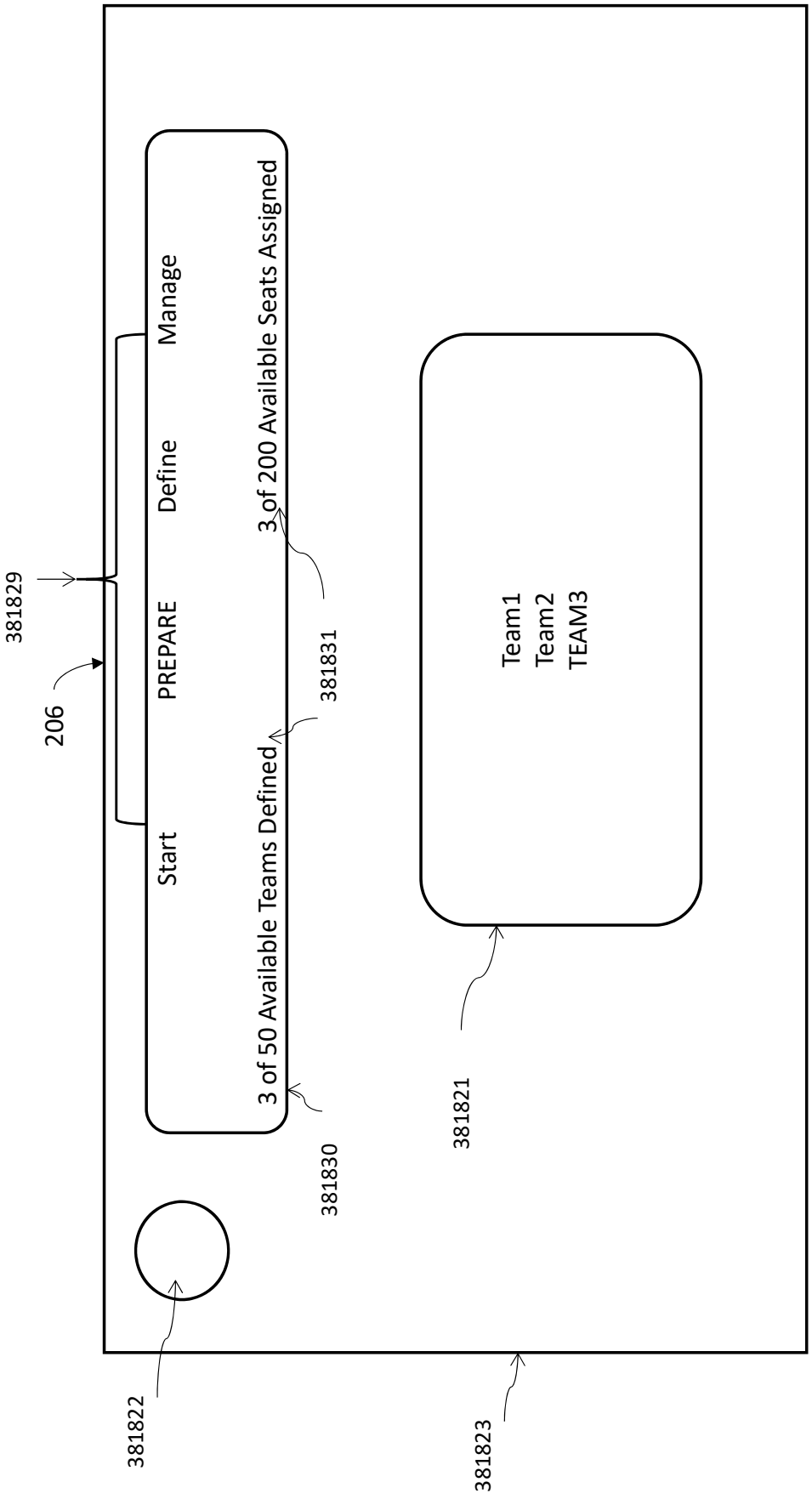

381829
206
Start
PREPARE
Define
Manage
3 of 200 Available Seats Assigned
381831
3 of 50 Available Teams Defined
381830
Team1
Team2
TEAM3
381821
381822
381823

FIG. 38H

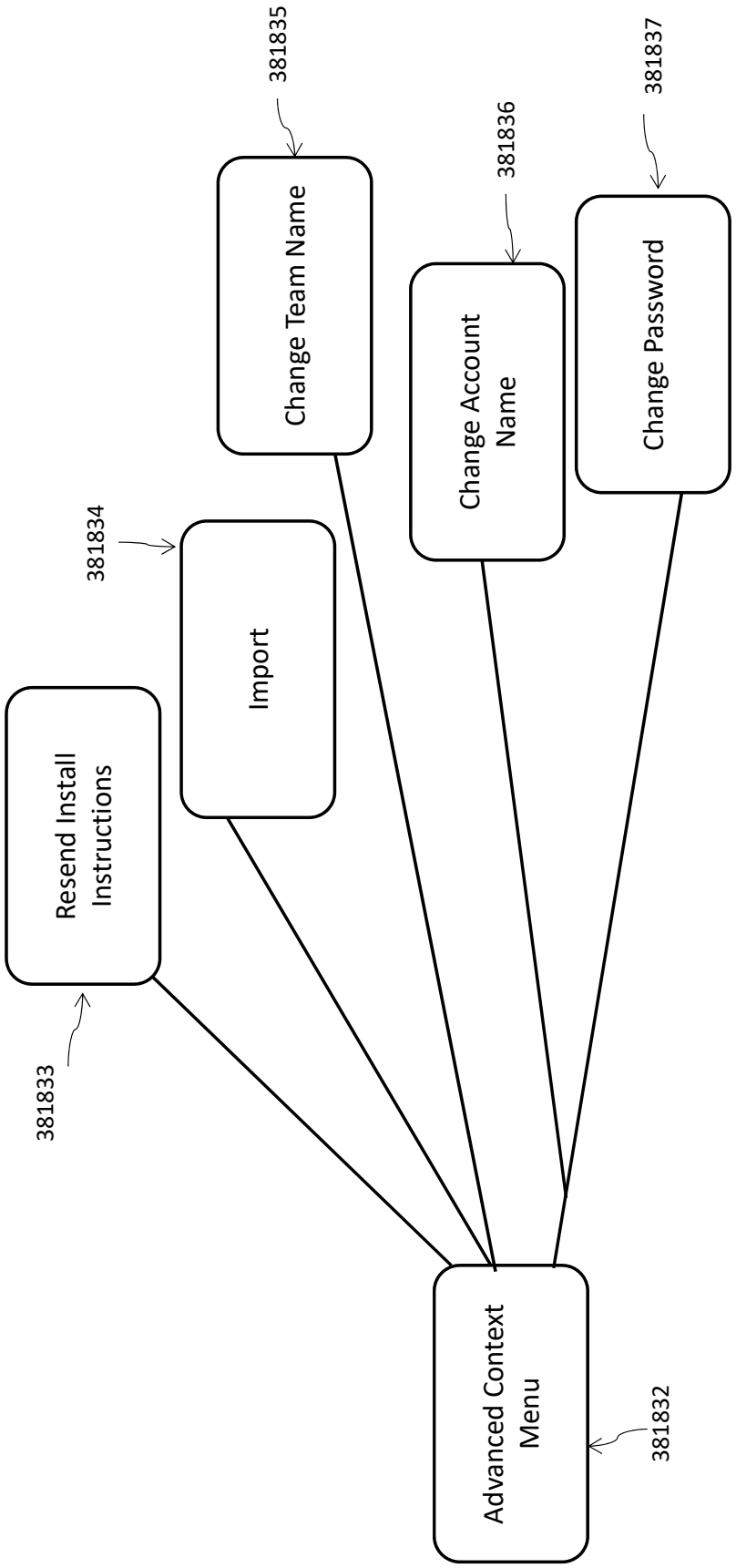

Advanced Context Menu
381832
Resend Install Instructions
381833
Import
381834
Change Team Name
381835
Change Account Name
381836
Change Password
381837

FIG. 38I

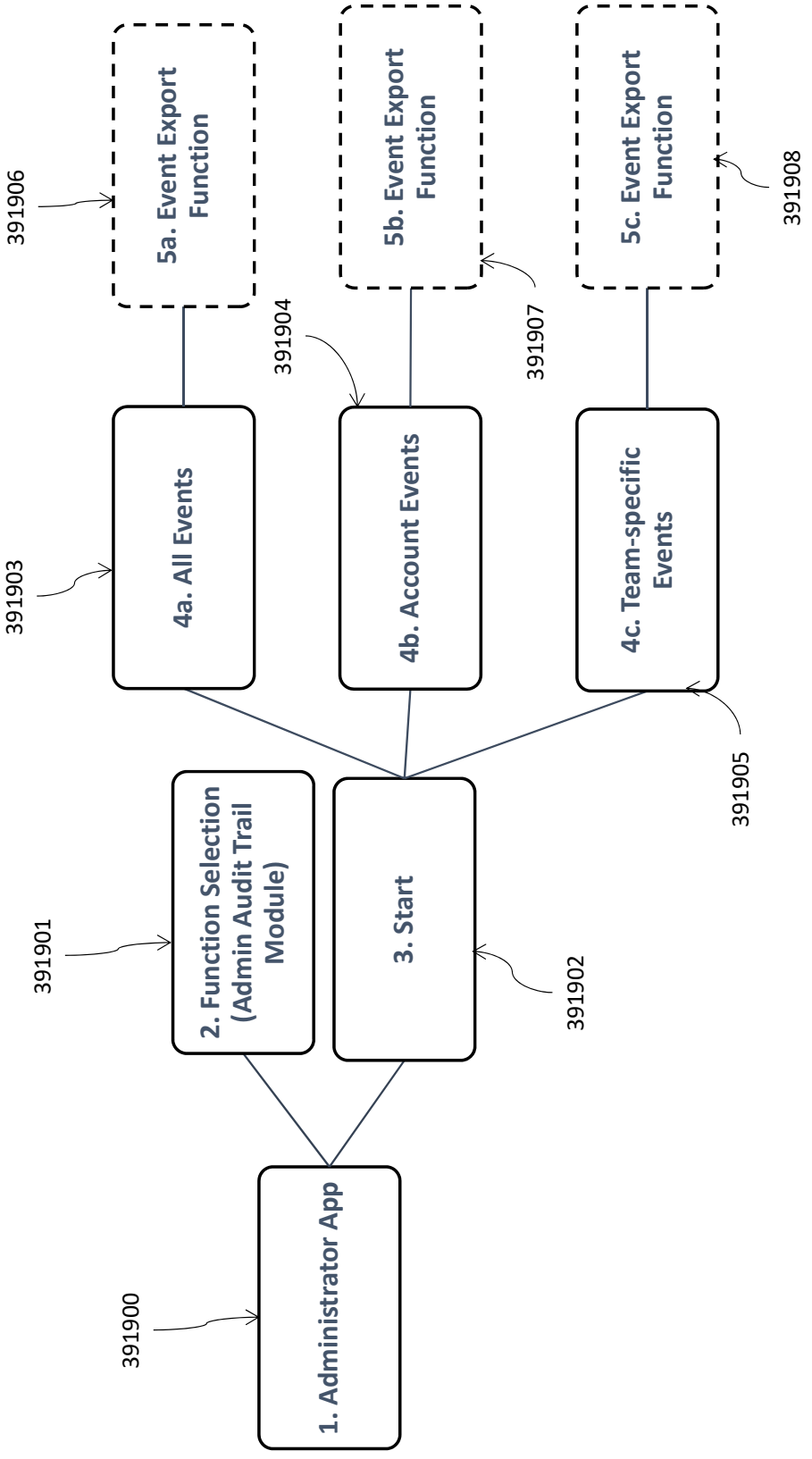

1. Administrator App
391900
2. Function Selection (Admin Audit Trail Module)
391901
3. Start
391902
4a. All Events
391903
4b. Account Events
391904
4c. Team-specific Events
391905
5a. Event Export Function
391906
5b. Event Export Function
391907
5c. Event Export Function
391908

FIG. 39A

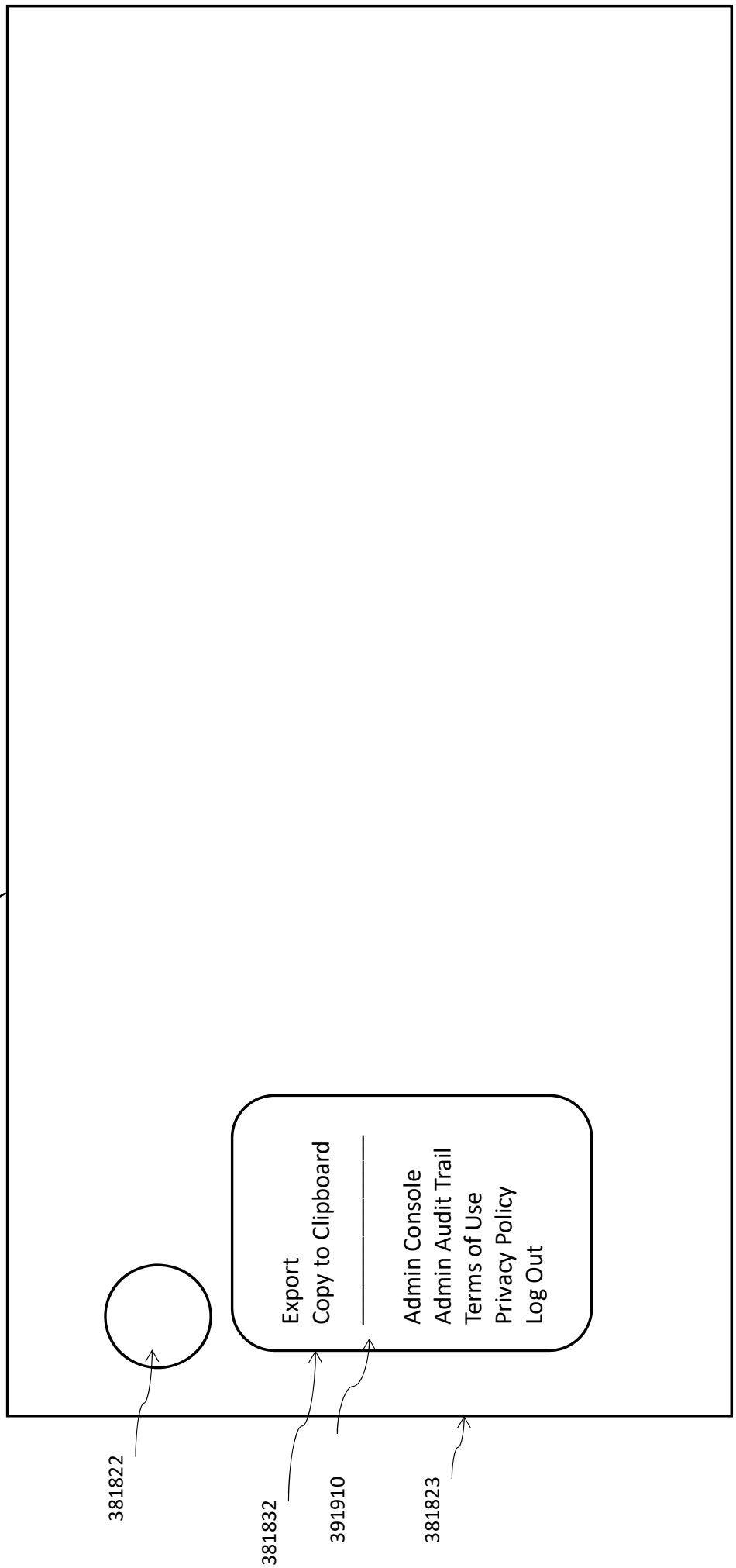

206
Export
Copy to Clipboard
Admin Console
Admin Audit Trail
Terms of Use
Privacy Policy
Log Out
381822
381832
391910
381823

FIG. 39B

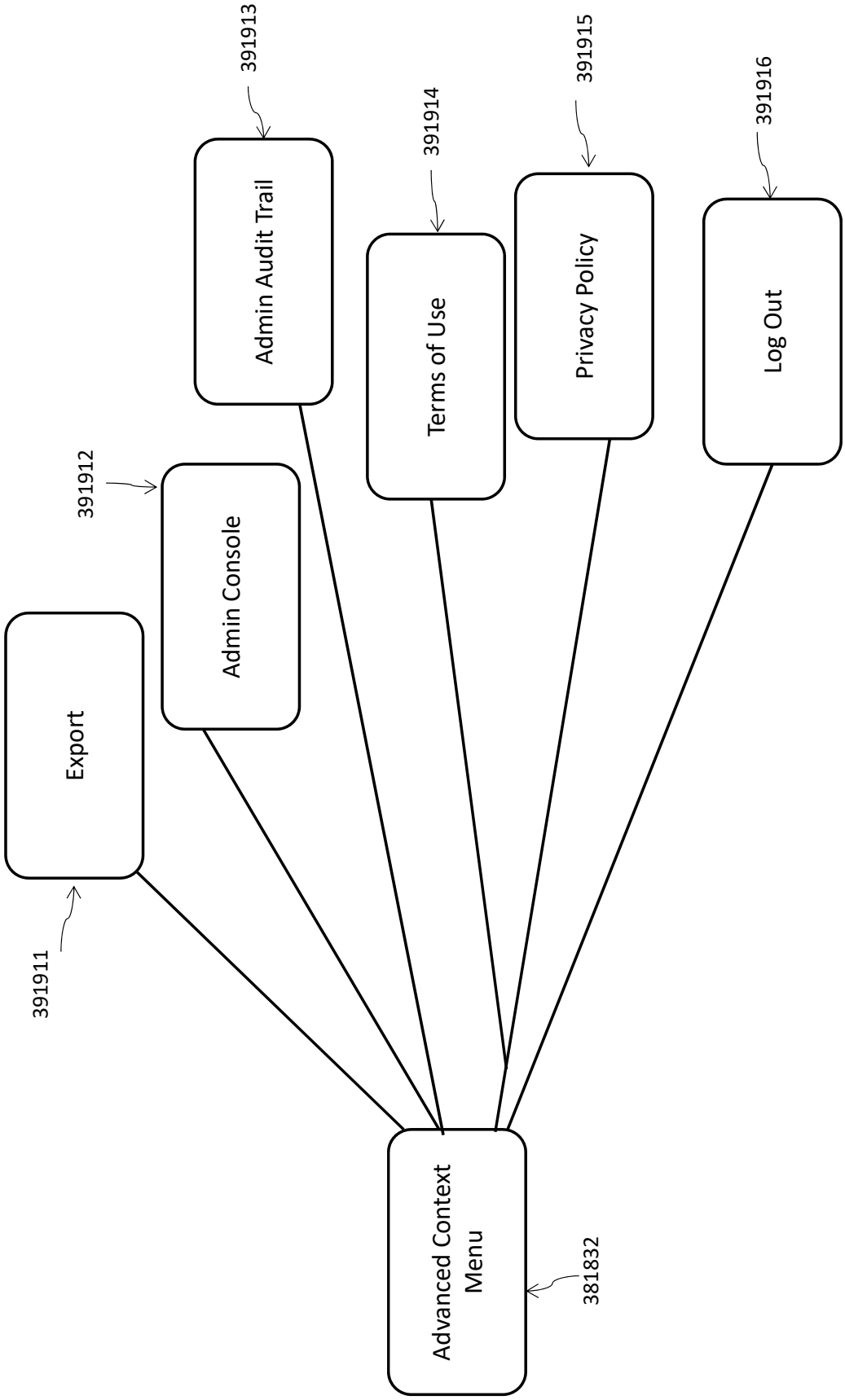

Advanced Context Menu
381832
Export
391911
Admin Console
391912
Admin Audit Trail
391913
Terms of Use
391914
Privacy Policy
391915
Log Out
391916

FIG. 39C

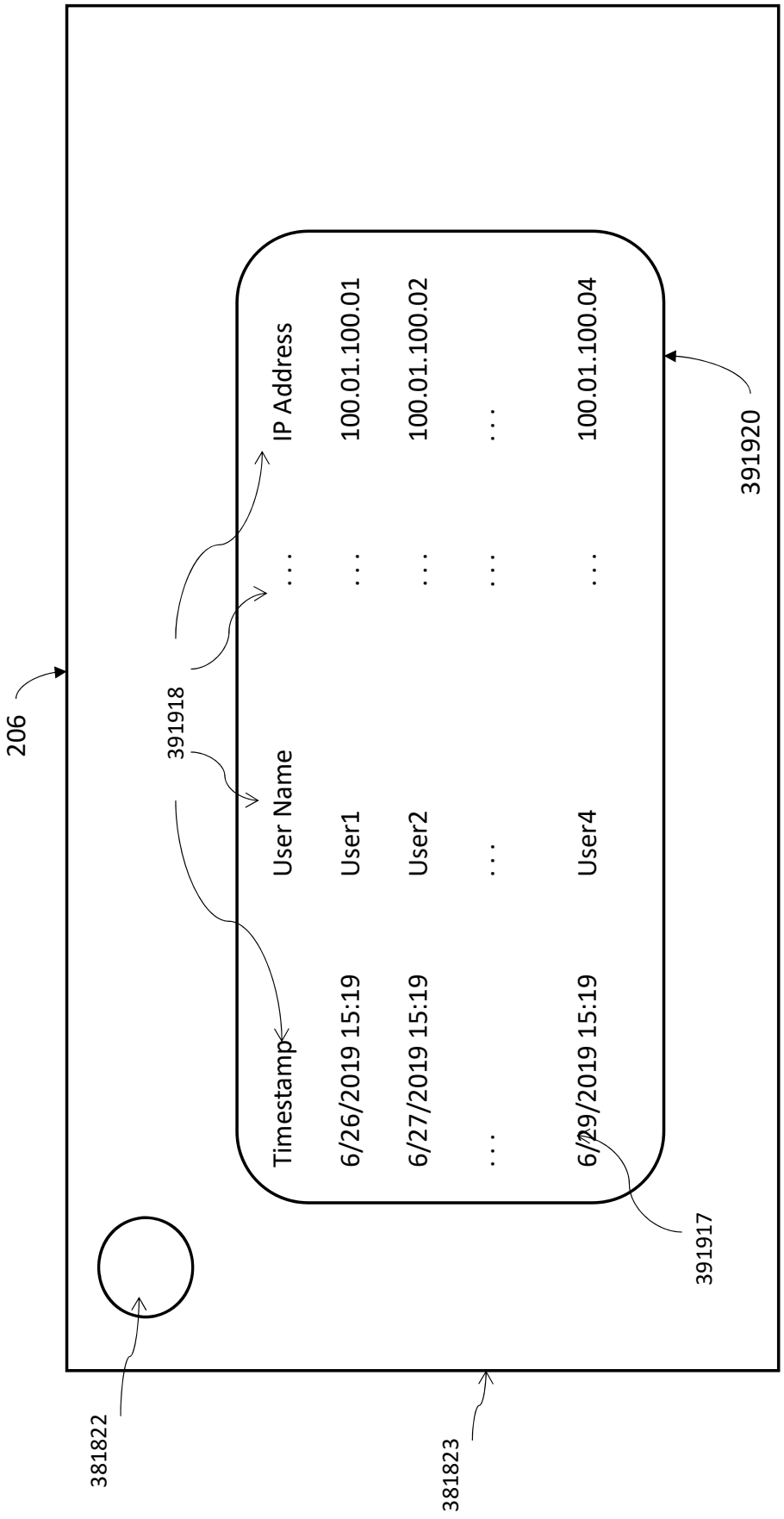

206
391918
391920
391917
381822
381823
Timestamp
User Name
IP Address
6/26/2019 15:19
User1
100.01.100.01
6/27/2019 15:19
User2
100.01.100.02
6/29/2019 15:19
User4
100.01.100.04

FIG. 39D

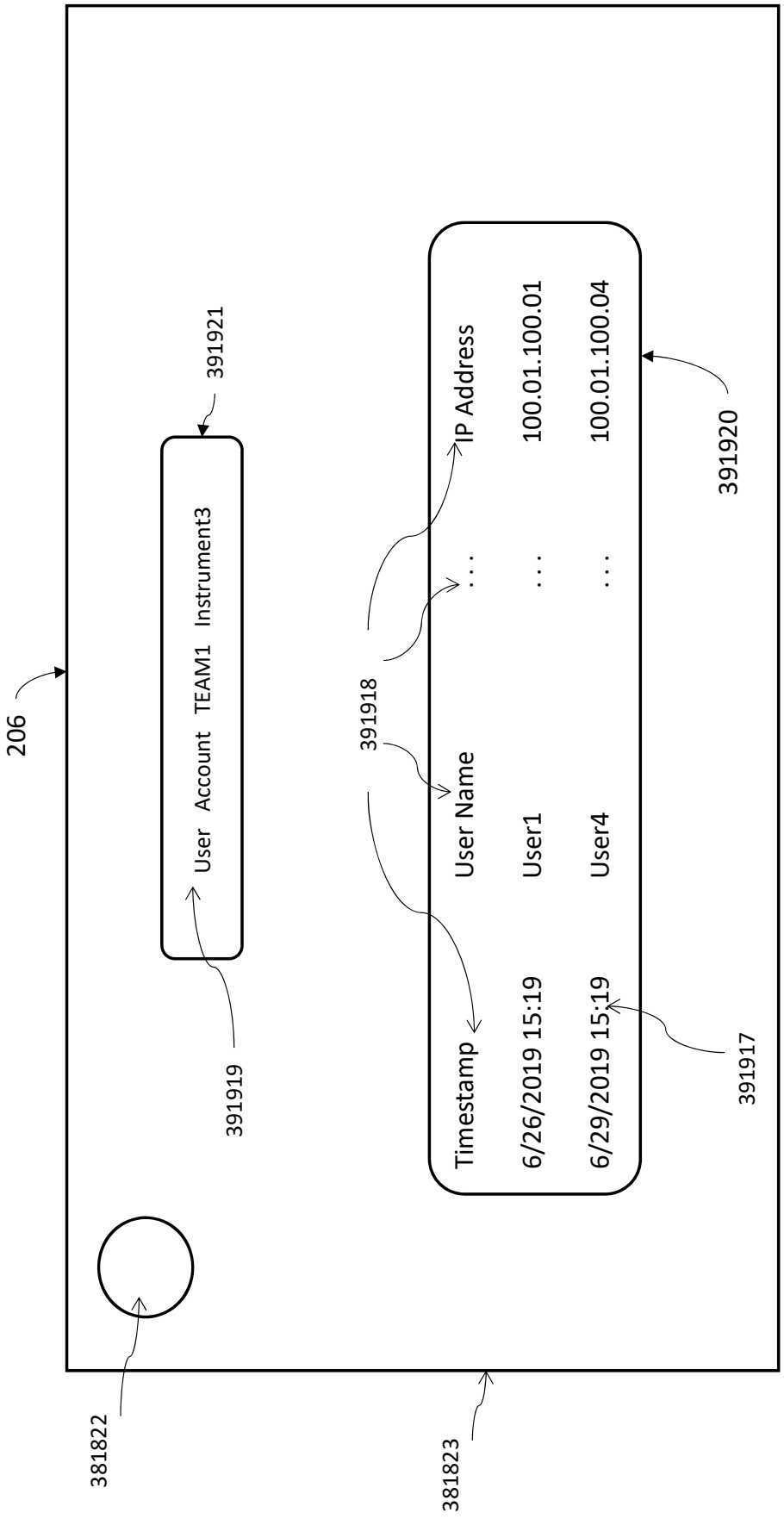

206
User Account TEAM1 Instrument3
391921
391919
391918
Timestamp
User Name
IP Address
6/26/2019 15:19
User1
100.01.100.01
6/29/2019 15:19
User4
100.01.100.04
391920
391917
381822
381823

FIG. 39E

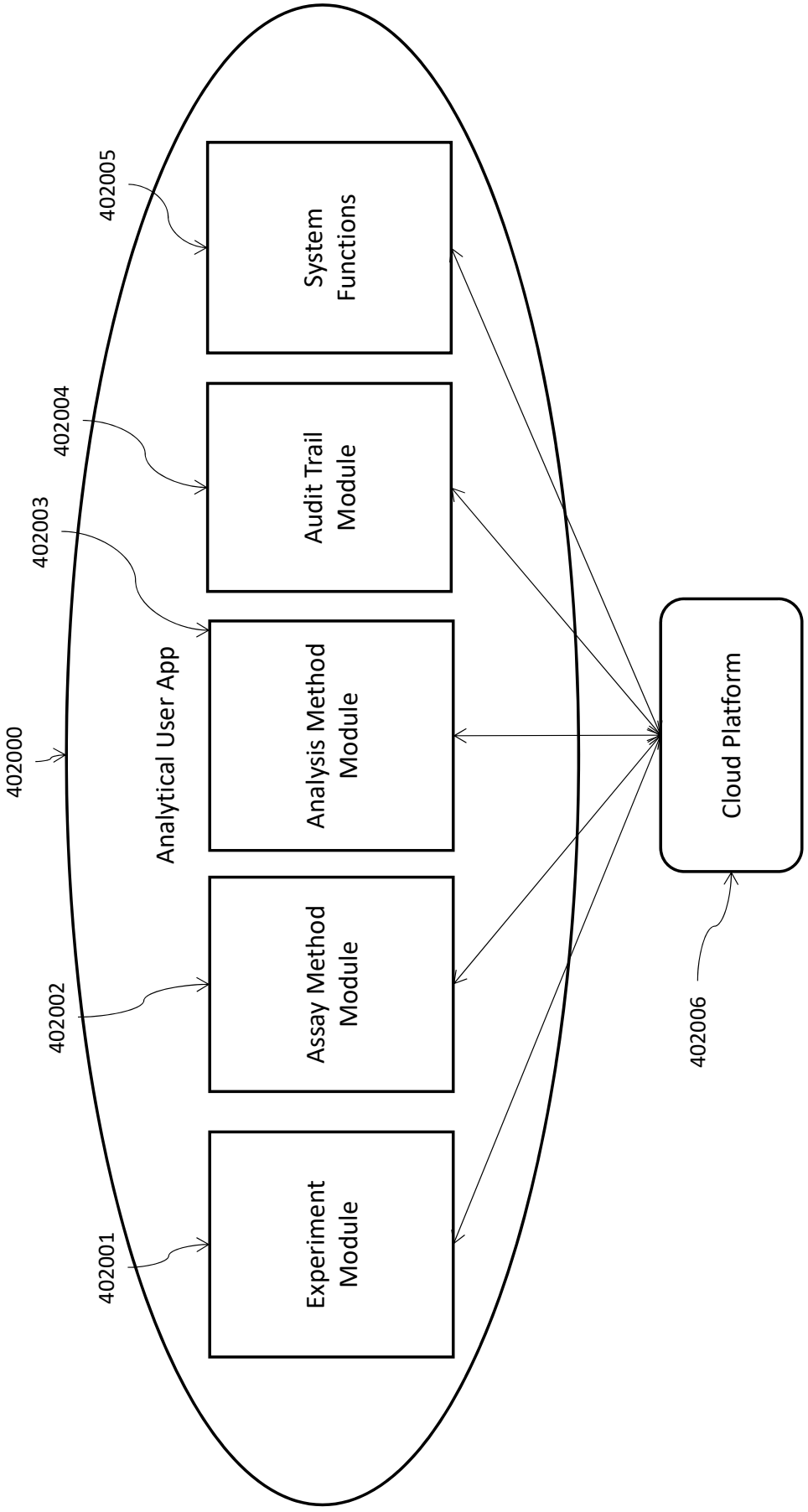

402000
Analytical User App
402001
Experiment Module
402002
Assay Method Module
402003
Analysis Method Module
402004
Audit Trail Module
402005
System Functions
402006
Cloud Platform

FIG. 40

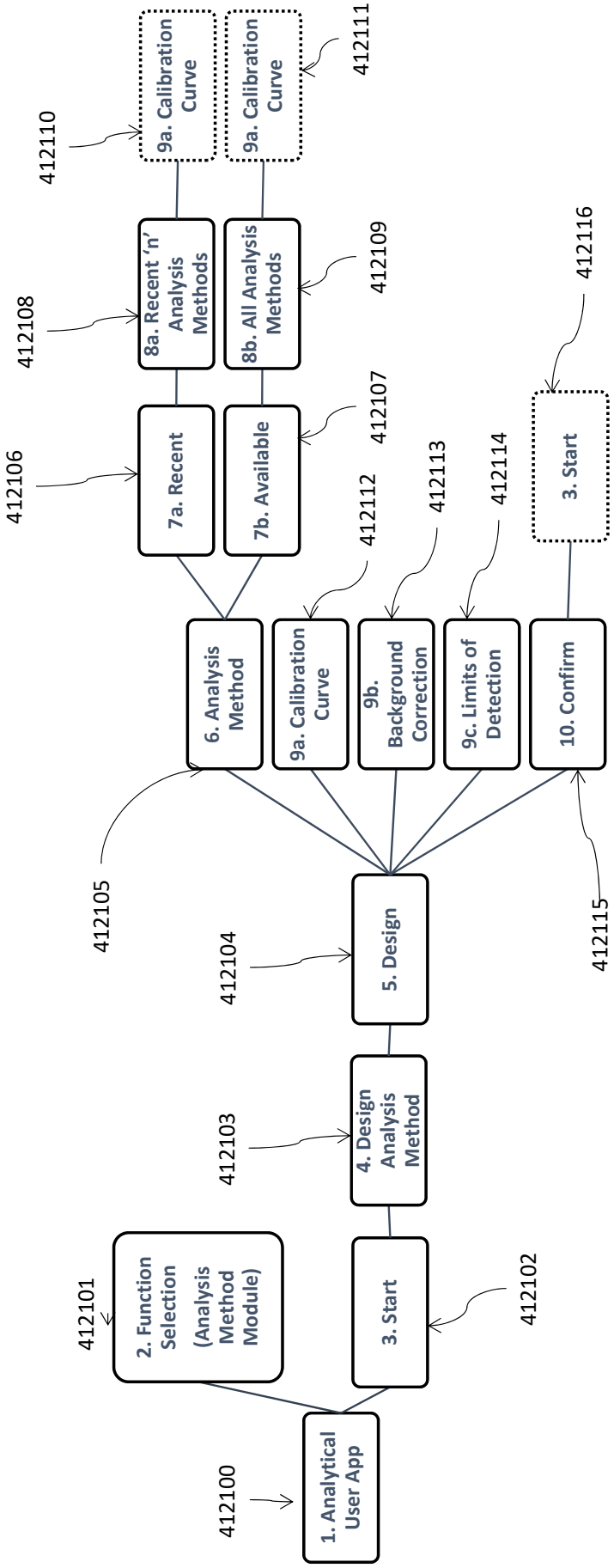


FIG. 41 – Analytical User App Analysis Method Module Flow

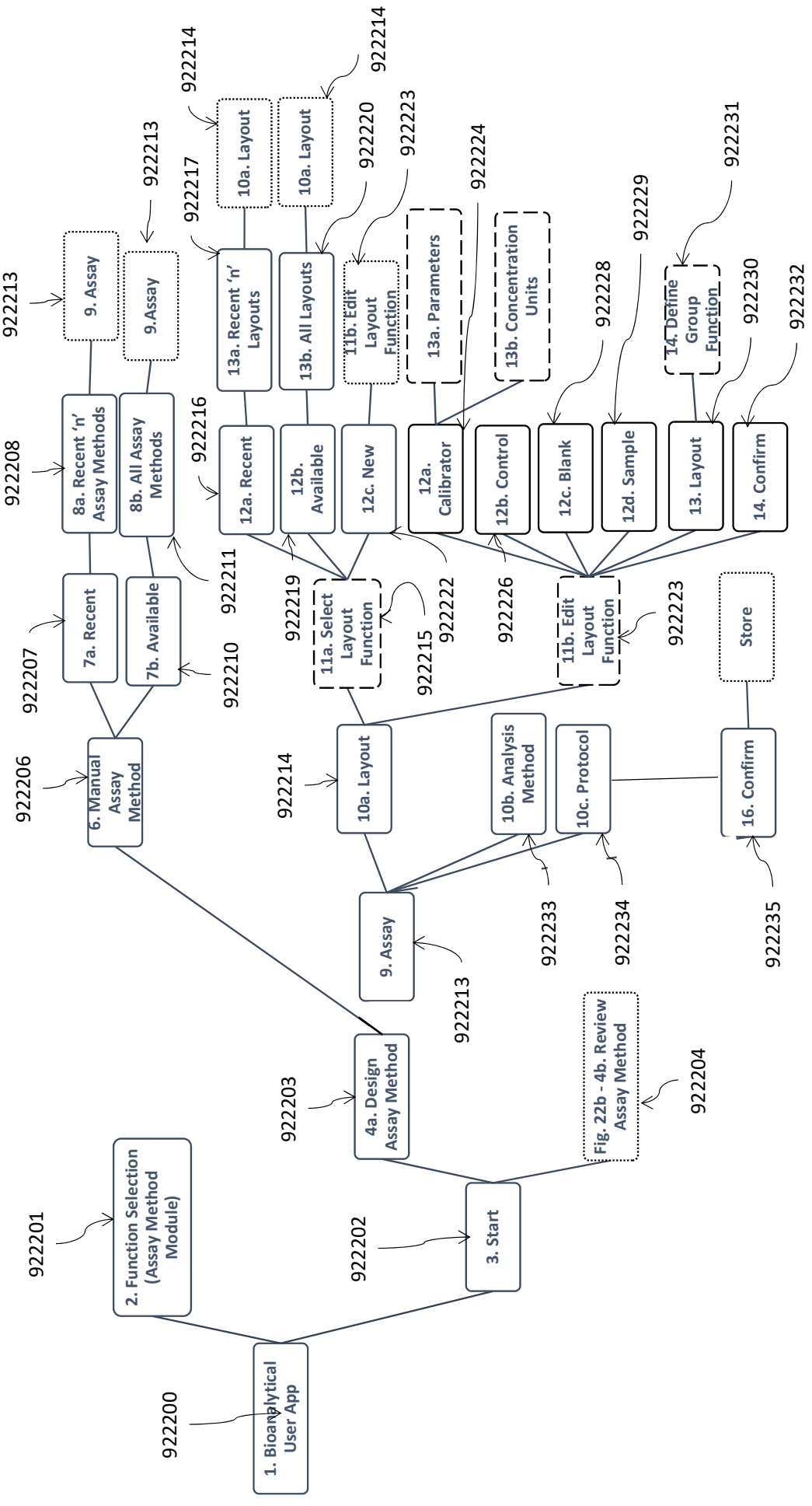


Fig. 42A – Bioanalytical User App Assay Method Module Design Flow

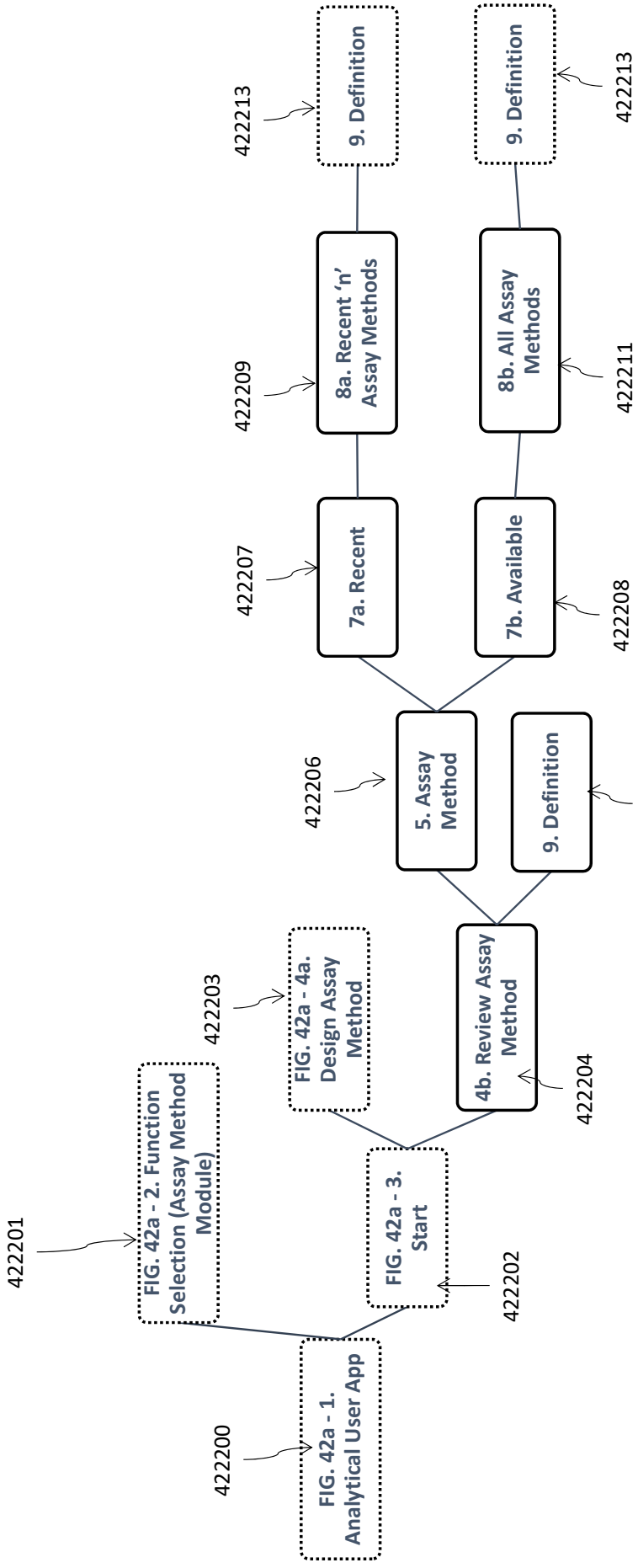

422200
FIG. 42a - 1. Analytical User App
422201
FIG. 42a - 2. Function Selection (Assay Method Module)
422202
FIG. 42a - 3. Start
422203
FIG. 42a - 4a. Design Assay Method
422204
4b. Review Assay Method
422206
5. Assay Method
422207
7a. Recent
422208
7b. Available
422209
8a. Recent 'n' Assay Methods
422211
8b. All Assay Methods
422213
9. Definition
422213
9. Definition
422213
9. Definition

FIG. 42B

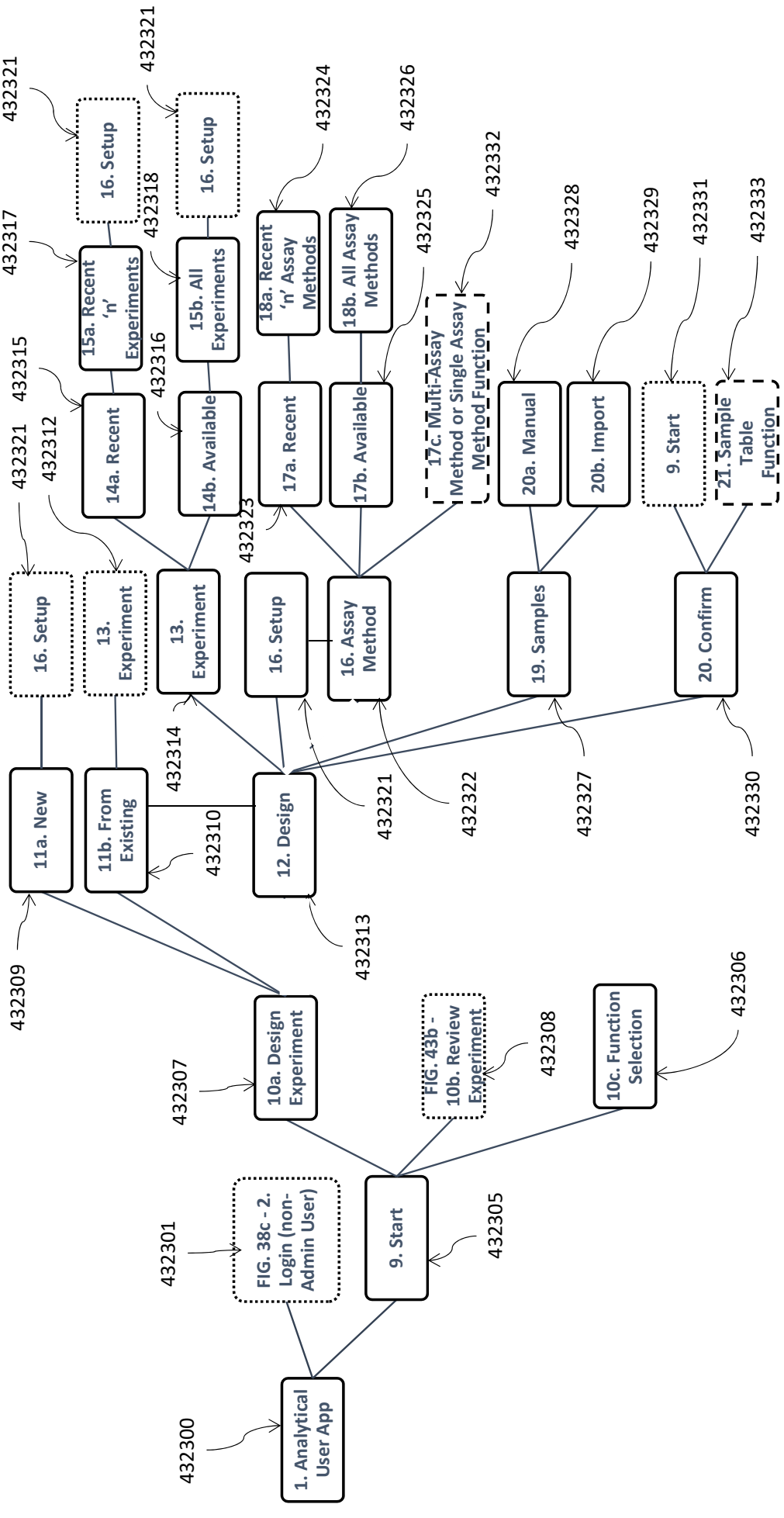

1. Analytical User App
FIG. 38c - 2. Login (non-Admin User)
9. Start
10a. Design Experiment
FIG. 43b - 10b. Review Experiment
10c. Function Selection
11a. New
11b. From Existing
12. Design
13. Experiment
13. Experiment
14a. Recent
14b. Available
15a. Recent 'n' Experiments
15b. All Experiments
16. Setup
16. Setup
16. Setup
16. Assay Method
17a. Recent
17b. Available
17c. Multi-Assay Method or Single Assay Method Function
18a. Recent 'n' Assay Methods
18b. All Assay Methods
19. Samples
20a. Manual
20b. Import
20. Confirm
9. Start
21. Sample Table Function
432300
432301
432305
432306
432307
432308
432309
432310
432312
432313
432314
432315
432316
432317
432318
432321
432321
432321
432321
432322
432323
432324
432325
432326
432327
432328
432329
432330
432331
432332
432333

