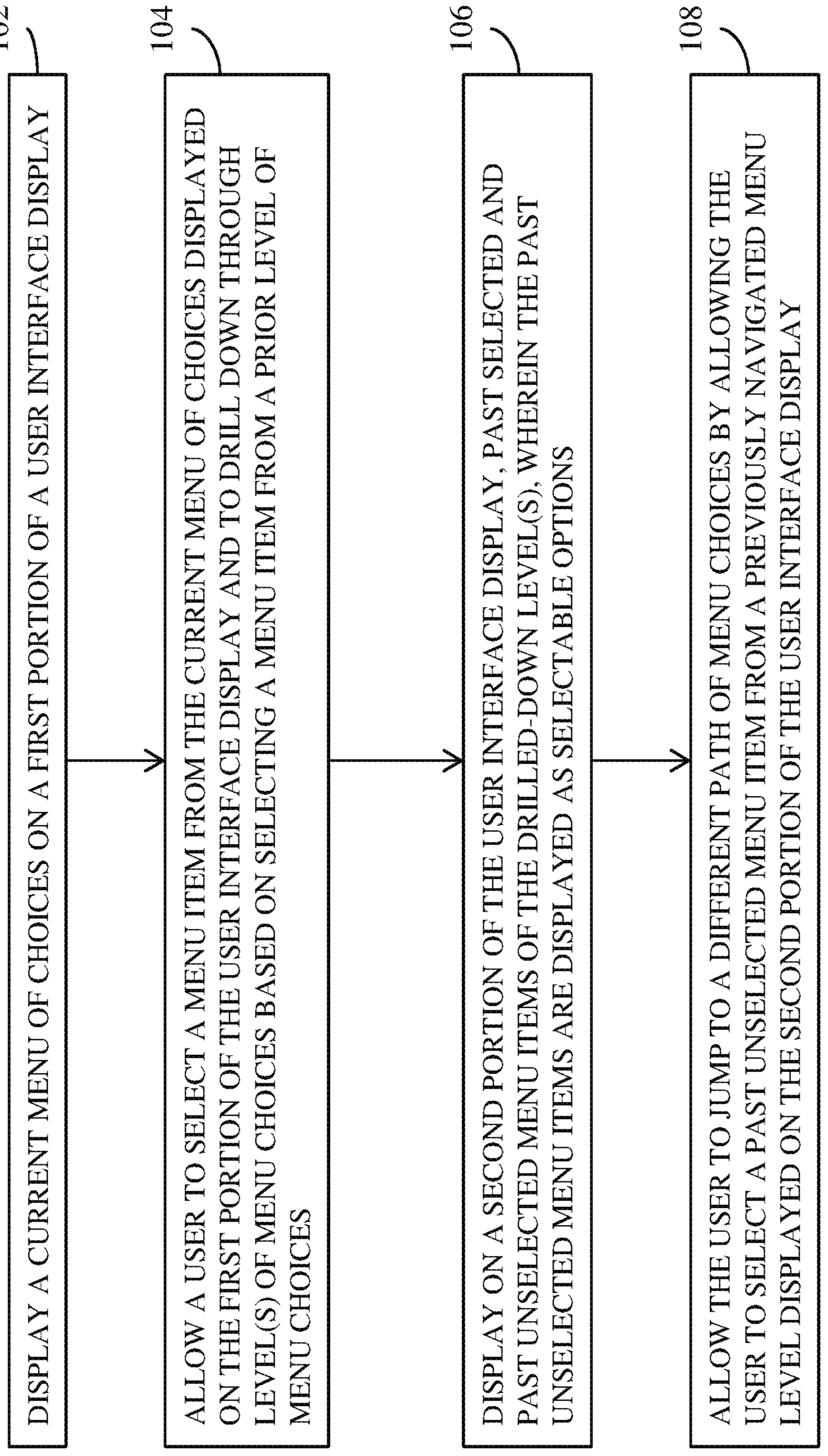

102
DISPLAY A CURRENT MENU OF CHOICES ON A FIRST PORTION OF A USER INTERFACE DISPLAY
104
ALLOW A USER TO SELECT A MENU ITEM FROM THE CURRENT MENU OF CHOICES DISPLAYED ON THE FIRST PORTION OF THE USER INTERFACE DISPLAY AND TO DRILL DOWN THROUGH LEVEL(S) OF MENU CHOICES BASED ON SELECTING A MENU ITEM FROM 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

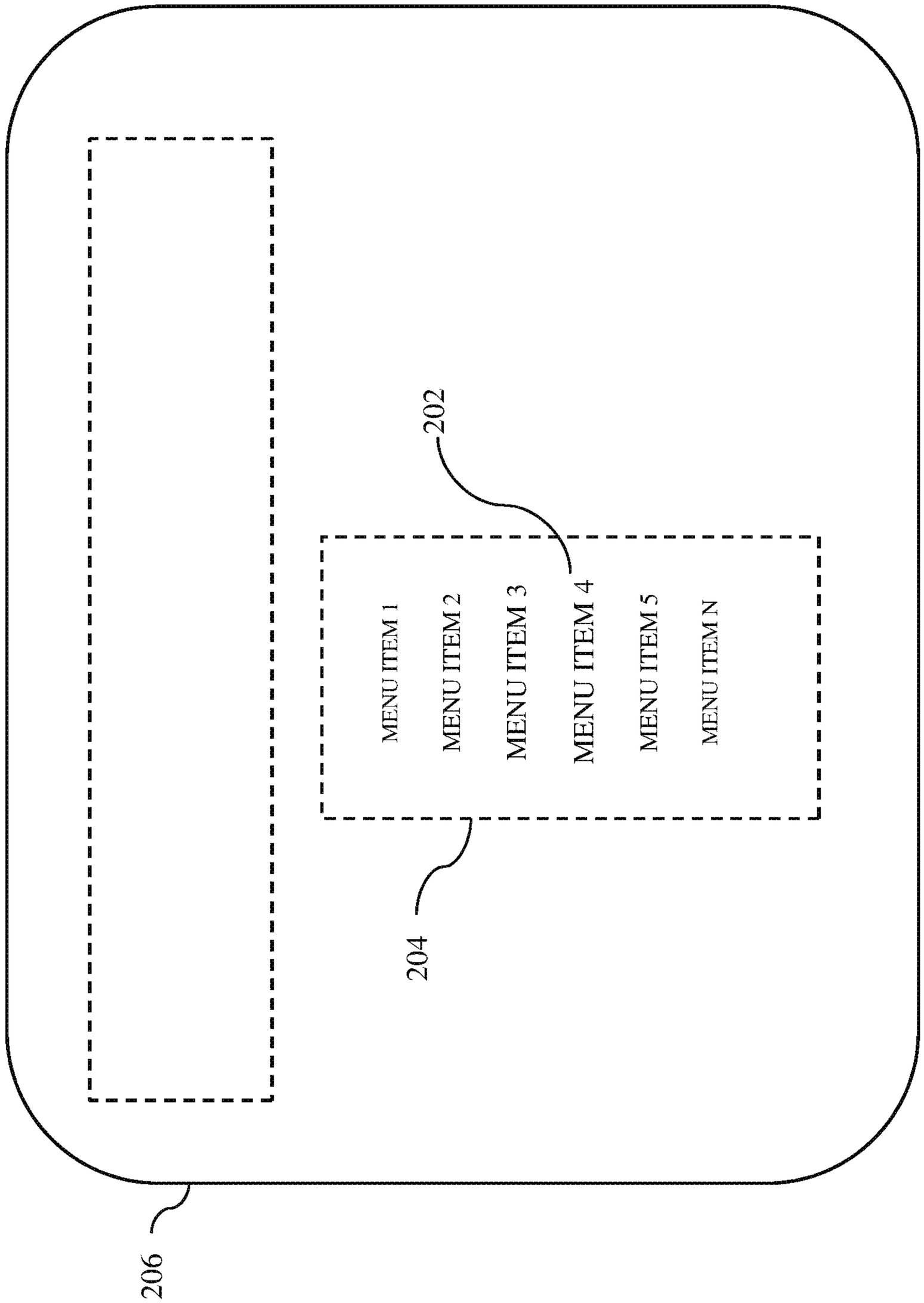

202
MENU ITEM 1
MENU ITEM 2
MENU ITEM 3
MENU ITEM 4
MENU ITEM 5
MENU ITEM N
204
206

FIG. 2A

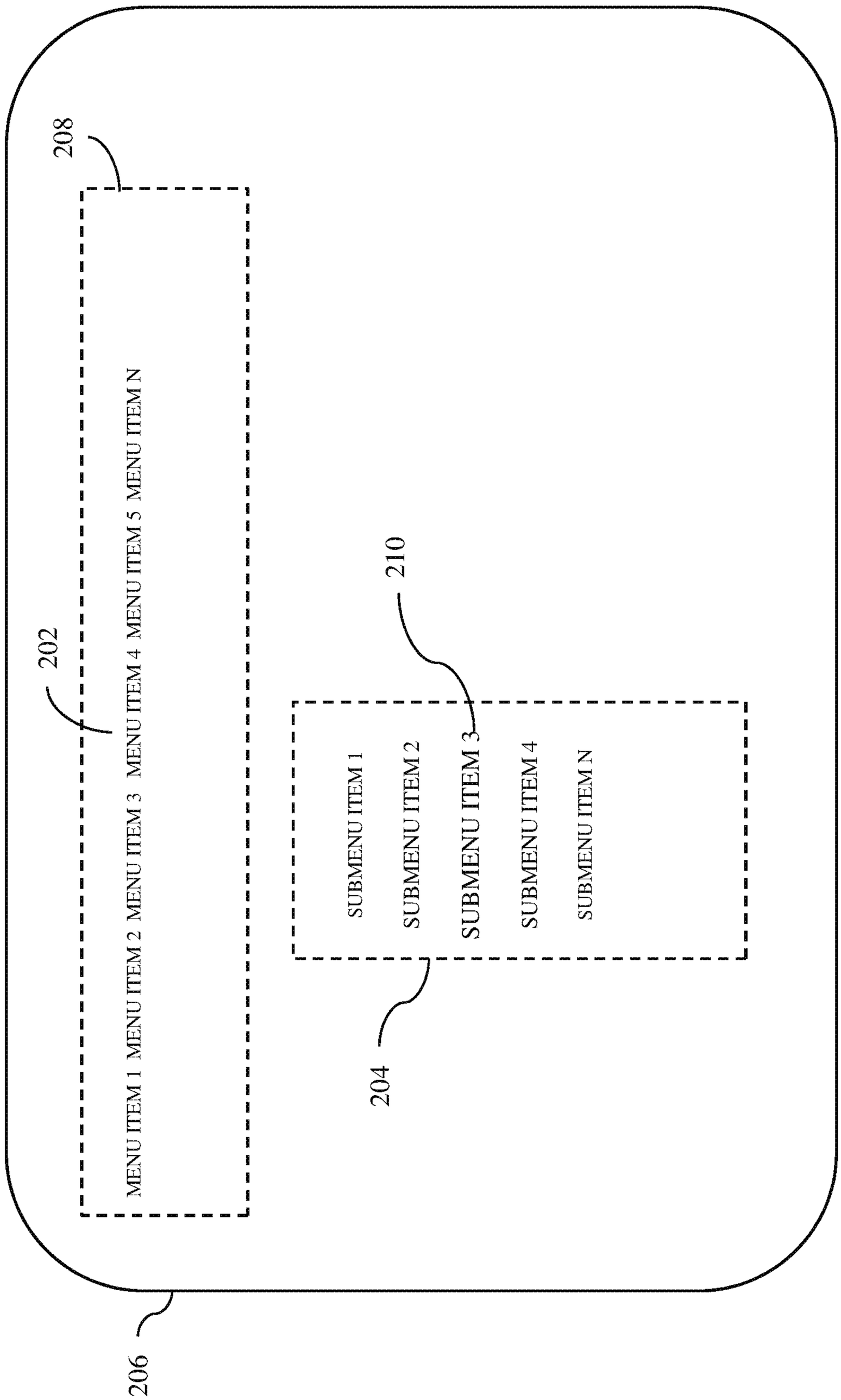

208
202
MENU ITEM 1 MENU ITEM 2 MENU ITEM 3 MENU ITEM 4 MENU ITEM 5 MENU ITEM N
210
SUBMENU ITEM 1
SUBMENU ITEM 2
SUBMENU ITEM 3
SUBMENU ITEM 4
SUBMENU ITEM N
204
206

FIG. 2B

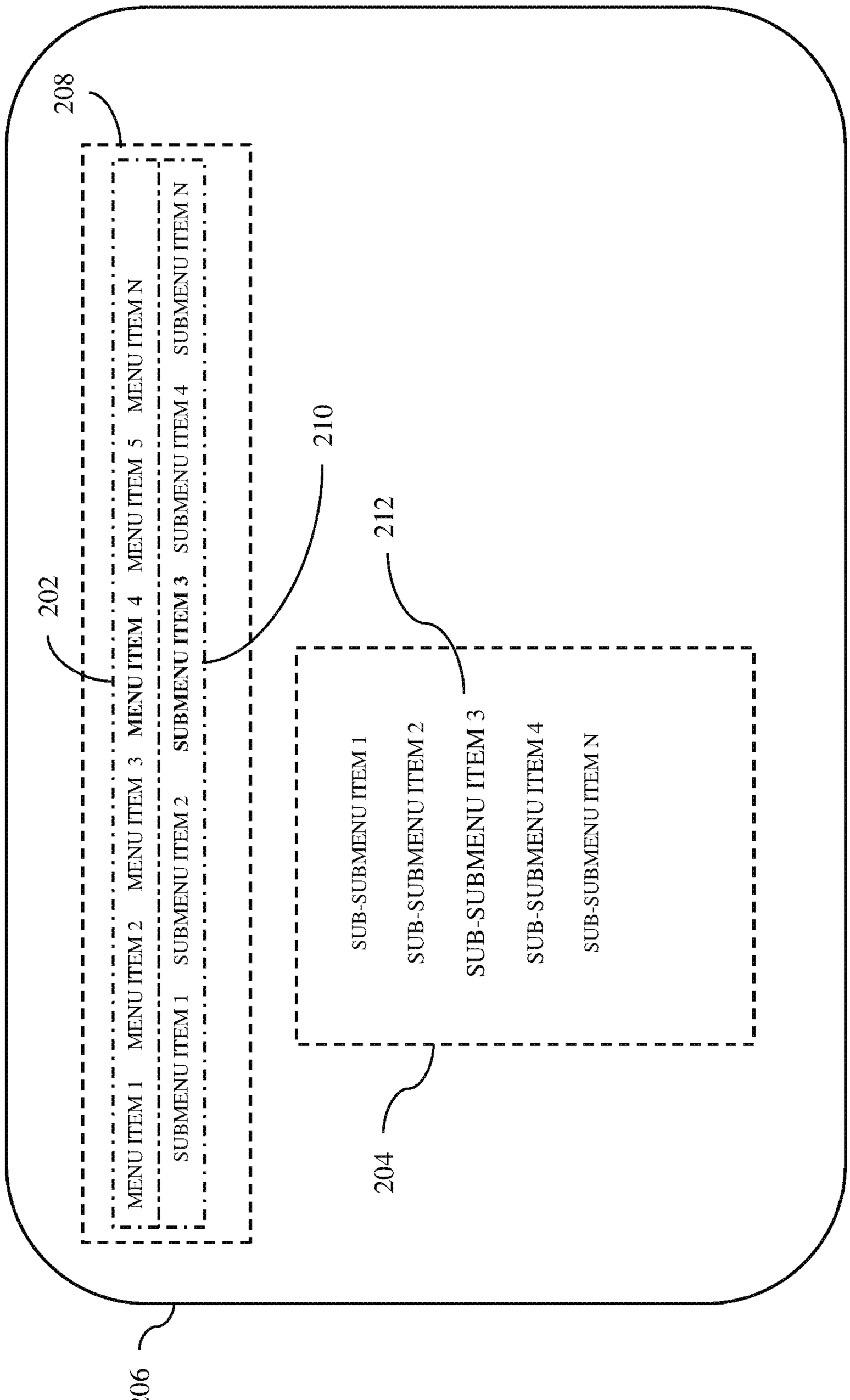

208
202
MENU ITEM 1
MENU ITEM 2
MENU ITEM 3
MENU ITEM 4
MENU ITEM 5
MENU ITEM N
SUBMENU ITEM 1
SUBMENU ITEM 2
SUBMENU ITEM 3
SUBMENU ITEM 4
SUBMENU ITEM N
210
212
204
SUB-SUBMENU ITEM 1
SUB-SUBMENU ITEM 2
SUB-SUBMENU ITEM 3
SUB-SUBMENU ITEM 4
SUB-SUBMENU ITEM N
206

FIG. 2C

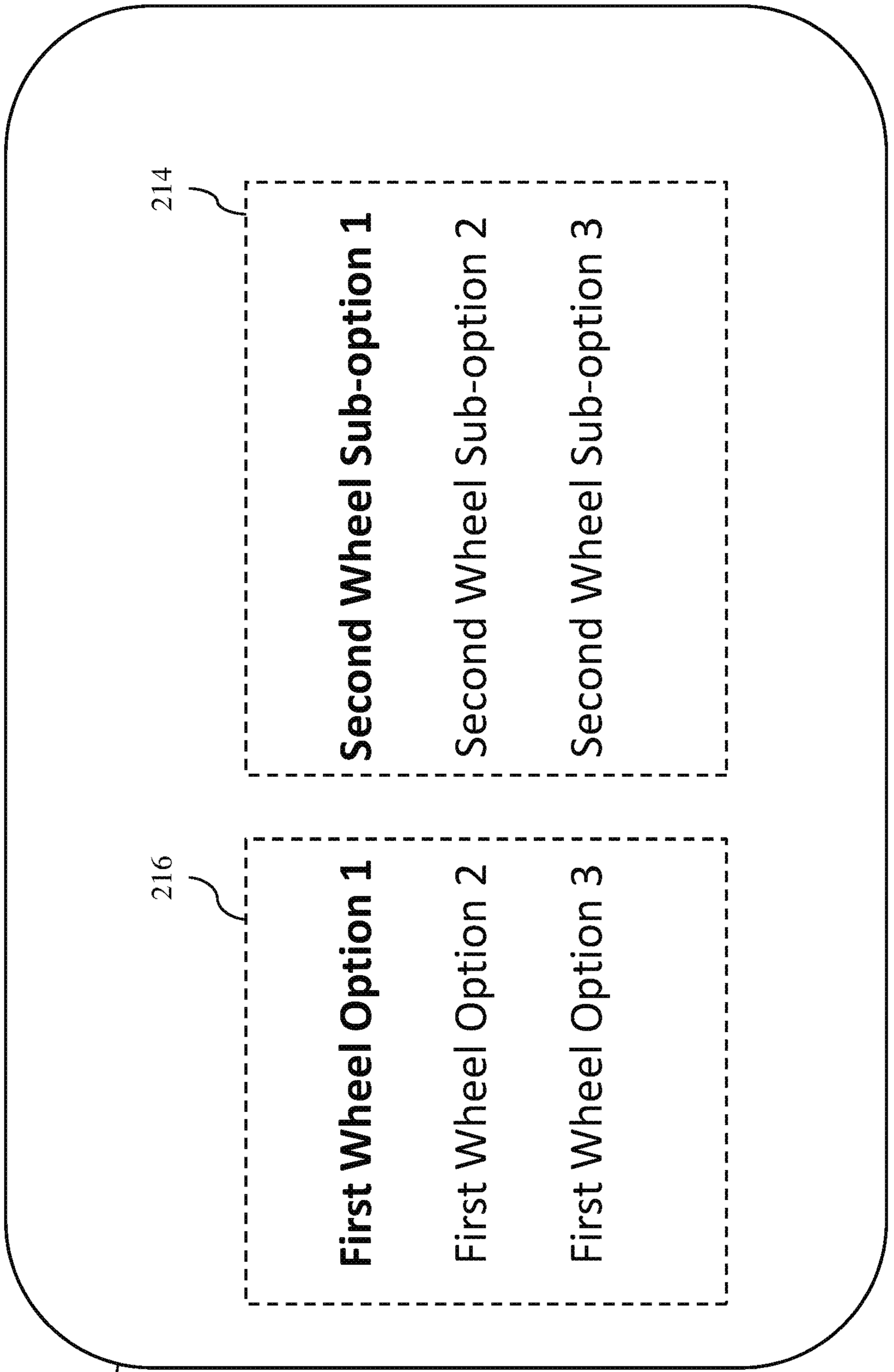

206
214
Second Wheel Sub-option 1
Second Wheel Sub-option 2
Second Wheel Sub-option 3
216
First Wheel Option 1
First Wheel Option 2
First Wheel Option 3

FIG. 2D

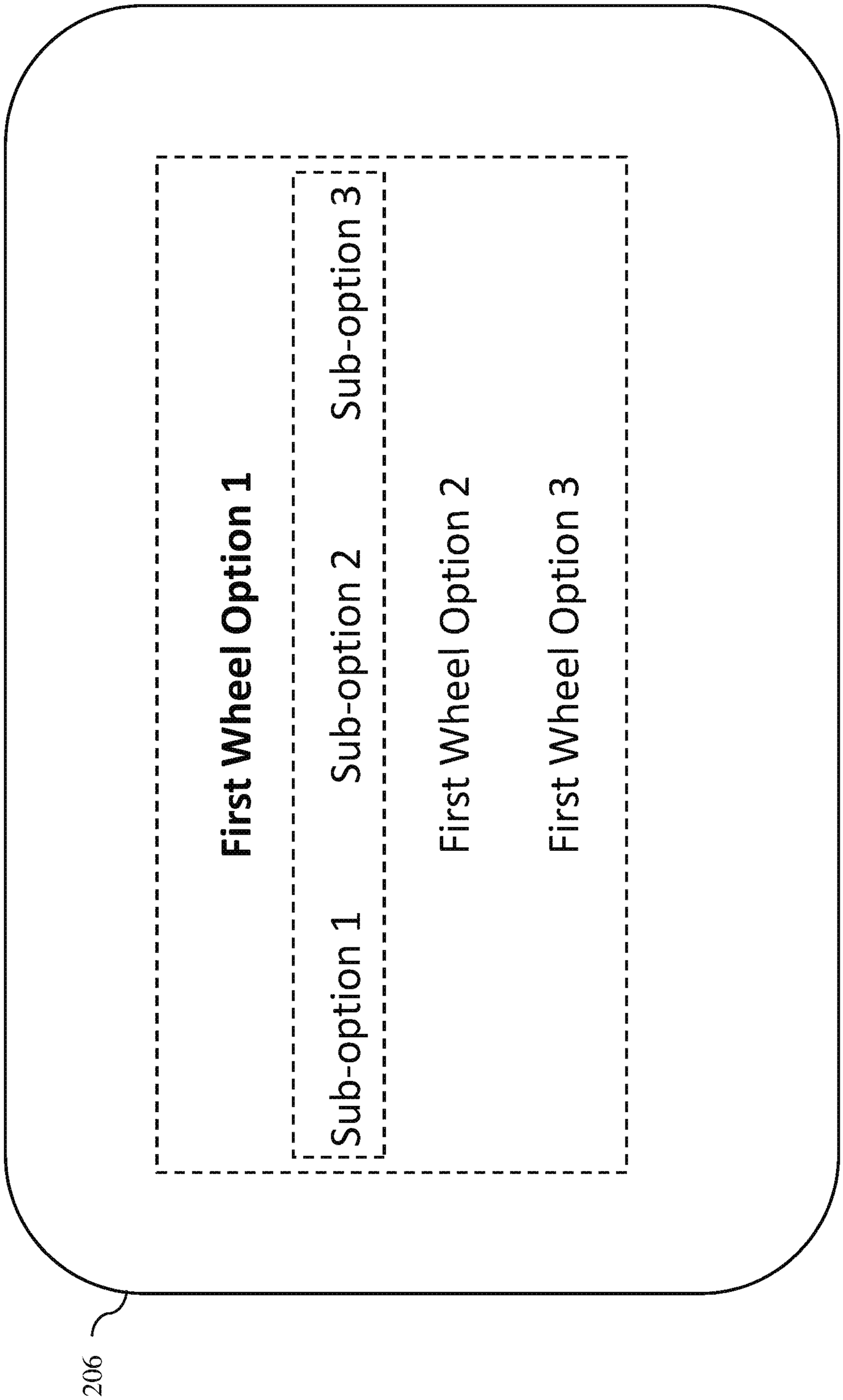

First Wheel Option 1
Sub-option 1
Sub-option 2
Sub-option 3
First Wheel Option 2
First Wheel Option 3
206

FIG. 2E

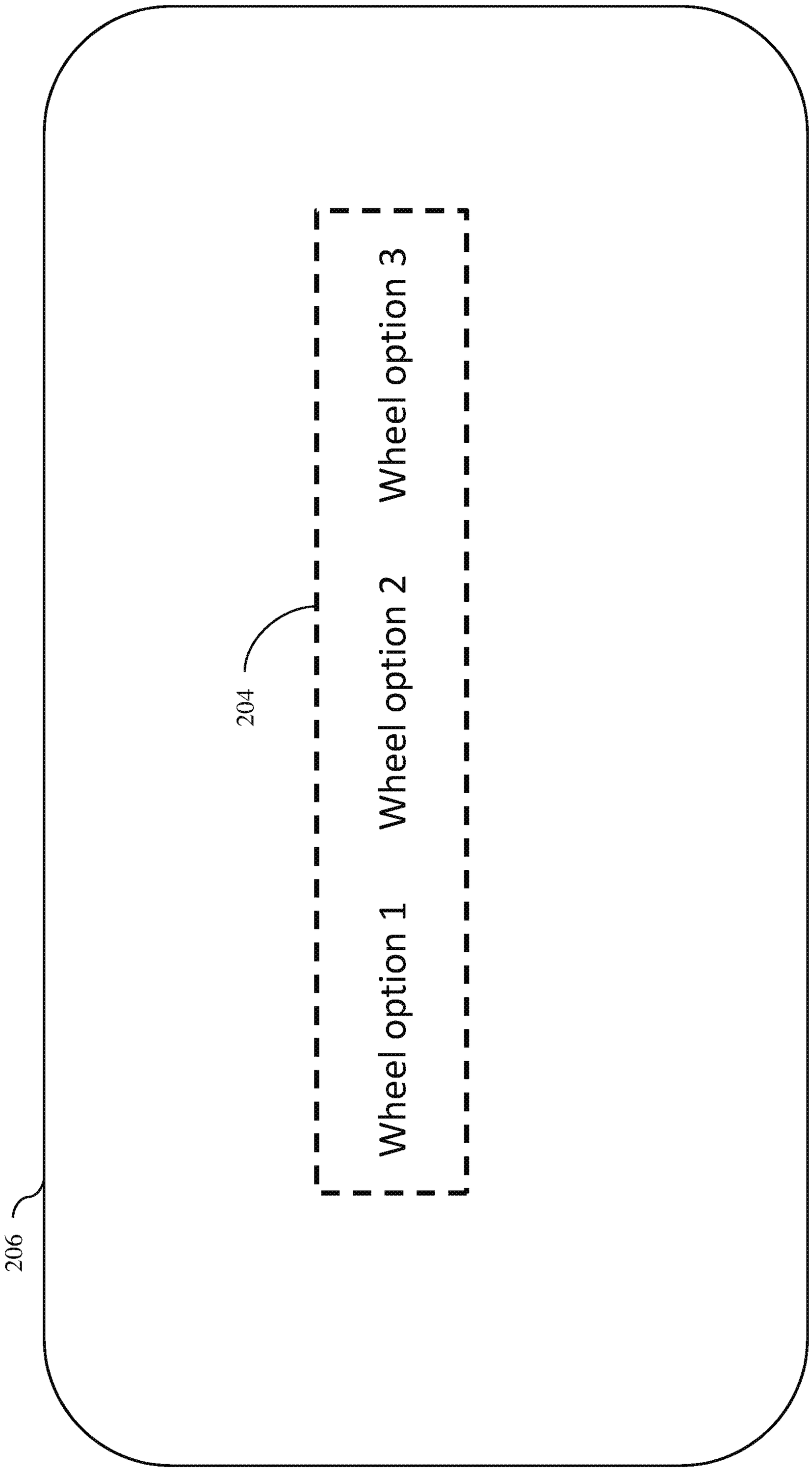


FIG. 2F

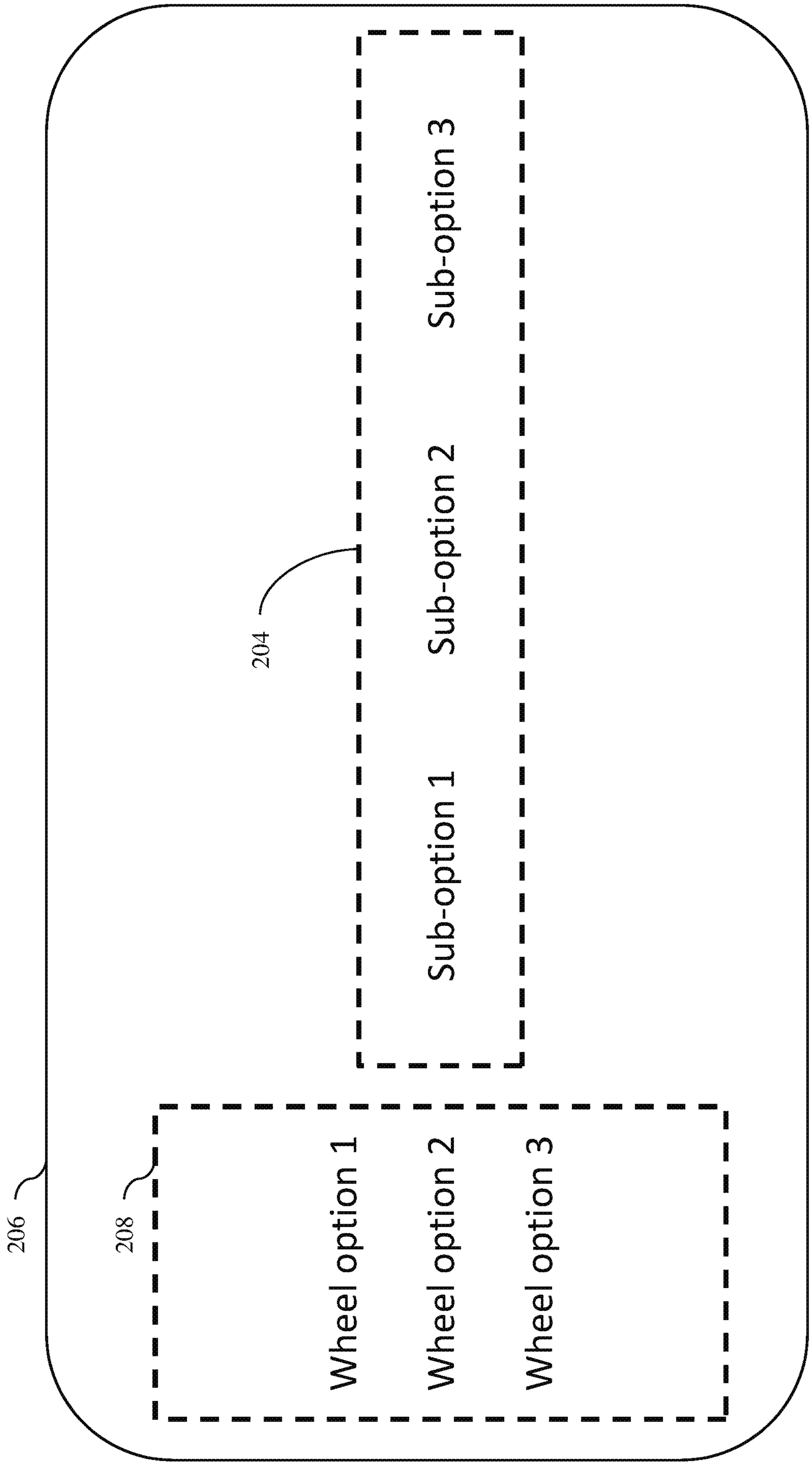

206
208
Wheel option 1
Wheel option 2
Wheel option 3
204
Sub-option 1
Sub-option 2
Sub-option 3

FIG. 2G

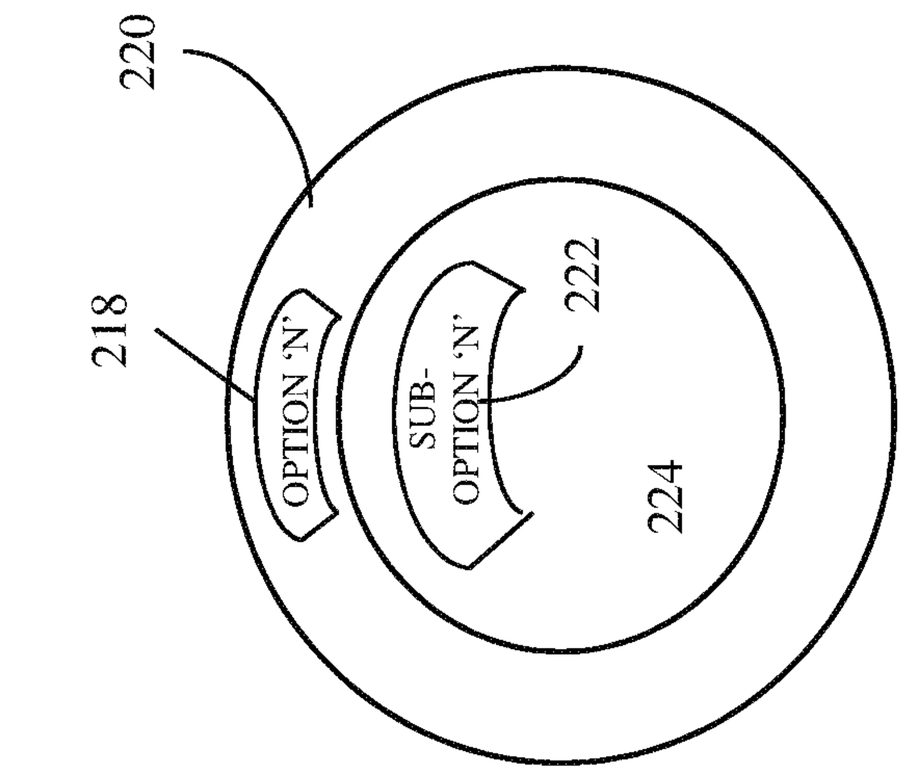


FIG. 2J

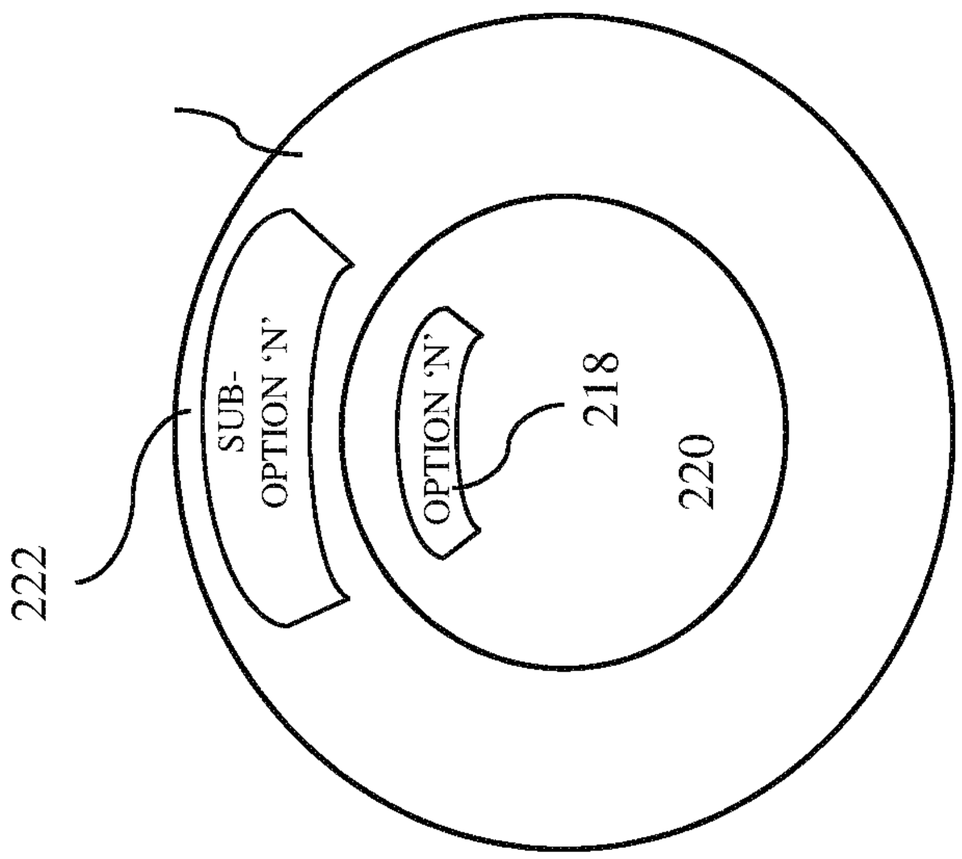


FIG. 2I

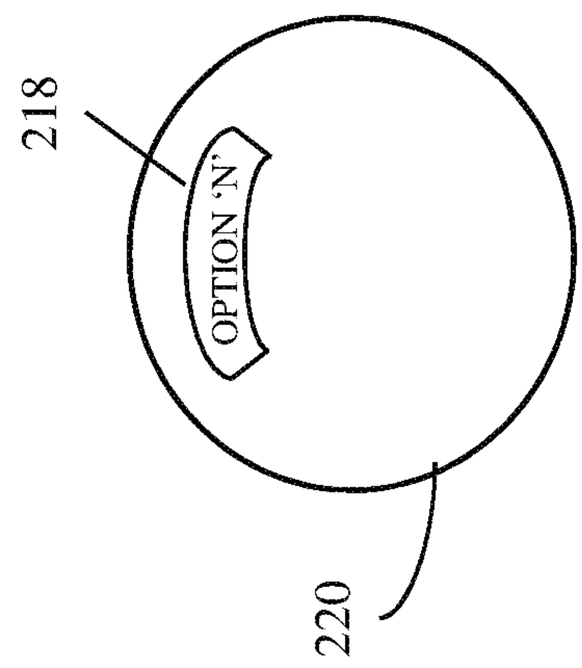


FIG. 2H

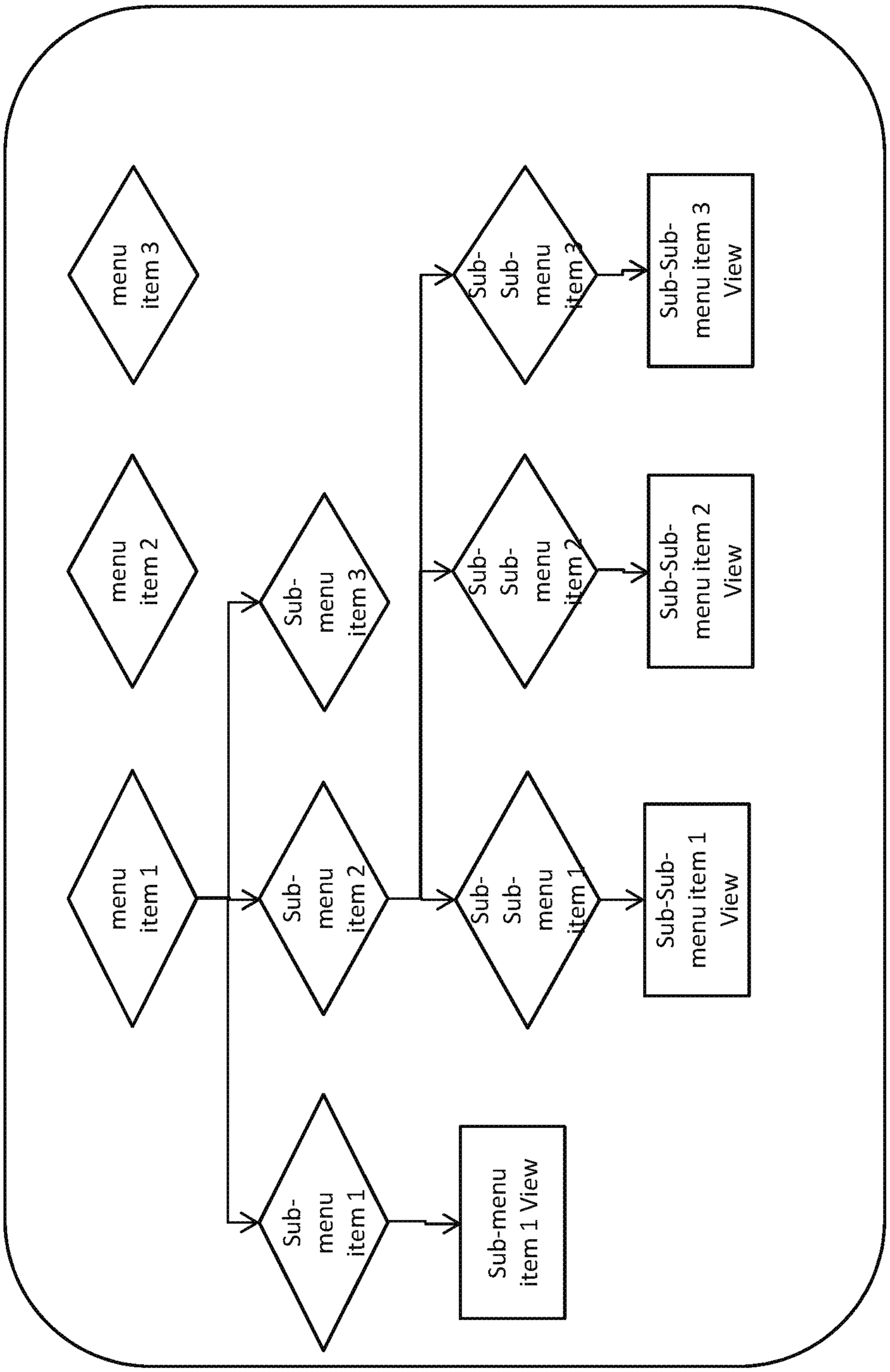

menu item 1
menu item 2
menu item 3
Sub-menu item 1
Sub-menu item 2
Sub-menu item 3
Sub-Sub-menu item 1
Sub-Sub-menu item 2
Sub-Sub-menu item 3
Sub-menu item 1 View
Sub-Sub-menu item 1 View
Sub-Sub-menu item 2 View
Sub-Sub-menu item 3 View

FIG. 2K

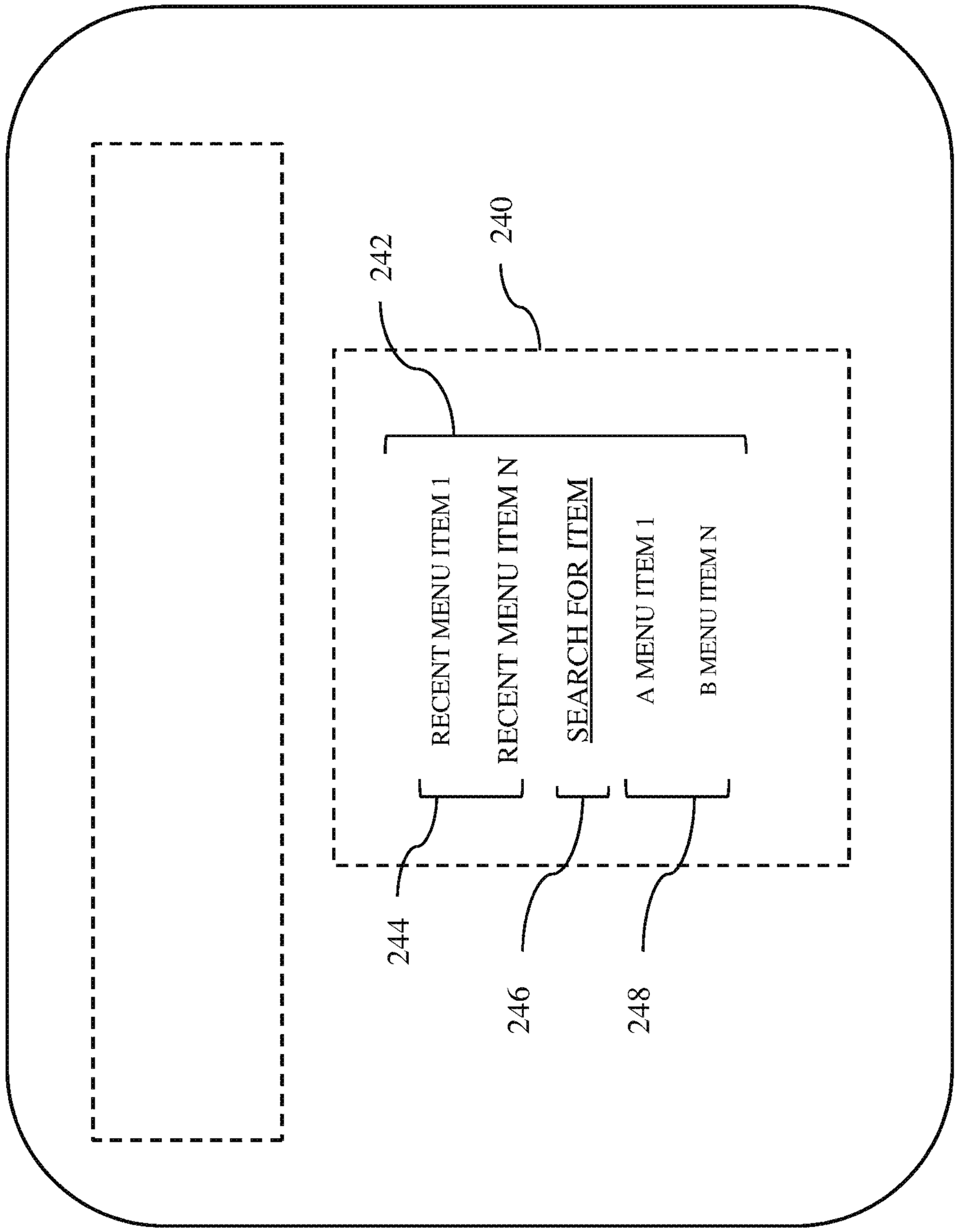

242
240
RECENT MENU ITEM 1
RECENT MENU ITEM N
SEARCH FOR ITEM
A MENU ITEM 1
B MENU ITEM N
244
246
248

FIG. 2L

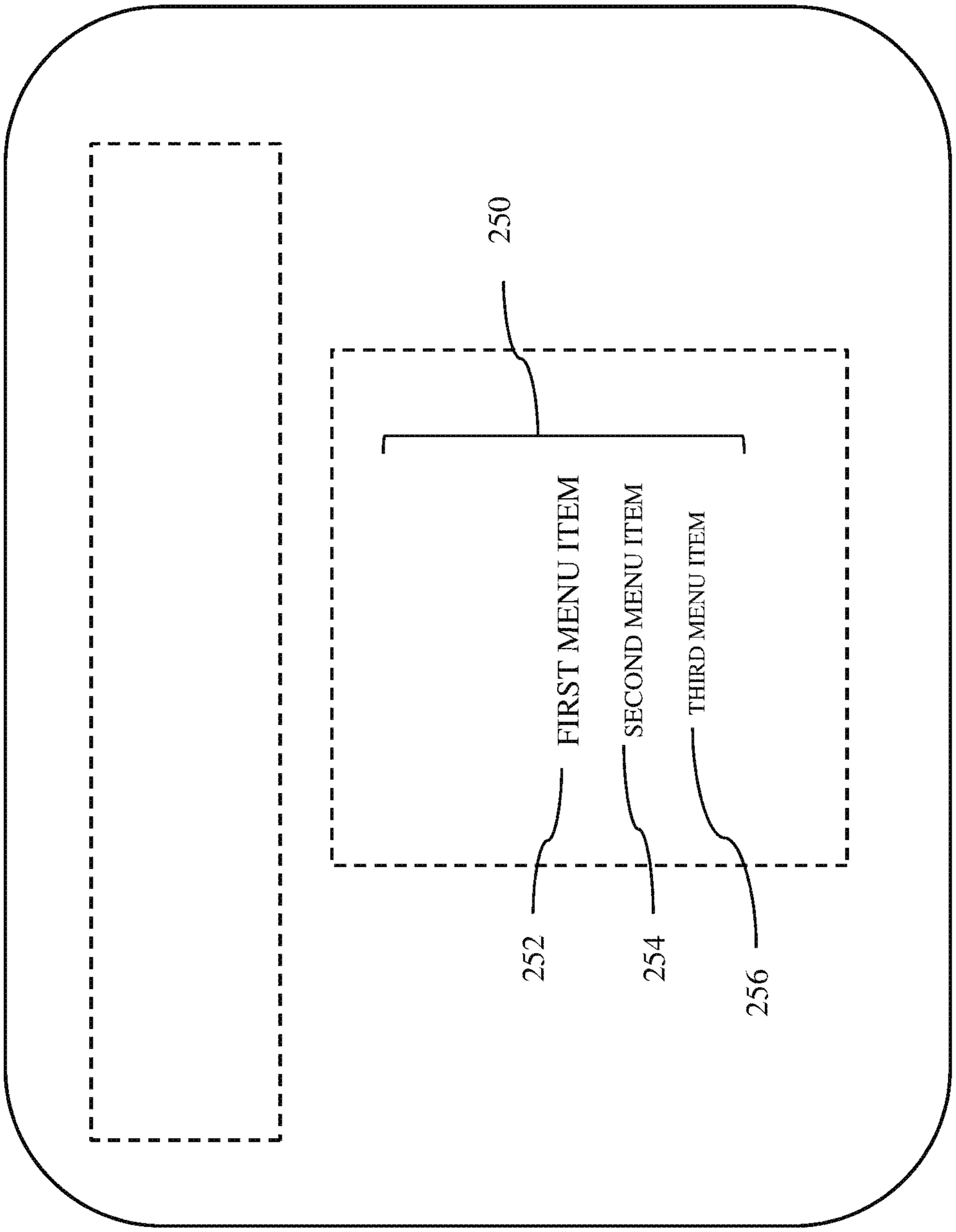

250
FIRST MENU ITEM
SECOND MENU ITEM
THIRD MENU ITEM
252
254
256

FIG. 2M

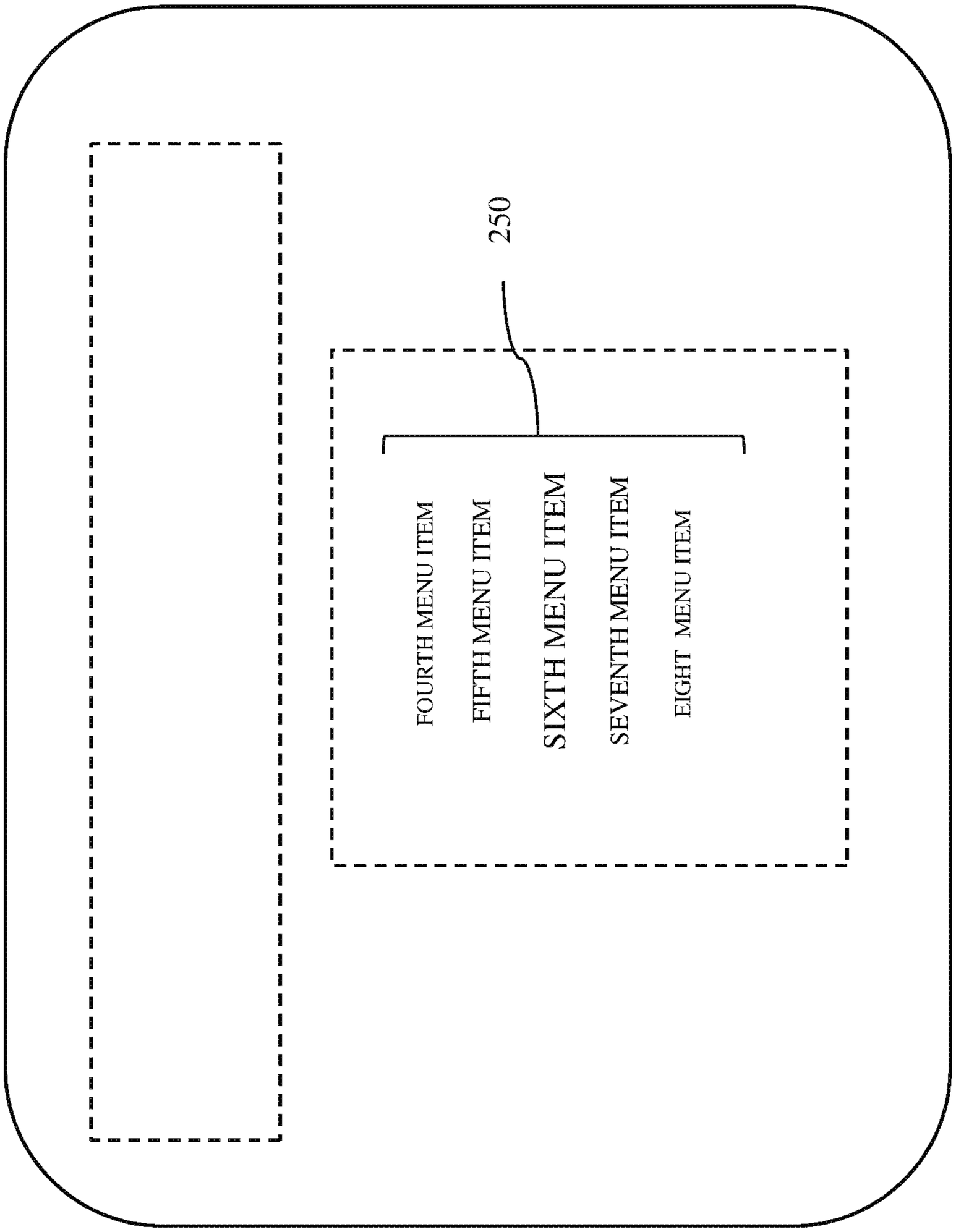

250
FOURTH MENU ITEM
FIFTH MENU ITEM
SIXTH MENU ITEM
SEVENTH MENU ITEM
EIGHT MENU ITEM

FIG. 2N

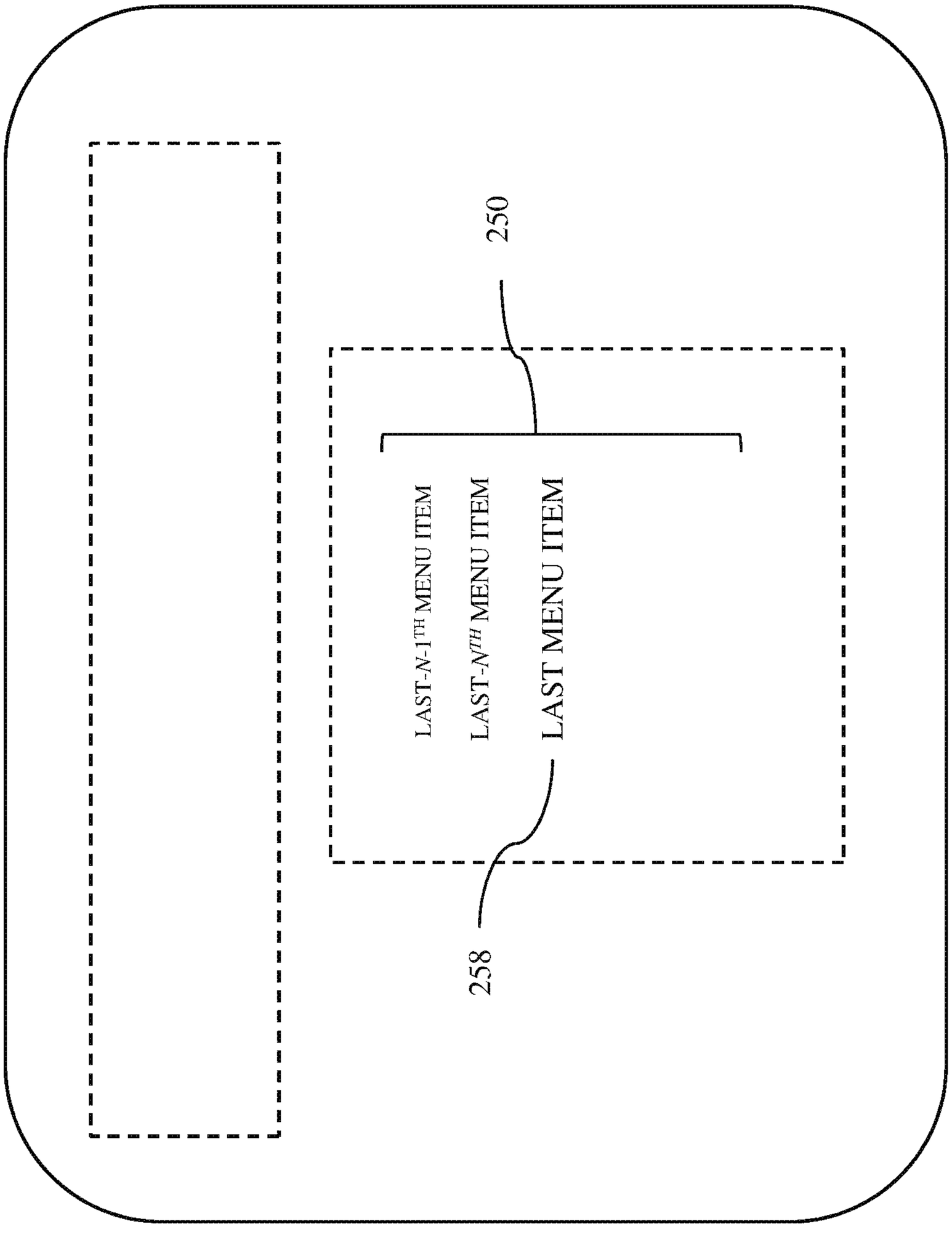


FIG. 2O

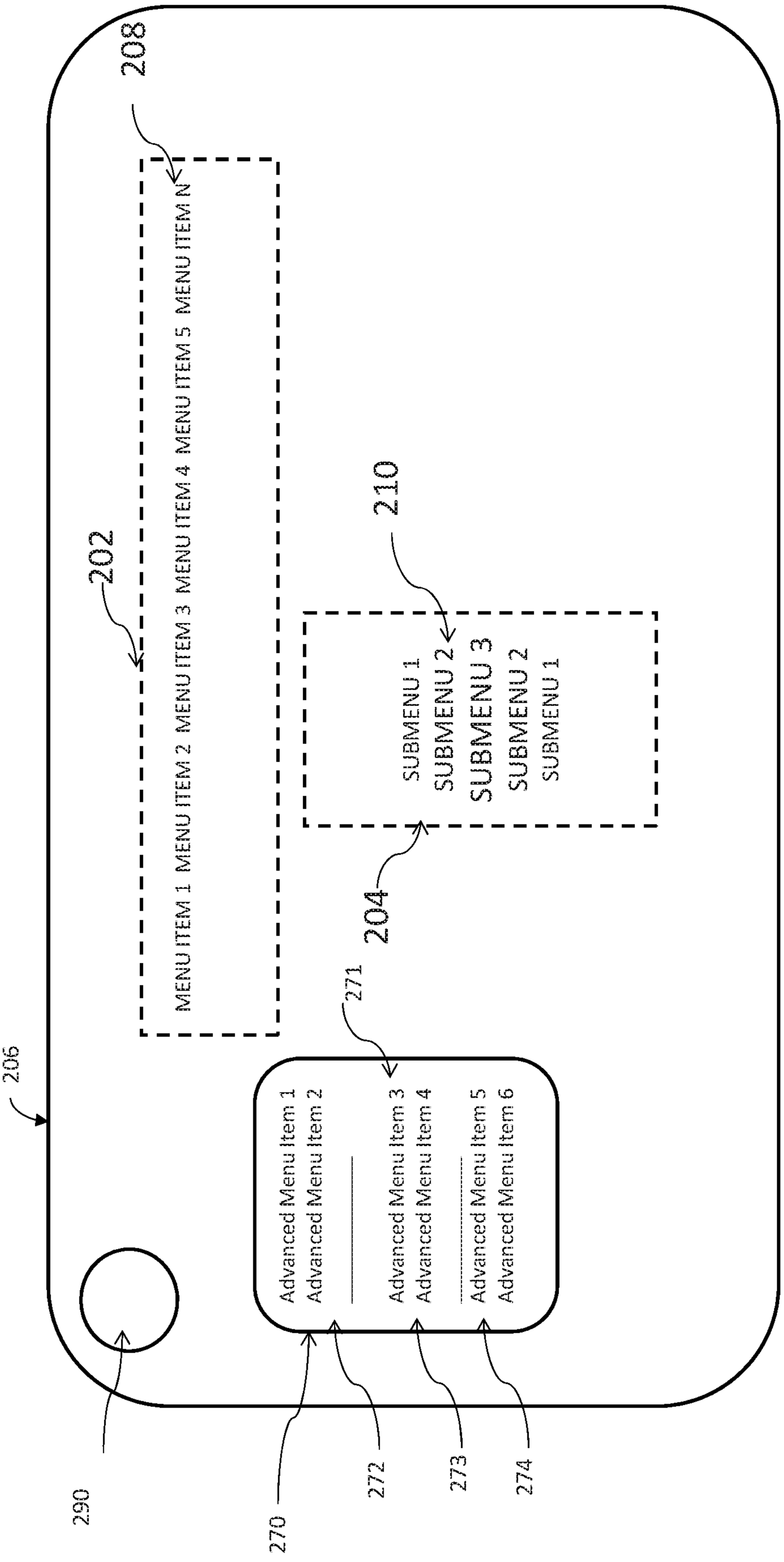

208
MENU ITEM 1 MENU ITEM 2 MENU ITEM 3 MENU ITEM 4 MENU ITEM 5 MENU ITEM N
202
210
SUBMENU 1
SUBMENU 2
SUBMENU 3
SUBMENU 2
SUBMENU 1
204
206
271
Advanced Menu Item 1
Advanced Menu Item 2
Advanced Menu Item 3
Advanced Menu Item 4
Advanced Menu Item 5
Advanced Menu Item 6
290
270
272
273
274