FIG. 43A

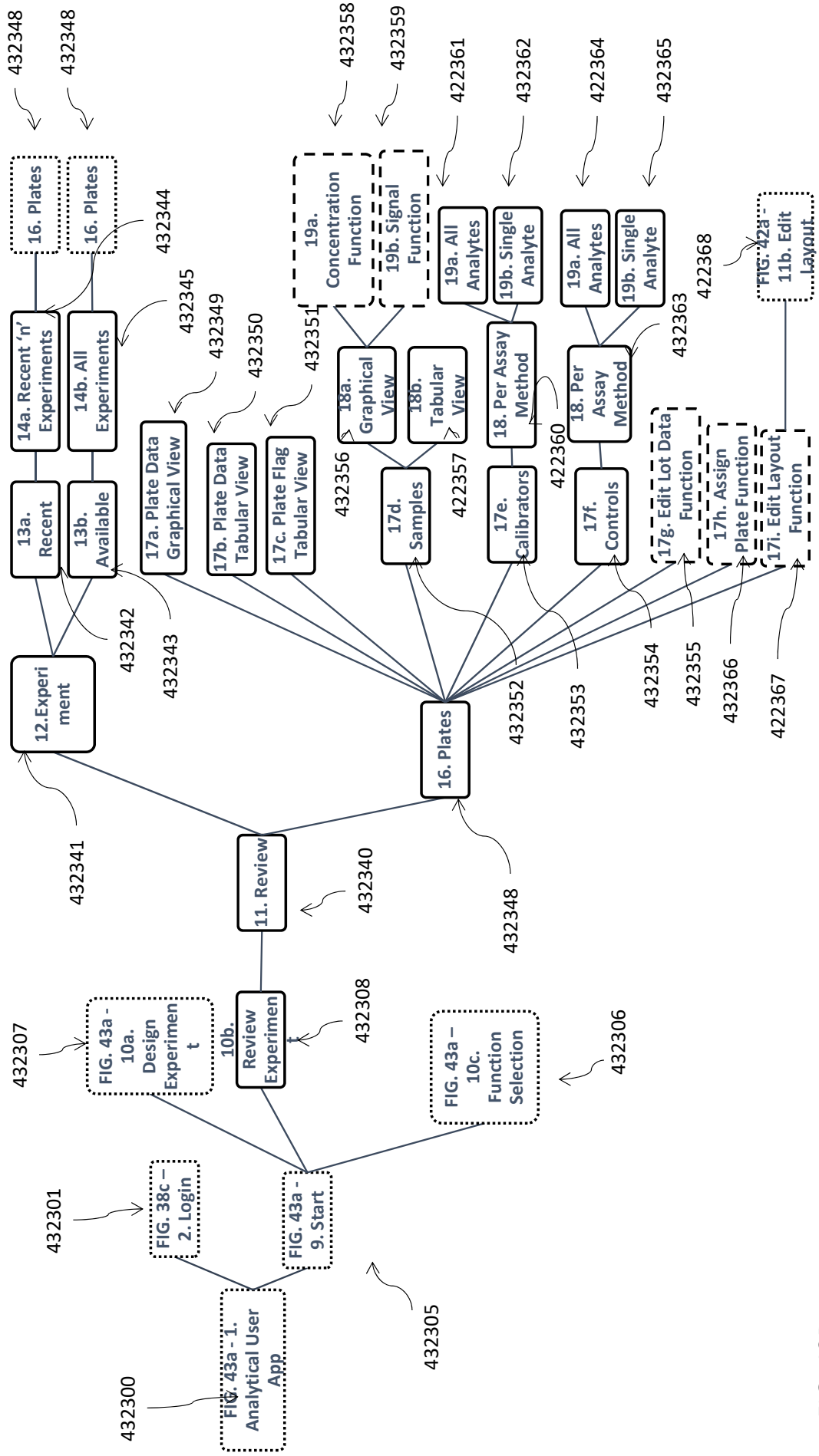


FIG. 43a - 1. Analytical User App
FIG. 38c – 2. Login
FIG. 43a - 9. Start
FIG. 43a – 10a. Design Experiment
10b. Review Experiment
FIG. 43a – 10c. Function Selection
11. Review
12.Experiment
13a. Recent
13b. Available
14a. Recent 'n' Experiments
14b. All Experiments
16. Plates
16. Plates
16. Plates
17a. Plate Data Graphical View
17b. Plate Data Tabular View
17c. Plate Flag Tabular View
17d. Samples
17e. Calibrators
17f. Controls
17g. Edit Lot Data Function
17h. Assign Plate Function
17i. Edit Layout Function
18a. Graphical View
18b. Tabular View
18. Per Assay Method
18. Per Assay Method
19a. Concentration Function
19b. Signal Function
19a. All Analytes
19b. Single Analyte
19a. All Analytes
19b. Single Analyte
FIG. 42a - 11b. Edit Layout
432300
432301
432305
432306
432307
432308
432340
432341
432342
432343
432344
432345
432348
432348
432348
432349
432350
432351
432352
432353
432354
432355
432356
432357
432358
432359
422360
422361
432362
422363
422364
432365
422366
422367
422368

FIG. 43B

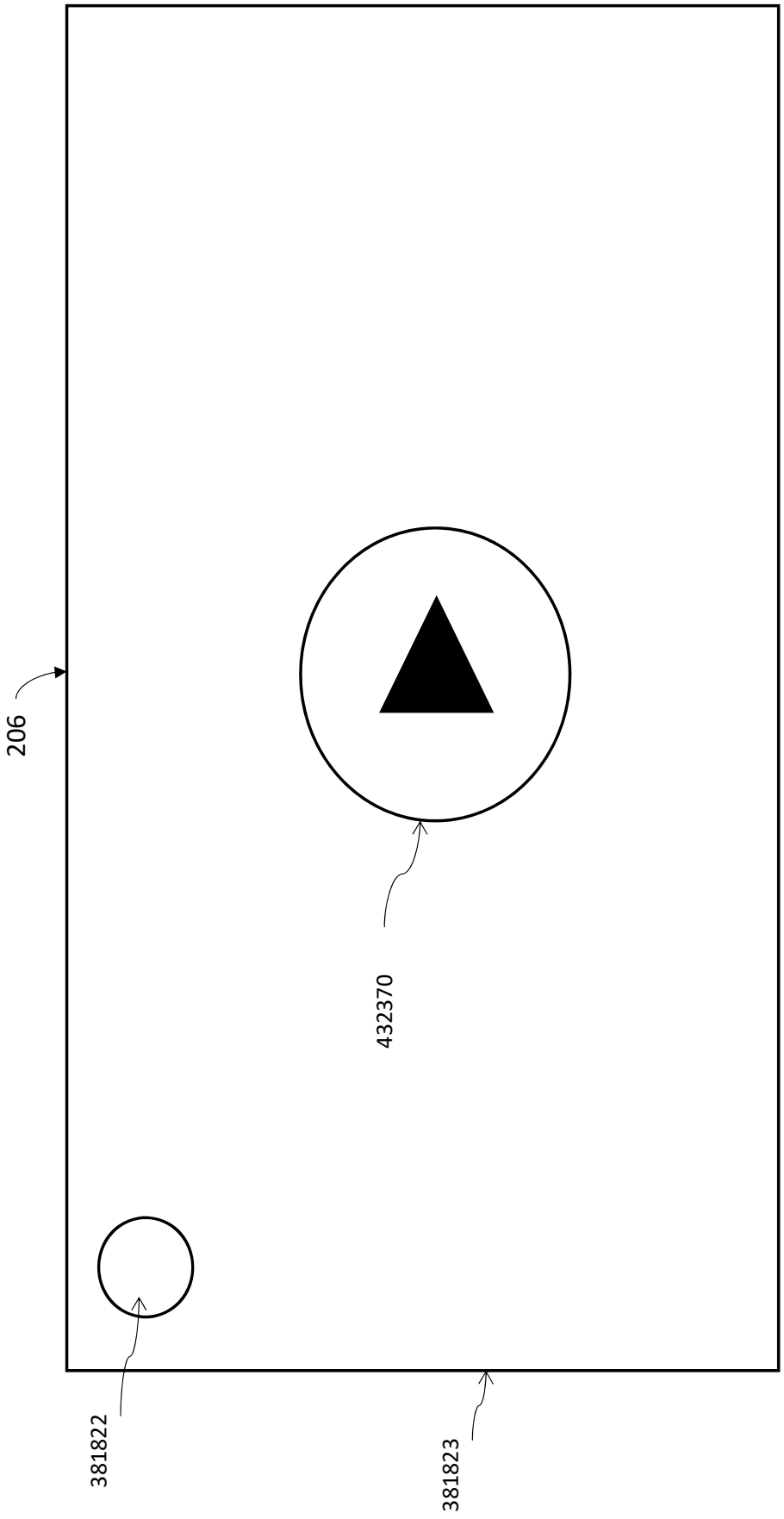


FIG. 43C

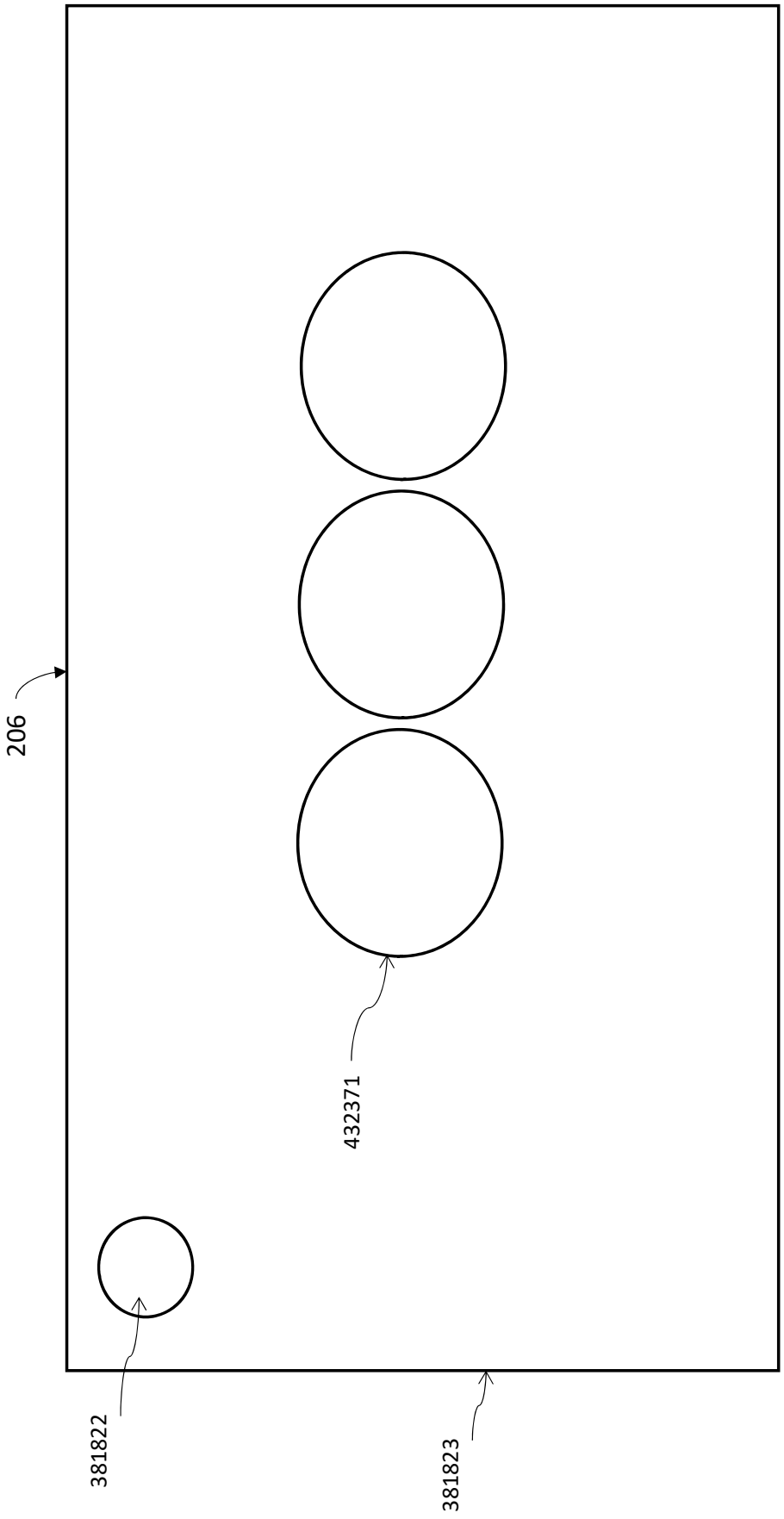


FIG. 43D

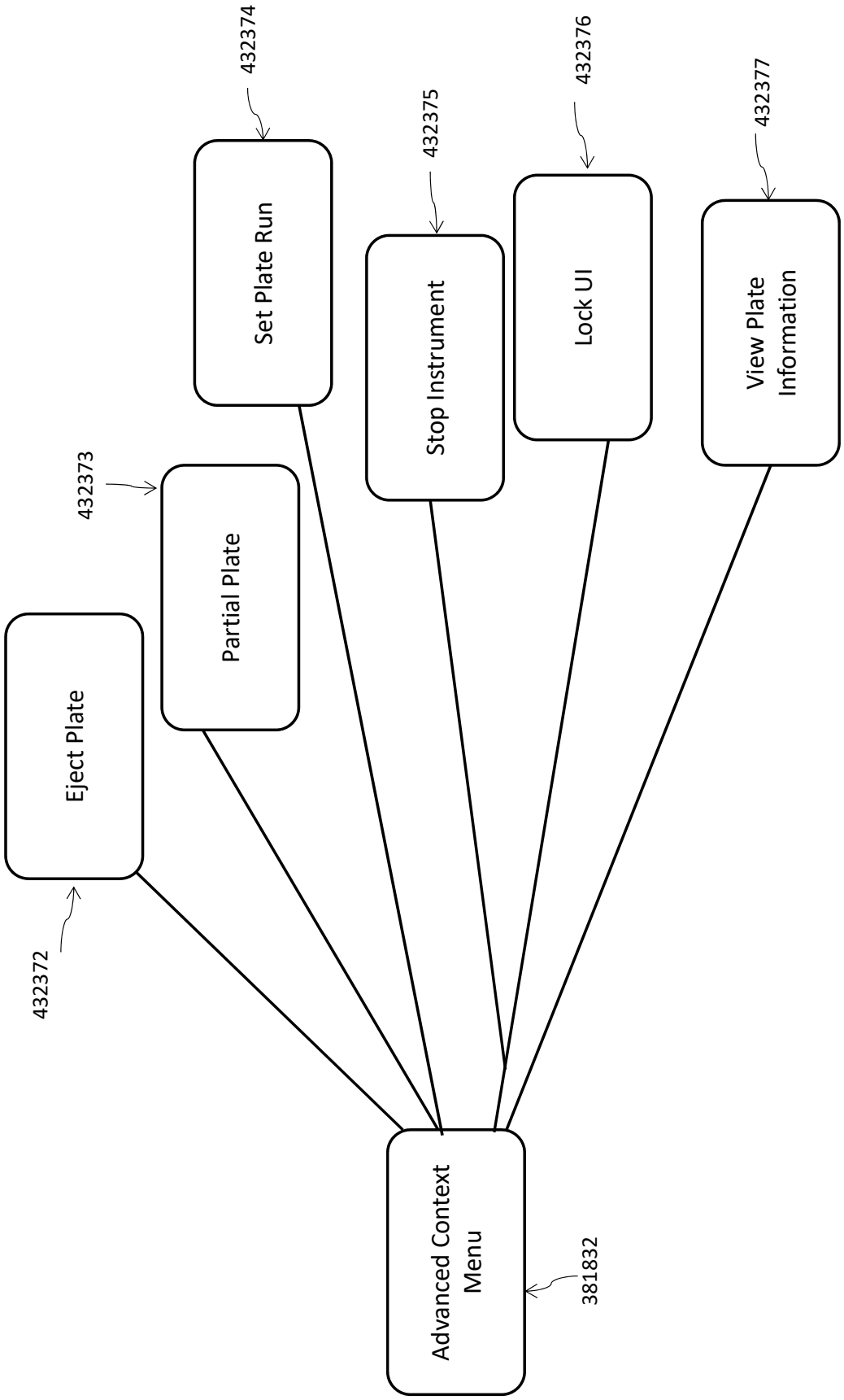

Advanced Context Menu
381832
Eject Plate
432372
Partial Plate
432373
Set Plate Run
432374
Stop Instrument
432375
Lock UI
432376
View Plate Information
432377

FIG. 43E

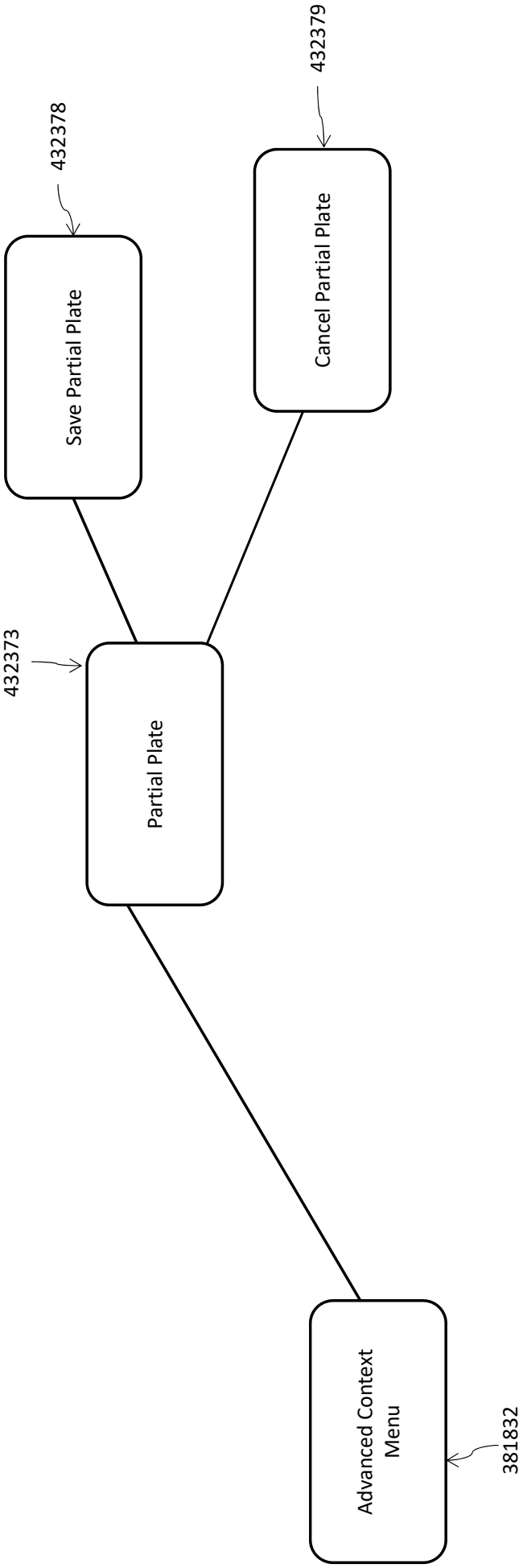

Save Partial Plate
Cancel Partial Plate
Partial Plate
Advanced Context Menu
432378
432379
432373
381832

FIG. 43F

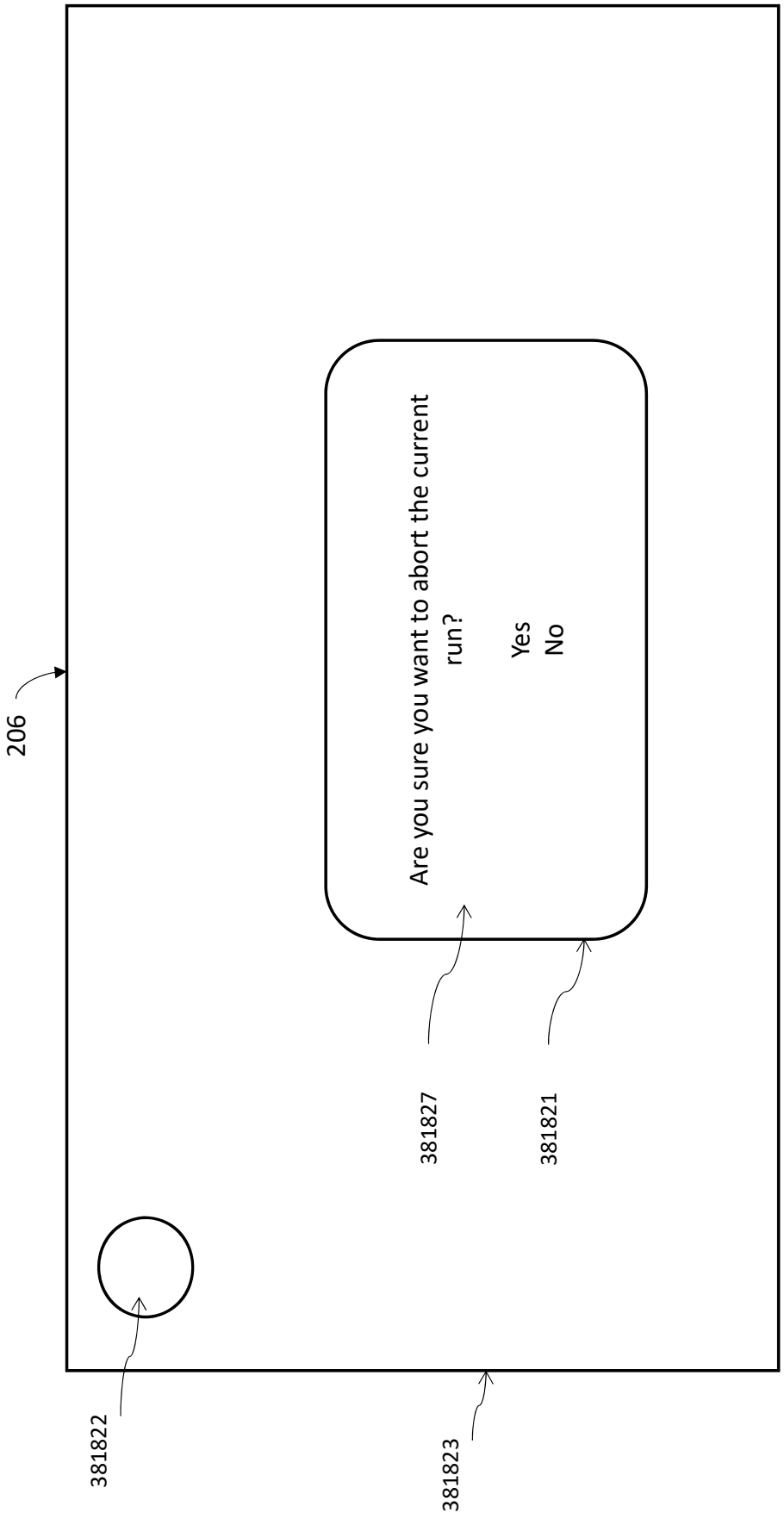

206
Are you sure you want to abort the current run?
Yes
No
381827
381821
381822
381823

FIG. 43G

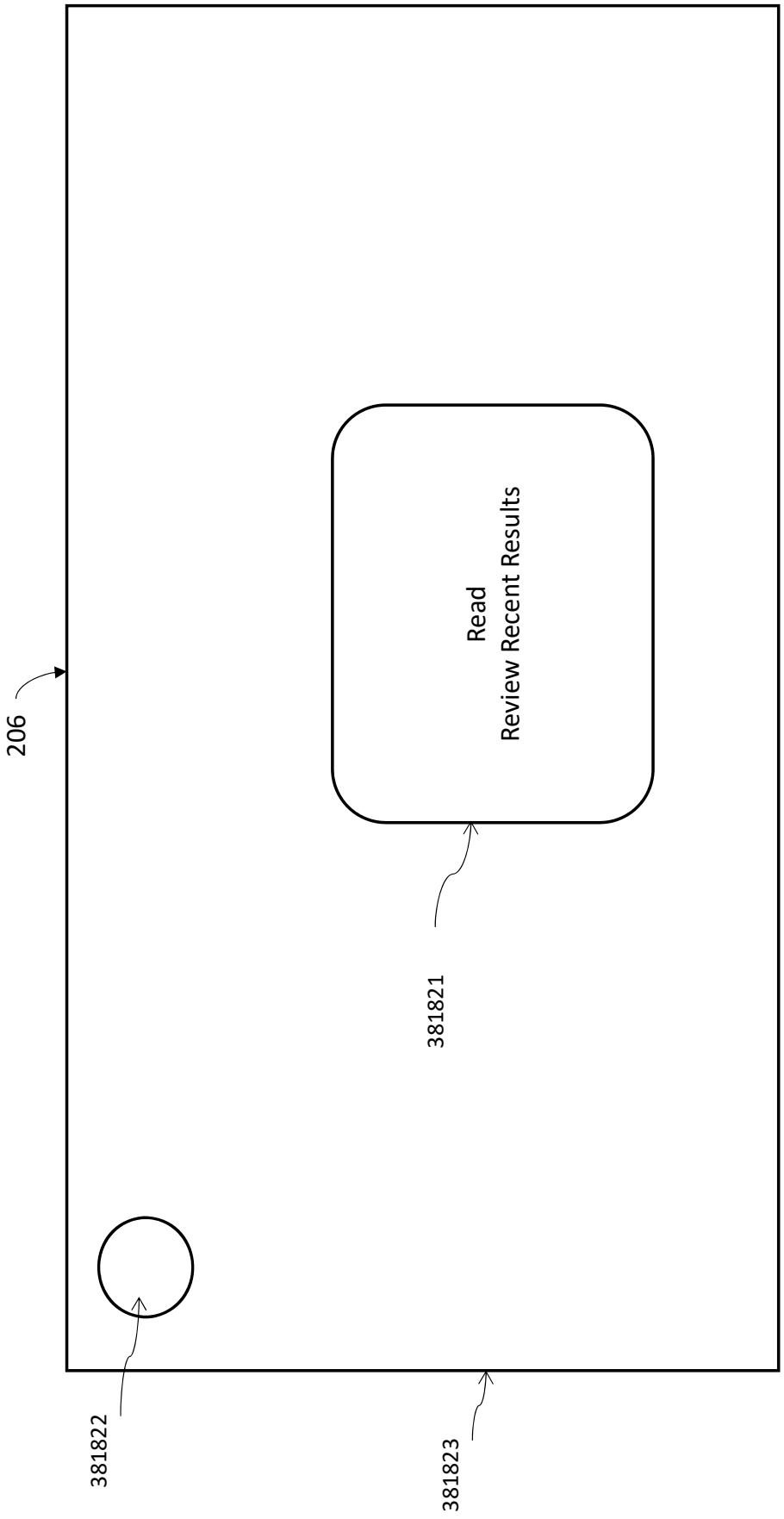


FIG. 43H

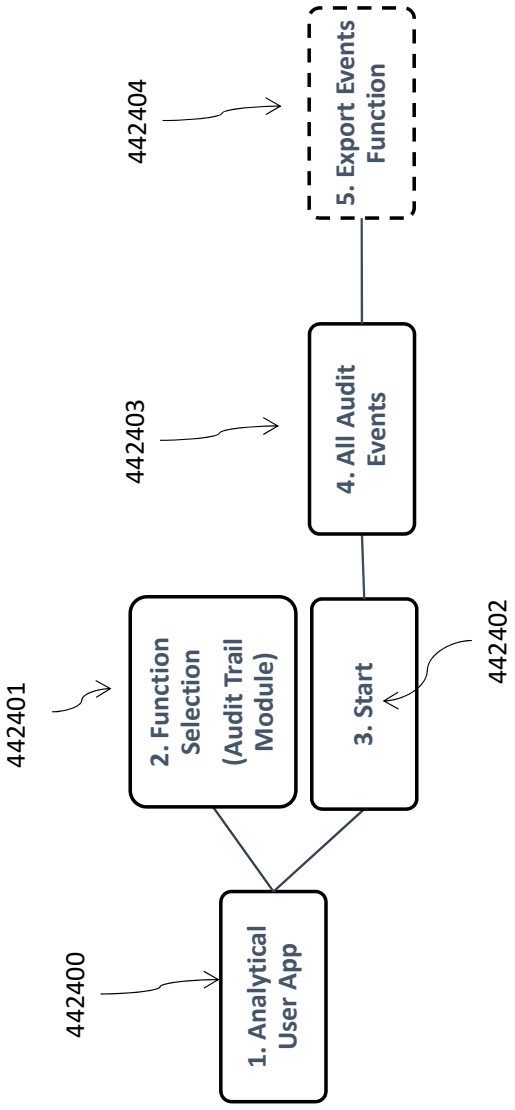

1. Analytical User App
2. Function Selection (Audit Trail Module)
3. Start
4. All Audit Events
5. Export Events Function
442400
442401
442402
442403
442404

FIG. 44

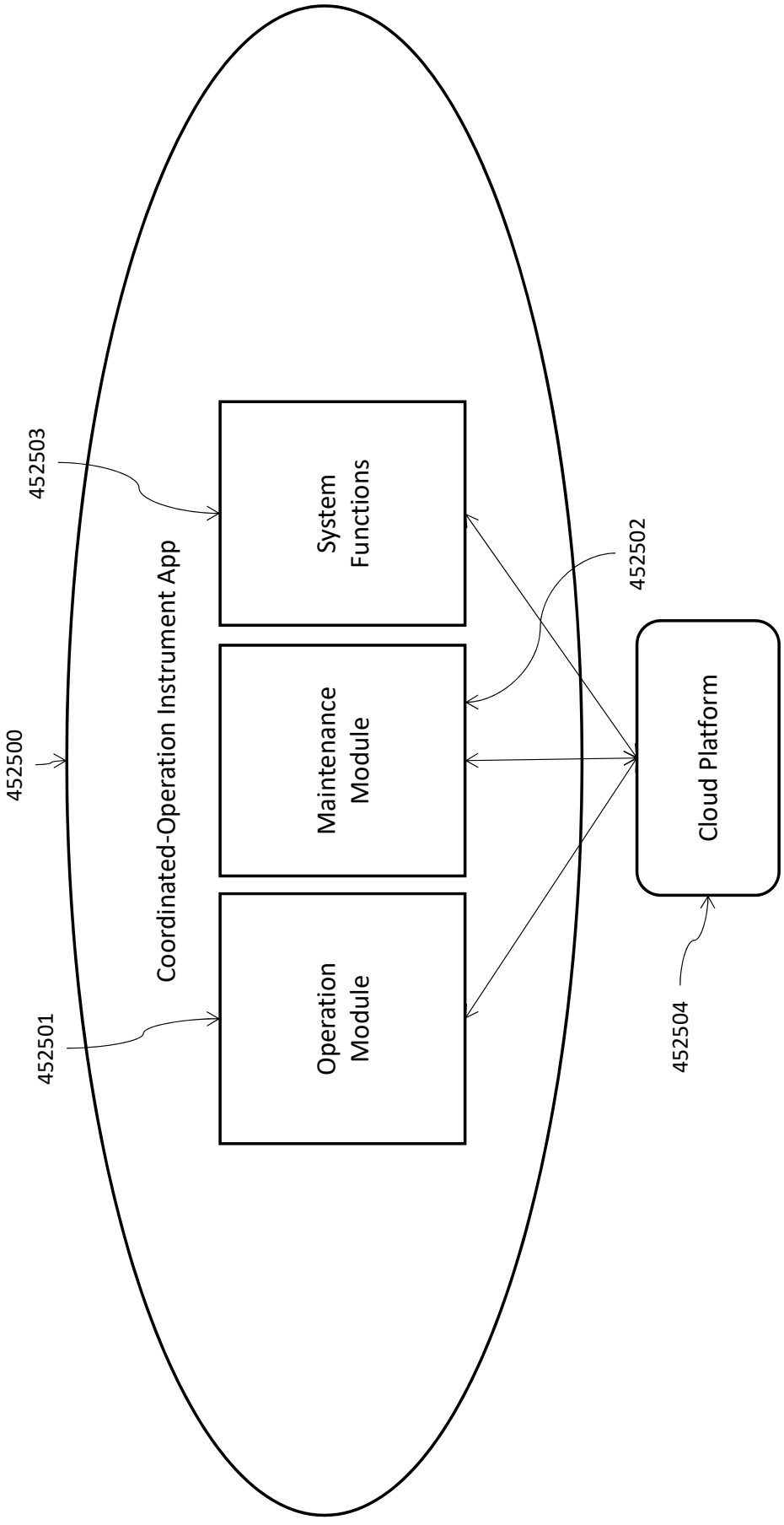

452503
System Functions
452502
Coordinated-Operation Instrument App
452500
Maintenance Module
Cloud Platform
Operation Module
452501
452504

FIG. 45

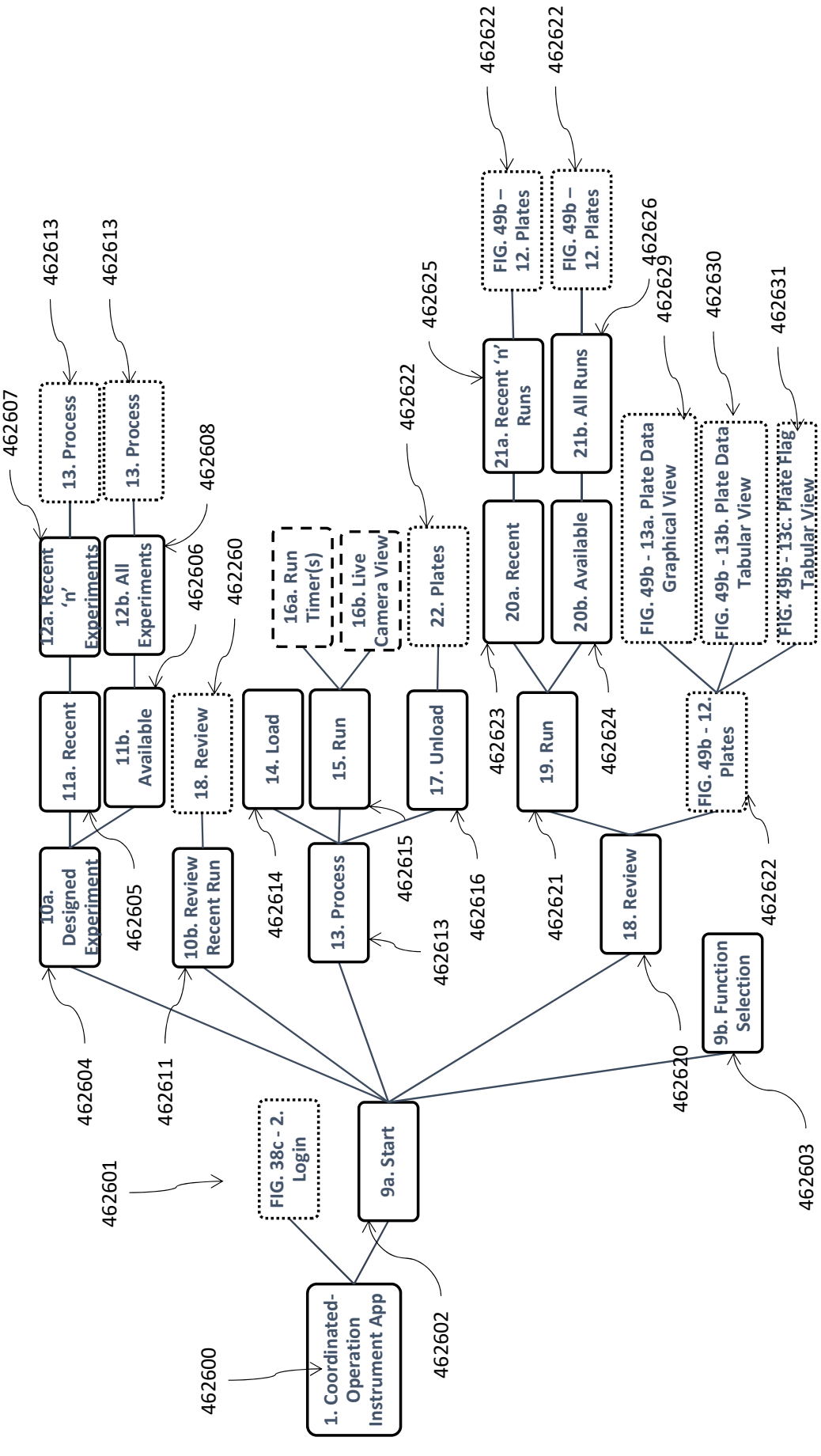

462600
1. Coordinated-Operation Instrument App
462602
9a. Start
462601
FIG. 38c - 2. Login
462603
9b. Function Selection
462604
10a. Designed Experiment
462605
462606
11a. Recent
11b. Available
462607
12a. Recent 'n' Experiments
12b. All Experiments
462608
462611
10b. Review Recent Run
462260
18. Review
462613
462613
13. Process
13. Process
462614
14. Load
462615
15. Run
462616
17. Unload
462622
16a. Run Timer(s)
16b. Live Camera View
22. Plates
462620
18. Review
462621
19. Run
462623
462624
20a. Recent
20b. Available
462625
21a. Recent 'n' Runs
21b. All Runs
462622
462622
FIG. 49b – 12. Plates
FIG. 49b – 12. Plates
462626
462629
462630
462631
FIG. 49b - 13a. Plate Data Graphical View
FIG. 49b - 13b. Plate Data Tabular View
FIG. 49b - 13c. Plate Flag Tabular View
FIG. 49b - 12. Plates
462622

FIG. 46

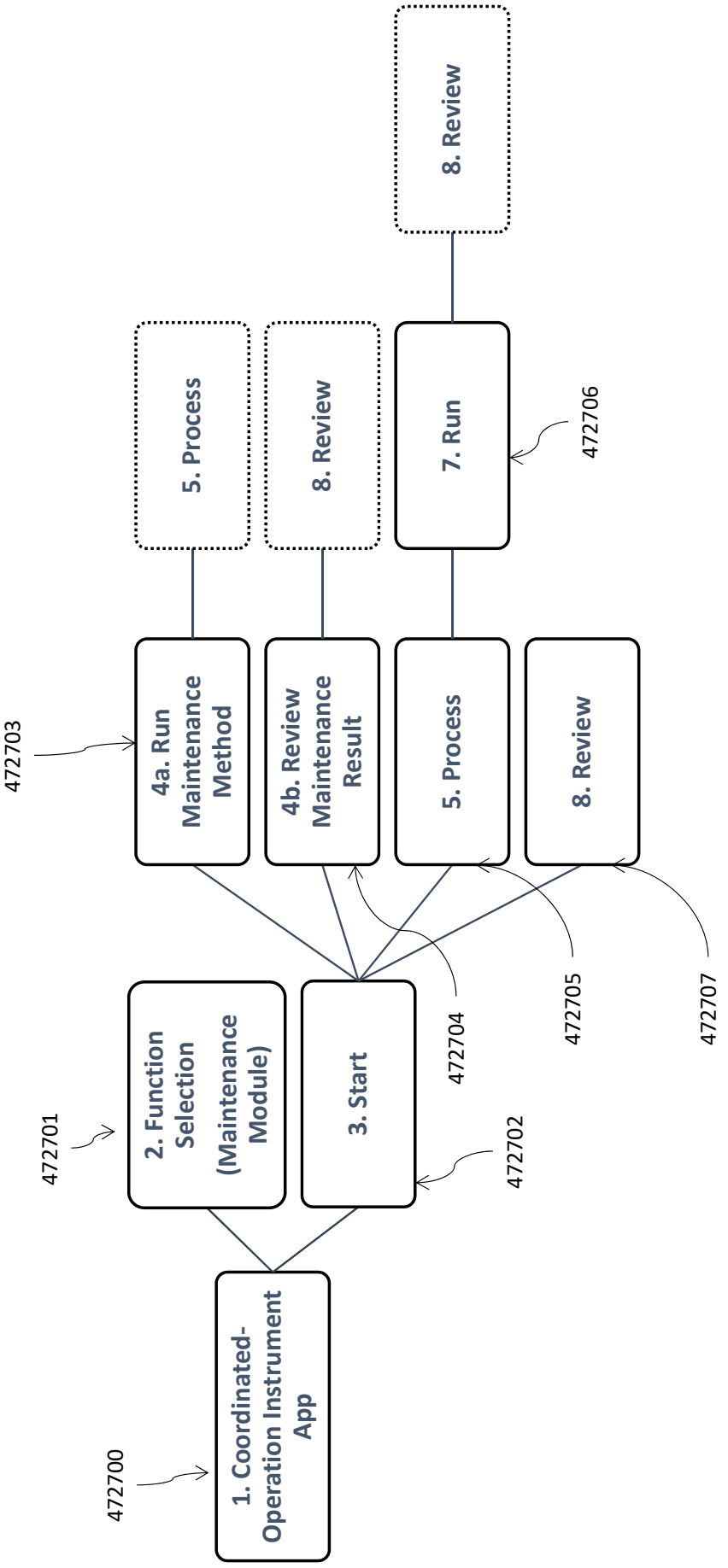

1. Coordinated-Operation Instrument App
472700
2. Function Selection (Maintenance Module)
472701
3. Start
472702
4a. Run Maintenance Method
472703
4b. Review Maintenance Result
472704
5. Process
472705
8. Review
472707
7. Run
472706
5. Process
8. Review
8. Review

FIG. 47

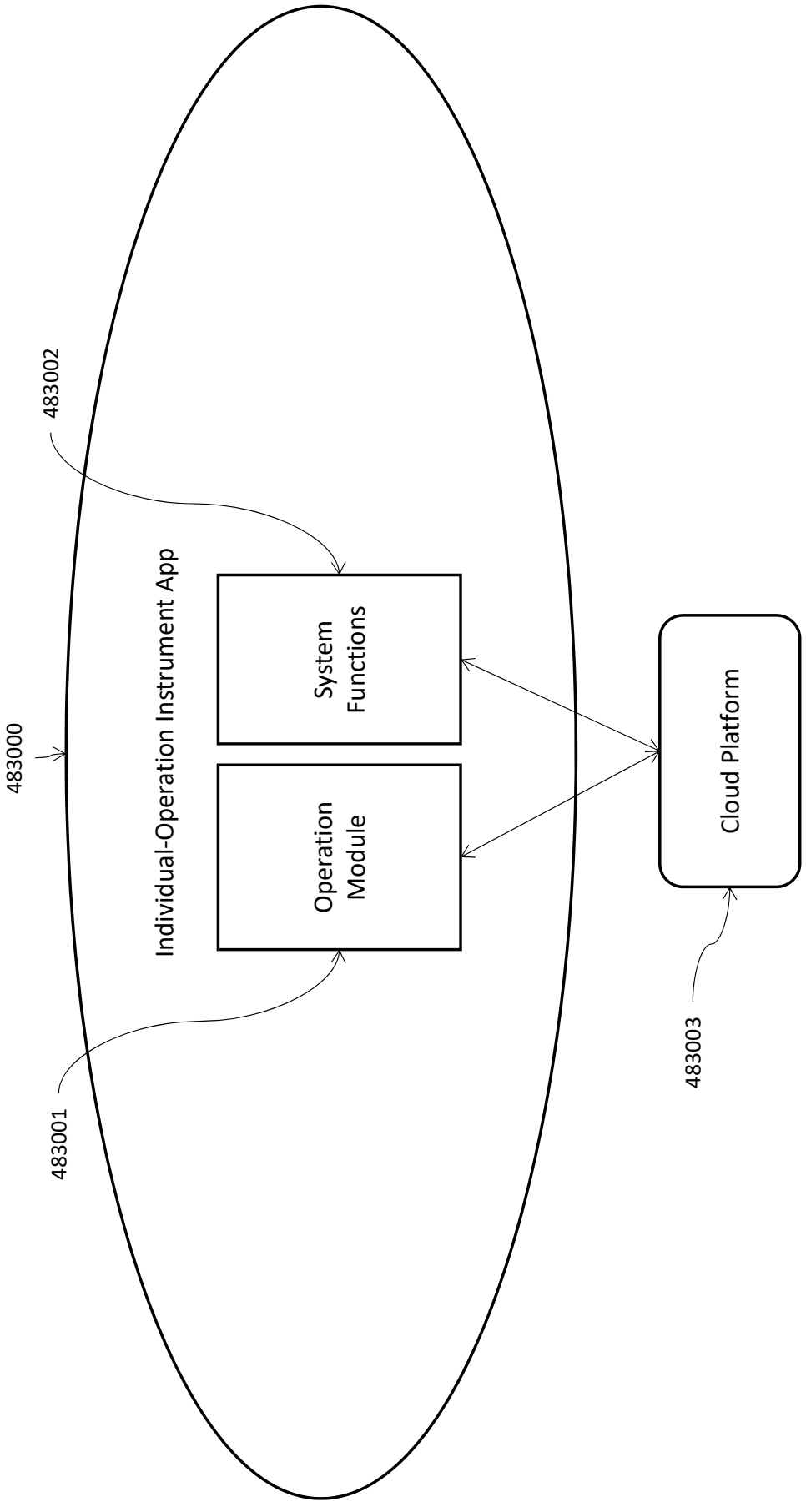

483002
Individual-Operation Instrument App
System Functions
483000
Operation Module
Cloud Platform
483001
483003

FIG. 48

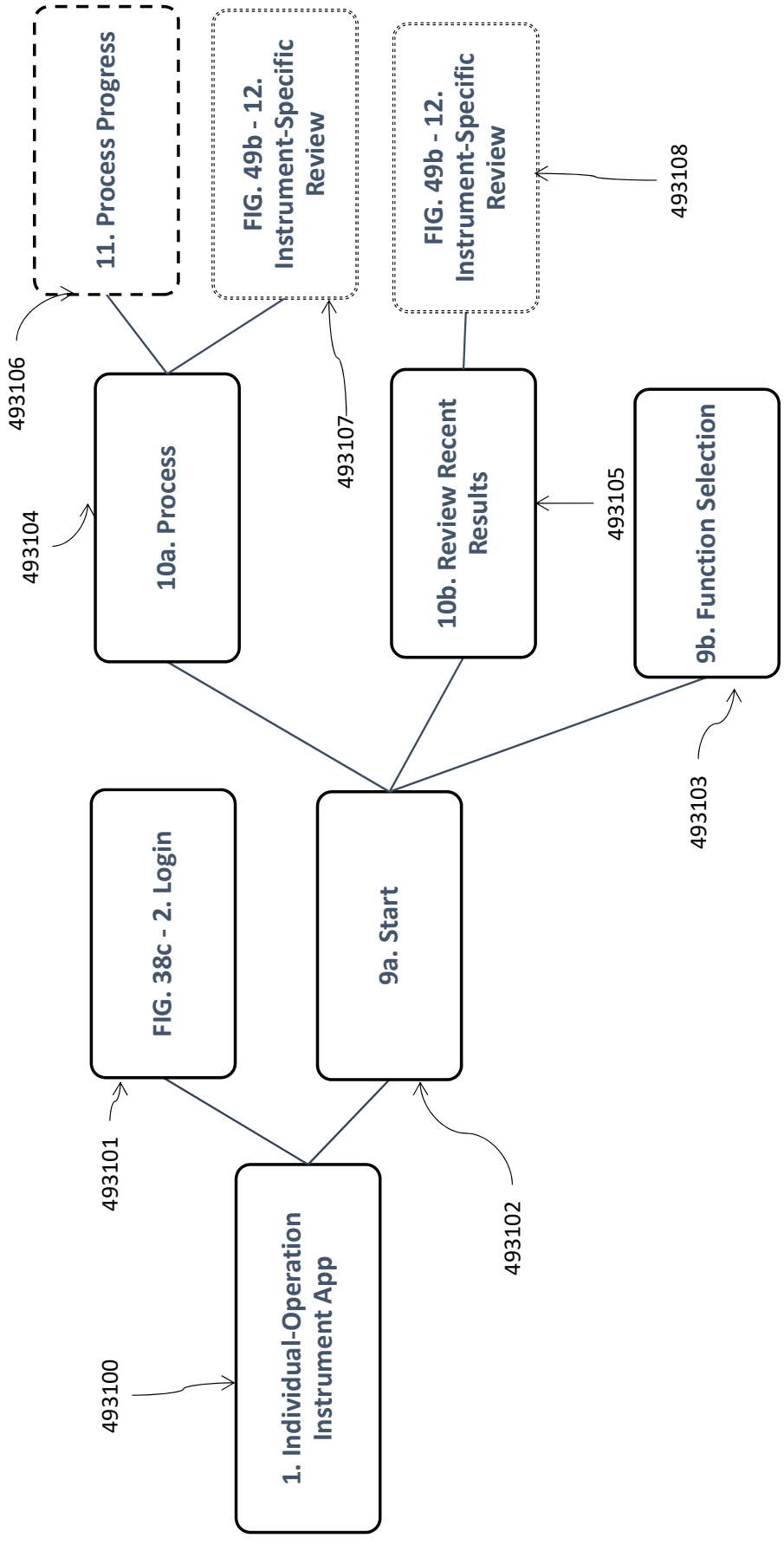

1. Individual-Operation Instrument App
493100
FIG. 38c - 2. Login
493101
9a. Start
493102
10a. Process
493104
10b. Review Recent Results
493105
9b. Function Selection
493103
11. Process Progress
493106
FIG. 49b - 12. Instrument-Specific Review
493107
FIG. 49b - 12. Instrument-Specific Review
493108