FIG. 2P

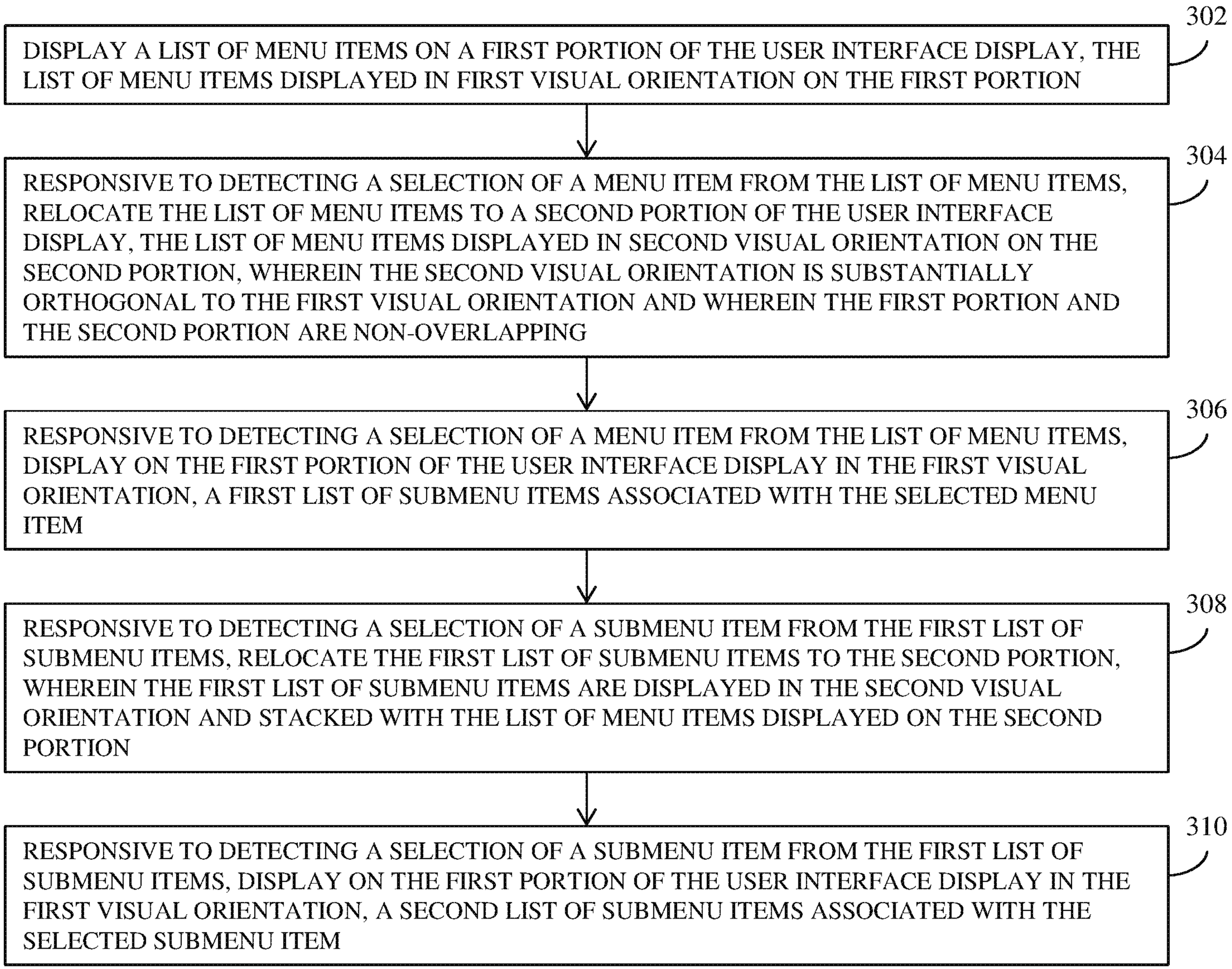

DISPLAY A LIST OF MENU ITEMS ON A FIRST PORTION OF THE USER INTERFACE DISPLAY, THE LIST OF MENU ITEMS DISPLAYED IN FIRST VISUAL ORIENTATION ON THE FIRST PORTION
302
RESPONSIVE TO DETECTING A SELECTION OF A MENU ITEM FROM THE LIST OF MENU ITEMS, RELOCATE THE LIST OF MENU ITEMS TO A SECOND PORTION OF THE 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
304
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
306
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
308
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
310

FIG. 3

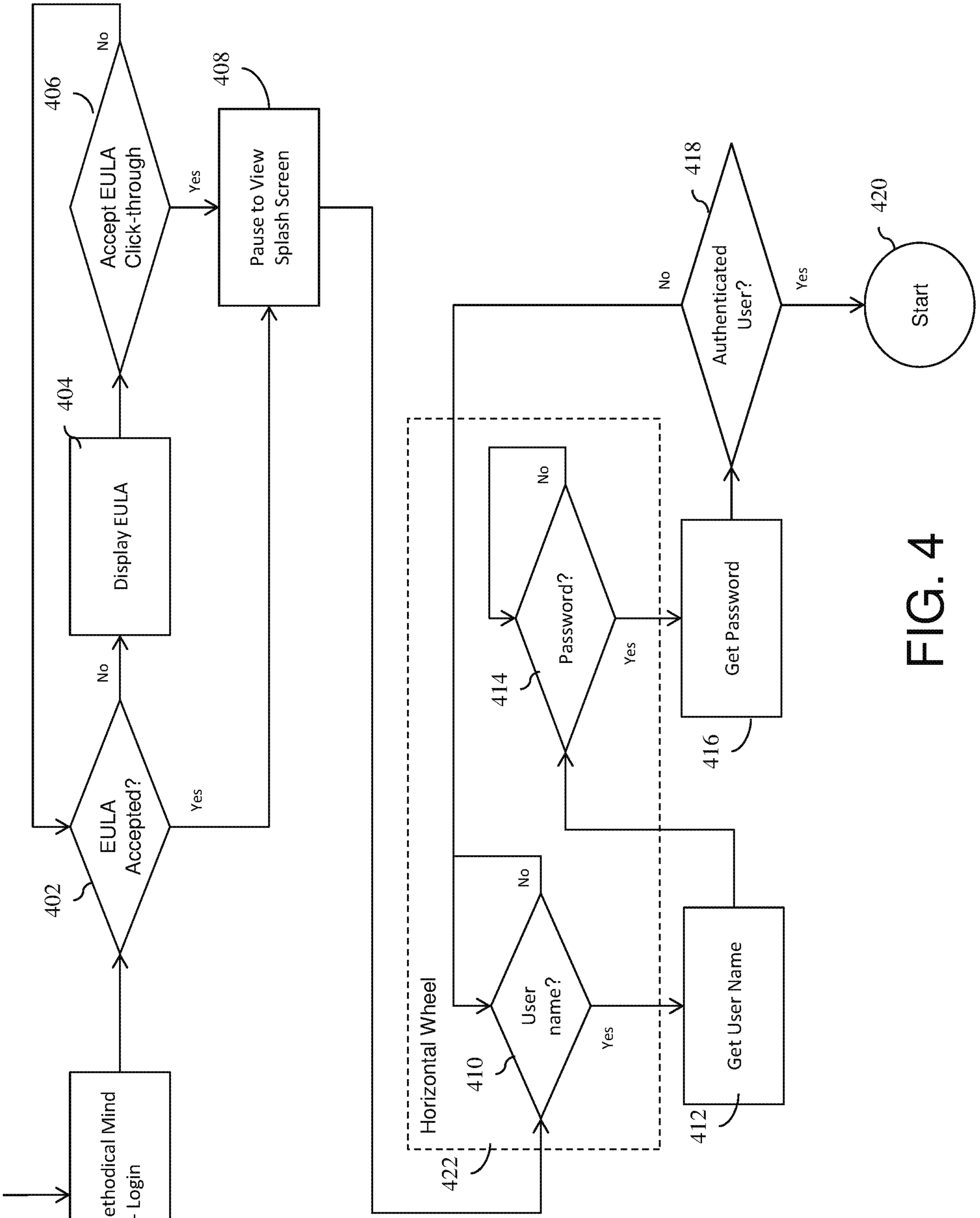

Launch Methodical Mind
-- Login
EULA Accepted?
402
Yes
No
Display EULA
404
EULA Accepted?
406
Yes
No
Pause to View Splash Screen
408
Horizontal Wheel
User name?
410
Yes
No
Get User Name
412
Password?
414
Yes
No
Get Password
416
Authenticated User?
418
Yes
No
Start
420
422

FIG. 4

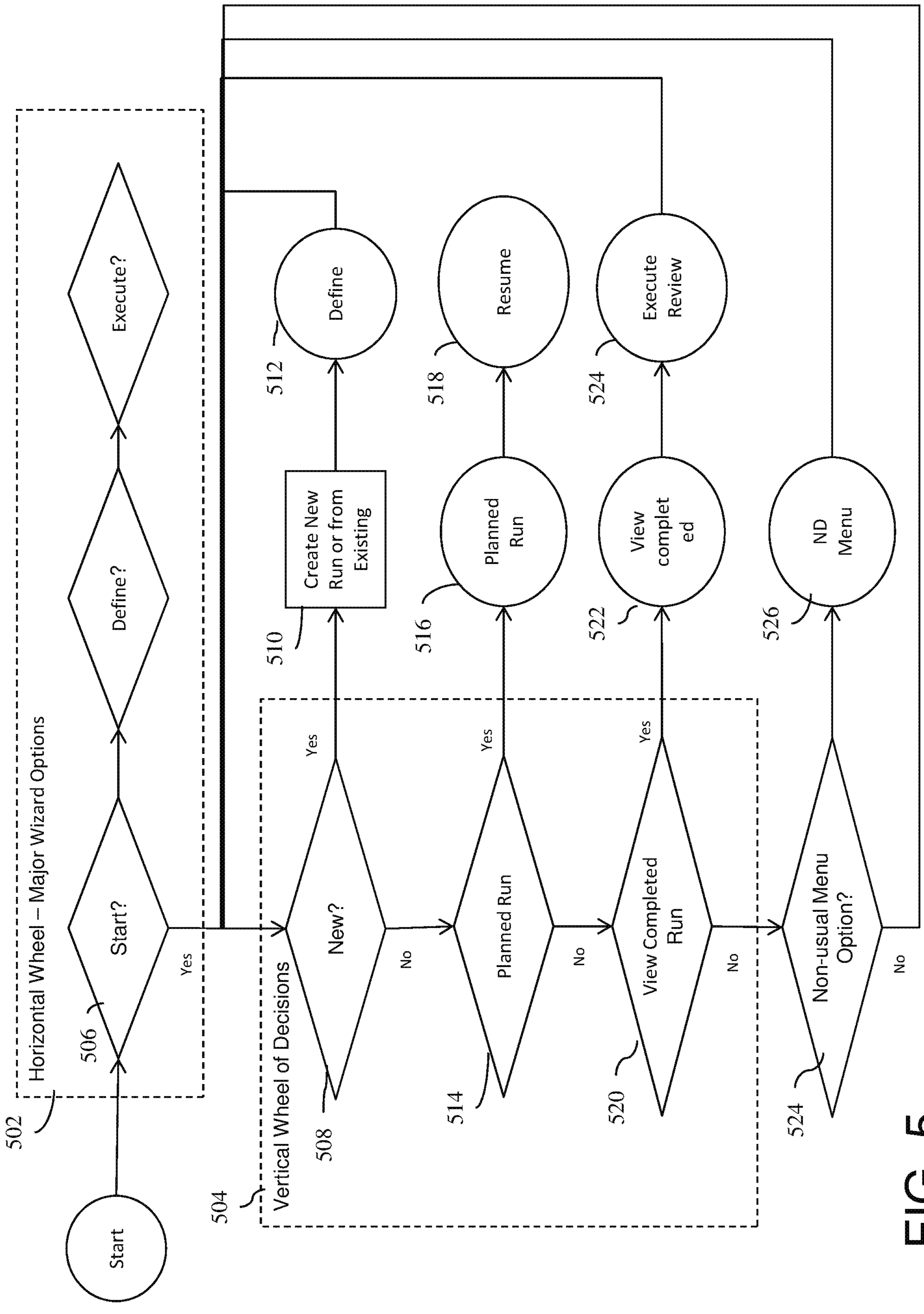

Start
502
Horizontal Wheel – Major Wizard Options
Start?
506
Yes
Define?
Execute?
Vertical Wheel of Decisions
504
508
New?
Yes
No
Create New Run or from Existing
510
Define
512
Planned Run?
514
Yes
No
Planned Run
516
Resume
518
View Completed Run?
520
Yes
No
View completed
522
Execute Review
524
Non-usual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

FIG. 5

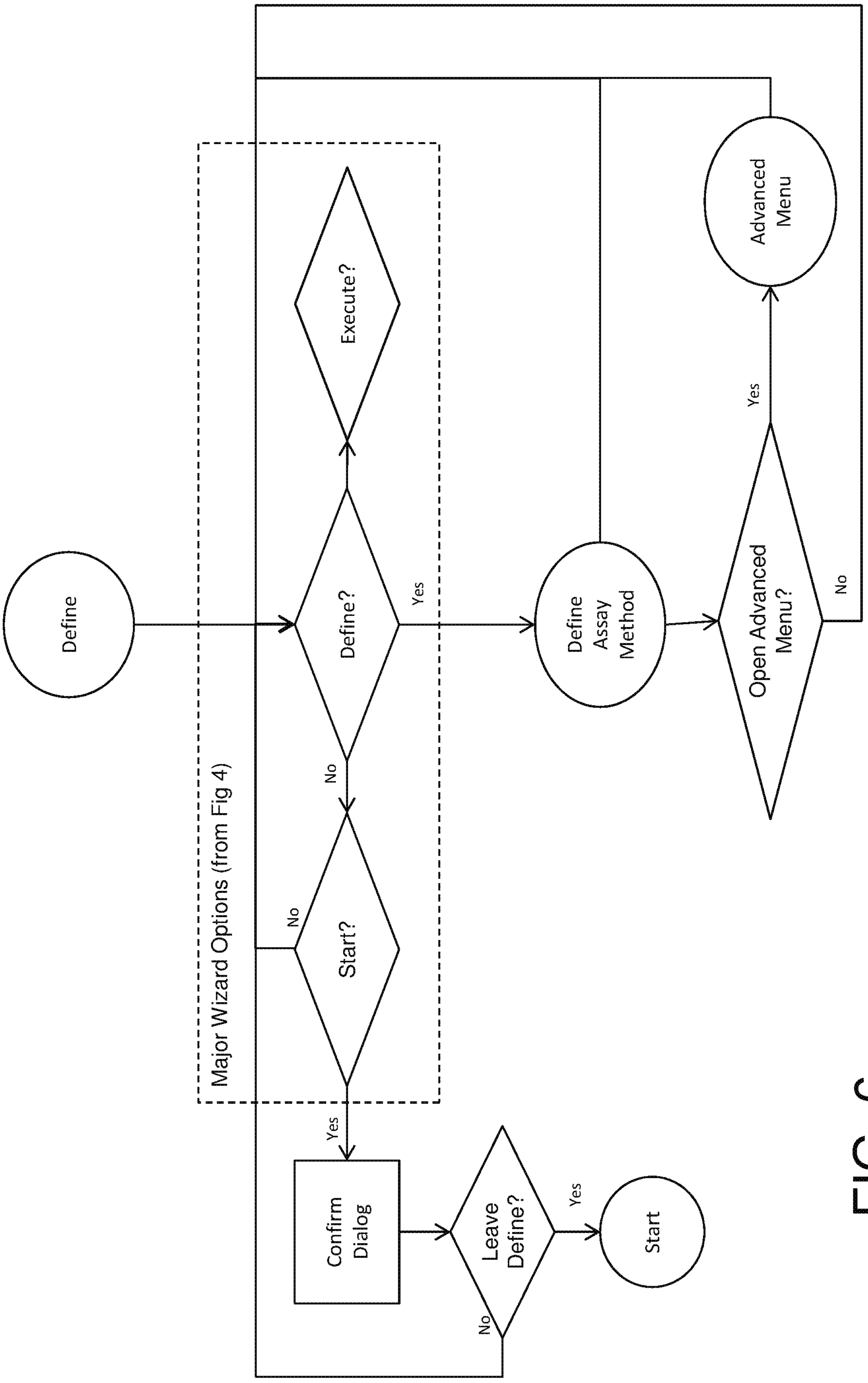

Define
Define?
Yes
No
Execute?
Major Wizard Options (from Fig 4)
No
Start?
Yes
Confirm Dialog
Leave Define?
No
Yes
Start
Define Assay Method
Open Advanced Menu?
Yes
No
Advanced Menu

FIG. 6

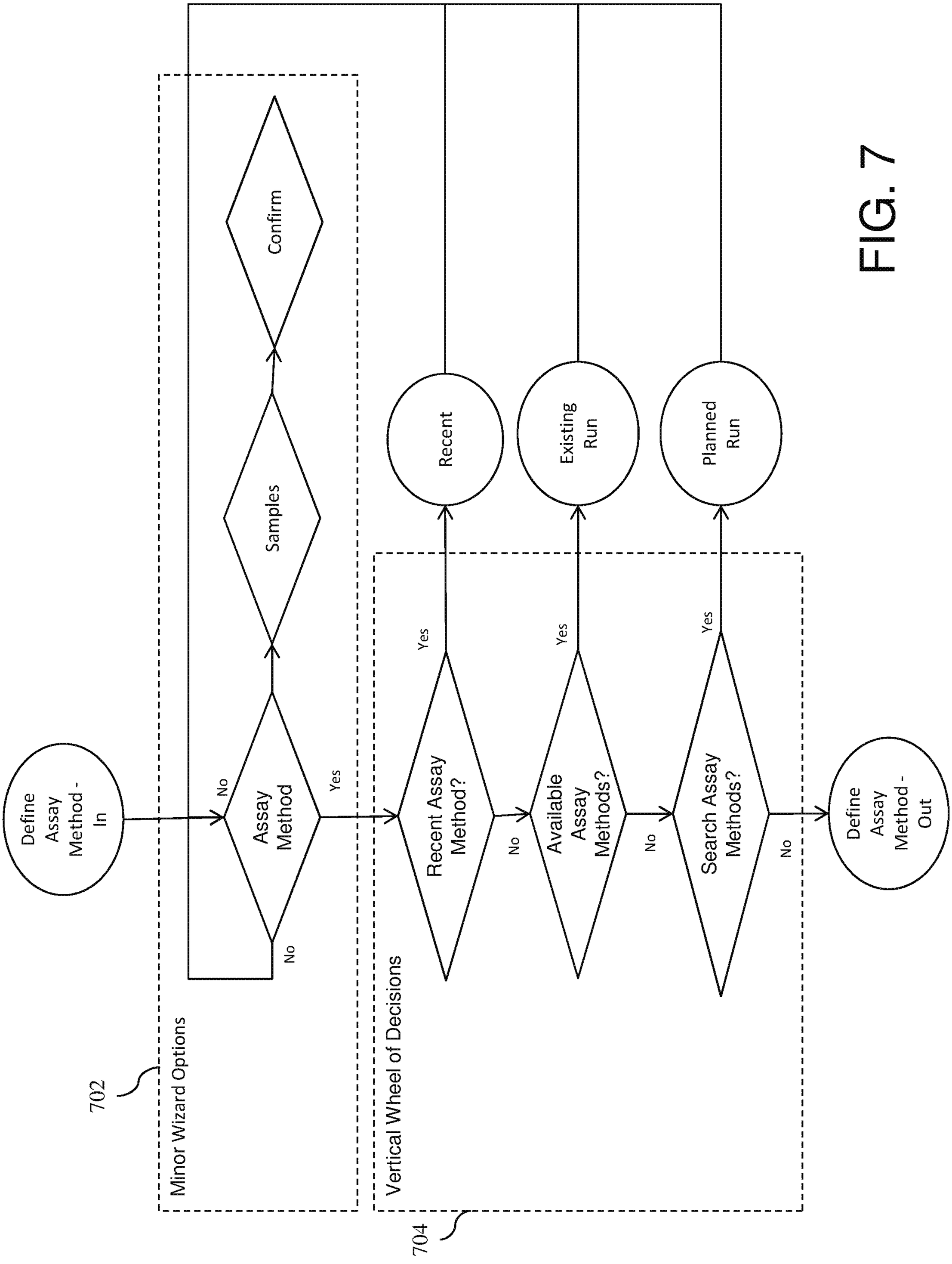

Define Assay Method - In
Assay Method
No
Yes
Confirm
Samples
Recent
Existing Run
Planned Run
Recent Assay Method?
Available Assay Methods?
Search Assay Methods?
Yes
No
Define Assay Method - Out
Minor Wizard Options
Vertical Wheel of Decisions
702
704

FIG. 7

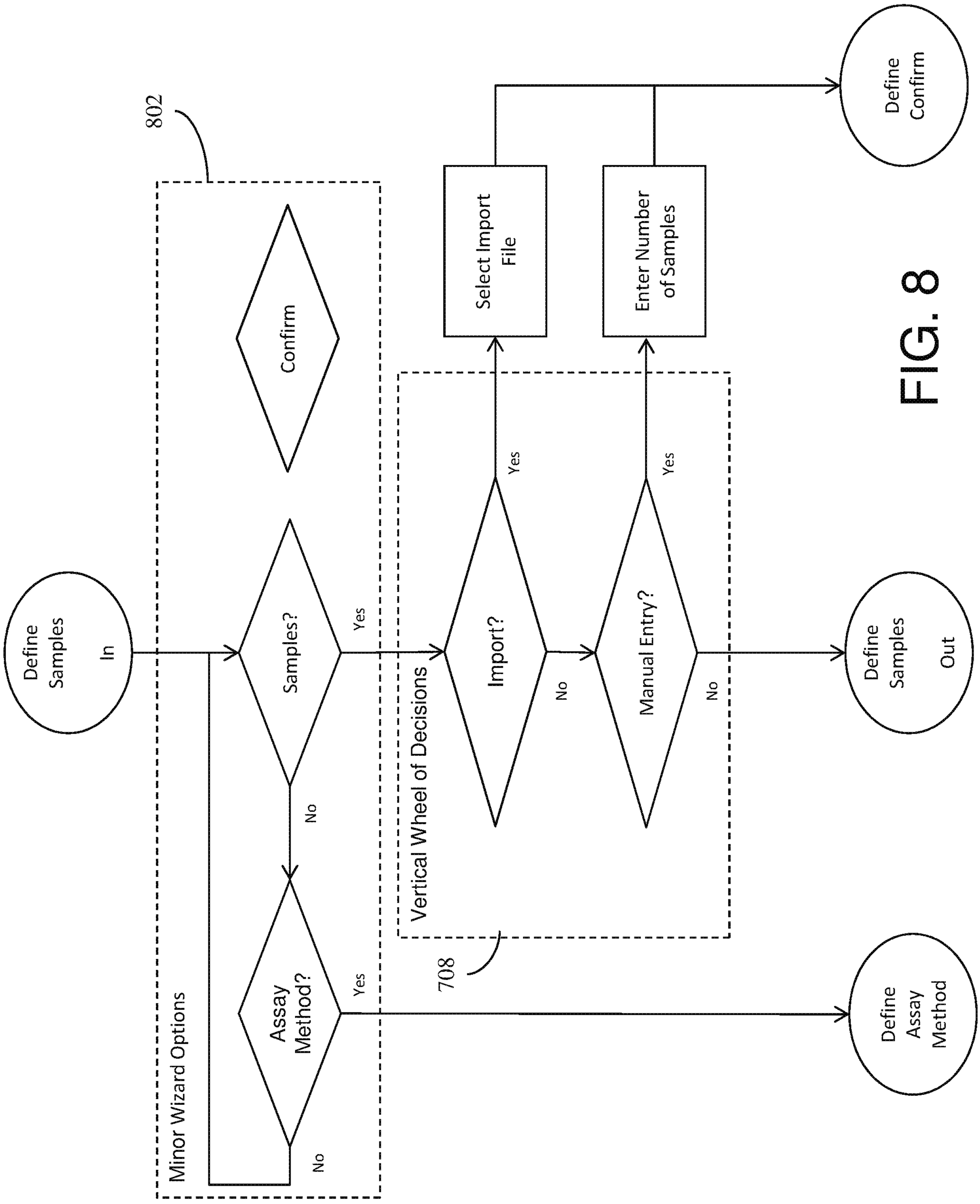

802
Minor Wizard Options
Define Samples In
Samples?
Yes
No
Assay Method?
Yes
No
Vertical Wheel of Decisions
Import?
No
Manual Entry?
No
Select Import File
Yes
Enter Number of Samples
Yes
Define Confirm
Confirm
Define Samples Out
Define Assay Method
708

FIG. 8

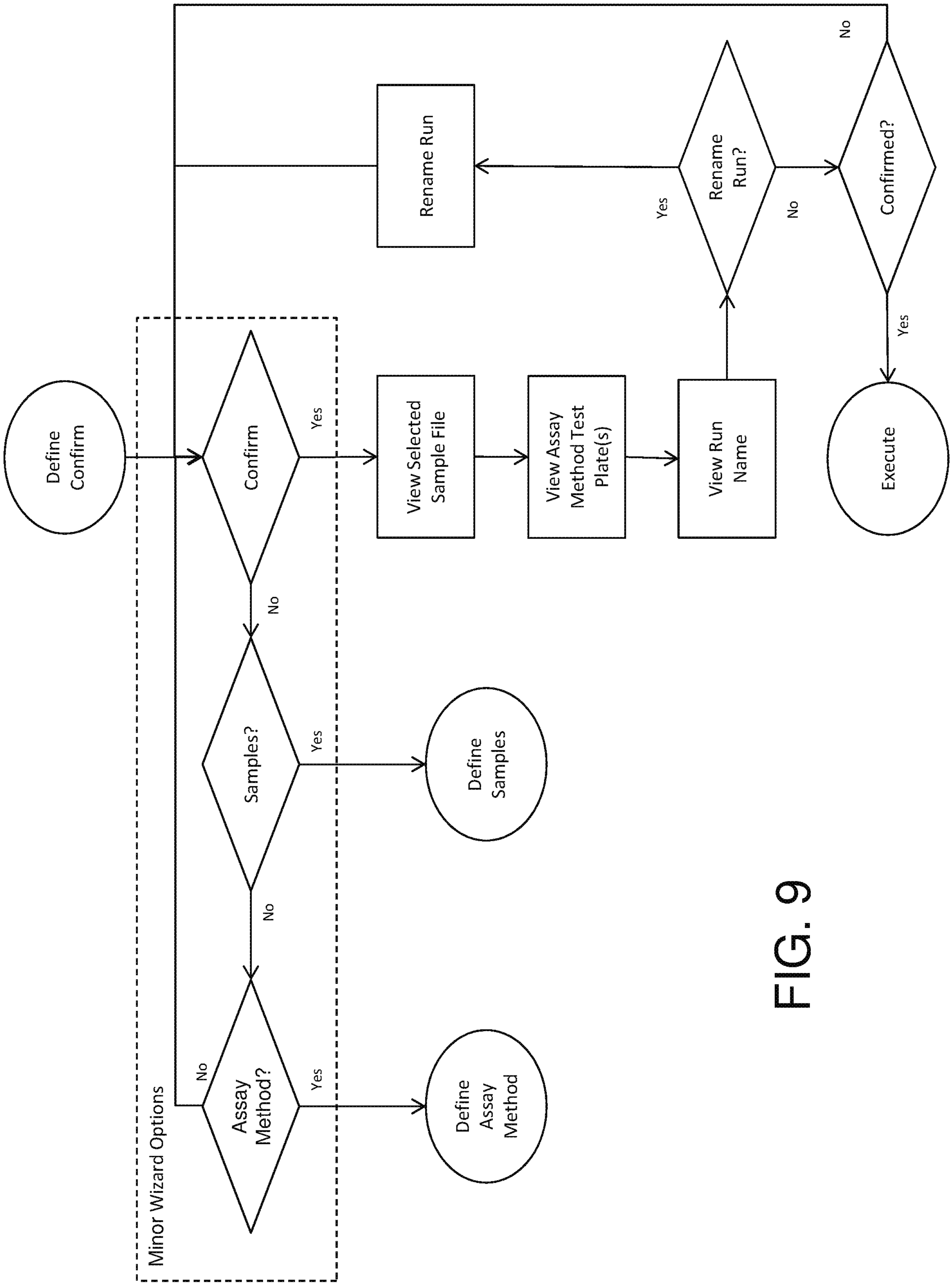

Minor Wizard Options
Define Confirm
Confirm
Yes
No
Samples?
Yes
No
Define Samples
Assay Method?
No
Yes
Define Assay Method
View Selected Sample File
View Assay Method Test Plate(s)
View Run Name
Rename Run?
Yes
No
Rename Run
Confirmed?
No
Yes
Execute

FIG. 9

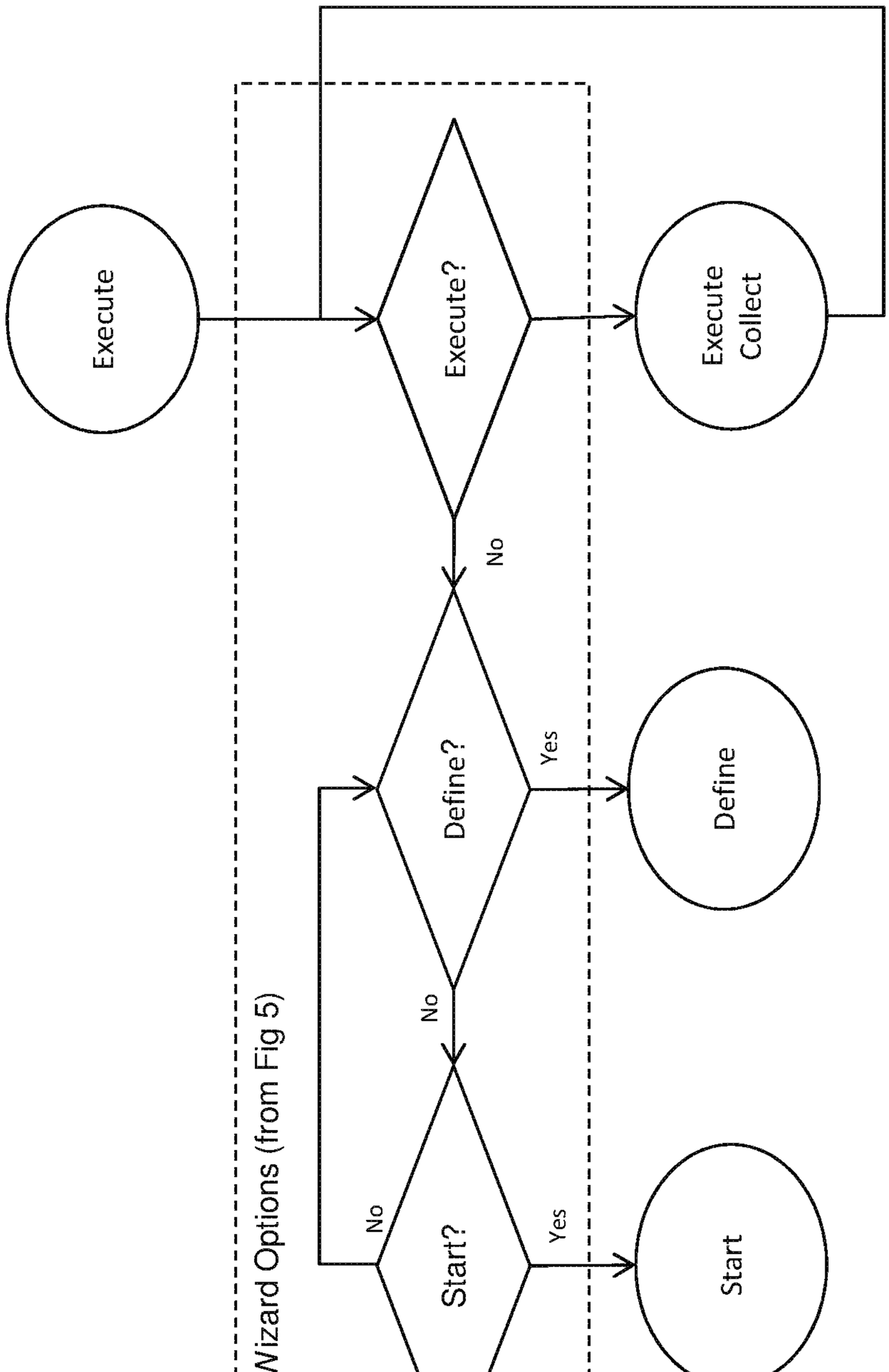

Major Wizard Options (from Fig 5)
Execute
Execute?
No
Execute
Collect
Define?
Yes
Define
No
Start?
No
Yes
Start

FIG. 10

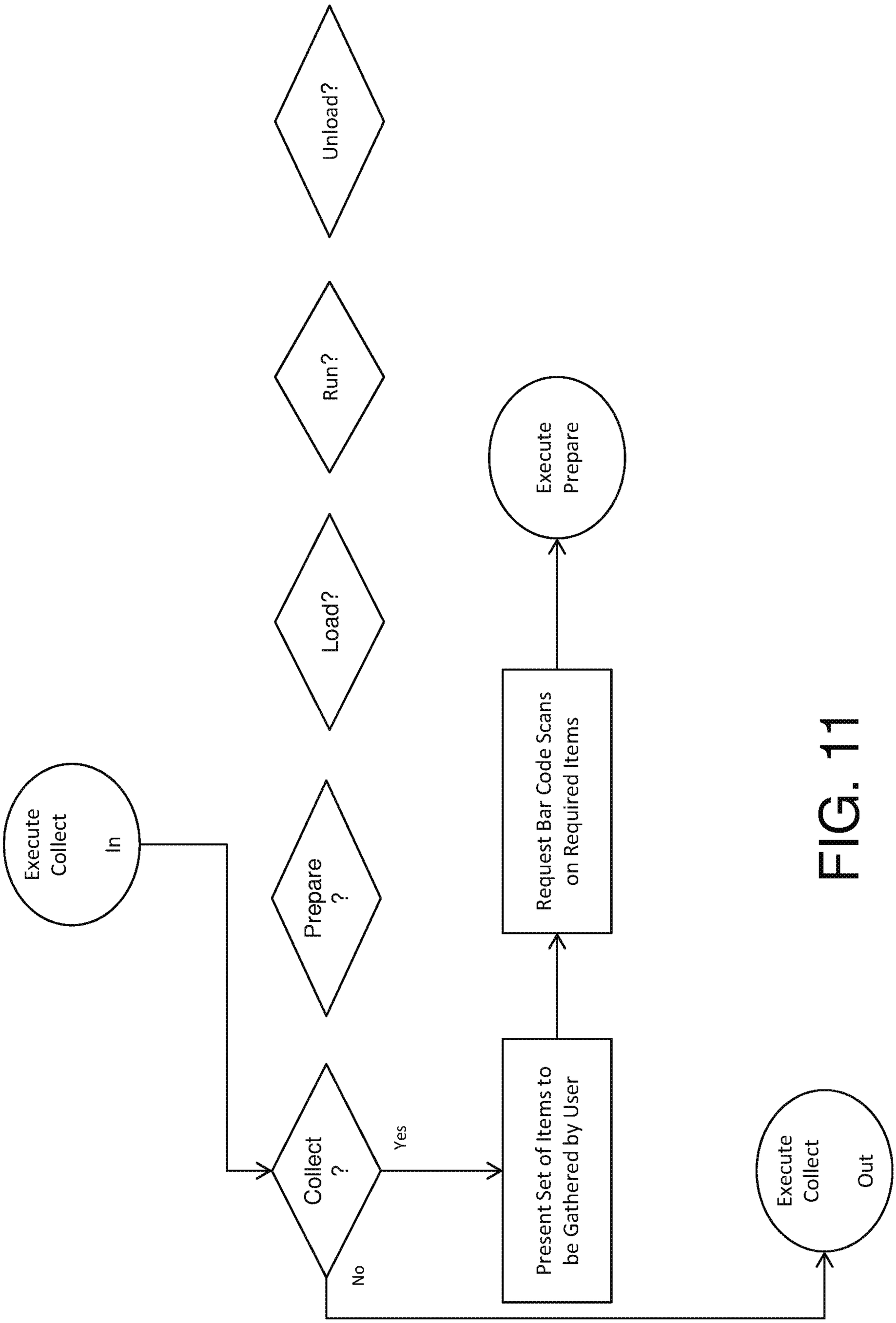

Unload?
Run?
Load?
Execute
Prepare
Execute
Collect
In
Prepare
?
Request Bar Code Scans
on Required Items
Collect
?
Yes
No
Present Set of Items to
be Gathered by User
Execute
Collect
Out

FIG. 11

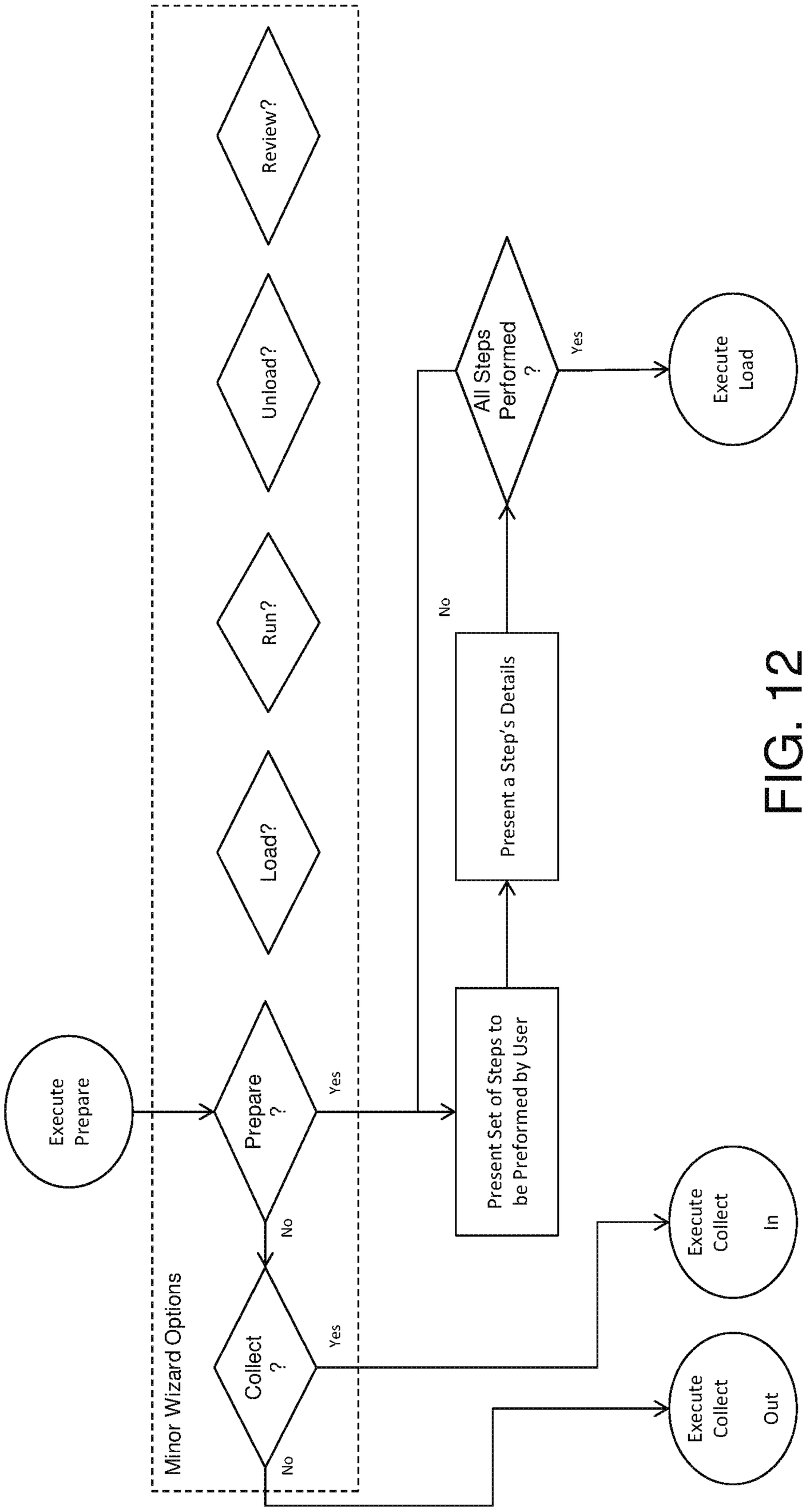

Minor Wizard Options
Execute Prepare
Prepare ?
Yes
No
Present Set of Steps to be Preformed by User
Present a Step's Details
All Steps Performed ?
Yes
No
Execute Load
Collect ?
Yes
No
Execute Collect In
Execute Collect Out
Run?
Unload?
Load?
Review?

FIG. 12

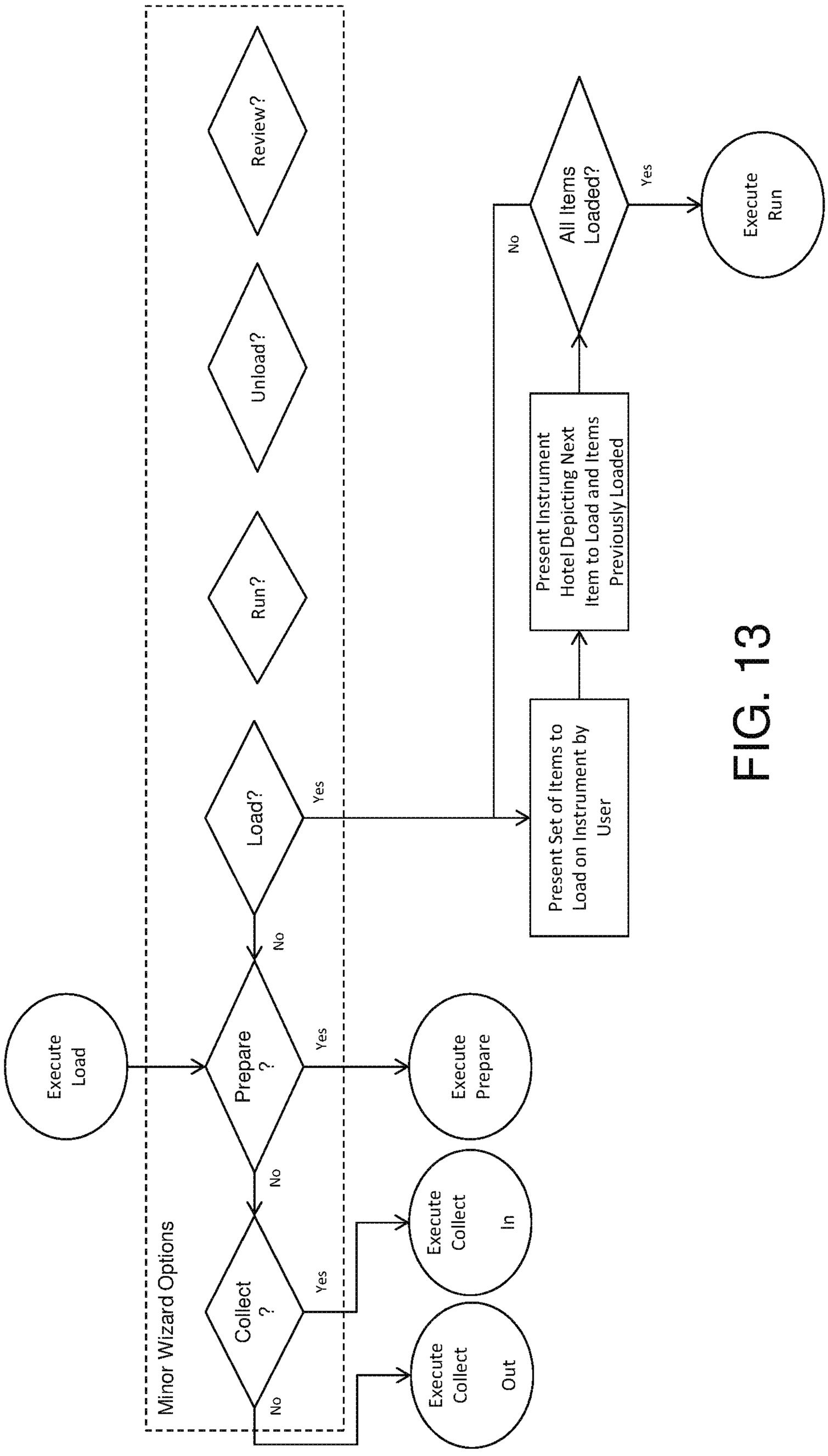

Minor Wizard Options
Review?
Unload?
Run?
Load?
Yes
No
Present Set of Items to Load on Instrument by User
Present Instrument Hotel Depicting Next Item to Load and Items Previously Loaded
All Items Loaded?
No
Yes
Execute Run
Execute Load
Prepare ?
Yes
No
Execute Prepare
Collect ?
Yes
No
Execute Collect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

FIG. 13

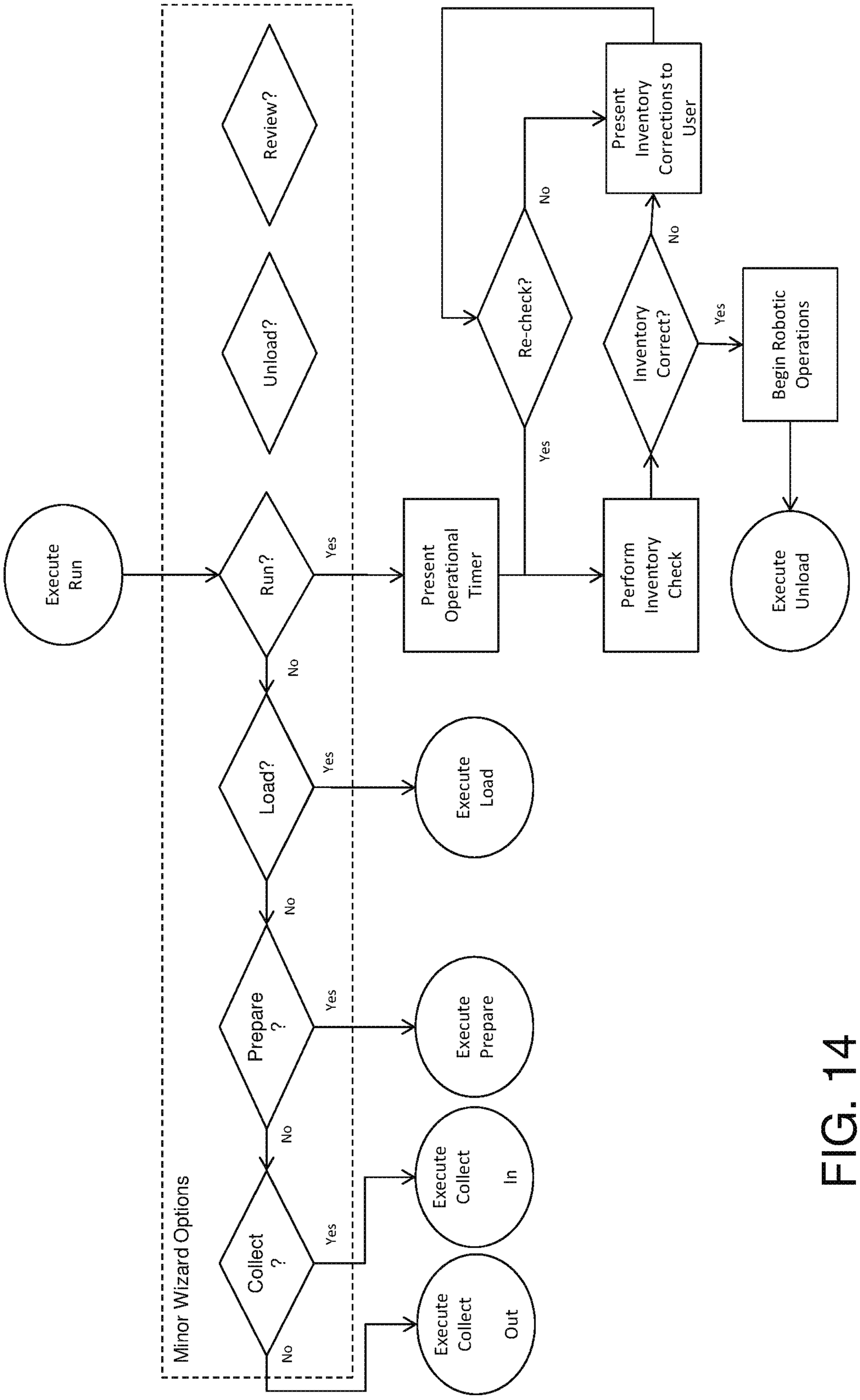

Minor Wizard Options
Review?
Unload?
Run?
Yes
No
Load?
Yes
No
Prepare ?
Yes
No
Collect ?
Yes
No
Execute Run
Present Operational Timer
Re-check?
Yes
No
Present Inventory Corrections to User
Perform Inventory Check
Inventory Correct?
Yes
No
Begin Robotic Operations
Execute Unload
Execute Load
Execute Prepare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

FIG. 14

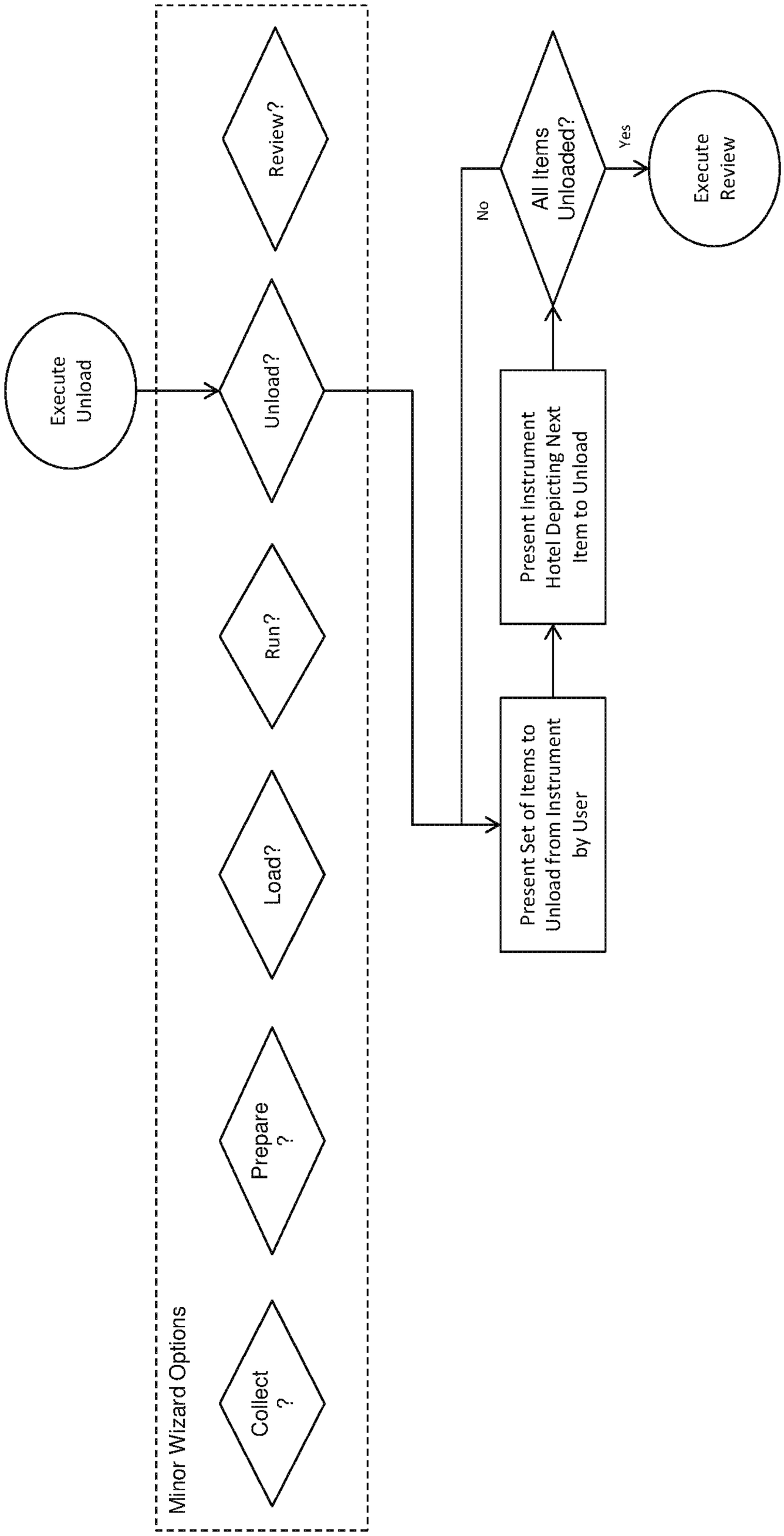

Review?
Execute Unload
Unload?
Run?
Load?
Prepare ?
Minor Wizard Options
Collect ?
All Items Unloaded?
Yes
No
Execute Review
Present Instrument Hotel Depicting Next Item to Unload
Present Set of Items to Unload from Instrument by User

FIG. 15

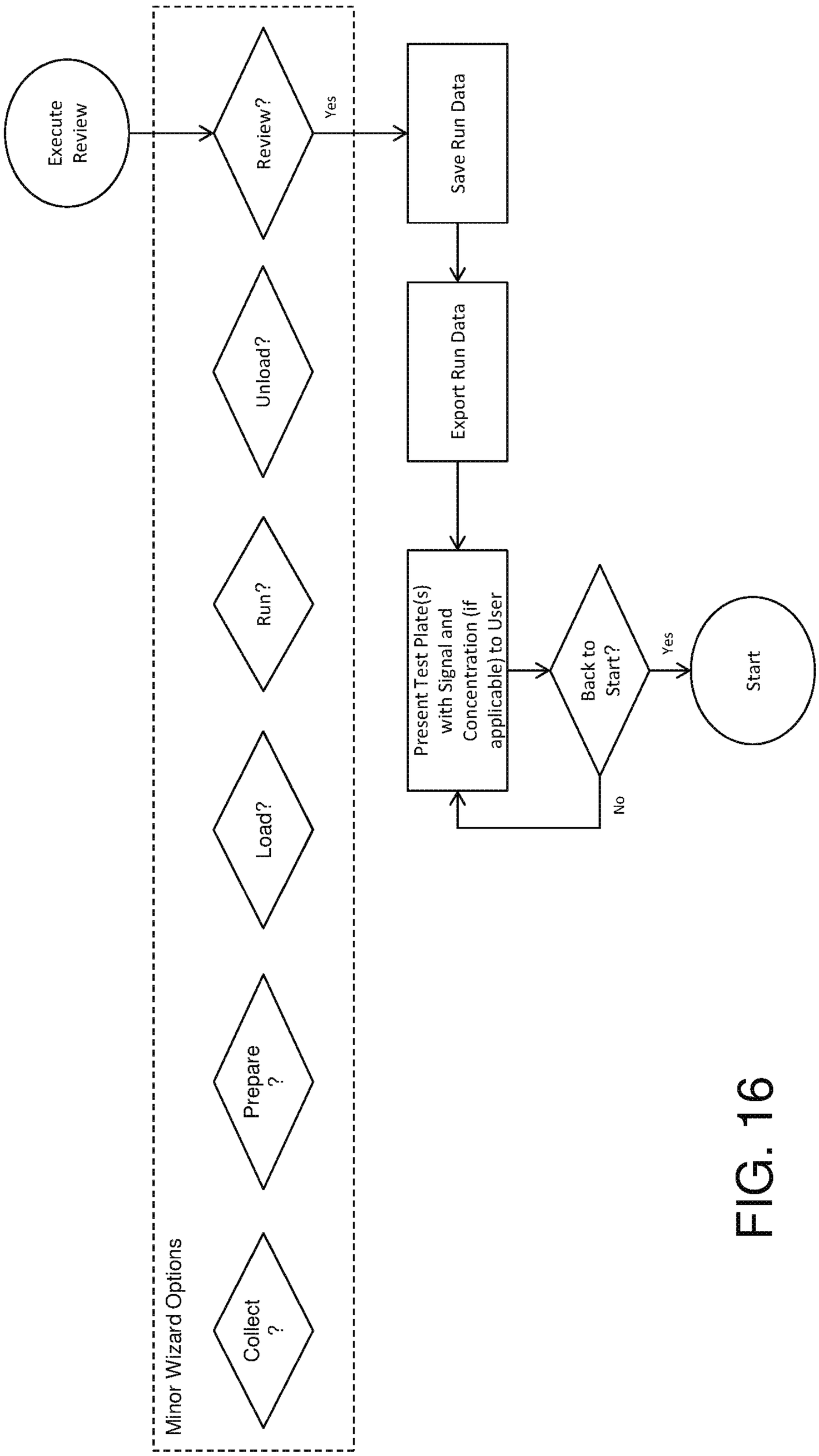
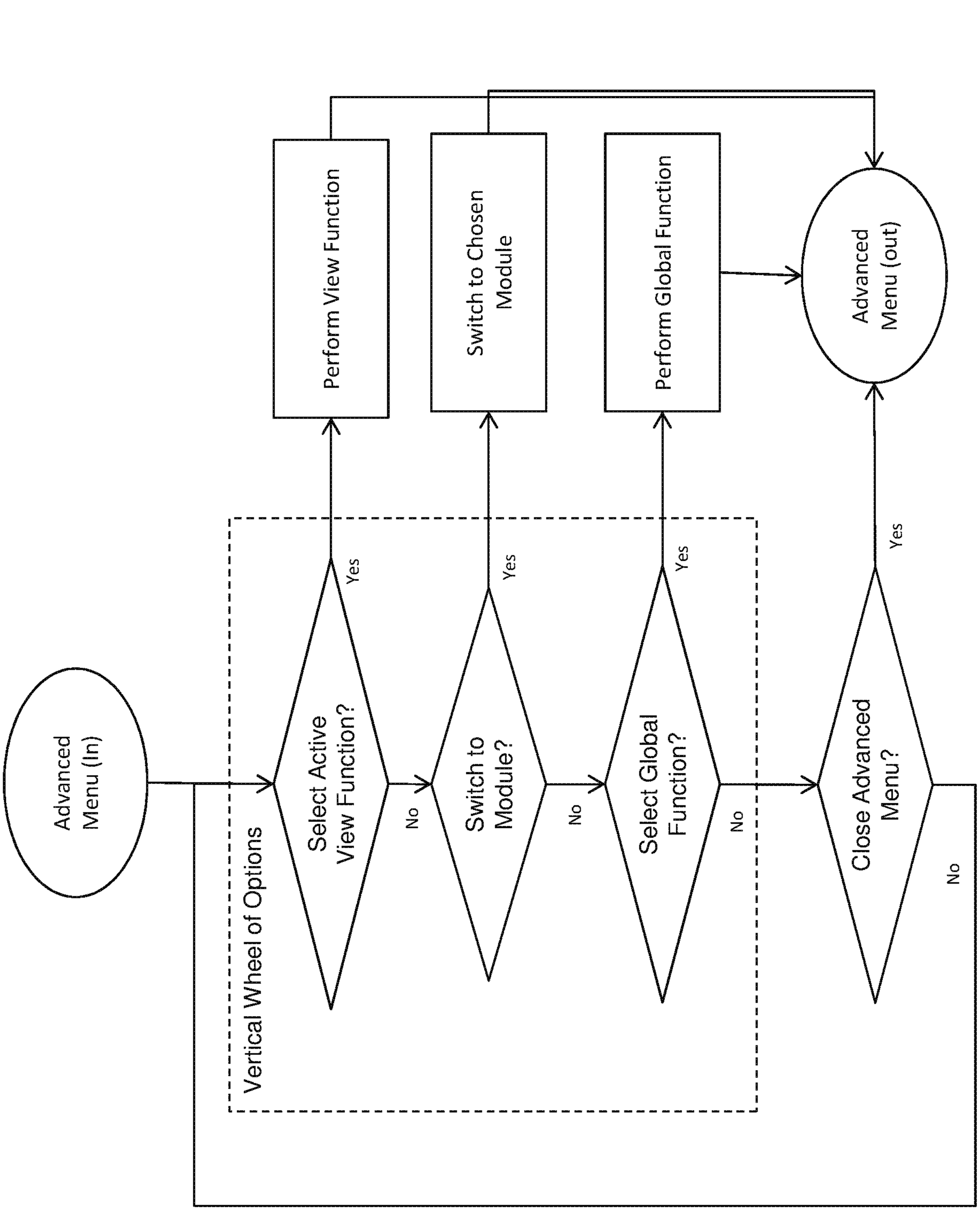

Execute Review
Review?
Yes
Save Run Data
Export Run Data
Present Test Plate(s) with Signal and Concentration (if applicable) to User
Back to Start?
Yes
Start
No
Minor Wizard Options
Collect ?
Prepare ?
Load?
Run?
Unload?

FIG. 16

FIG. 1


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

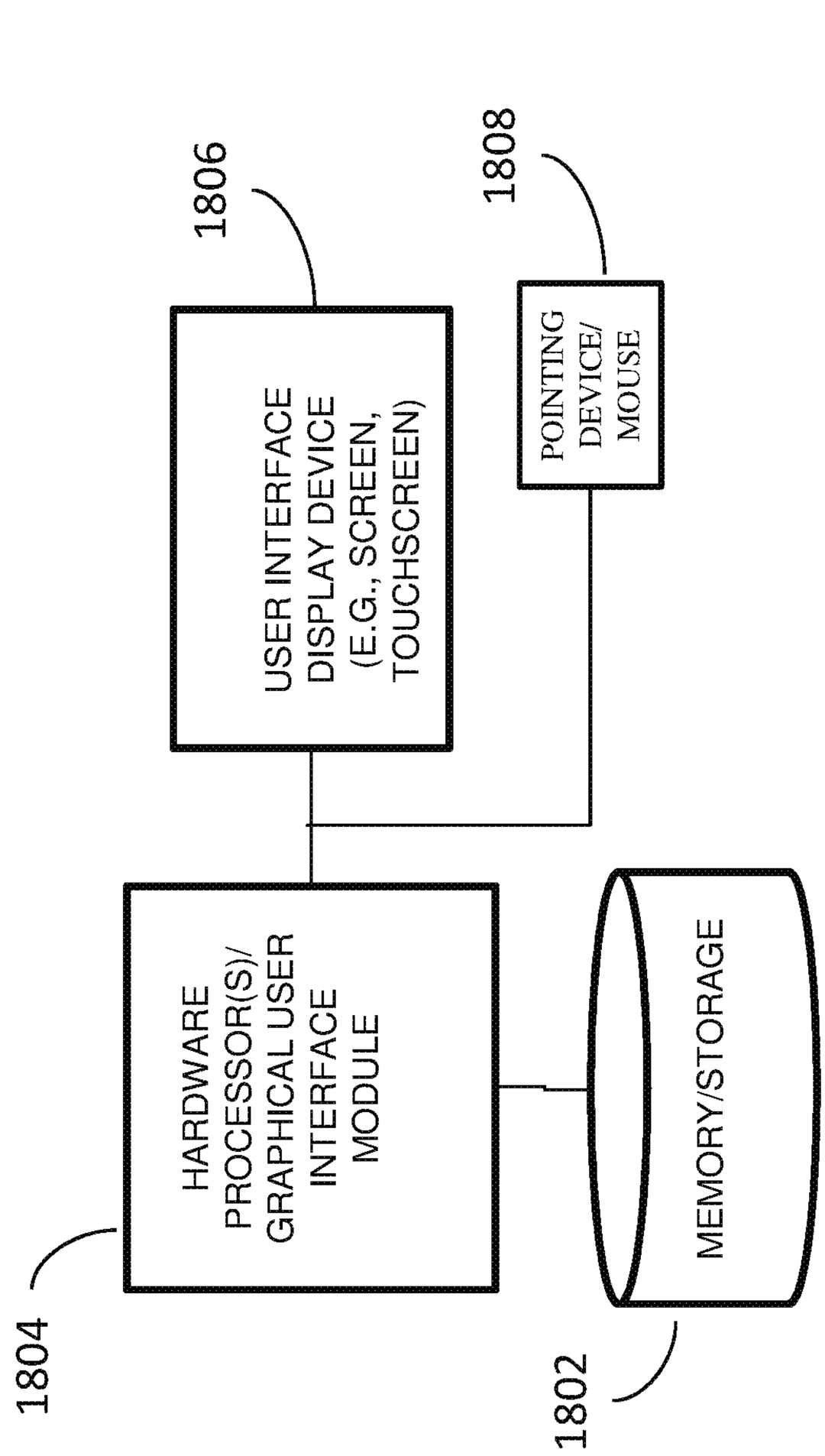

1806
USER INTERFACE DISPLAY DEVICE (E.G., SCREEN, TOUCHSCREEN)
1808
POINTING DEVICE/ MOUSE
1804
HARDWARE PROCESSOR(S)/ GRAPHICAL USER INTERFACE MODULE
802
MEMORY/STORAGE

FIG. 18

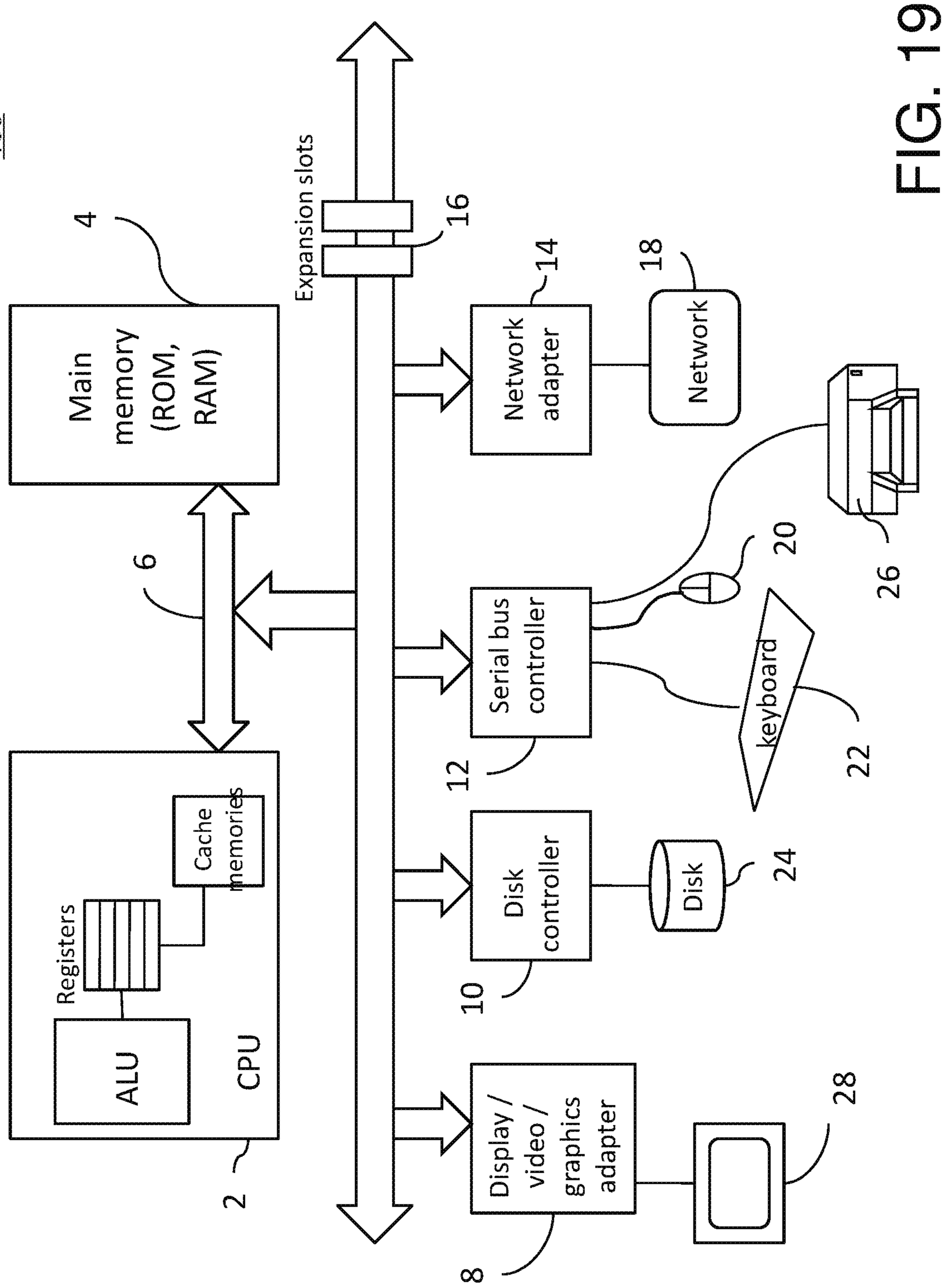

100
Main memory (ROM, RAM)
4
6
Expansion slots
16
Network adapter
14
Network
18
Serial bus controller
12
Disk controller
10
Disk
24
keyboard
22
20
26
Display / video / graphics adapter
8
28
CPU
2
ALU
Registers
Cache memories

FIG. 19

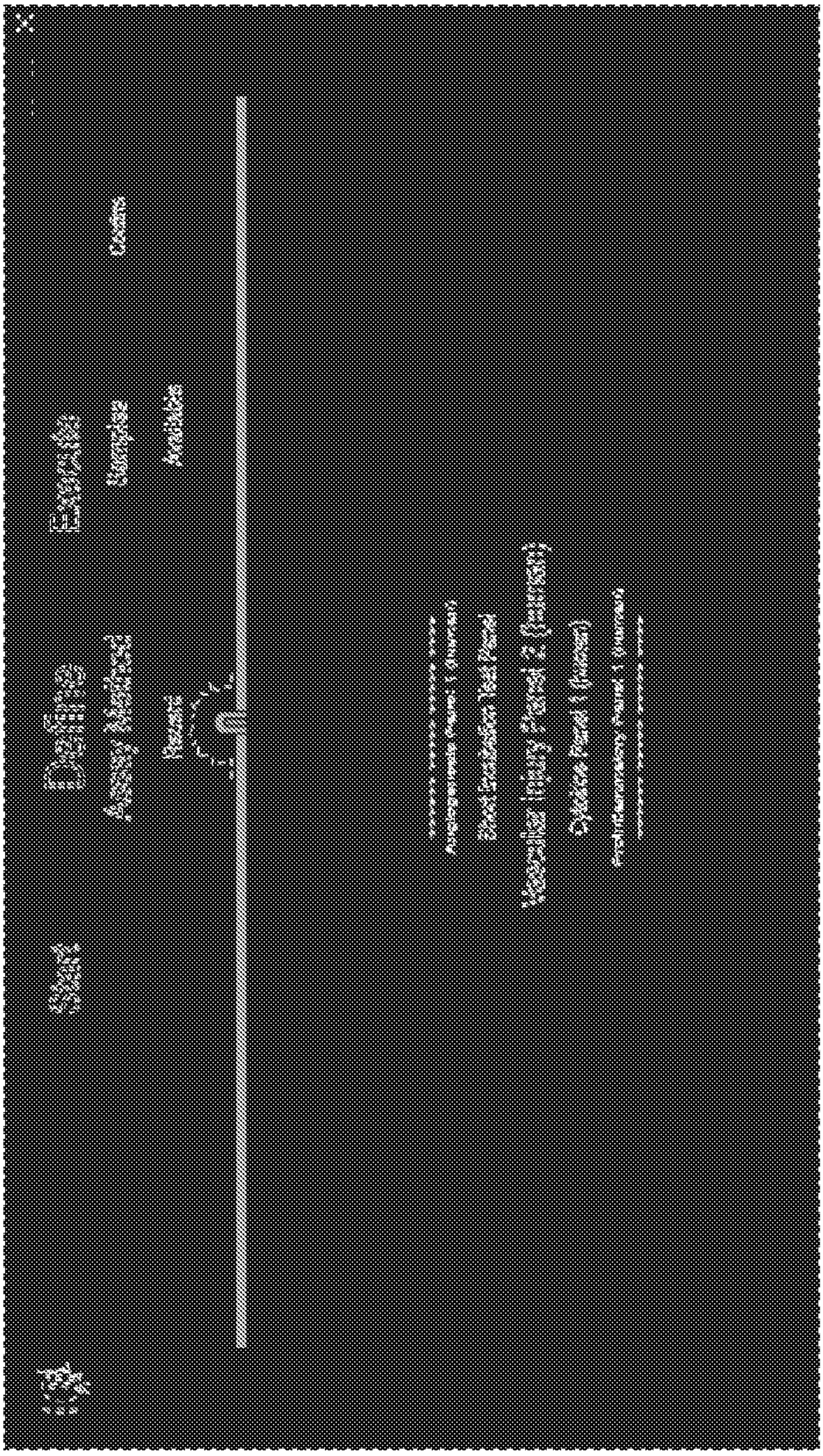

Pembrolizumab
Nivolumab
Durvalumab
Avelumab
Atezolizumab
Ipilimumab
Tremelimumab
Durvalumab + Tremelimumab
Nivolumab + Ipilimumab
Pembrolizumab + Ipilimumab
Pembrolizumab + Chemotherapy
Nivolumab + Chemotherapy
Atezolizumab + Chemotherapy
Durvalumab + Chemotherapy
Atezolizumab + Bevacizumab
Pembrolizumab + Axitinib
Nivolumab + Cabozantinib
Nivolumab + Ipilimumab + Chemotherapy
Durvalumab + Tremelimumab + Chemotherapy
Nivolumab + Ipilimumab + Cabozantinib
Pembrolizumab + Ipilimumab + Chemotherapy
Nivolumab + Ipilimumab + Bevacizumab
Pembrolizumab + Ipilimumab + Axitinib
Nivolumab + Ipilimumab + Cabozantinib + Chemotherapy
Pembrolizumab + Ipilimumab + Bevacizumab + Chemotherapy
Pembrolizumab + Ipilimumab + Axitinib + Chemotherapy
Nivolumab + Ipilimumab + Bevacizumab + Chemotherapy
Nivolumab + Ipilimumab + Axitinib + Chemotherapy
Pembrolizumab + Ipilimumab + Cabozantinib + Chemotherapy
Nivolumab + Ipilimumab + Cabozantinib + Bevacizumab
Nivolumab + Ipilimumab + Cabozantinib + Axitinib
Pembrolizumab + Ipilimumab + Cabozantinib + Bevacizumab
Pembrolizumab + Ipilimumab + Cabozantinib + Axitinib
Nivolumab + Ipilimumab + Cabozantinib + Bevacizumab + Chemotherapy
Nivolumab + Ipilimumab + Cabozantinib + Axitinib + Chemotherapy
Pembrolizumab + Ipilimumab + Cabozantinib + Bevacizumab + Chemotherapy
Pembrolizumab + Ipilimumab + Cabozantinib + Axitinib + Chemotherapy
Nivolumab + Ipilimumab + Cabozantinib + Bevacizumab + Axitinib
Pembrolizumab + Ipilimumab + Cabozantinib + Bevacizumab + Axitinib
Nivolumab + Ipilimumab + Cabozantinib + Bevacizumab + Axitinib + Chemotherapy
Pembrolizumab + Ipilimumab + Cabozantinib + Bevacizumab + Axitinib + Chemotherapy

FIG. 20

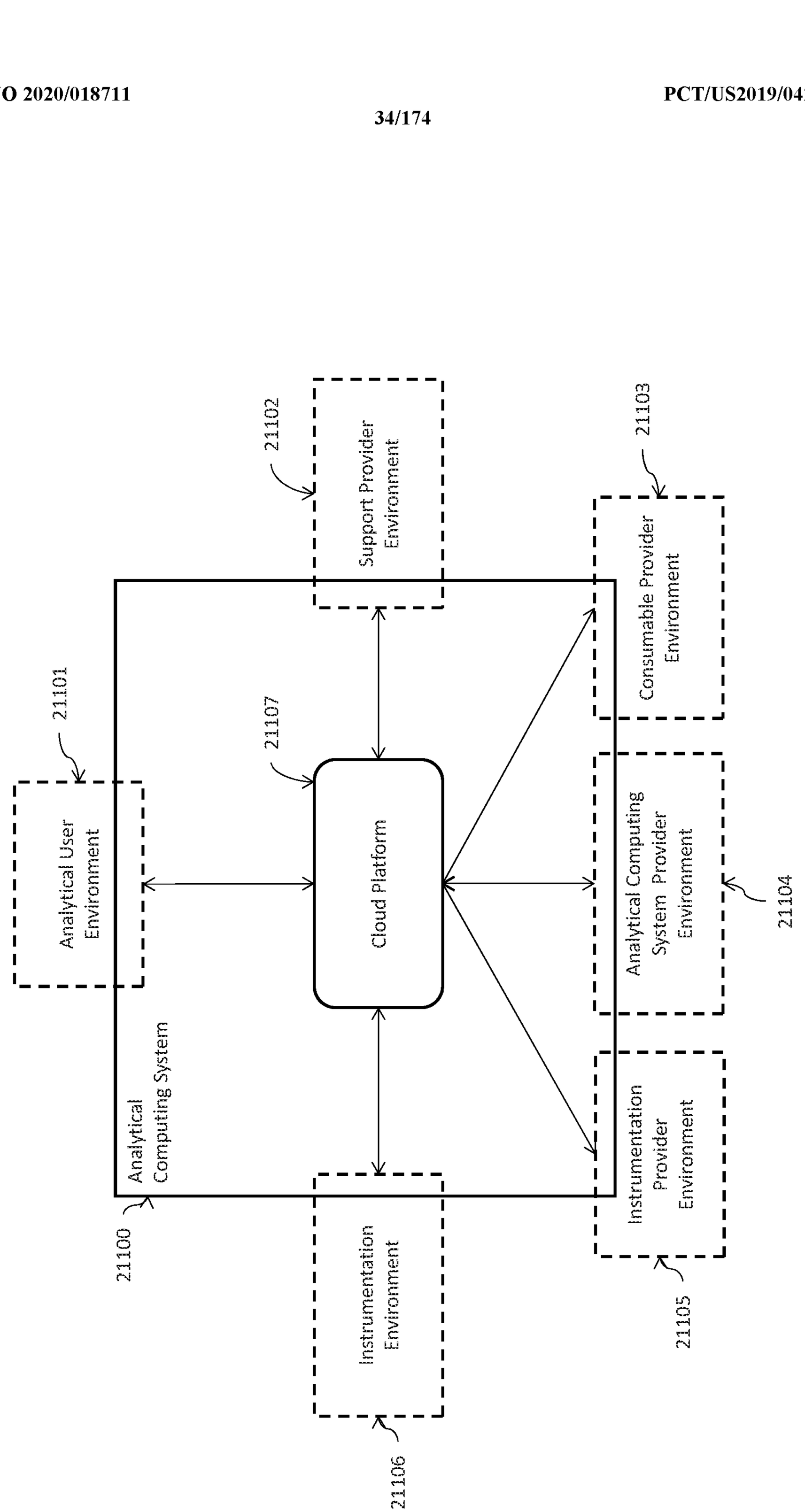

21102
Support Provider Environment
21103
Consumable Provider Environment
21101
Analytical User Environment
21107
Cloud Platform
Analytical Computing System Provider Environment
21104
Analytical Computing System
21100
Instrumentation Provider Environment
21105
21106

FIG. 21

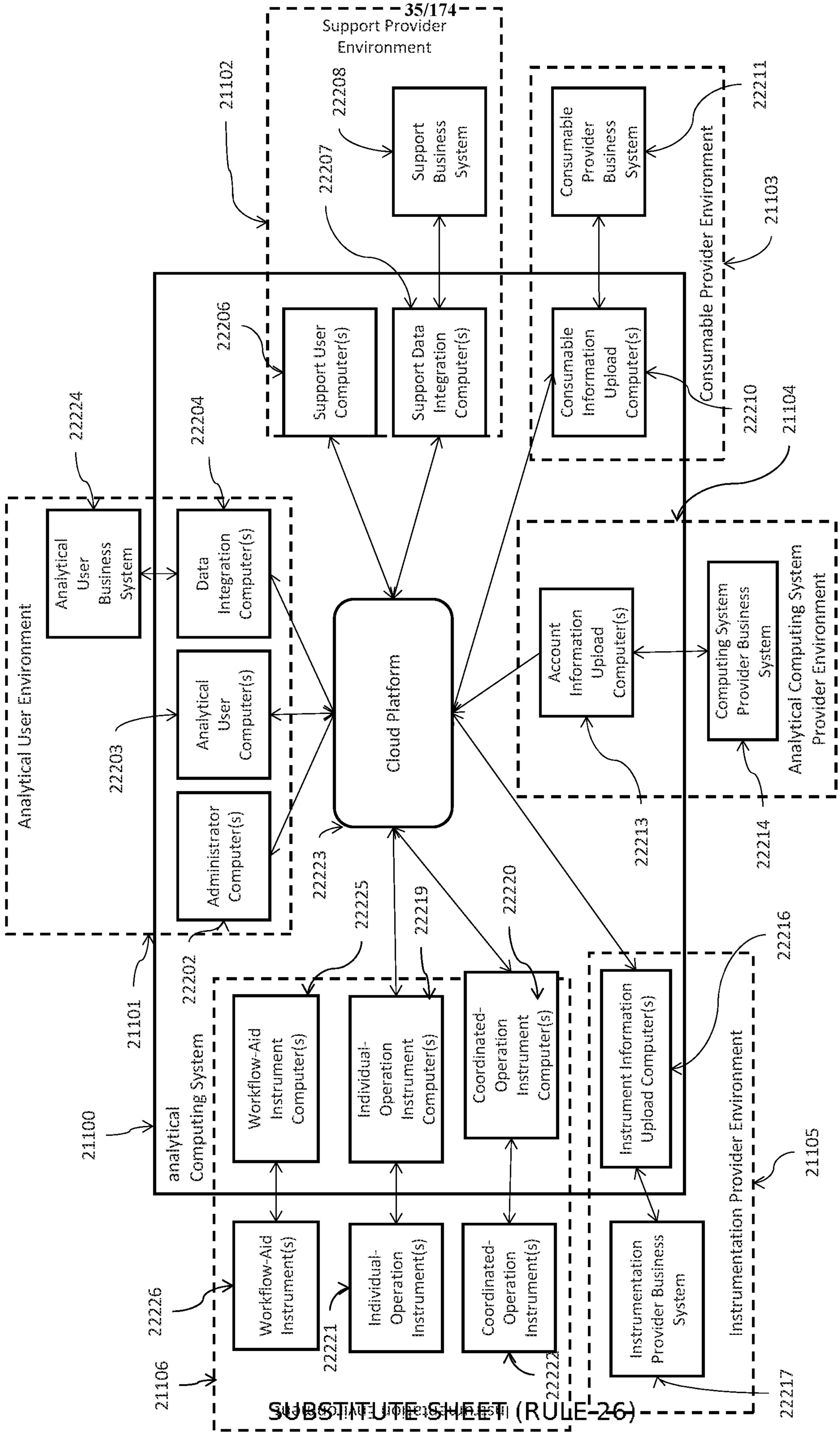

Support Provider Environment
21102
22208
Support Business System
22207
Support User Computer(s)
Support Data Integration Computer(s)
22206
Consumable Provider Business System
22211
Consumable Provider Environment
21103
Consumable Information Upload Computer(s)
22210
21104
22224
22204
Analytical User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

FIG. 22

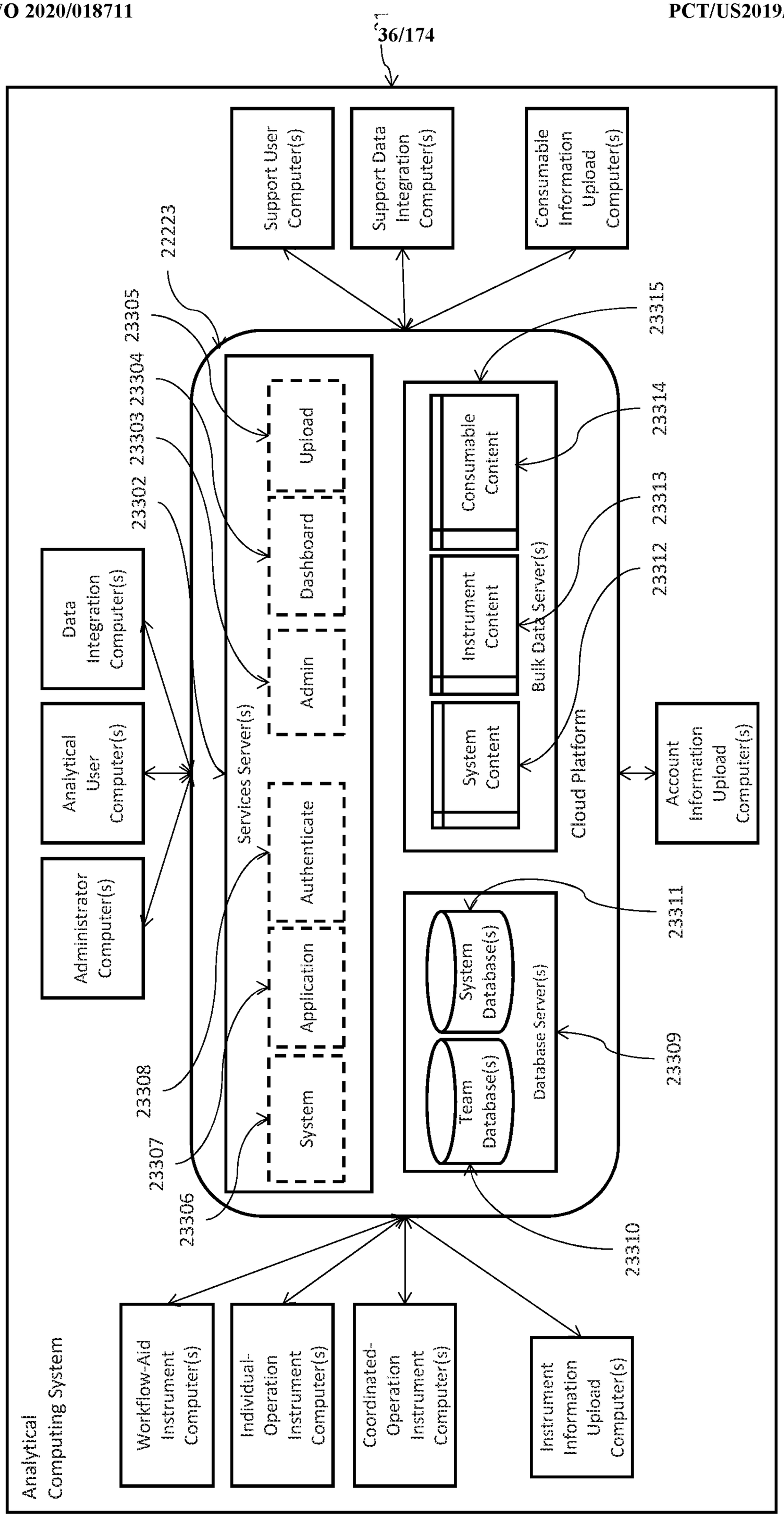

Analytical Computing System
Workflow-Aid Instrument Computer(s)
Individual-Operation Instrument Computer(s)
Coordinated-Operation Instrument Computer(s)
Instrument Information Upload Computer(s)
Cloud Platform
Services Server(s)
Authenticate
Application
Admin
Dashboard
Upload
Bulk Data Server(s)
System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

FIG. 23

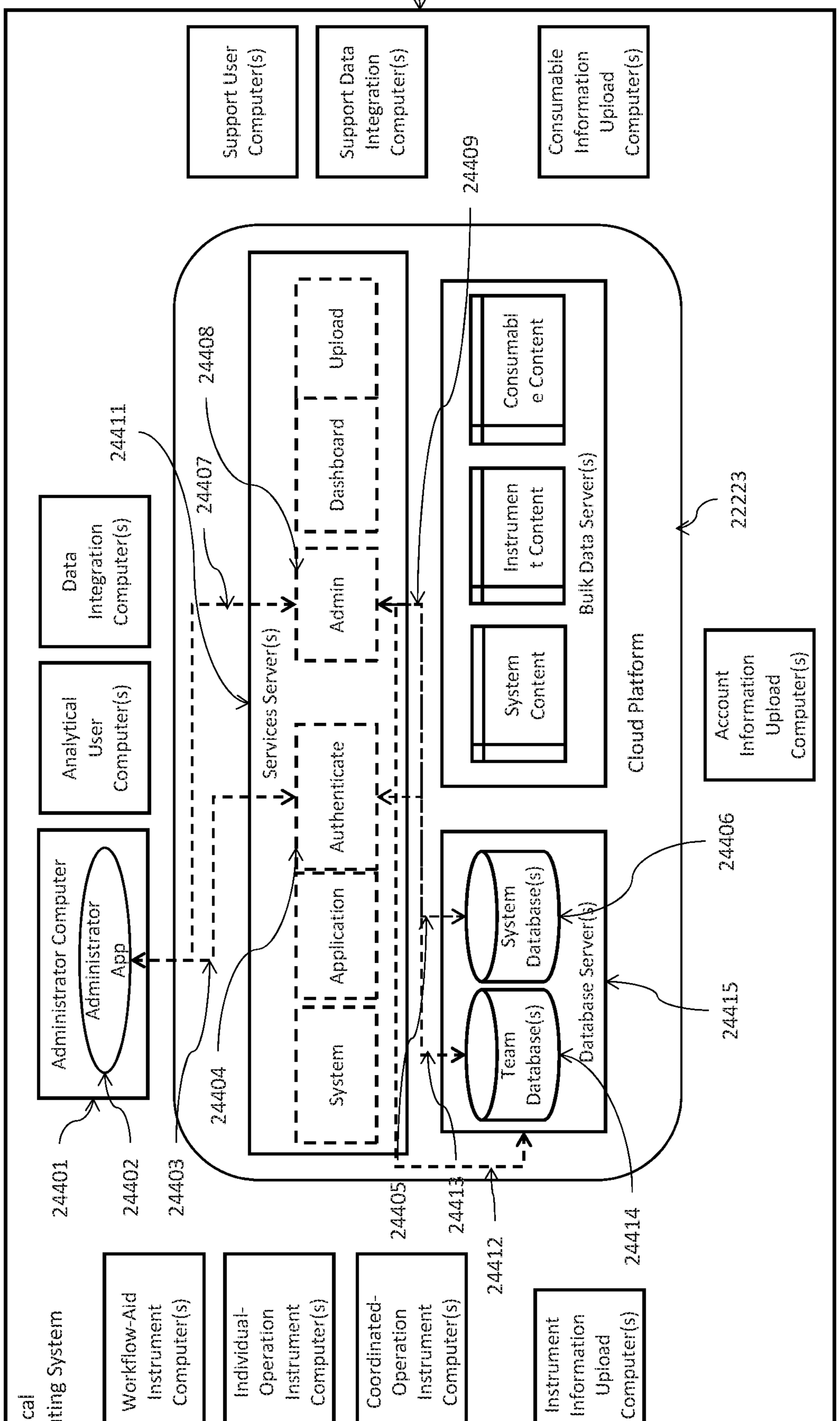

Support User Computer(s)
Support Data Integration Computer(s)
Consumable Information Upload Computer(s)
24409
Data Integration Computer(s)
Analytical User Computer(s)
Administrator Computer
Administrator App
24411
24407
24408
Admin
Dashboard
Upload
Services Server(s)
System
Application
Authenticate
24404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

FIG. 24

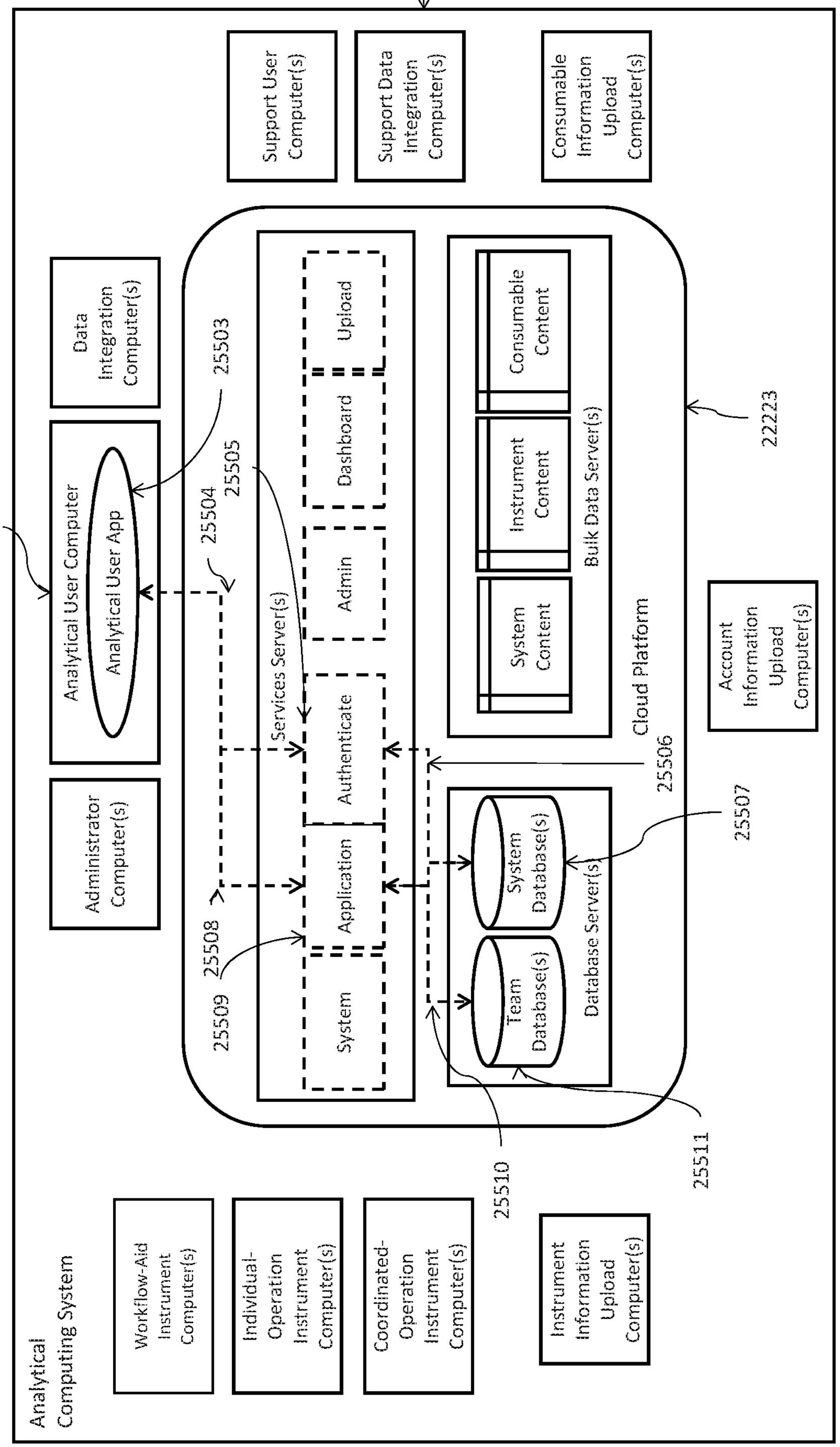

21101
Support User Computer(s)
Support Data Integration Computer(s)
Consumable Information Upload Computer(s)
Analytical Computing System
Workflow-Aid Instrument Computer(s)
Individual-Operation Instrument Computer(s)
Coordinated-Operation Instrument Computer(s)
Instrument Information Upload Computer(s)
25510
25511
Cloud Platform
22223
Bulk Data Server(s)
System Content
Instrument Content
Consumable Content
Account Information Upload Computer(s)
Services Server(s)
Admin
Dashboard
Upload
Authentication
System Application
25502
Analytical User Computer
Analytical User App
25503
25504
25505
25506
25507
25508
25509
Database Server(s)
System Database(s)
Team Database(s)
Data Integration Computer(s)
Administrator Computer(s)

FIG. 25

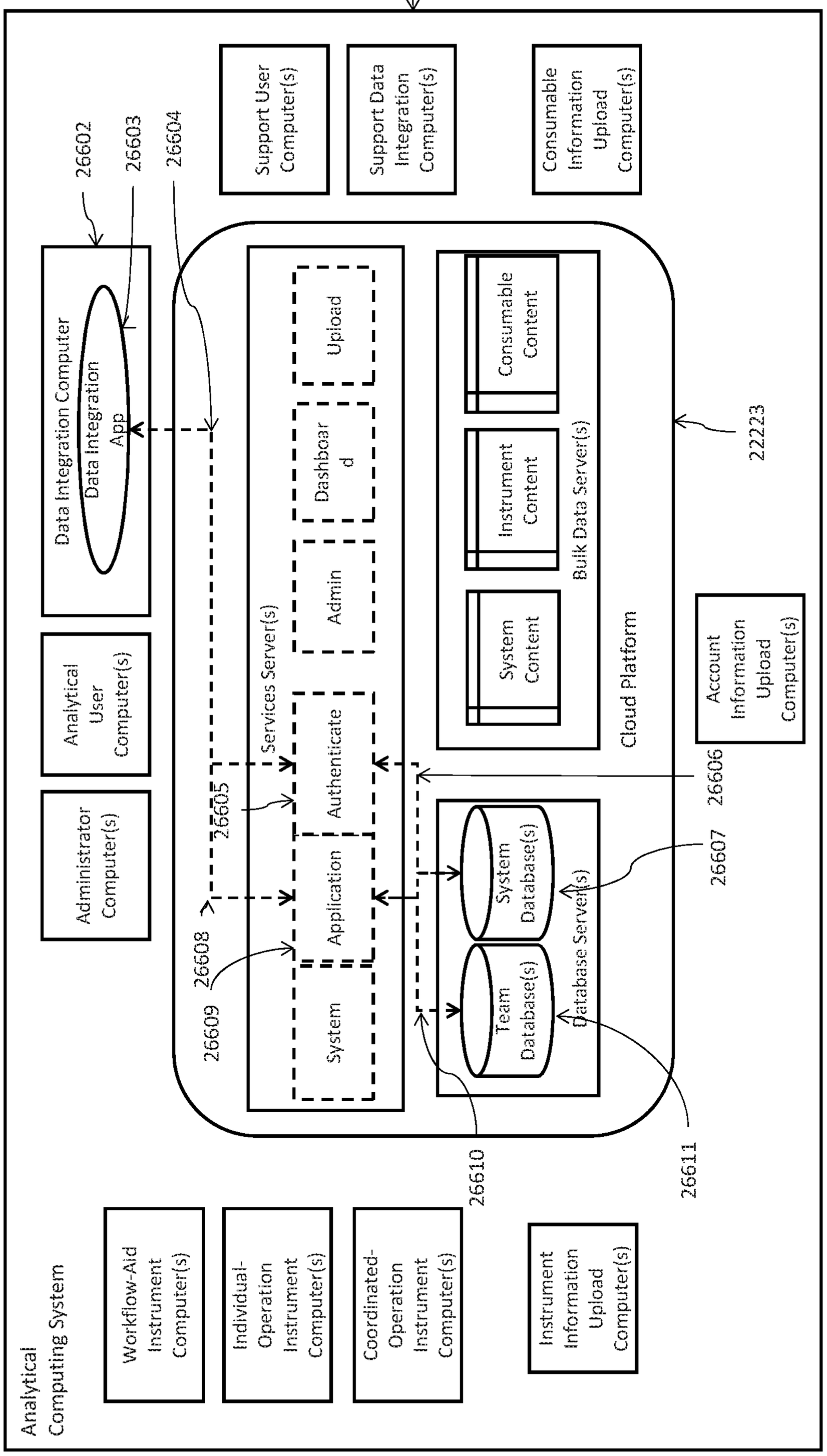

Analytical Computing System
21101
Support User Computer(s)
Support Data Integration Computer(s)
Consumable Information Upload Computer(s)
26602
26603
26604
Data Integration Computer
Data Integration App
Analytical User Computer(s)
Administrator Computer(s)
Services Server(s)
Dashboard
Upload
Admin
Authentication
Application
System
26605
26608
26609
Bulk Data Server(s)
Consumable Content
Instrument Content
System Content
Cloud Platform
22223
Account Information Upload Computer(s)
26606
26607
Database Server(s)
System Database(s)
Team Database(s)
26610
26611
Workflow-Aid Instrument Computer(s)
Individual-Operation Instrument Computer(s)
Coordinated-Operation Instrument Computer(s)
Instrument Information Upload Computer(s)

FIG. 26

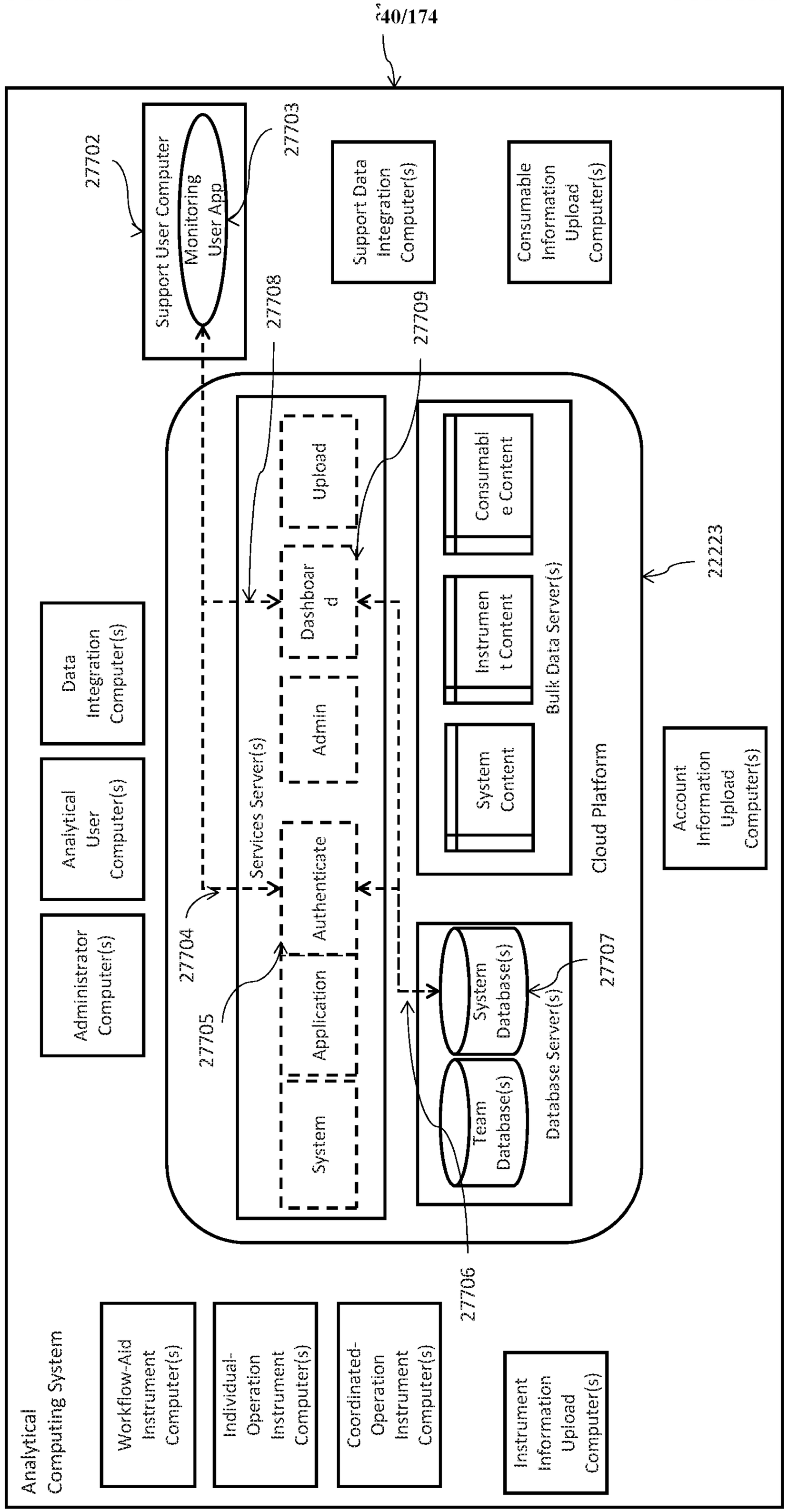

Analytical Computing System
Workflow-Aid Instrument Computer(s)
Individual-Operation Instrument Computer(s)
Coordinated-Operation Instrument Computer(s)
Instrument Information Upload Computer(s)
27706
Cloud Platform
Administrator Computer(s)
Analytical User Computer(s)
Data Integration Computer(s)
Services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

FIG. 27

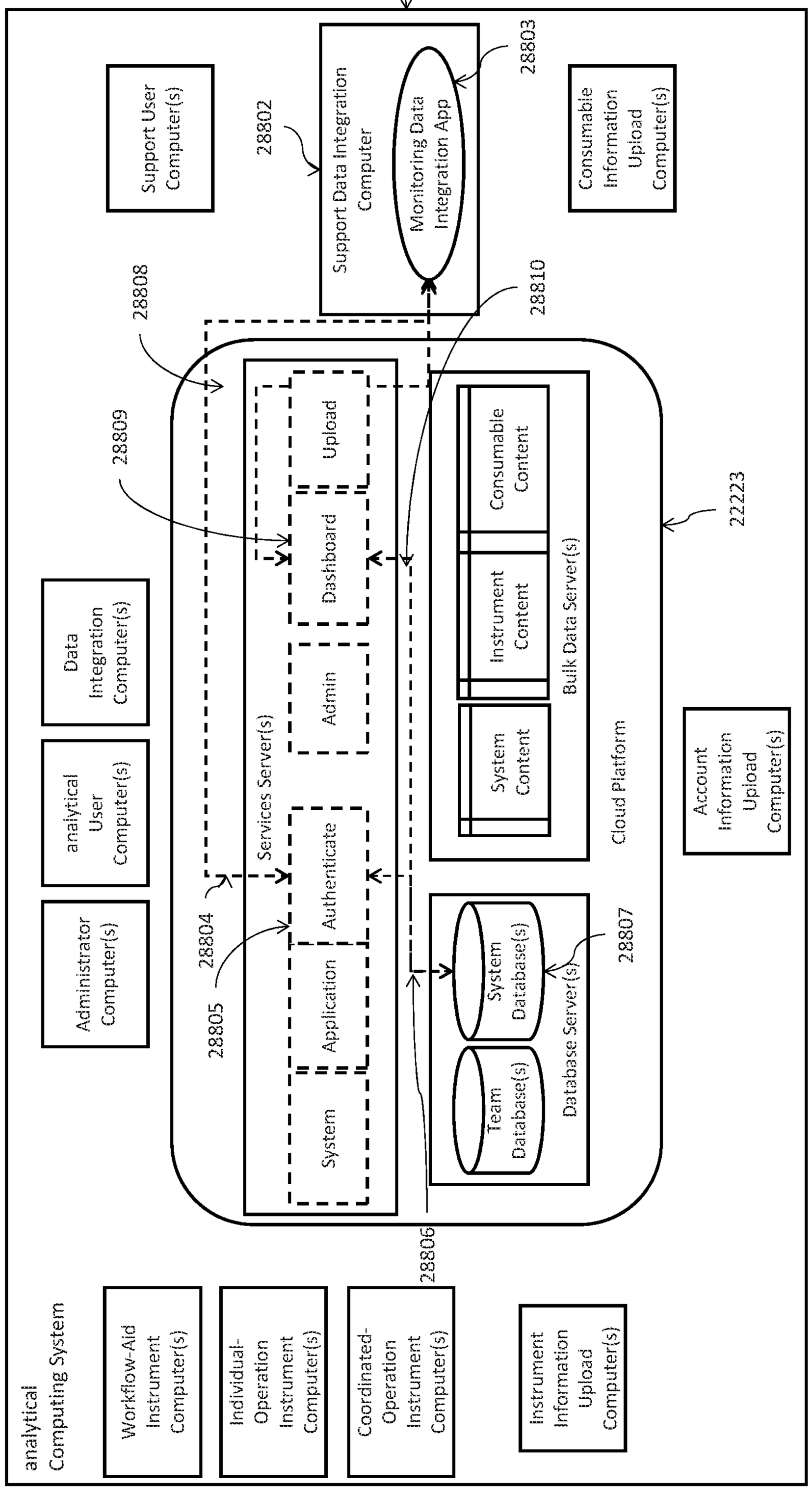

analytical Computing System
Support User Computer(s)
Support Data Integration Computer
Monitoring Data Integration App
Consumable Information Upload Computer(s)
Data Integration Computer(s)
analytical User Computer(s)
Administrator Computer(s)
Cloud Platform
Services Server(s)
Application
Authenticate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

FIG. 28

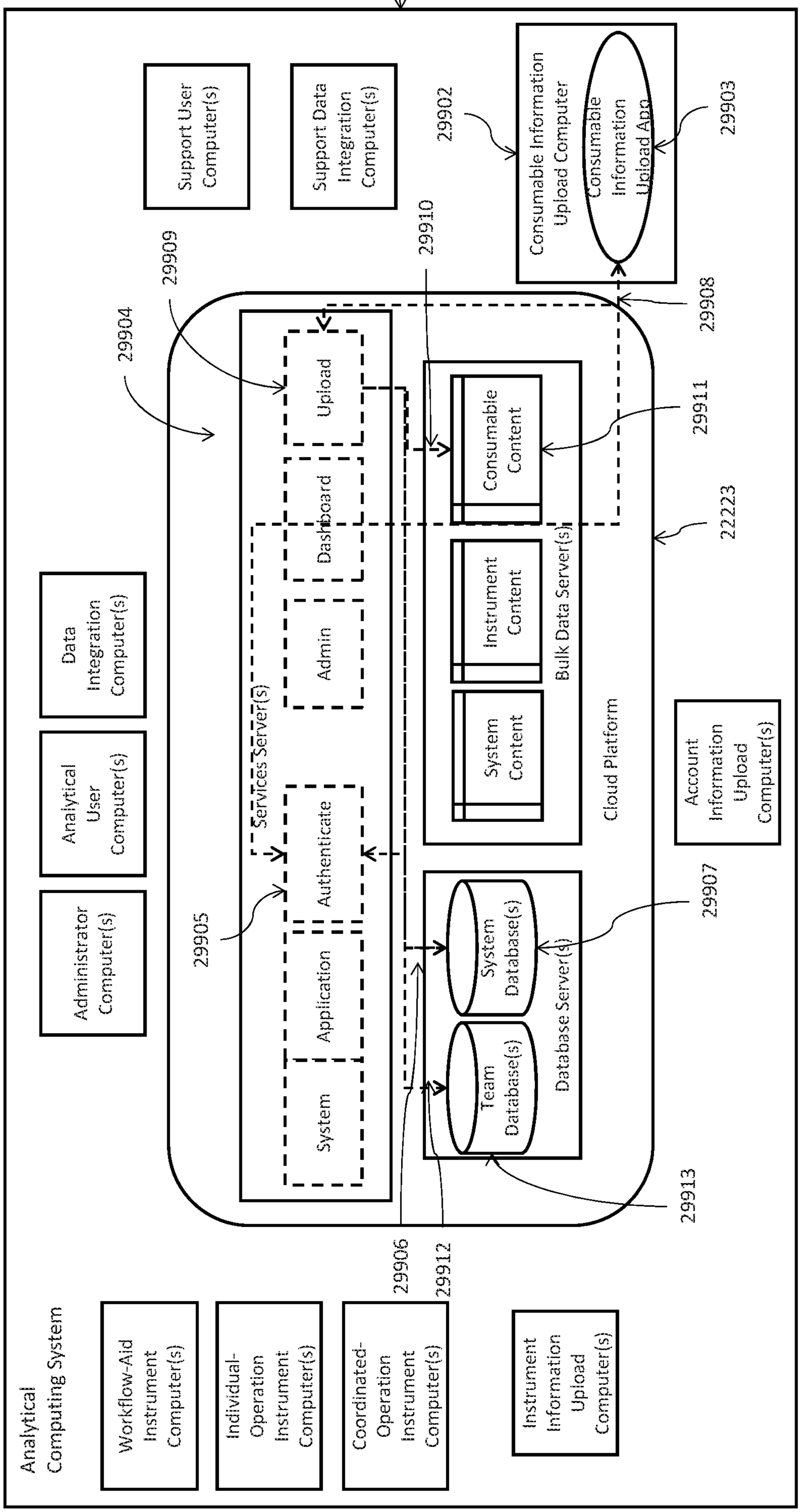

Analytical Computing System
Administrator Computer(s)
Analytical User Computer(s)
Data Integration Computer(s)
Support User Computer(s)
Support Data Integration Computer(s)
Consumable Information Upload Computer
Consumable Information Upload App
29902
29903
29909
29910
29908
29904
Cloud Platform
Services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

FIG. 29

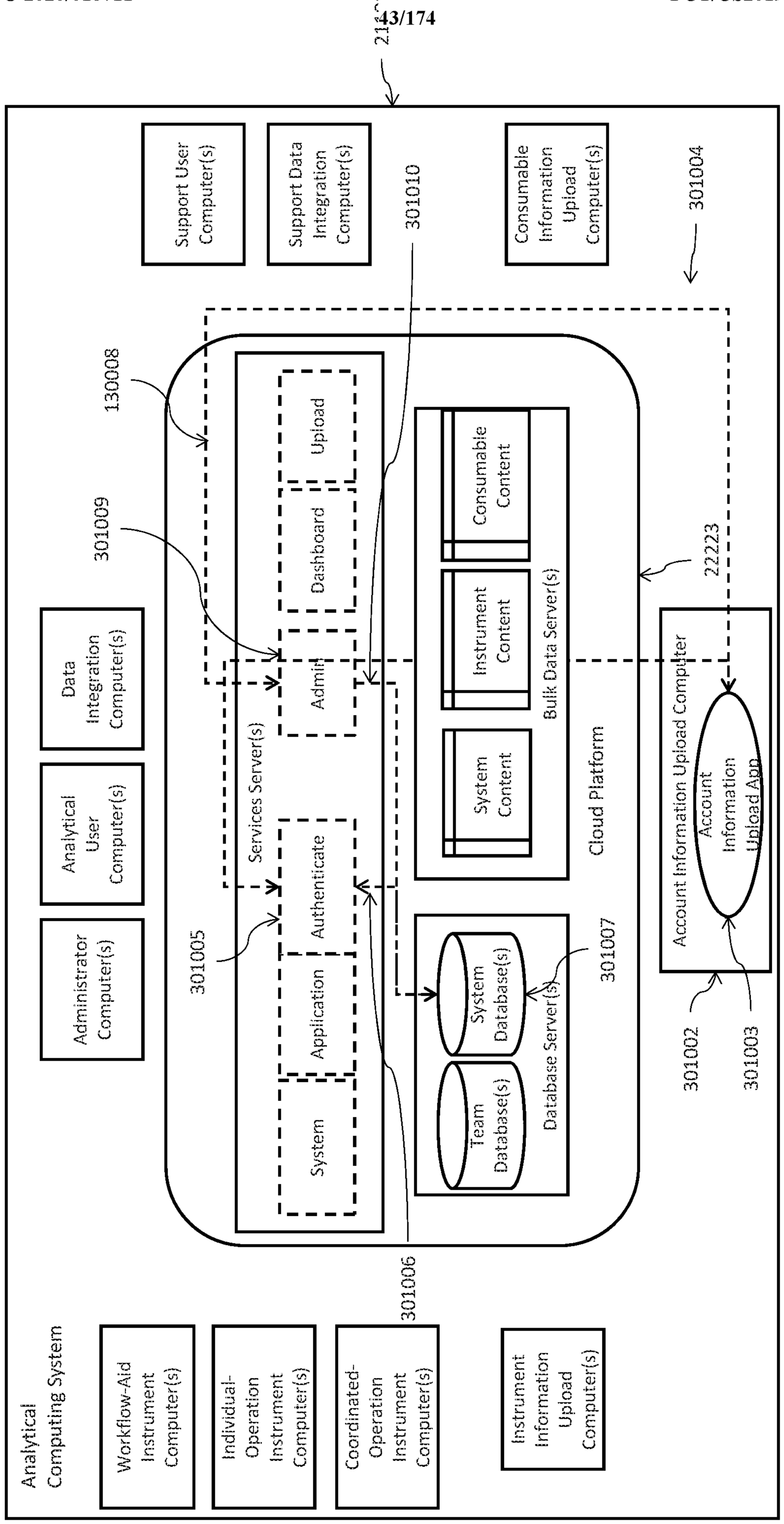

Analytical Computing System
Administrator Computer(s)
Analytical User Computer(s)
Data Integration Computer(s)
Support User Computer(s)
Support Data Integration Computer(s)
Consumable Information Upload Computer(s)
Workflow-Aid Instrument Computer(s)
Individual-Operation Instrument Computer(s)
Coordinated-Operation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

FIG. 30

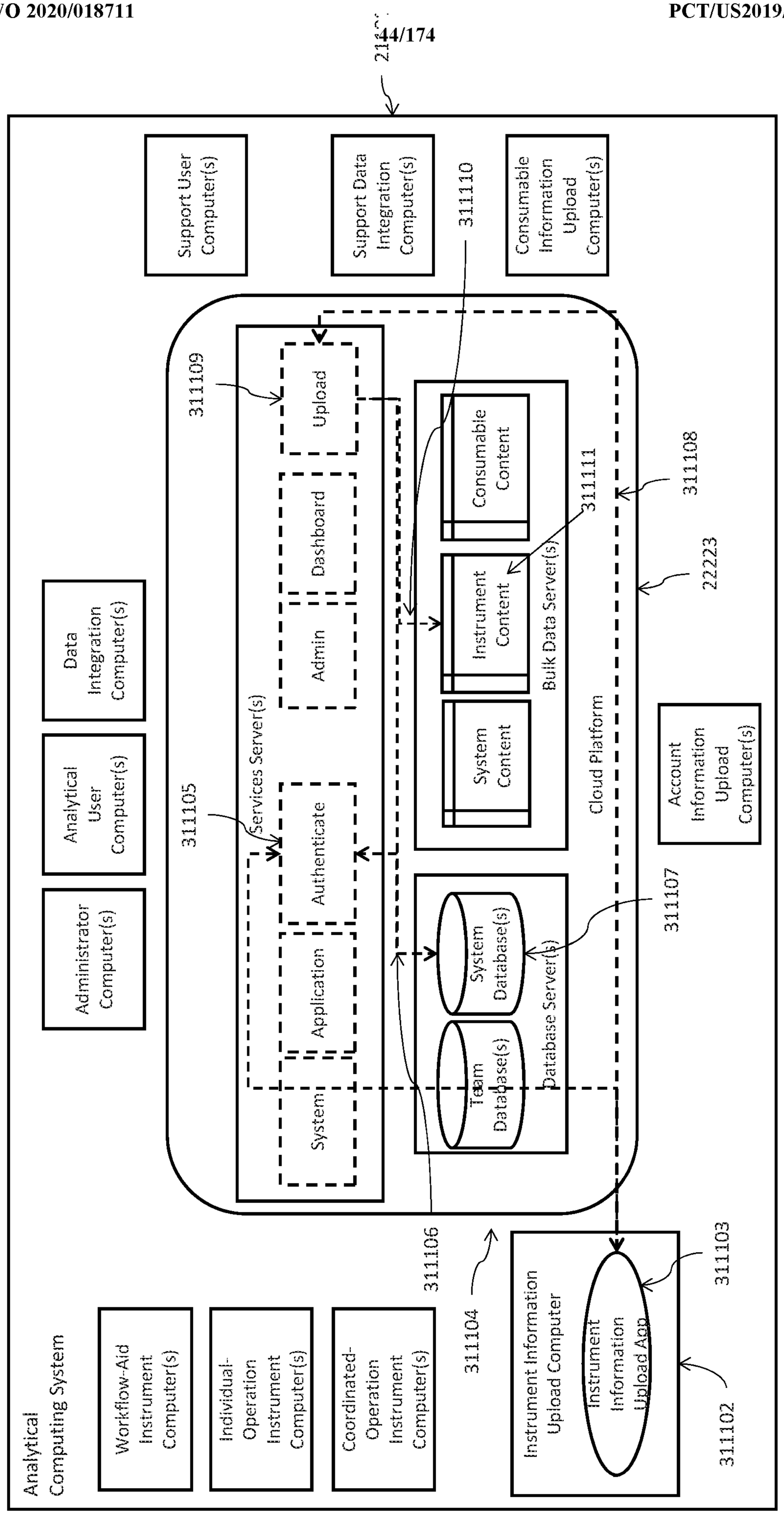

Analytical Computing System
Workflow-Aid Instrument Computer(s)
Individual-Operation Instrument Computer(s)
Coordinated-Operation Instrument Computer(s)
311106
311104
Instrument Information Upload Computer
Instrument Information Upload App
311103
311102
Cloud Platform
Services Server(s)
311105
System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

FIG. 31

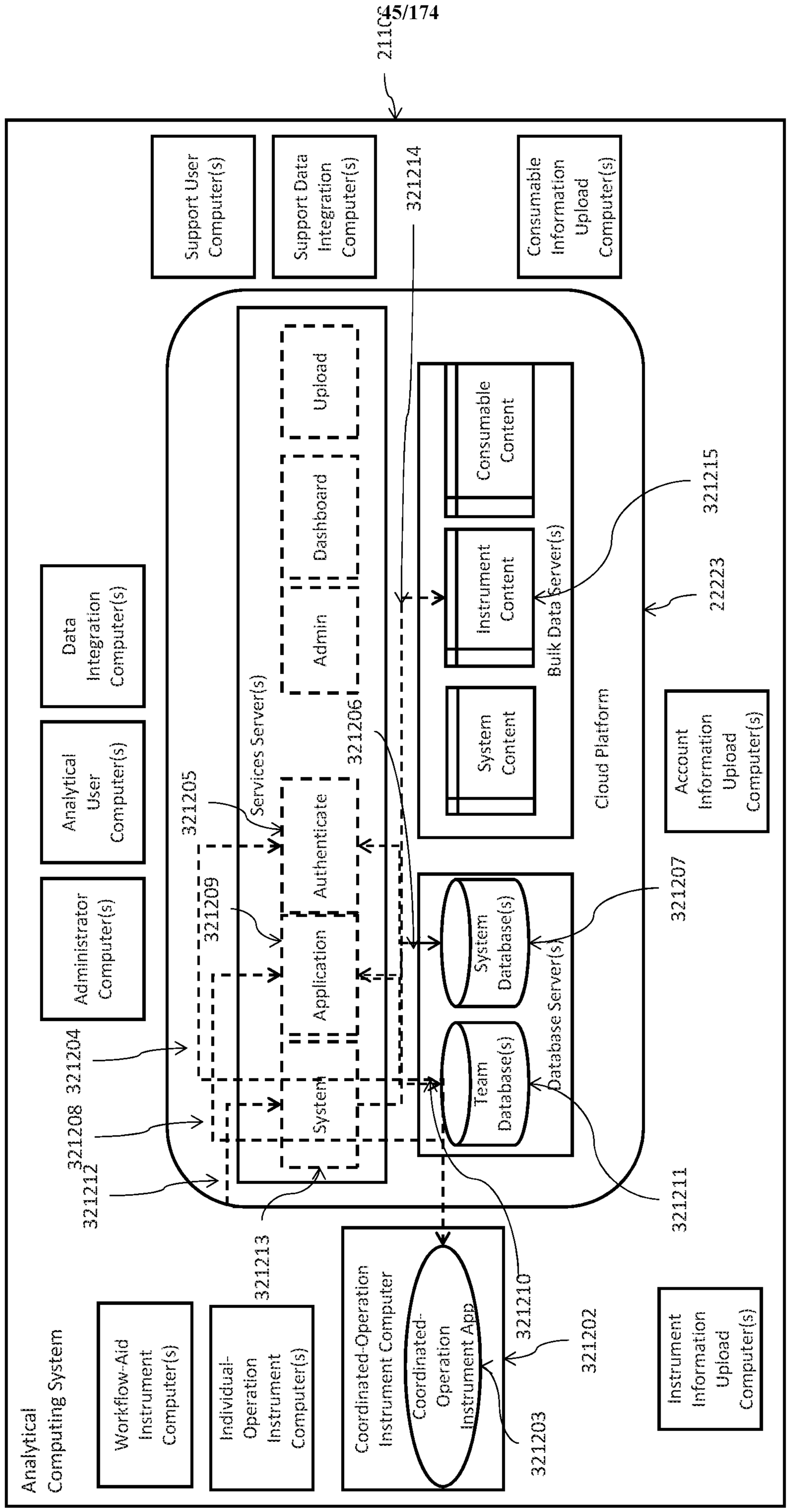

Analytical Computing System
Administrator Computer(s)
Analytical User Computer(s)
Data Integration Computer(s)
Support User Computer(s)
Support Data Integration Computer(s)
Consumable Information Upload Computer(s)
Account Information Upload Computer(s)
Instrument Information Upload Computer(s)
Workflow-Aid Instrument Computer(s)
Individual-Operation Instrument Computer(s)
Coordinated-Operation Instrument Computer
Coordinated-Operation Instrument App
Cloud Platform
Bulk Data Server(s)
Consumable Content
Instrument Content
System Content
Database Server(s)
System Database(s)
Team Database(s)
Services Server(s)
Upload
Dashboard
Admin
Authenticate
Application
System
21106
321214
321215
22223
321205
321206
321209
321204
321208
321212
321207
321211
321213
321210
321202
321203