FIG. 49A

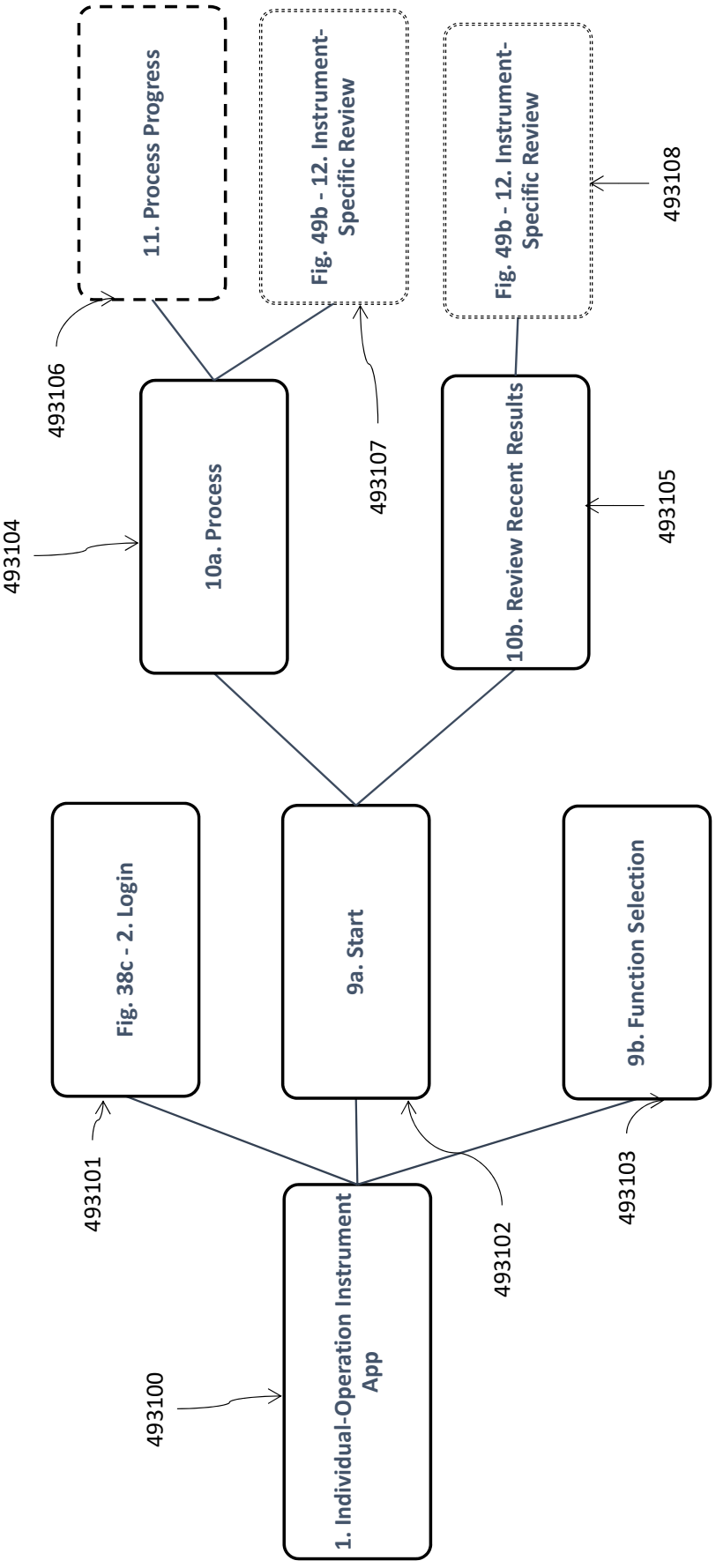

1. Individual-Operation Instrument App
493100
Fig. 38c - 2. Login
493101
9a. Start
493102
9b. Function Selection
493103
10a. Process
493104
10b. Review Recent Results
493105
11. Process Progress
493106
Fig. 49b - 12. Instrument-Specific Review
493107
Fig. 49b - 12. Instrument-Specific Review
493108

Fig. 49AA

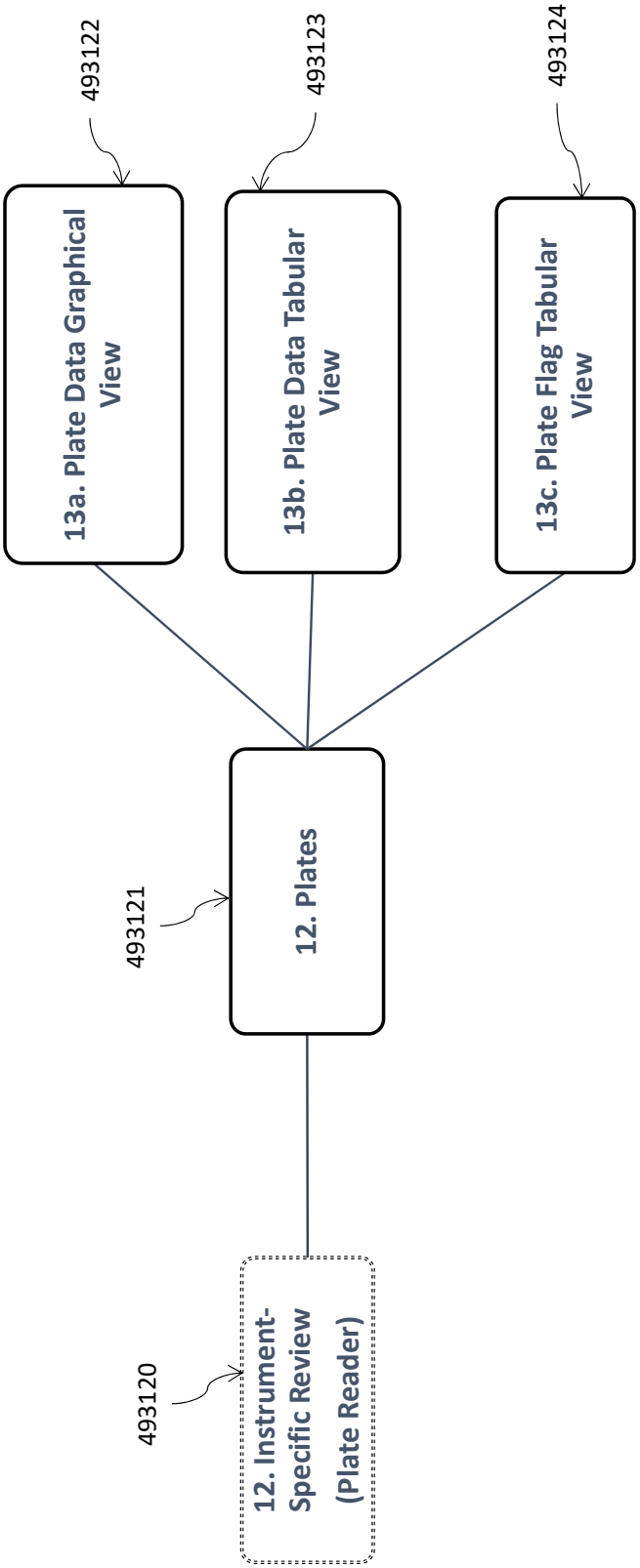

493122
493123
493124
13a. Plate Data Graphical View
13b. Plate Data Tabular View
13c. Plate Flag Tabular View
493121
12. Plates
493120
12. Instrument-Specific Review (Plate Reader)

FIG. 49B

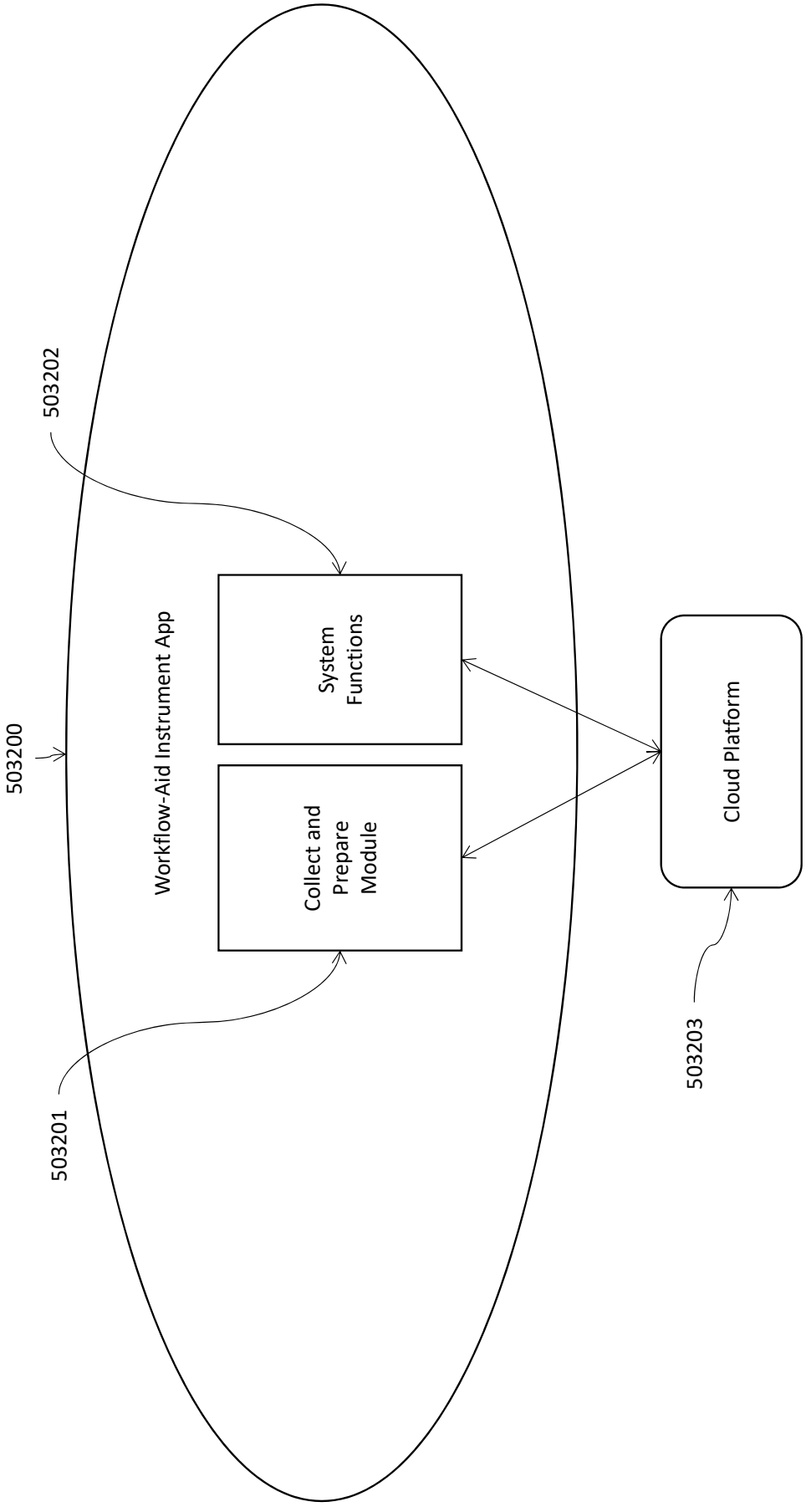

503202
503200
Workflow-Aid Instrument App
System Functions
Collect and Prepare Module
Cloud Platform
503201
503203

FIG. 50

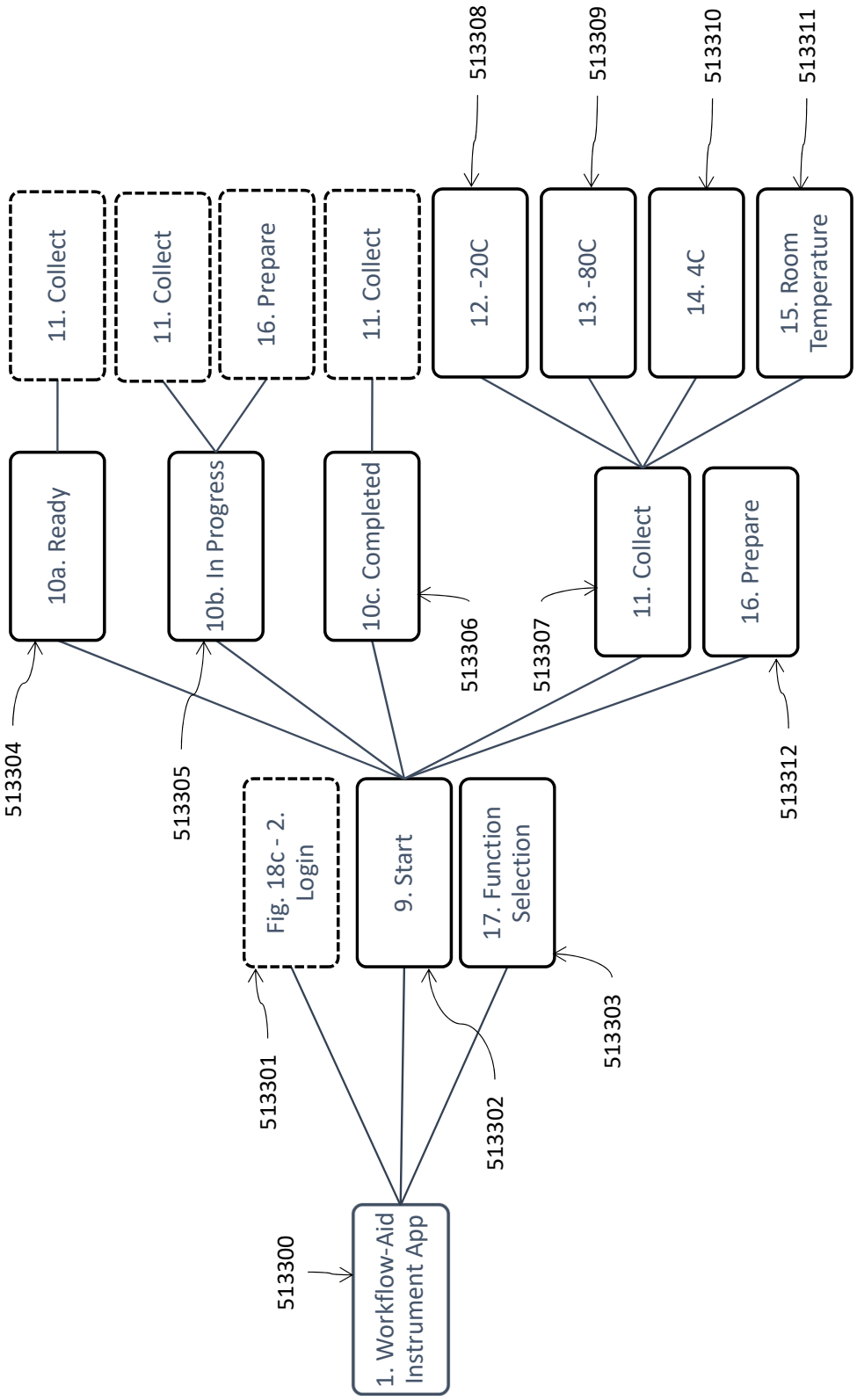

1. Workflow-Aid Instrument App
513300
Fig. 18c - 2. Login
513301
9. Start
513302
17. Function Selection
513303
513304
10a. Ready
11. Collect
513305
10b. In Progress
11. Collect
16. Prepare
513306
10c. Completed
11. Collect
513307
11. Collect
16. Prepare
513308
12. -20C
513309
13. -80C
513310
14. 4C
513311
15. Room Temperature
513312

FIG. 51

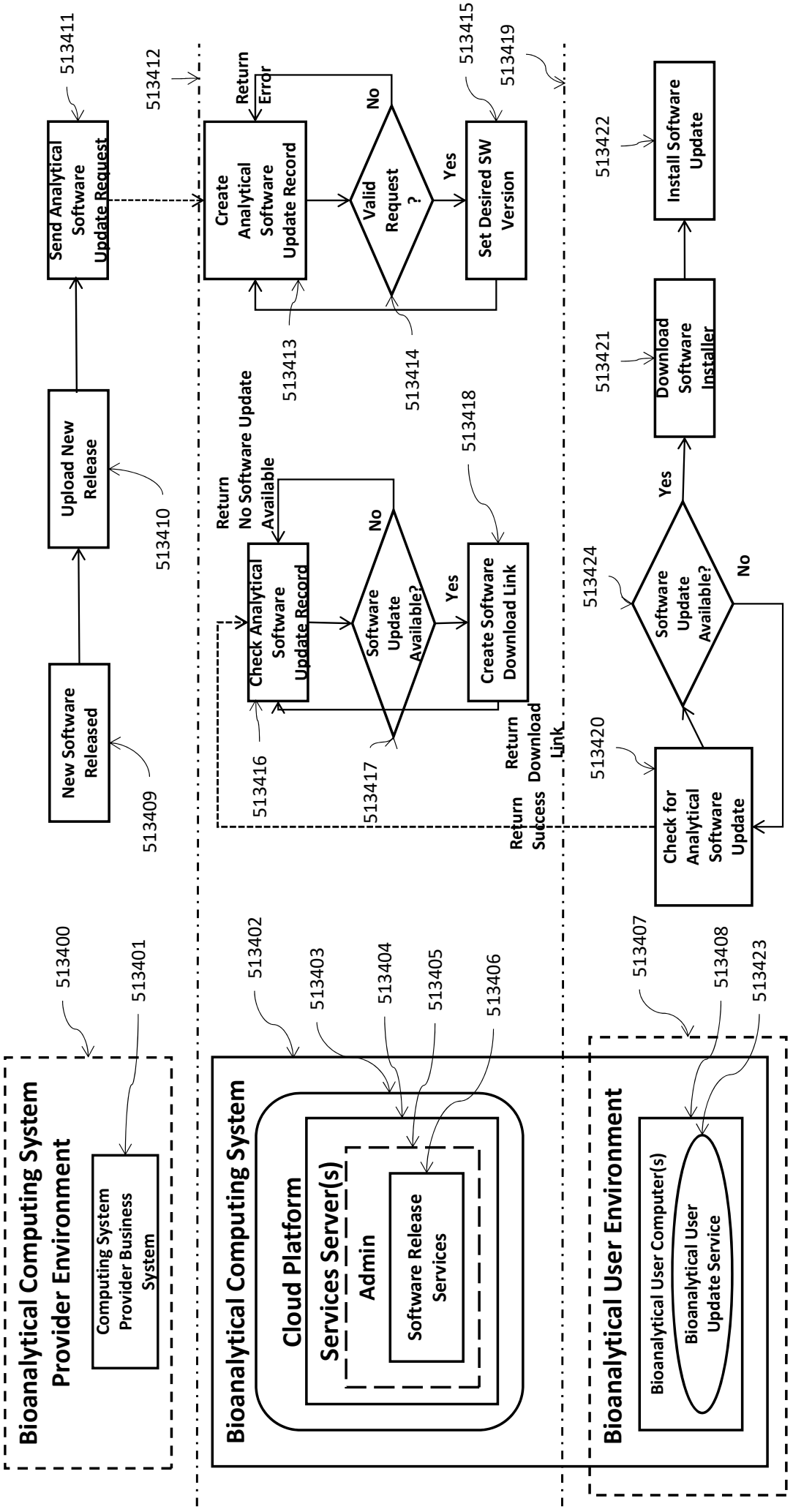

Bioanalytical Computing System Provider Environment
Computing System Provider Business System
513400
513401
Bioanalytical Computing System
Cloud Platform
Services Server(s)
Admin
Software Release Services
513402
513403
513404
513405
513406
Bioanalytical User Environment
Bioanalytical User Computer(s)
Bioanalytical User Update Service
513407
513408
513423
New Software Released
513409
Upload New Release
513410
Send Analytical Software Update Request
513411
513412
Create Analytical Software Update Record
Return Error
Valid Request ?
No
Yes
Set Desired SW Version
513413
513414
513415
513419
Check Analytical Software Update Record
Return No Software Update Available
Software Update Available?
No
Yes
Create Software Download Link
513416
513417
513418
Return Download Link
Return Success
Check for Analytical Software Update
513420
Software Update Available?
513424
Yes
No
Download Software Installer
513421
Install Software Update
513422

FIG. 52

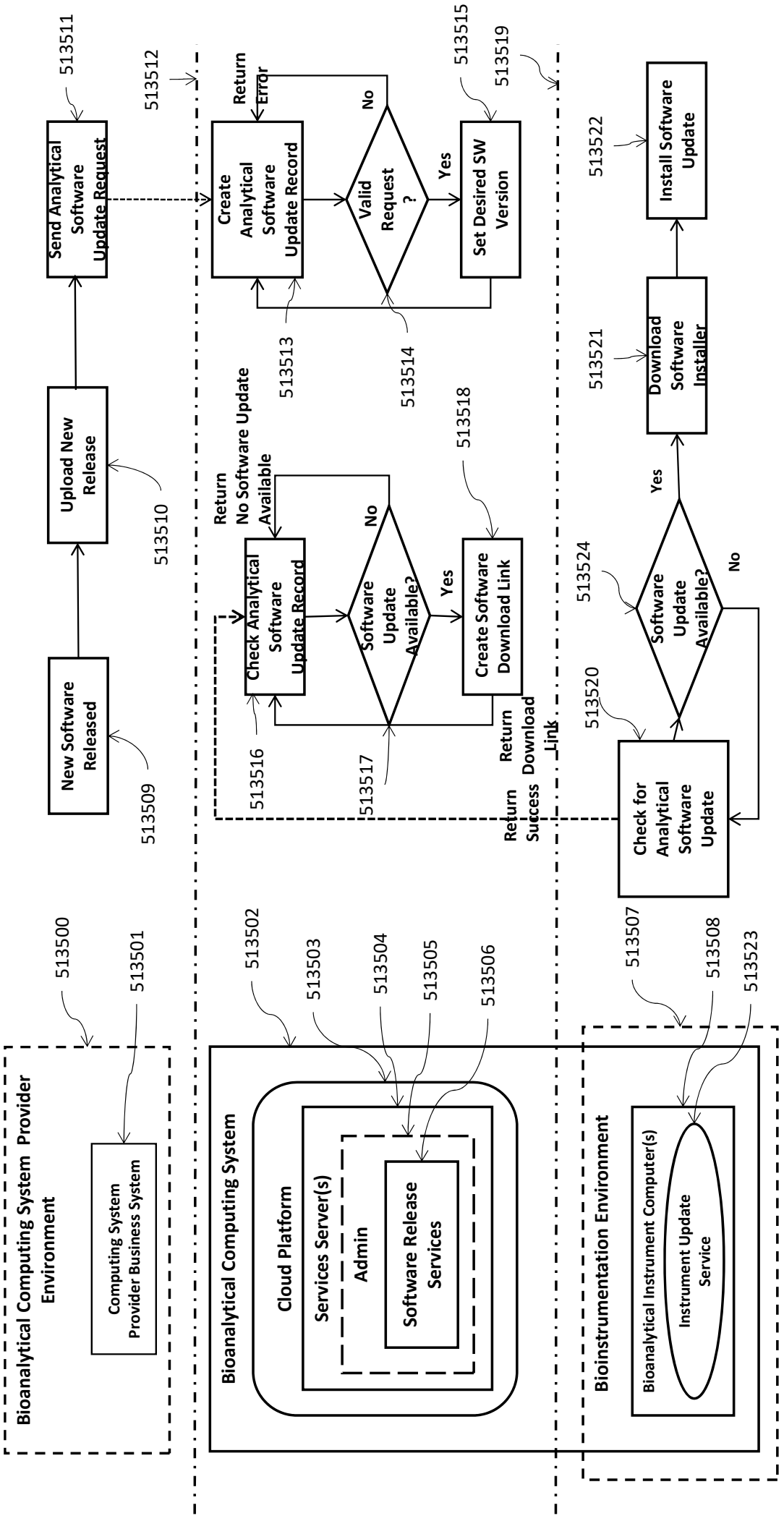

Bioanalytical Computing System Provider Environment
Computing System Provider Business System
Bioanalytical Computing System
Cloud Platform
Services Server(s)
Admin
Software Release Services
Bioinstrumentation Environment
Bioanalytical Instrument Computer(s)
Instrument Update Service
New Software Released
Upload New Release
Send Analytical Software Update Request
Create Analytical Software Update Record
Valid Request ?
Return Error
No
Yes
Set Desired SW Version
Check Analytical Software Update Record
Software Update Available?
Return No Software Update Available
Create Software Download Link
Return Download Link
Return Success
Check for Analytical Software Update
Software Update Available?
Download Software Installer
Install Software Update
513500
513501
513502
513503
513504
513505
513506
513507
513508
513509
513510
513511
513512
513513
513514
513515
513516
513517
513518
513519
513520
513521
513522
513523
513524

FIG. 53

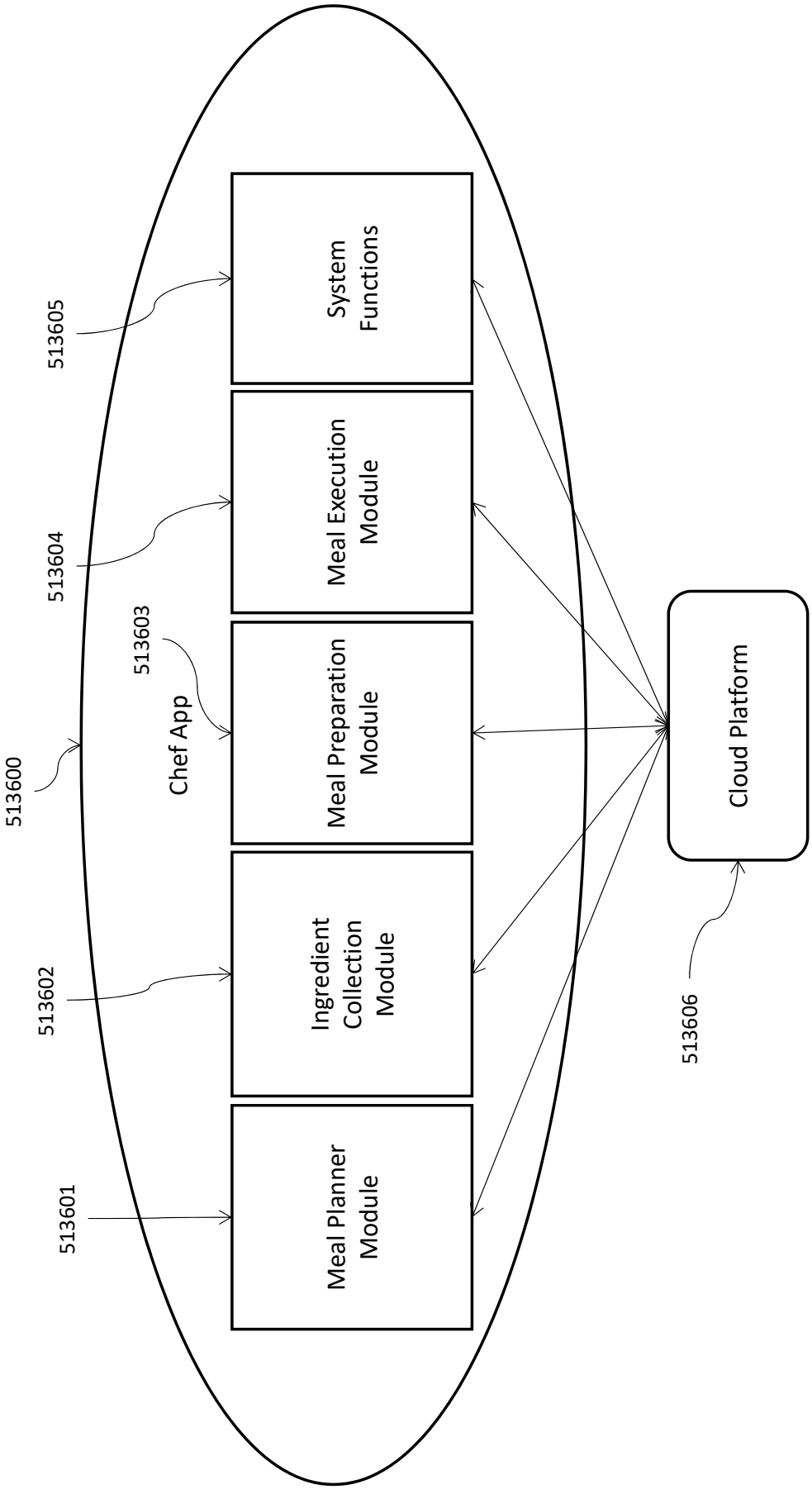

513600
513601
513602
513603
Chef App
513604
513605
513606
Meal Planner Module
Ingredient Collection Module
Meal Preparation Module
Meal Execution Module
System Functions
Cloud Platform

FIG. 54

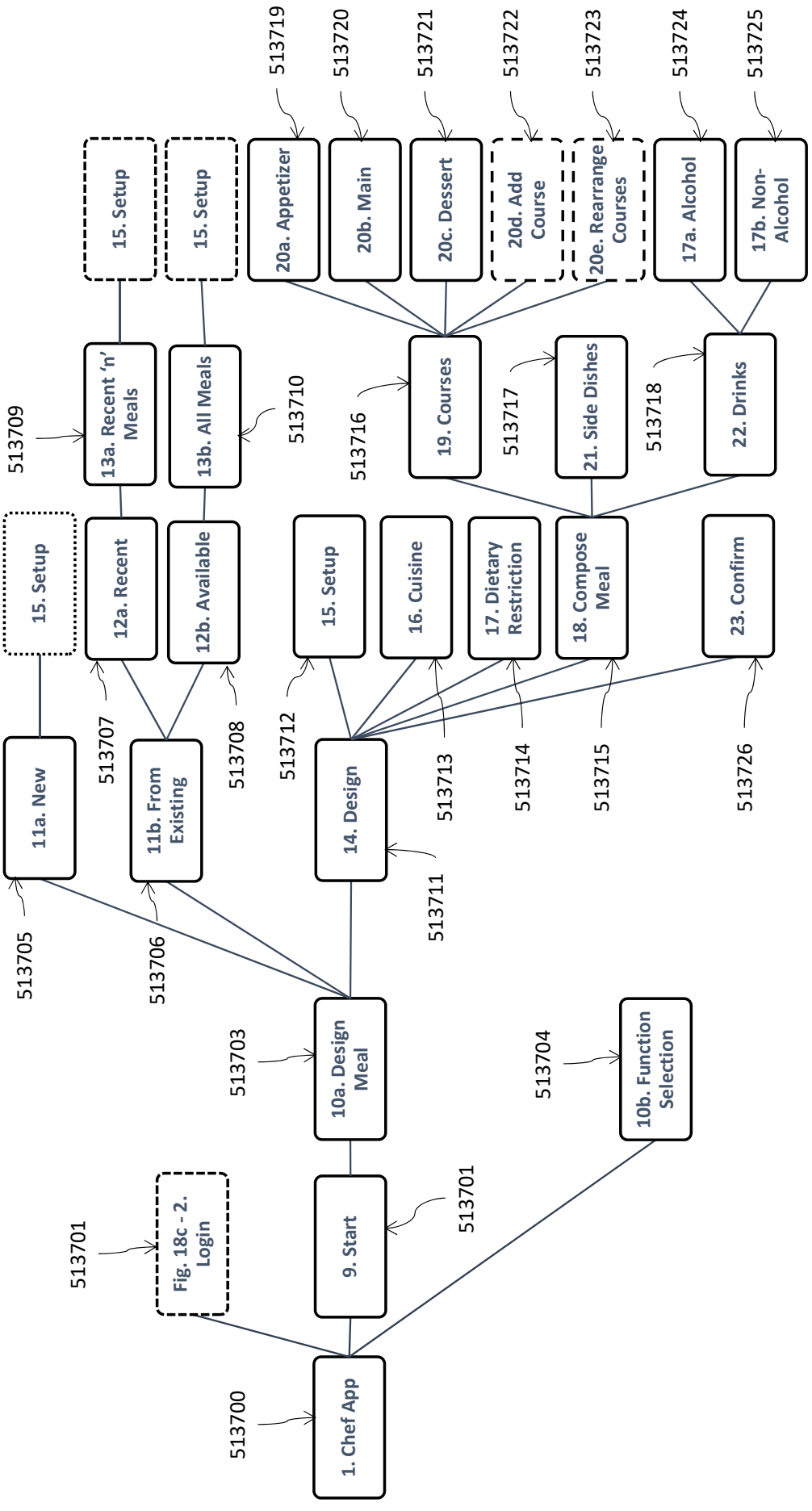

1. Chef App
513700
9. Start
513701
Fig. 18c - 2. Login
513701
10a. Design Meal
513703
10b. Function Selection
513704
11a. New
513705
11b. From Existing
513706
12a. Recent
513707
12b. Available
513708
13a. Recent 'n' Meals
513709
13b. All Meals
513710
14. Design
513711
15. Setup
513712
16. Cuisine
513713
17. Dietary Restriction
513714
18. Compose Meal
513715
19. Courses
513716
21. Side Dishes
513717
22. Drinks
513718
20a. Appetizer
513719
20b. Main
513720
20c. Dessert
513721
20d. Add Course
513722
20e. Rearrange Courses
513723
17a. Alcohol
513724
17b. Non-Alcohol
513725
23. Confirm
513726
15. Setup
15. Setup
15. Setup

FIG. 55

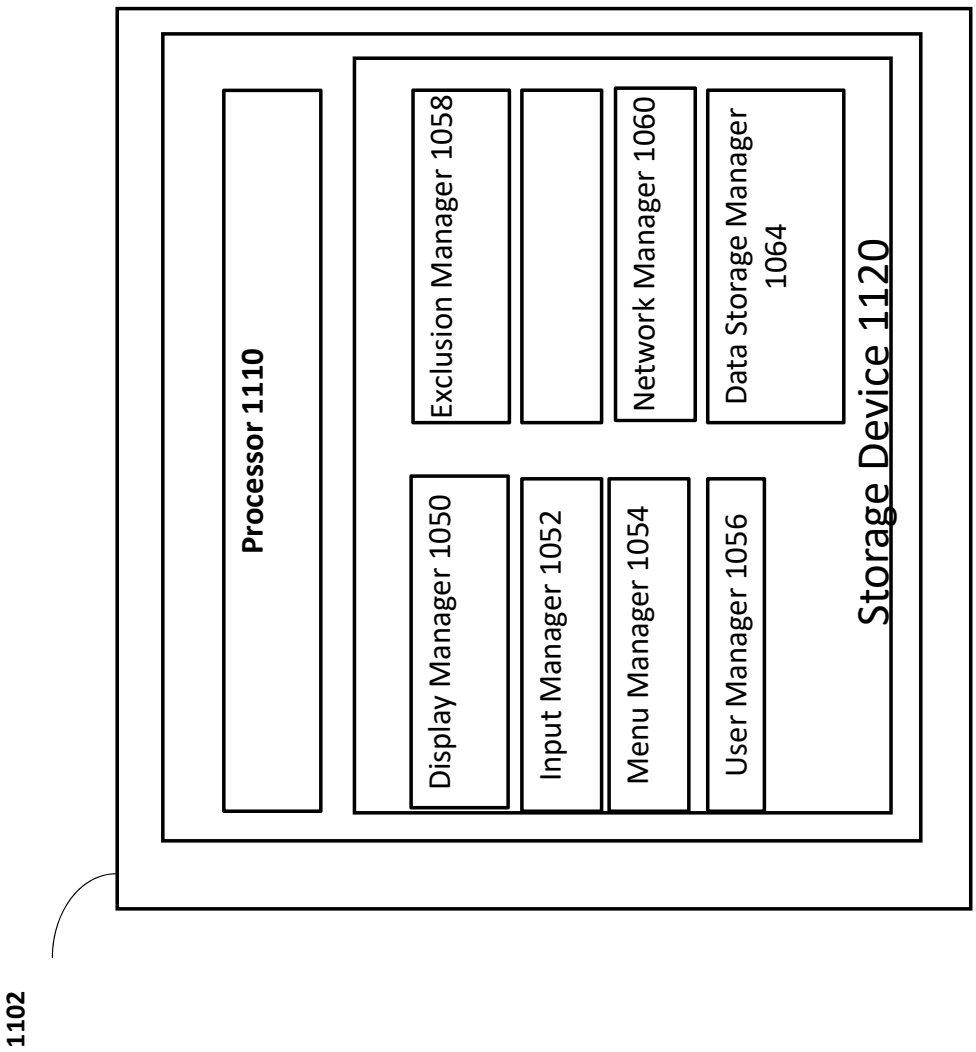

1102
Processor 1110
Storage Device 1120
Display Manager 1050
Input Manager 1052
Menu Manager 1054
User Manager 1056
Exclusion Manager 1058
Network Manager 1060
Data Storage Manager 1064

FIG. 56

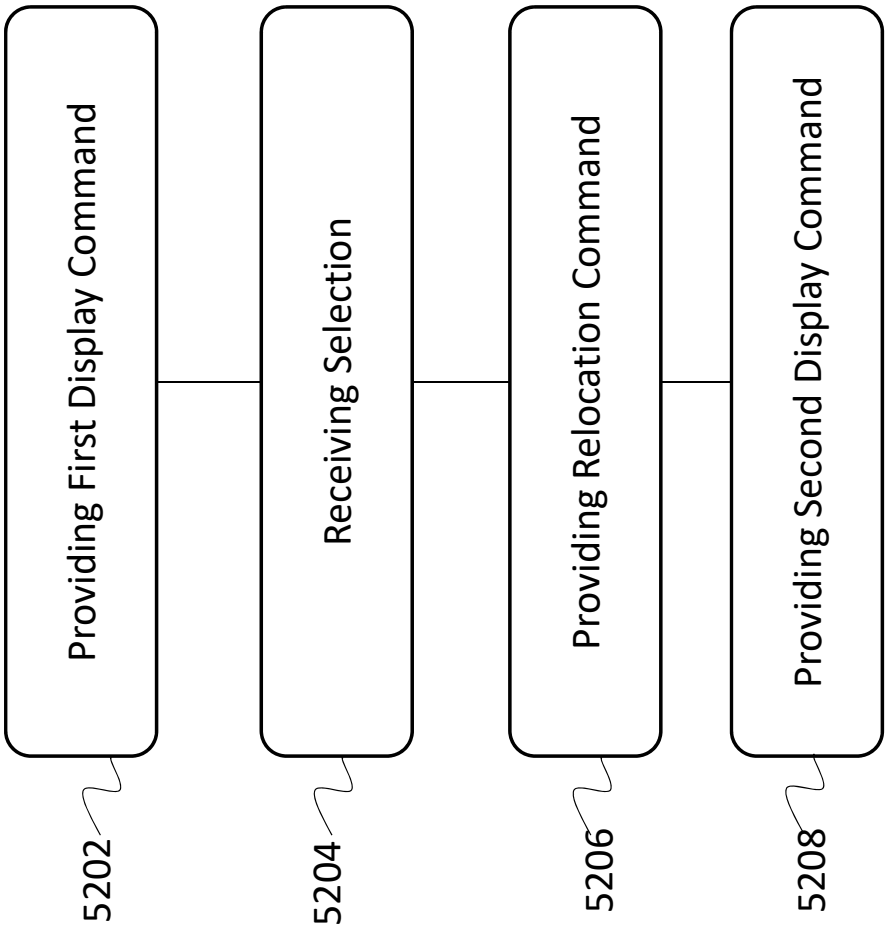

5200
Providing First Display Command
Receiving Selection
Providing Relocation Command
Providing Second Display Command
5202
5204
5206
5208

FIG. 57

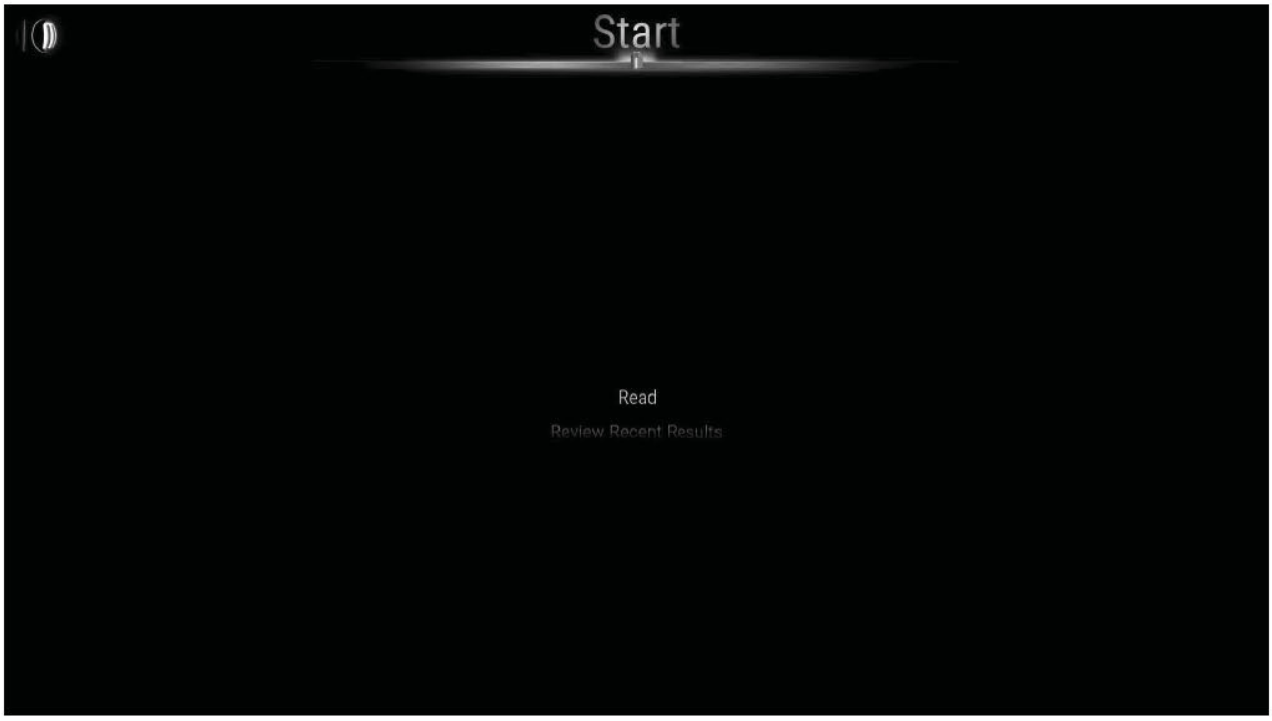


FIG. 58A

FIG. 58B



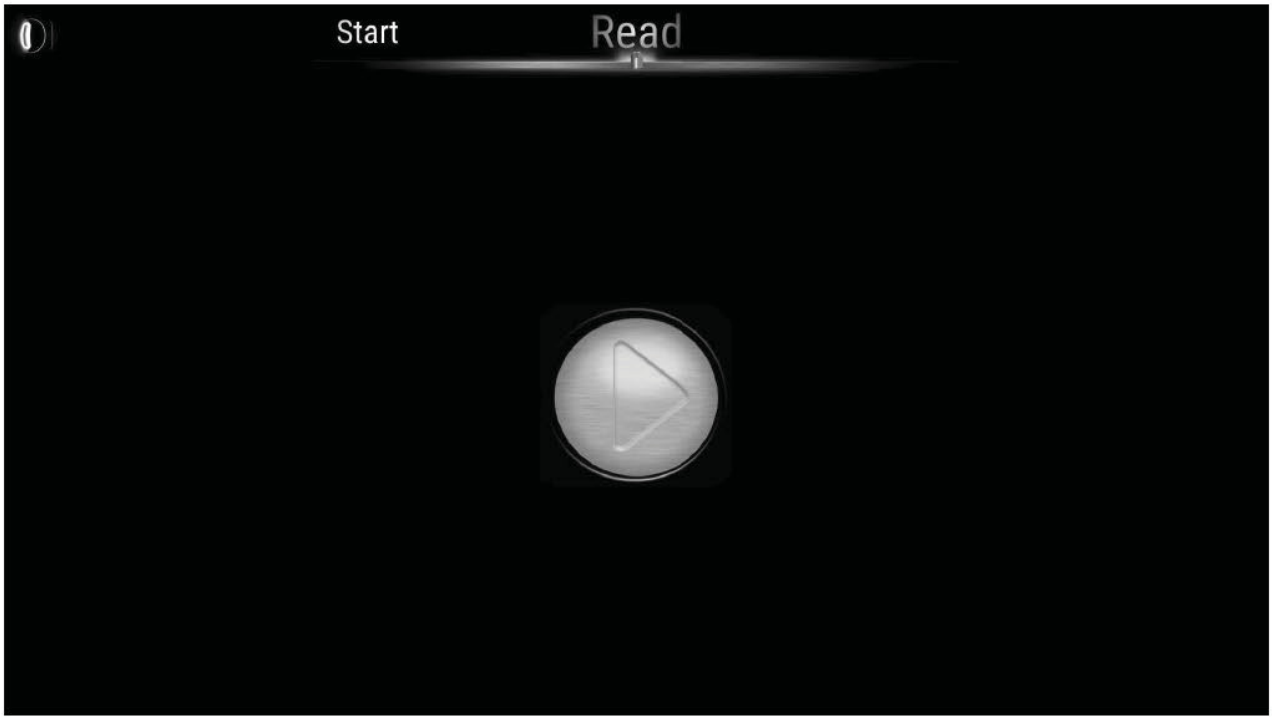
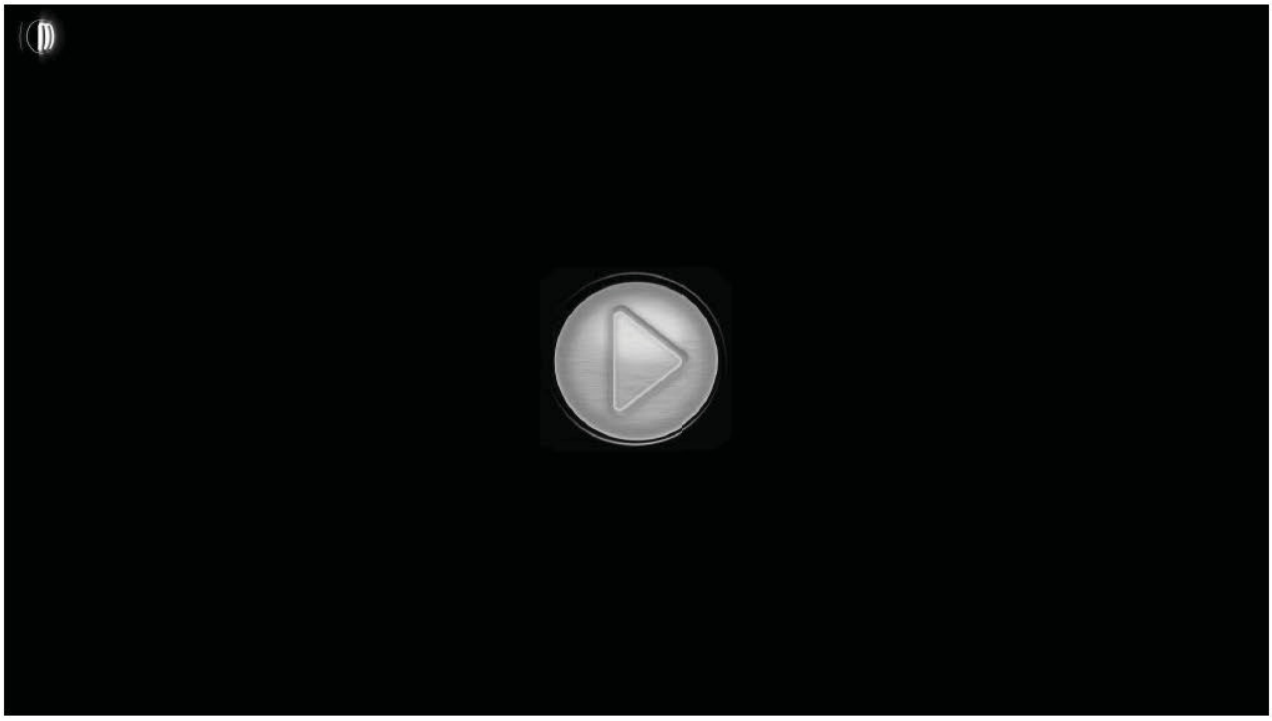


FIG. 58C

FIG. 58D



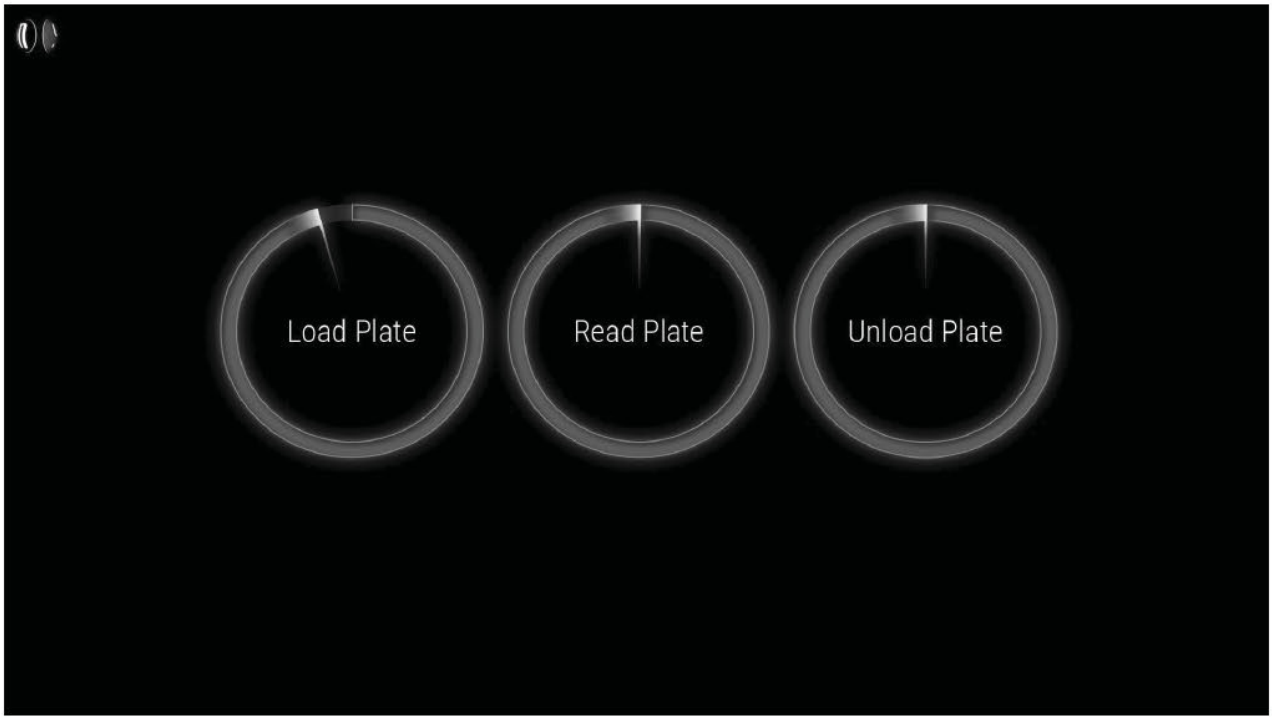
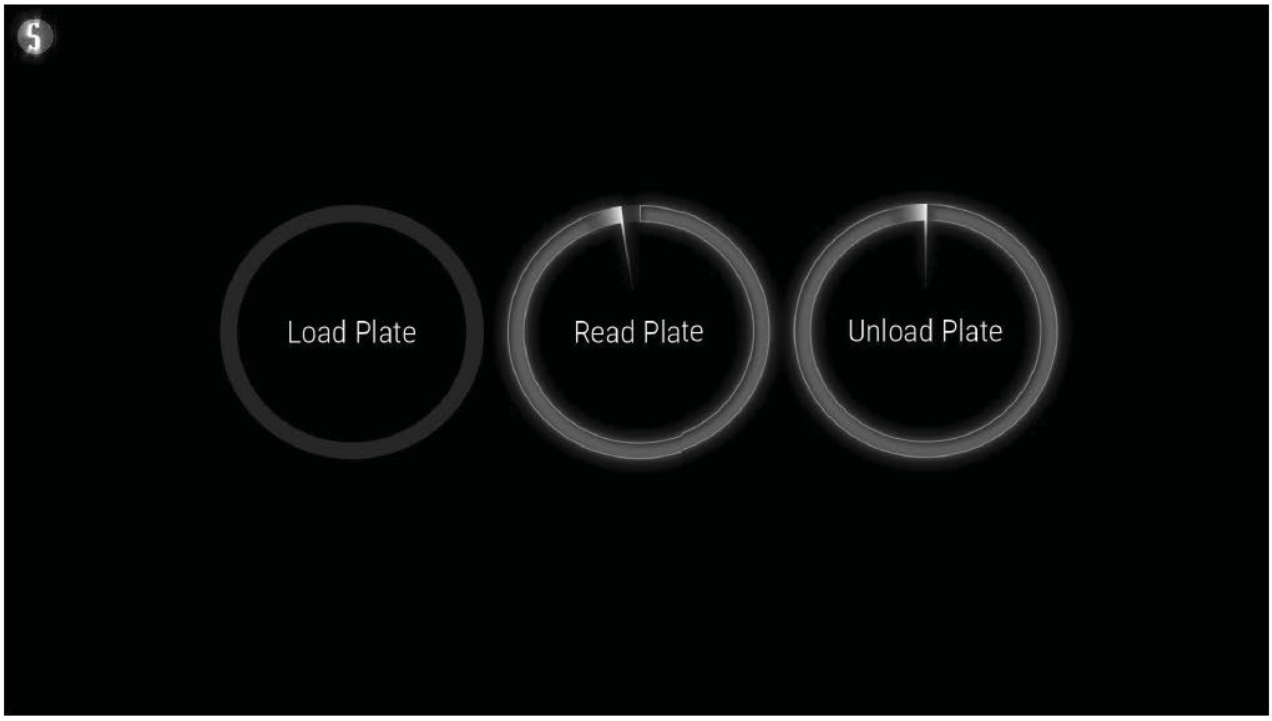


FIG. 58E

FIG. 58F



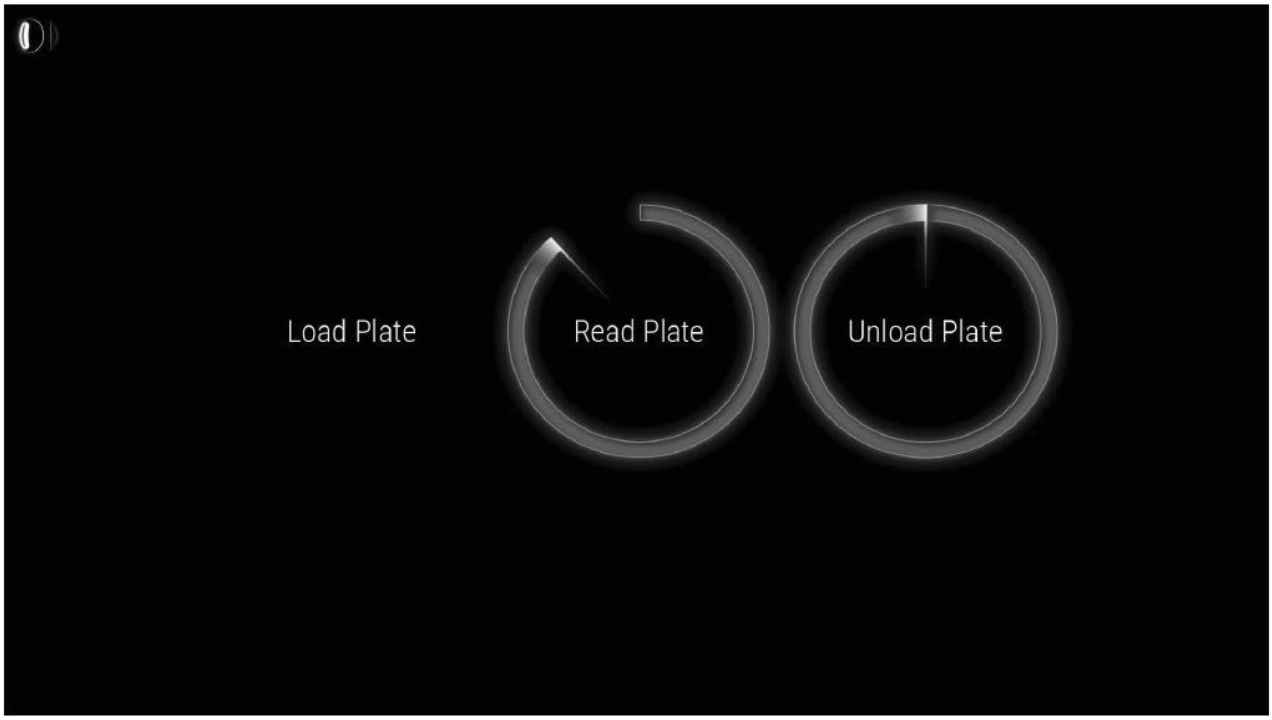


FIG. 58G

FIG. 58H



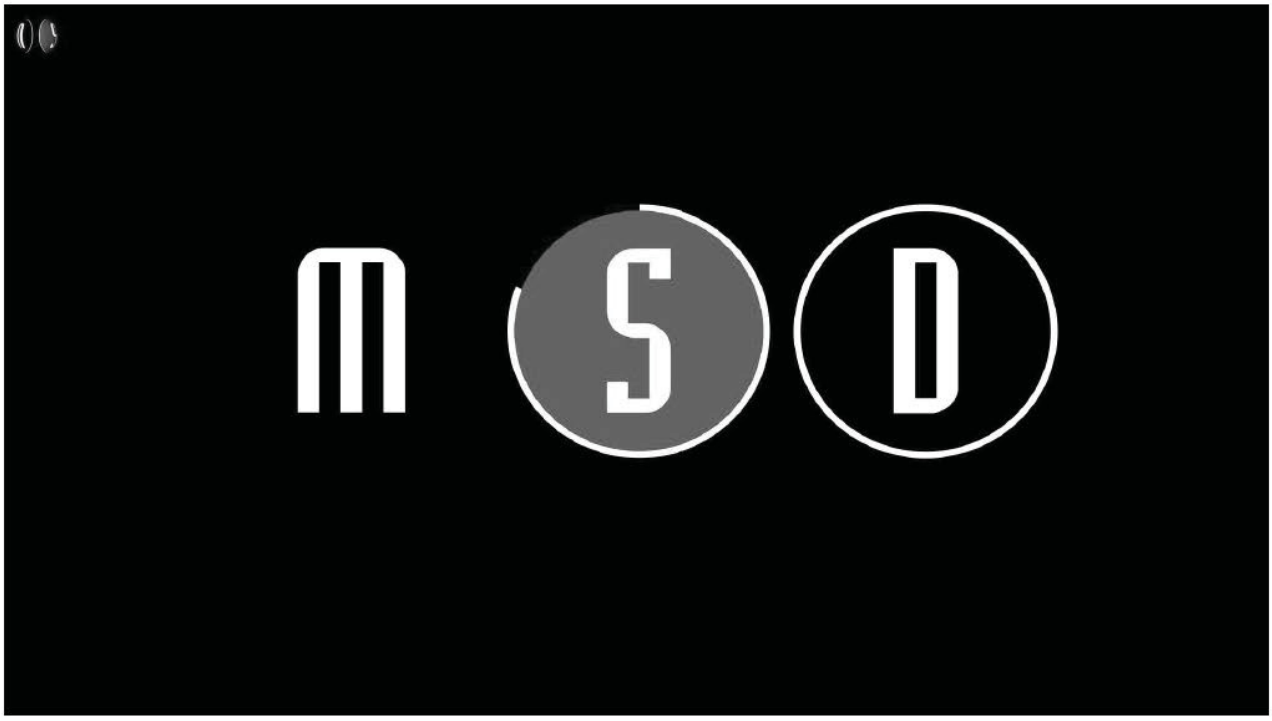


FIG. 58I

FIG. 58J

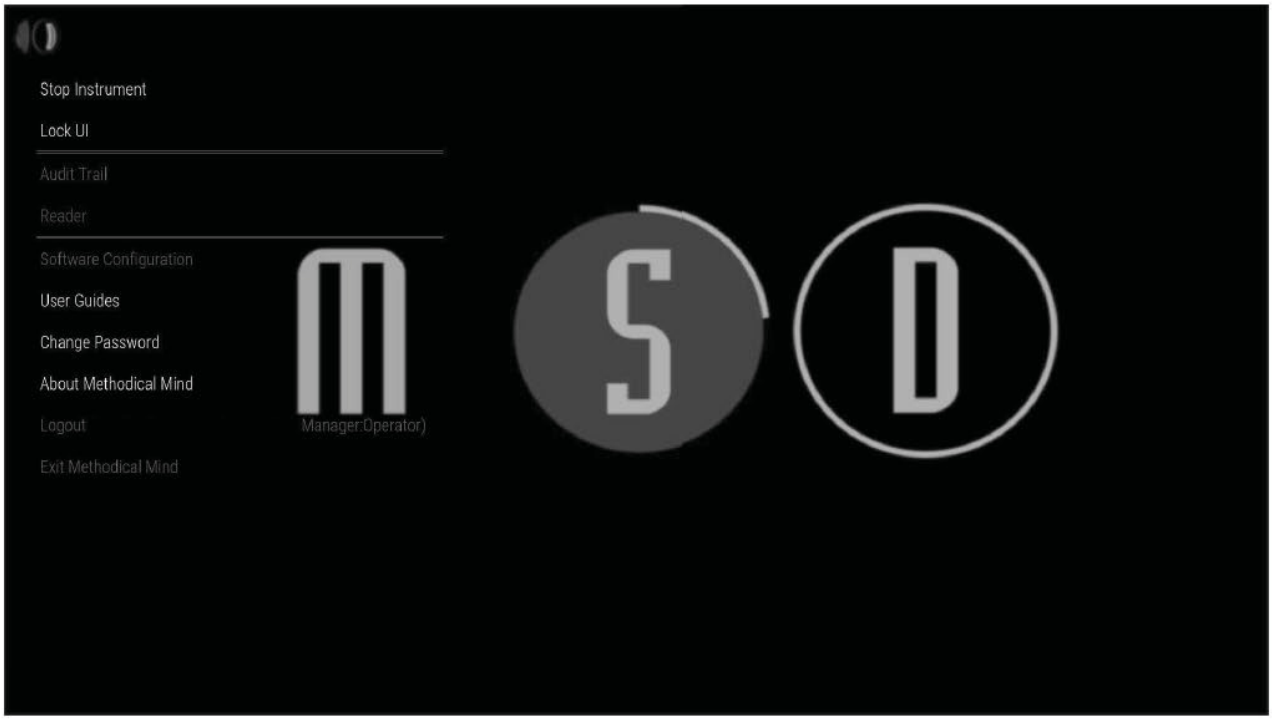
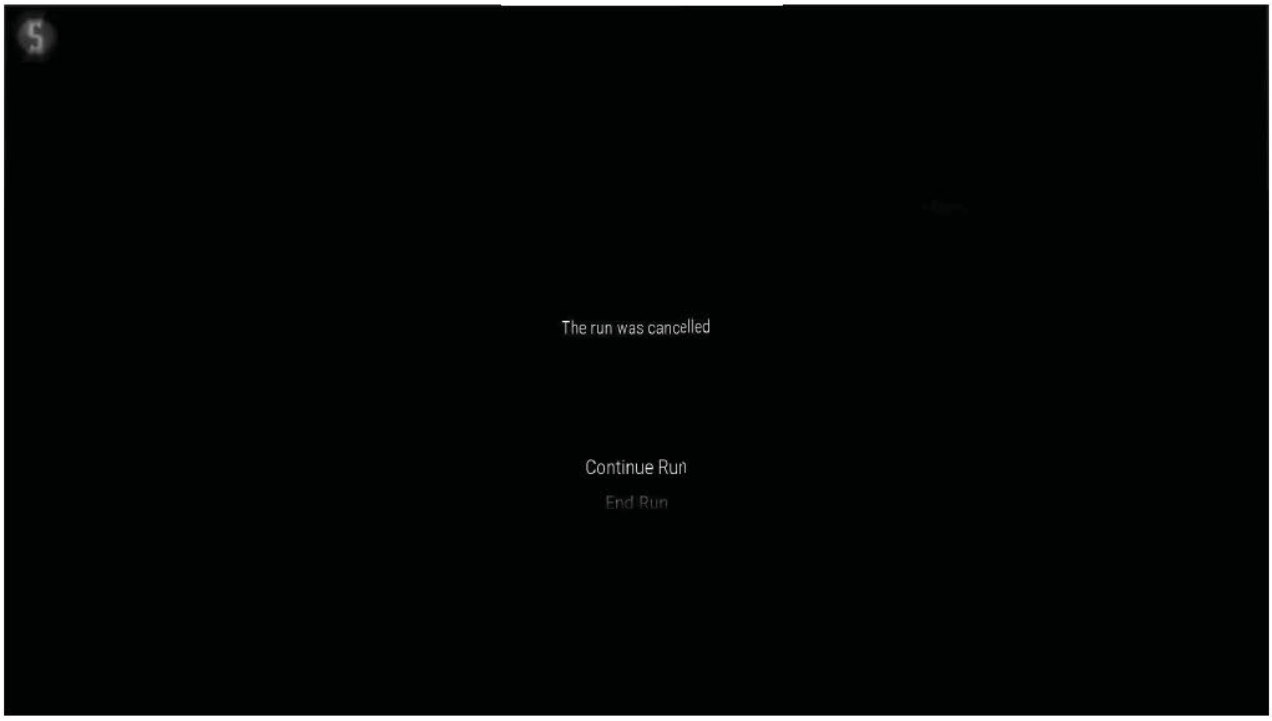




FIG. 58 K

FIG. 58L



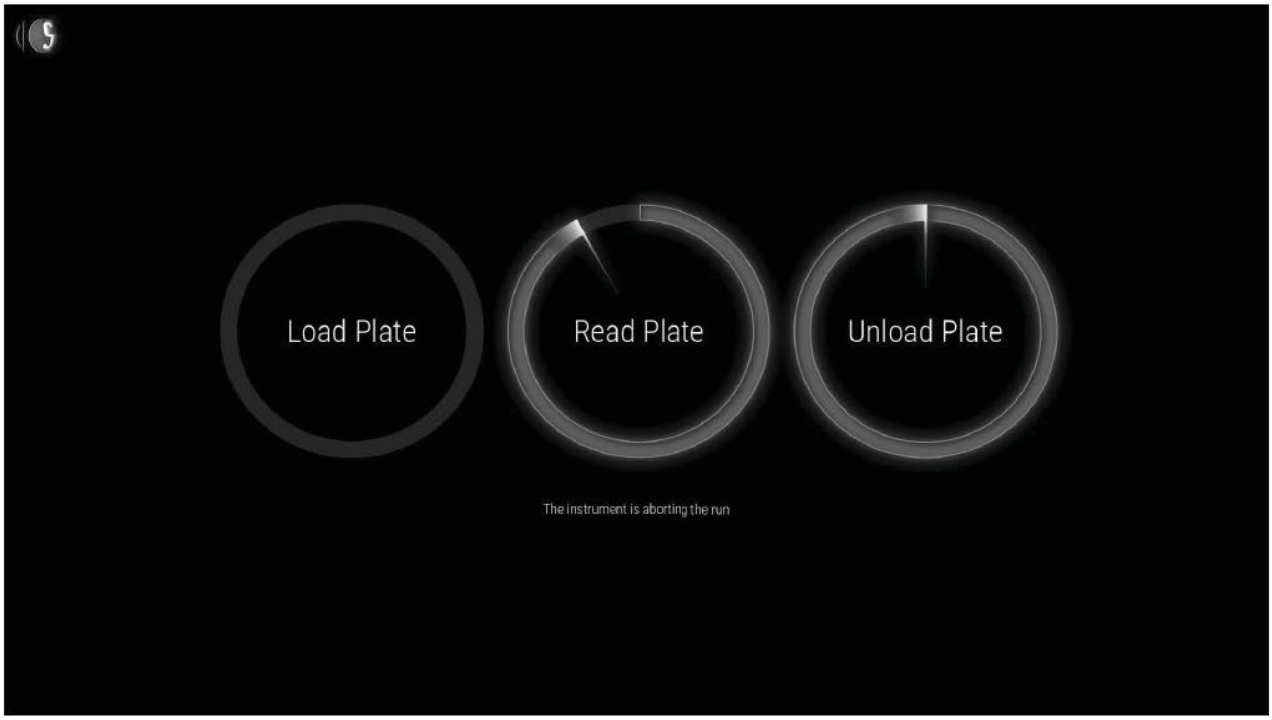


FIG. 58M

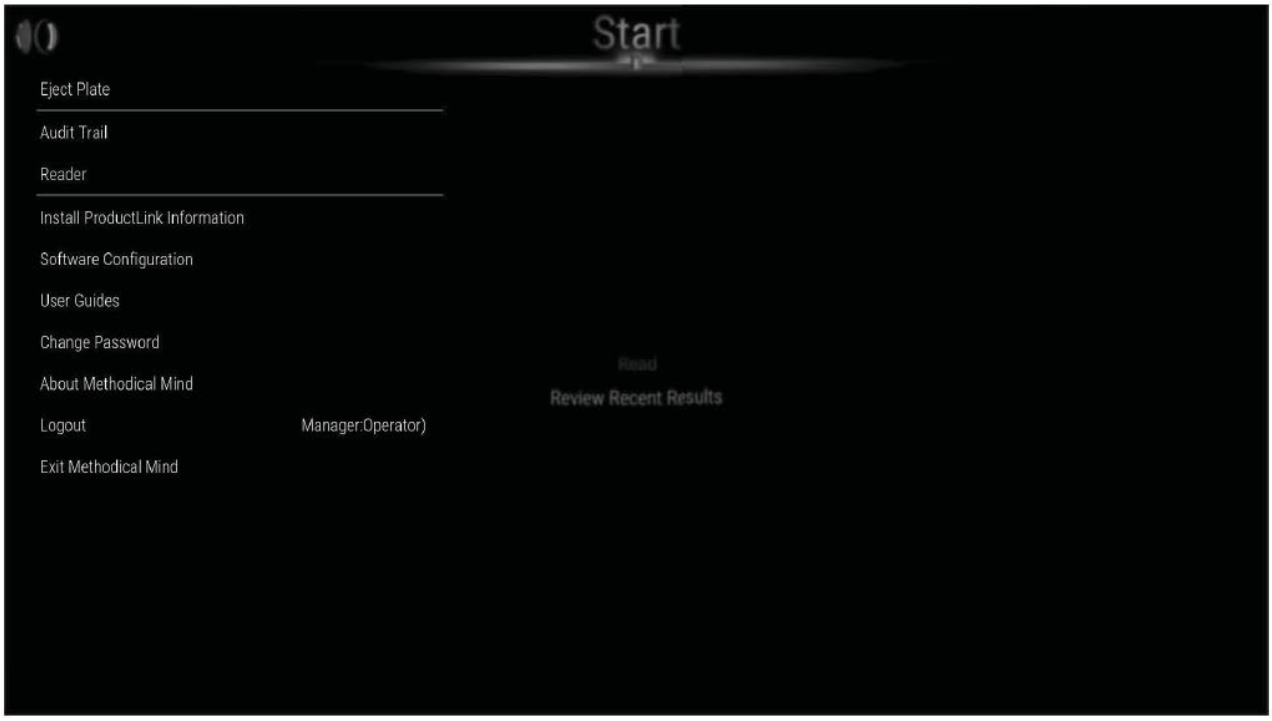
FIG. 58N





FIG. 58O

FIG. 58P



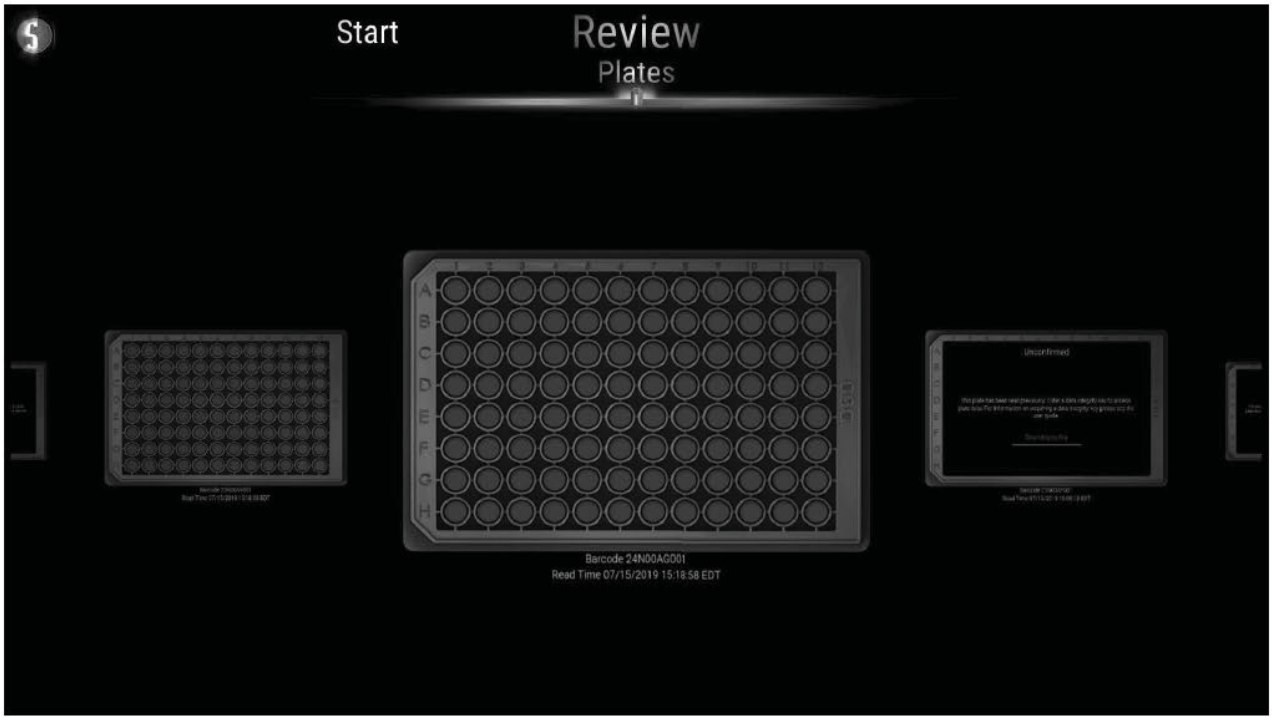


FIG. 58Q

FIG. 58R



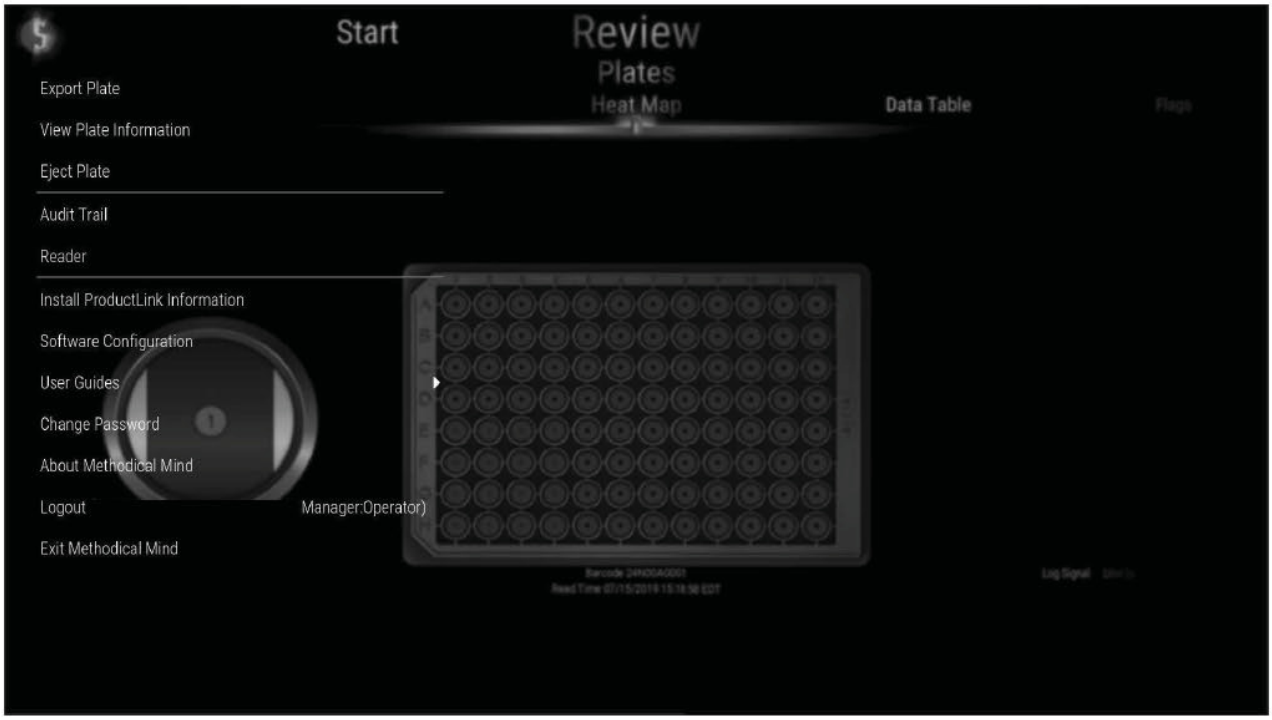


FIG. 58S

FIG. 58T



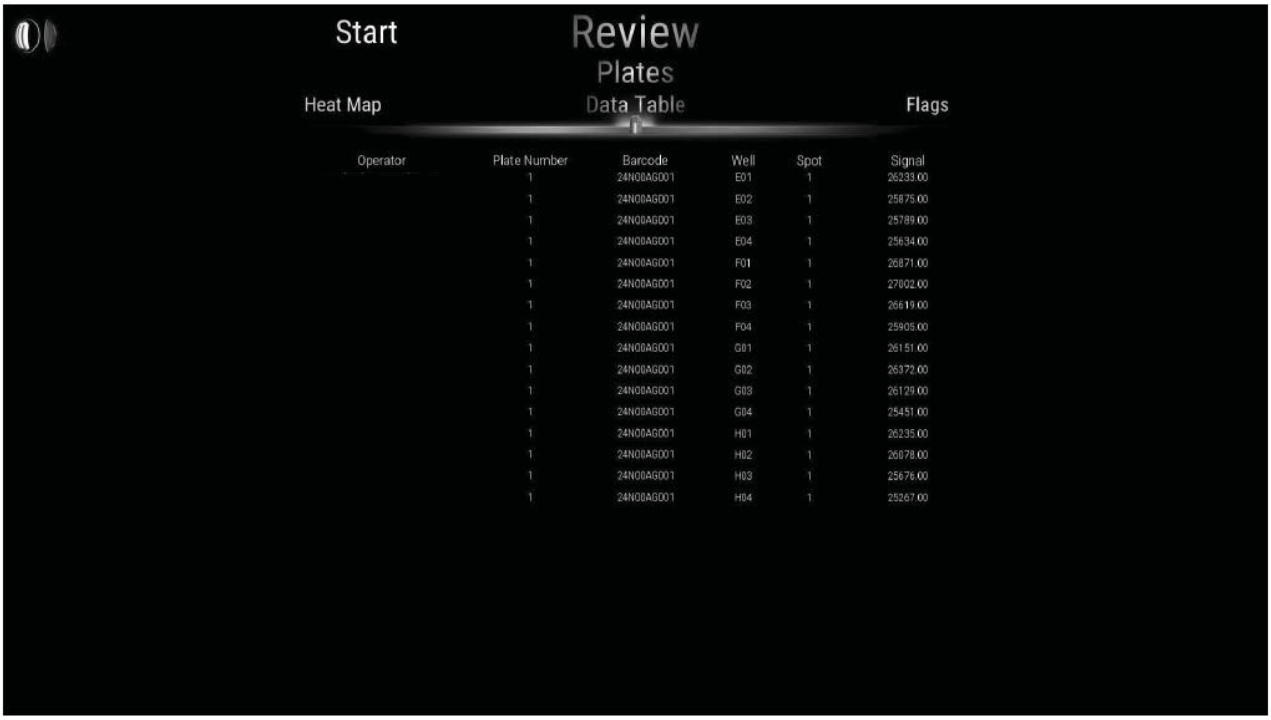
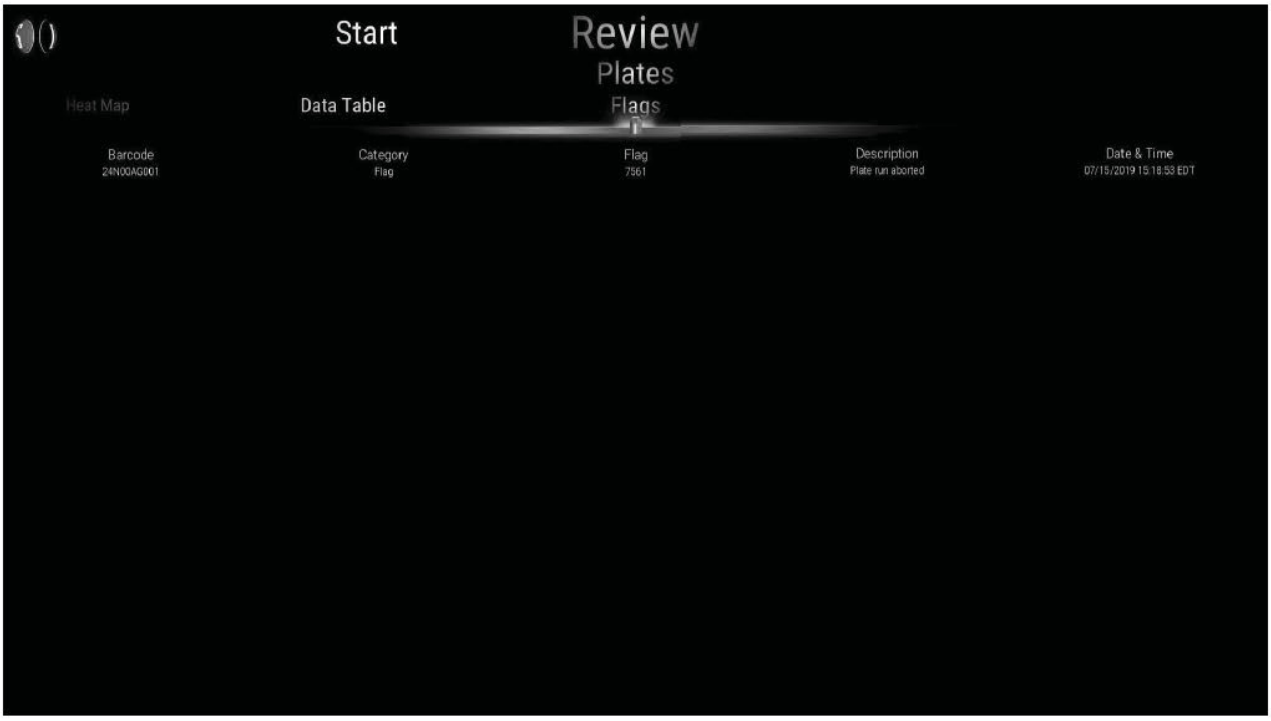


FIG. 58U

FIG. 58V



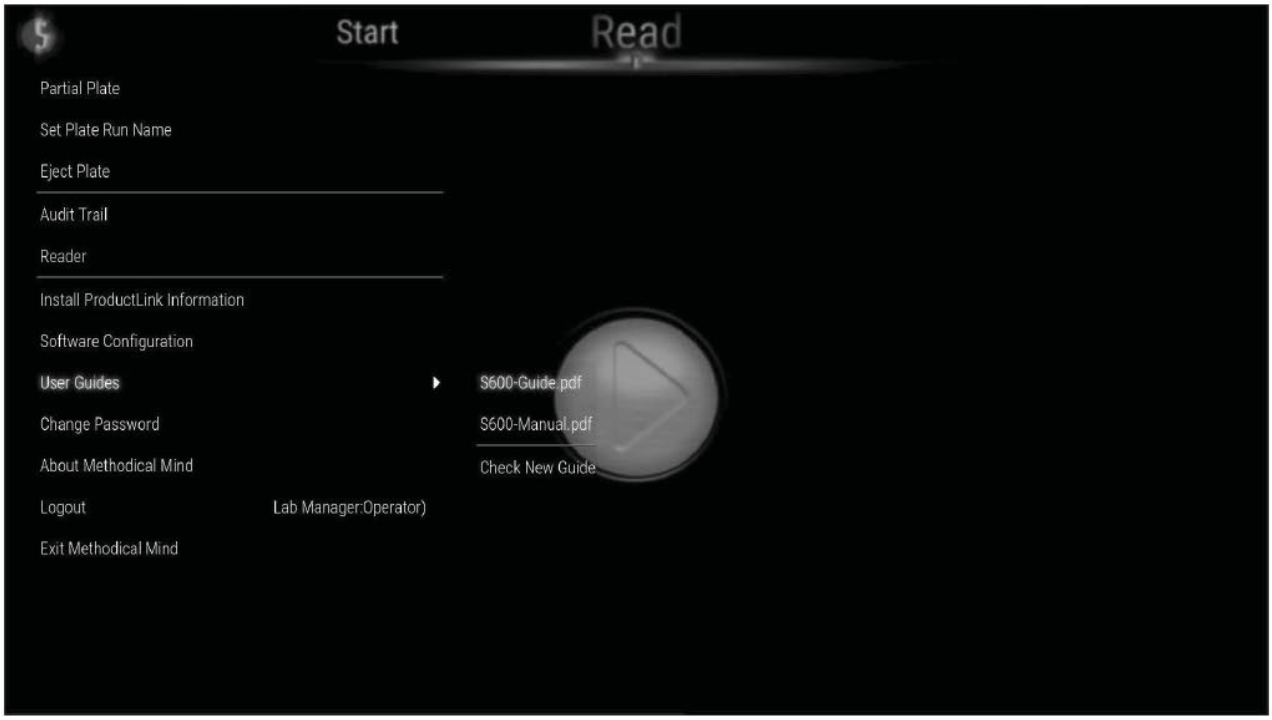


FIG. 58W

FIG. 58X

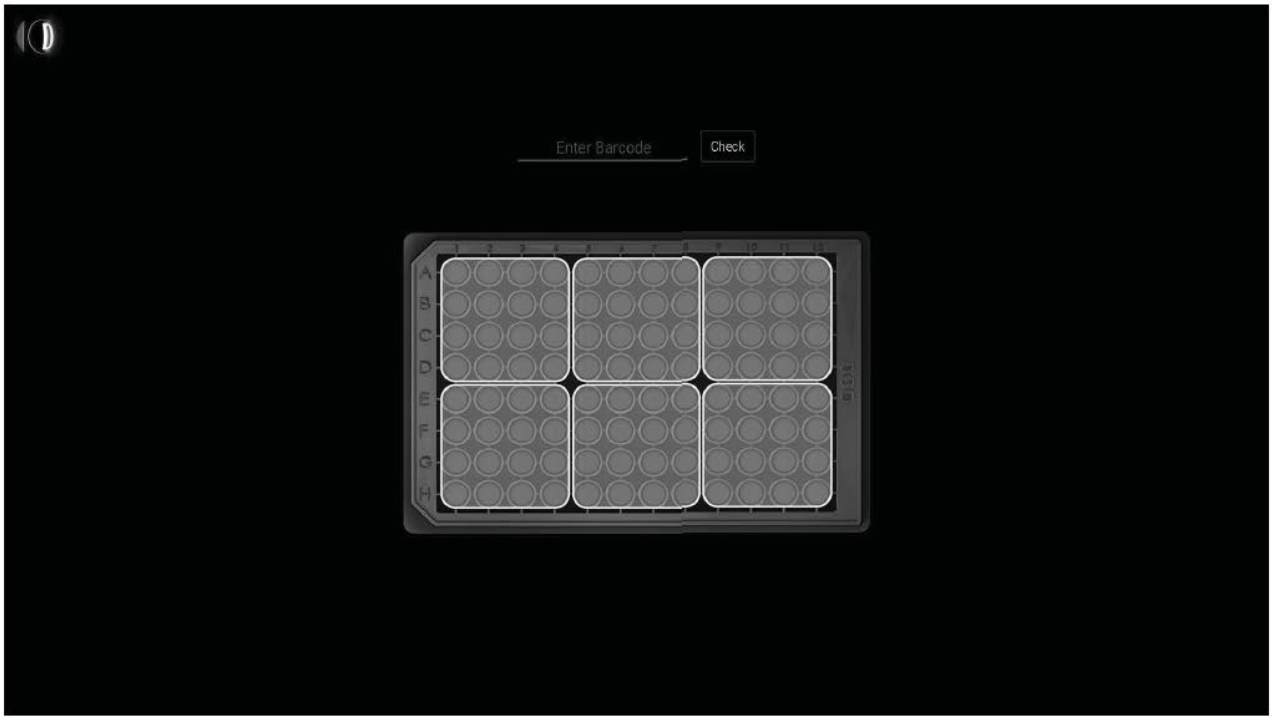
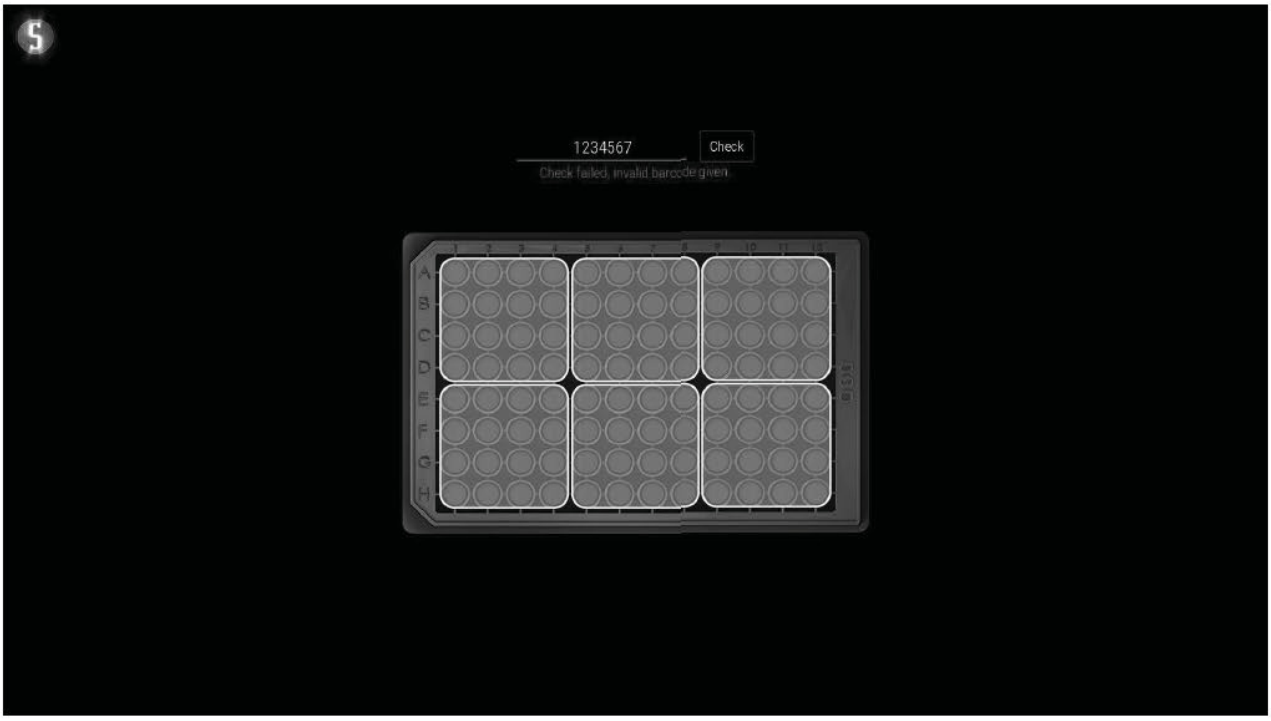




FIG. 58Y

FIG. 58Z



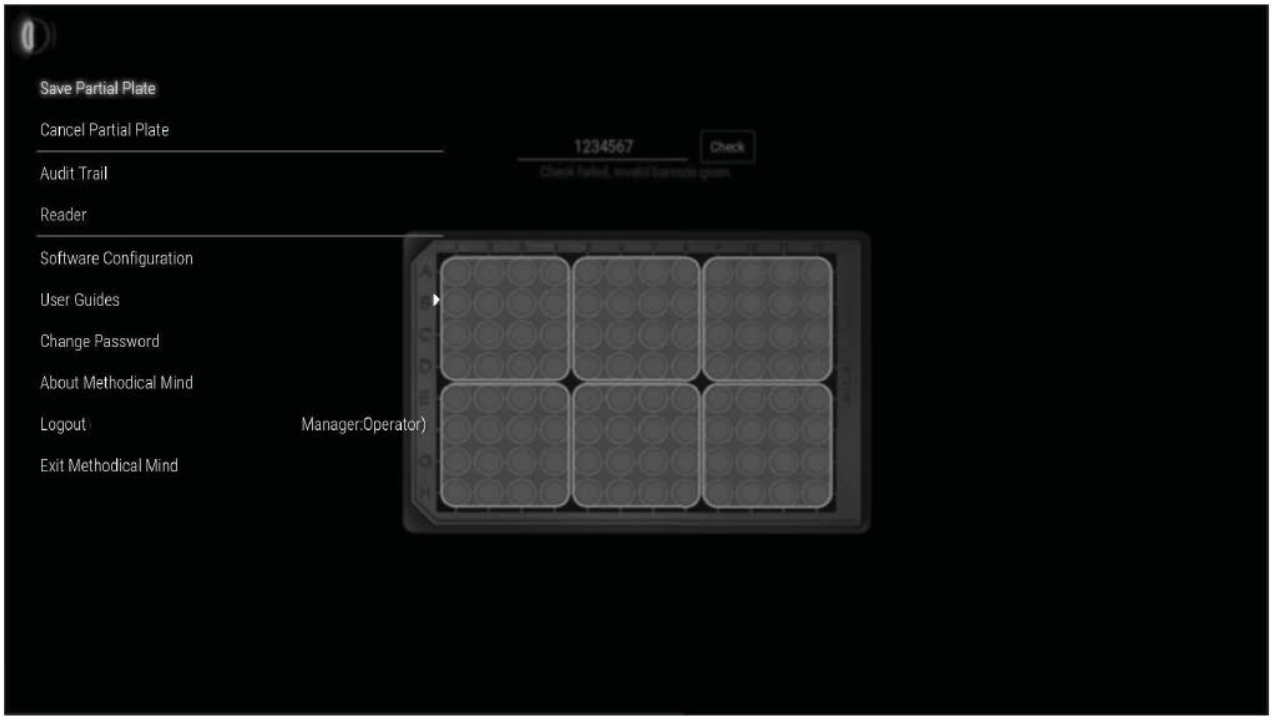
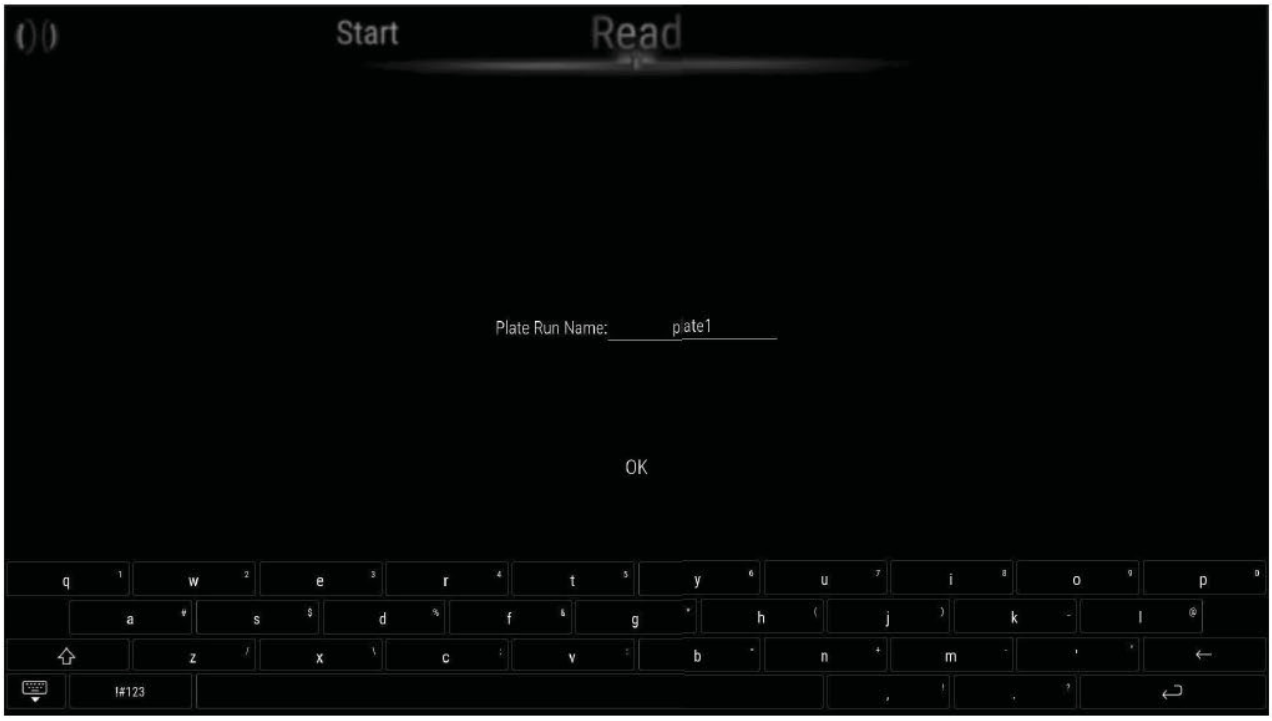