FIG. 32

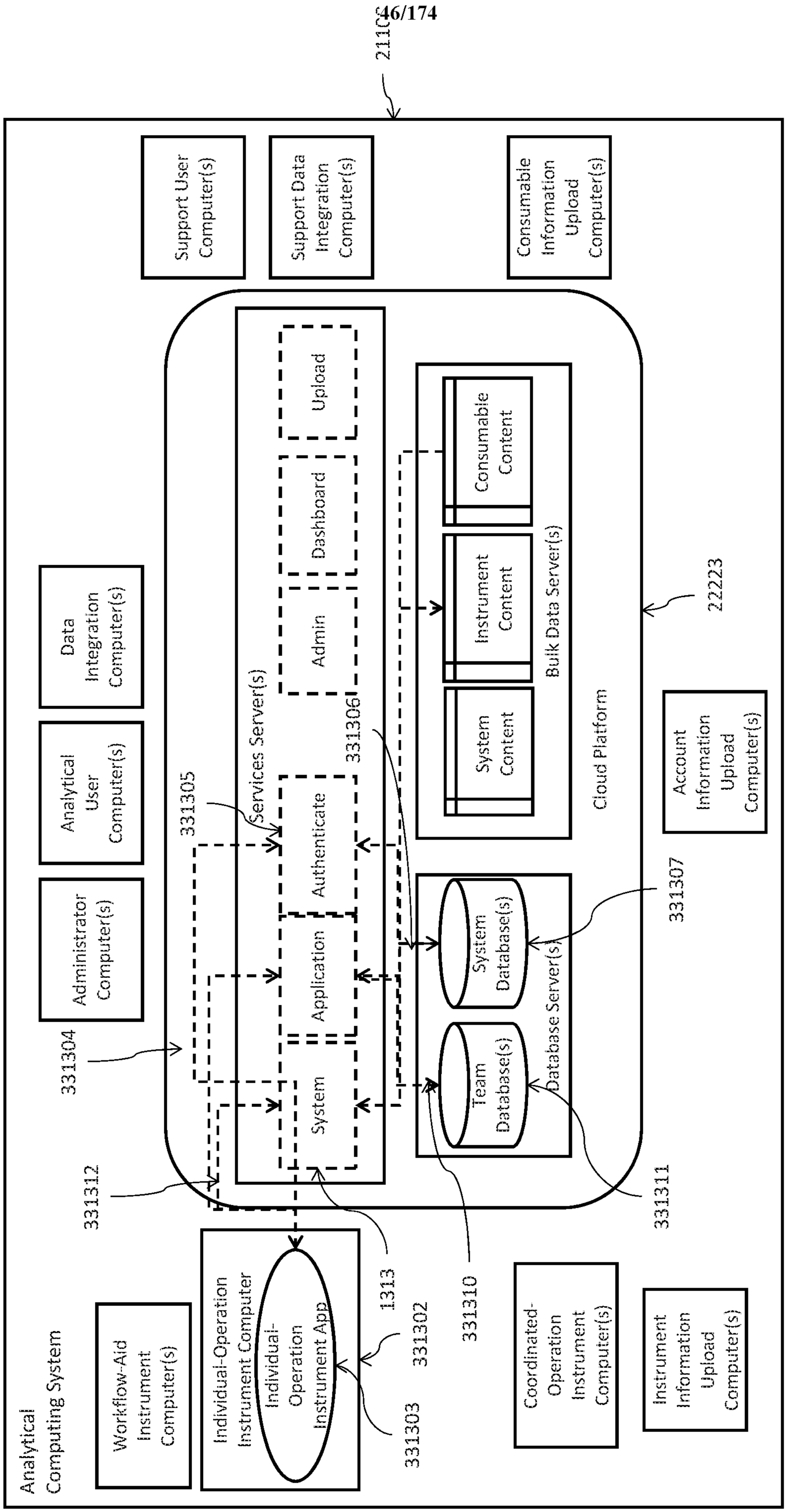

21106
Support User Computer(s)
Support Data Integration Computer(s)
Consumable Information Upload Computer(s)
Data Integration Computer(s)
Analytical User Computer(s)
Administrator Computer(s)
331304
331312
Services Server(s)
Admin
Dashboard
Upload
331305
331306
Authenticate
Application
System
Bulk Data Server(s)
Consumable Content
Instrument Content
System Content
22223
Cloud Platform
Database Server(s)
System Database(s)
Team Database(s)
331307
331311
Account Information Upload Computer(s)
Analytical Computing System
Workflow-Aid Instrument Computer(s)
Individual-Operation Instrument Computer
Individual-Operation Instrument App
1313
331303
331302
331310
Coordinated-Operation Instrument Computer(s)
Instrument Information Upload Computer(s)

FIG. 33A

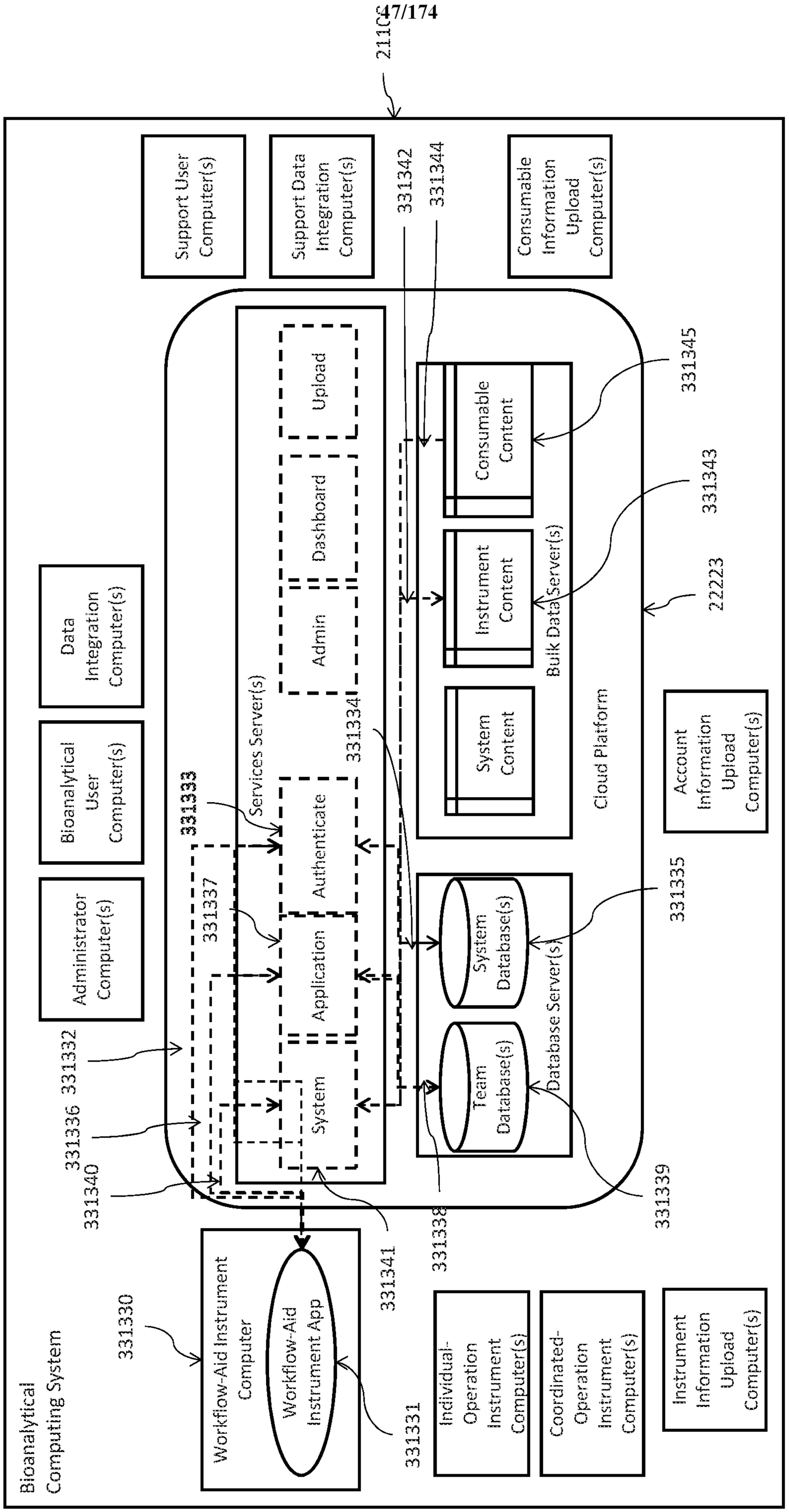

Bioanalytical Computing System
Workflow-Aid Instrument Computer
Workflow-Aid Instrument App
331330
331331
Individual-Operation Instrument Computer(s)
Coordinated-Operation Instrument Computer(s)
Instrument Information Upload Computer(s)
331338
331339
331341
Cloud Platform
Bulk Data Server(s)
Consumable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

FIG. 33B

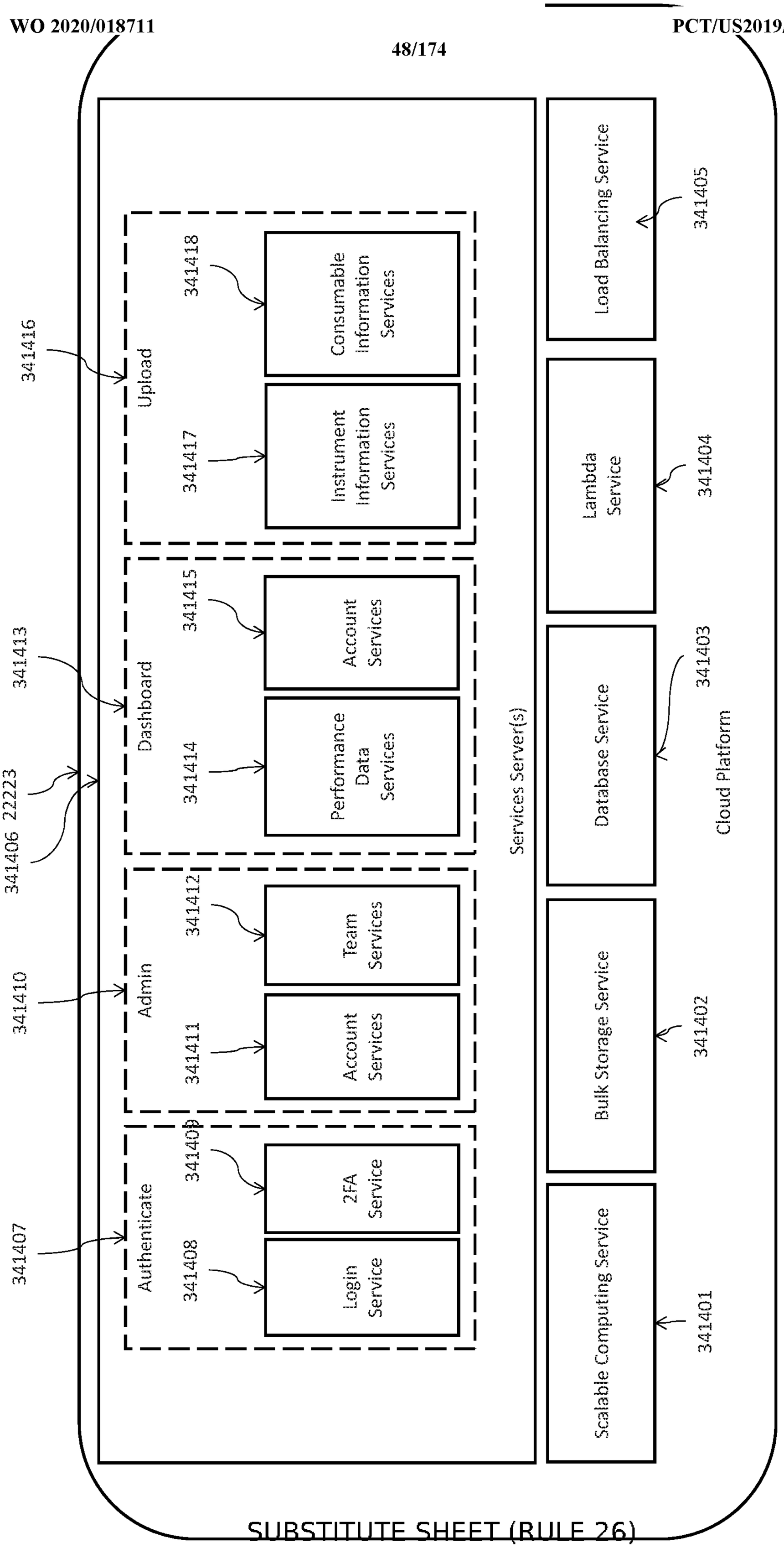

Load Balancing Service
341405
Consumable Information Services
341418
Instrument Information Services
341417
Performance Data Services
341414
Account Services
341415
Team Services
341412
Account Services
341411
2FA Service
341408b
Login Service
341408
Lambda Service
341404
Database Service
341403
Bulk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

FIG. 34A

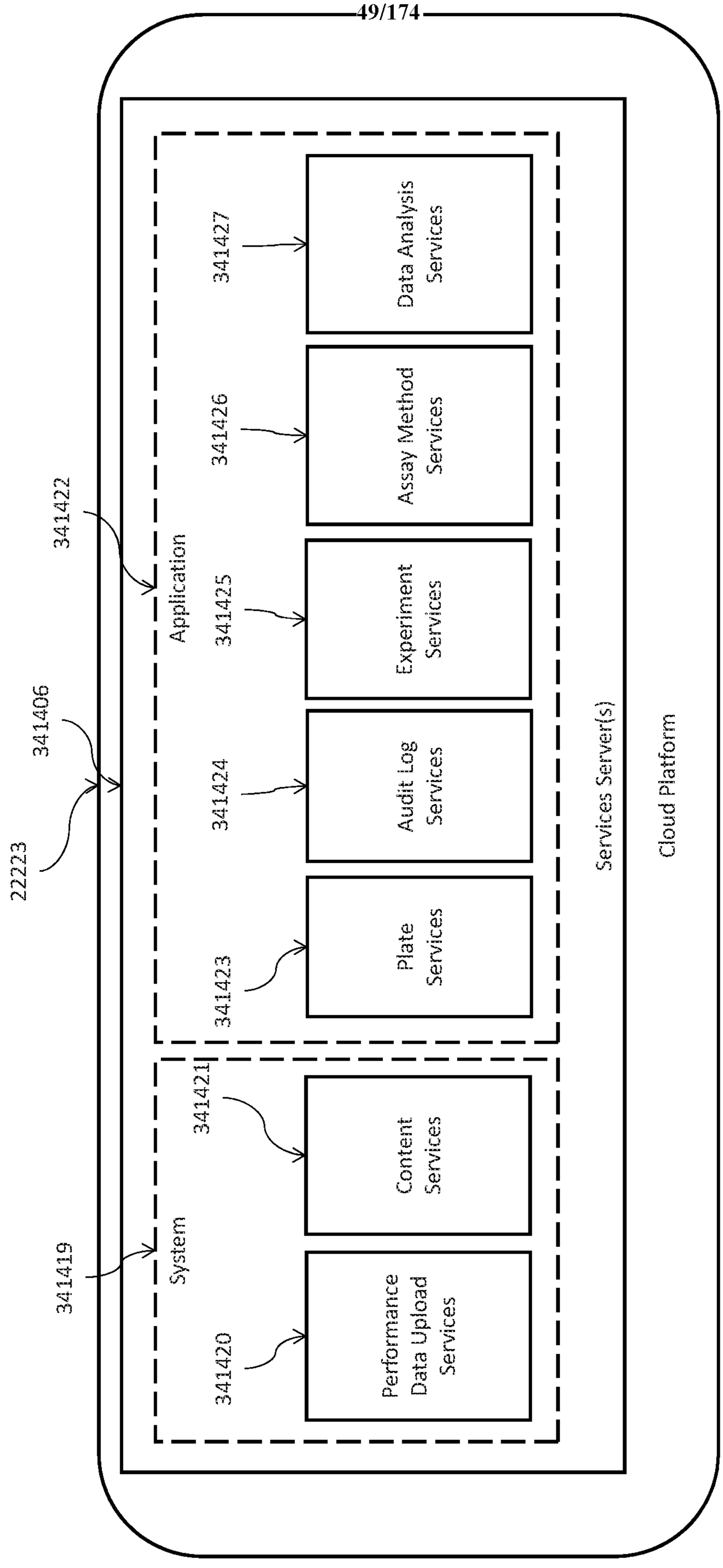

341427
Data Analysis Services
341422
341426
Assay Method Services
Application
341425
Experiment Services
341406
341424
Audit Log Services
22223
Services Server(s)
Cloud Platform
341423
Plate Services
341421
Content Services
341419
System
341420
Performance Data Upload Services

FIG. 34B

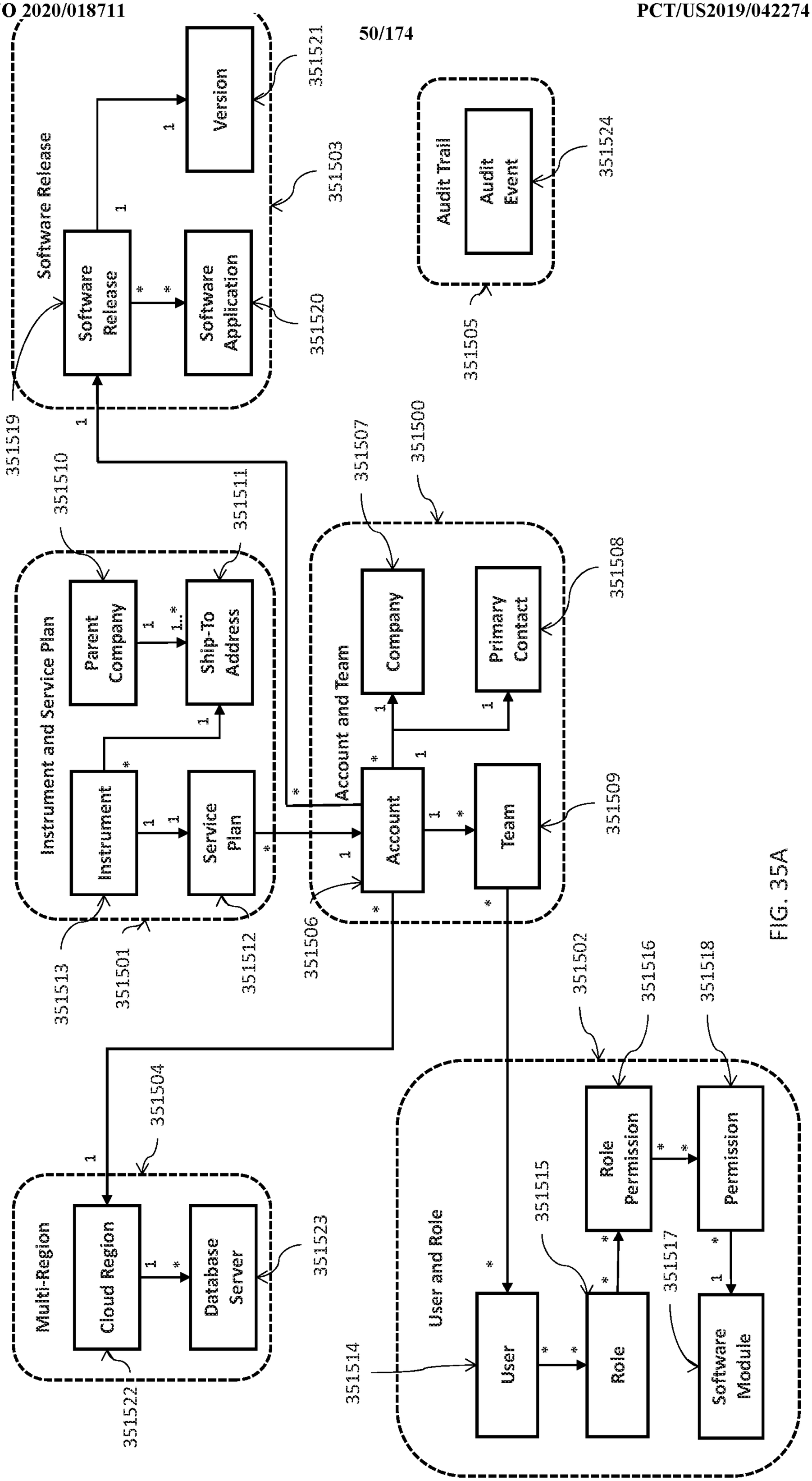

Software Release
Software Release
Version
1
1
351521
351503
Software Application
*
*
351520
1
351519
Audit Trail
Audit Event
351524
351505
351500
351507
351510
351511
351508
Instrument and Service Plan
Parent Company
1
1..*
Ship-To Address
1
Company
Primary Contact
1
1
Account and Team
*
1
Instrument
1
1
Service Plan
*
Account
1
*
Team
351509
1
*
*
351513
351501
351512
351506
351504
351502
351516
351518
1
Multi-Region
Cloud Region
1
*
Database Server
351523
351522
User and Role
351514
User
*
*
Role
351515
*
*
Role Permission
*
*
Permission
351517
1
*
Software Module

FIG. 35A

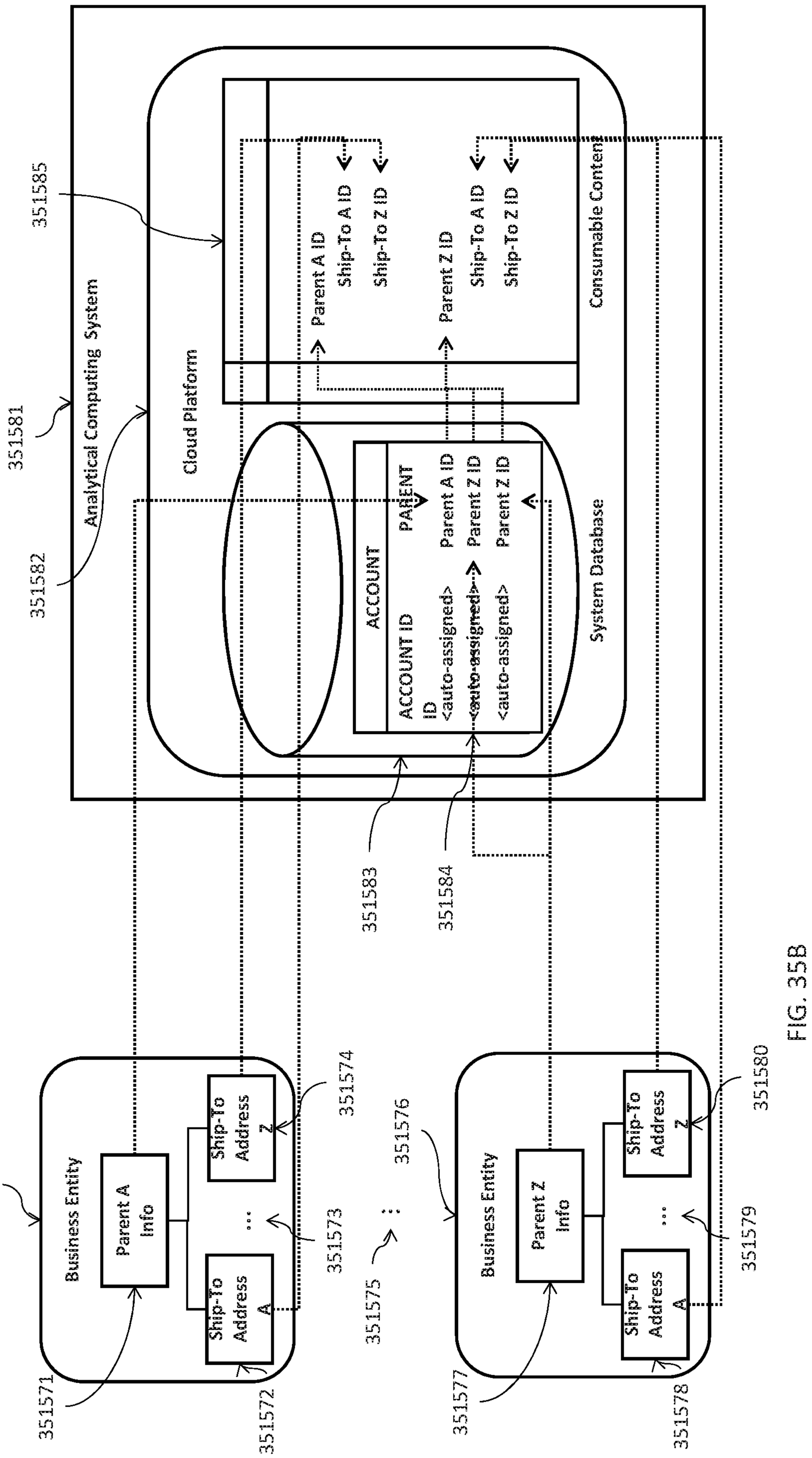

351585
Analytical Computing System
351581
351582
Cloud Platform
Parent A ID
Ship-To A ID
Ship-To Z ID
Parent Z ID
Ship-To A ID
Ship-To Z ID
Consumable Content
ACCOUNT
ACCOUNT ID
ID
<auto-assigned>
<auto-assigned>
<auto-assigned>
PARENT
Parent A ID
Parent Z ID
Parent Z ID
System Database
351583
351584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

FIG. 358

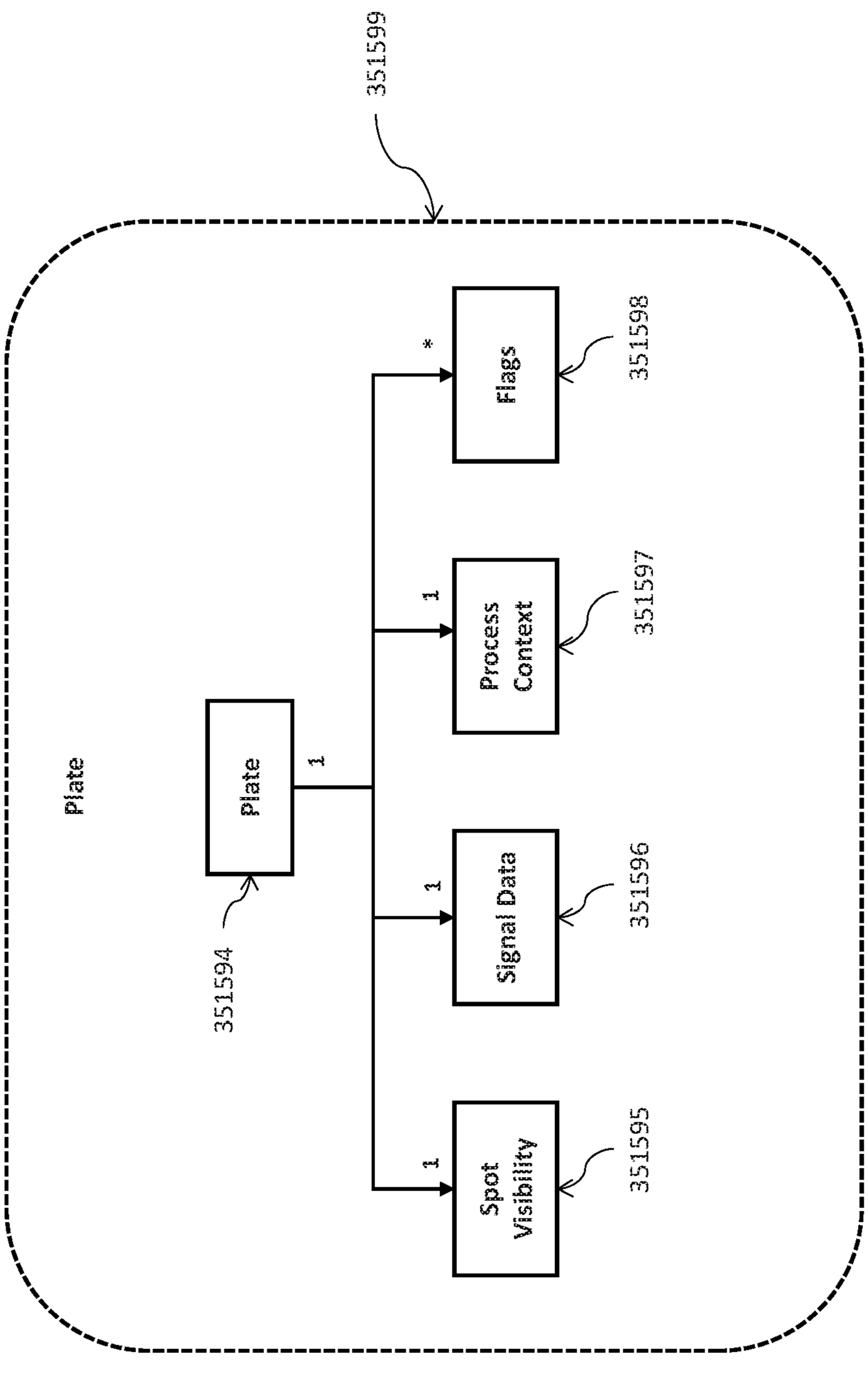

351599
Plate
Plate
1
351594
Flags
*
351598
Process Context
1
351597
Signal Data
1
351596
Spot Visibility
1
351595

FIG. 35C

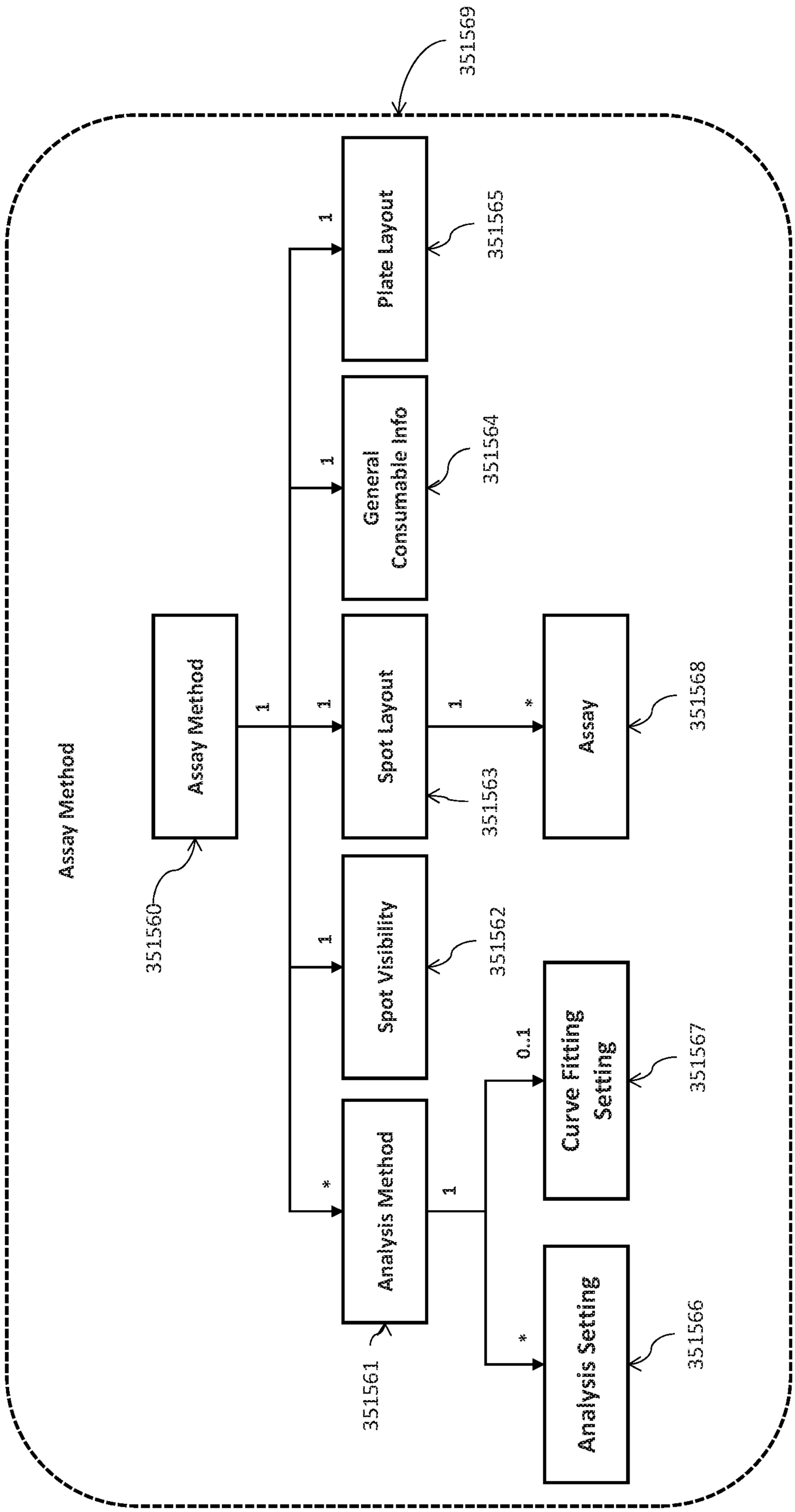

351569
Assay Method
1
Plate Layout
351565
1
General Consumable Info
351564
1
Assay Method
1
Spot Layout
1
*
Assay
351568
351560
351563
1
Spot Visibility
351562
*
Analysis Method
1
0..1
Curve Fitting Setting
351567
351561
*
Analysis Setting
351566

FIG. 35D

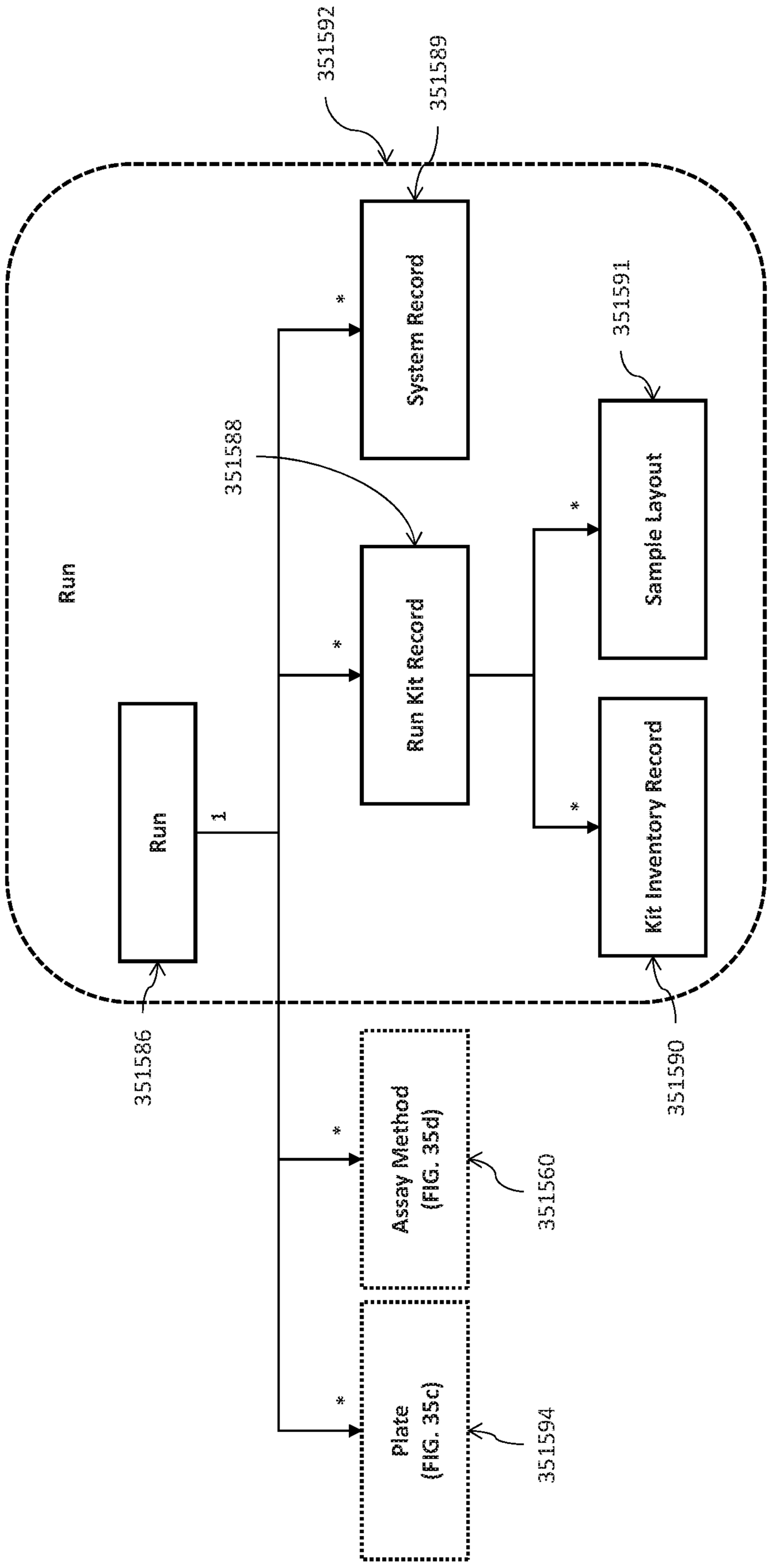

351592
351589
System Record
351591
351588
Sample Layout
Run
Run Kit Record
Run
1
Kit Inventory Record
351586
351590
Assay Method
(FIG. 35d)
351560
Plate
(FIG. 35c)
351594
*
1

FIG. 35E

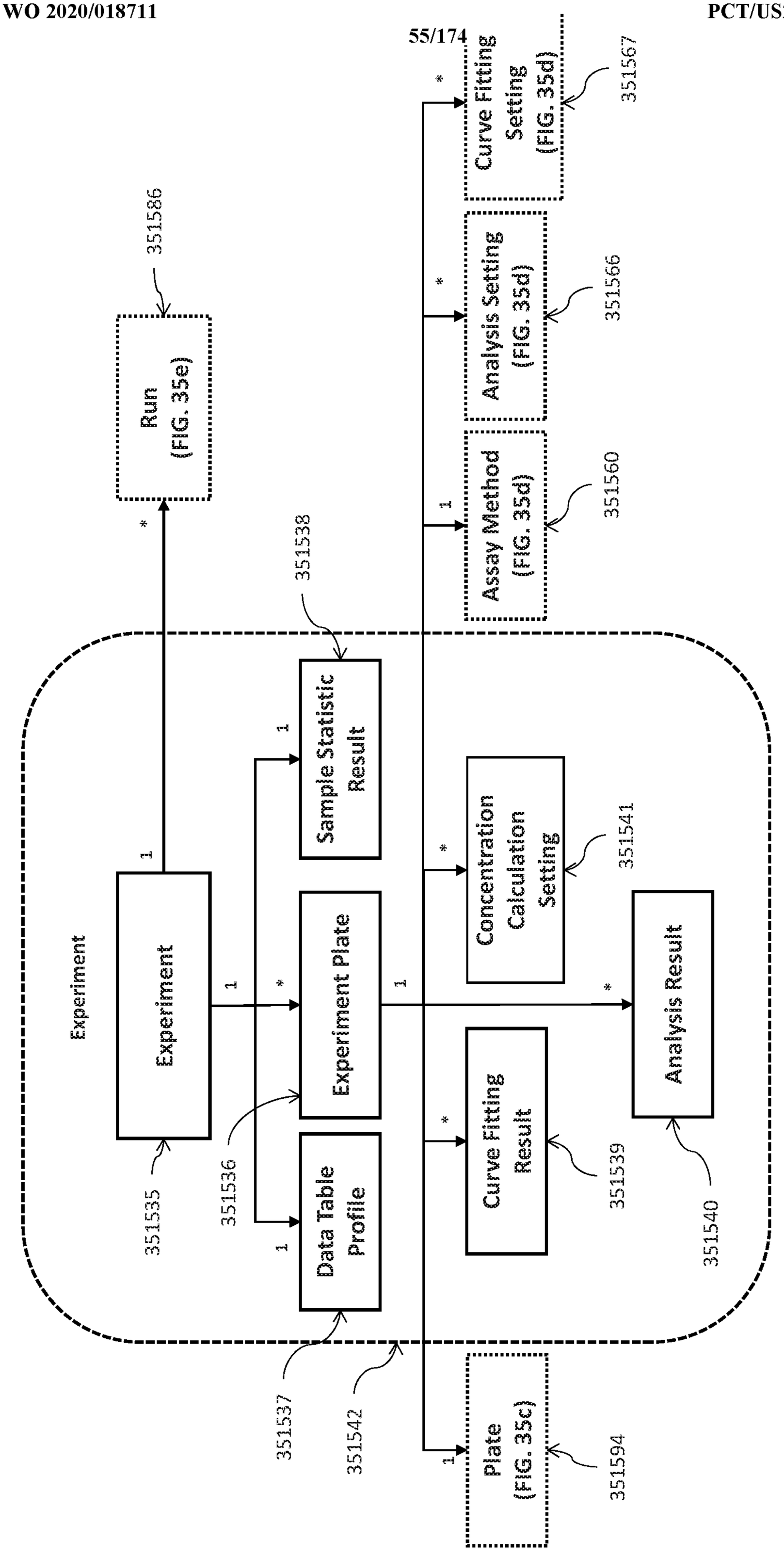

Experiment
Experiment
Experiment Plate
Data Table Profile
Sample Statistic Result
Curve Fitting Result
Concentration Calculation Setting
Analysis Result
Run (FIG. 35e)
Curve Fitting Setting (FIG. 35d)
Analysis Setting (FIG. 35d)
Assay Method (FIG. 35d)
Plate (FIG. 35c)
351535
351536
351537
351538
351539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

FIG. 35F

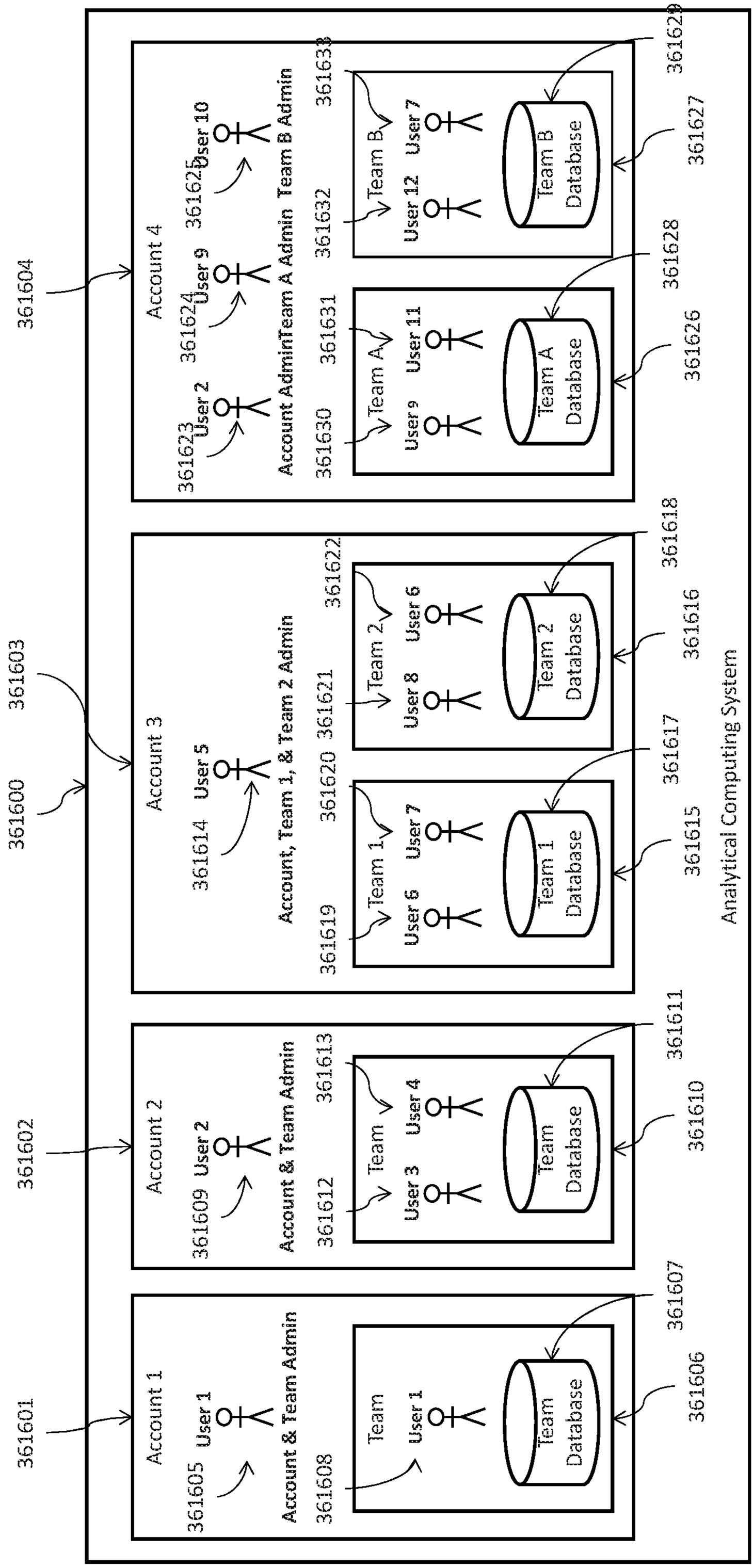

361601
361602
361603
361604
361600
Account 1
User 1
Account & Team Admin
361605
Team
User 1
361608
Team Database
361606
361607
Account 2
User 2
Account & Team Admin
361609
Team
User 3
User 4
361612
Team Database
361610
361611
Account 3
User 5
Account, Team 1, & Team 2 Admin
361614
Team 1
User 6
User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

FIG. 36A

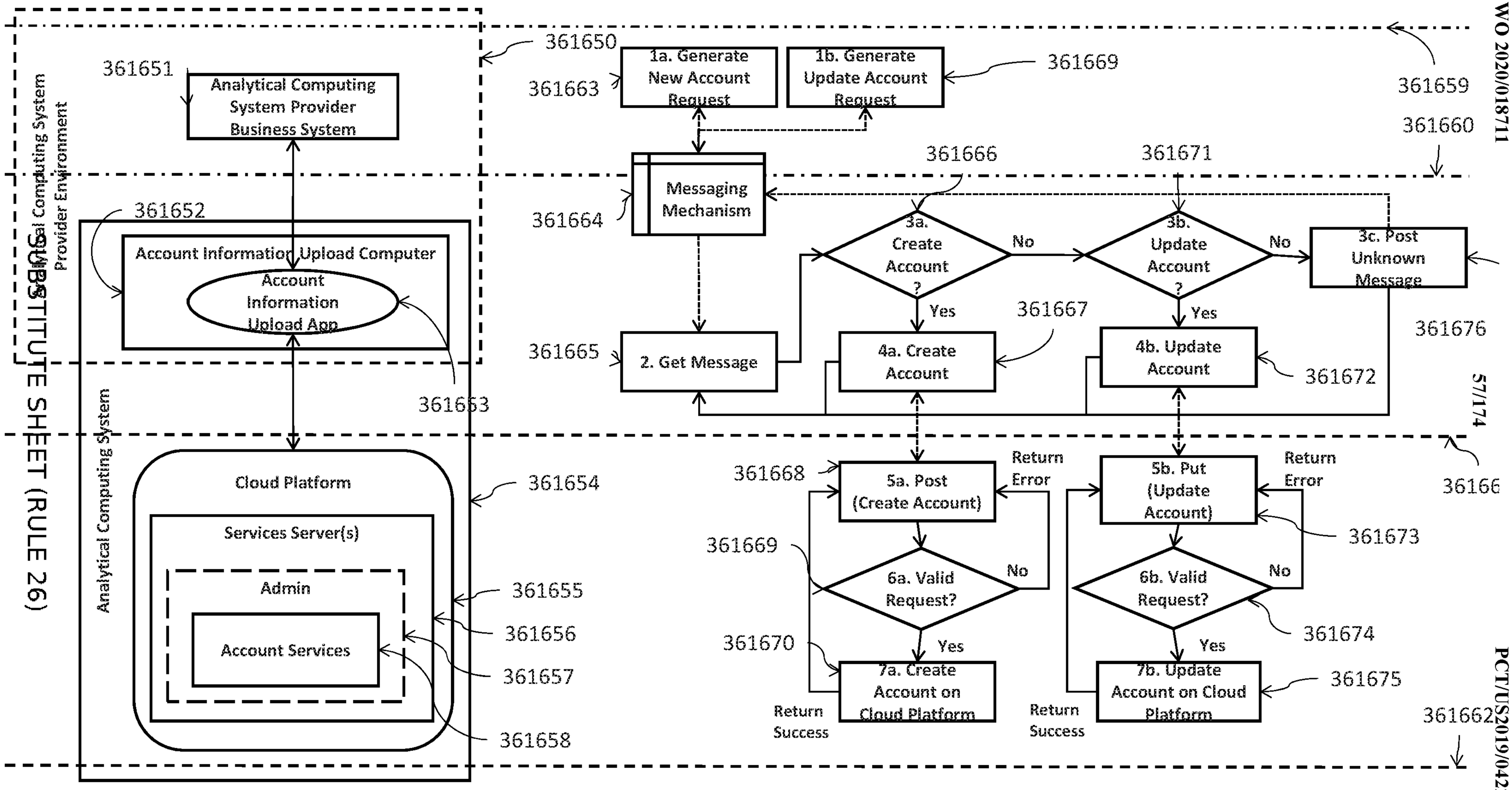

Analytical Computing System Provider Environment
361650
361651
Analytical Computing System Provider Business System
361652
Account Information Upload Computer
Account Information Upload App
361653
Analytical Computing System
Cloud Platform
361654
Services Server(s)
Admin
361655
Account Services
361656
361657
361658
1a. Generate New Account Request
1b. Generate Update Account Request
361669
361659
361660
361663
361666
361671
Messaging Mechanism
361664
3a. Create Account ?
No
3b. Update Account ?
No
3c. Post Unknown Message
Yes
Yes
361667
361676
361665
2. Get Message
4a. Create Account
4b. Update Account
361672
361668
5a. Post (Create Account)
Return Error
5b. Put (Update Account)
Return Error
361673
361669
6a. Valid Request?
No
6b. Valid Request?
No
361674
361670
Yes
Yes
7a. Create Account on Cloud Platform
7b. Update Account on Cloud Platform
361675
Return Success
Return Success
36166
361662

FIG. 36B

SUBSTITUTE SHEET (RULE 26)

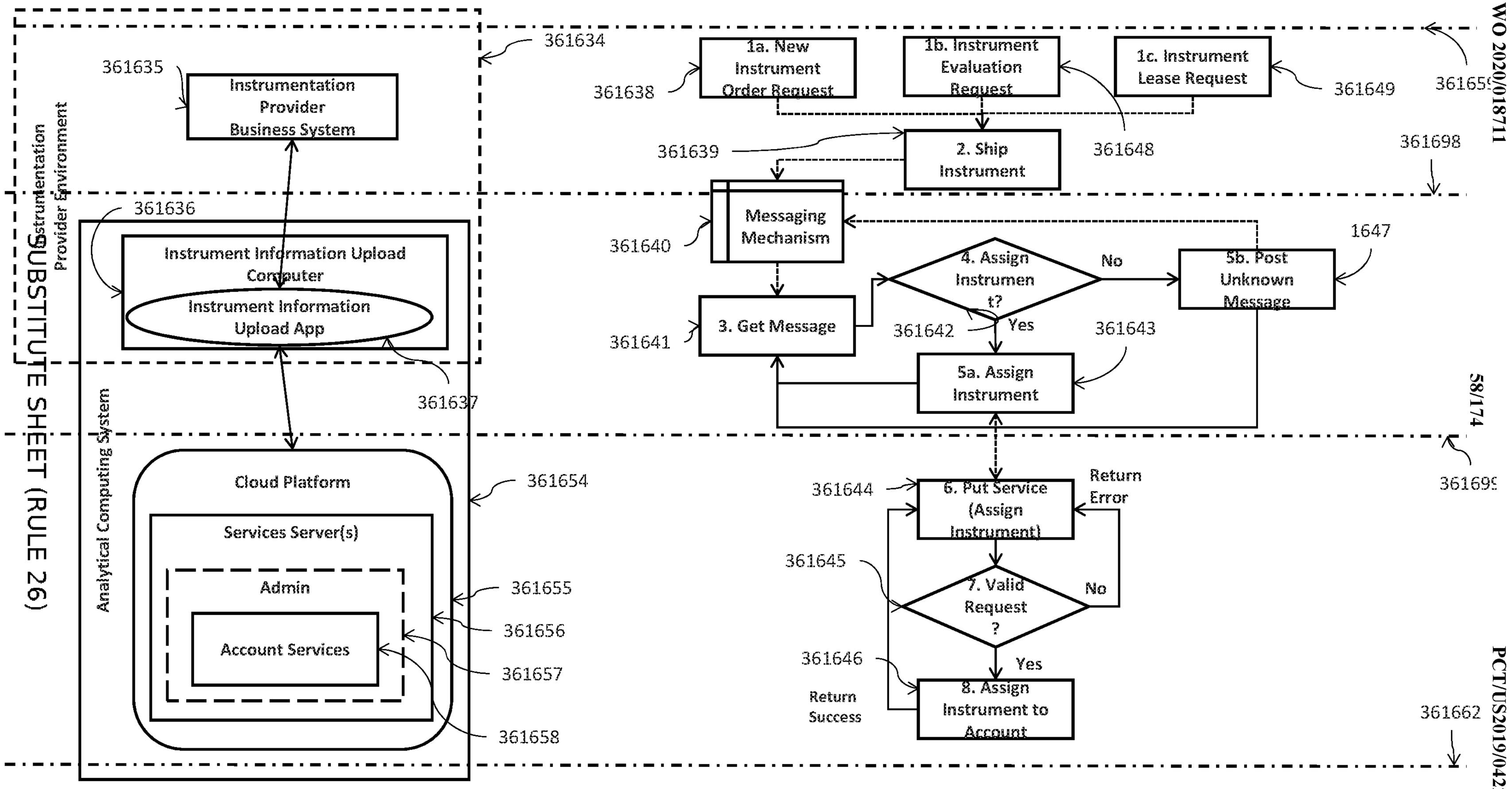


FIG. 36C

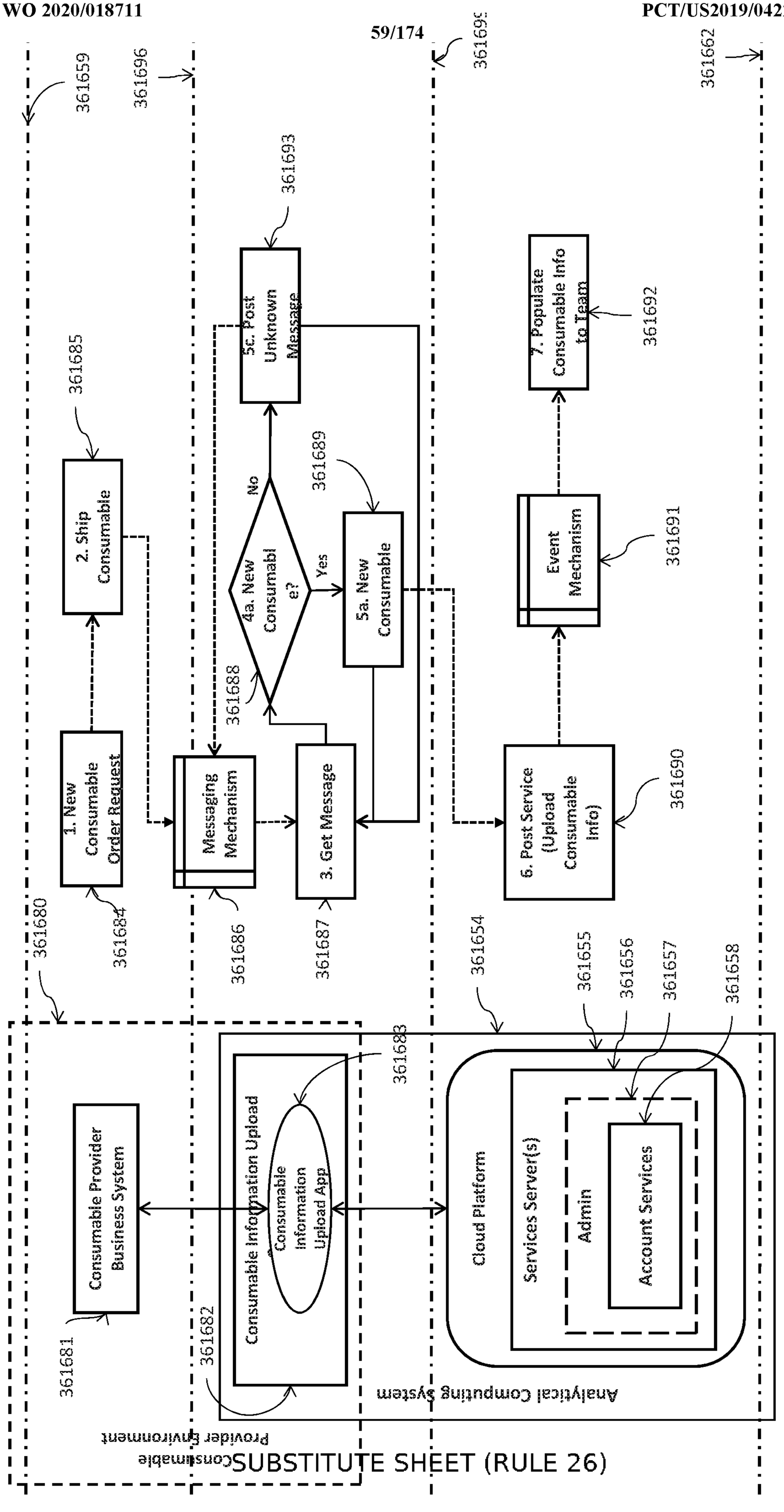

Provider Environment
Consumable Information Upload
Analytical Computing System
Cloud Platform
Services Server(s)
Admin
Account Services
Consumable Provider Business System
Consumable Information Upload App
1. New Consumable Order Request
2. Ship Consumable
3. Get Message
4a. New Consumable?
5a. New Consumable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

FIG. 36D

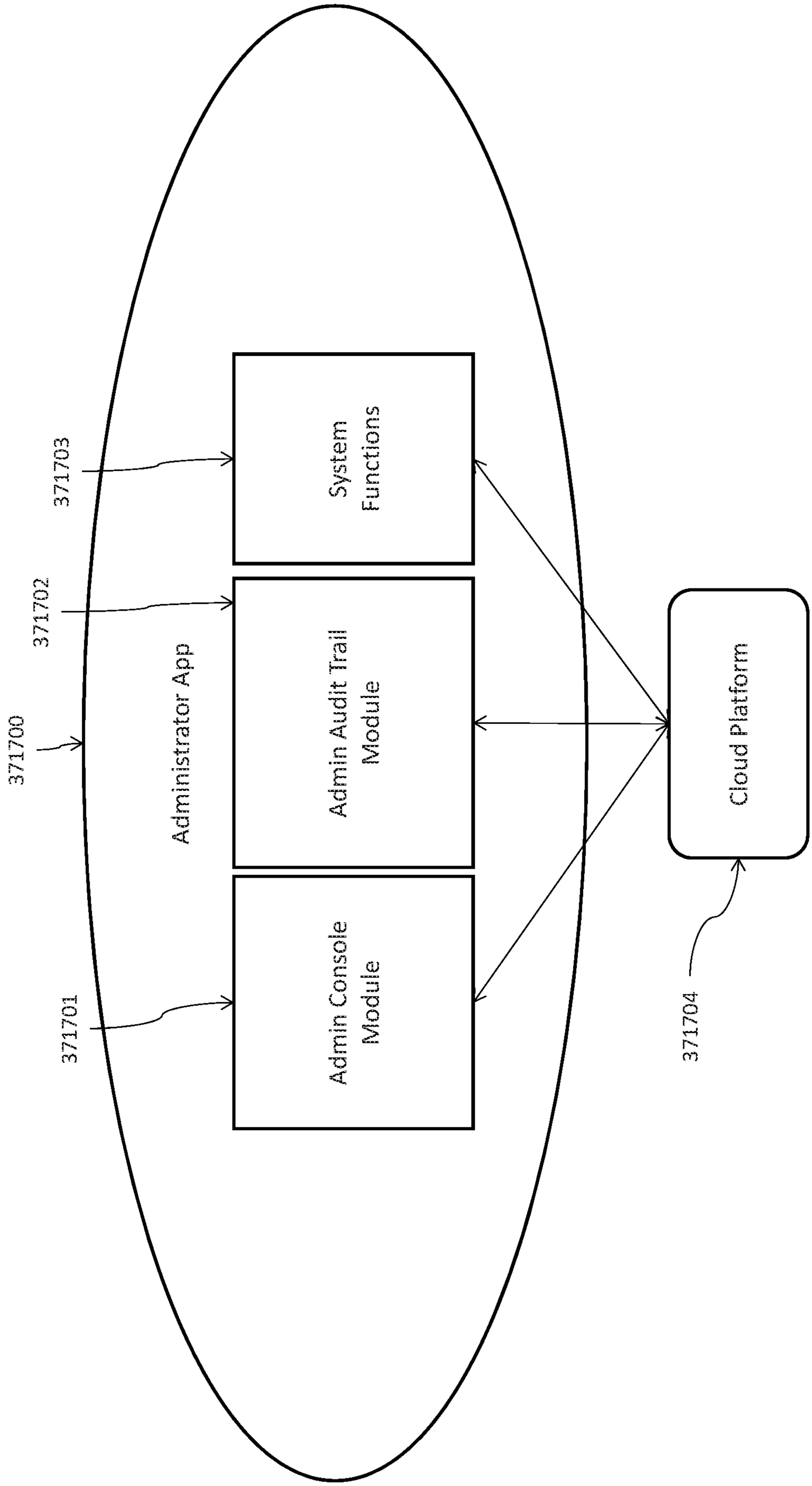

371700
Administrator App
371702
Admin Audit Trail Module
371703
System Functions
371701
Admin Console Module
371704
Cloud Platform