FIG. 58AA

FIG. 58BB



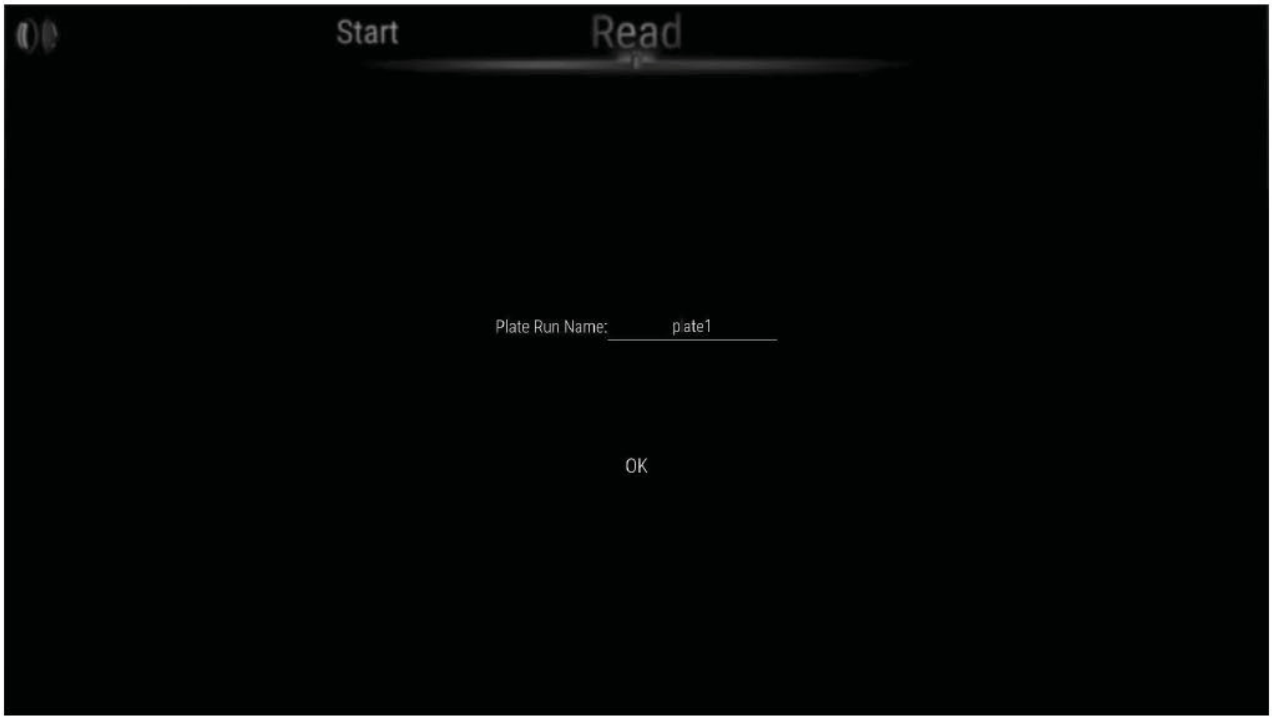
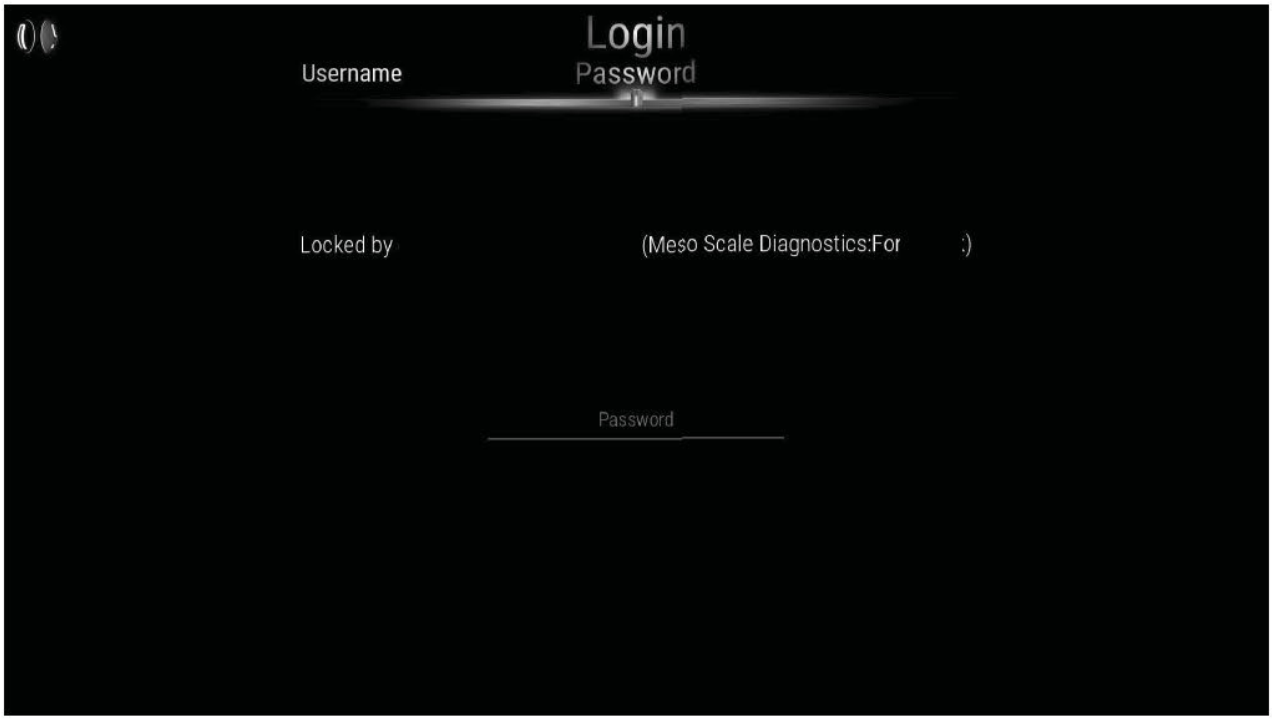


FIG. 58CC

FIG. 58DD



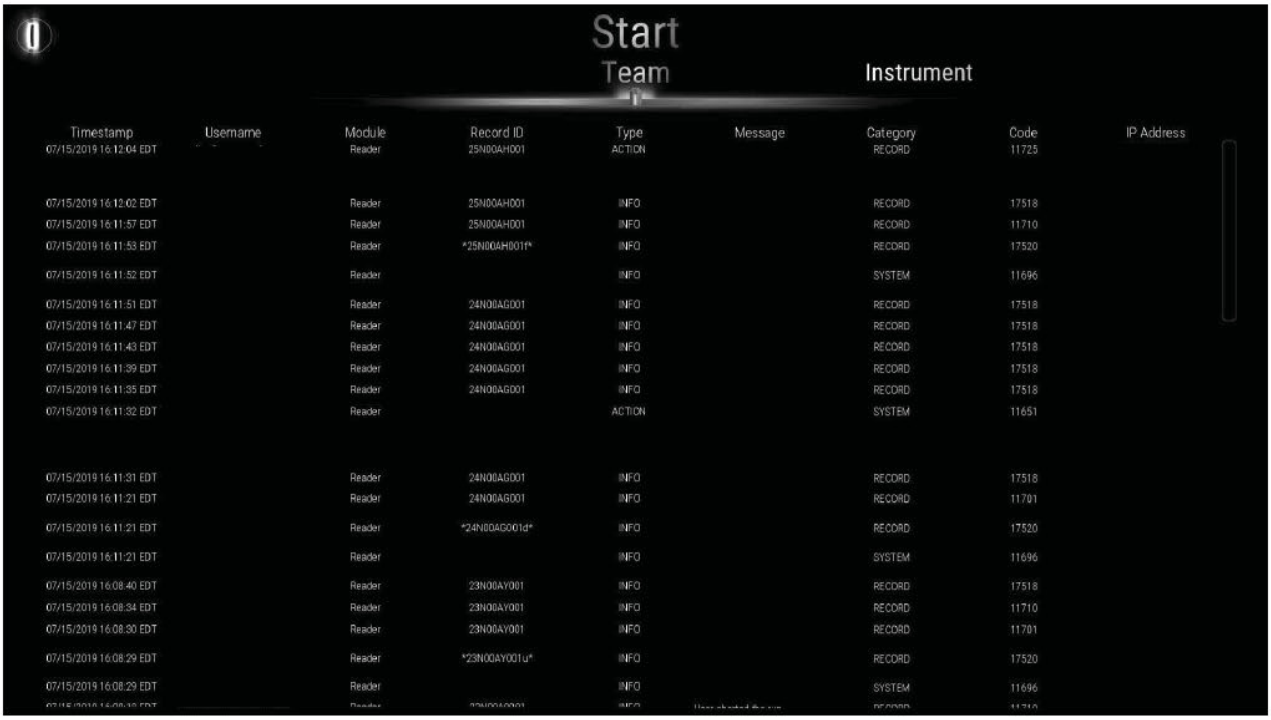


FIG. 58EE

FIG. 58FF

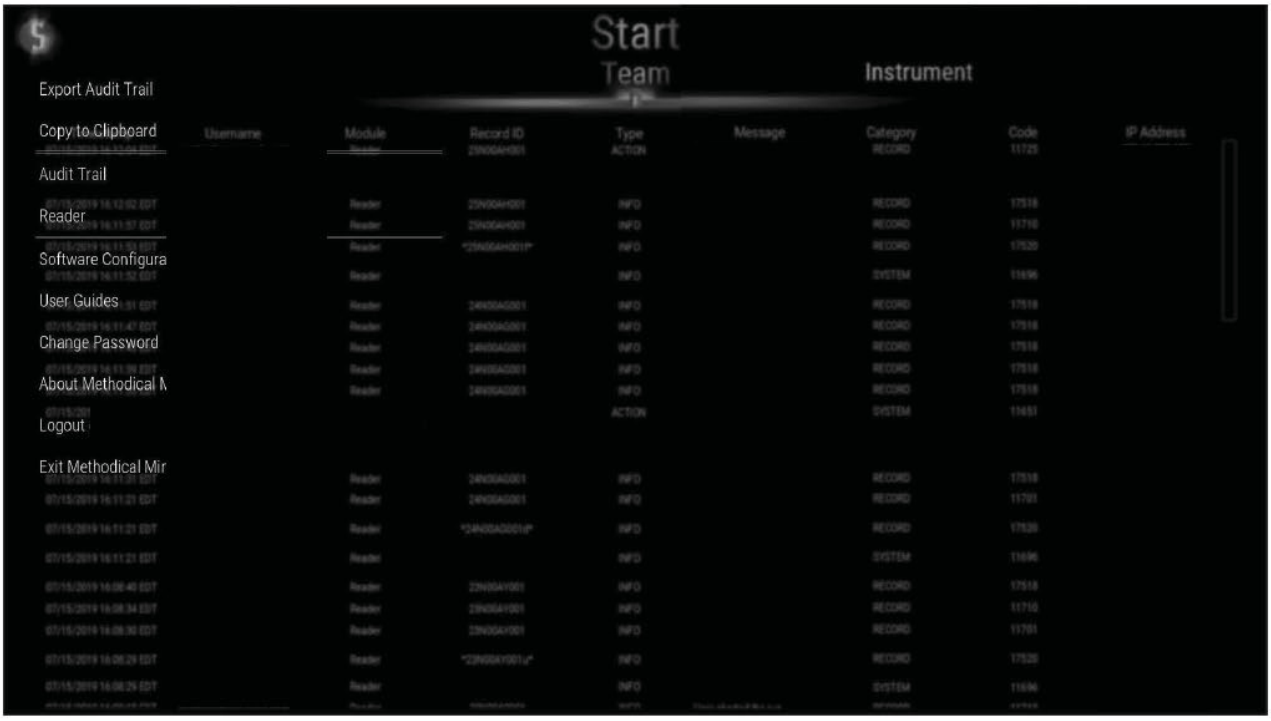




FIG. 58GG

FIG. 58HH

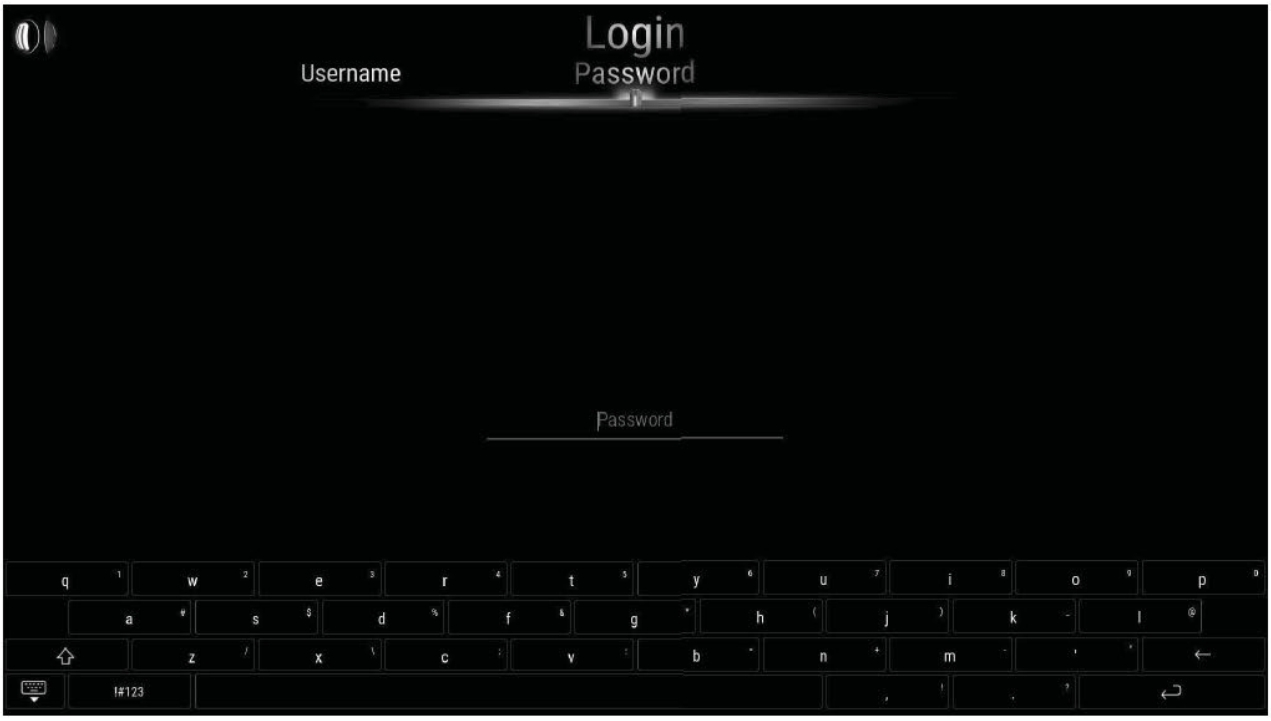




FIG. 59A

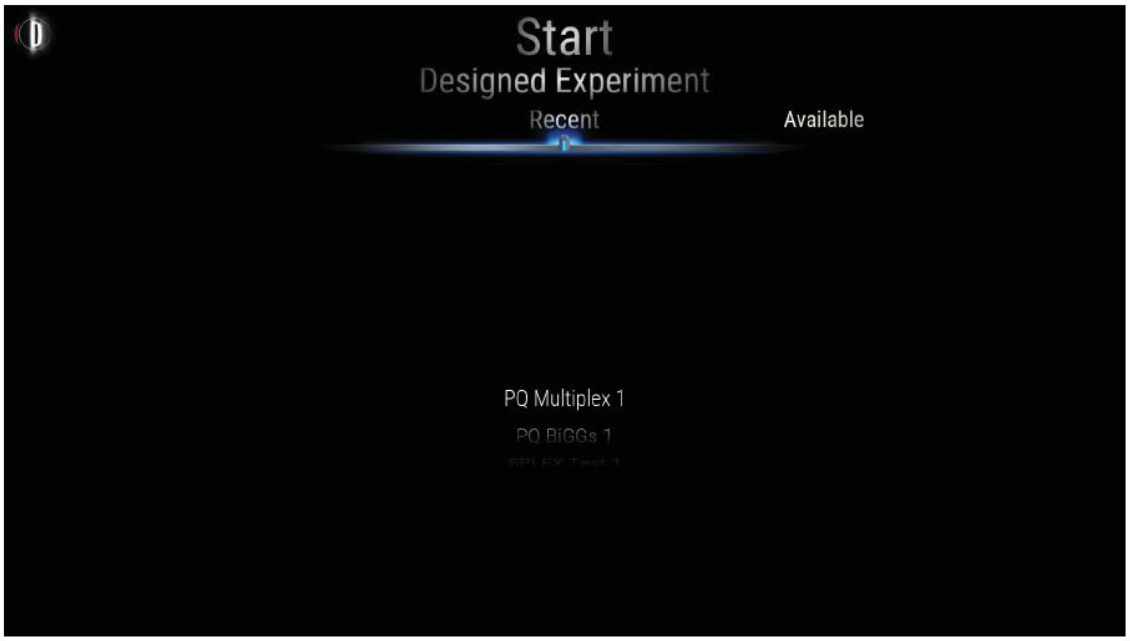


FIG. 59B

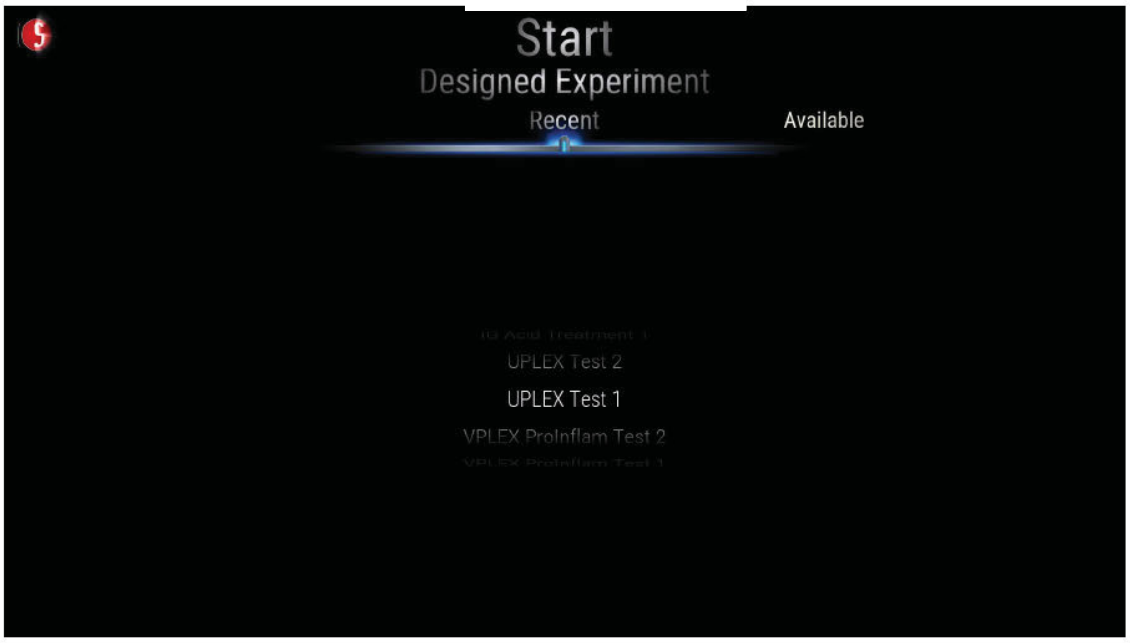


FIG. 59C

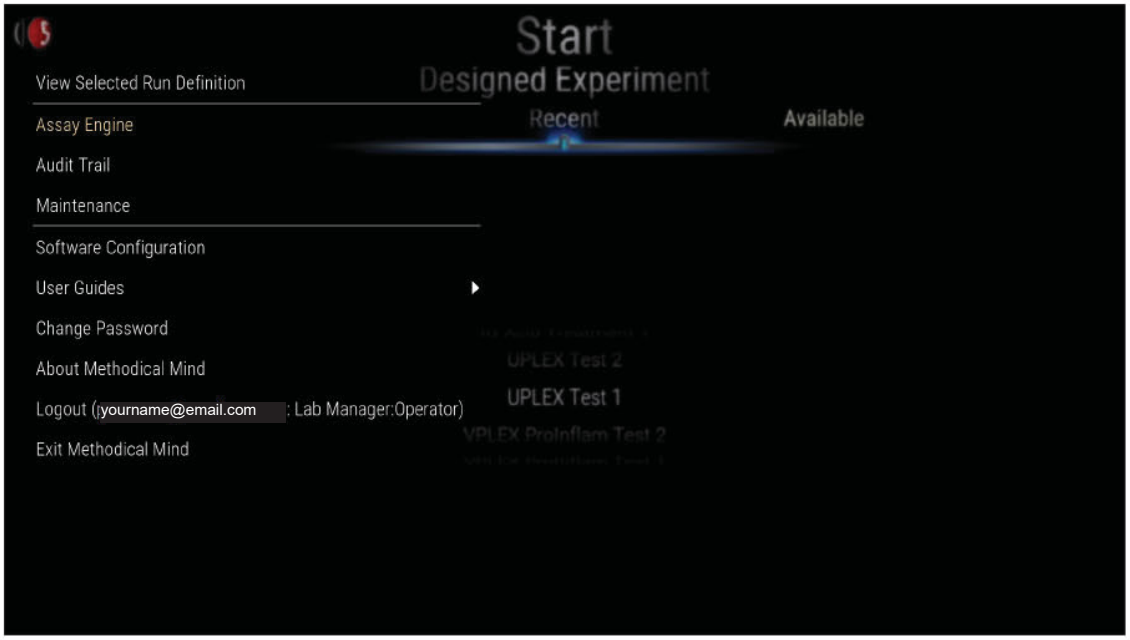
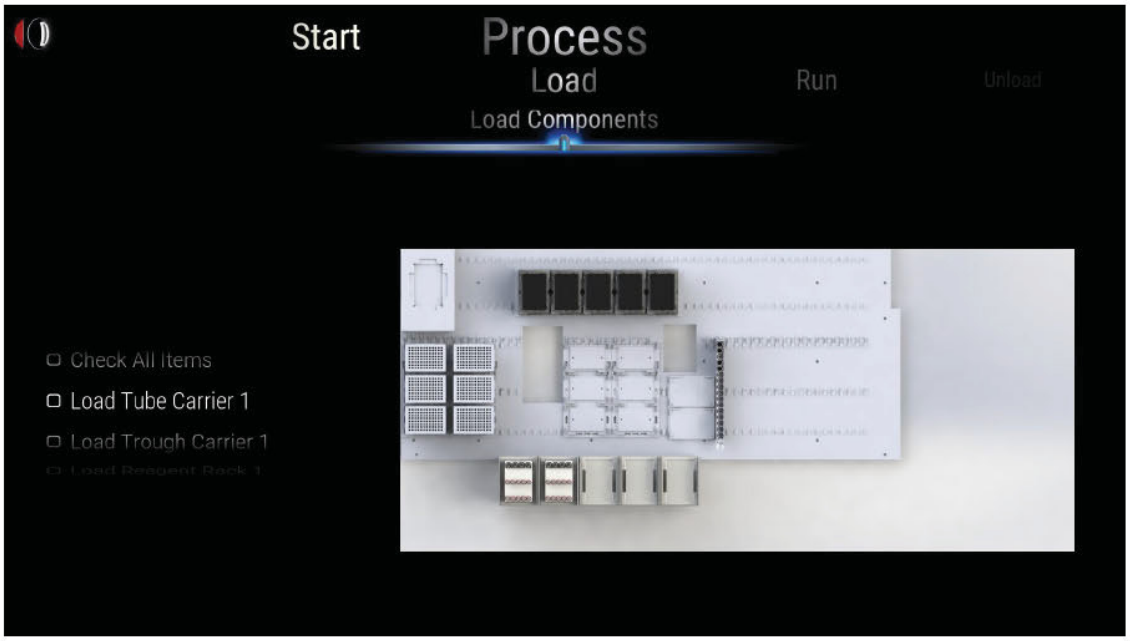


FIG. 59D

FIG. 59E



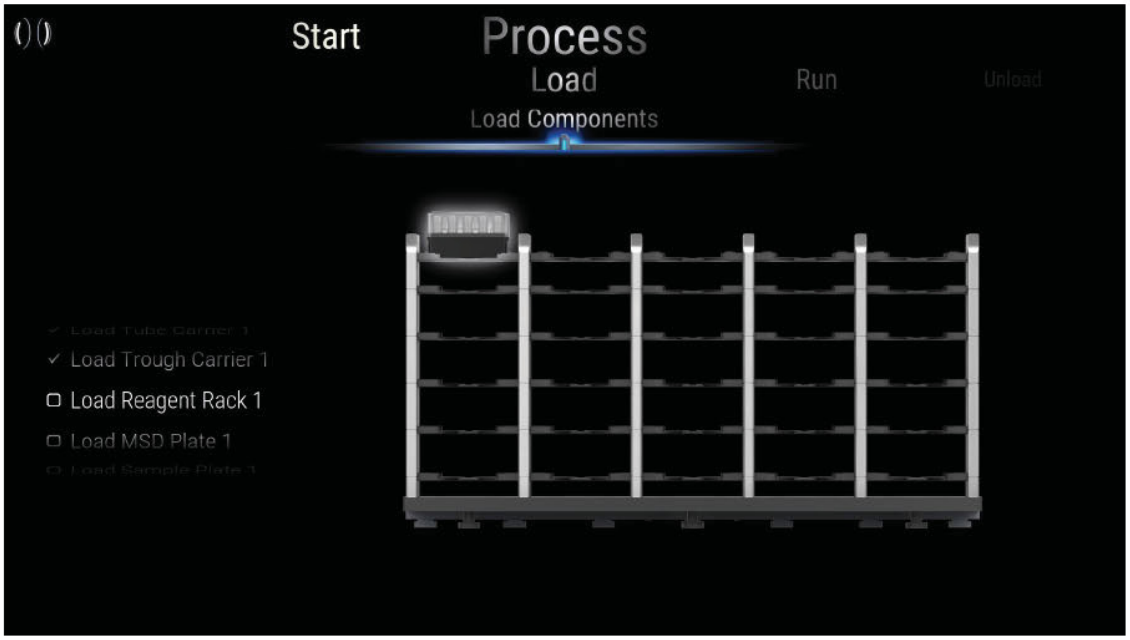
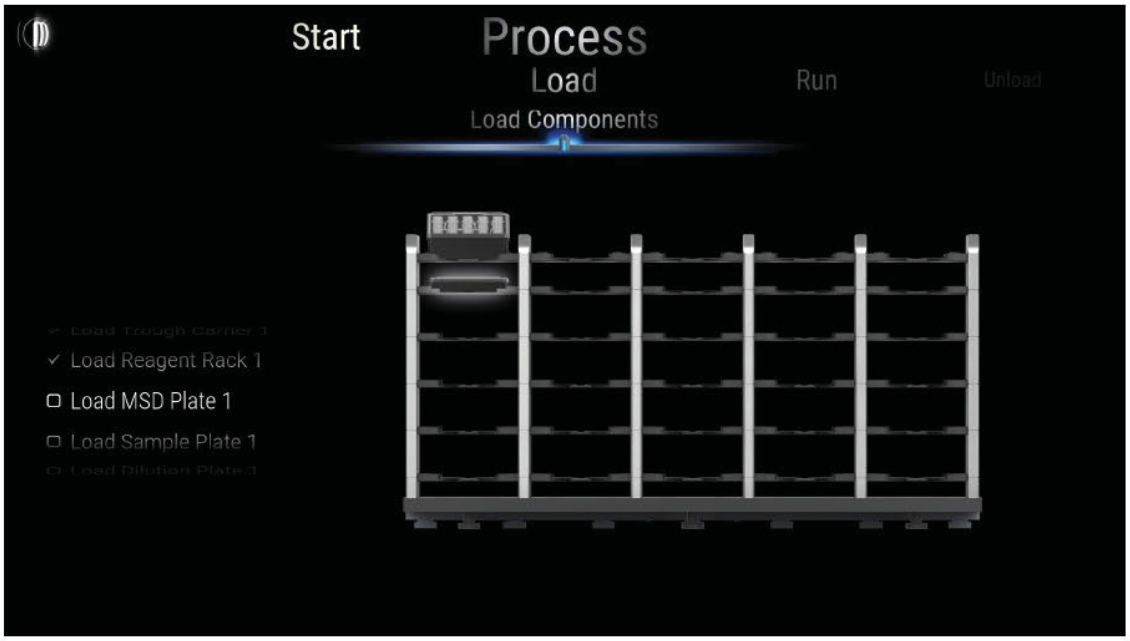


FIG. 59F

FIG. 59G



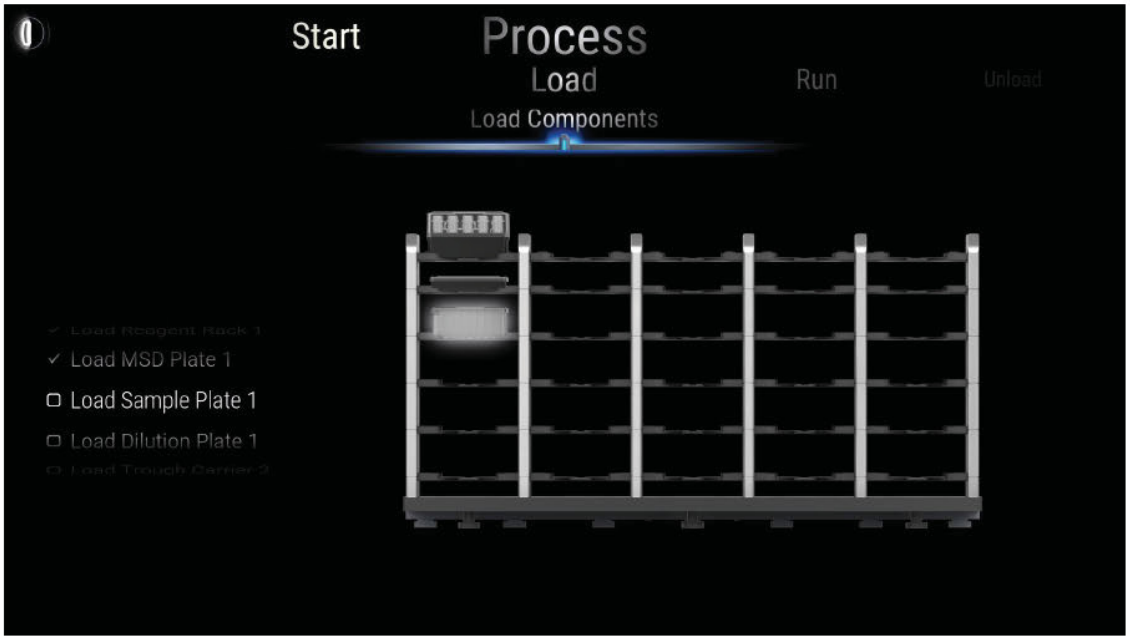
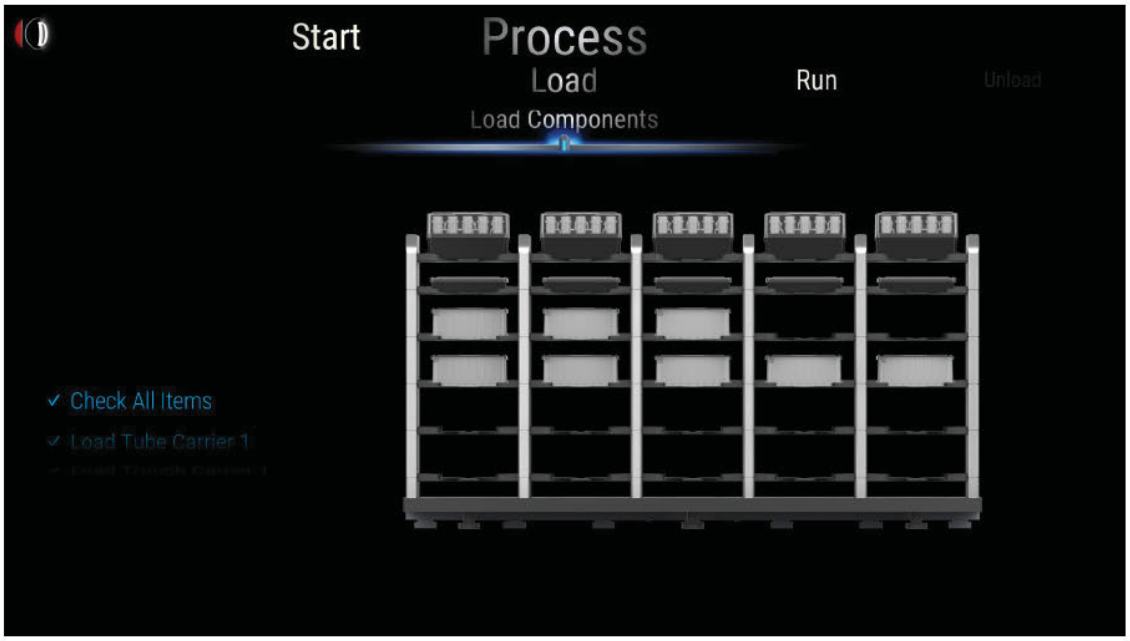


FIG. 59H

FIG. 59I



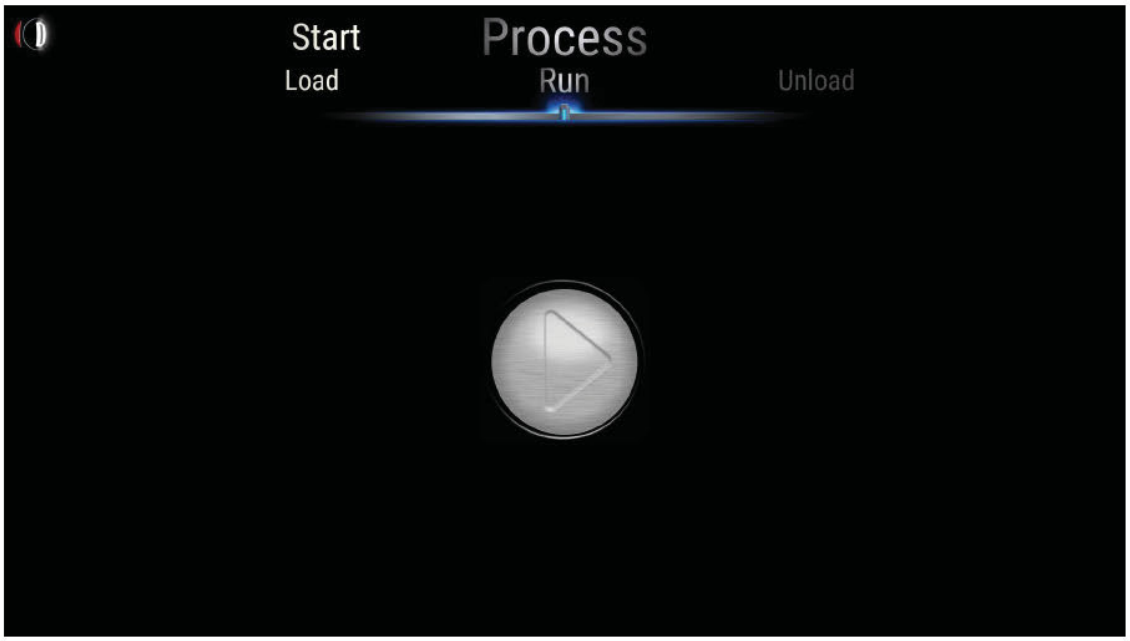
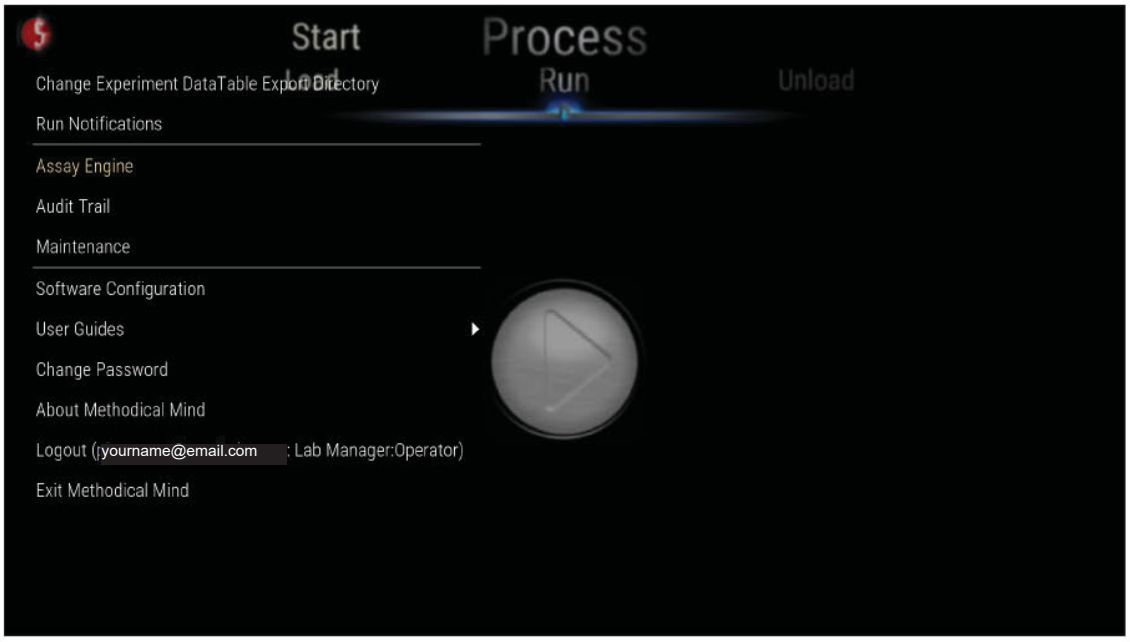


FIG. 59J

FIG. 59K



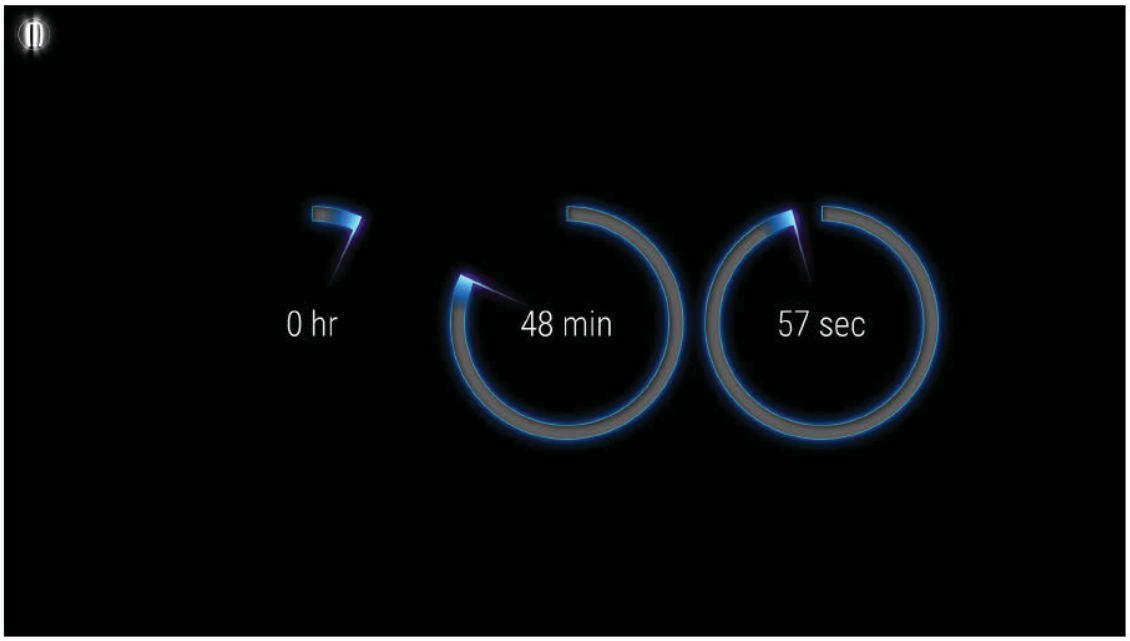


FIG. 59L

FIG. 59M



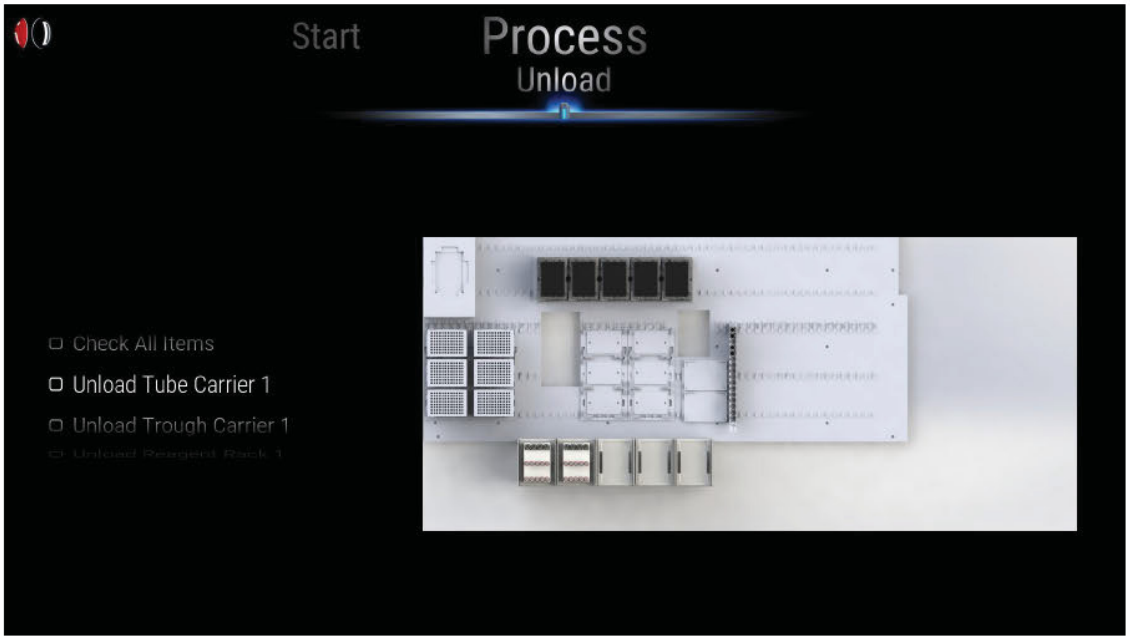
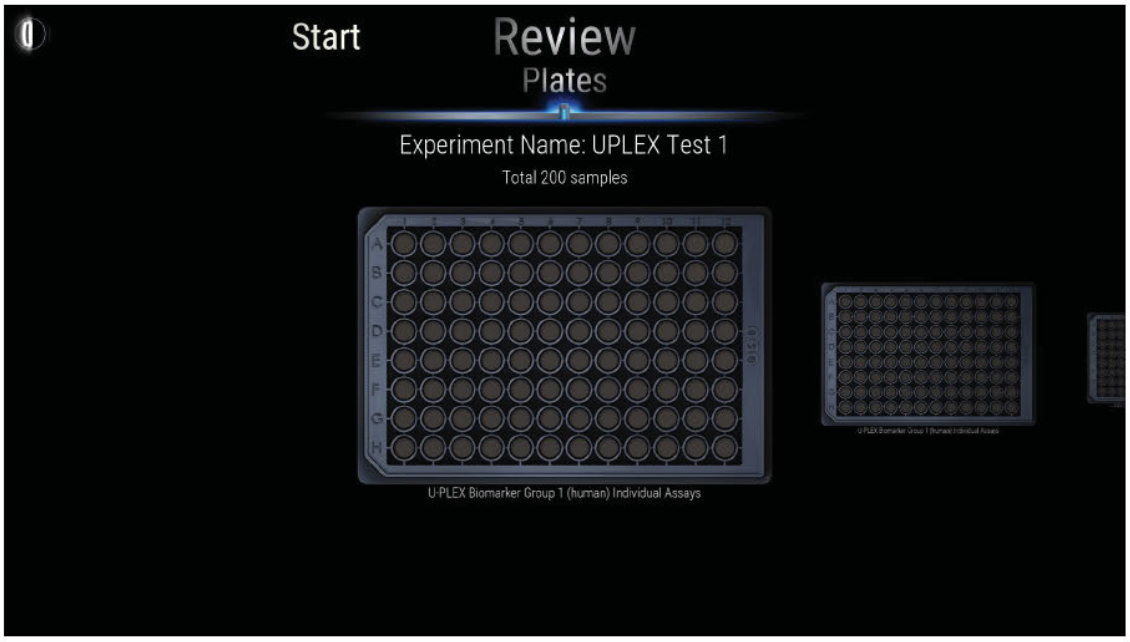


FIG. 59N

FIG. 59O



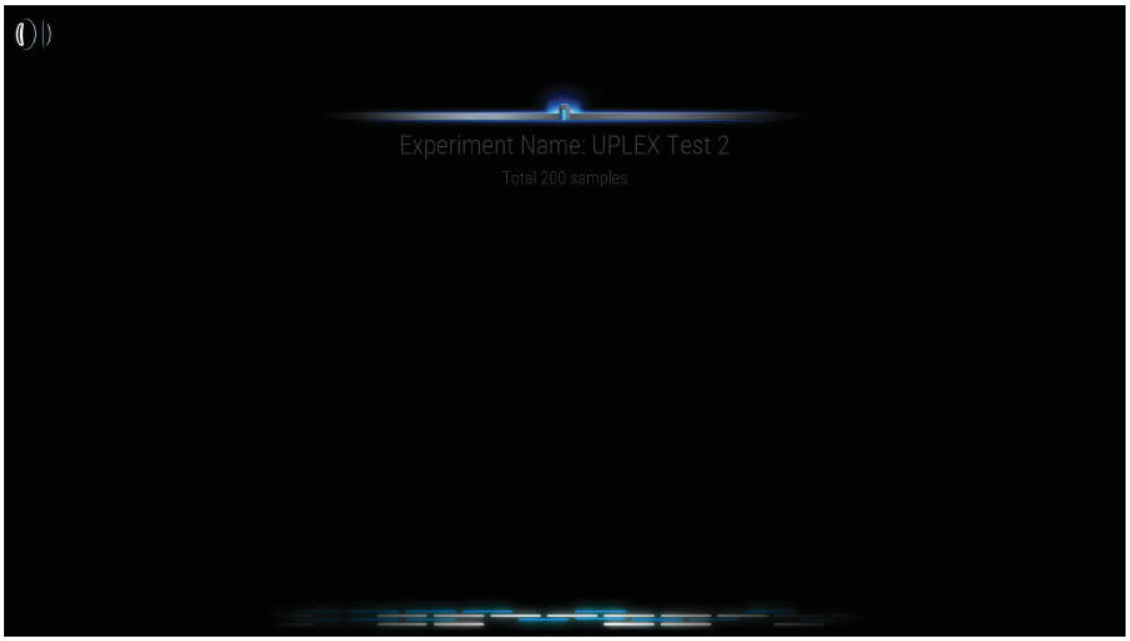
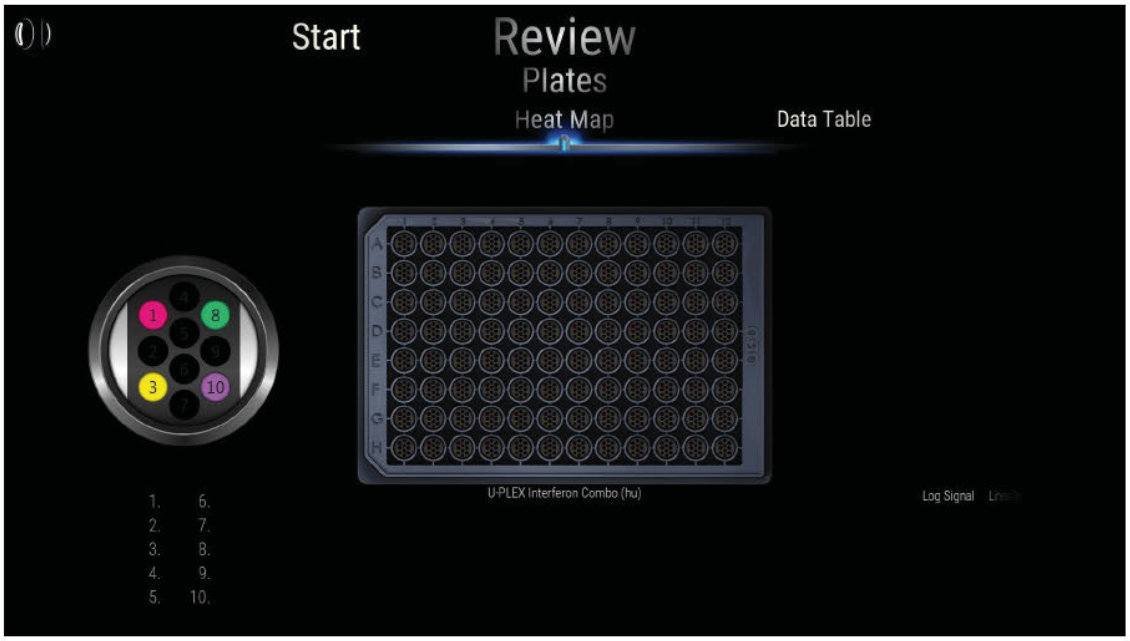


FIG. 59P

FIG. 59Q



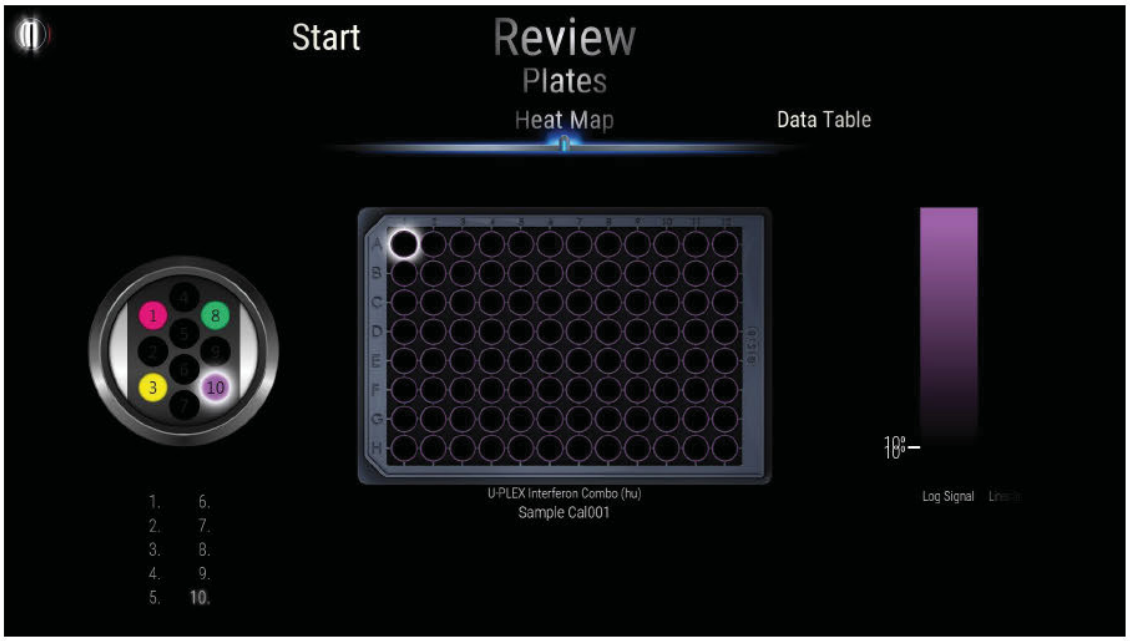
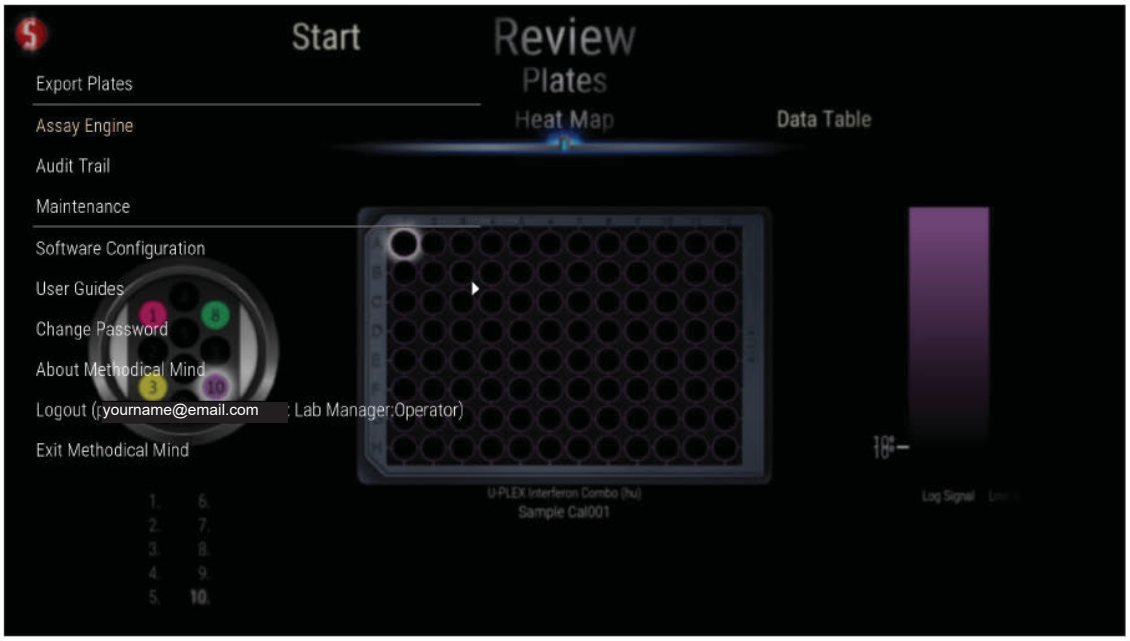


FIG. 59R

FIG. 59S



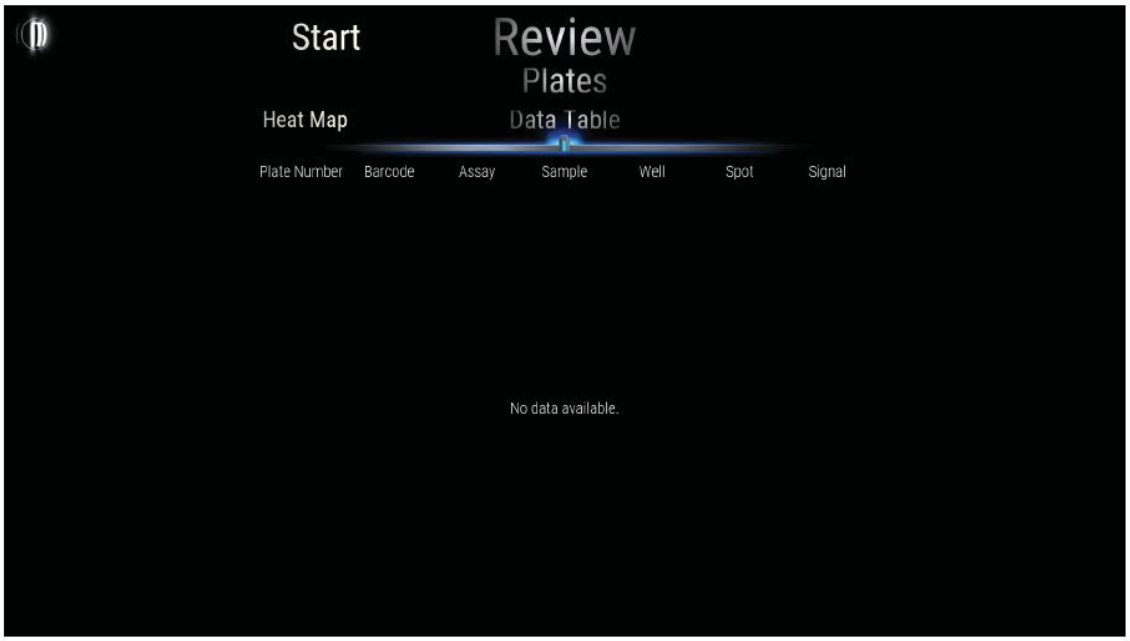


FIG. 59T



FIG. 60A

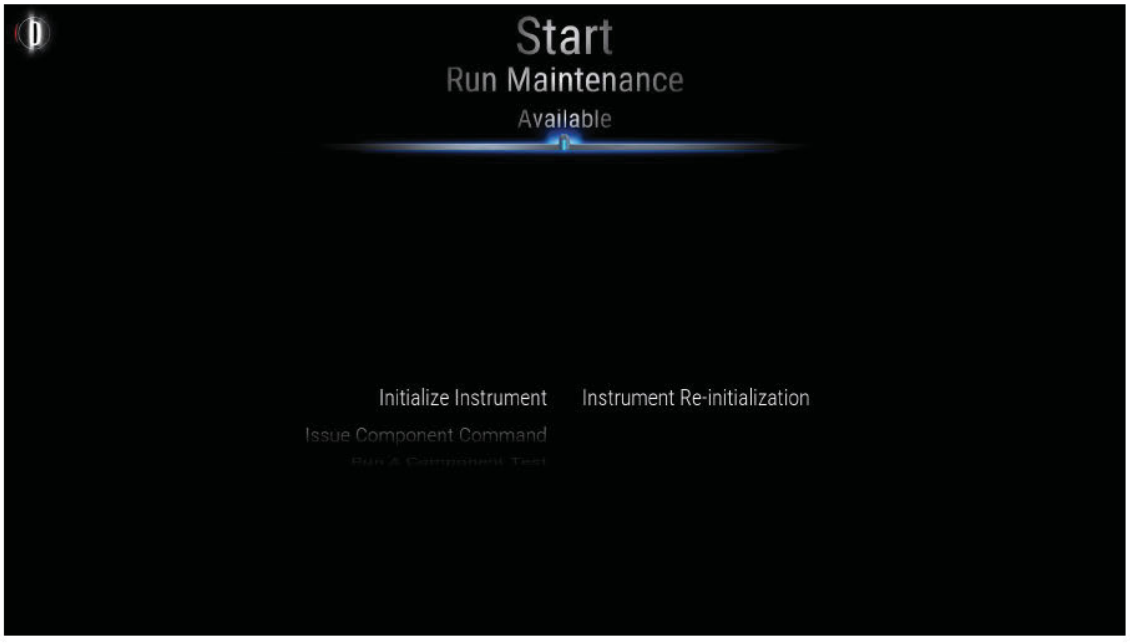
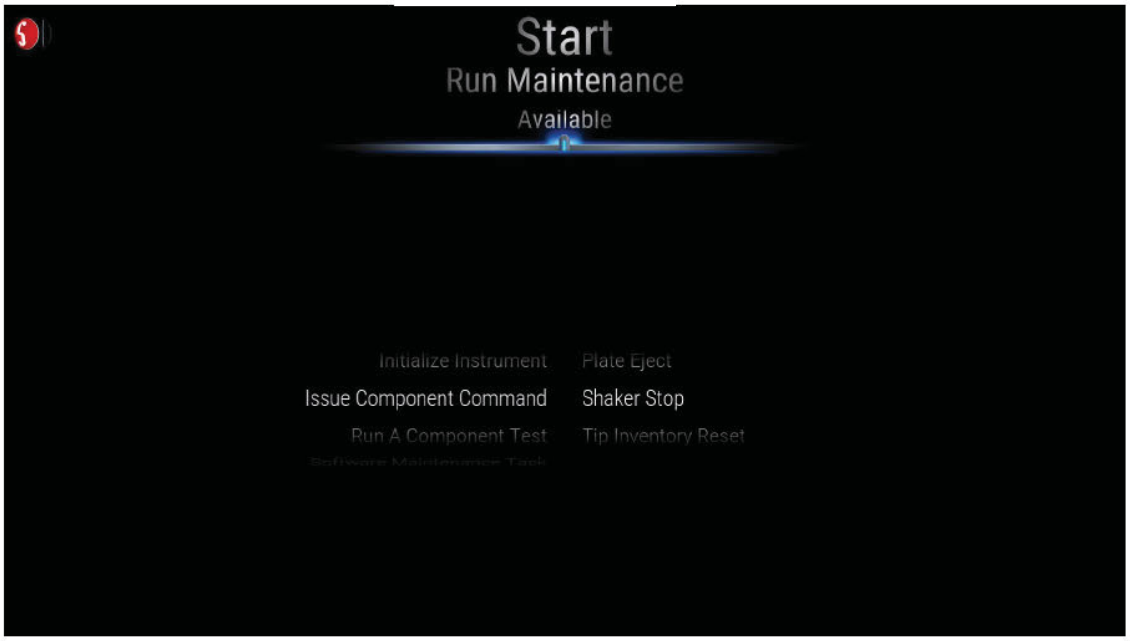


FIG. 60B

FIG. 60C



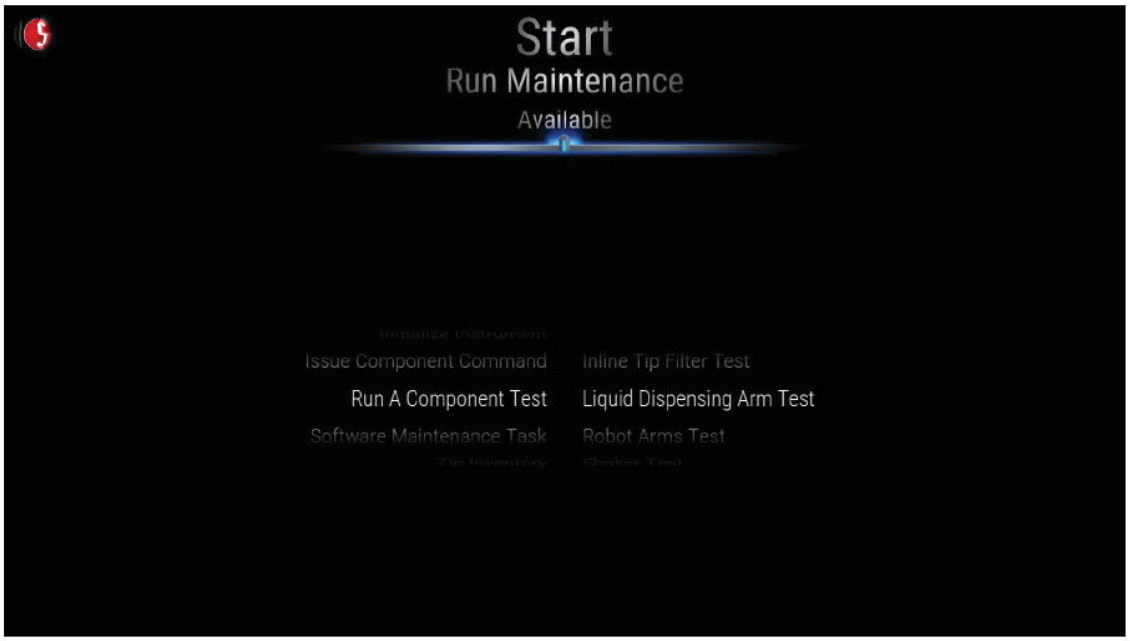


FIG. 60D

FIG. 60E

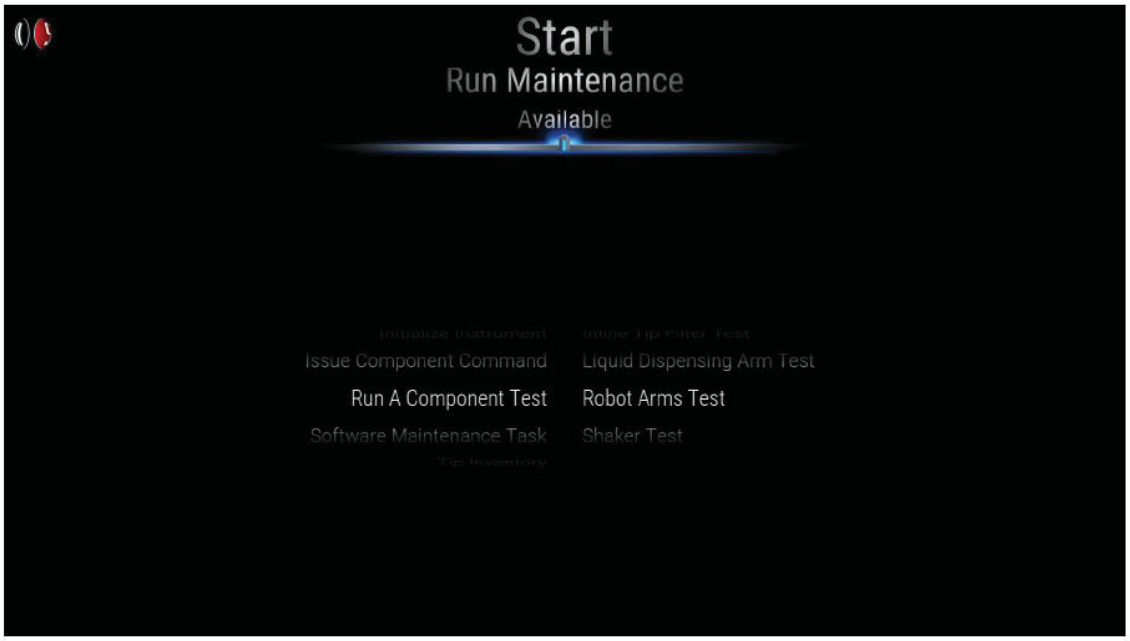
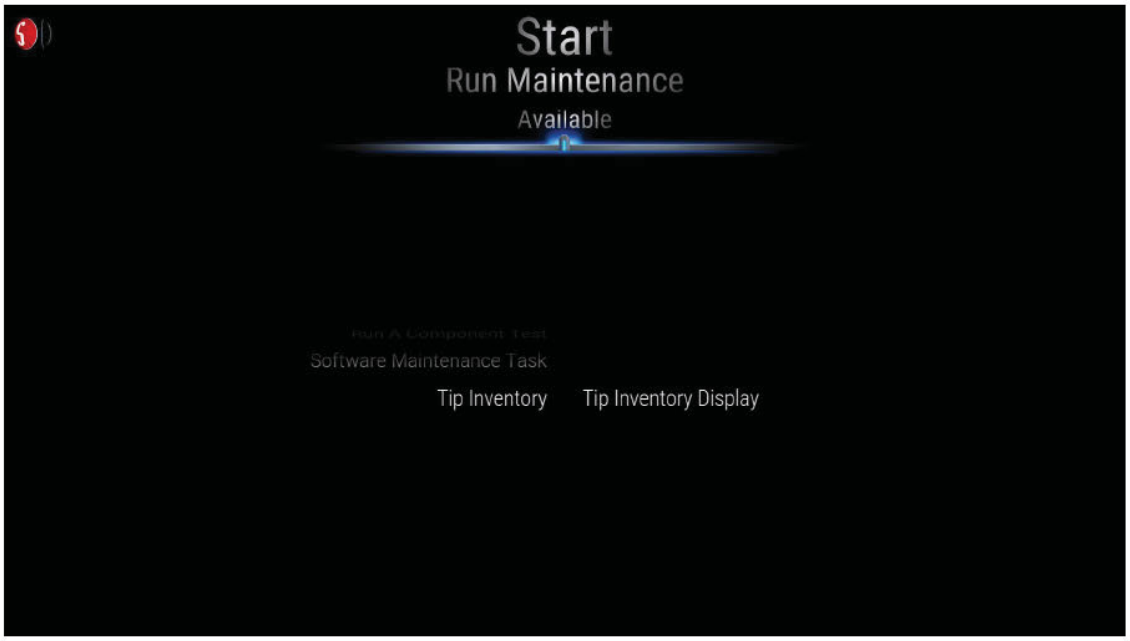




FIG. 60F

FIG. 60G



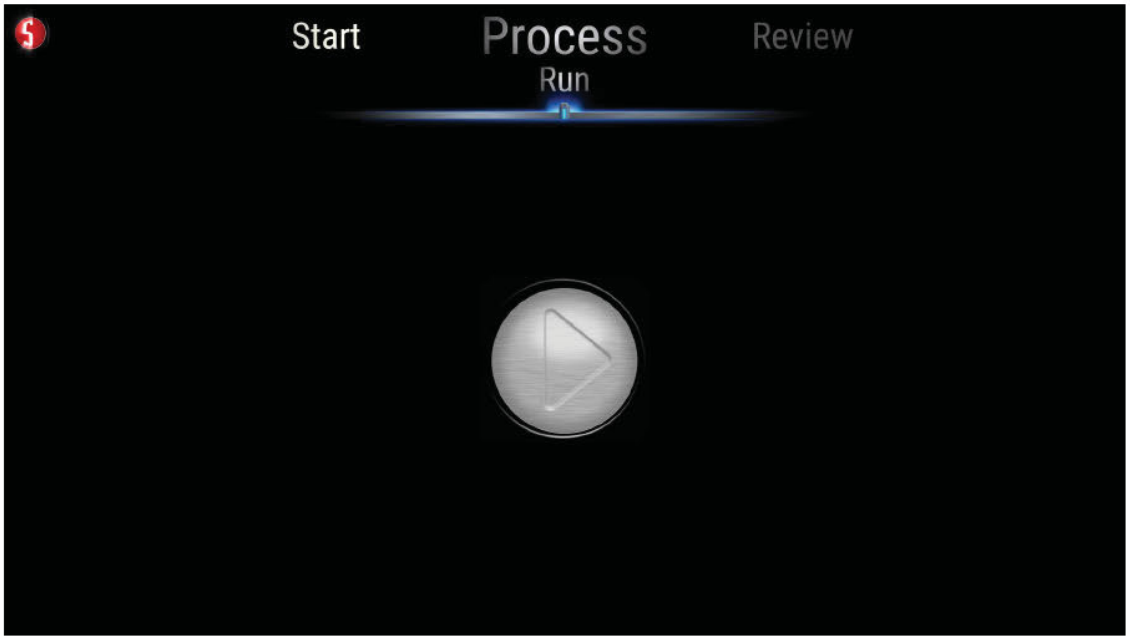


FIG. 60H

FIG. 60I

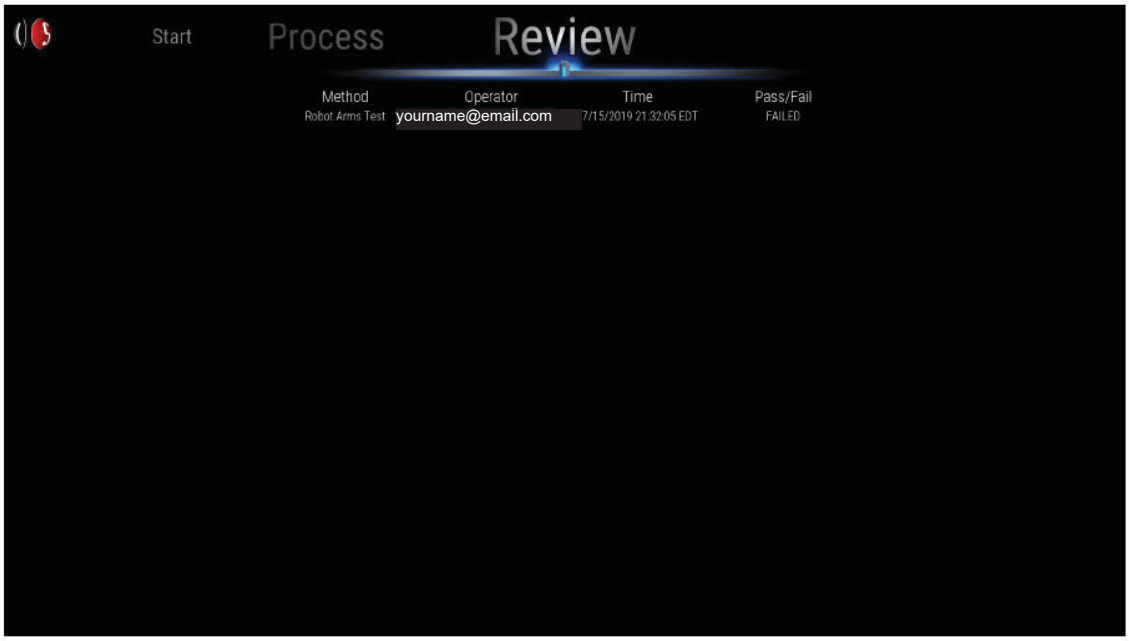

Start
Process
Review
Method
Operator
Time
Pass/Fail
Robot Arms Test
yourname@email.com
7/15/2019 21:32:05 EDT
FAILED



FIG. 61A



FIG. 61B

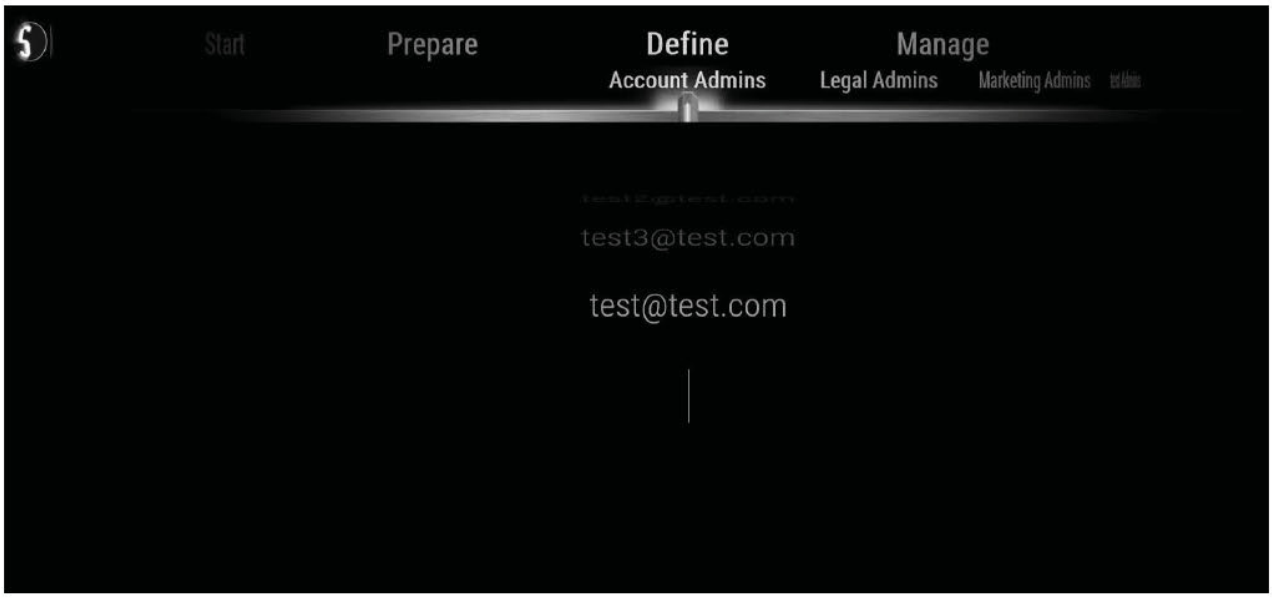


FIG. 61C



FIG. 61D



FIG. 61E



FIG. 61F



FIG. 61G



FIG. 61H

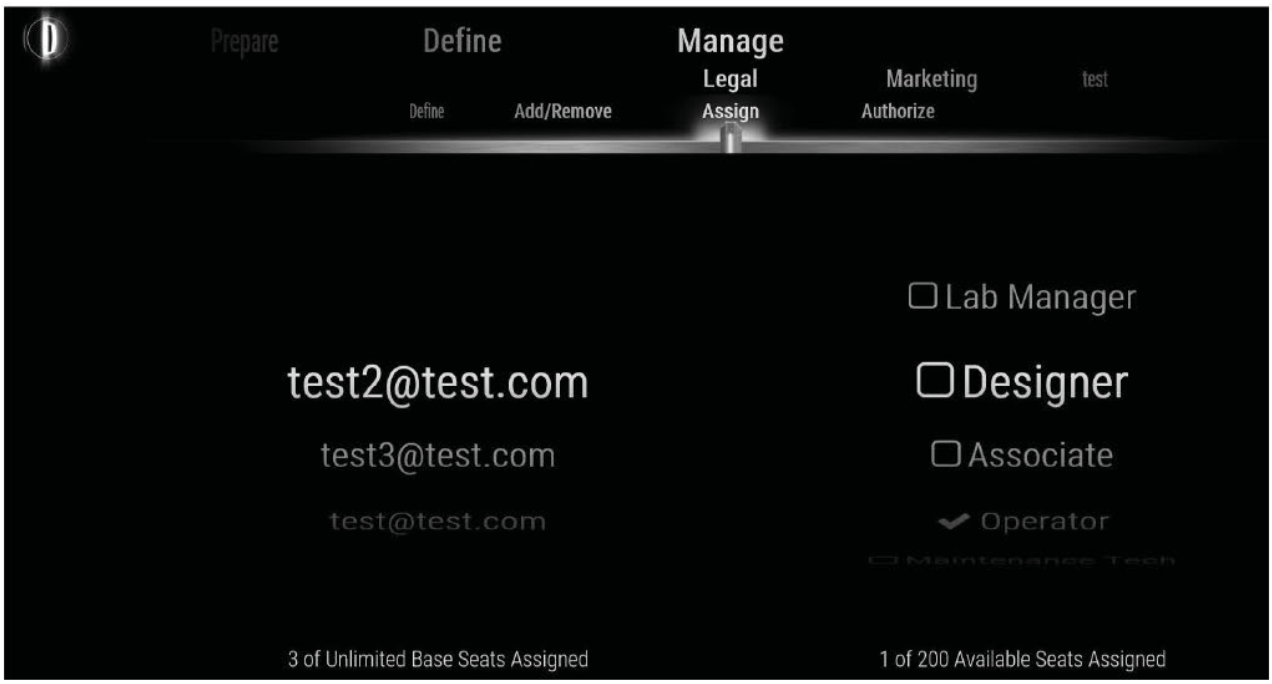


FIG. 61I

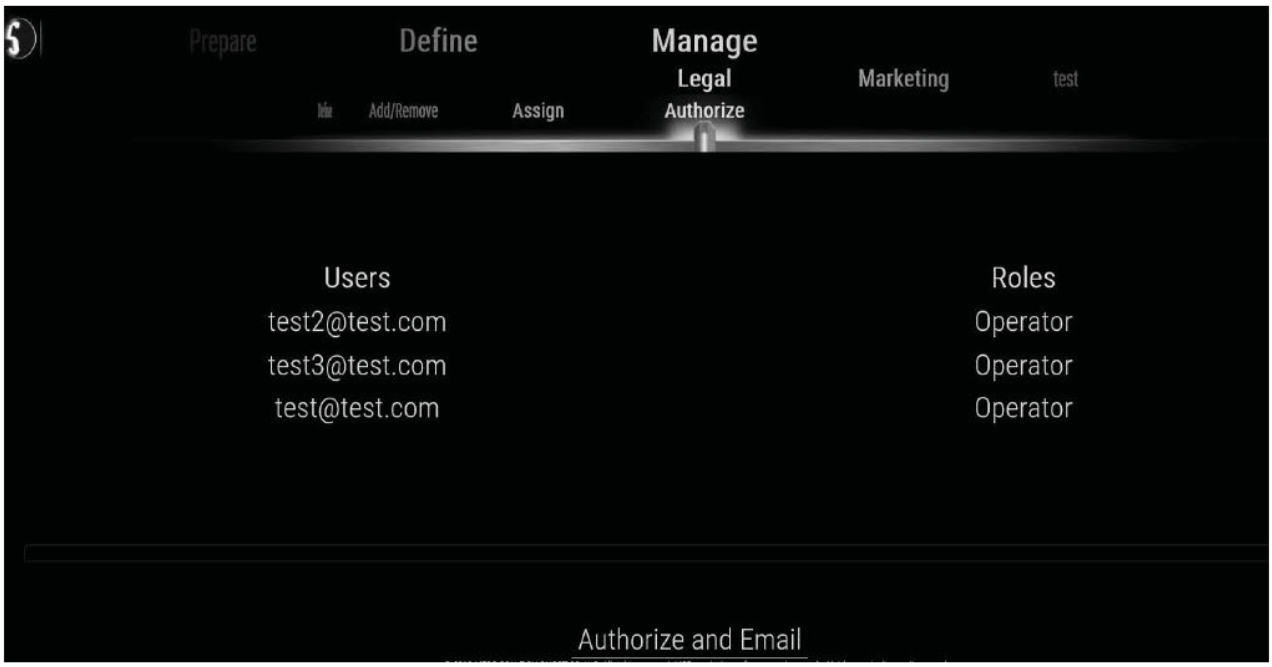


FIG. 61J

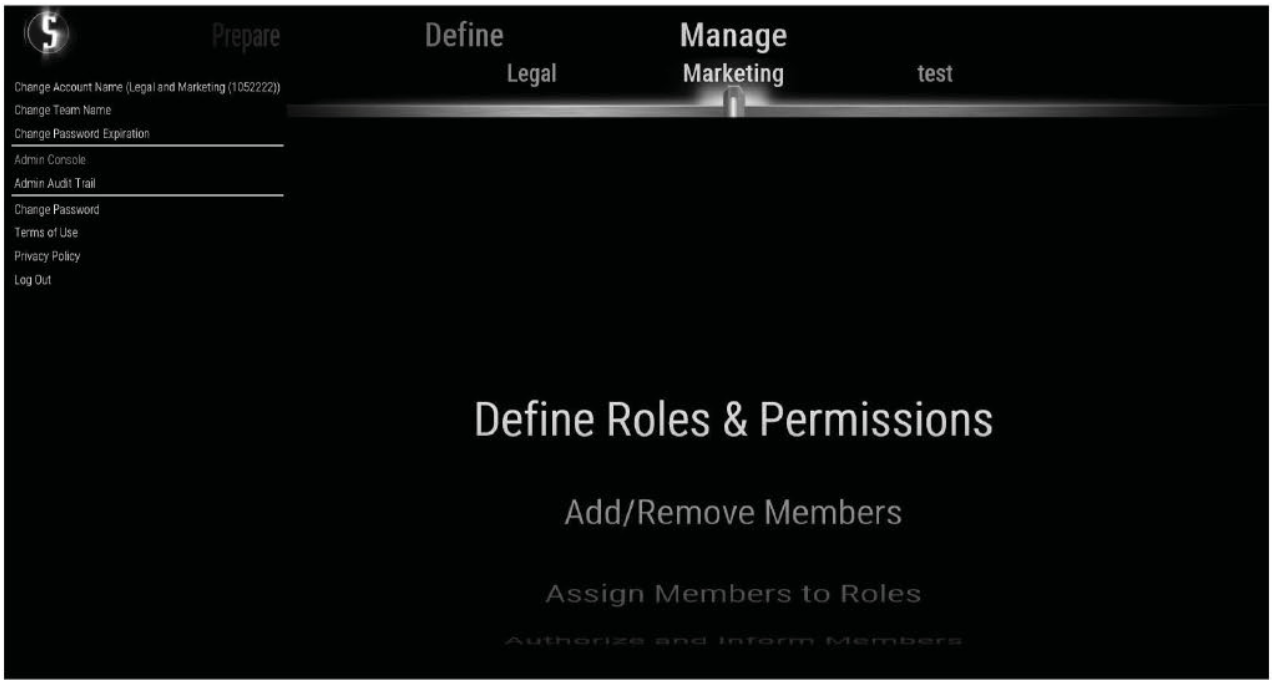


FIG. 61K

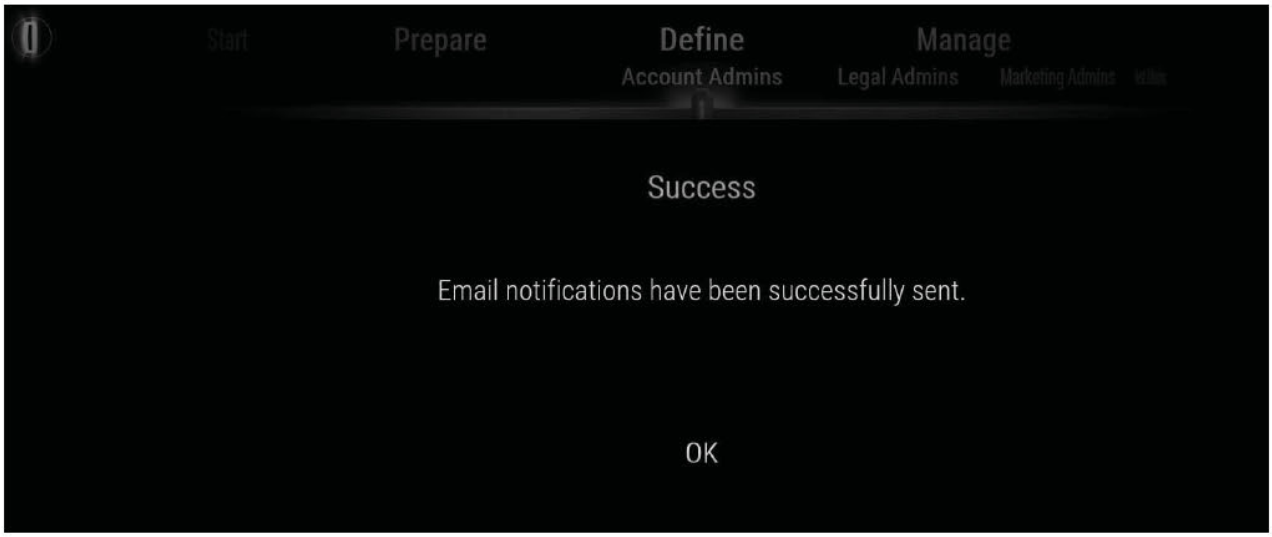


FIG. 61L



FIG. 61M

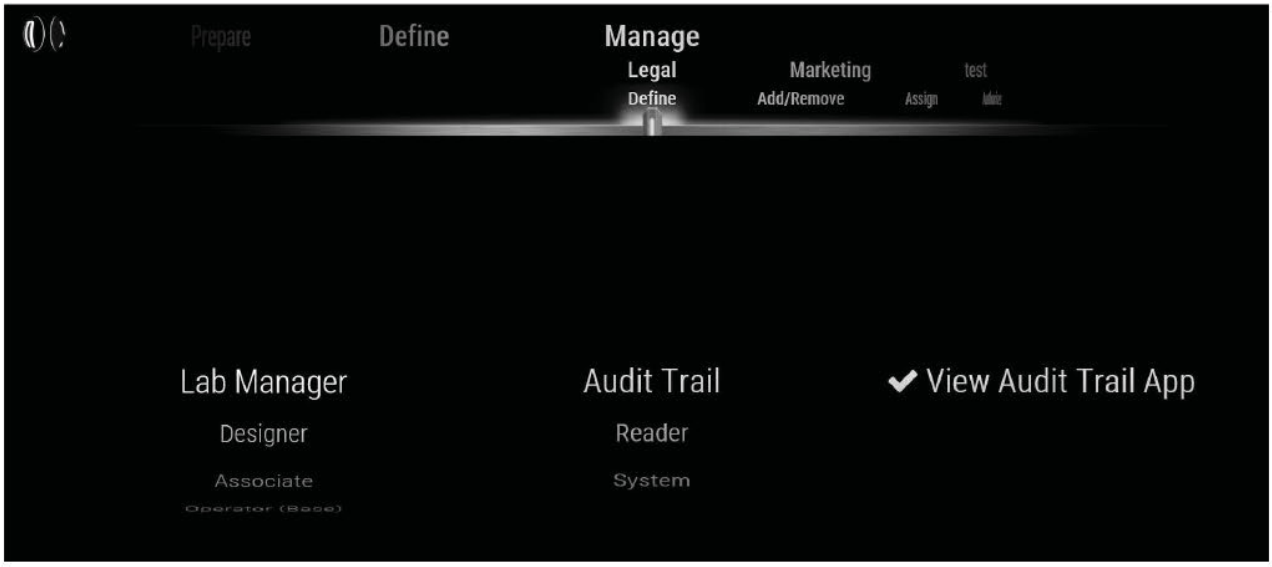


FIG. 61N

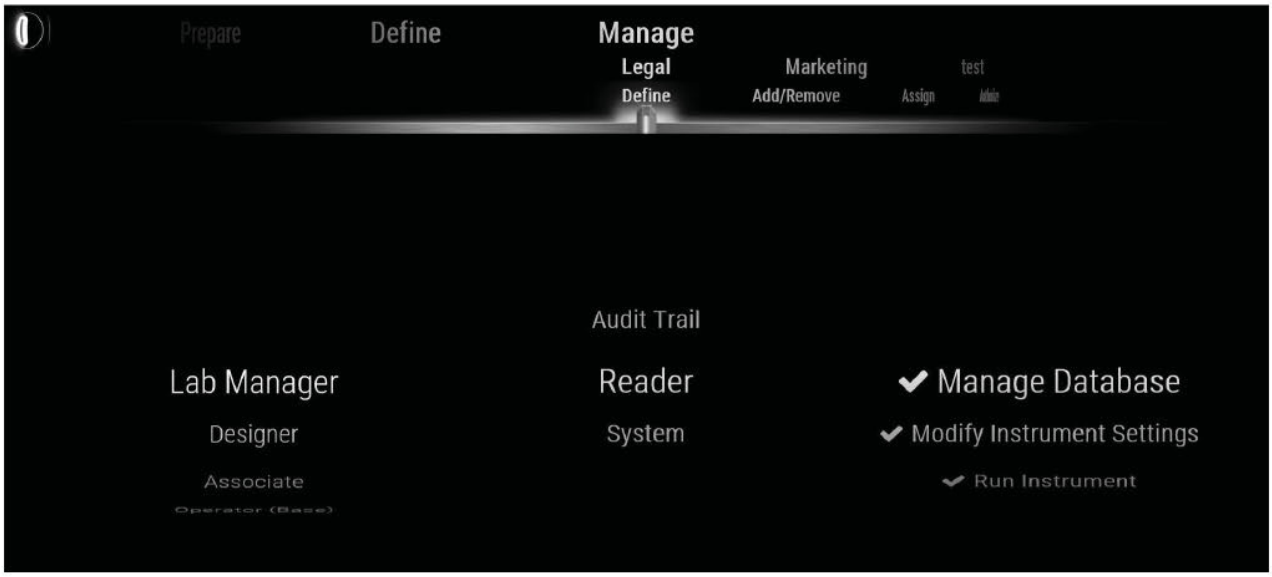


FIG. 61O

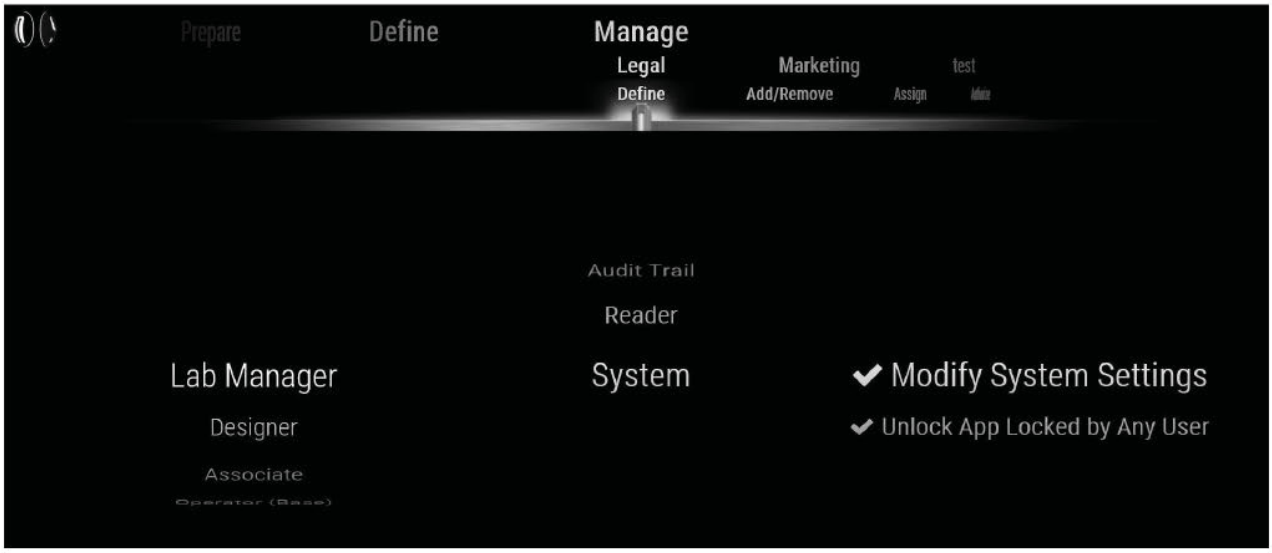


FIG. 61P

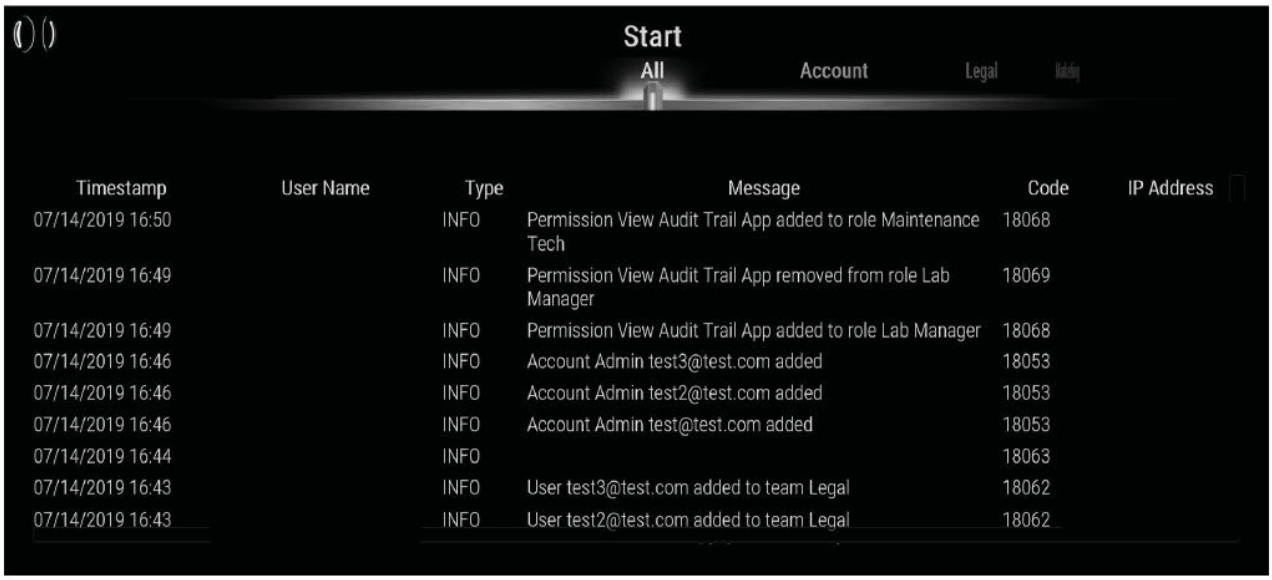

Start
All
Account
Legal
Timestamp
User Name
Type
Message
Code
IP Address
07/14/2019 16:50
INFO
Permission View Audit Trail App added to role Maintenance Tech
18068
07/14/2019 16:49
INFO
Permission View Audit Trail App removed from role Lab Manager
18069
07/14/2019 16:49
INFO
Permission View Audit Trail App added to role Lab Manager
18068
07/14/2019 16:46
INFO
Account Admin test3@test.com added
18053
07/14/2019 16:46
INFO
Account Admin test2@test.com added
18053
07/14/2019 16:46
INFO
Account Admin test@test.com added
18053
07/14/2019 16:44
INFO
18063
07/14/2019 16:43
INFO
User test3@test.com added to team Legal
18062
07/14/2019 16:43
INFO
User test2@test.com added to team Legal
18062