FIG. 37

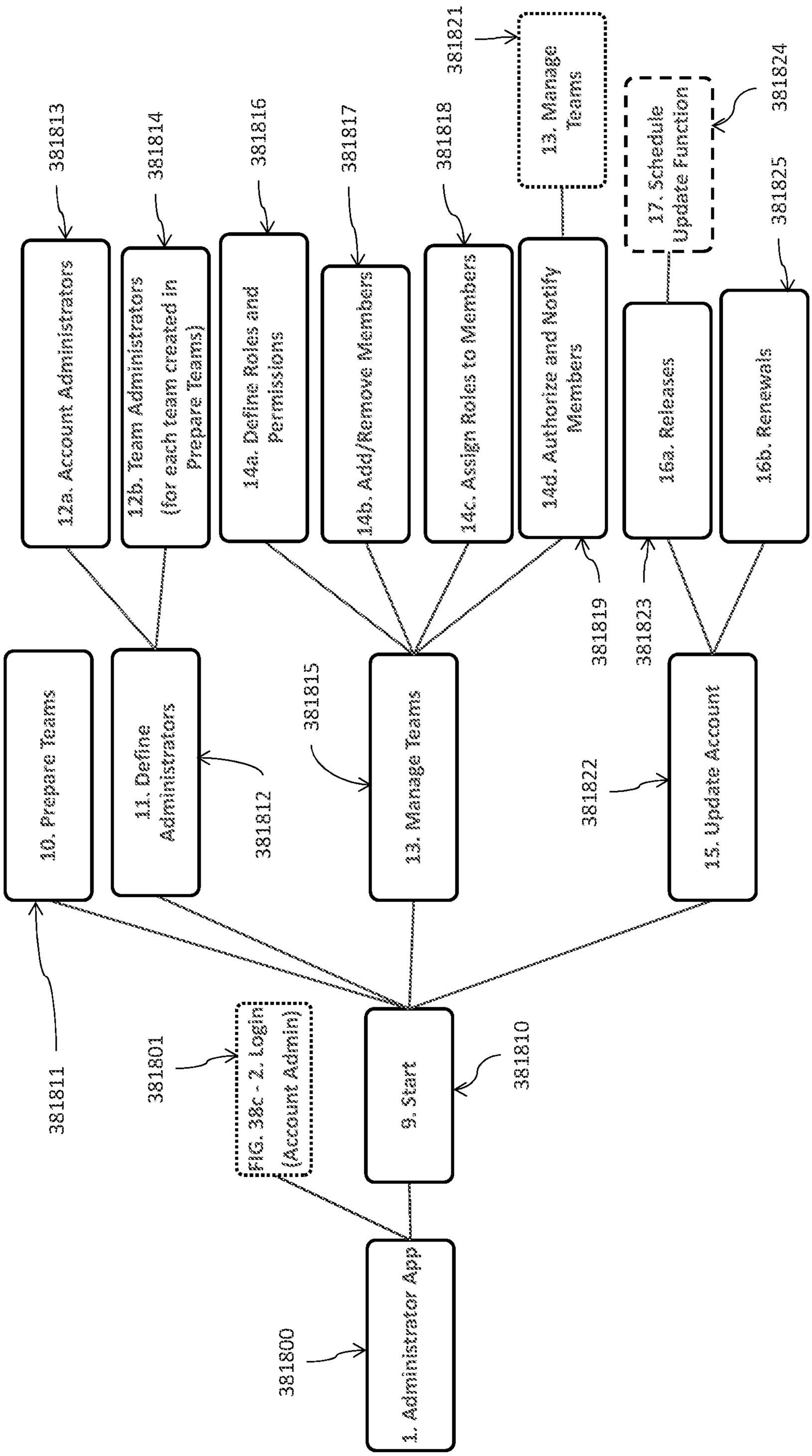

1. Administrator App
381800
9. Start
381810
FIG. 38c - 2. Login (Account Admin)
381801
381811
10. Prepare Teams
11. Define Administrators
381812
12a. Account Administrators
12b. Team Administrators (for each team created in Prepare Teams)
13. Manage Teams
381815
14a. Define Roles and Permissions
14b.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

FIG. 38A

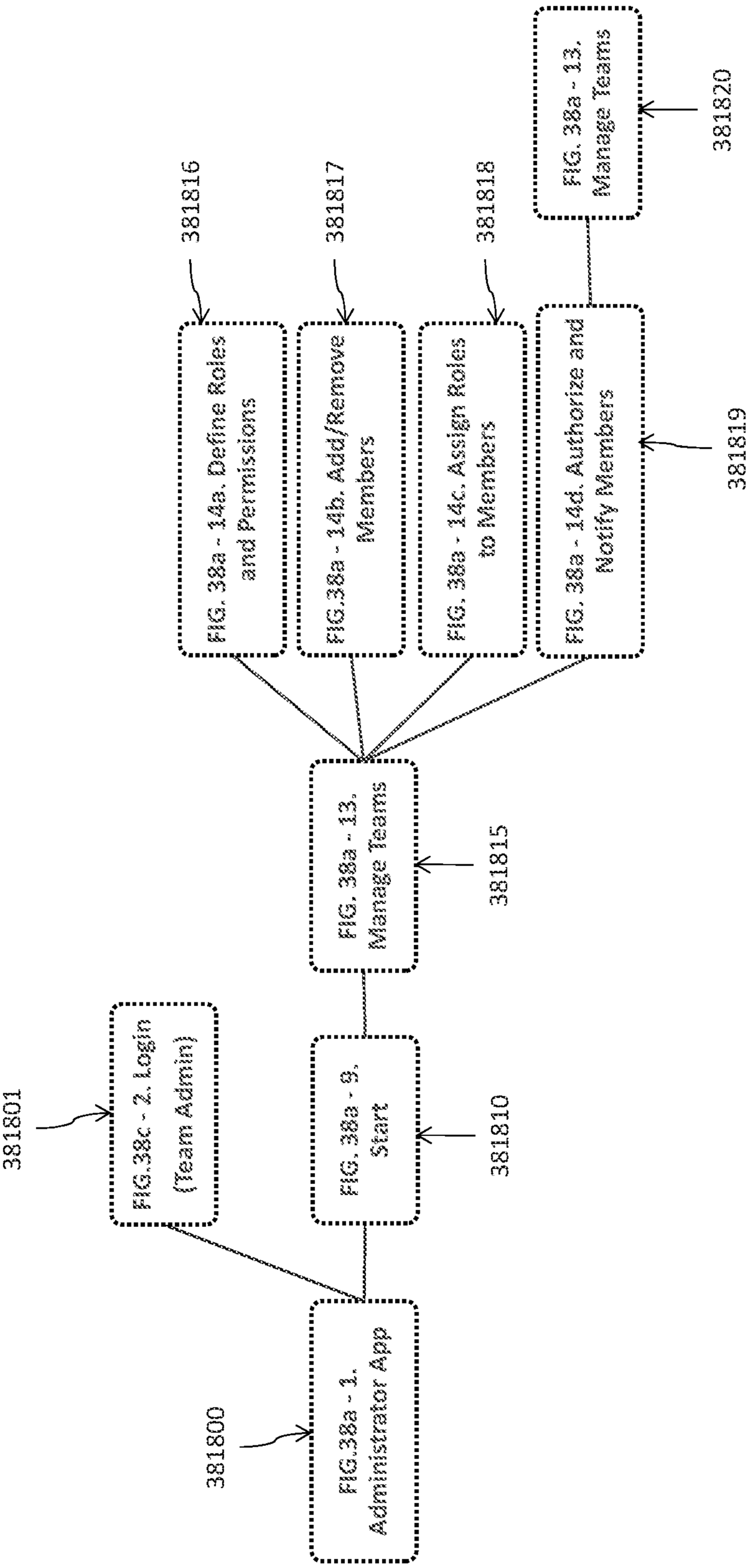

FIG. 38a - 1. Administrator App
381800
FIG. 38c - 2. Login (Team Admin)
381801
FIG. 38a - 9. Start
381810
FIG. 38a - 13. Manage Teams
381815
FIG. 38a - 14a. Define Roles and Permissions
381816
FIG. 38a - 14b. Add/Remove Members
381817
FIG. 38a - 14c. Assign Roles to Members
381818
FIG. 38a - 14d. Authorize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

FIG. 38B

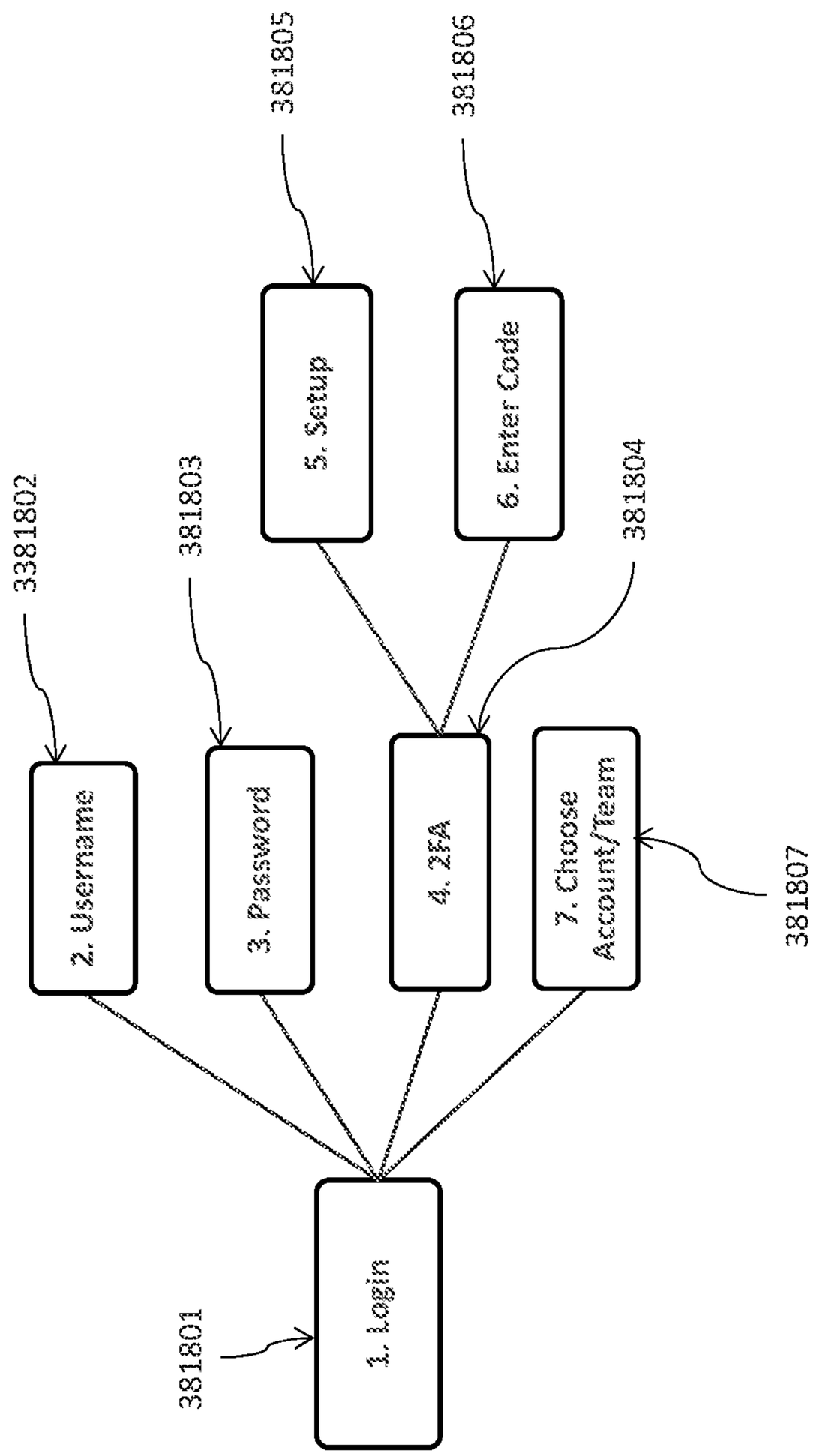

1. Login
2. Username
3. Password
4. 2FA
5. Setup
6. Enter Code
7. Choose Account/Team
381801
3381802
381803
381804
381805
381806
381807

FIG. 38C

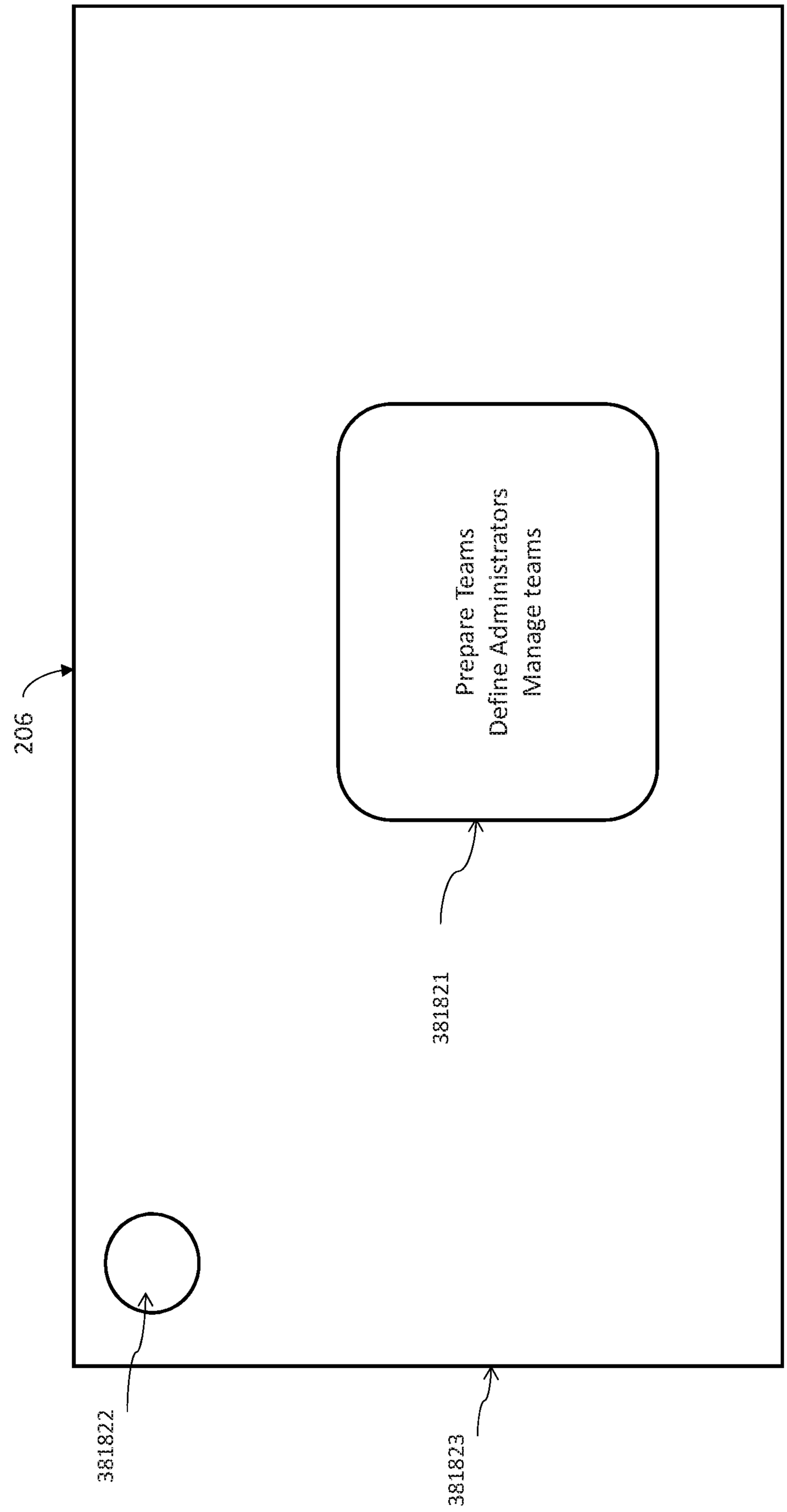

206
Prepare Teams
Define Administrators
Manage teams
381821
381822
381823

FIG. 38D

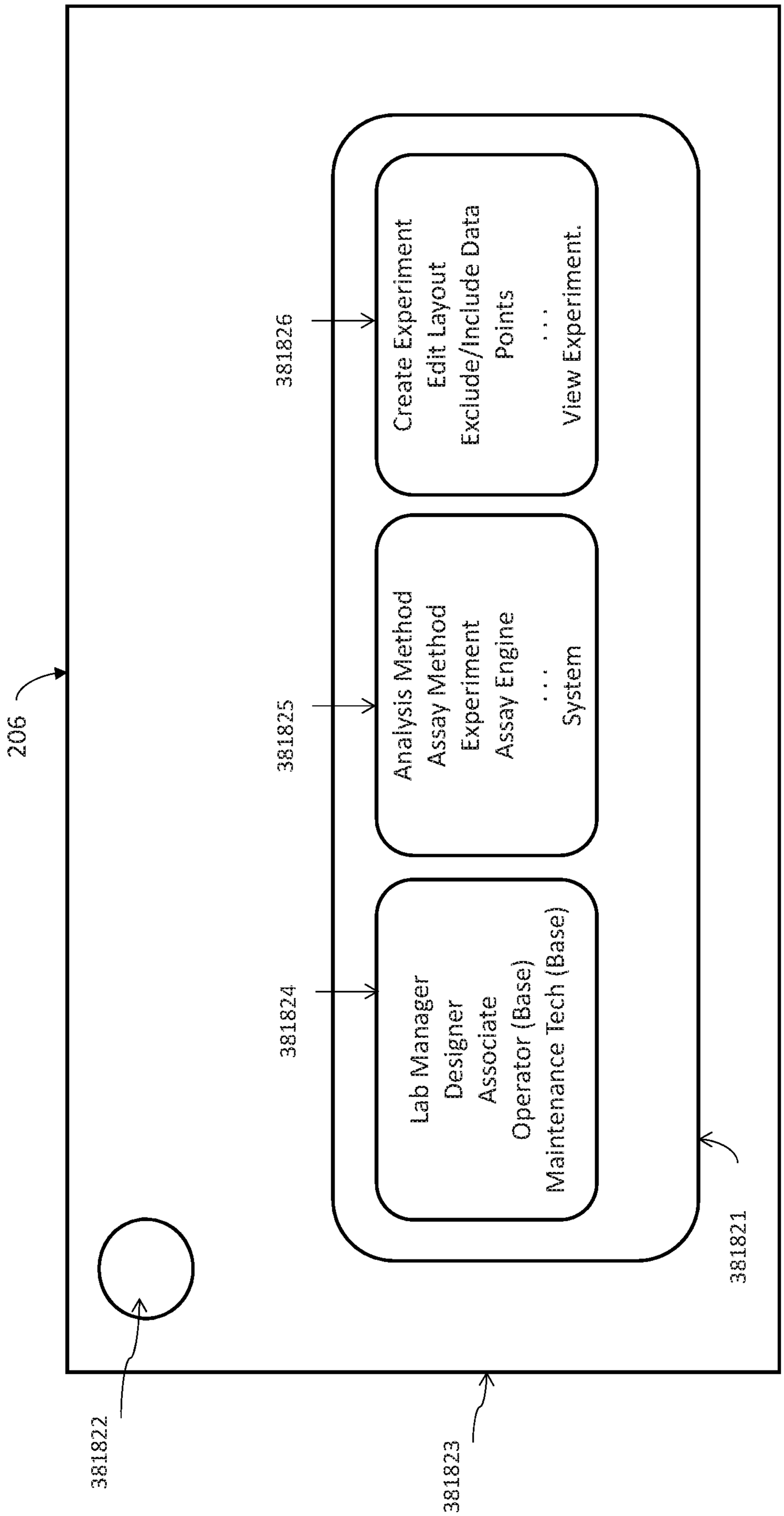

206
381821
381822
381823
381824
Lab Manager
Designer
Associate
Operator (Base)
Maintenance Tech (Base)
381825
Analysis Method
Assay Method
Experiment
Assay Engine
...
System
381826
Create Experiment
Edit Layout
Exclude/Include Data Points
...
View Experiment.

FIG. 38E

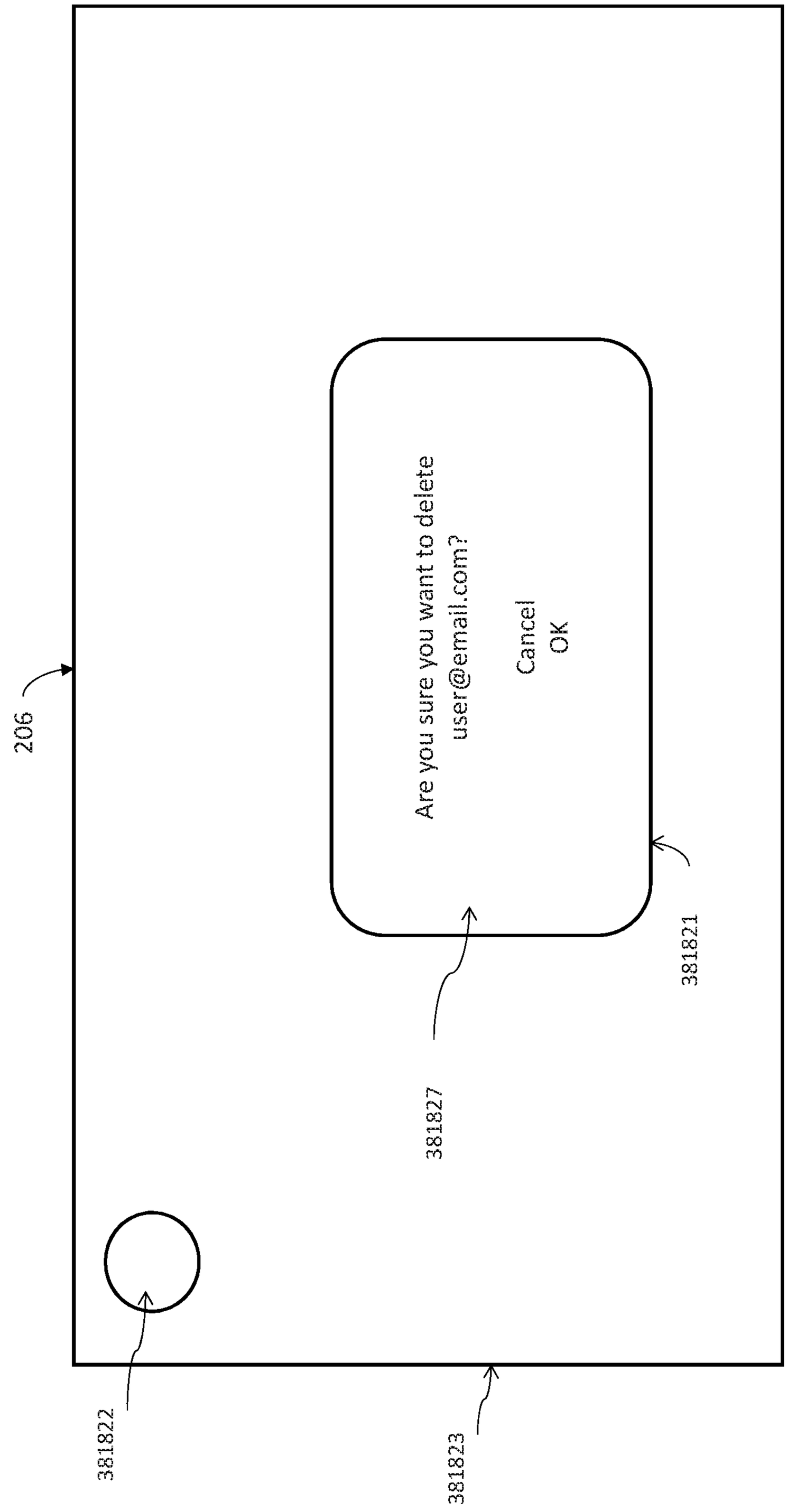

206
Are you sure you want to delete
user@email.com?
Cancel
OK
381827
381821
381822
381823

FIG. 38F

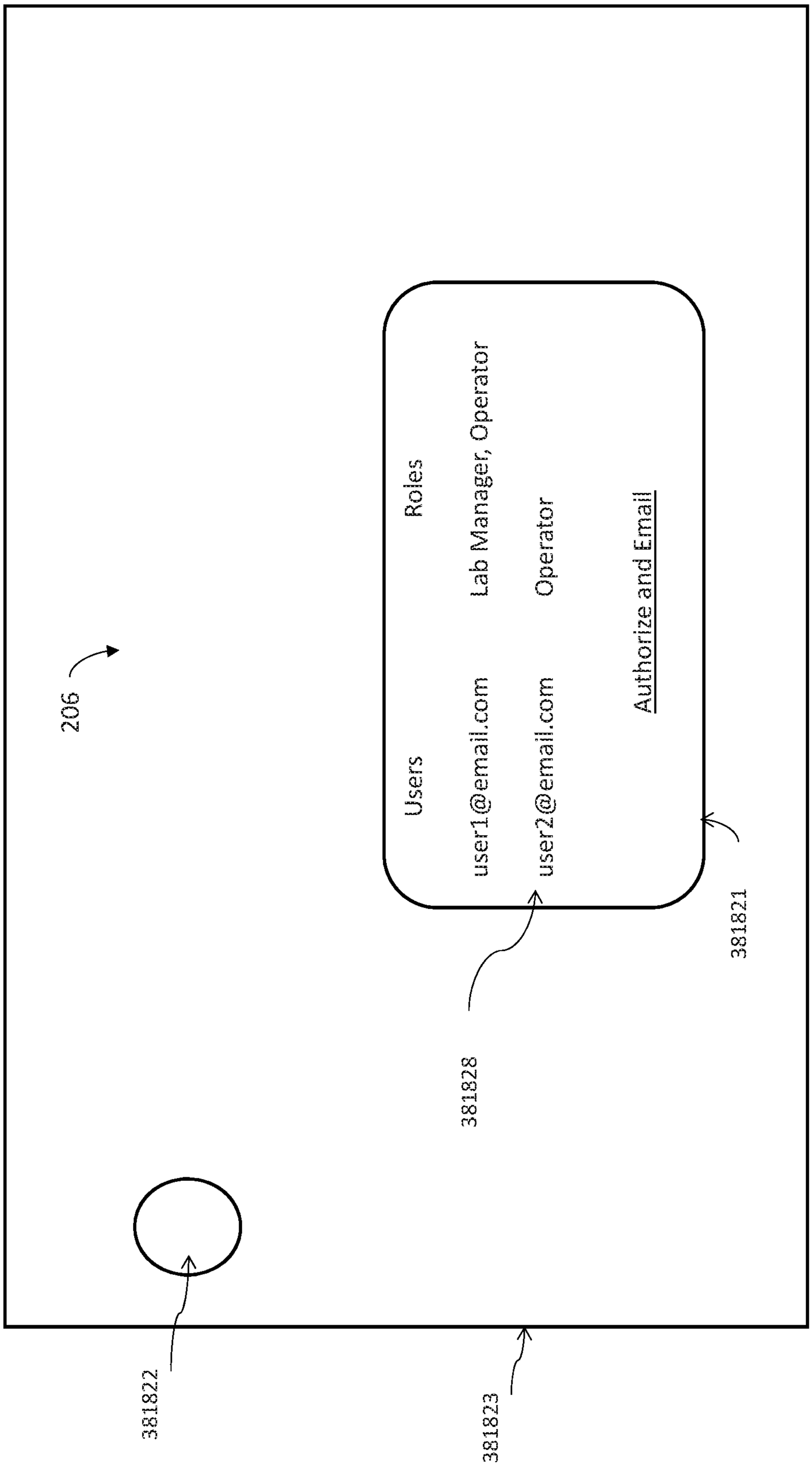

206
Roles
Lab Manager, Operator
Operator
Authorize and Email
Users
user1@email.com
user2@email.com
381828
381821
381822
381823

FIG. 38G

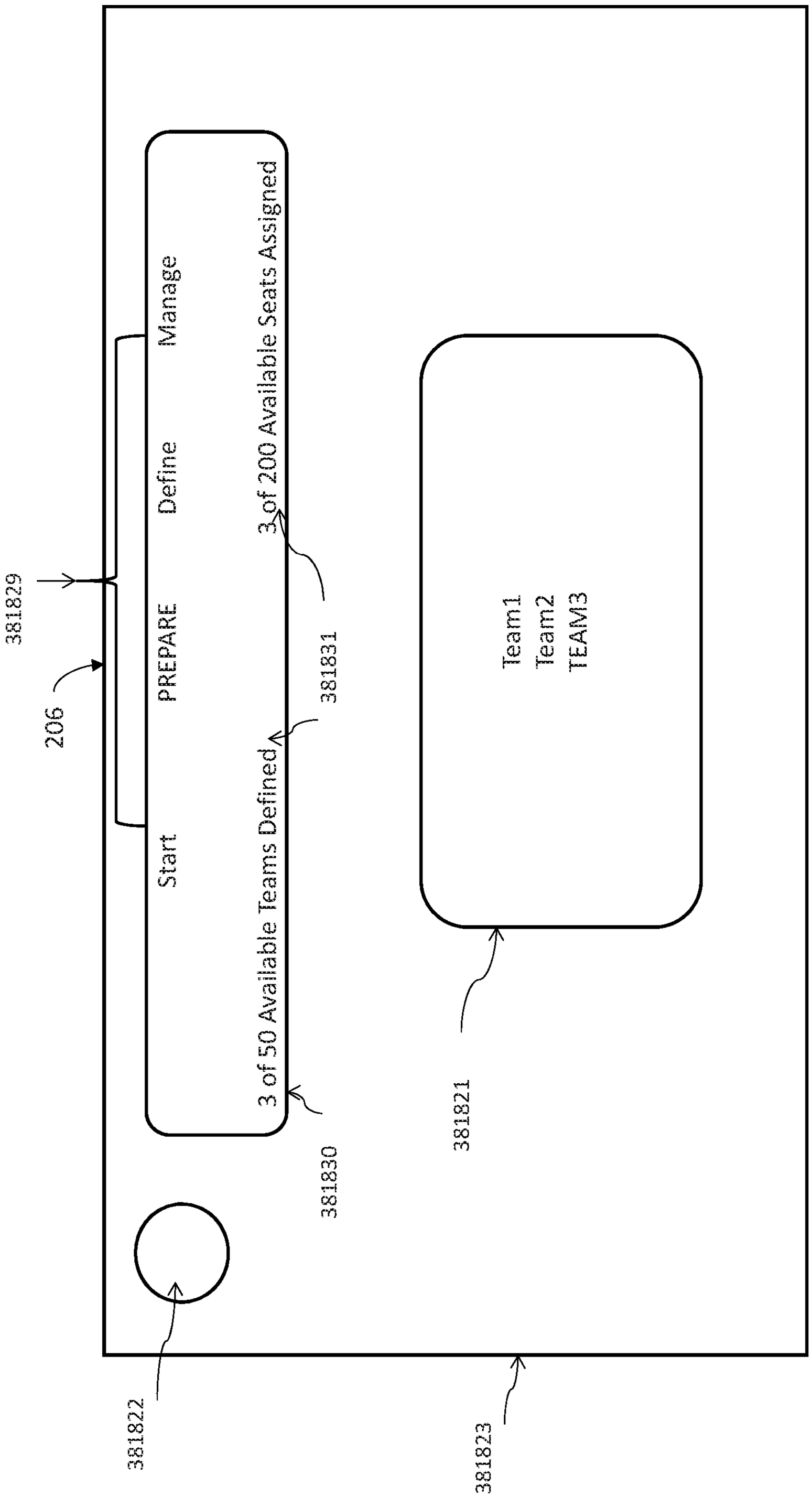

206
381829
PREPARE
Define
Manage
Start
3 of 200 Available Seats Assigned
3 of 50 Available Teams Defined
381831
Team1
Team2
TEAM3
381821
381830
381822
381823

FIG. 38H

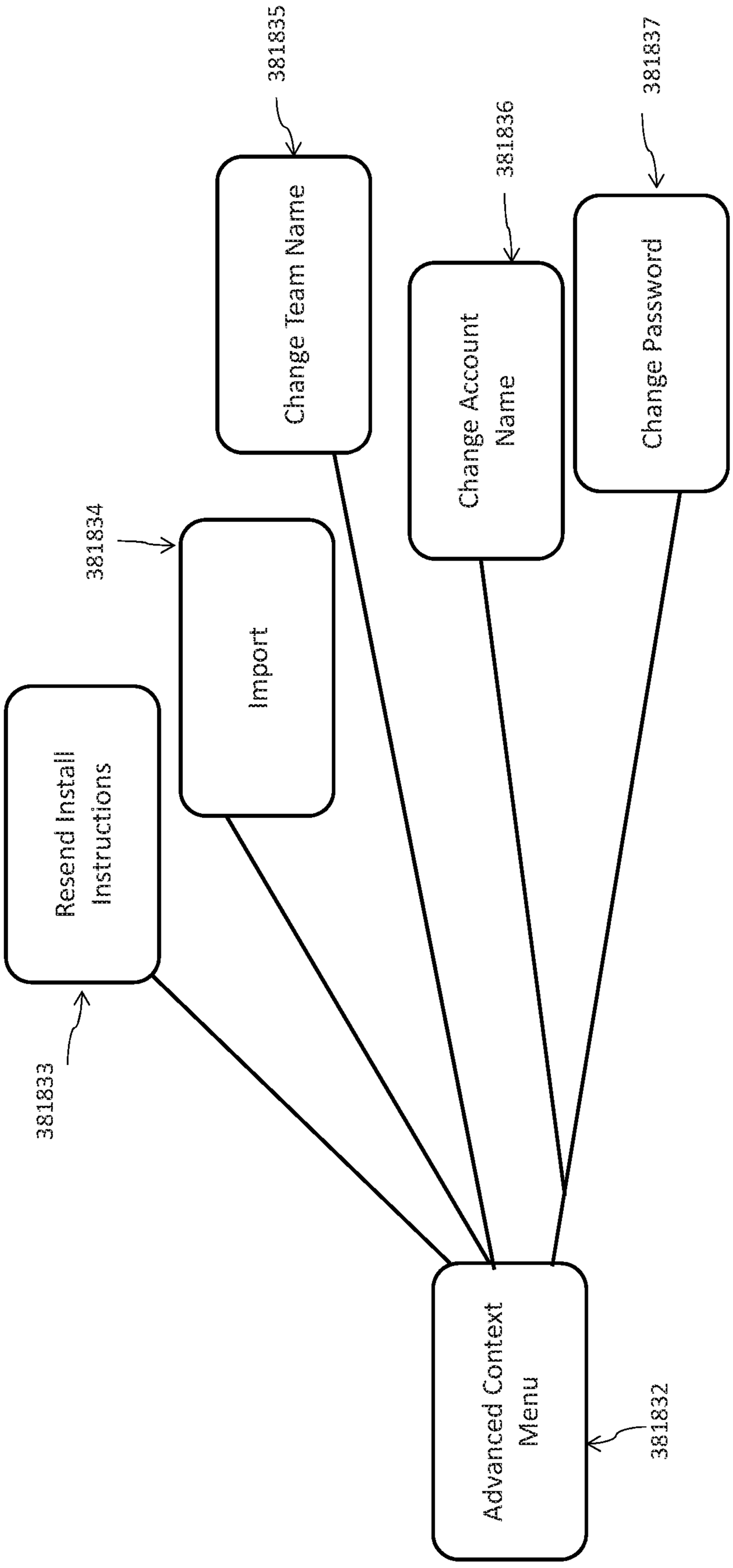

381835
Change Team Name
381836
Change Account Name
381837
Change Password
381834
Import
Resend Install Instructions
381833
Advanced Context Menu
381832

FIG. 38I

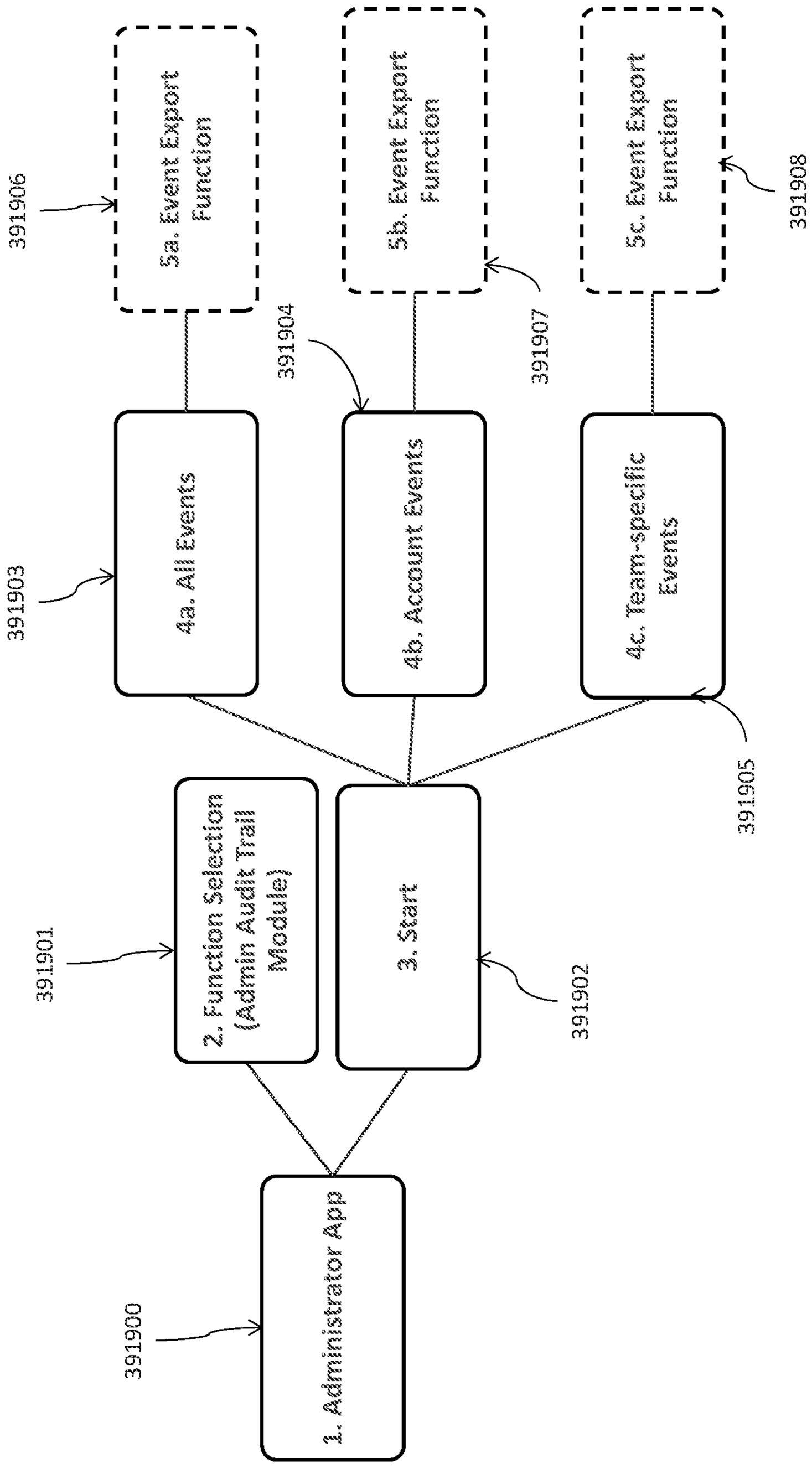

1. Administrator App
2. Function Selection (Admin Audit Trail Module)
3. Start
4a. All Events
4b. Account Events
4c. Team-specific Events
5a. Event Export Function
5b. Event Export Function
5c. Event Export Function
391900
391901
391902
391903
391904
391905
391906
391907
391908

FIG. 39A

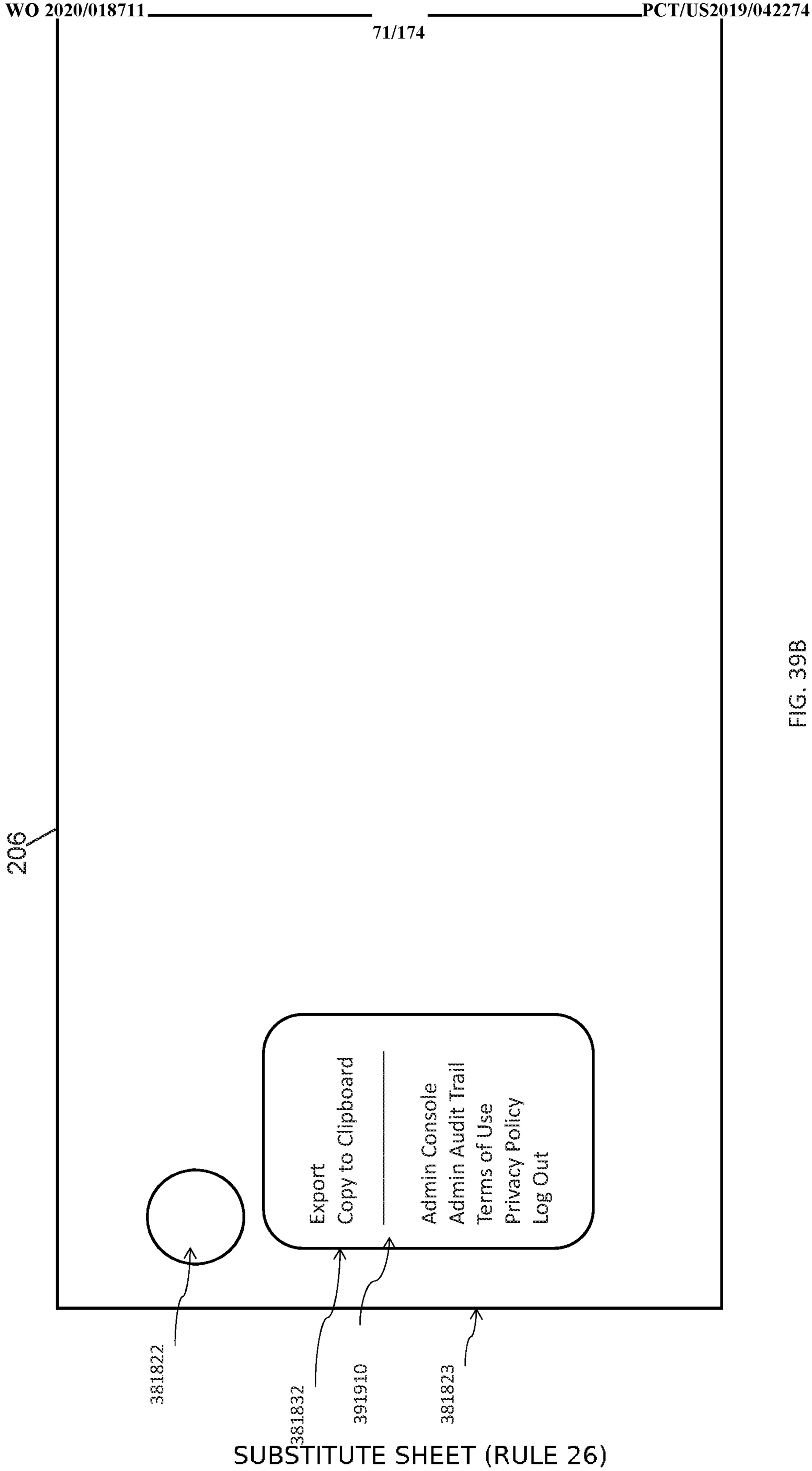

206
Export
Copy to Clipboard
Admin Console
Admin Audit Trail
Terms of Use
Privacy Policy
Log Out
381822
381832
391910
381823

FIG. 39B

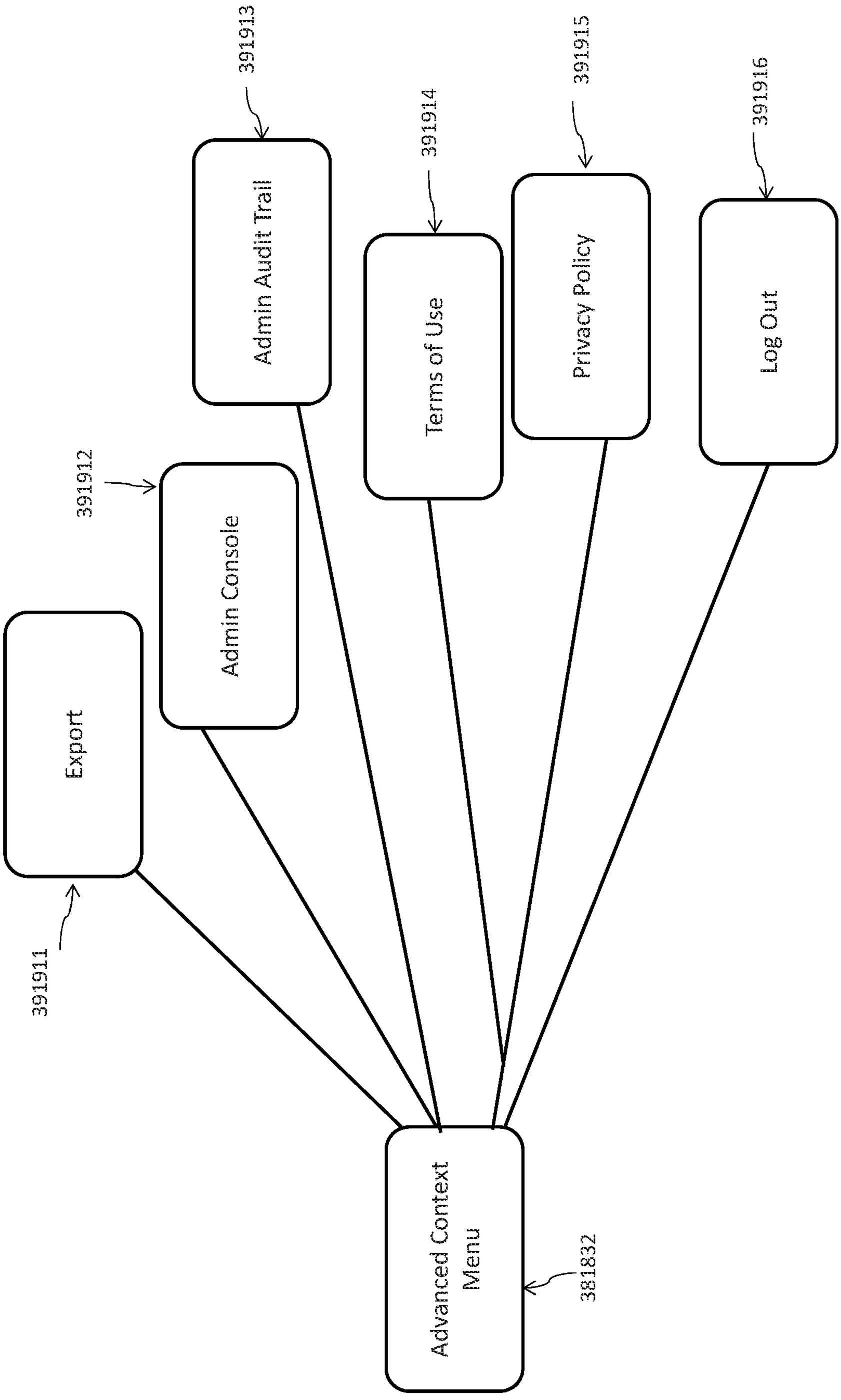

391913
Admin Audit Trail
391914
Terms of Use
391915
Privacy Policy
391916
Log Out
391912
Admin Console
391911
Export
381832
Advanced Context Menu

FIG. 39C

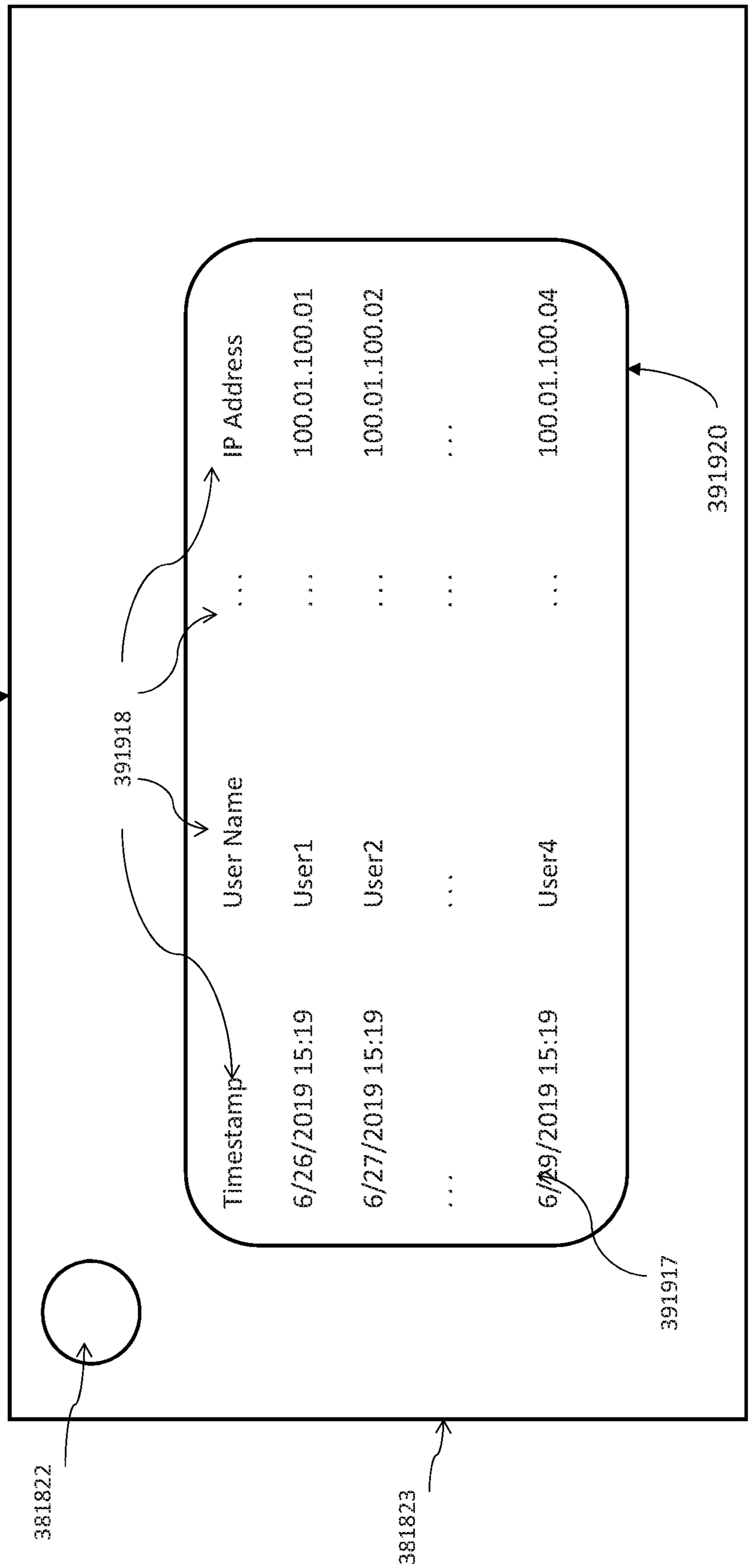

206
391918
IP Address
100.01.100.01
100.01.100.02
100.01.100.04
391920
User Name
User1
User2
User4
Timestamp
6/26/2019 15:19
6/27/2019 15:19
6/29/2019 15:19
391917
381822
381823

FIG. 39D

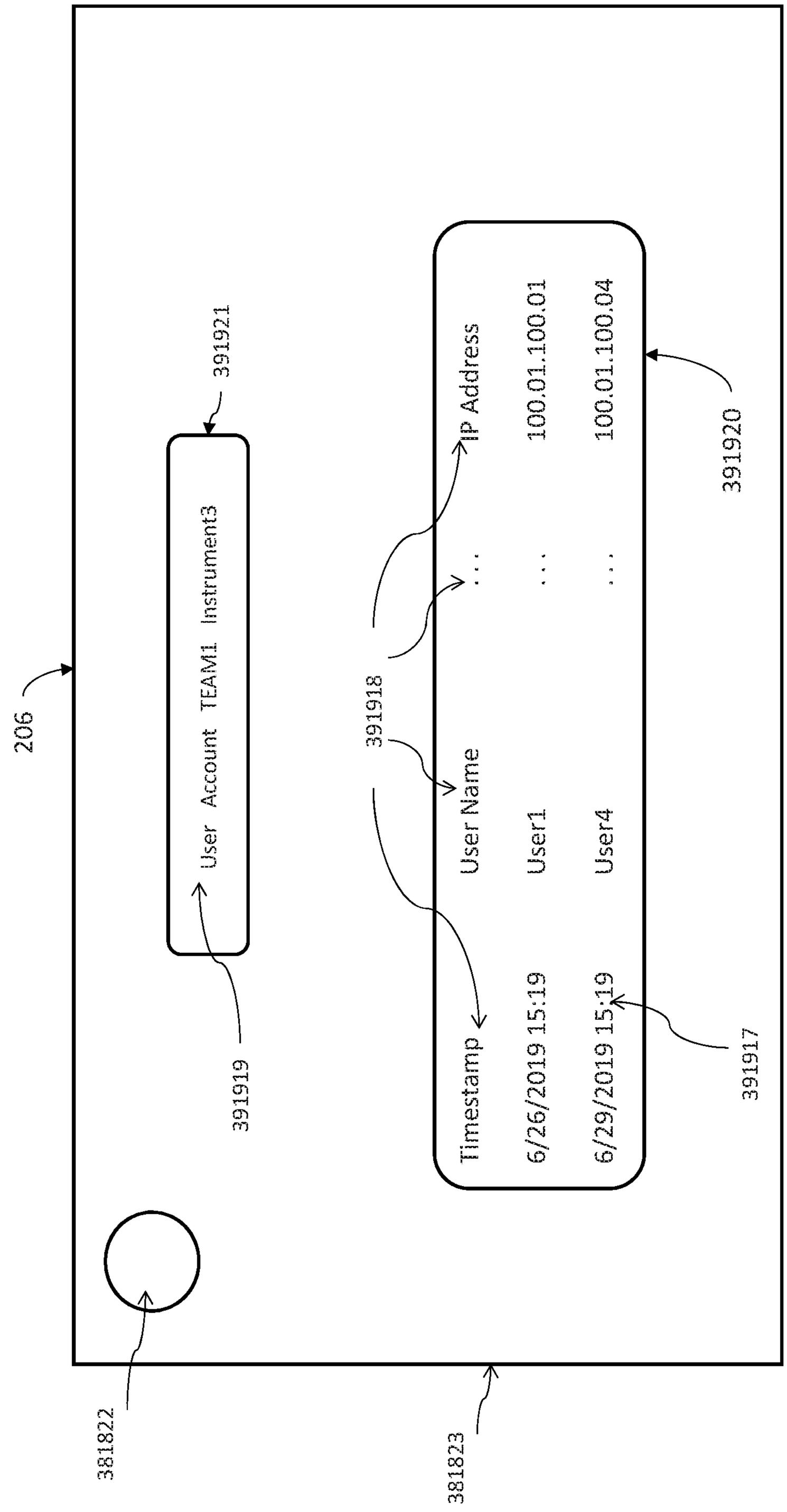

206
User Account TEAM1 Instrument3
391921
391919
391918
IP Address
100.01.100.01
100.01.100.04
391920
User Name
User1
User4
Timestamp
6/26/2019 15:19
6/29/2019 15:19
391917
381822
381823

FIG. 39E

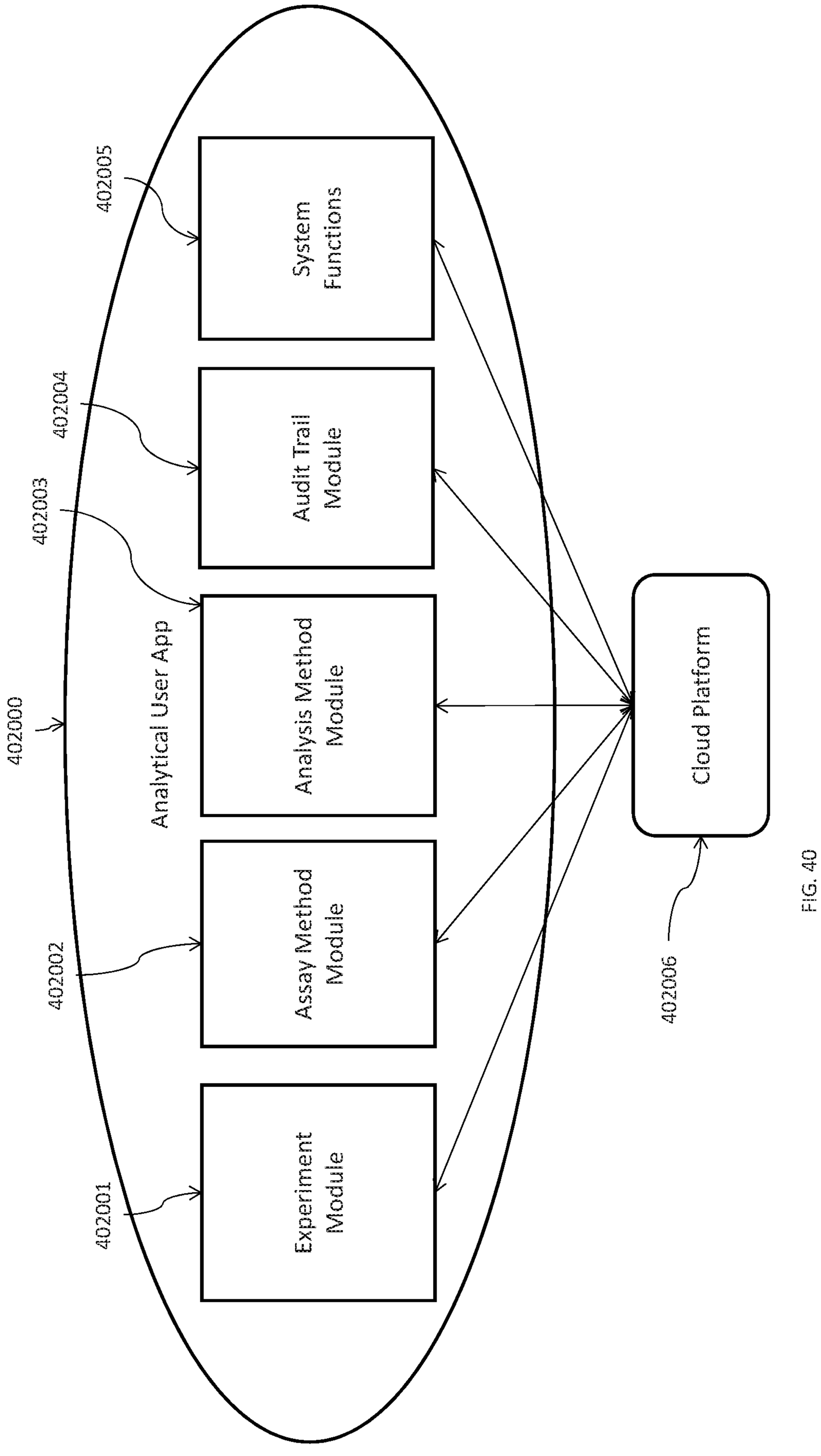

402000
Analytical User Application
402001
Experiment Module
402002
Assay Method Module
402003
Analysis Method Module
402004
Audit Trail Module
402005
System Functions
402006
Cloud Platform