FIG. 61Q

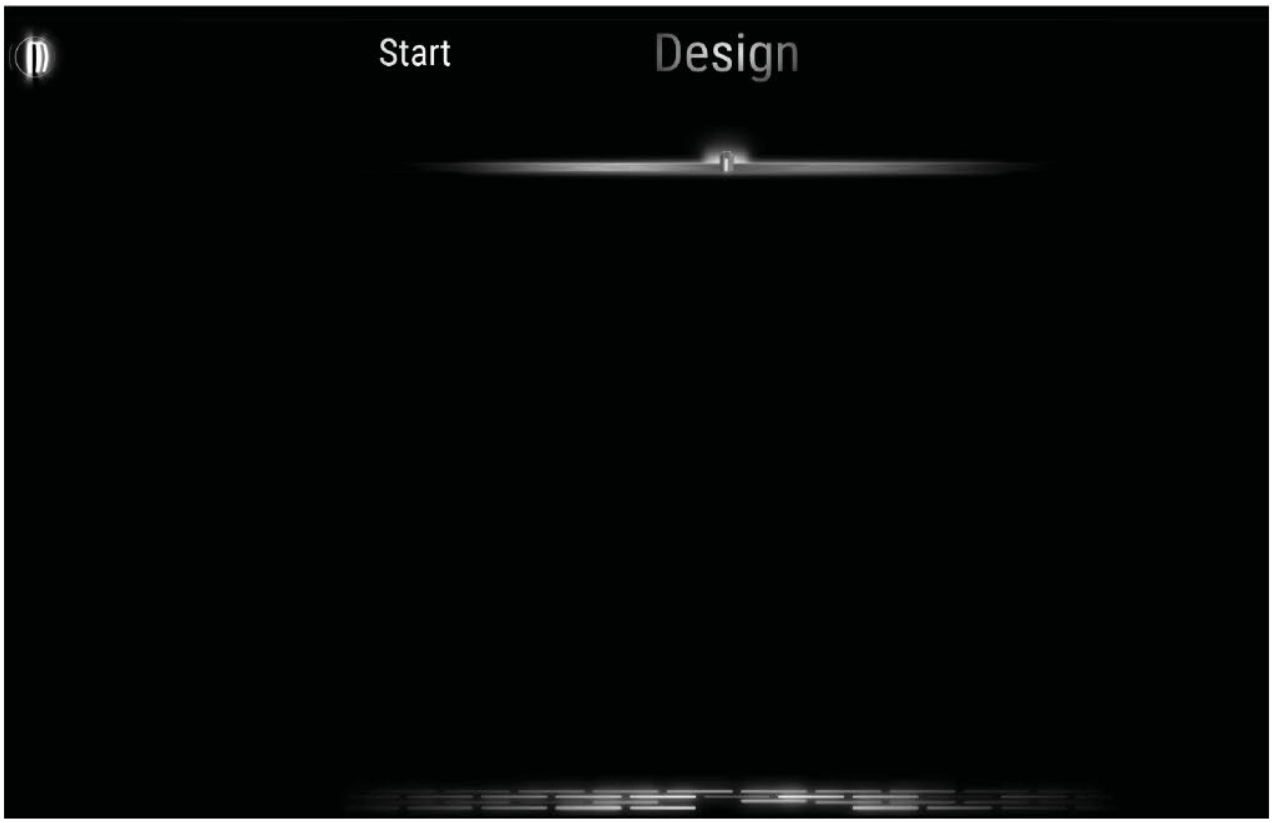


FIG. 62A

FIG. 62B



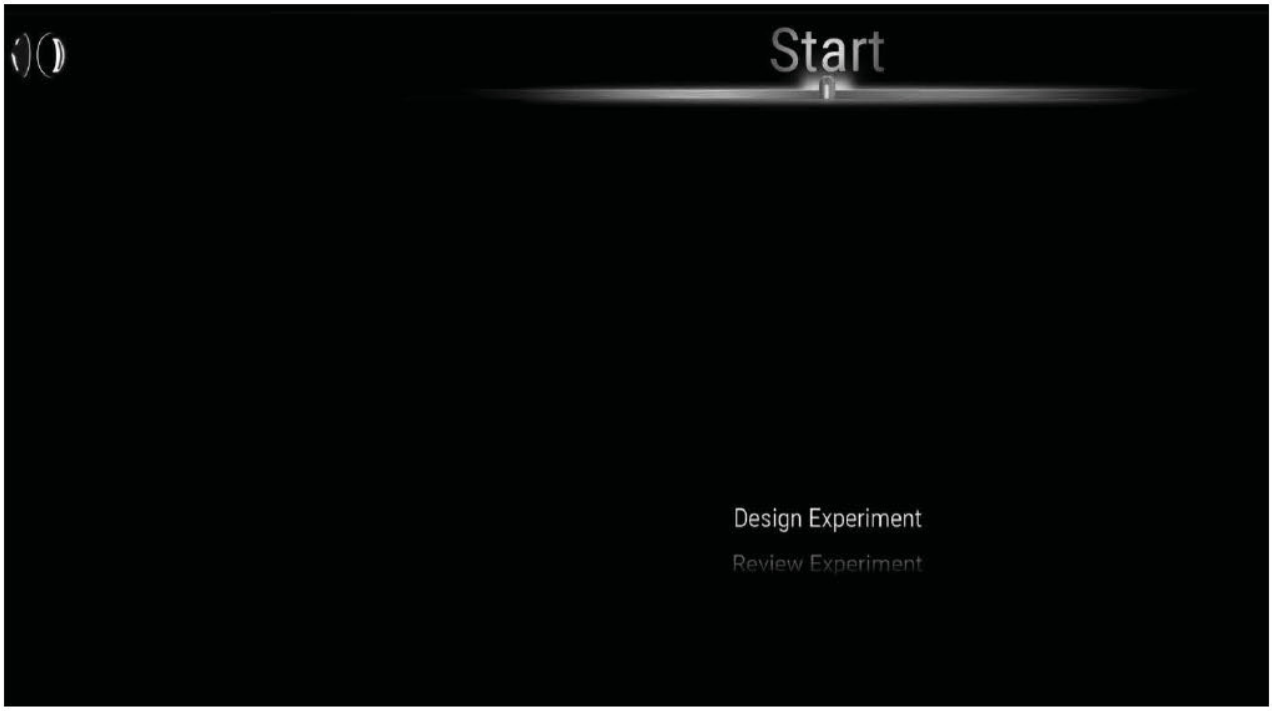
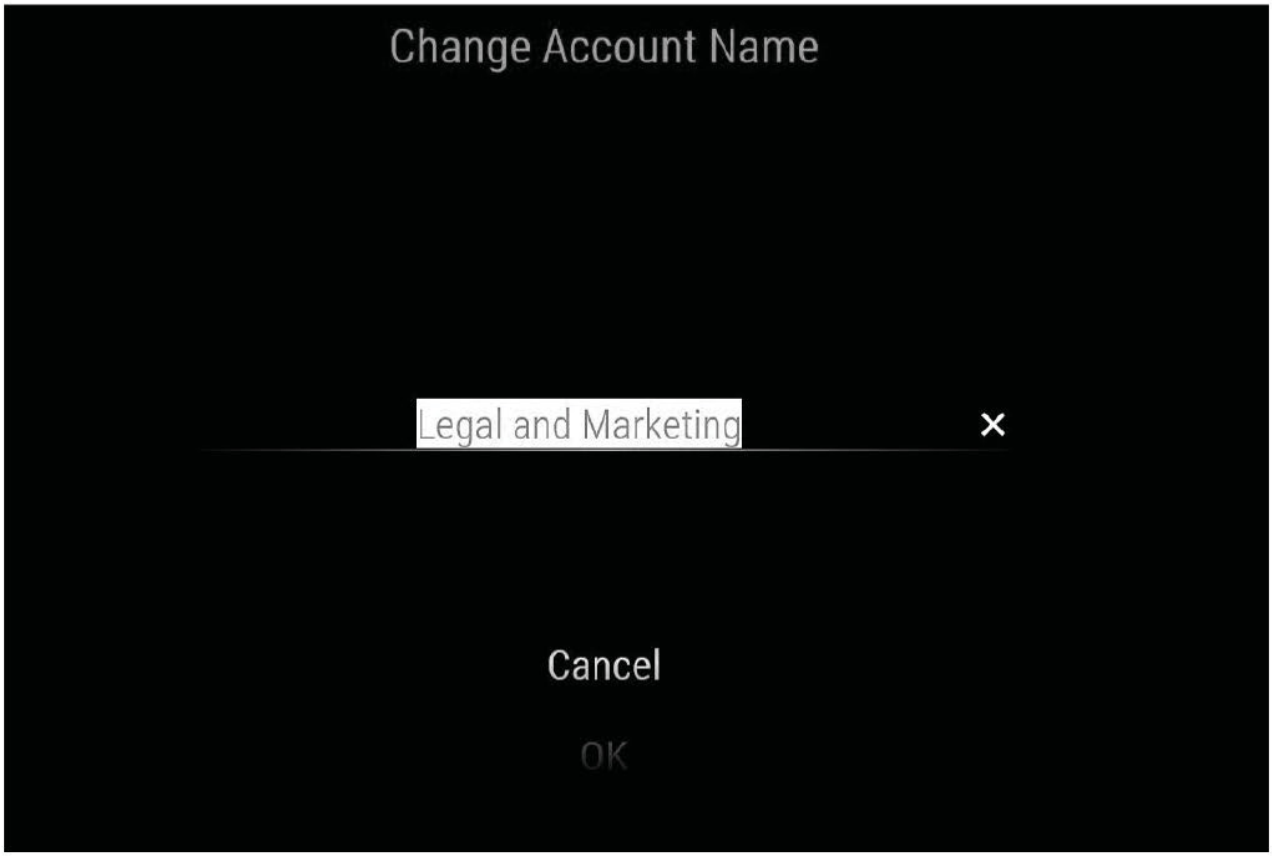


FIG. 62C

FIG. 62D



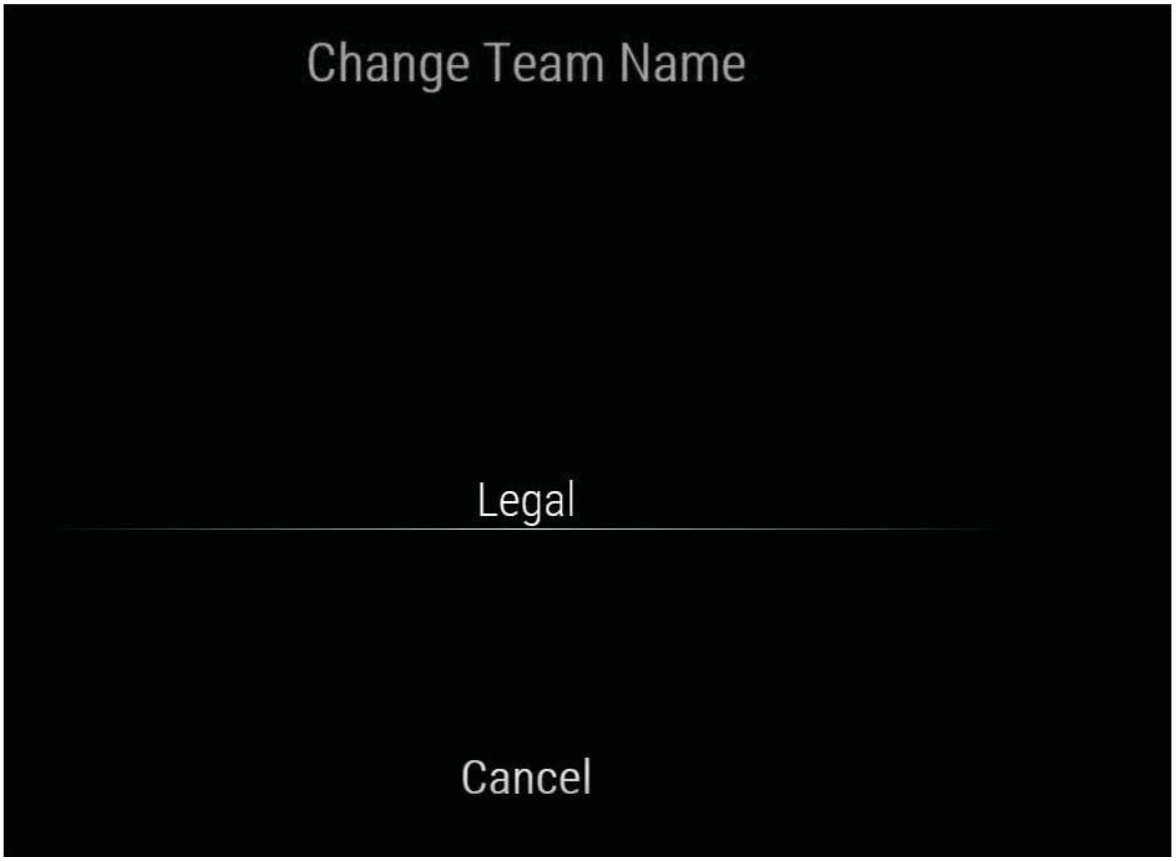


FIG. 62E

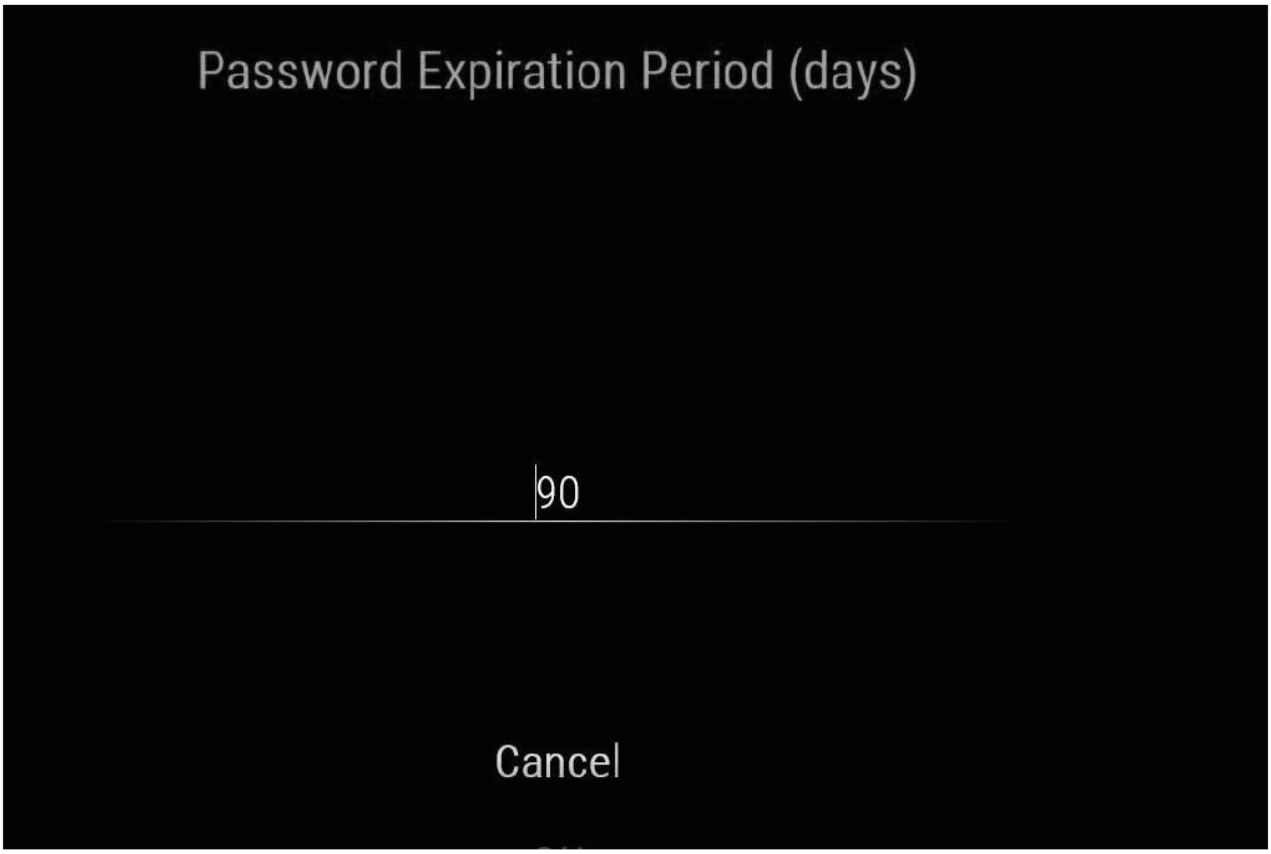


FIG. 62F

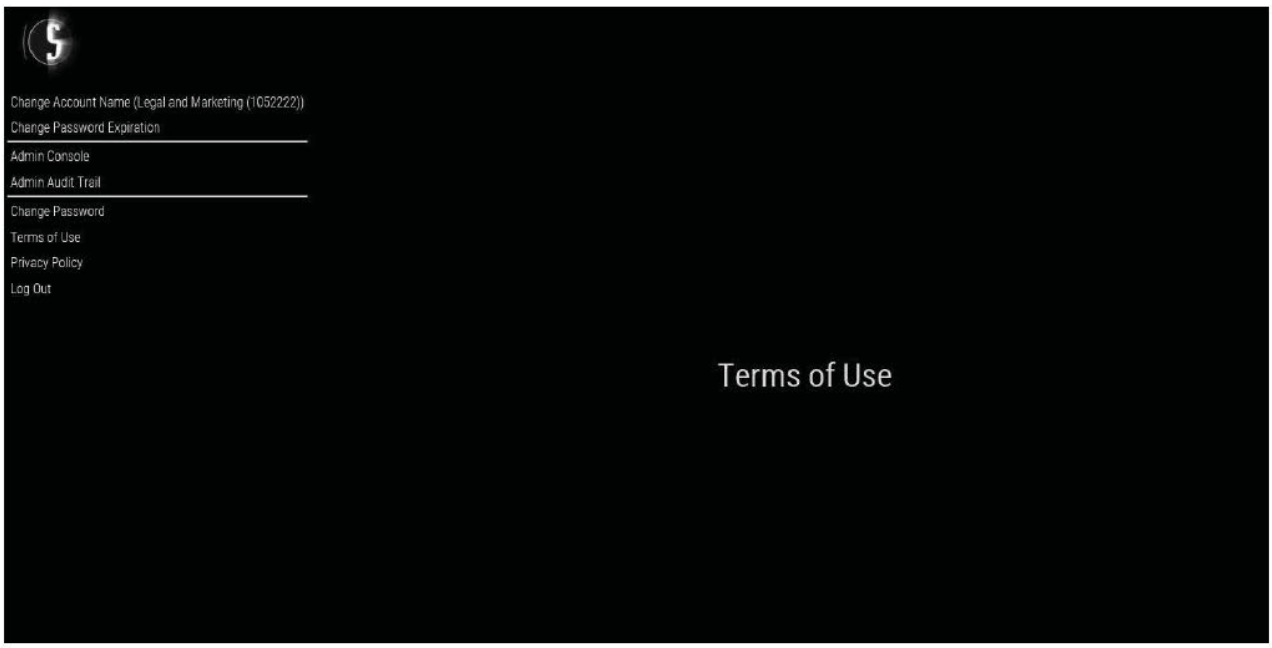


FIG. 62G



FIG. 62H

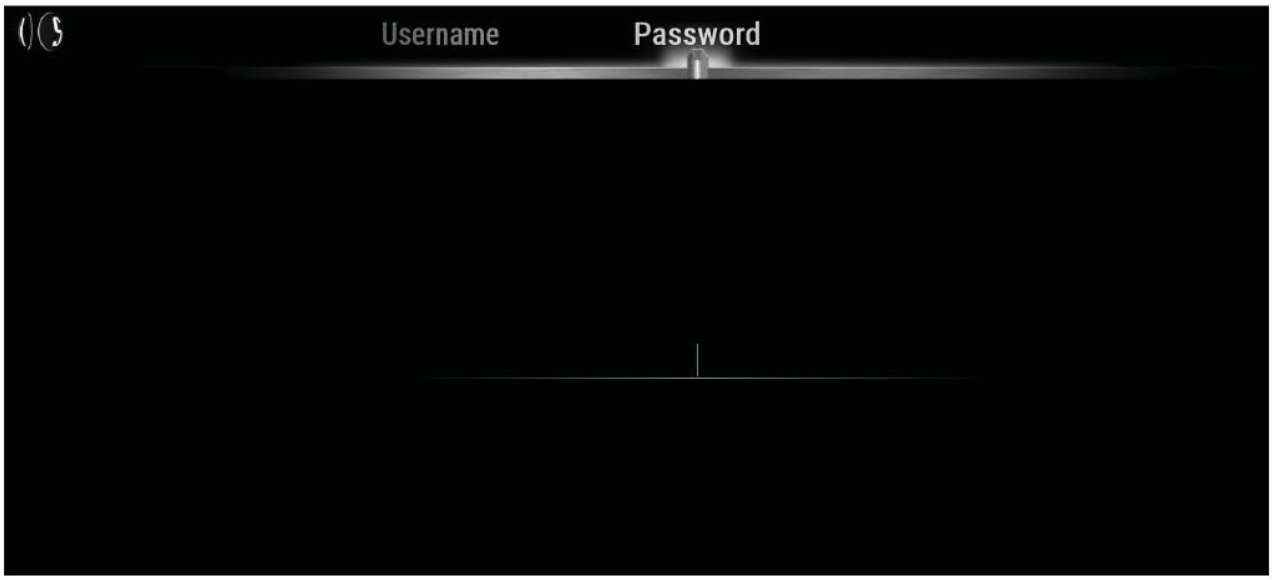


FIG. 62I

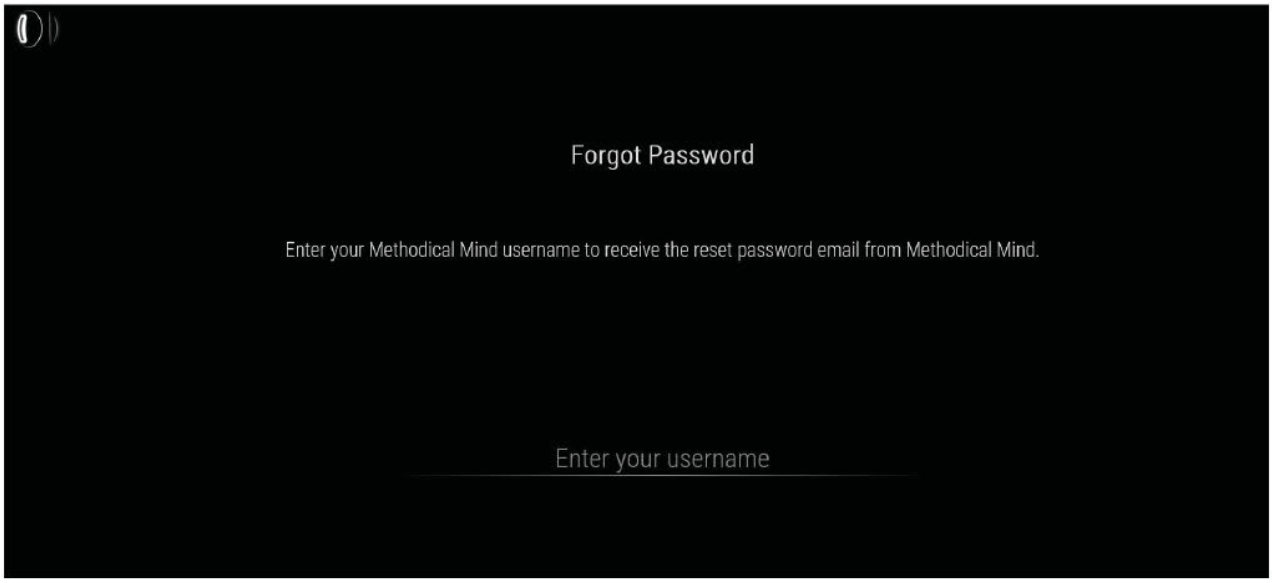


FIG. 62J

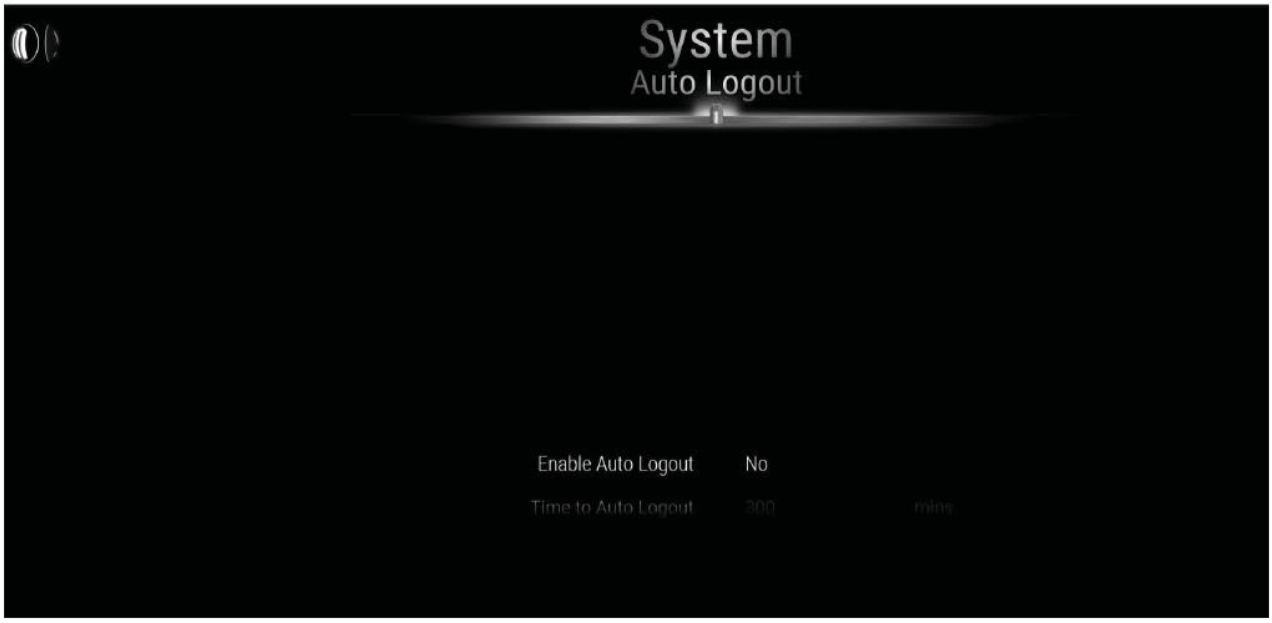


FIG. 62K

FIG. 62L

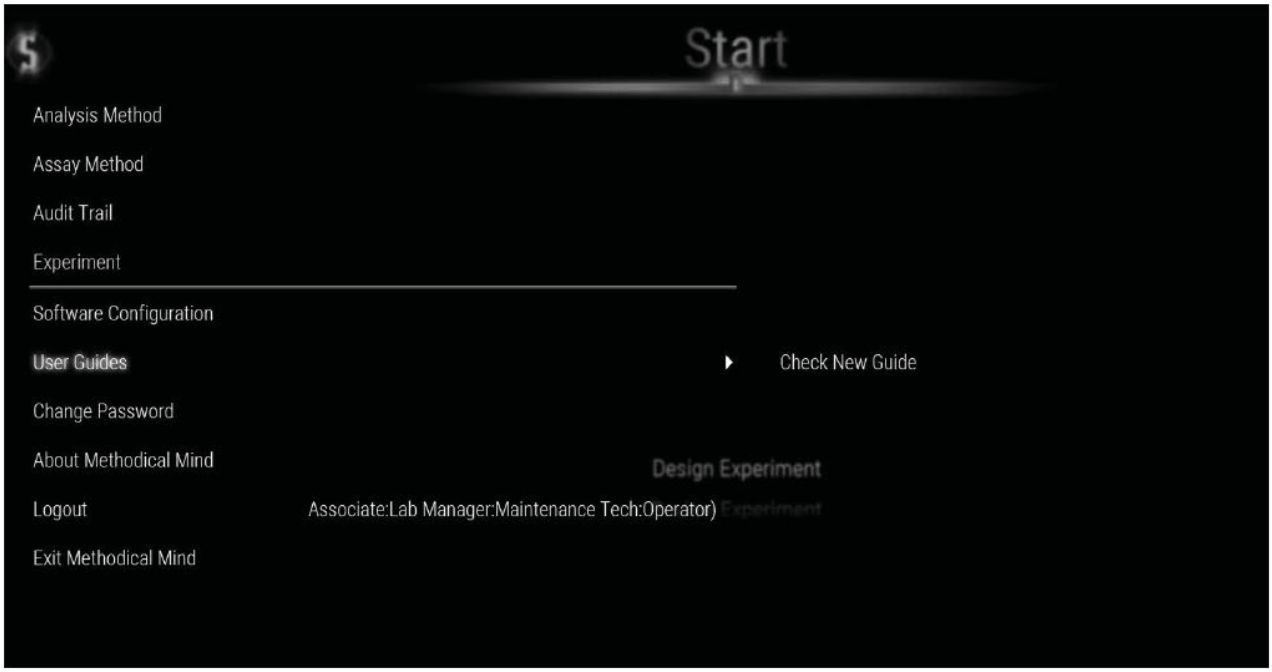




FIG. 62M

FIG. 62N



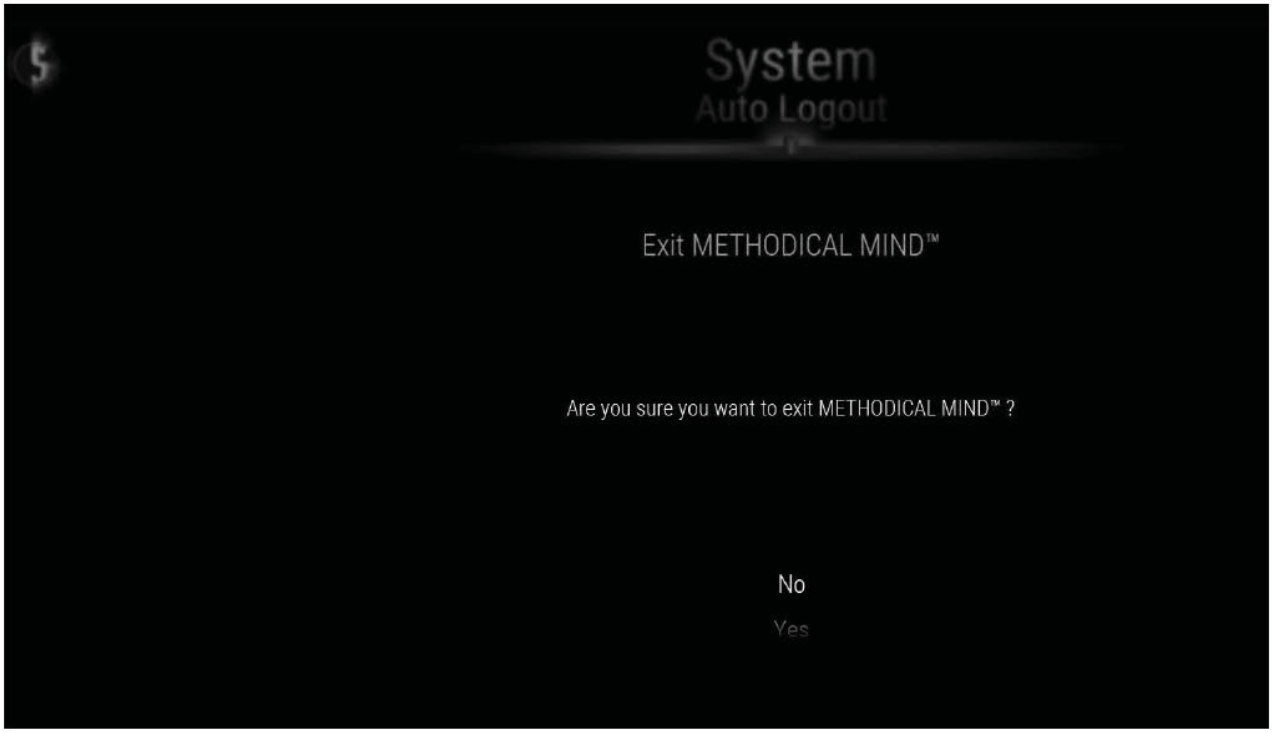


FIG. 62O

FIG. 62P




Start
Timestamp
Username
Module
Record ID
Type
Message
Category
Code
IP Address
06/17/2019 15:17:54 EDT
Assay Engine
AUTOMATIC
RECORD
11715
1/10

FIG. 63



FIG. 64A



FIG. 64B



FIG. 64C

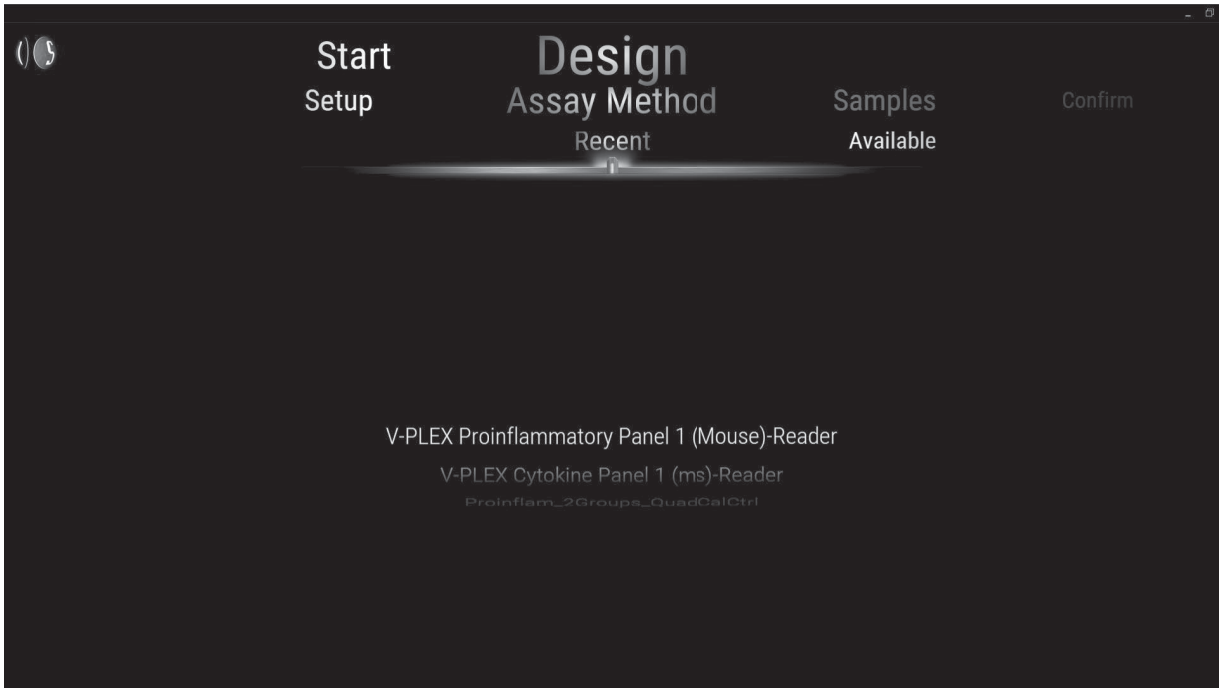


FIG. 64D



FIG. 64E

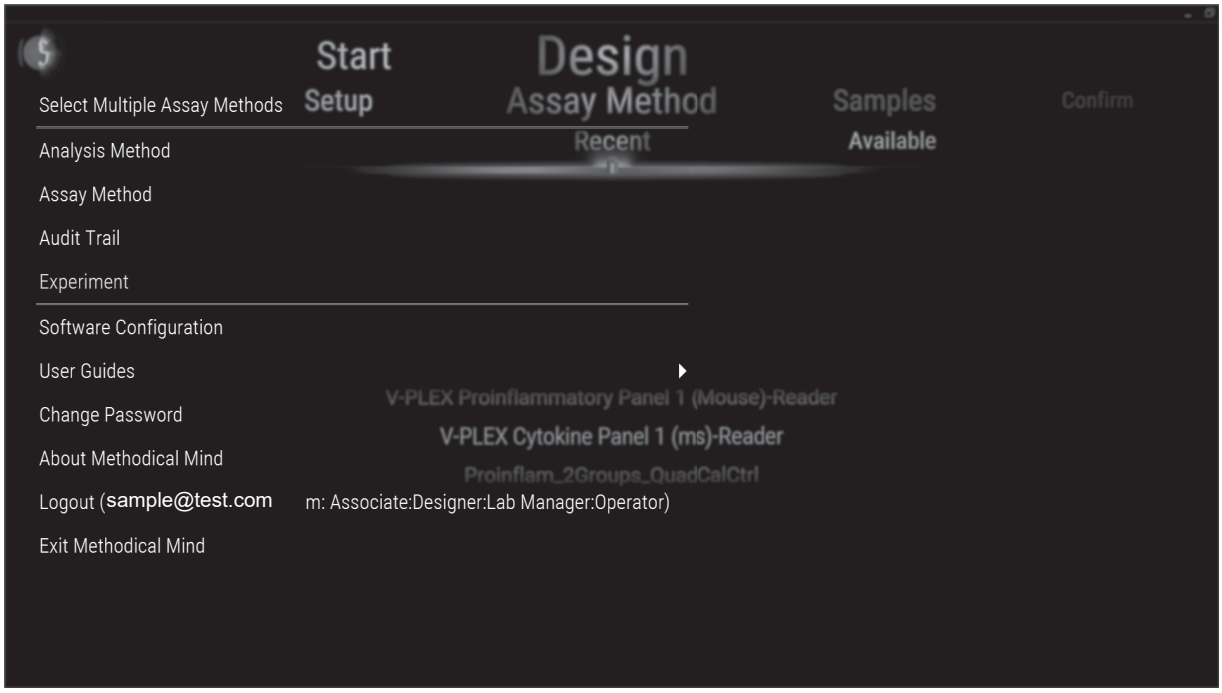


FIG. 64F



FIG. 64G

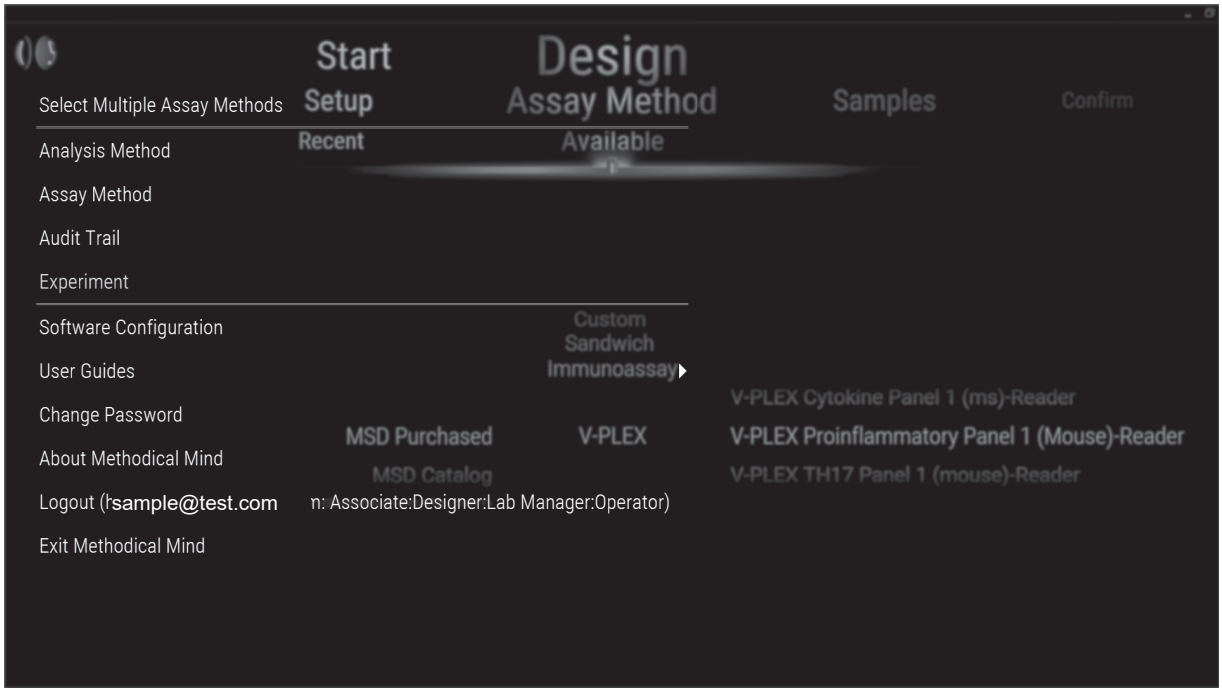


FIG. 64H

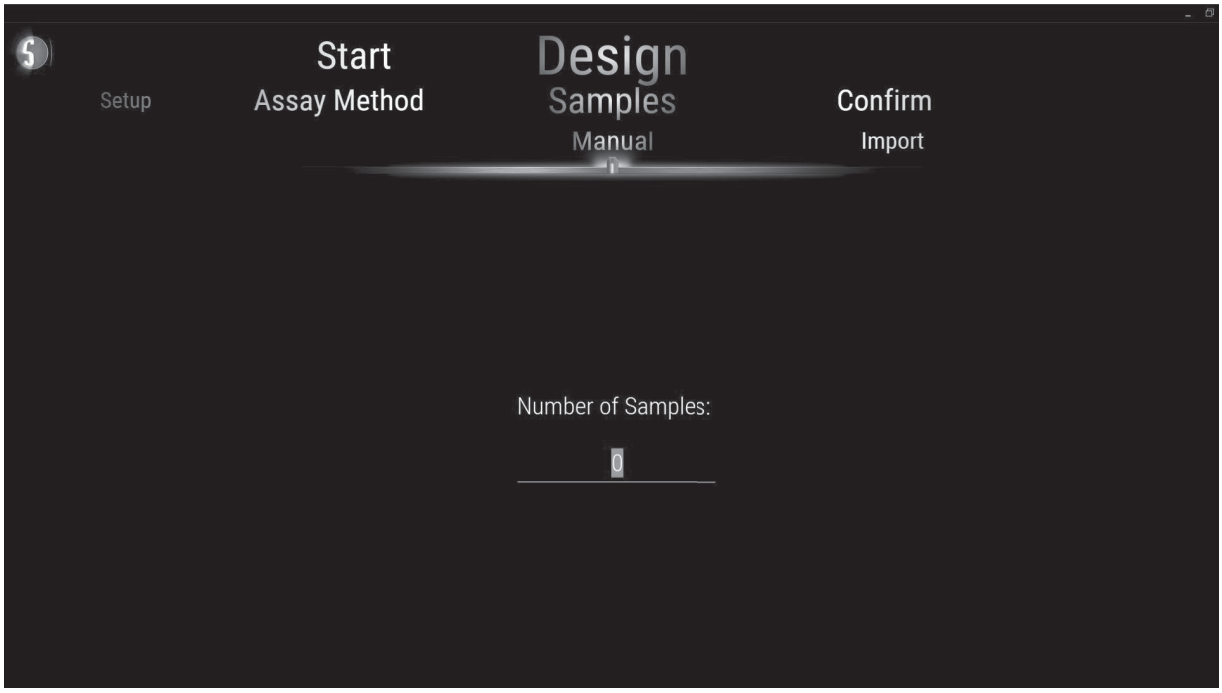


FIG. 64I



FIG. 64J

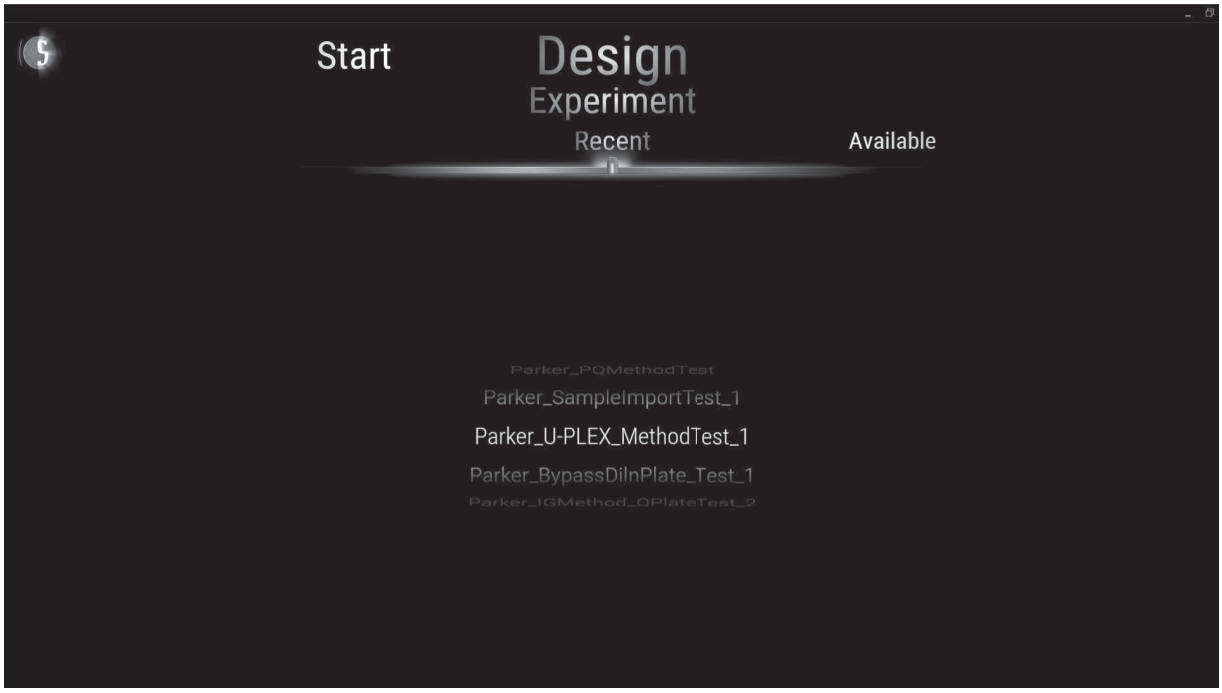


FIG. 64K

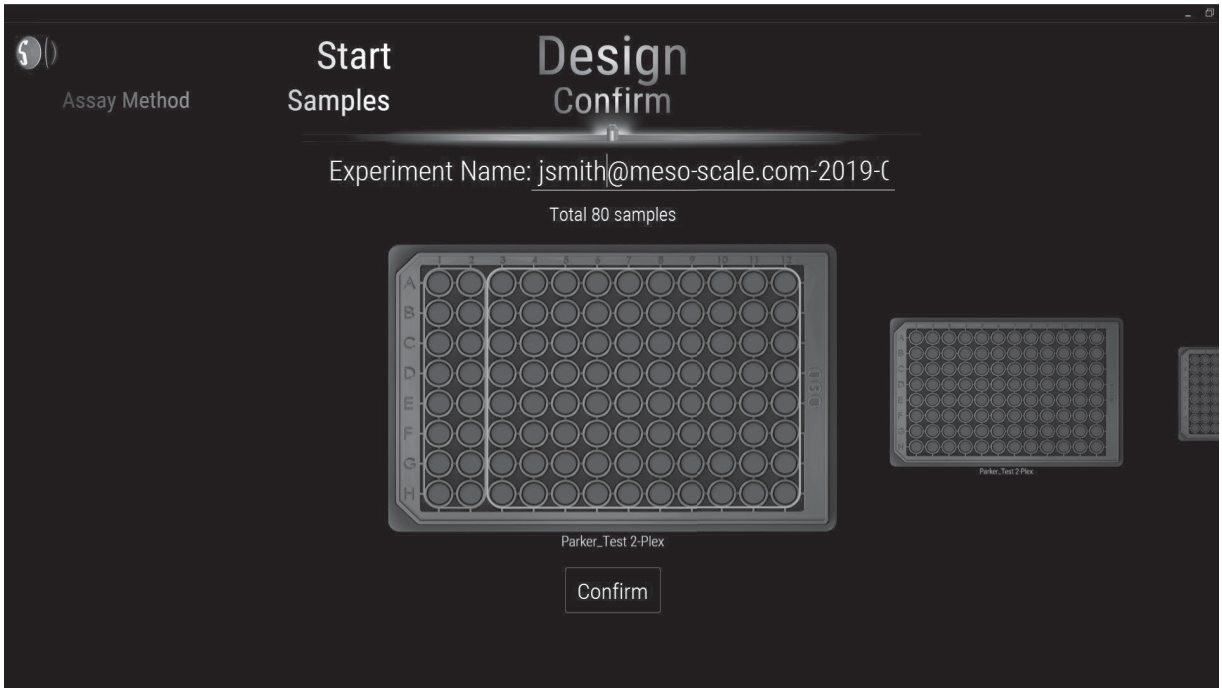


FIG. 64L

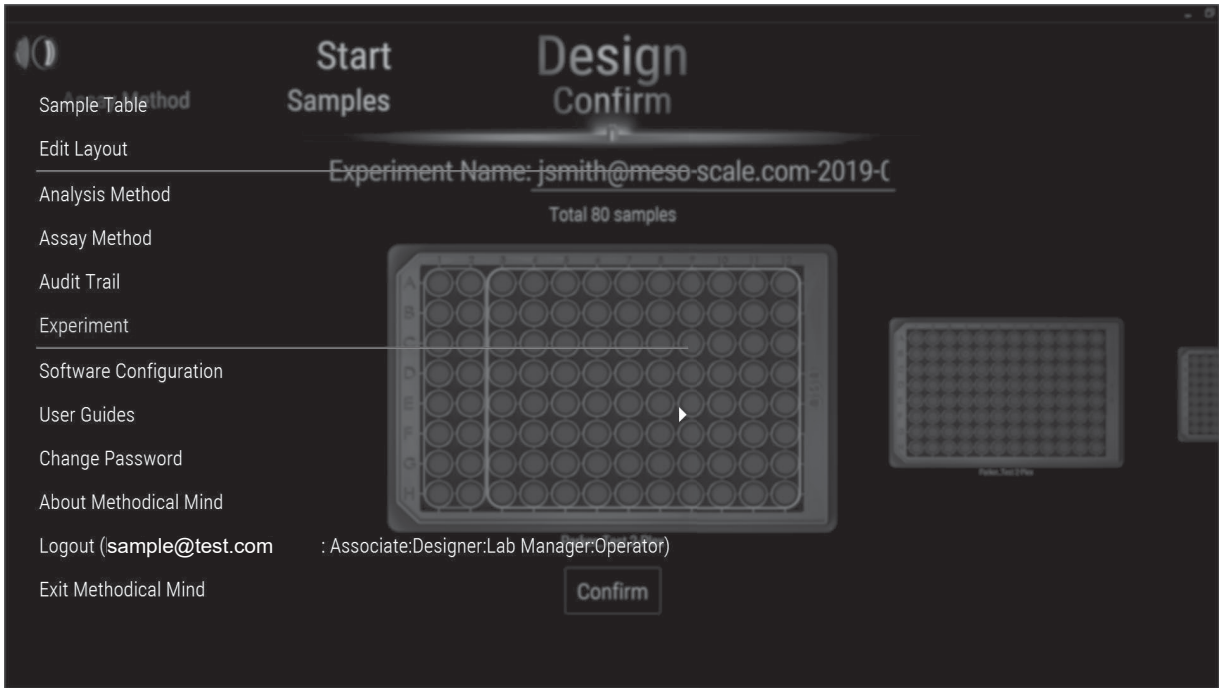


FIG. 64M



FIG. 64N



FIG. 64O



FIG. 64P



FIG. 64Q

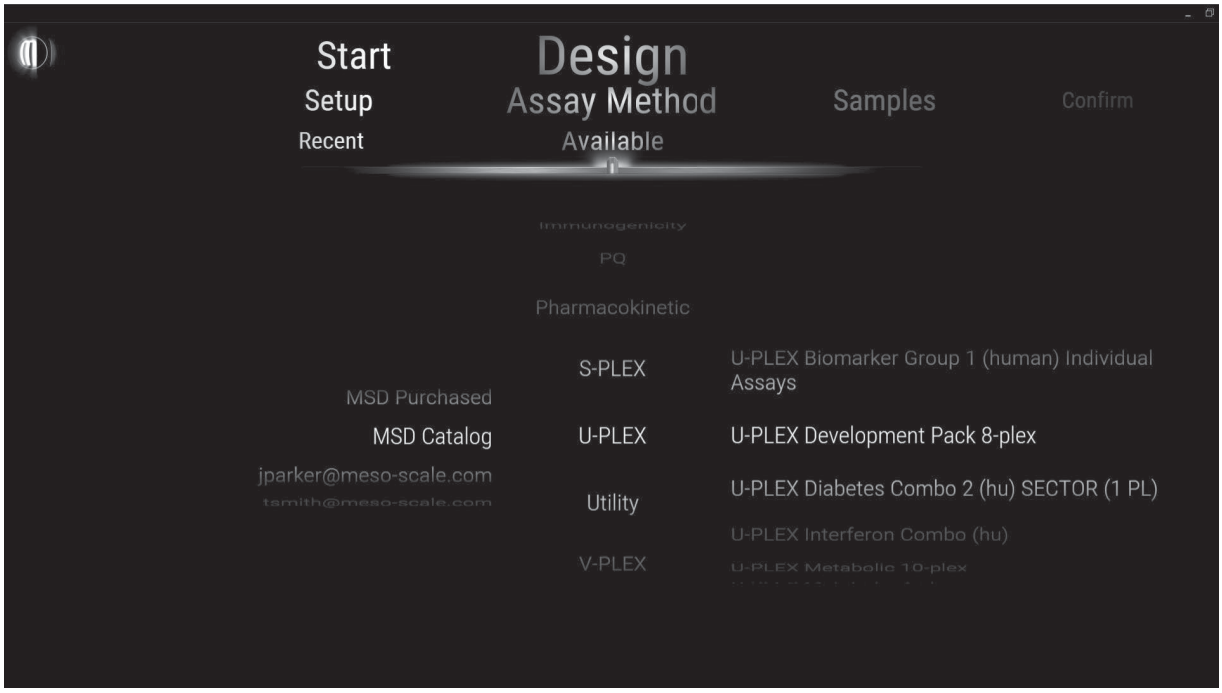


FIG. 64R

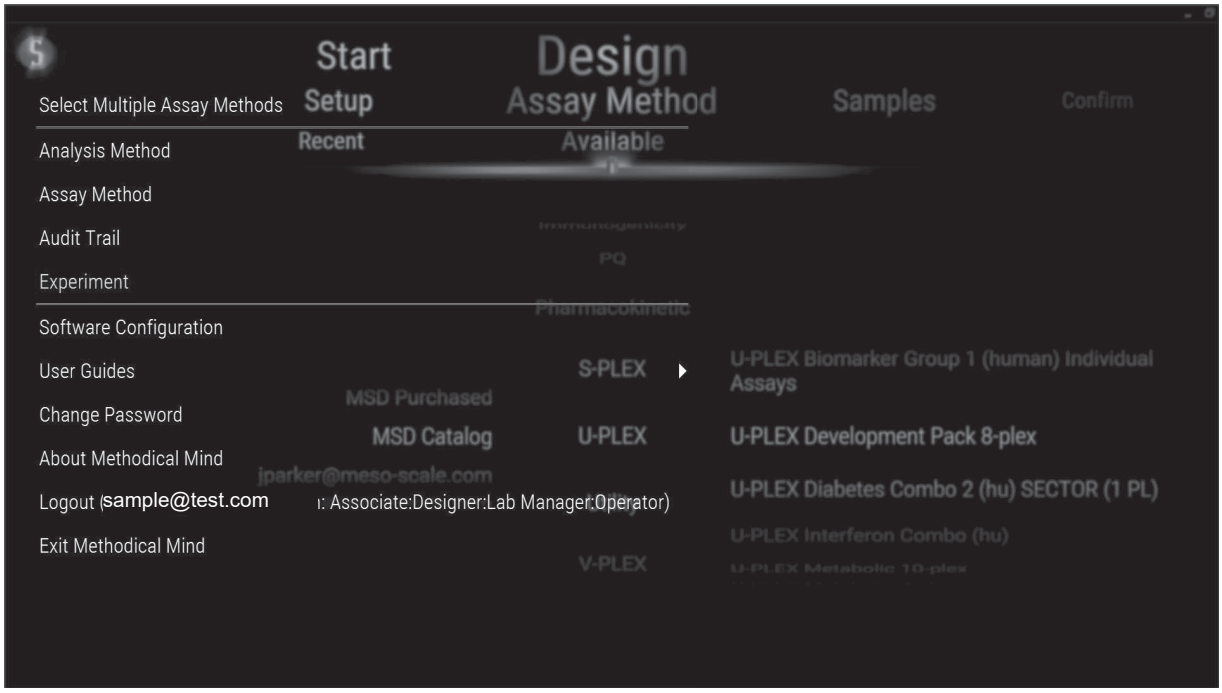


FIG. 64S

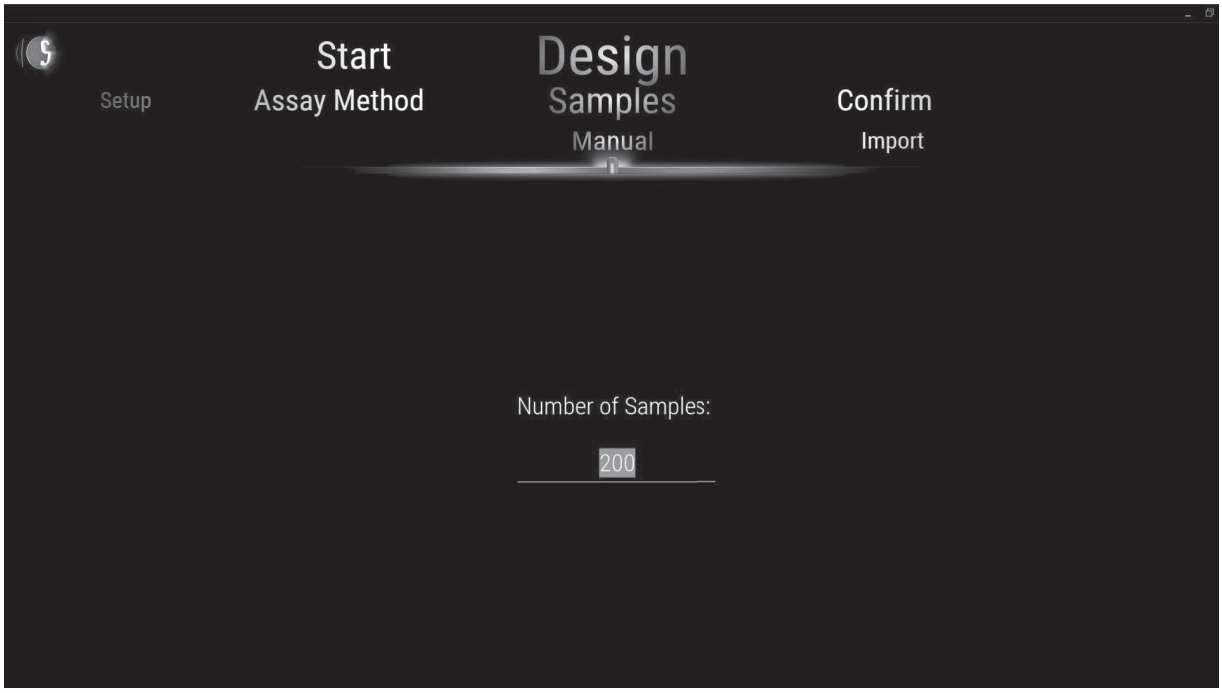


FIG. 64T

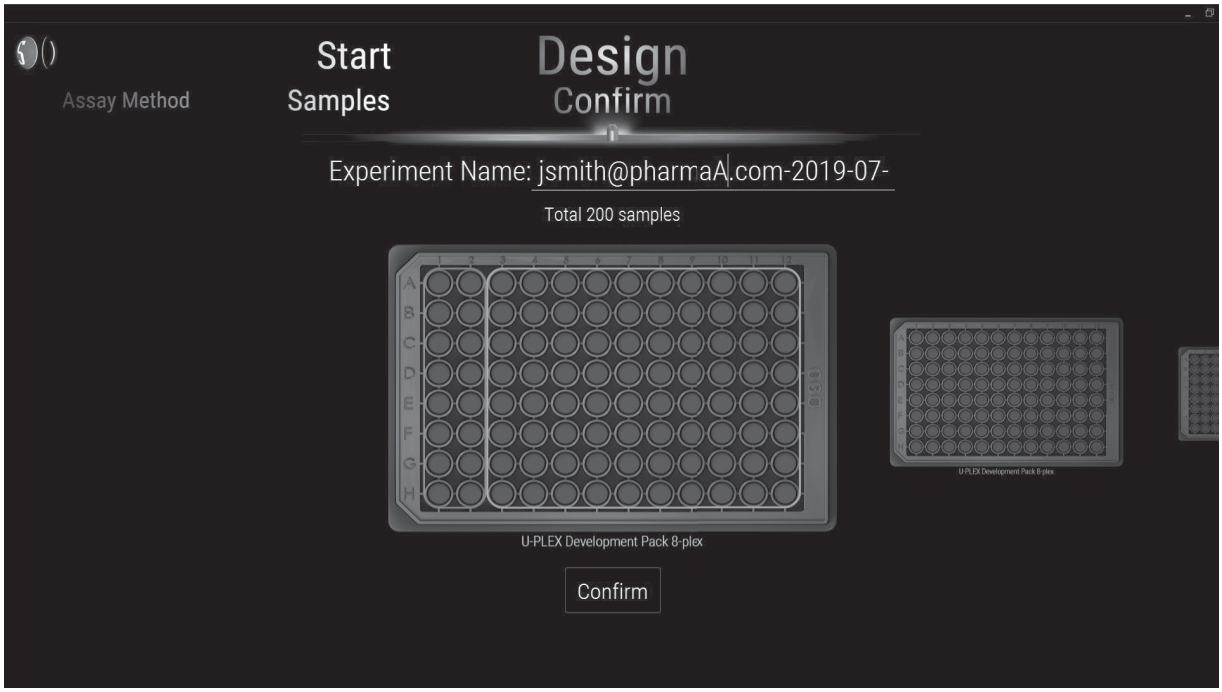


FIG. 64U

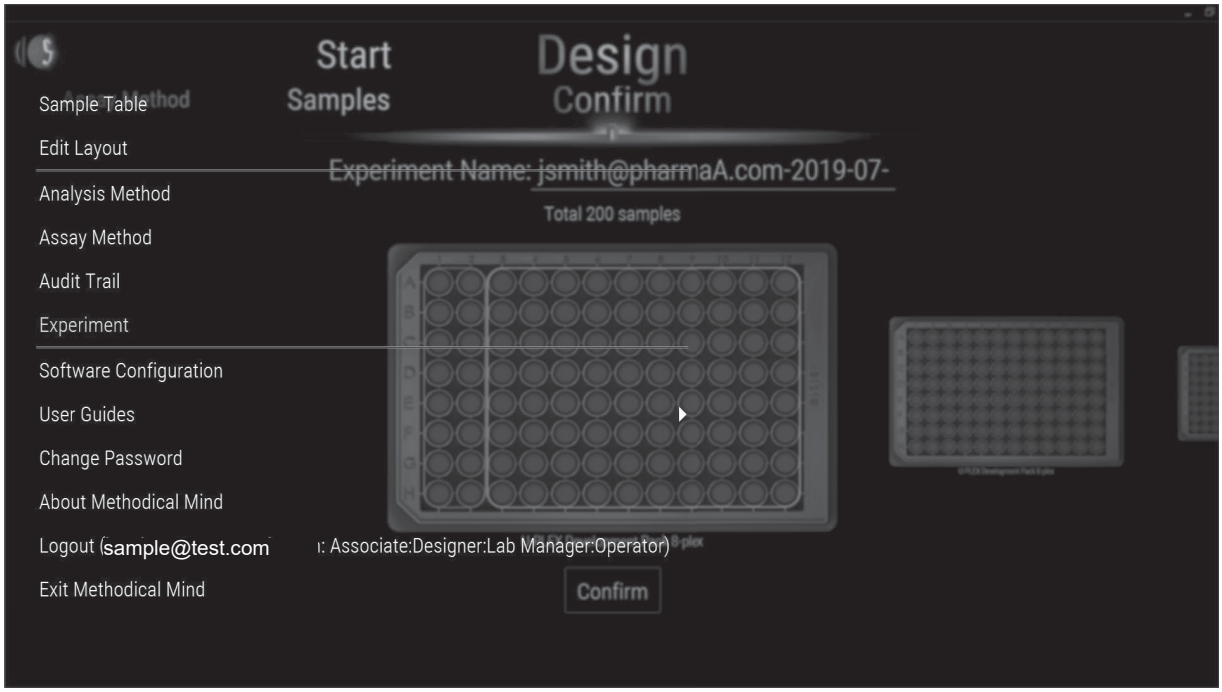


FIG. 64V

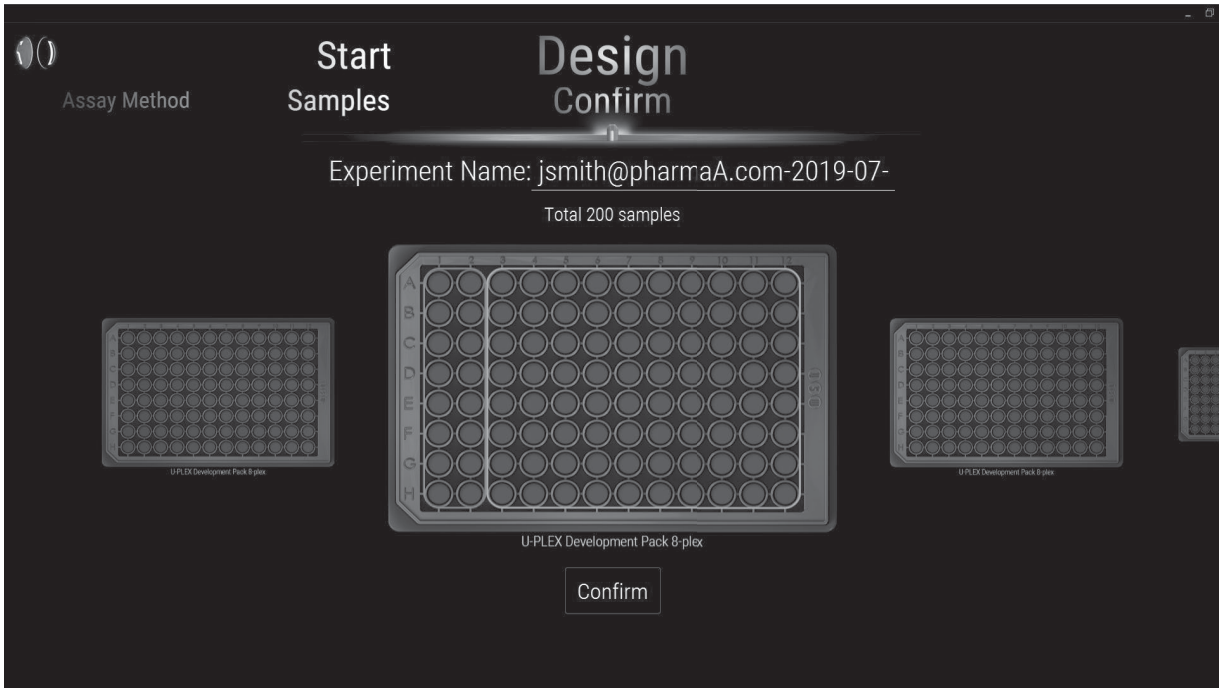


FIG. 64W



FIG. 64X

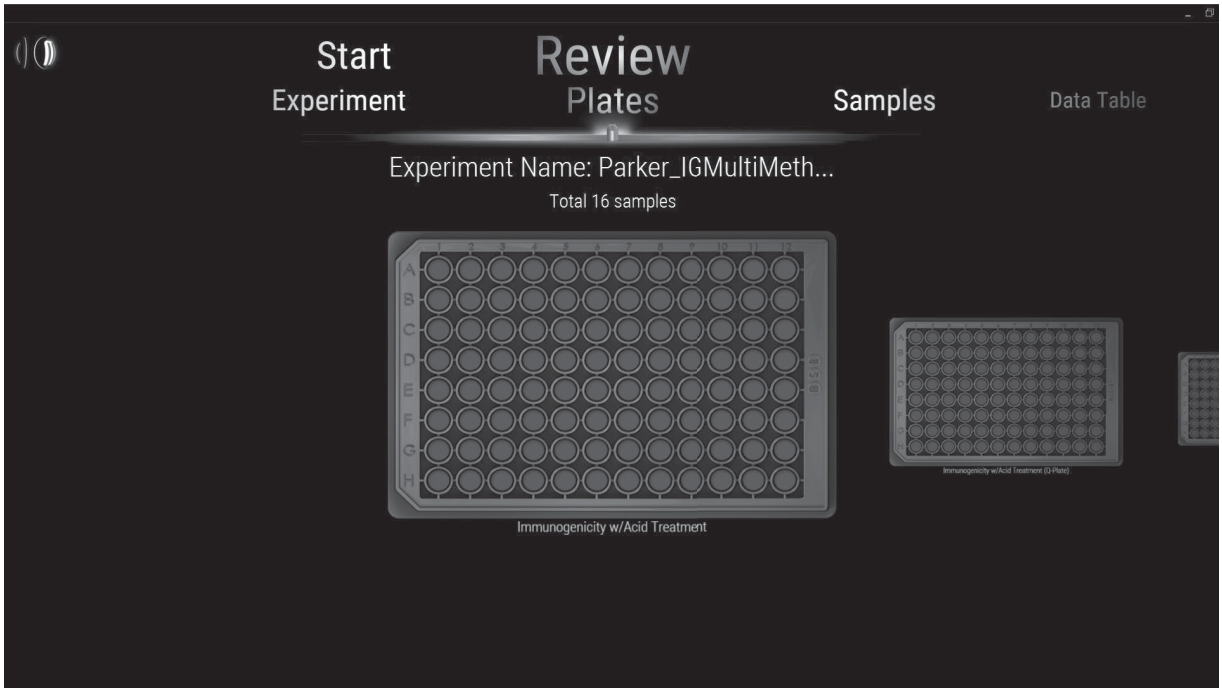


FIG. 64Y

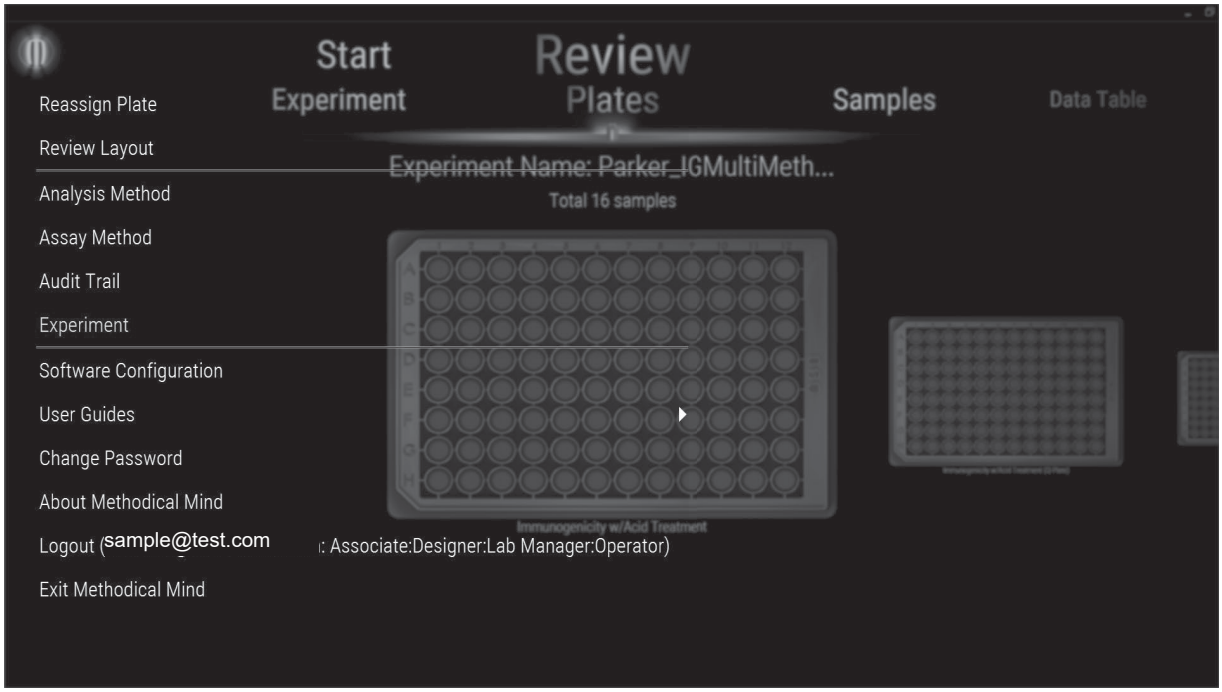


FIG. 64Z

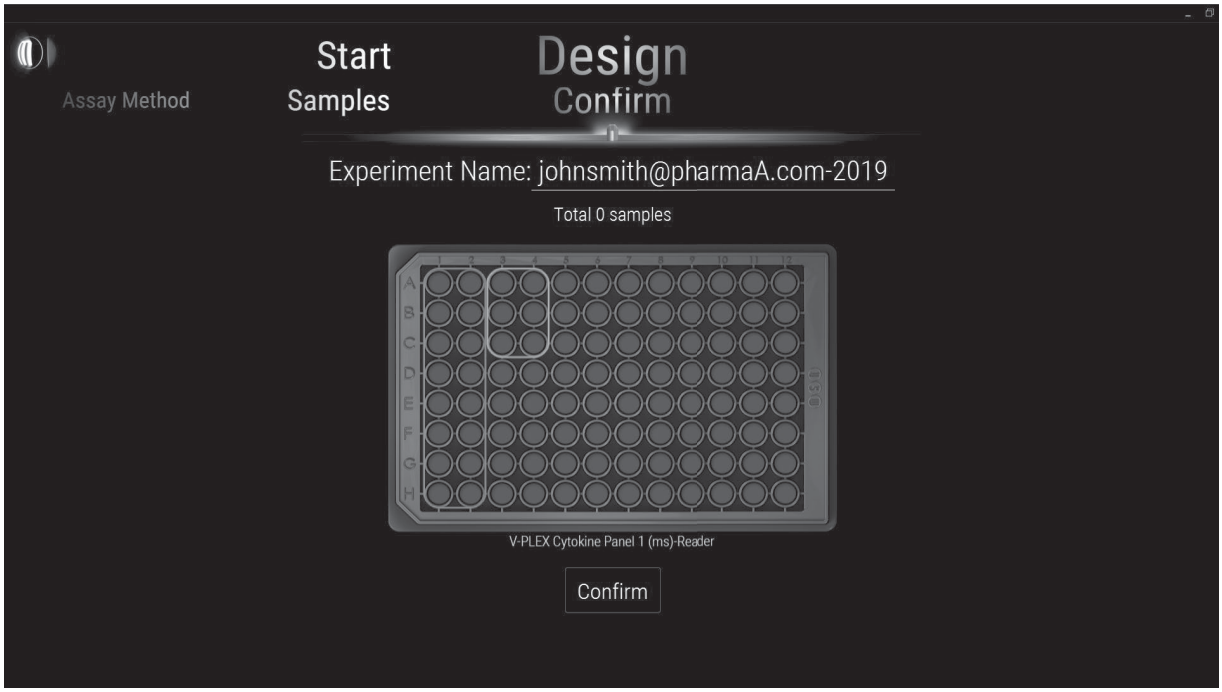


FIG. 64AA

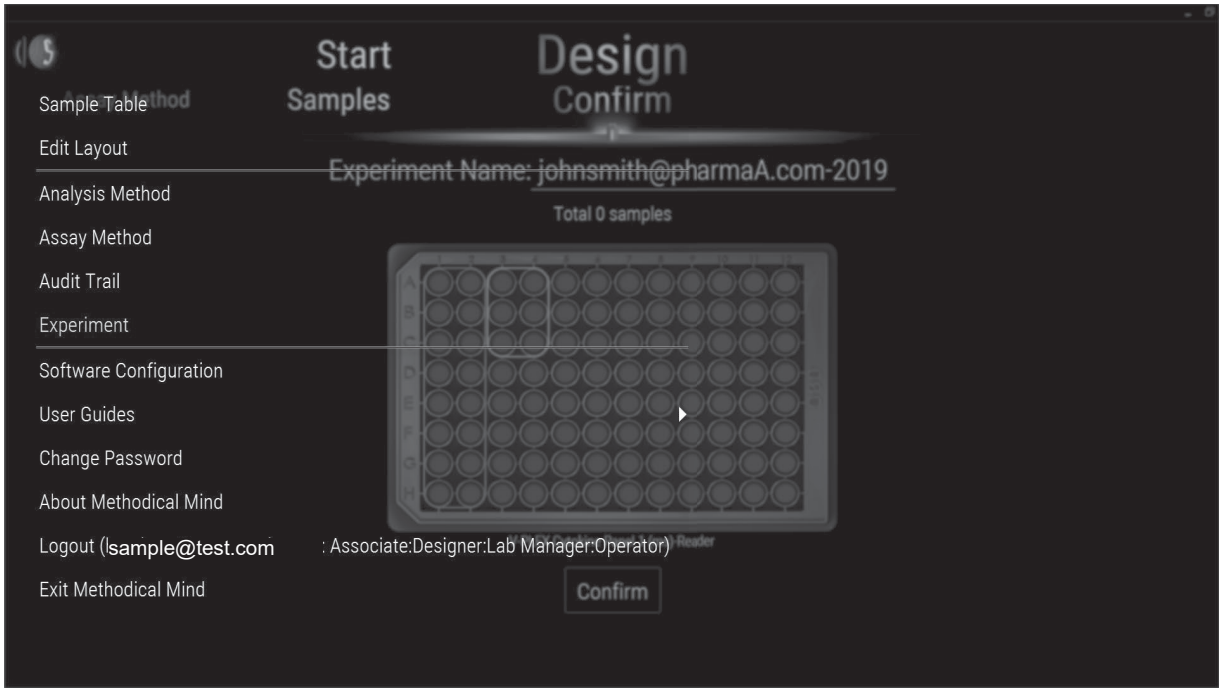


FIG. 64BB



FIG. 64CC

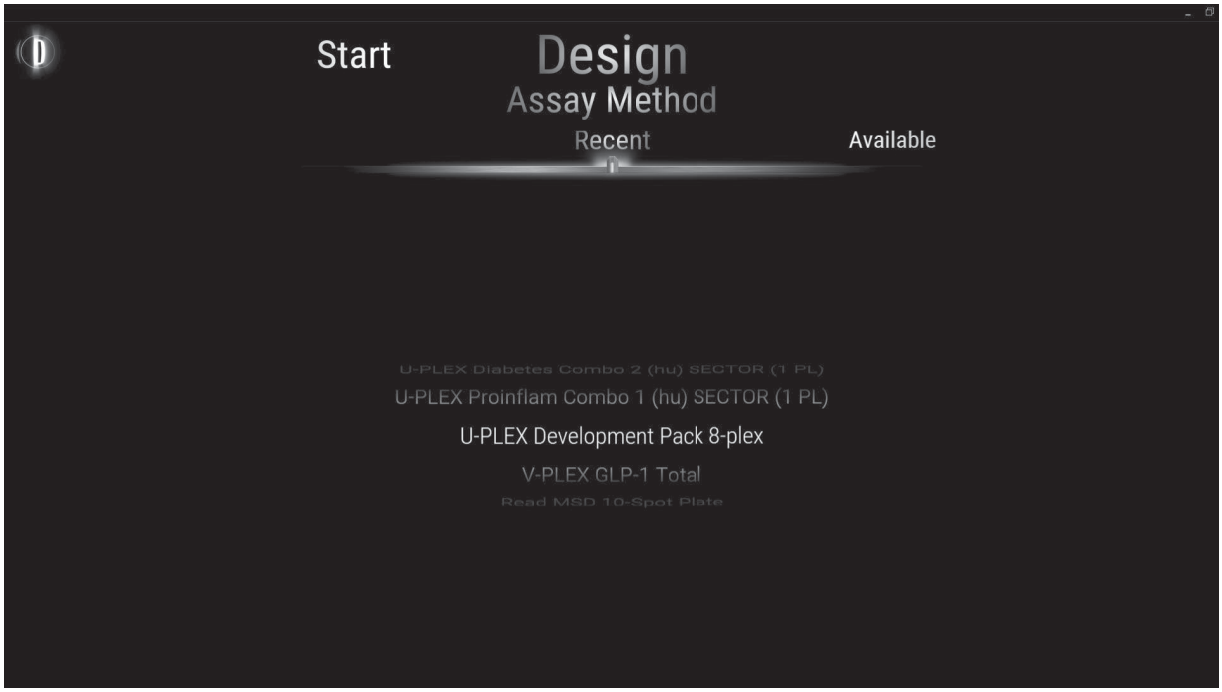


FIG. 64DD



FIG. 64EE



FIG. 64FF

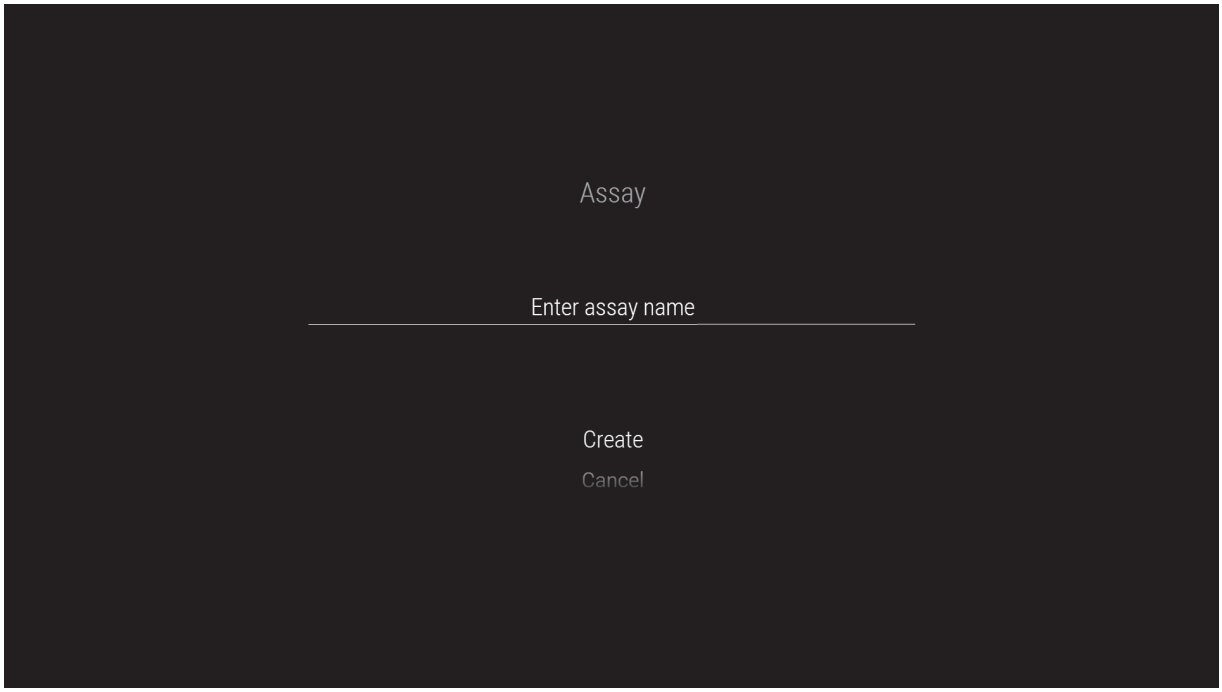


FIG. 64GG



FIG. 64HH



FIG. 64II



FIG. 64JJ



FIG. 64KK



FIG. 64LL



FIG. 64MM

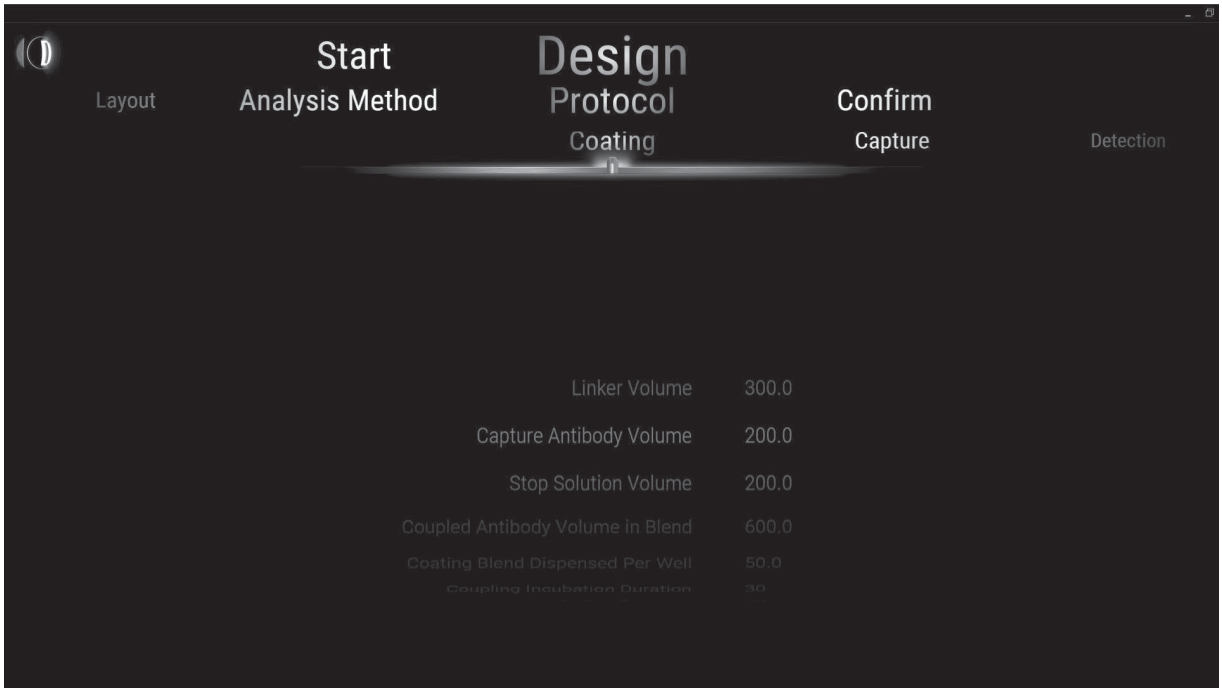


FIG. 64NN

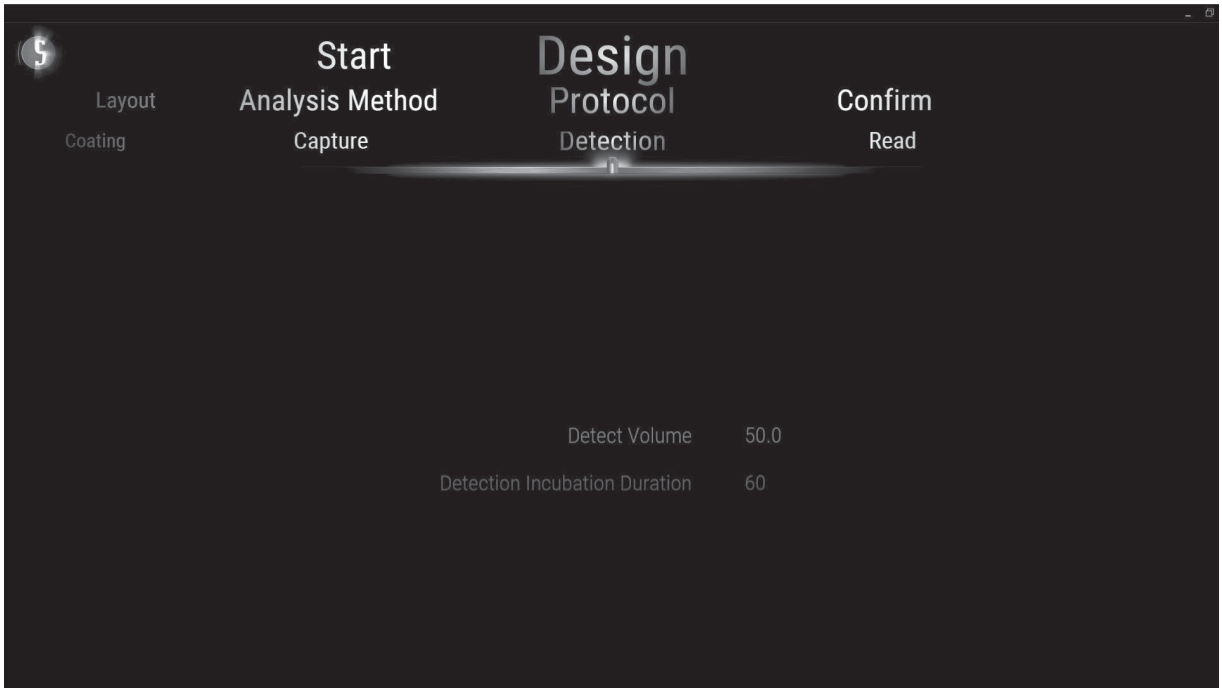


FIG. 64OO

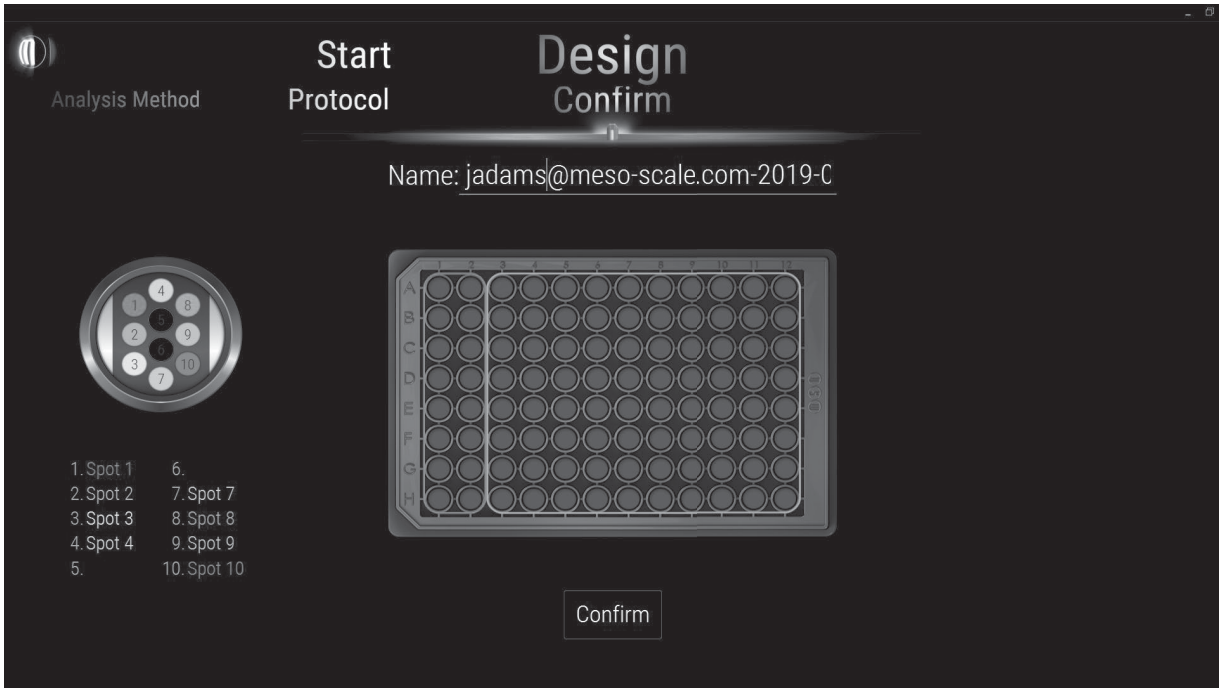


FIG. 64PP



FIG. 64QQ

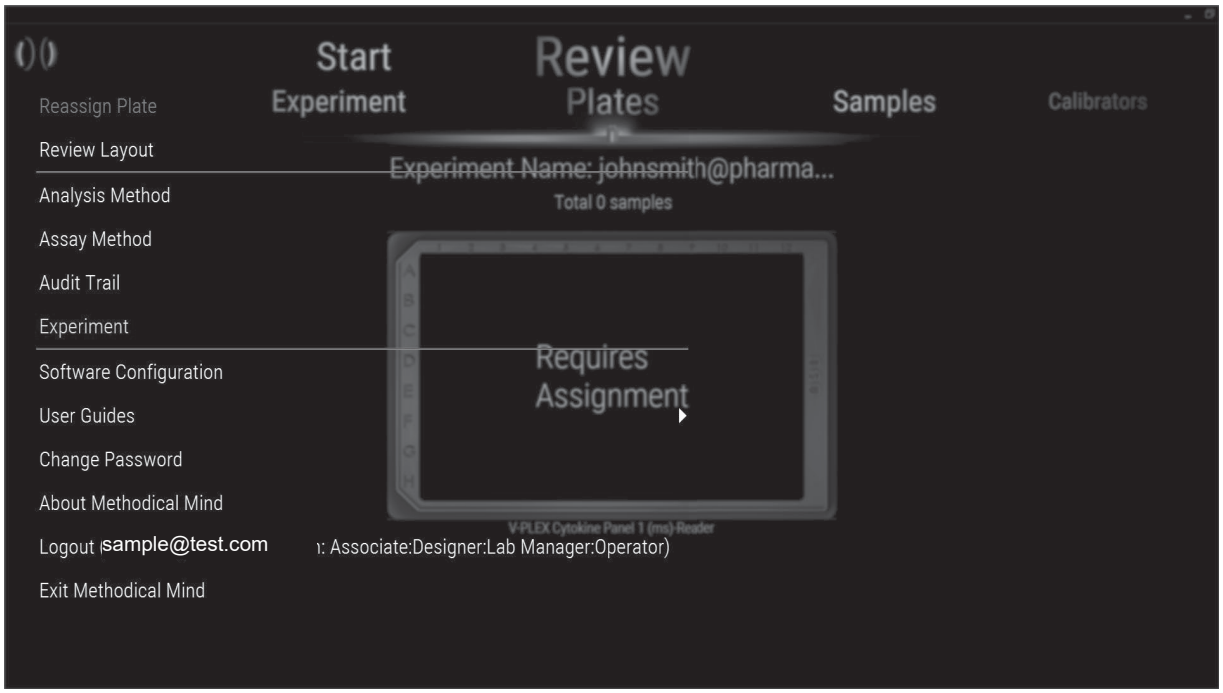


FIG. 64RR