FIG. 40

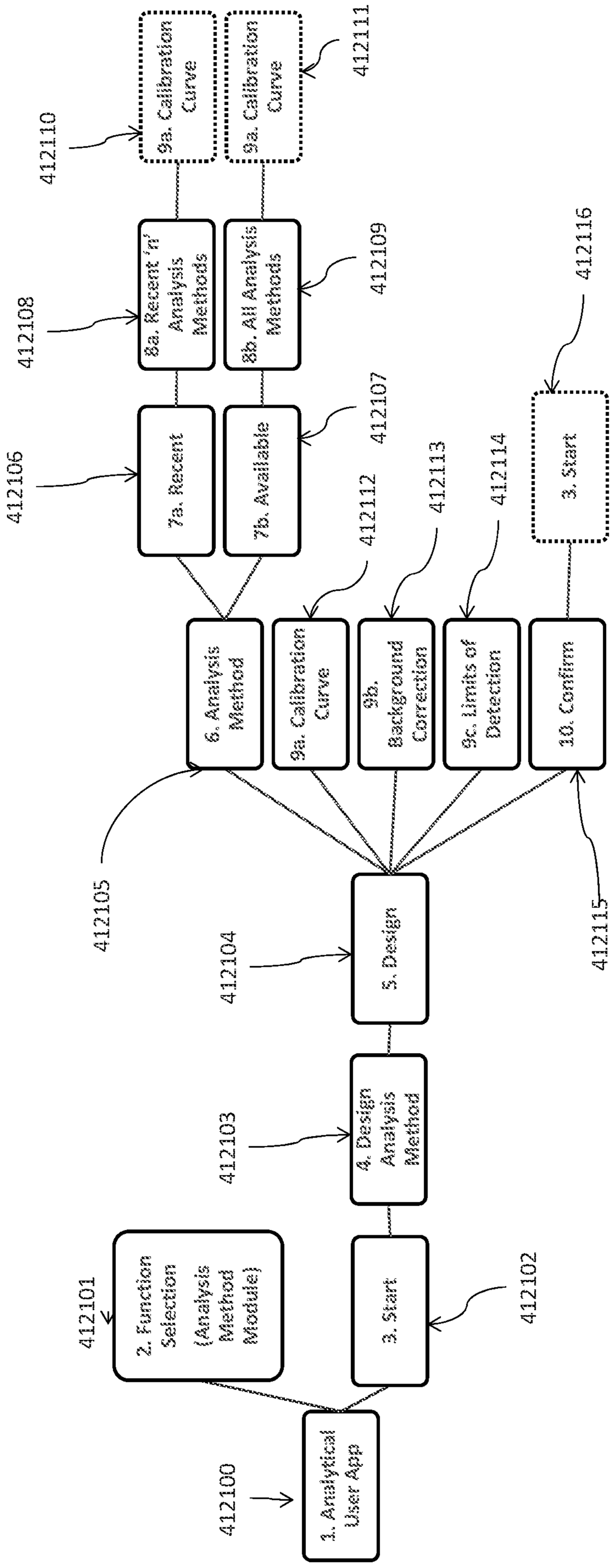


FIG. 41 – Analytical User App Analysis Method Module Flow

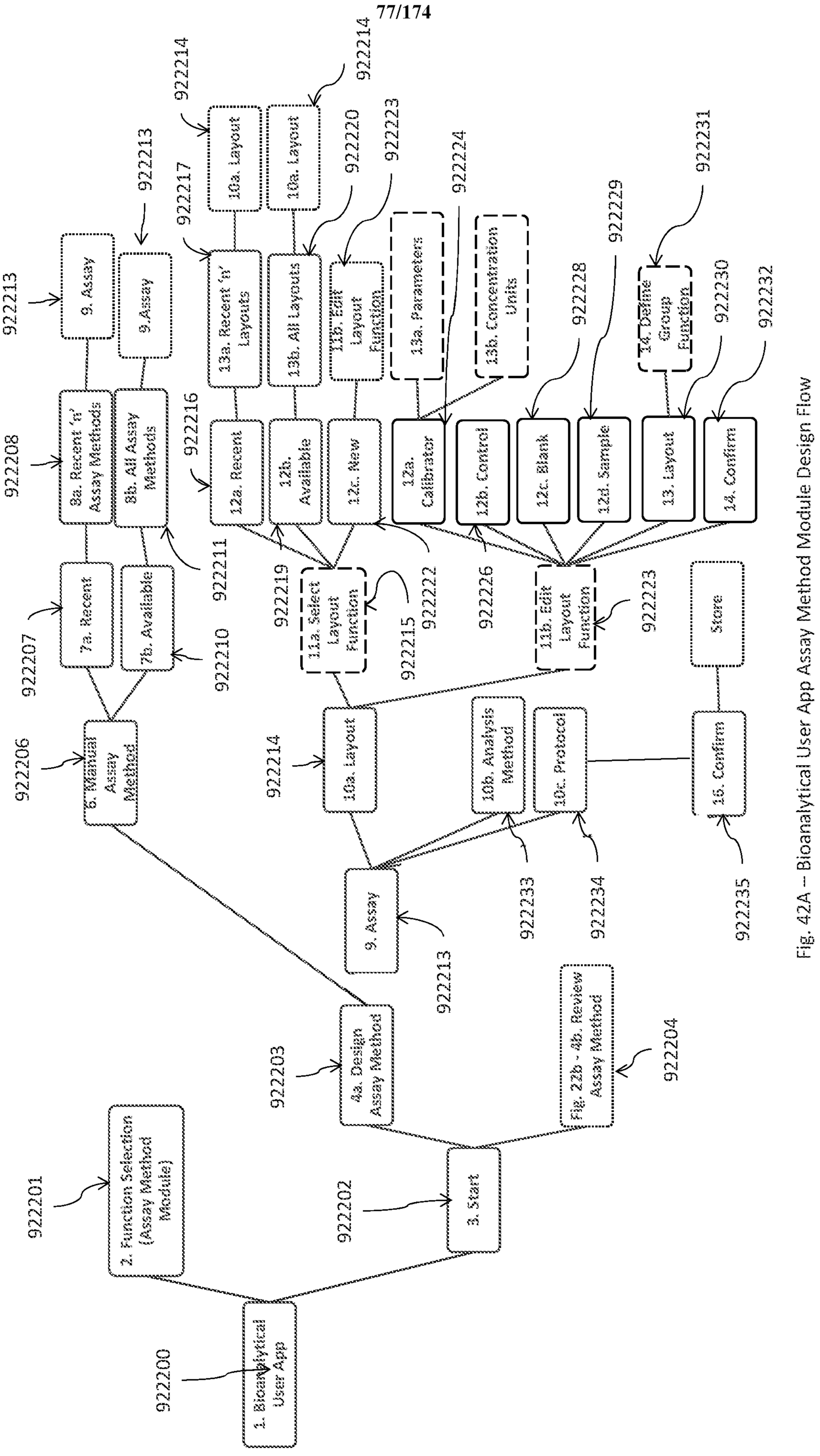


Fig. 42A – Bioanalytical User App Assay Method Module Design Flow

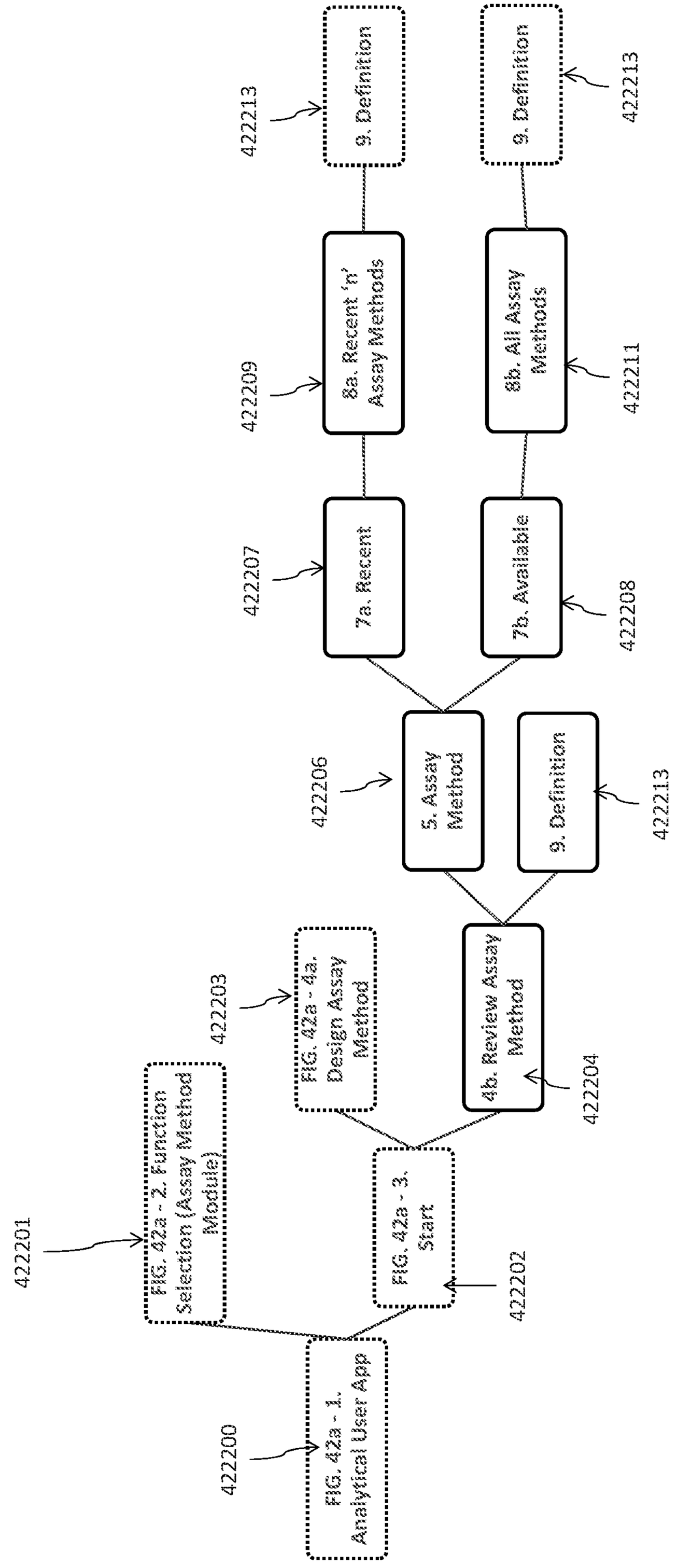

422213
9. Definition
422213
9. Definition
422209
8a. Recent 'n' Assay Methods
422211
8b. All Assay Methods
422207
7a. Recent
422208
7b. Available
422206
5. Assay Method
422213
9. Definition
422203
FIG. 42a - 4a. Design Assay Method
422204
4b. Review Assay Method
422201
FIG. 42a - 2. Function Selection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

FIG. 42B

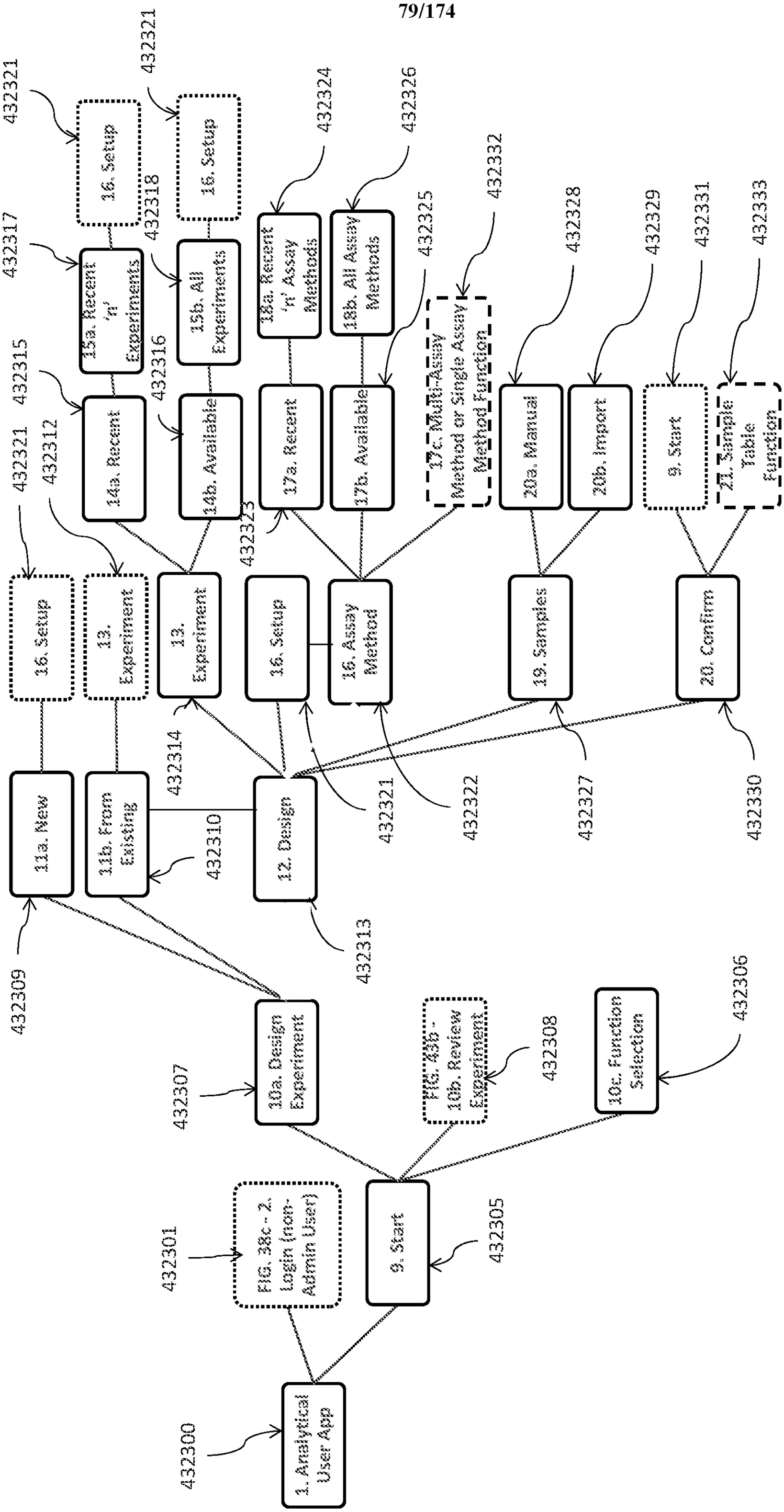

1. Analytical User App
FIG. 38c - 2. Login (non-Admin User)
9. Start
1a. New
1b. From Existing
2. Design
3a. Recent 'n' Experiments
3b. All Experiments
4a. Recent 'n' Assay Methods
4b. All Assay Methods
5. Multi-Assay or Single Assay Method Function
6a. Manual
6b. Import
7. Sample Table Function
8. Start
9. Samples
10. Confirm
11a. Design Experiment
FIG. 43b - 10b. Review Experiment
11c. Function Selection
12a. New
12b. From Existing
12. Design
13. Experiment
14a. Recent
14b. Available
14. Assay Method
15a. Recent 'n' Experiments
15b. All Experiments
16. Setup
17a. Recent
17b. Available
17. Assay Method
18a. Recent 'n' Assay Methods
18b. All Assay Methods
19. Samples
20. Confirm
21. Sample Table Function
432300
432301
432305
432306
432307
432308
432309
432310
432311
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

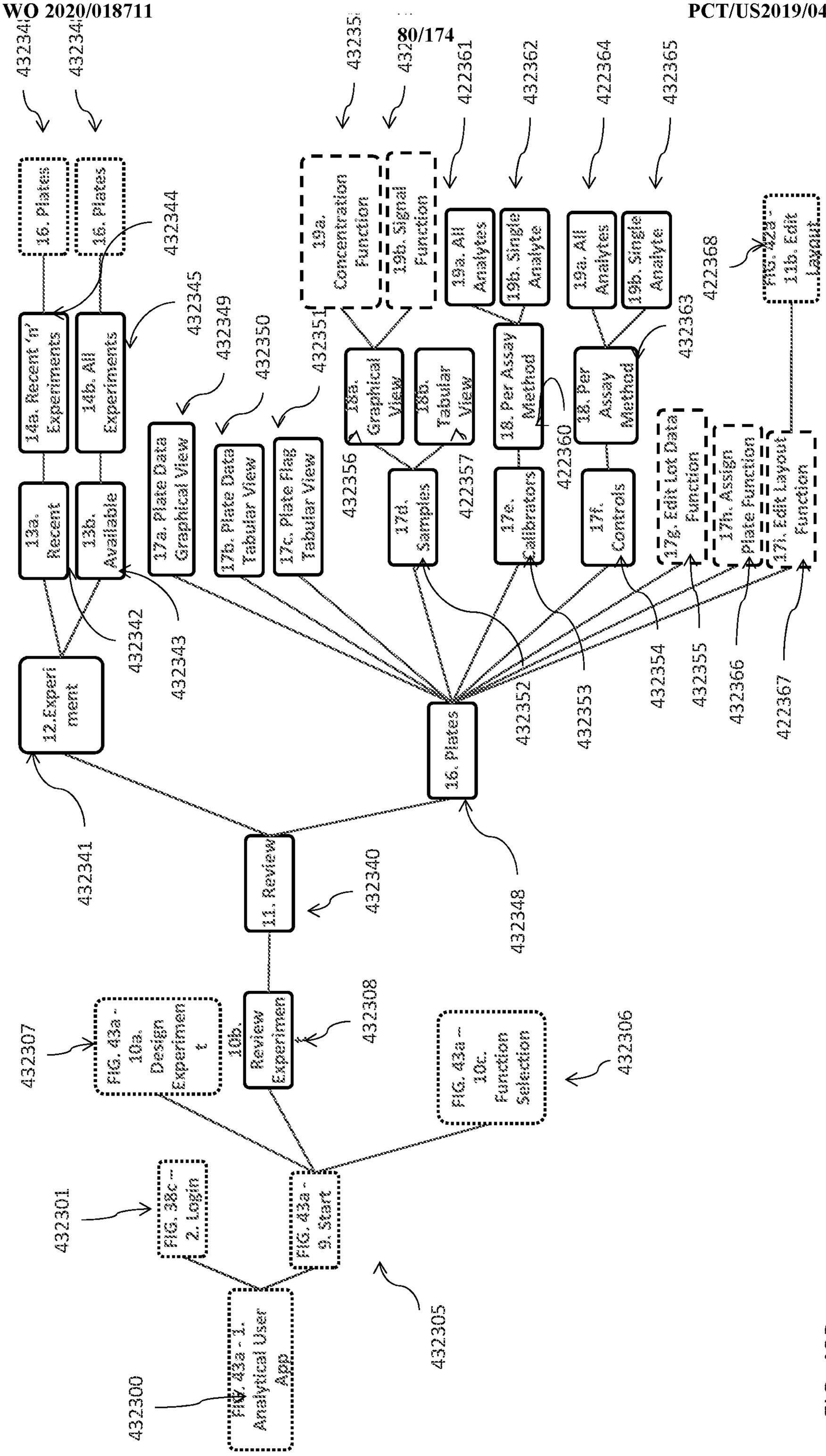

432341
432344
16. Plates
16. Plates
14a. Recent 'n' Experiments
14b. All Experiments
13a. Recent
13b. Available
12.Experiment
432342
432343
432349
432350
17a. Plate Data Graphical View
17b. Plate Data Tabular View
17c. Plate Flag Tabular View
432351
19a. Concentration Function
19b. Signal Function
422361
432362
19a. All Analytes
19b. Single Analyte
18a. Graphical View
18b. Tabular View
432356
17d. Samples
422357
18. Per Assay Method
17e. Calibrators
422360
422364
432365
19a. All Analytes
19b. Single Analyte
18. Per Assay Method
422368
432363
17f. Controls
17g. Edit Lot Data Function
17h. Assign Plate Function
17i. Edit Layout Function
FIG. 42a - 11b. Edit Layout
16. Plates
432352
432353
432354
432355
432366
422367
11. Review
432340
432348
10b. Review Experiment
432308
FIG. 43a - 10a. Design Experiment
FIG. 43a - 10c. Function Selection
432307
432306
FIG. 38c - 2. Login
FIG. 43a - 9. Start
432301
FIG. 43a - 1. Analytical User App
432300
432305

FIG. 43B

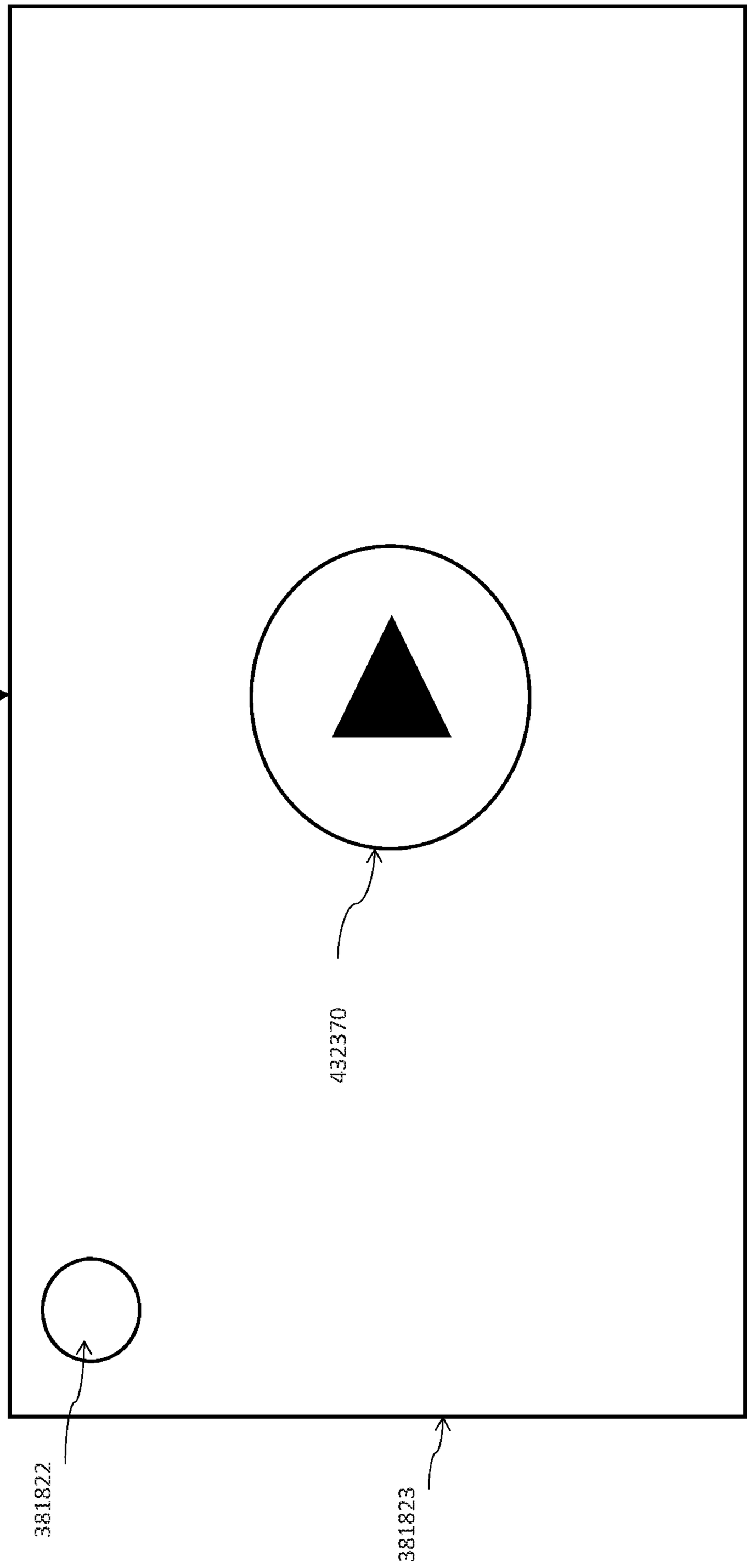


FIG. 43C

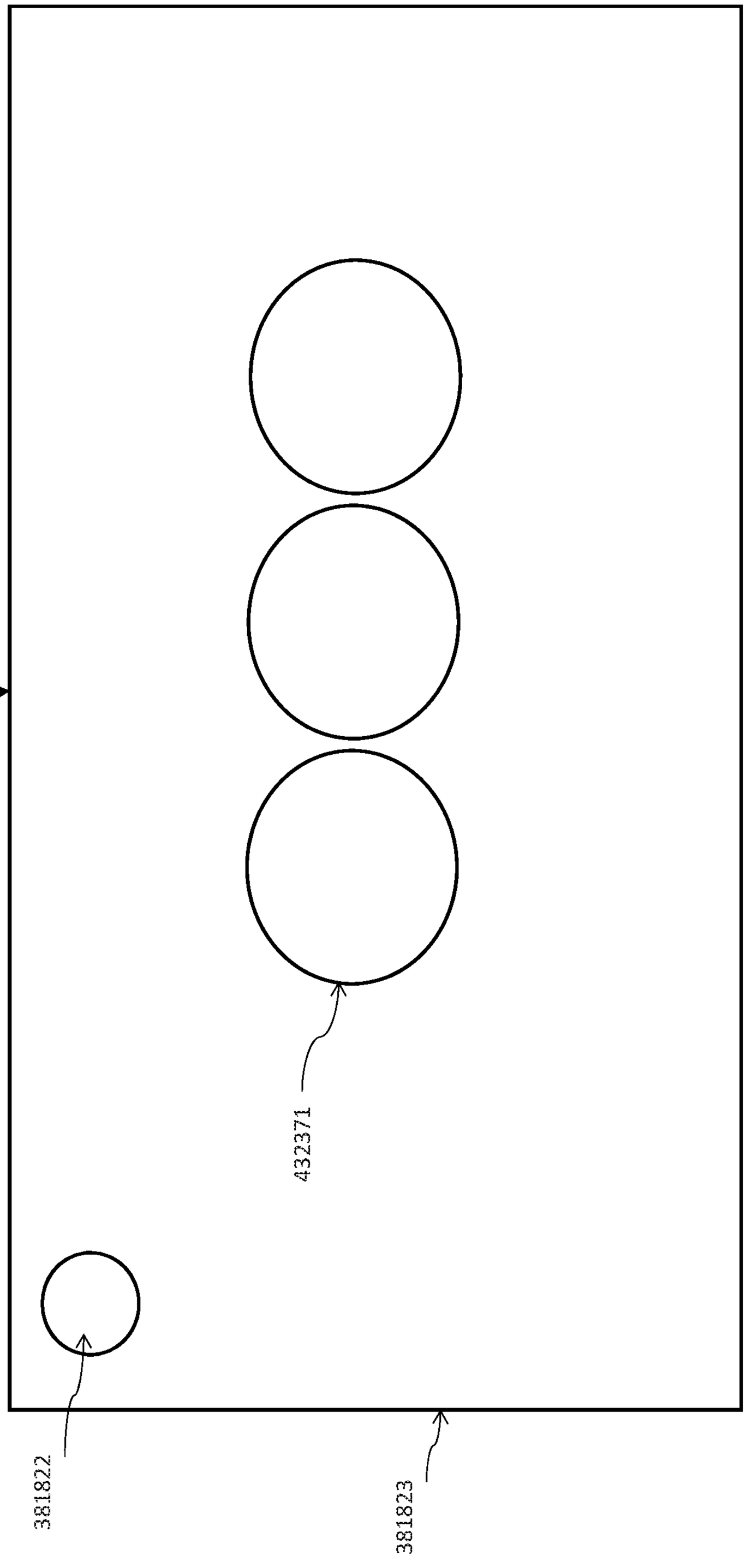


FIG. 43D

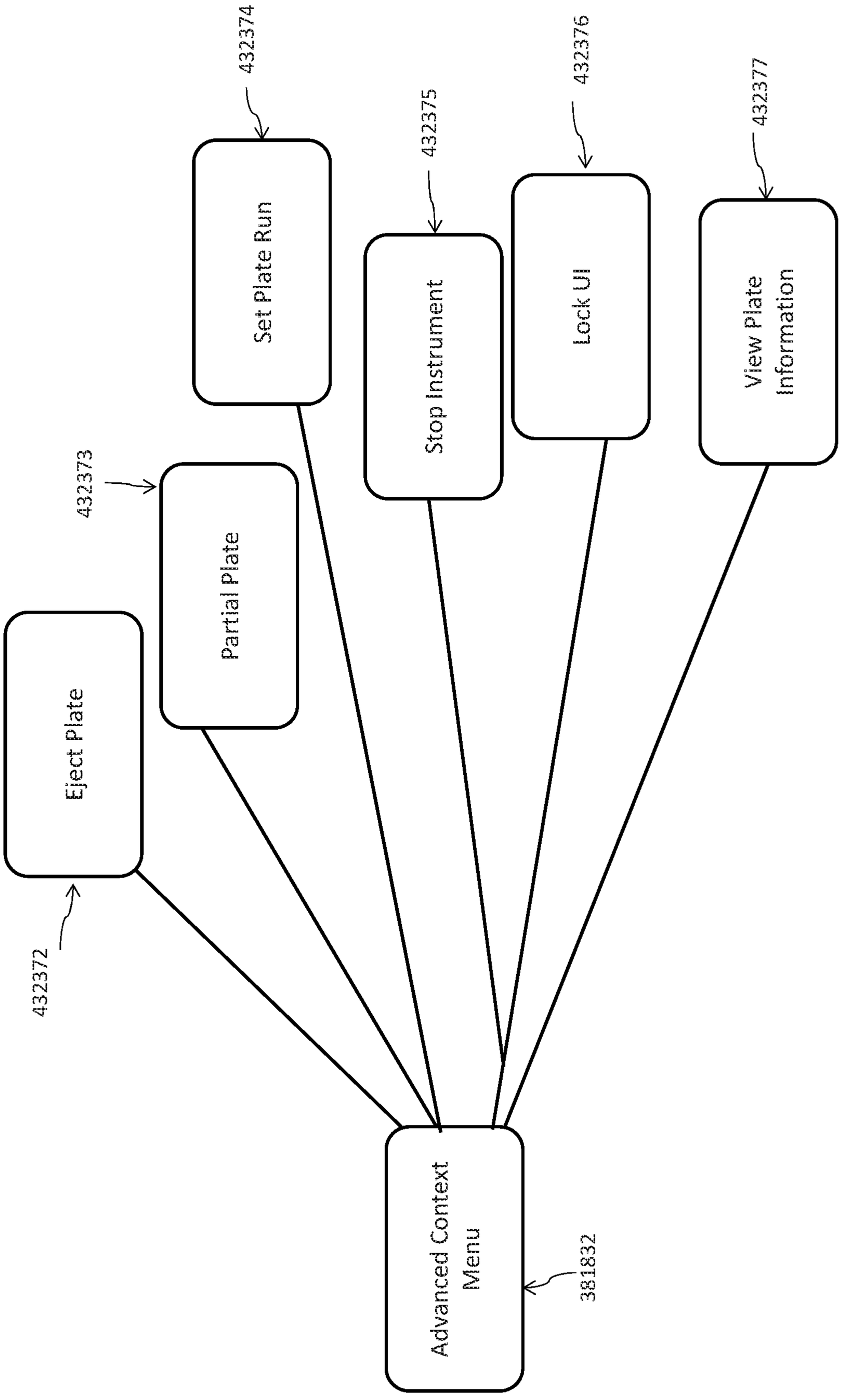

Advanced Context Menu
381832
Eject Plate
432372
Partial Plate
432373
Set Plate Run
432374
Stop Instrument
432375
Lock UI
432376
View Plate Information
432377

FIG. 43E

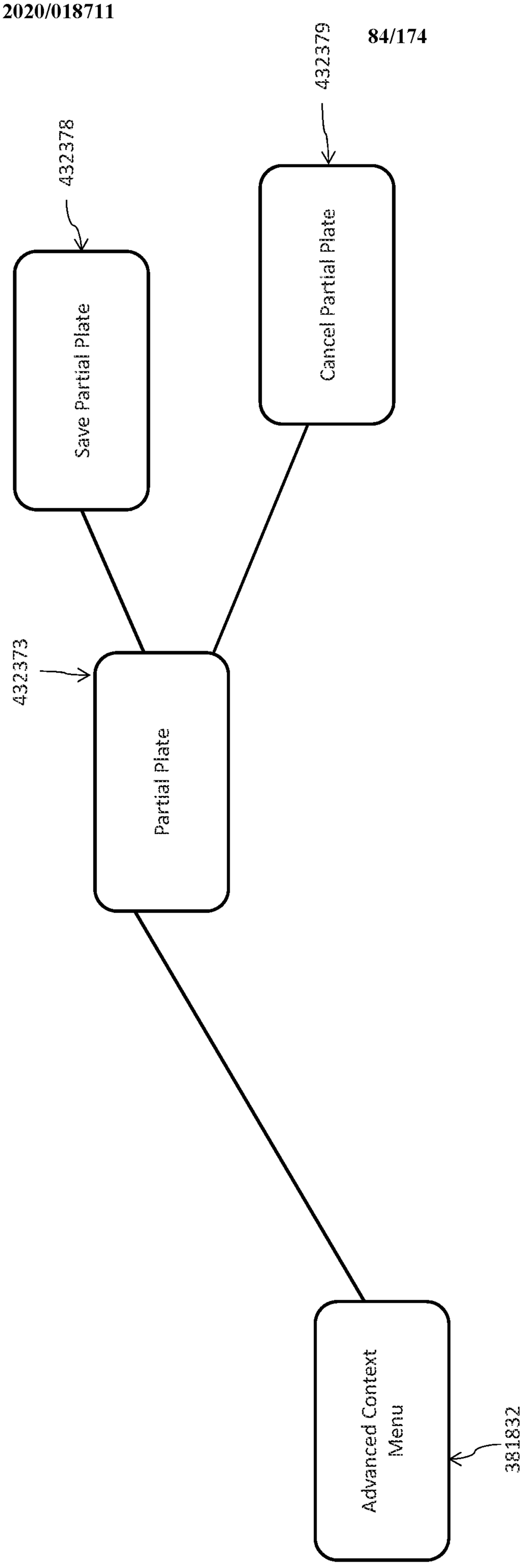

432378
Save Partial Plate
432379
Cancel Partial Plate
432373
Partial Plate
Advanced Context Menu
381832

FIG. 43F

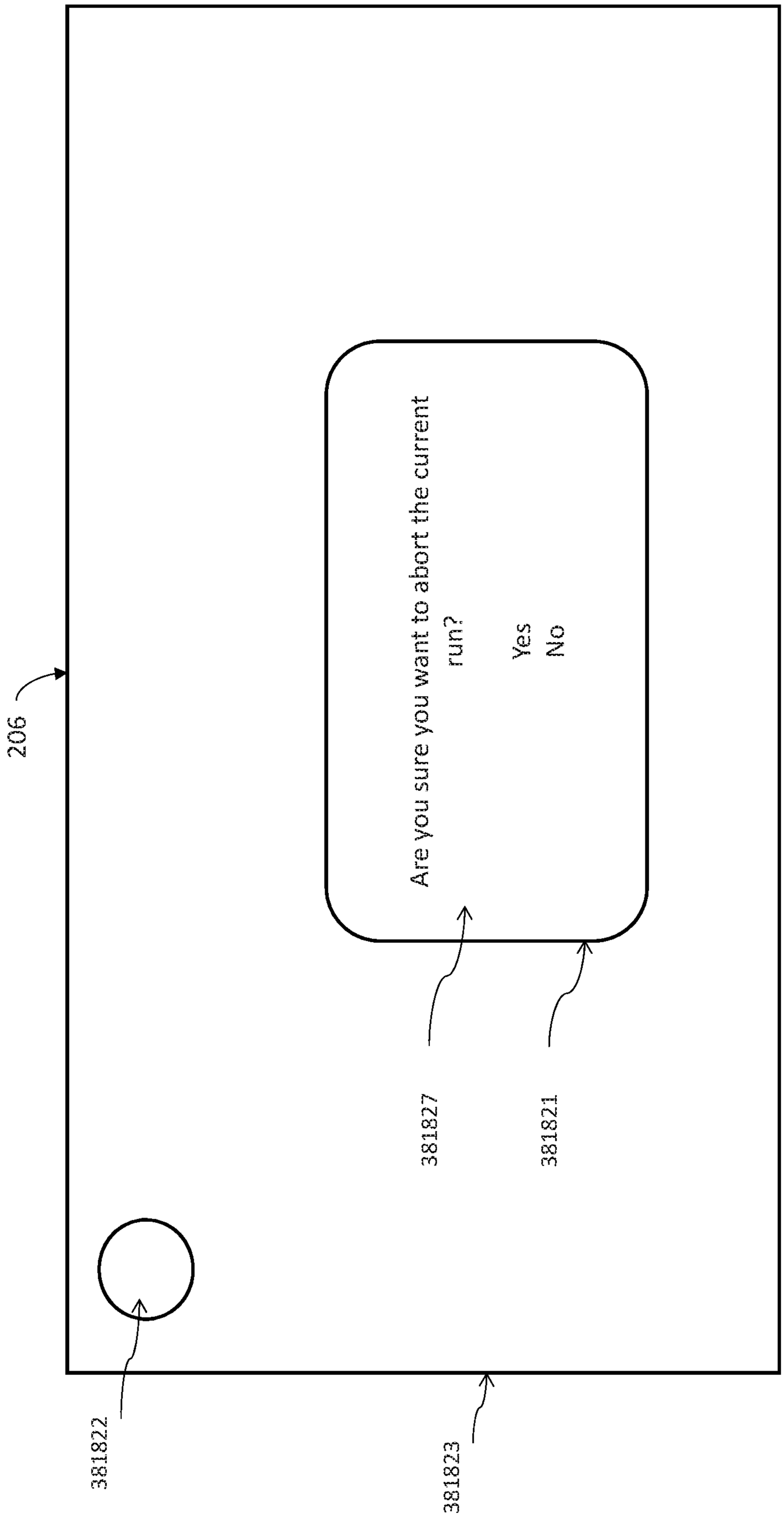

206
Are you sure you want to abort the current run?
Yes
No
381827
381821
381822
381823

FIG. 43G

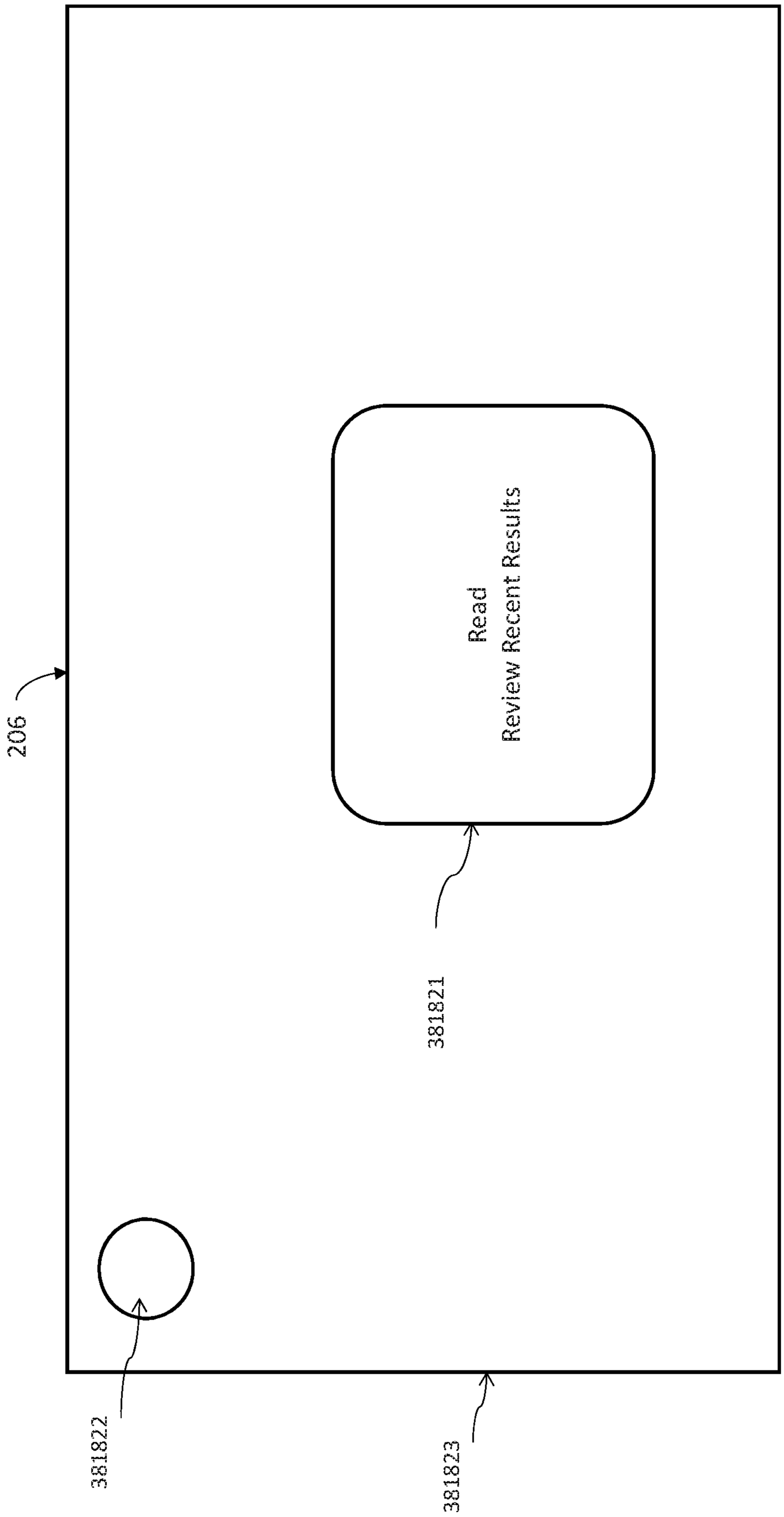


FIG. 43H

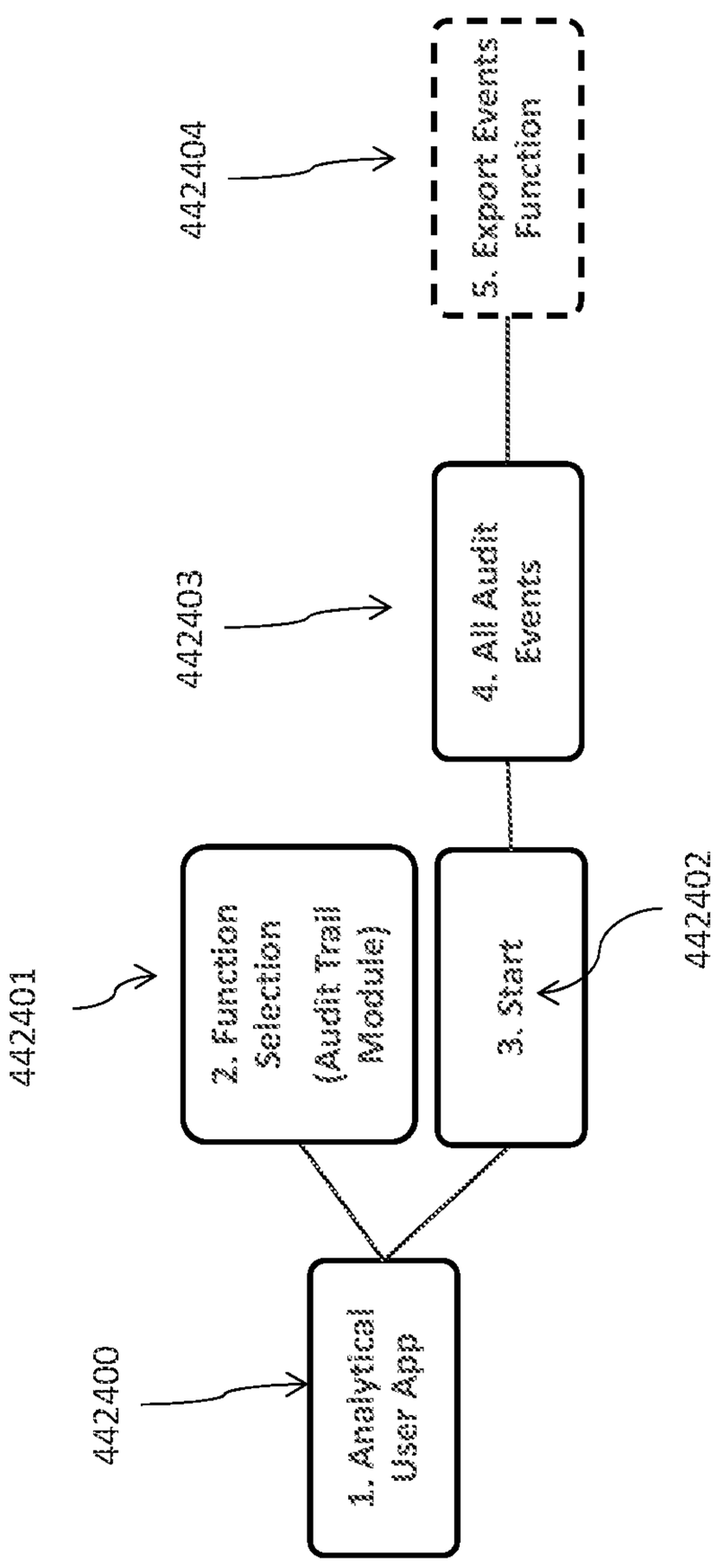

1. Analytical User App
442400
2. Function Selection (Audit Trail Module)
442401
3. Start
442402
4. All Audit Events
442403
5. Export Events Function
442404

FIG. 44

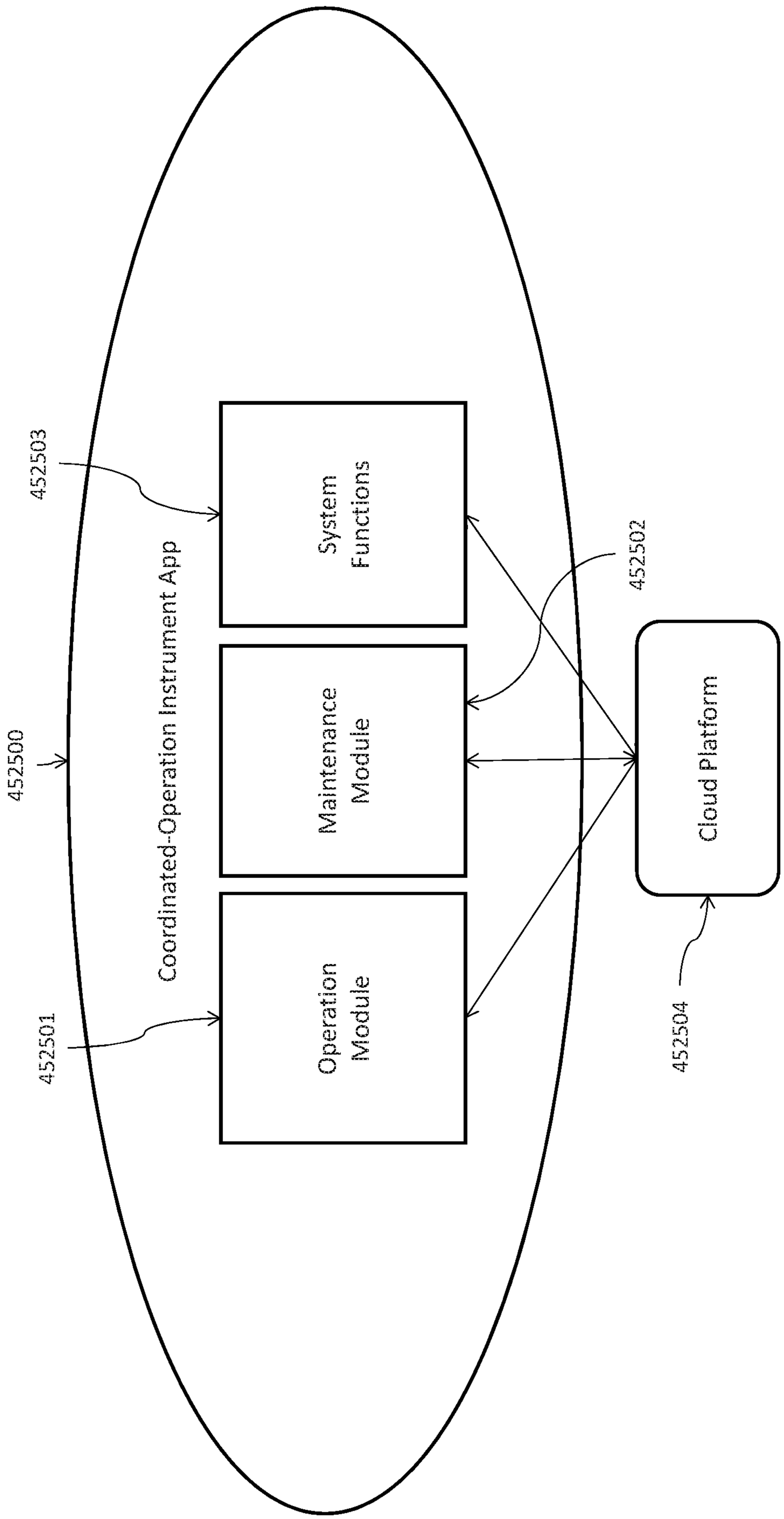

452503
452500
Coordinated-Operation Instrument App
452501
System Functions
Maintenance Module
Operation Module
452502
Cloud Platform
452504

FIG. 45

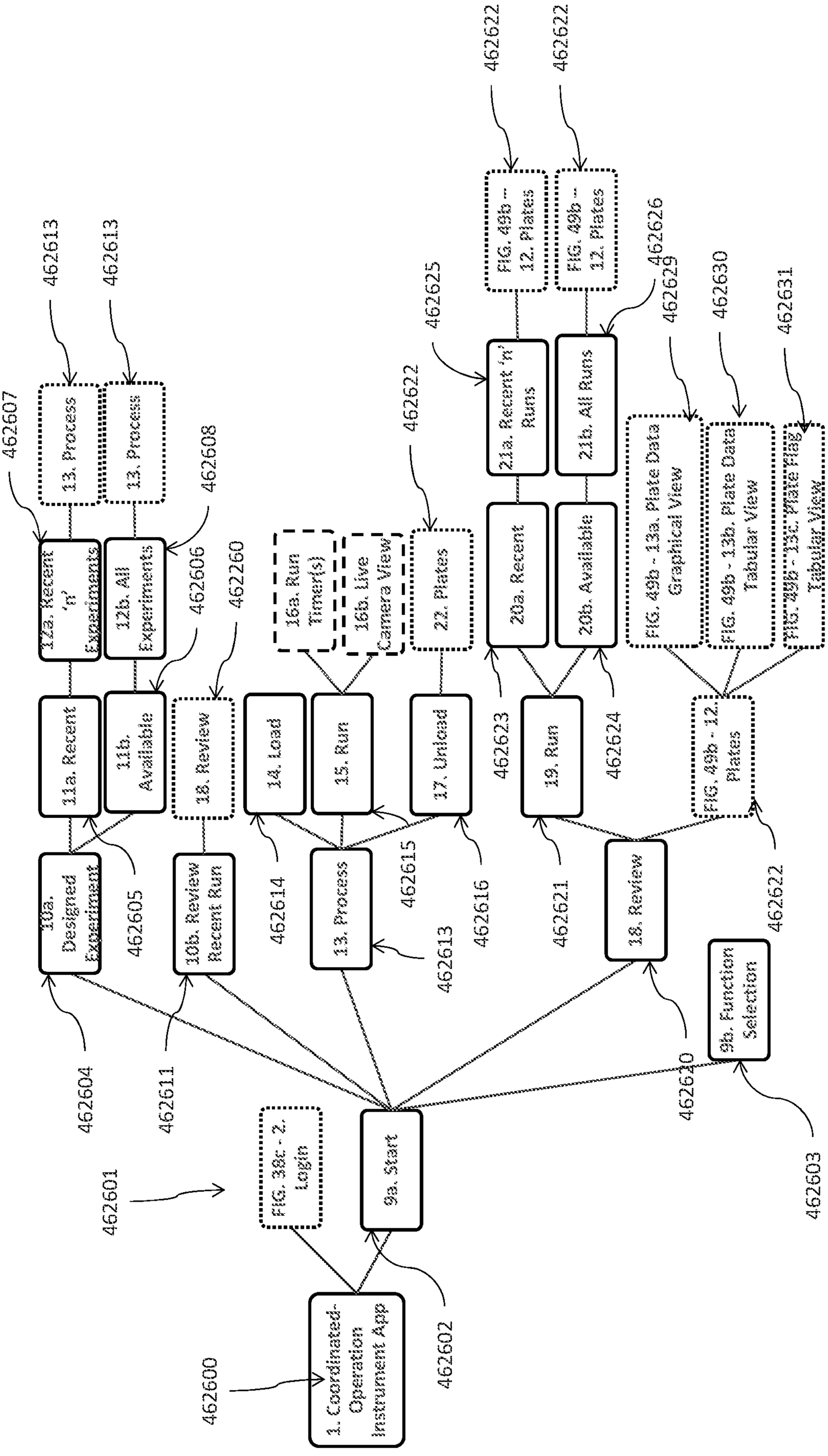

462622
462622
FIG. 49b - 12. Plates
FIG. 49b - 12. Plates
462626
462625
462629
462630
462631
21a. Recent 'n' Runs
21b. All Runs
FIG. 49b - 13a. Plate Data Graphical View
FIG. 49b - 13b. Plate Data Tabular View
FIG. 49b - 13c. Plate Flag Tabular View
462613
462613
462607
462608
462606
462260
462622
12a. Recent 'n' Experiments
12b. All Experiments
13. Process
13. Process
16a. Run Timer(s)
16b. Live Camera View
22. Plates
20a. Recent
20b. Available
11a. Recent
11b. Available
18. Review
14. Load
15. Run
17. Unload
19. Run
18. Review
FIG. 49b - 12. Plates
462623
462624
462615
462616
462621
462622
10a. Designed Experiment
10b. Review Recent Run
462605
462614
462613
462604
462611
462610
462601
FIG. 38c - 2. Login
9a. Start
9b. Function Selection
462603
462600
1. Coordinated-Operation Instrument App
462602

FIG. 46

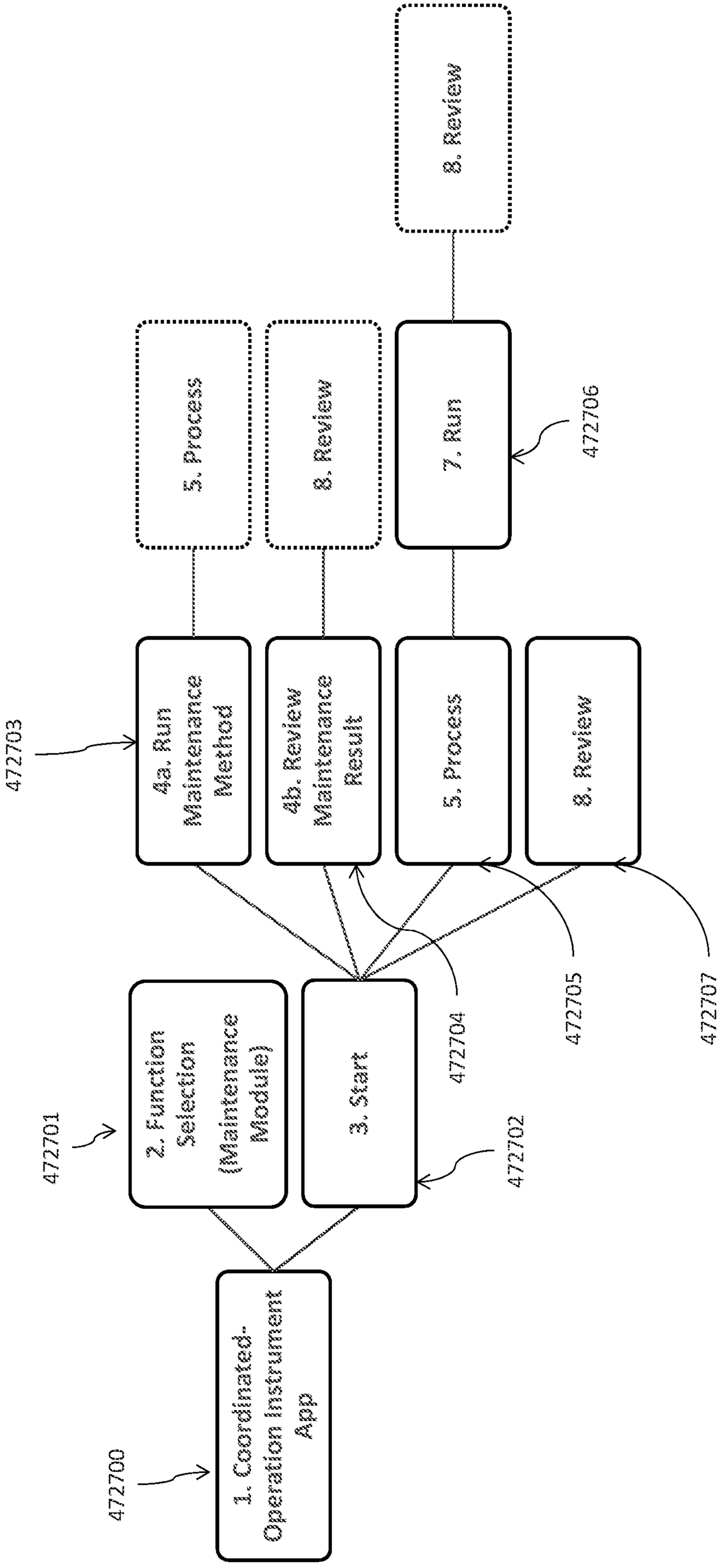

1. Coordinated-Operation Instrument App
2. Function Selection (Maintenance Module)
3. Start
4a. Run Maintenance Method
4b. Review Maintenance Result
5. Process
5. Process
7. Run
8. Review
8. Review
8. Review
472700
472701
472702
472703
472704
472705
472706
472707

FIG. 47

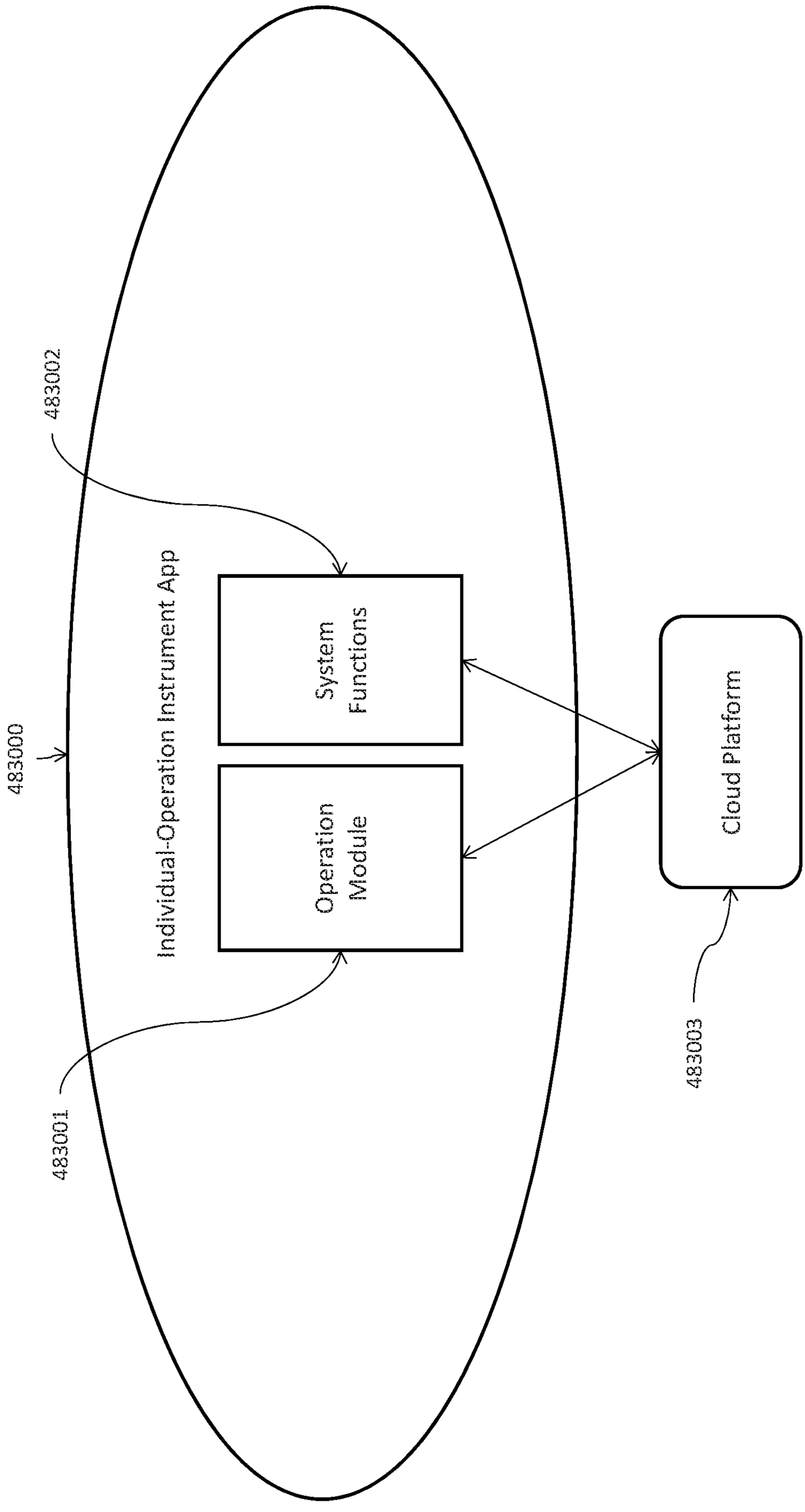

483002
Individual-Operation Instrument App
System Functions
Operation Module
483000
483001
Cloud Platform
483003

FIG. 48

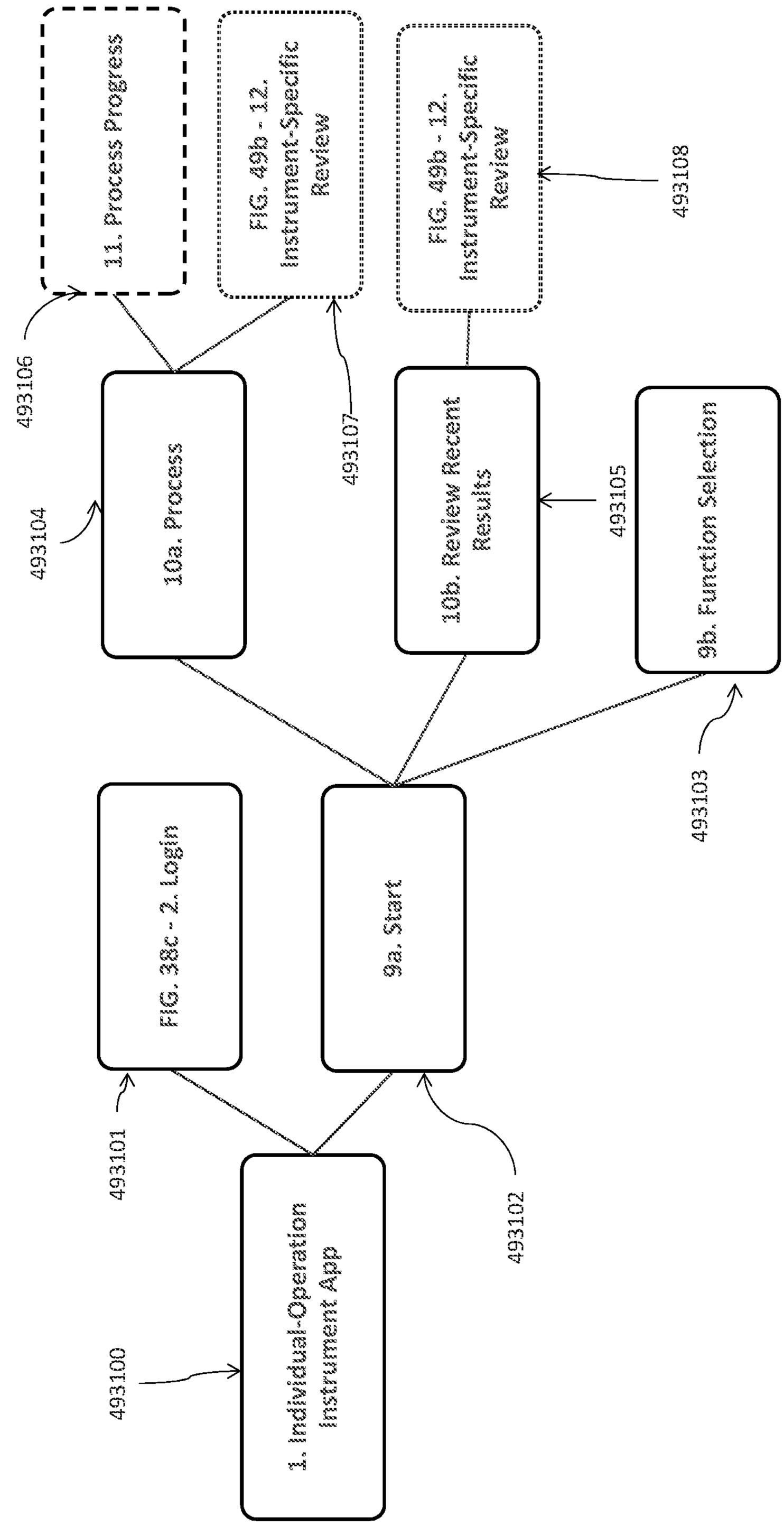

1. Individual-Operation Instrument App
9a. Start
9b. Function Selection
10a. Process
10b. Review Recent Results
11. Process Progress
FIG. 38c - 2. Login
FIG. 49b - 12. Instrument-Specific Review
FIG. 49b - 12. Instrument-Specific Review
493100
493101
493102
493103
493104
493105
493106
493107
493108

FIG. 49A

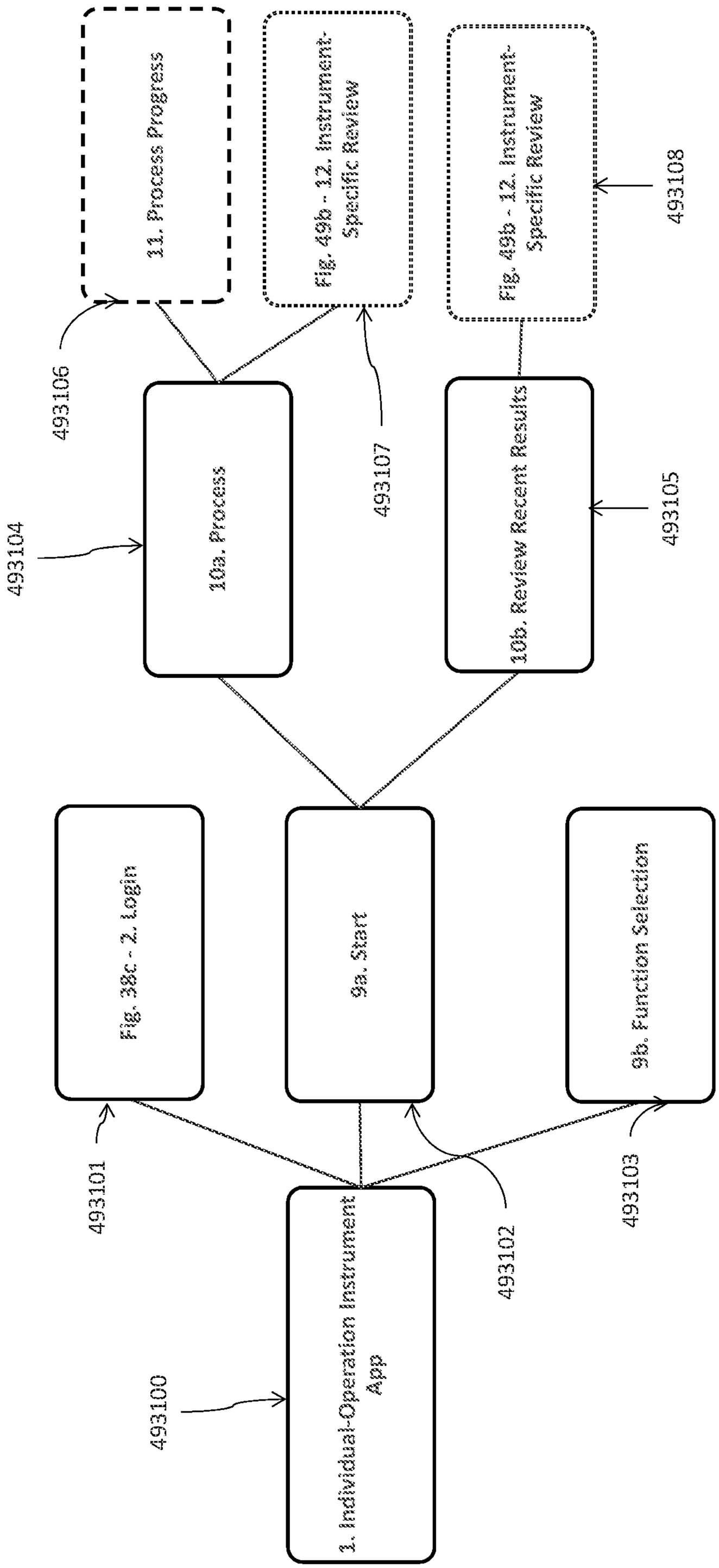

1. Individual-Operation Instrument App
493100
Fig. 38c - 2. Login
493101
9a. Start
9b. Function Selection
493103
10a. Process
493104
10b. Review Recent Results
493105
11. Process Progress
493106
493107
Fig. 49b - 12. Instrument-Specific Review
Fig. 49b - 12. Instrument-Specific Review
493108

Fig. 49AA

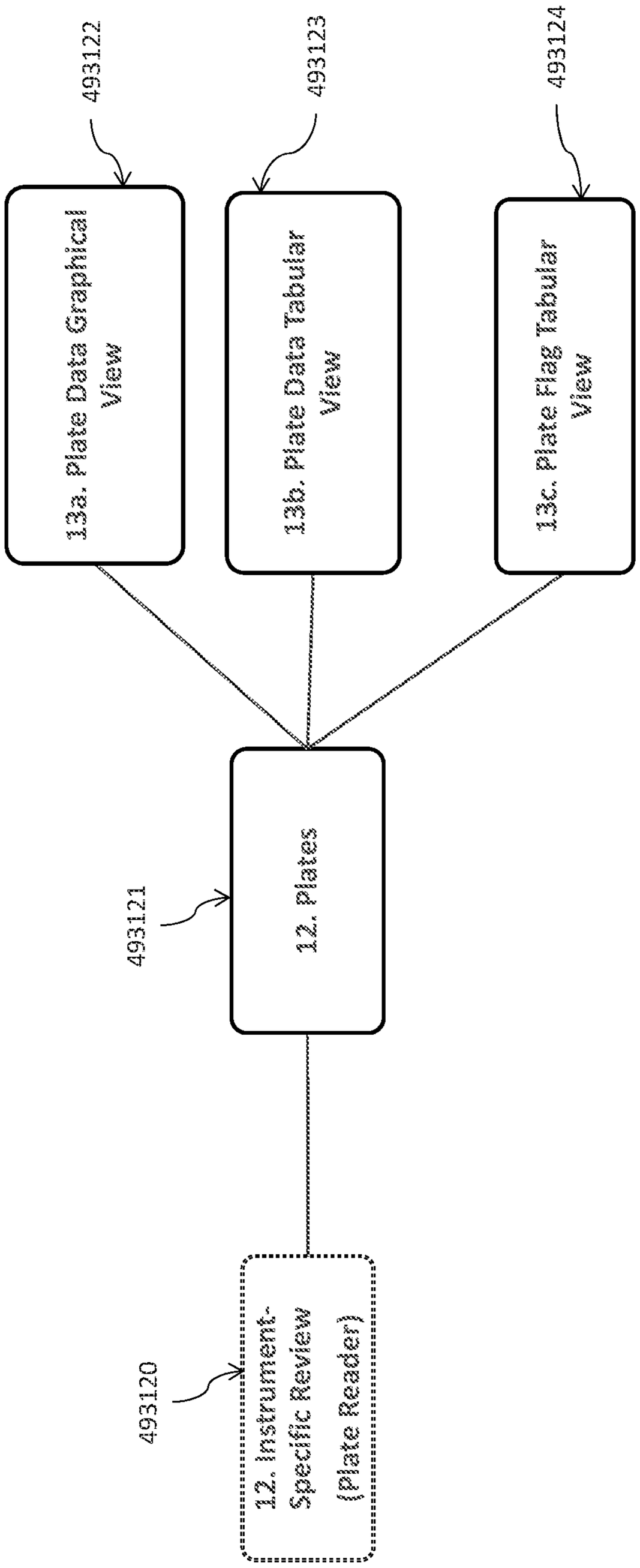

493122
493123
493124
13a. Plate Data Graphical View
13b. Plate Data Tabular View
13c. Plate Flag Tabular View
493121
12. Plate
493120
12. Instrument-Specific Review (Plate Reader)

FIG. 498

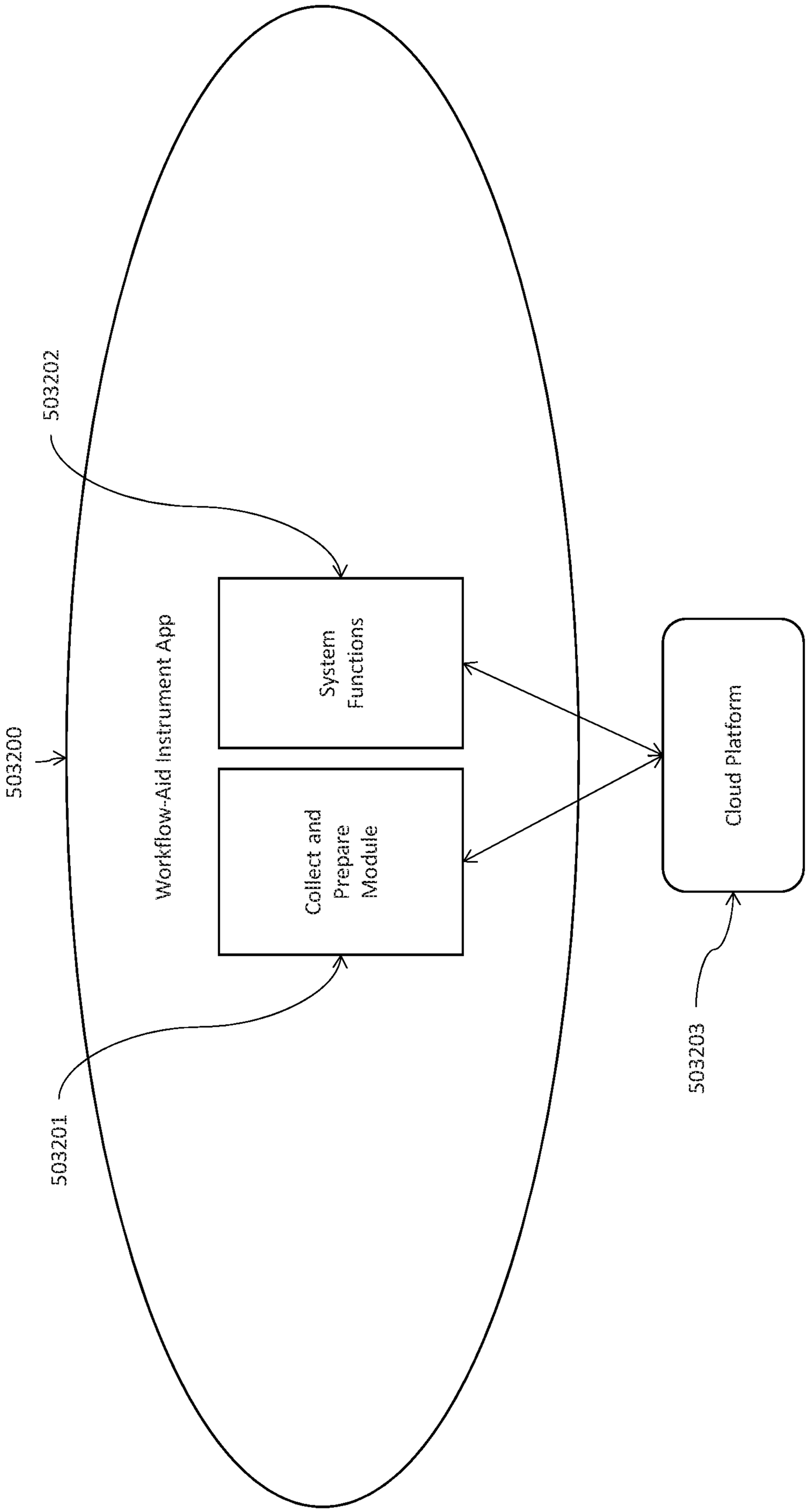

503200
Workflow-Aid Instrument App
503202
System Functions
Collect and Prepare Module
Cloud Platform
503201
503203

FIG. 50

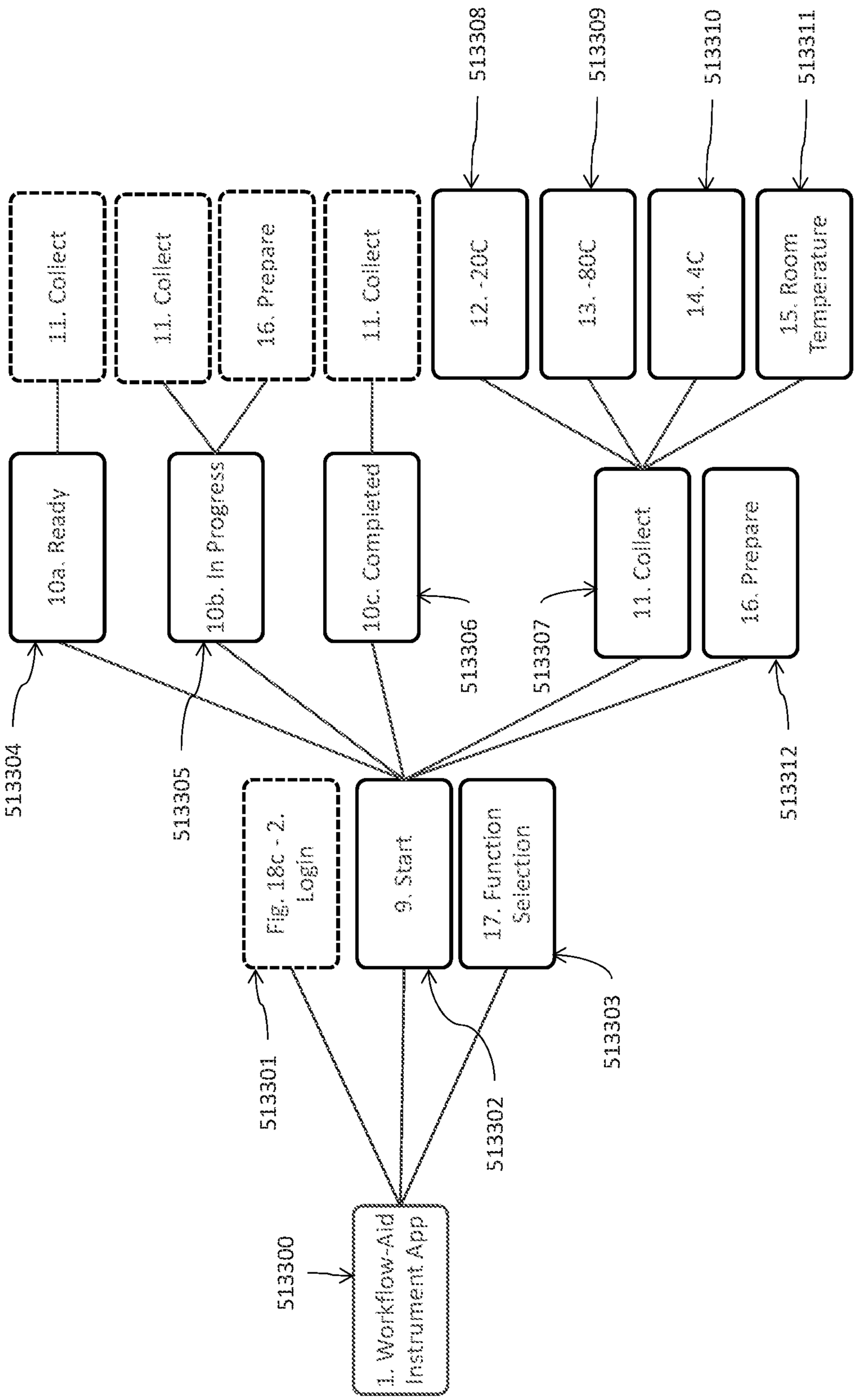

513300
1. Workflow-Aid Instrument App
513301
Fig. 18c - 2. Login
513302
9. Start
513303
17. Function Selection
513304
10a. Ready
513305
10b. In Progress
513306
10c. Completed
513307
11. Collect
513308
11. Collect
513309
11. Collect
513310
16. Prepare
513311
11. Collect
513312
16. Prepare
12. -20C
13.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

FIG. 51

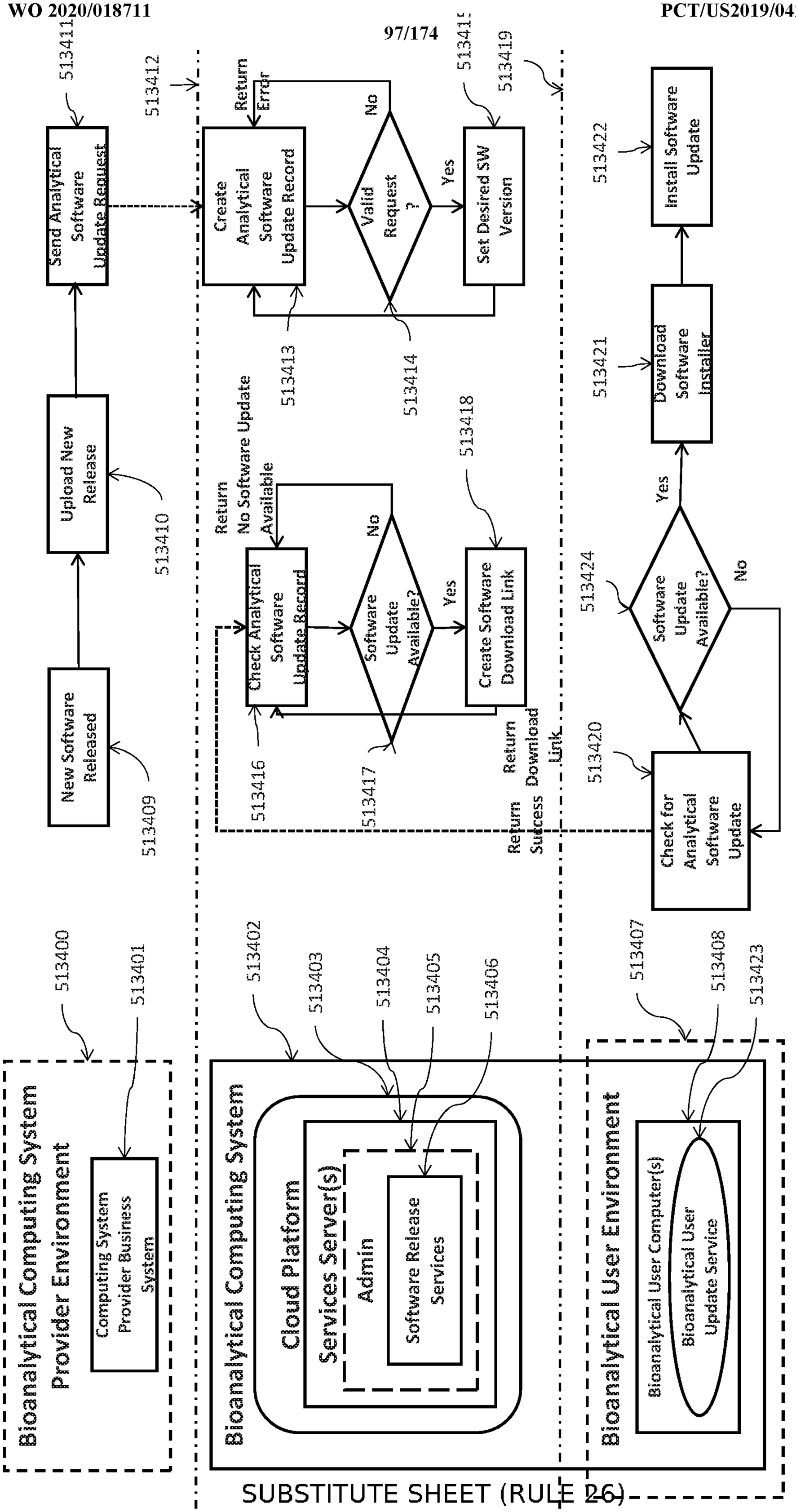

Bioanalytical Computing System Provider Enviroment
Computing System Provider Business System
Bioanalytical Computing System
Cloud Platform
Services Server(s)
Admin
Software Release Services
Bioanalytical User Enviroment
Bioanalytical User Computer(s)
Bioanalytical User Update Service
513400
513401
513402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

FIG. 52

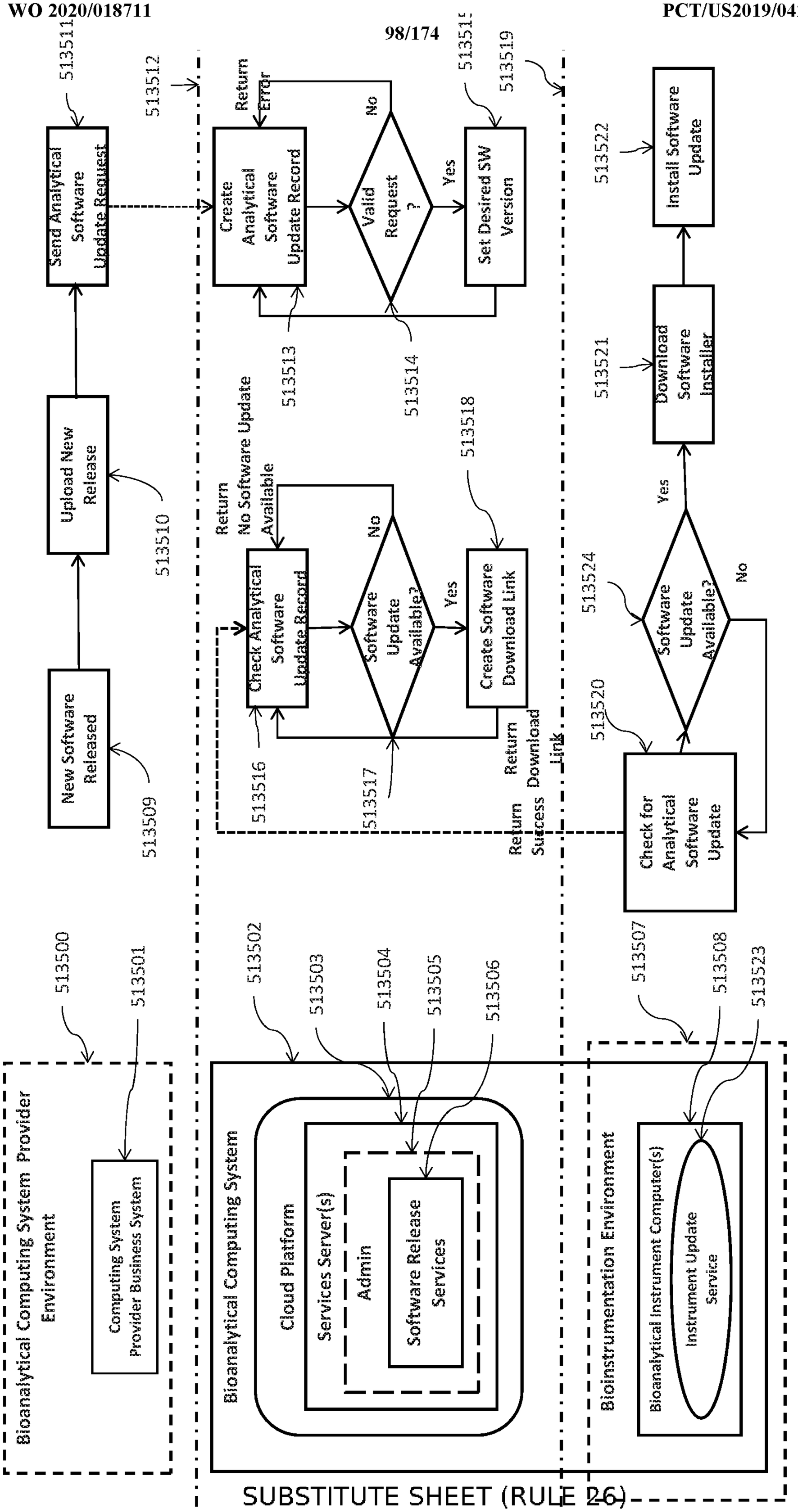

Bioanalytical Computing System Provider Environment
Computing System Provider Business System
Bioanalytical Computing System
Cloud Platform
Services Server(s)
Admin
Software Release Services
Bioinstrumentation Environment
Bioanalytical Instrument Computer(s)
Instrument Update Service
513500
513501
513502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

FIG. 53

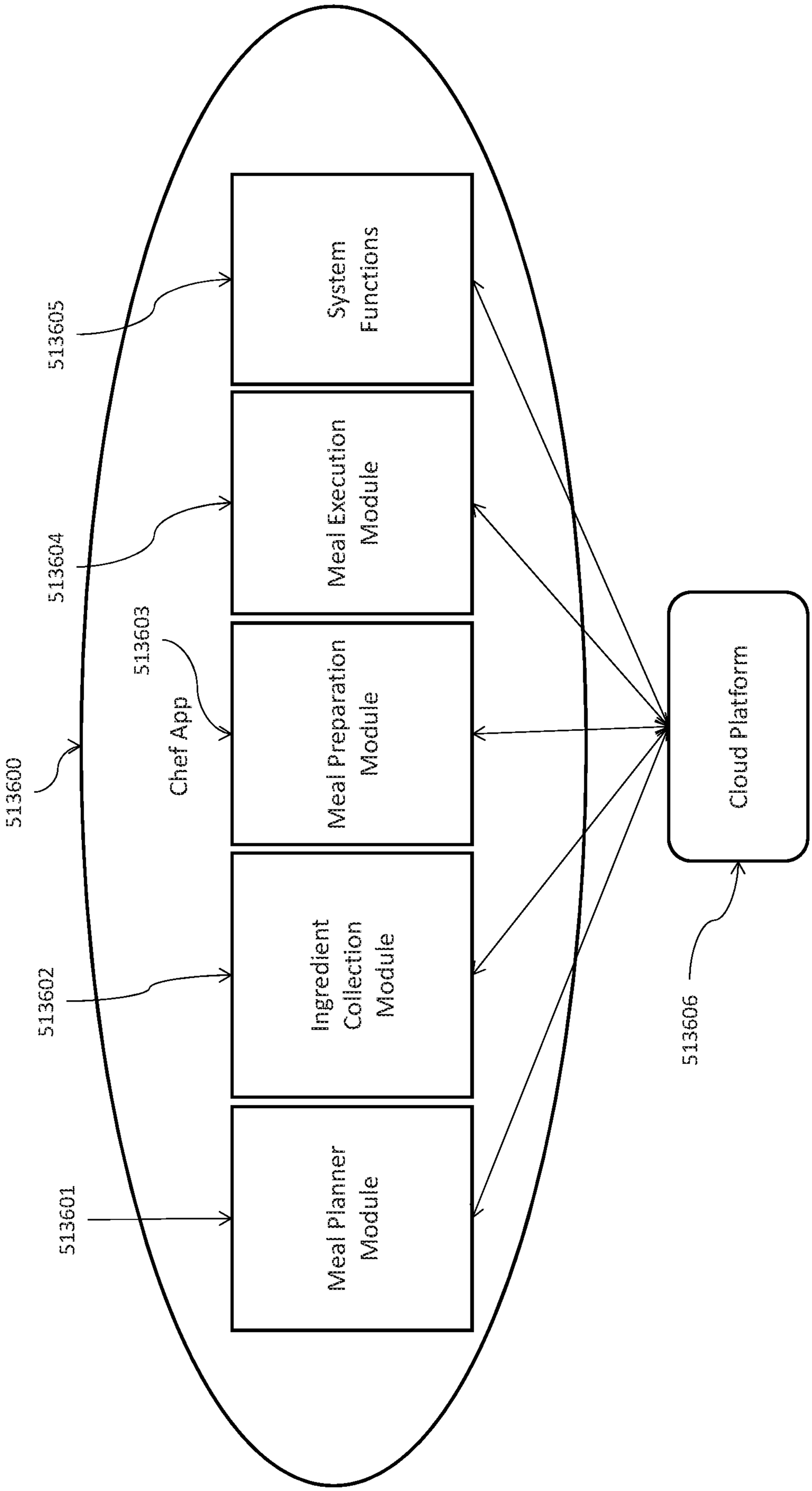

513605
System Functions
513604
Meal Execution Module
513603
Chef App
Meal Preparation Module
513600
513602
Ingredient Collection Module
513606
Cloud Platform
513601
Meal Planner Module

FIG. 54

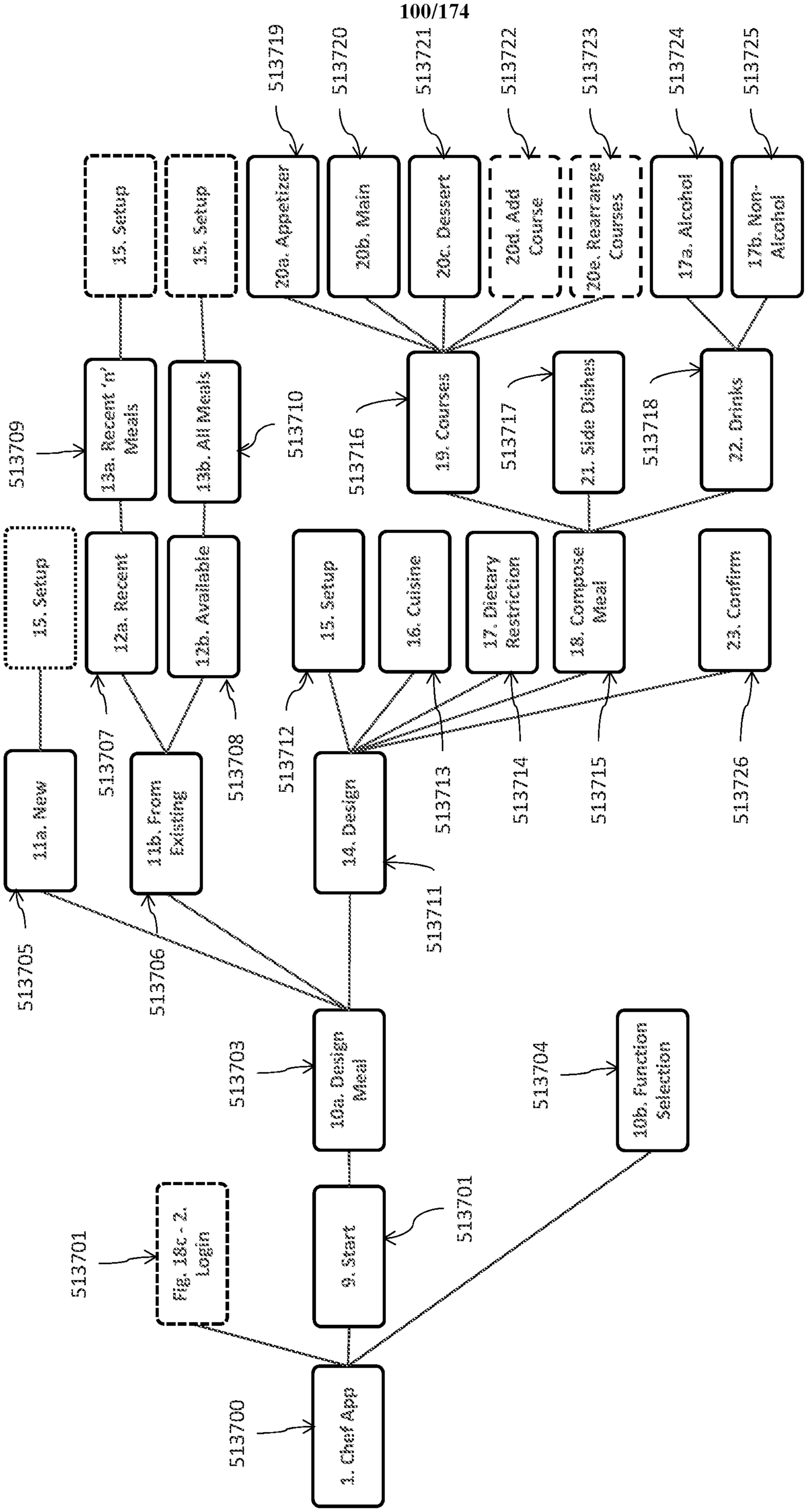

513719
513720
513721
513722
513723
513724
513725
15. Setup
15. Setup
20a. Appetizer
20b. Main
20c. Dessert
20d. Add Course
20e. Rearrange Courses
17a. Alcohol
17b. Non-Alcohol
513709
13a. Recent 'n' Meals
13b. All Meals
513710
513716
19. Courses
513717
21. Side Dishes
513718
22. Drinks
15. Setup
12a.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

FIG. 55

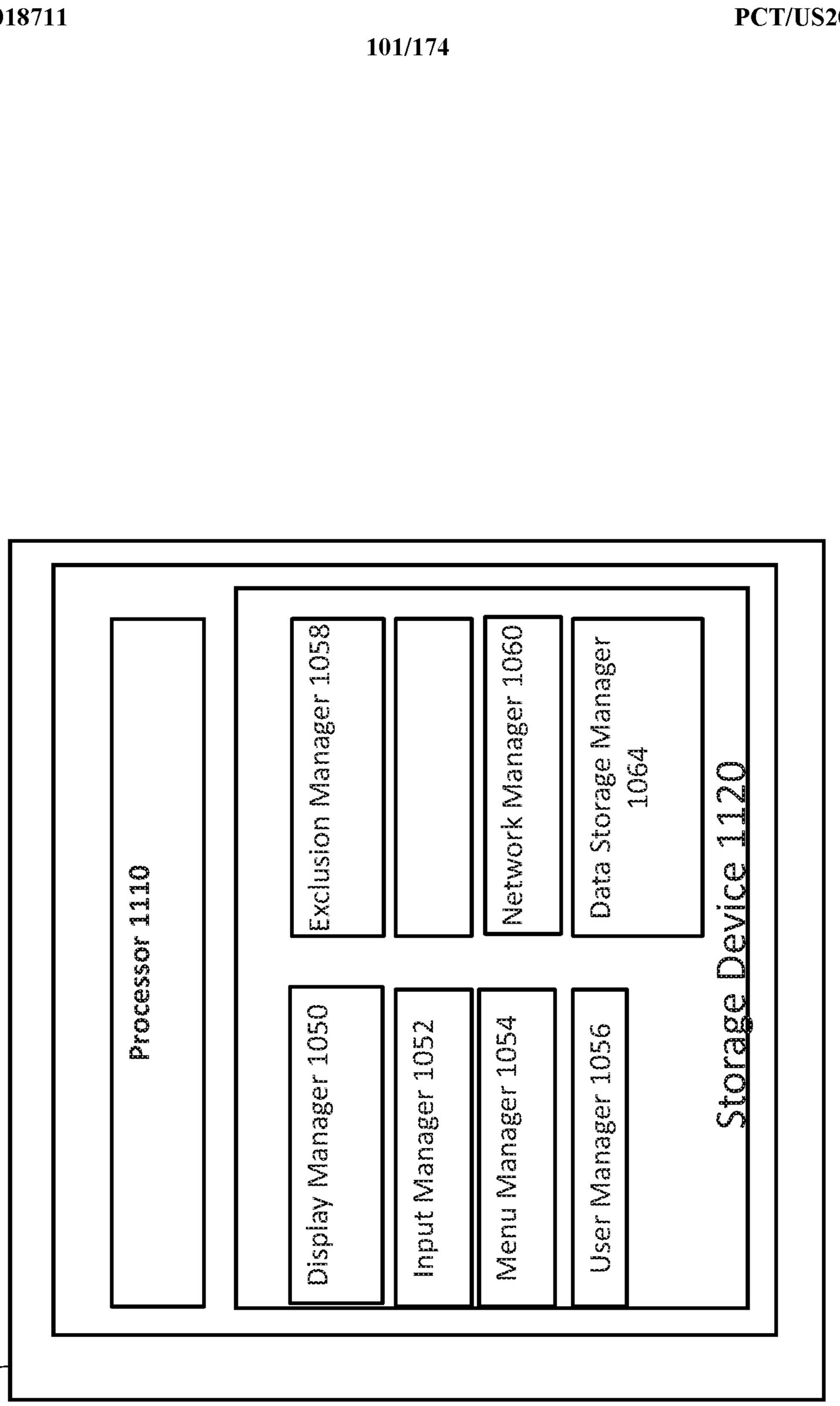

1102
Storage Device 1120
Processor 1110
Exclusion Manager 1058
Network Manager 1060
Data Storage Manager 1064
Display Manager 1050
Input Manager 1052
Menu Manager 1054
User Manager 1056

FIG. 56

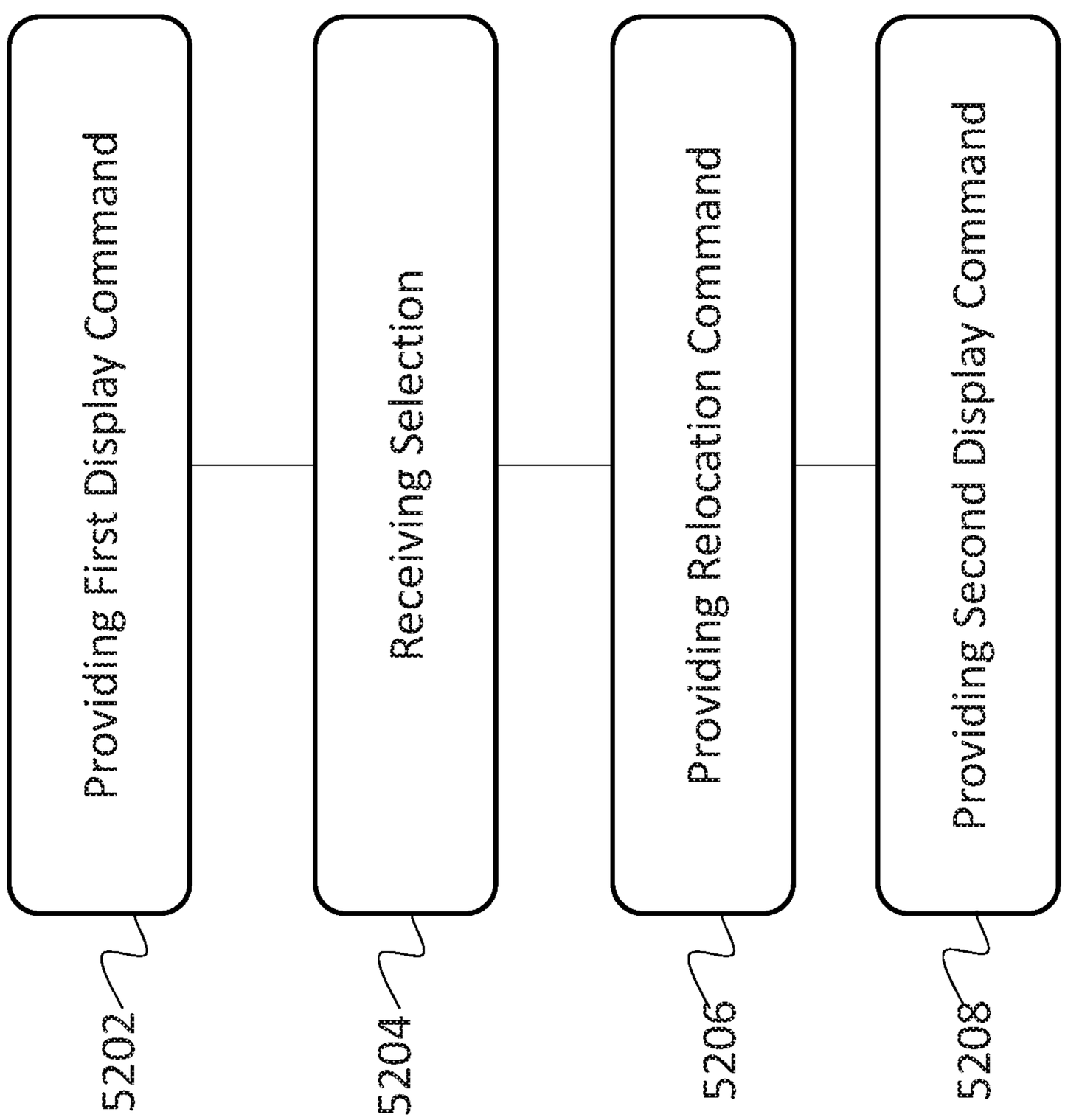

5200
Providing First Display Command
5202
Receiving Selection
5204
Providing Relocation Command
5206
Providing Second Display Command
5208

FIG. 57



FIG. 58A

FIG. 58B



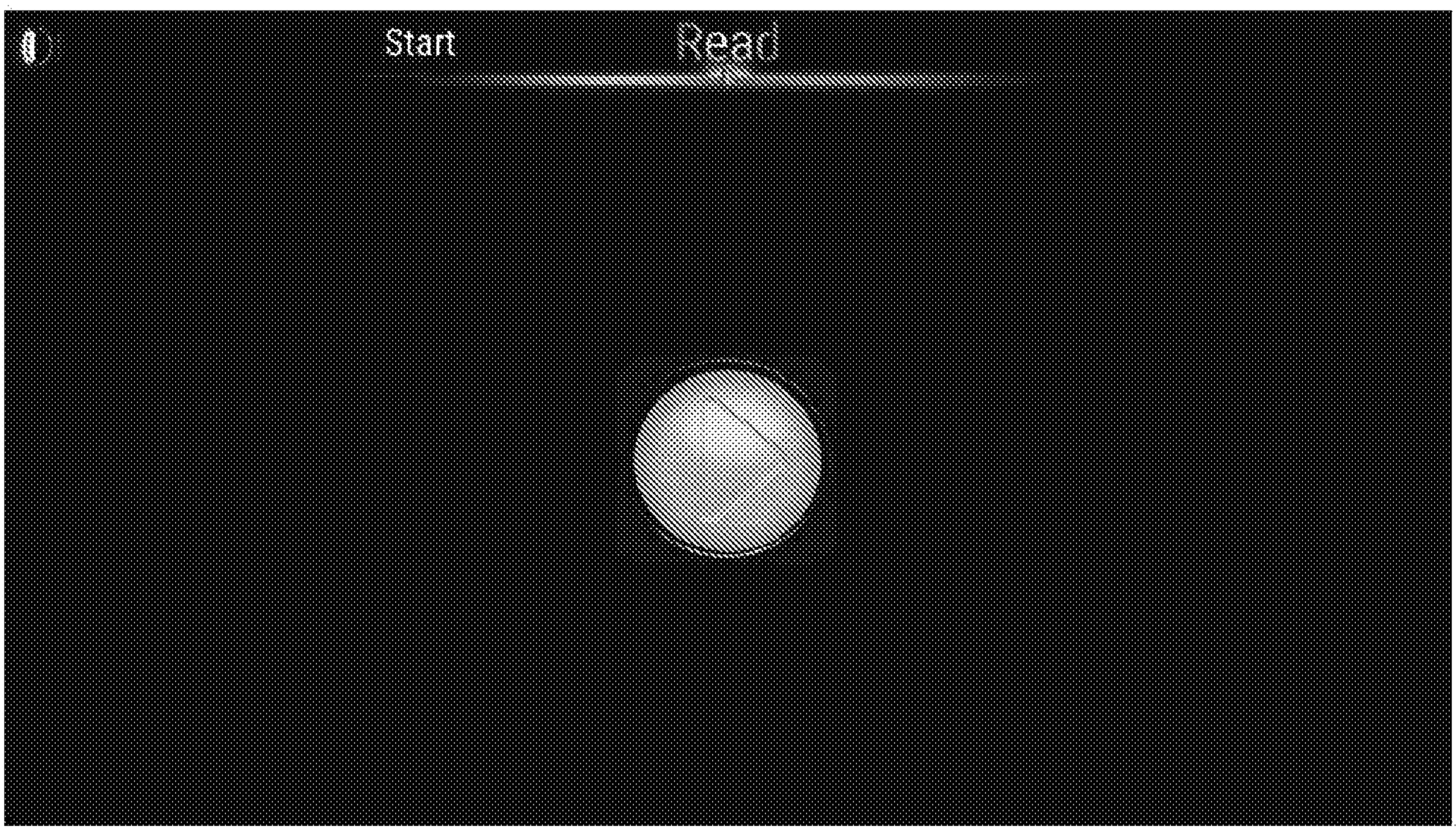
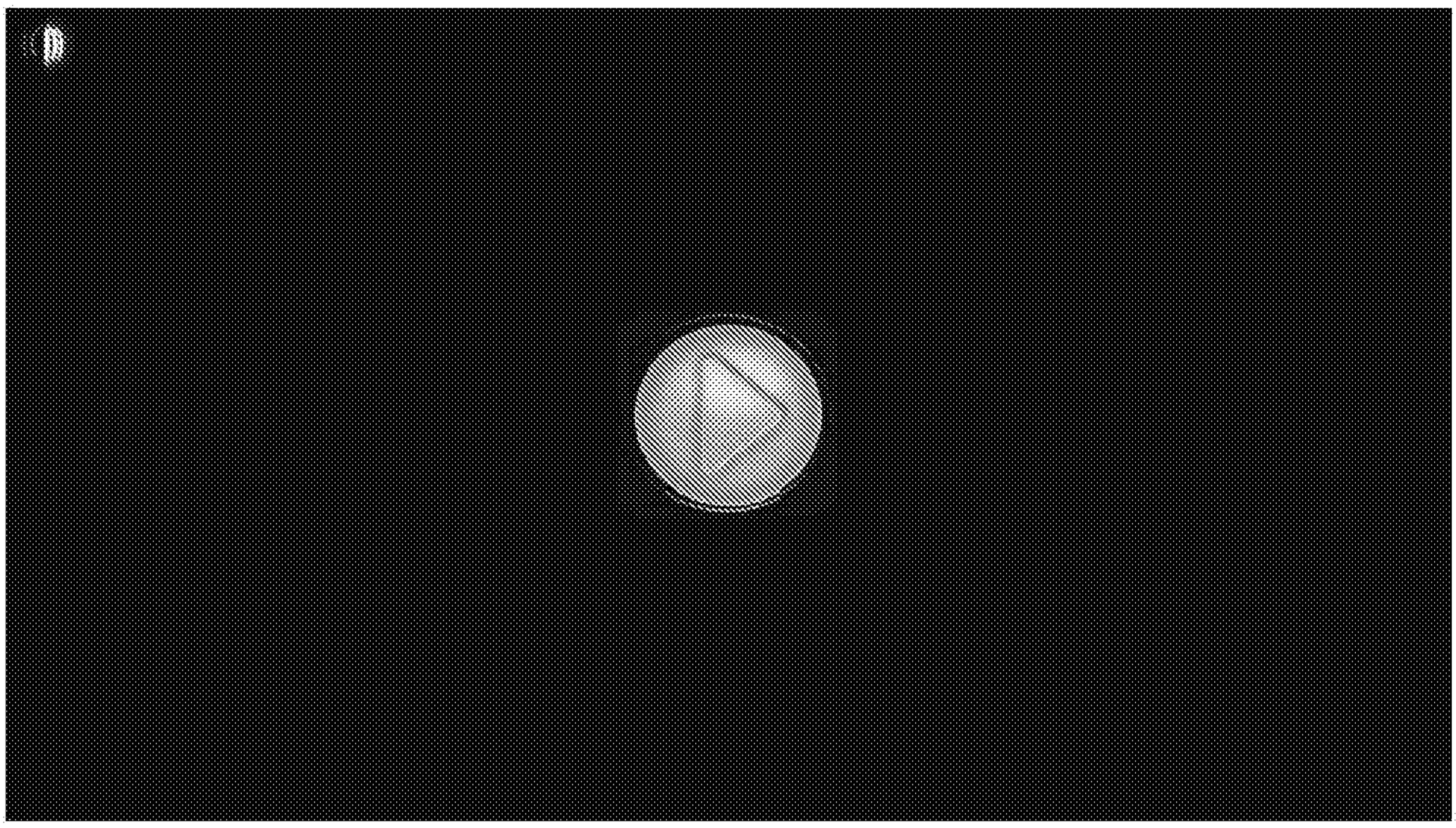


FIG. 58C

FIG. 58D



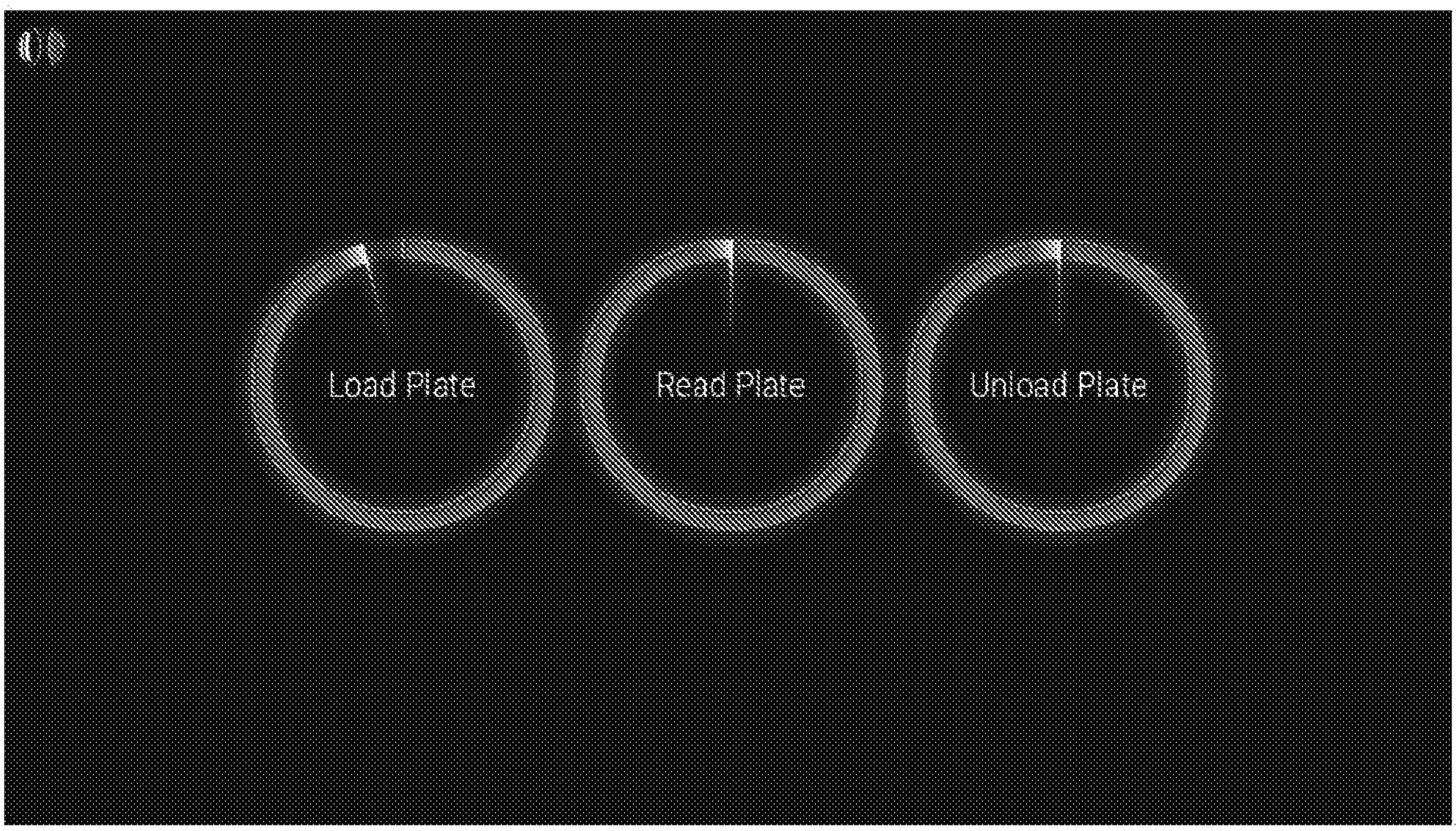
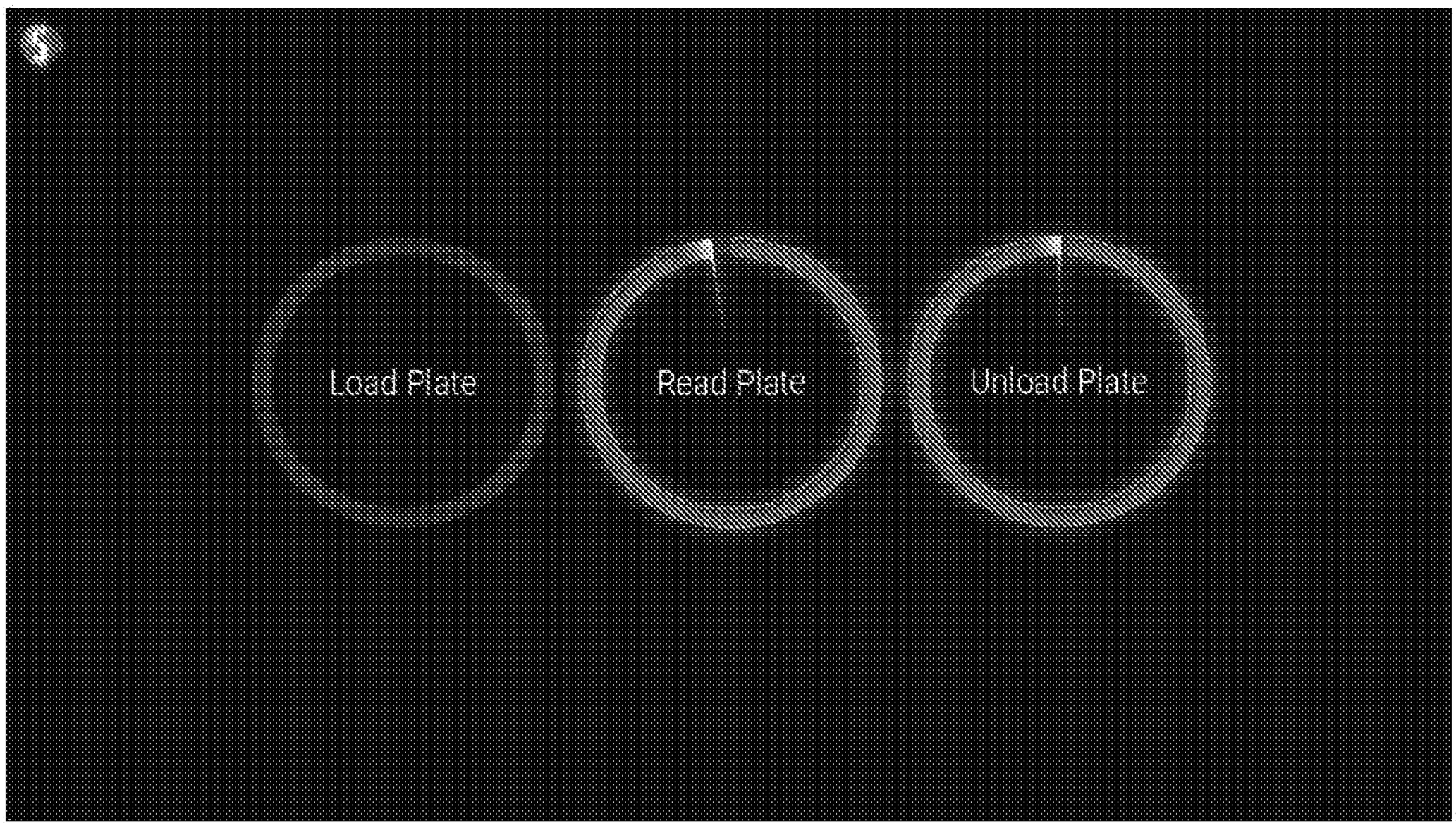


FIG. 58E

FIG. 58F



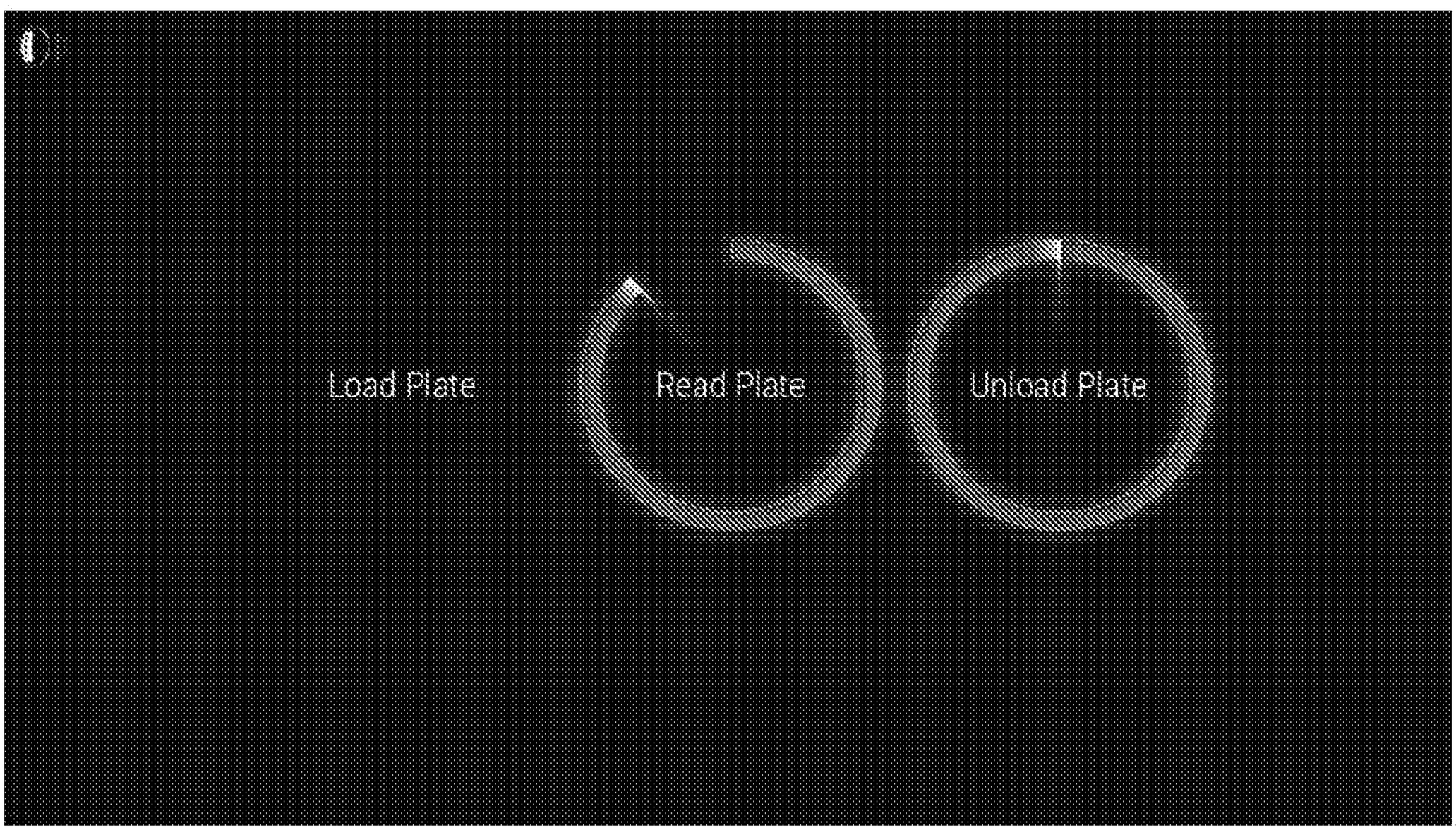
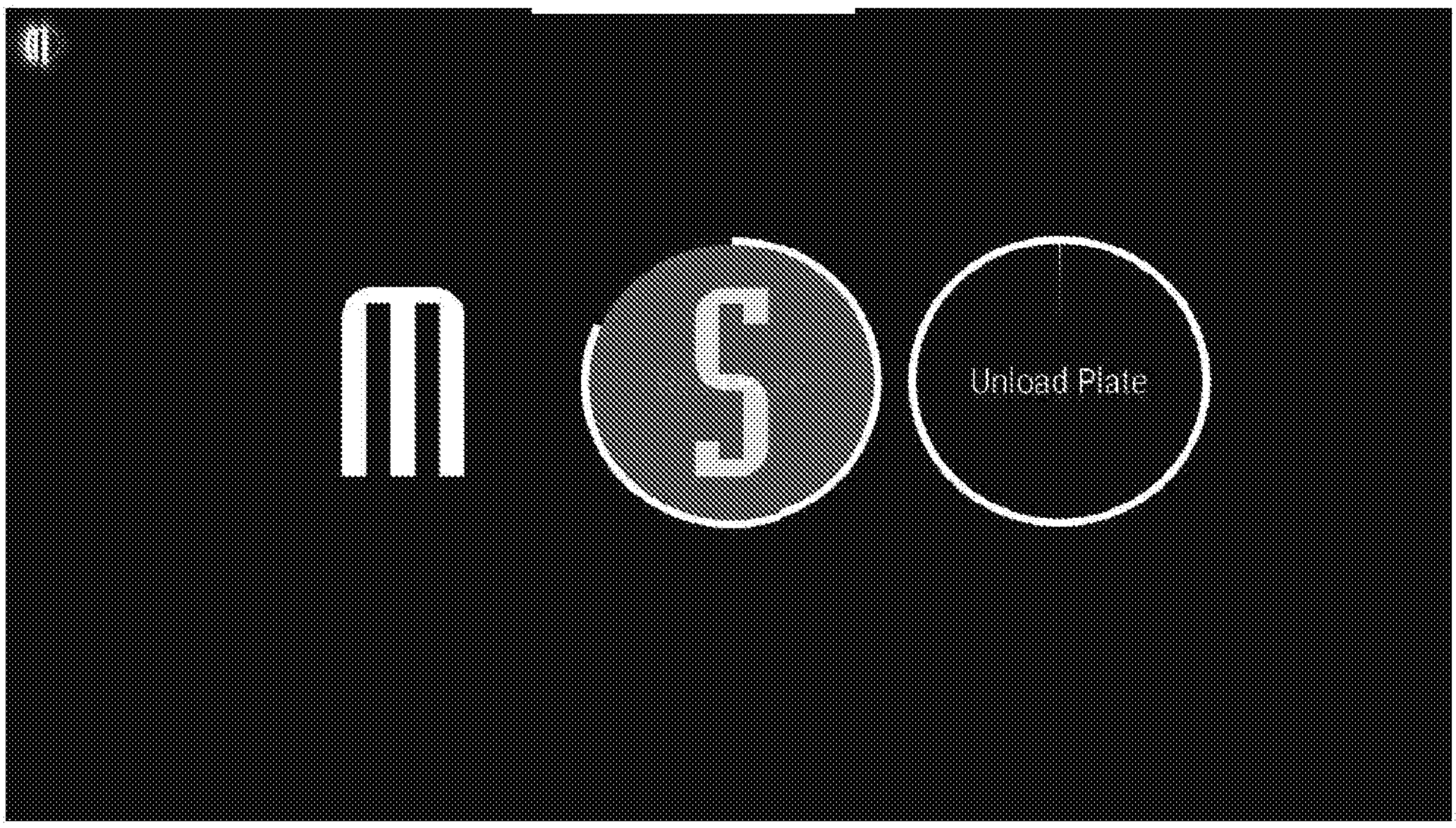


FIG. 58G

FIG. 58H



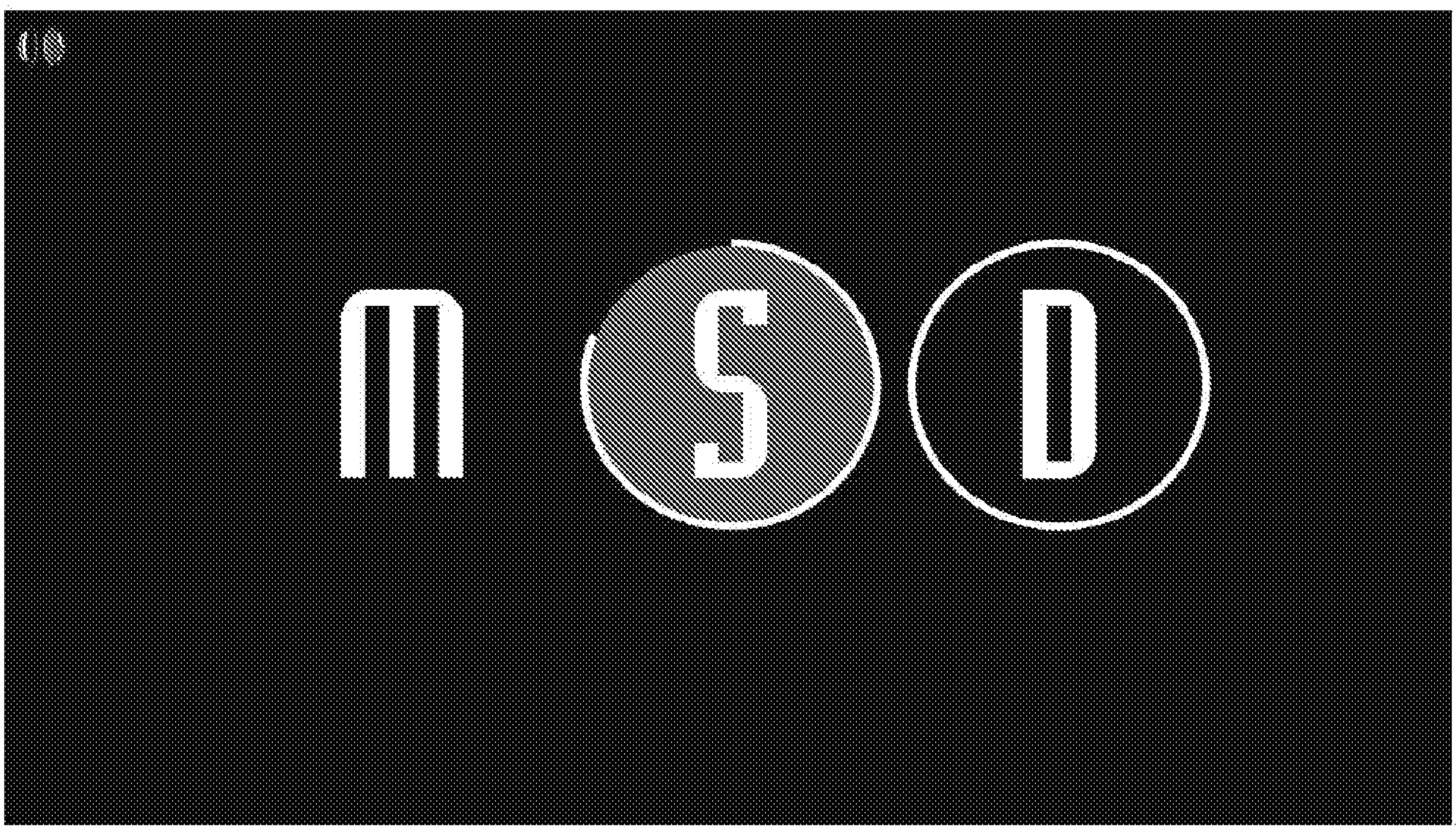


FIG. 58I

FIG. 58J

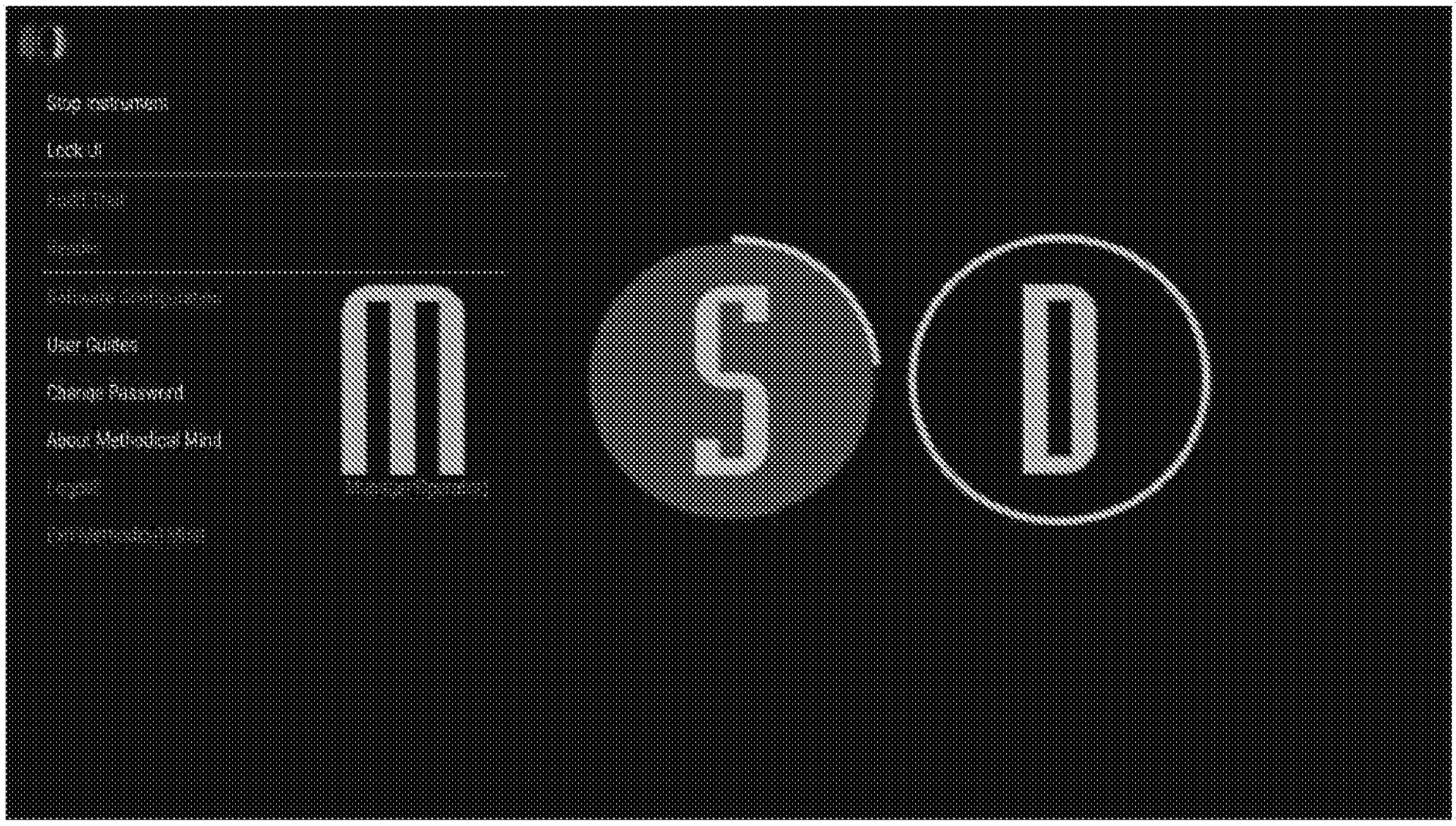




FIG. 58 K

FIG. 58L



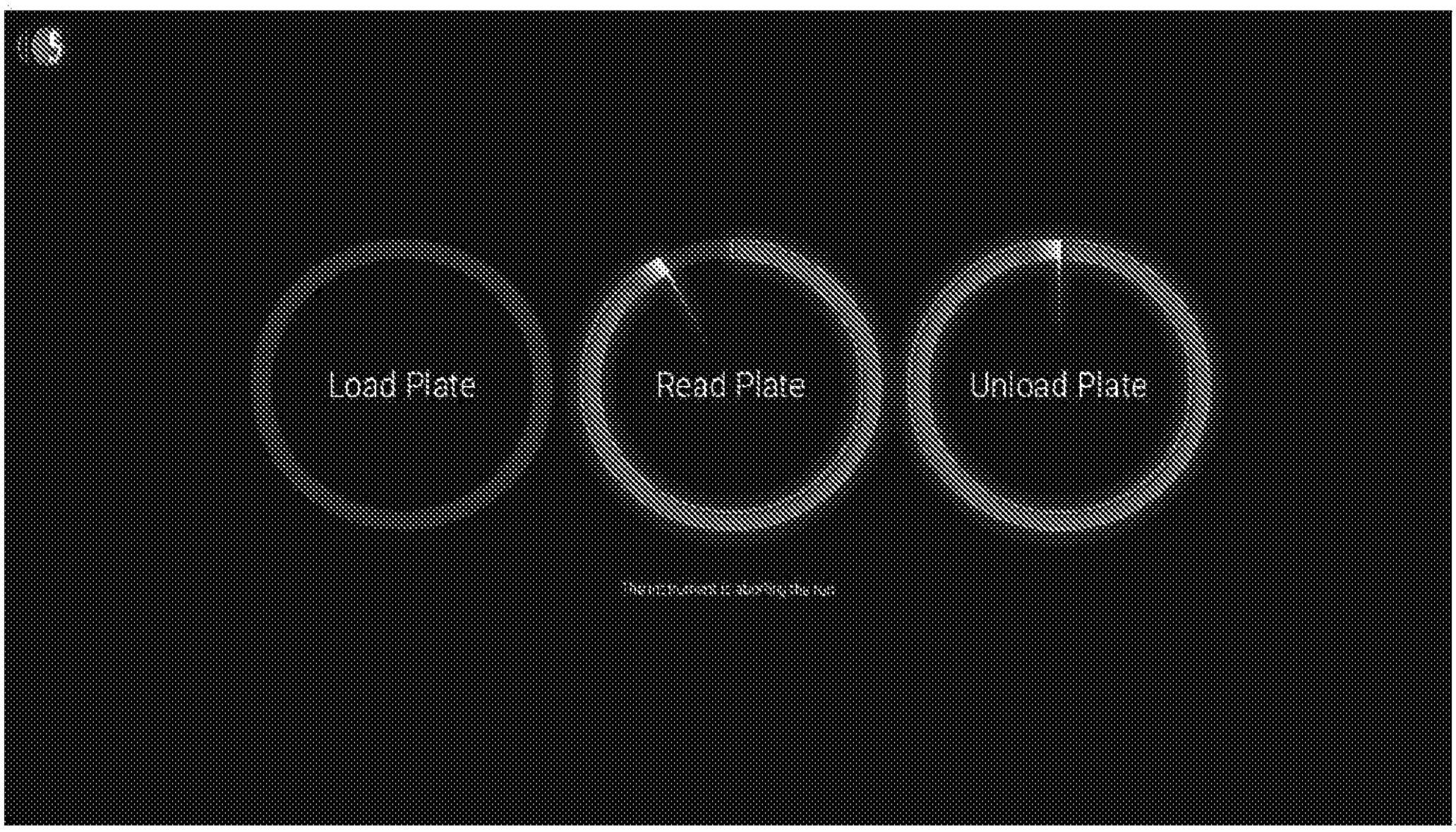


FIG. 58M

FIG. 58N

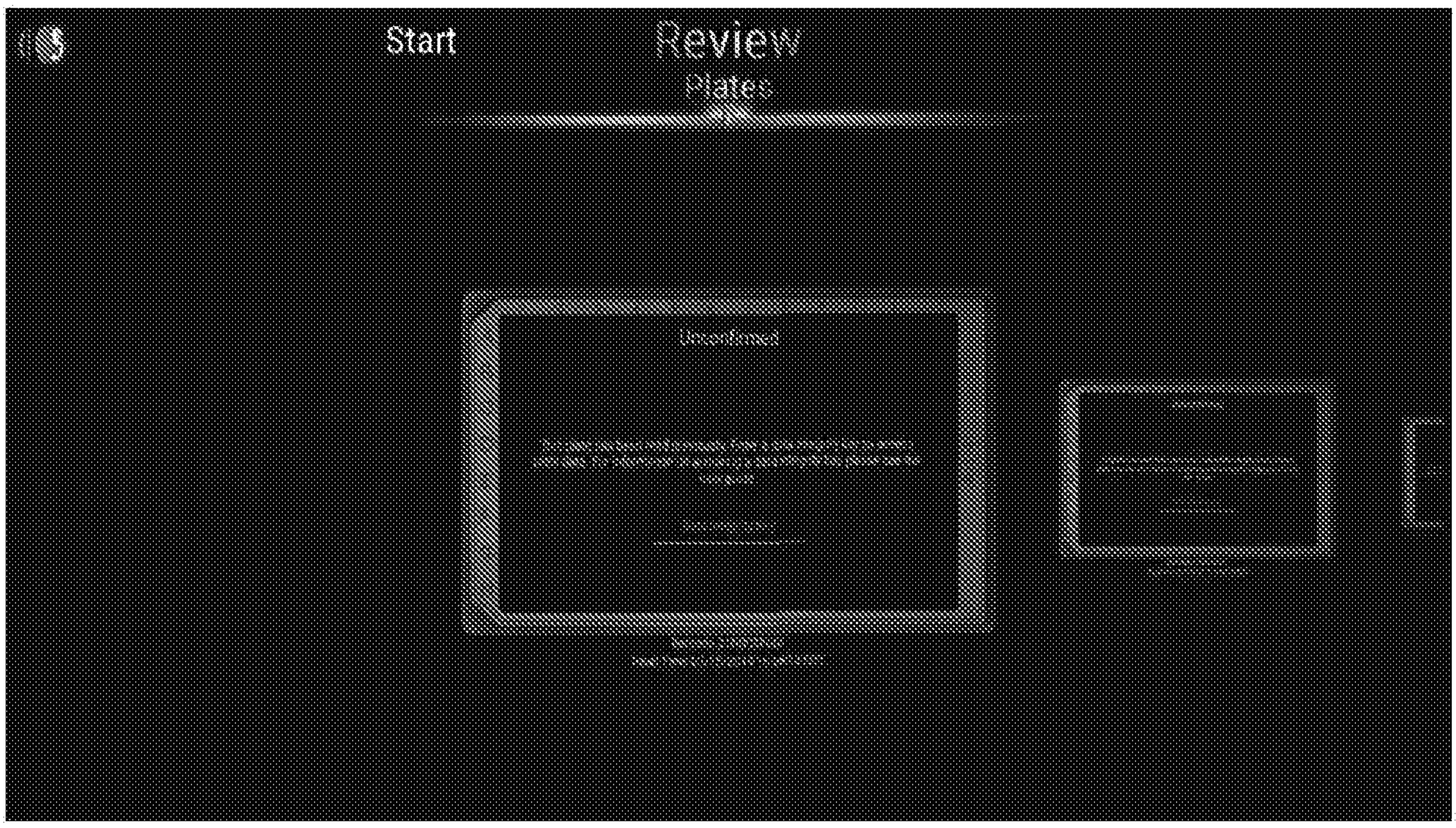
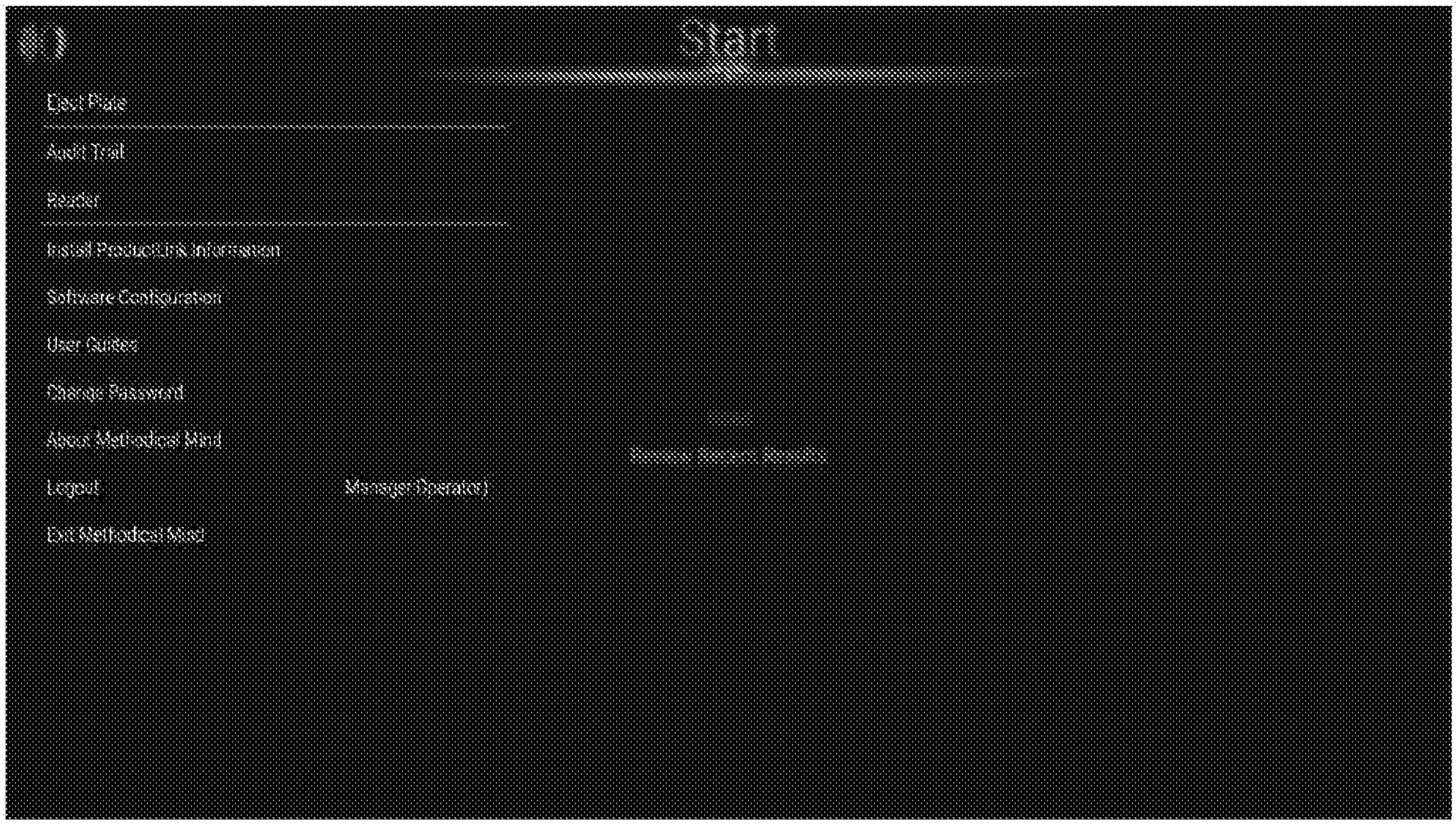




FIG. 58O

FIG. 58P



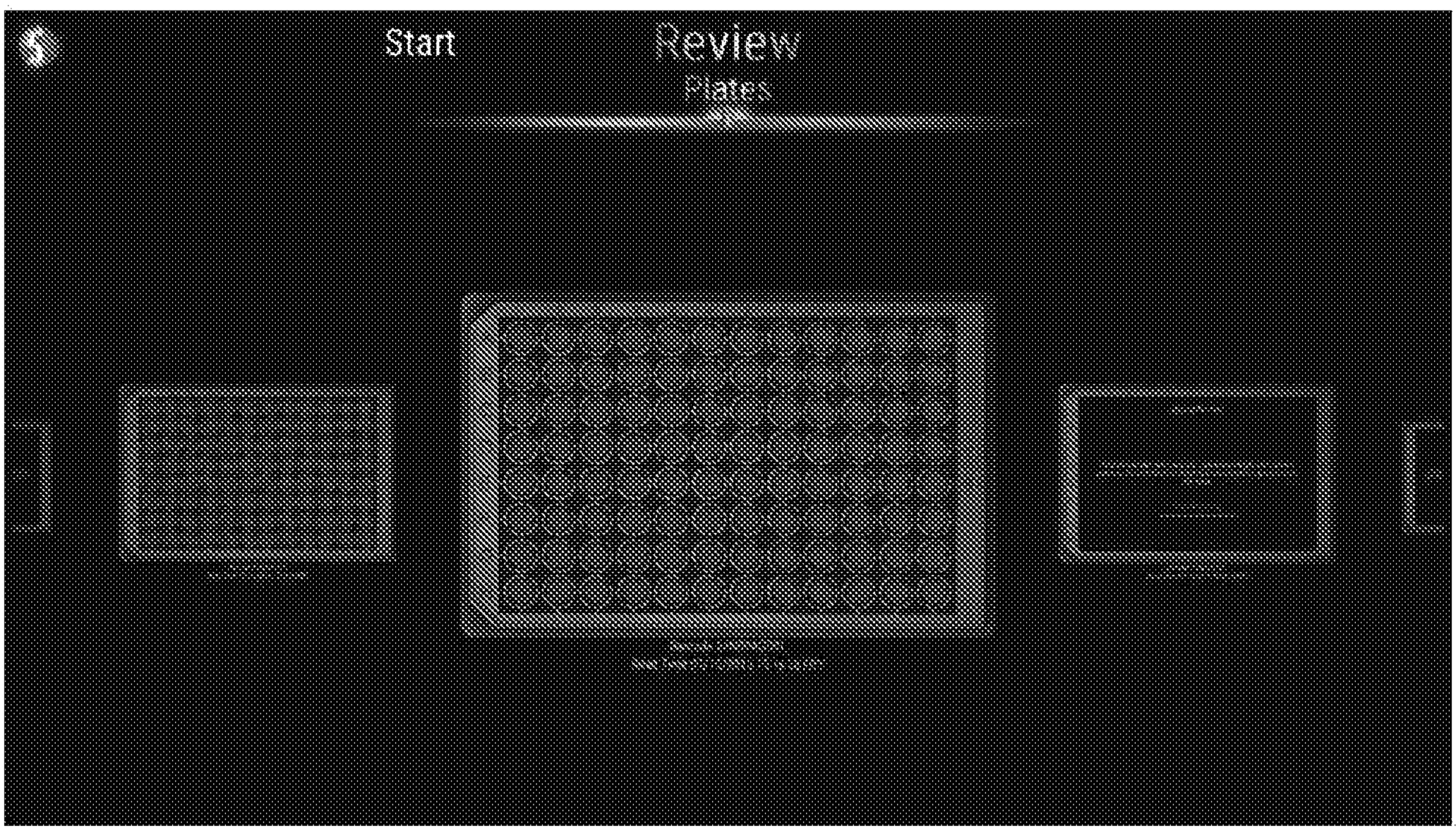


FIG. 58Q

FIG. 58R



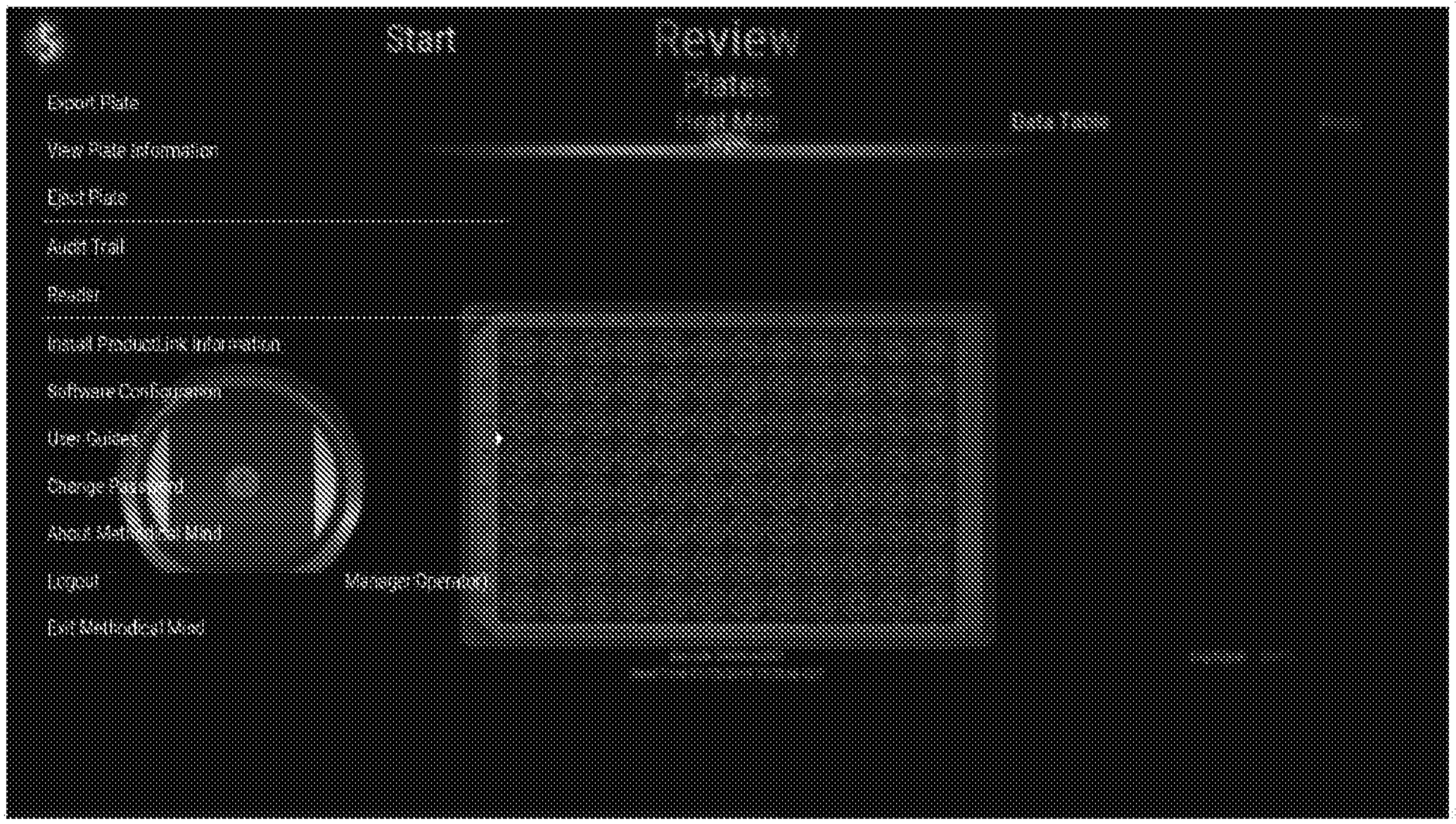
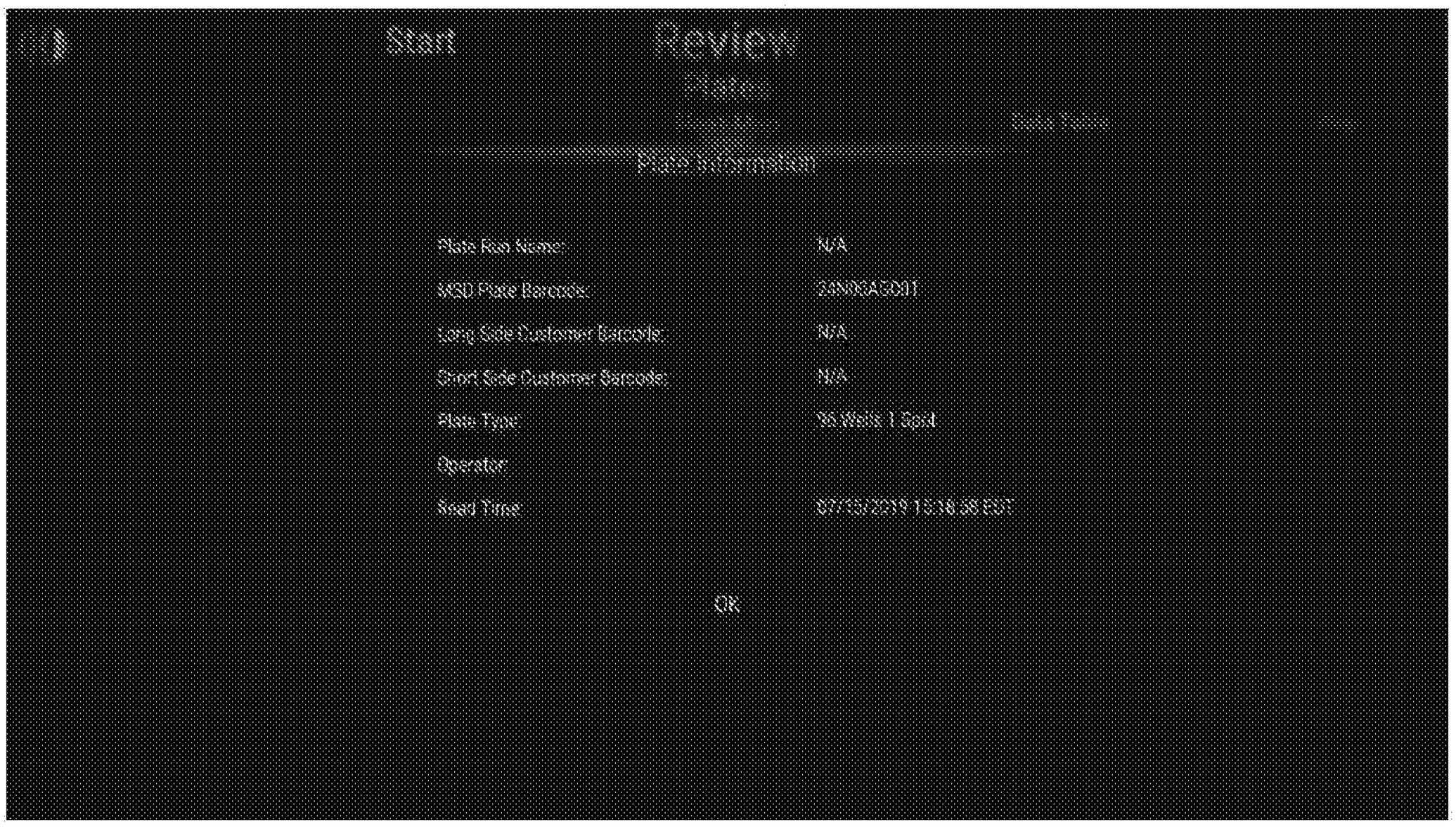


FIG. 58S

FIG. 58T



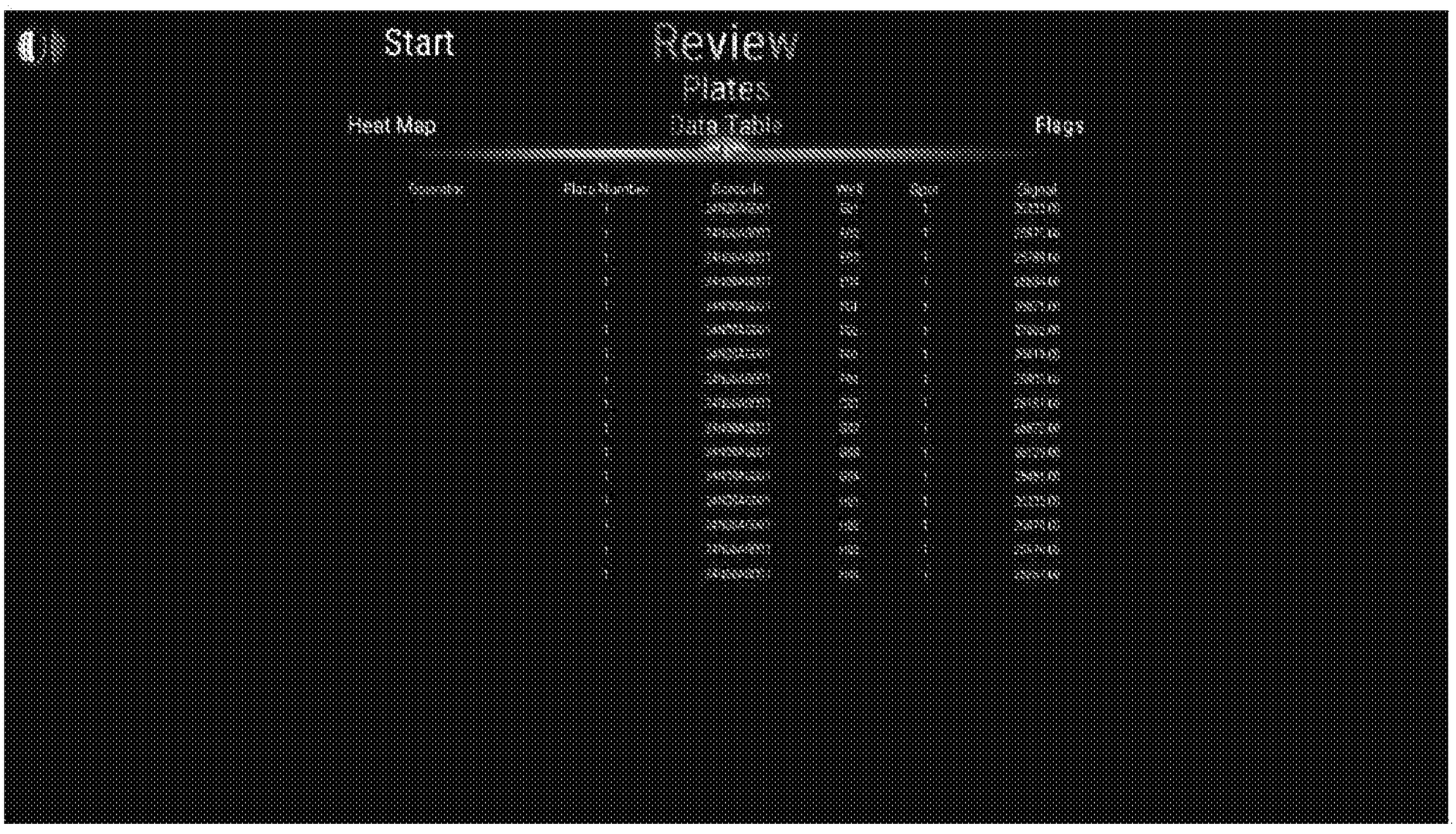
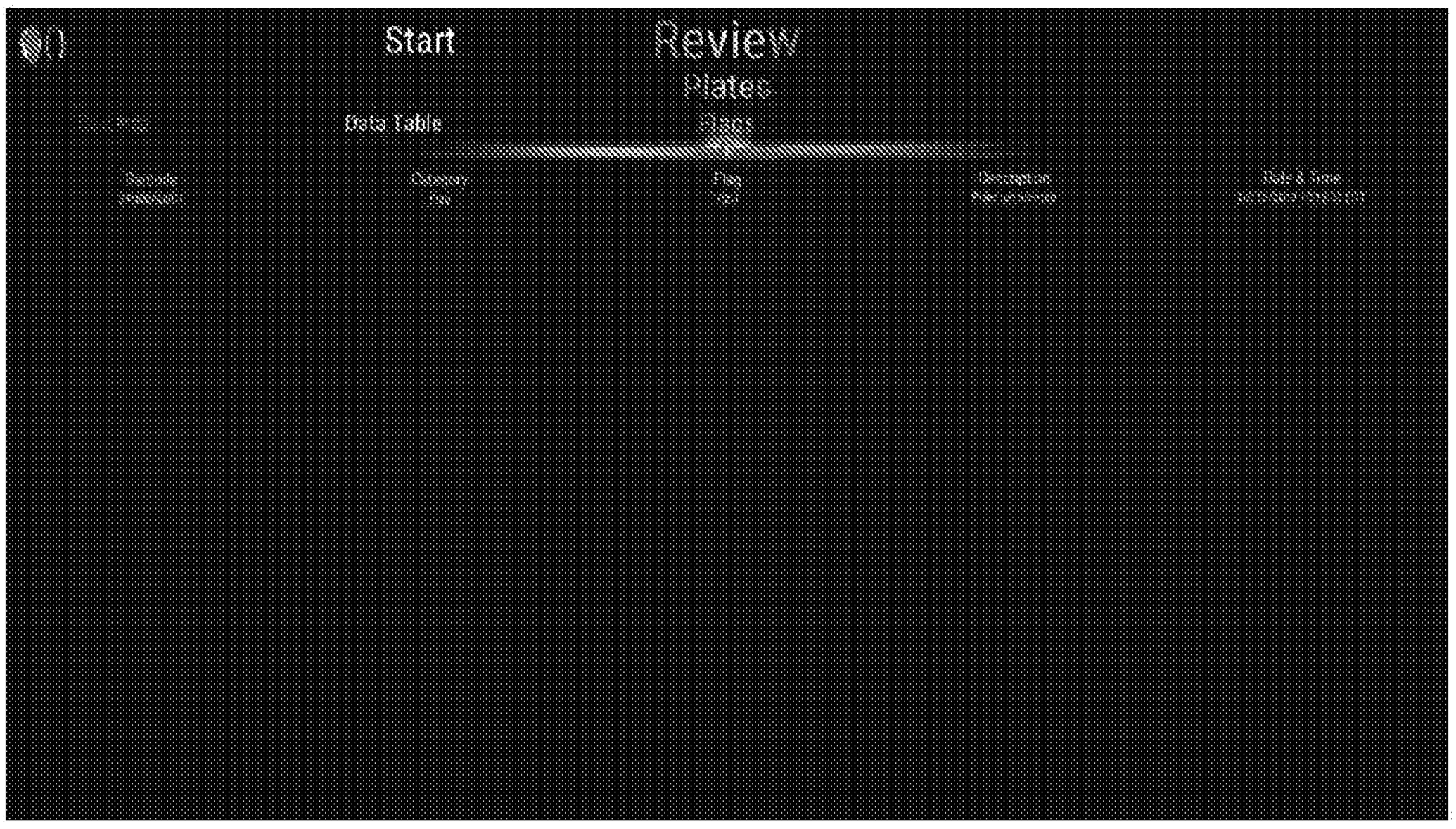


FIG. 58U

FIG. 58V



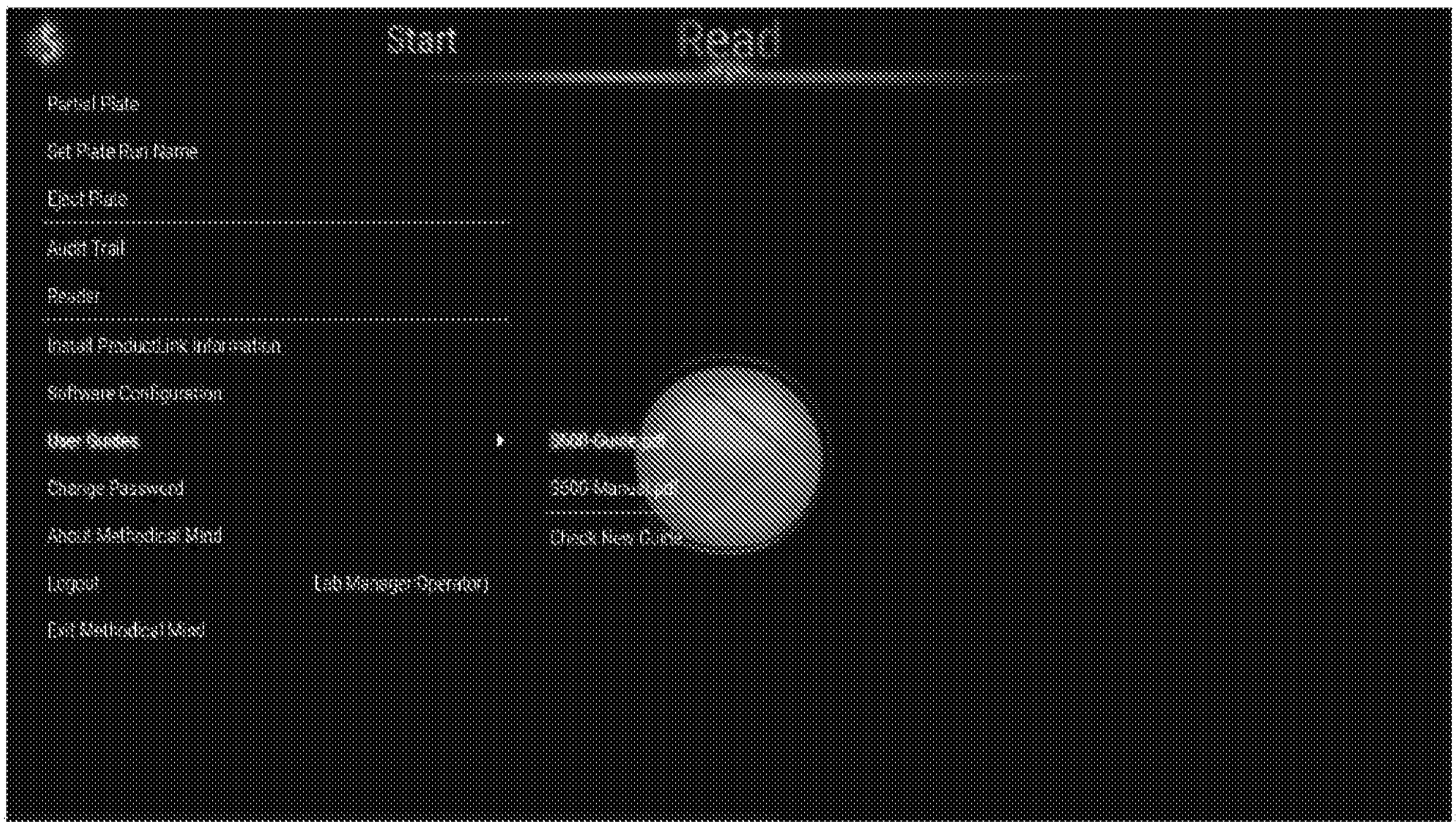


FIG. 58W

FIG. 58X

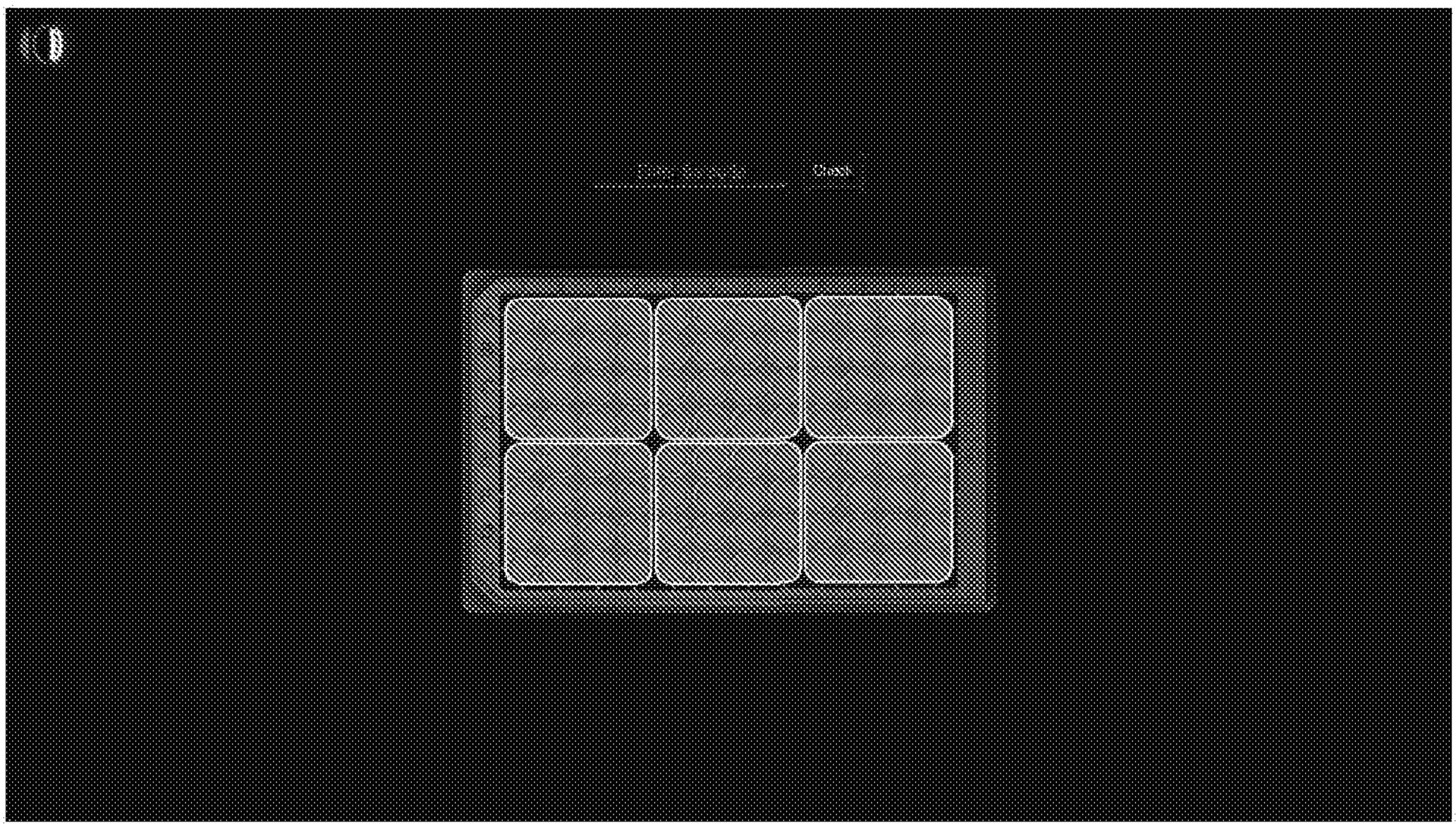
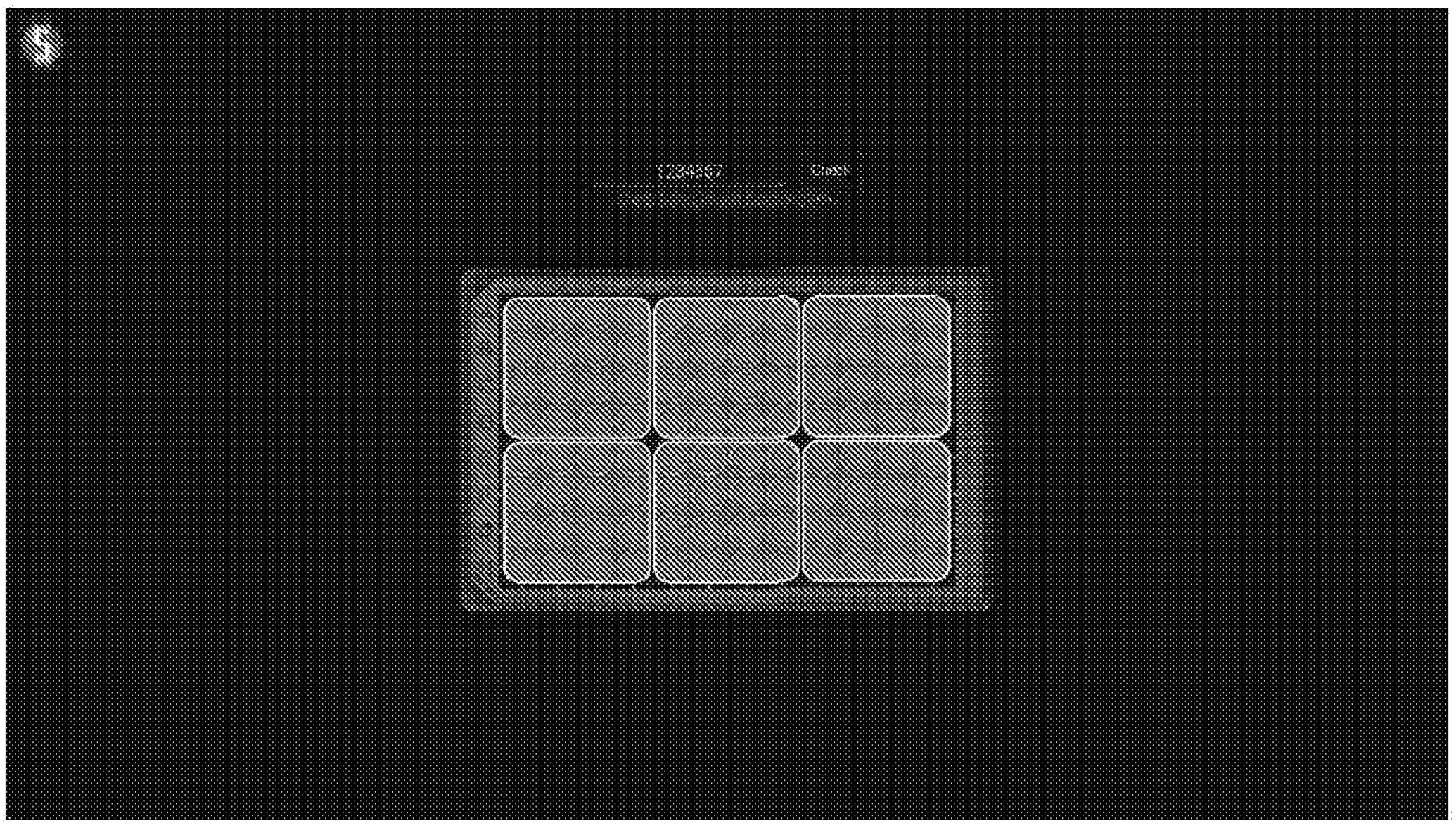




FIG. 58Y

FIG. 58Z



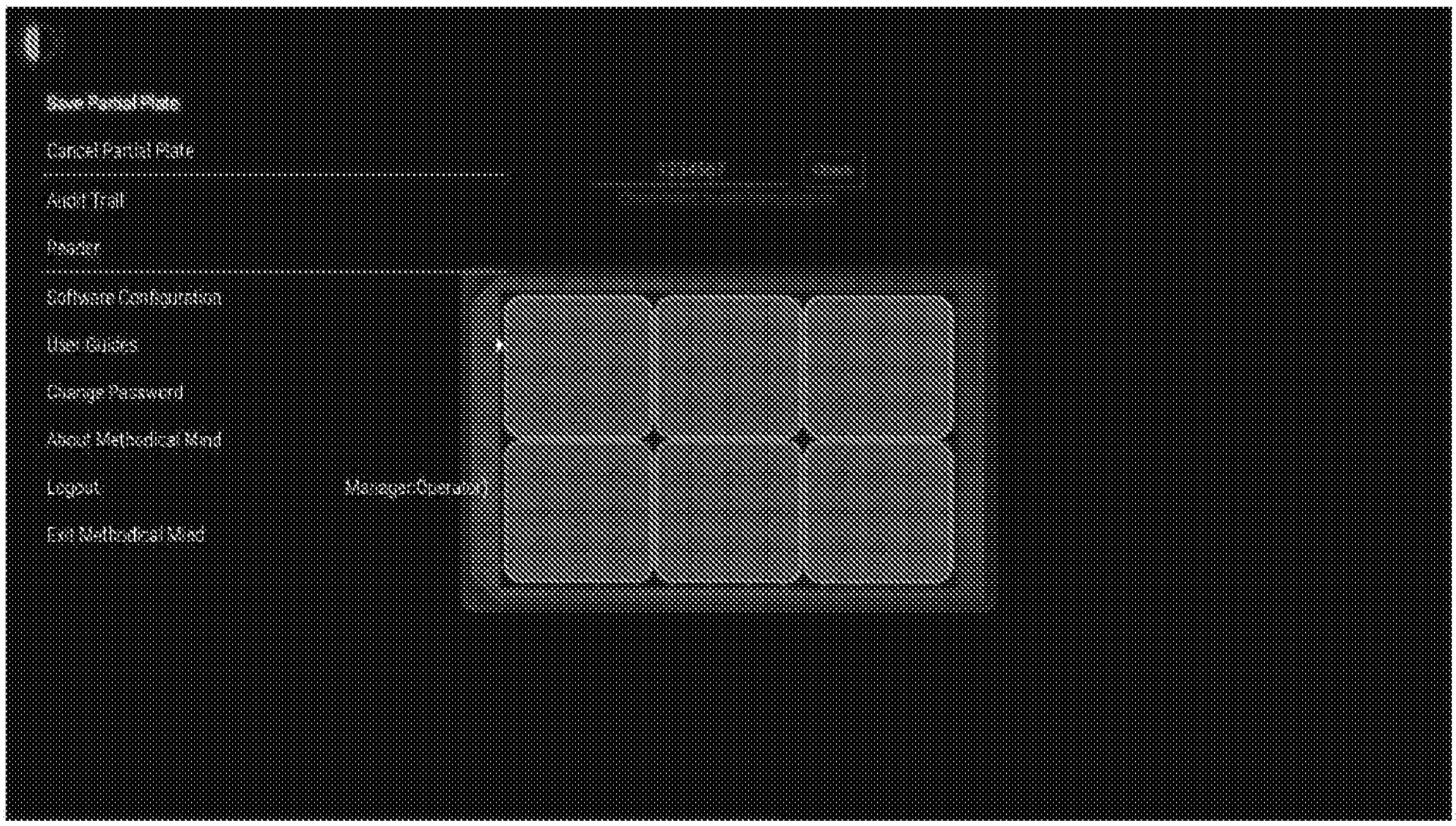
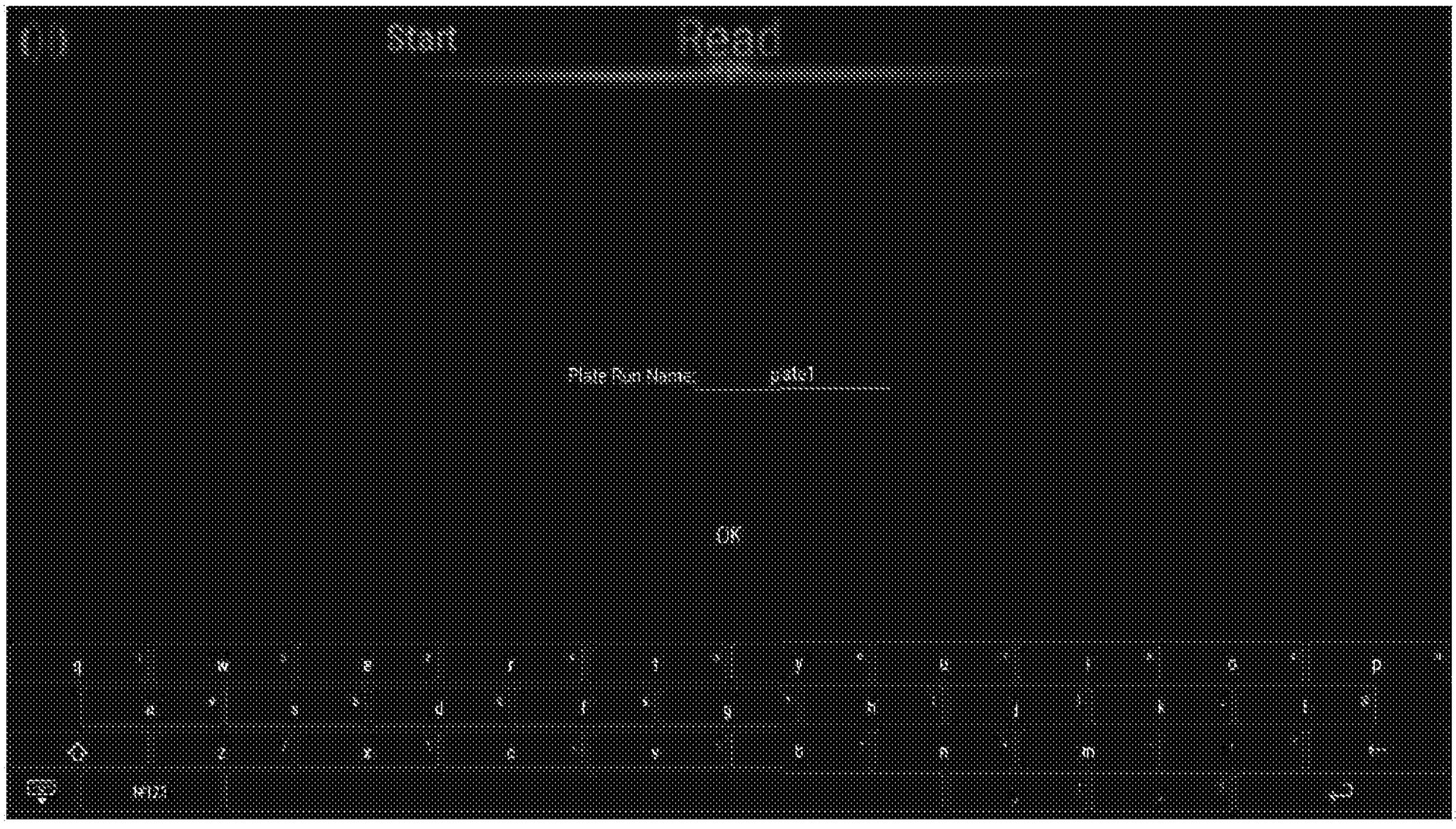


FIG. 58AA

FIG. 58BB



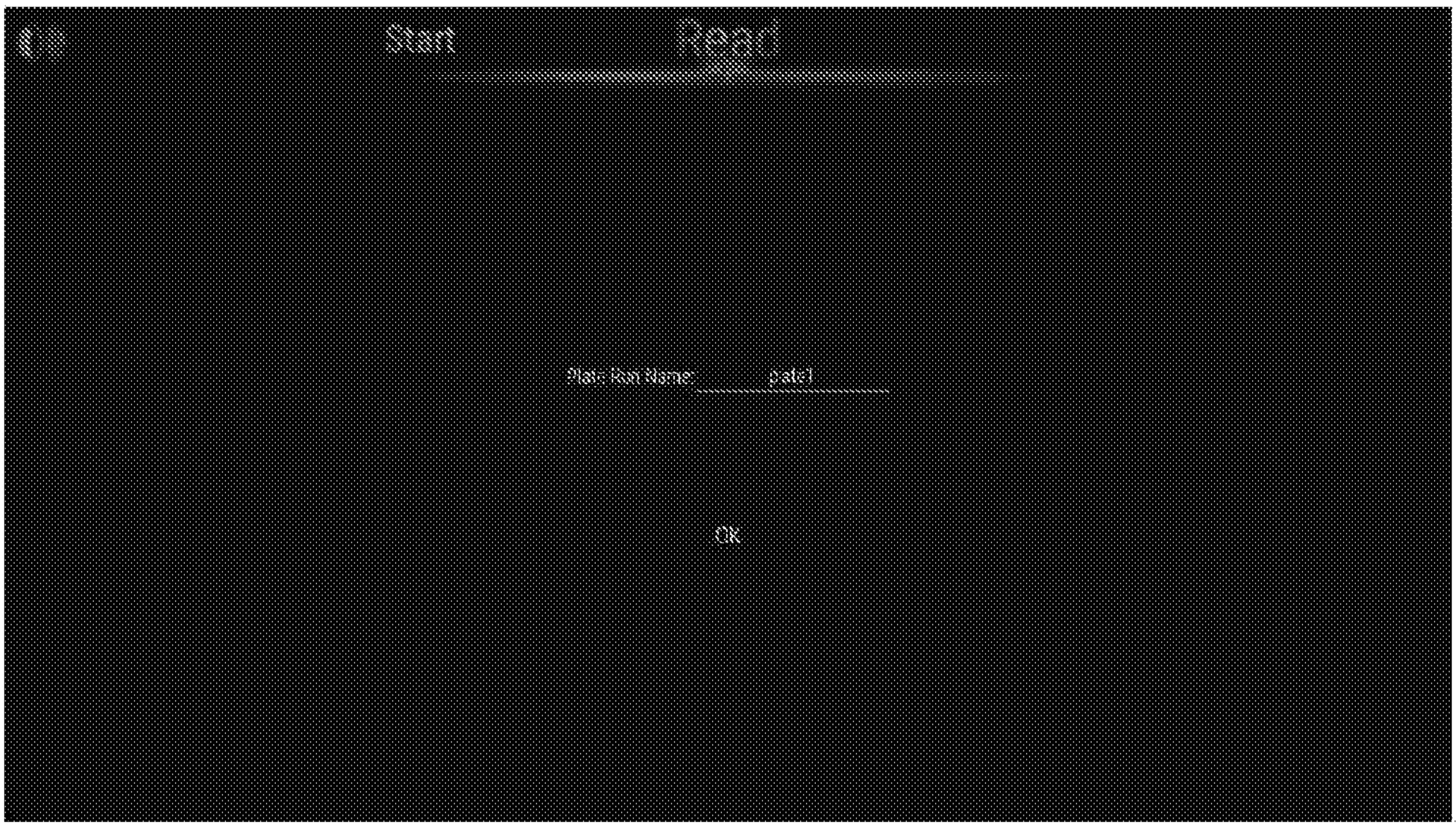
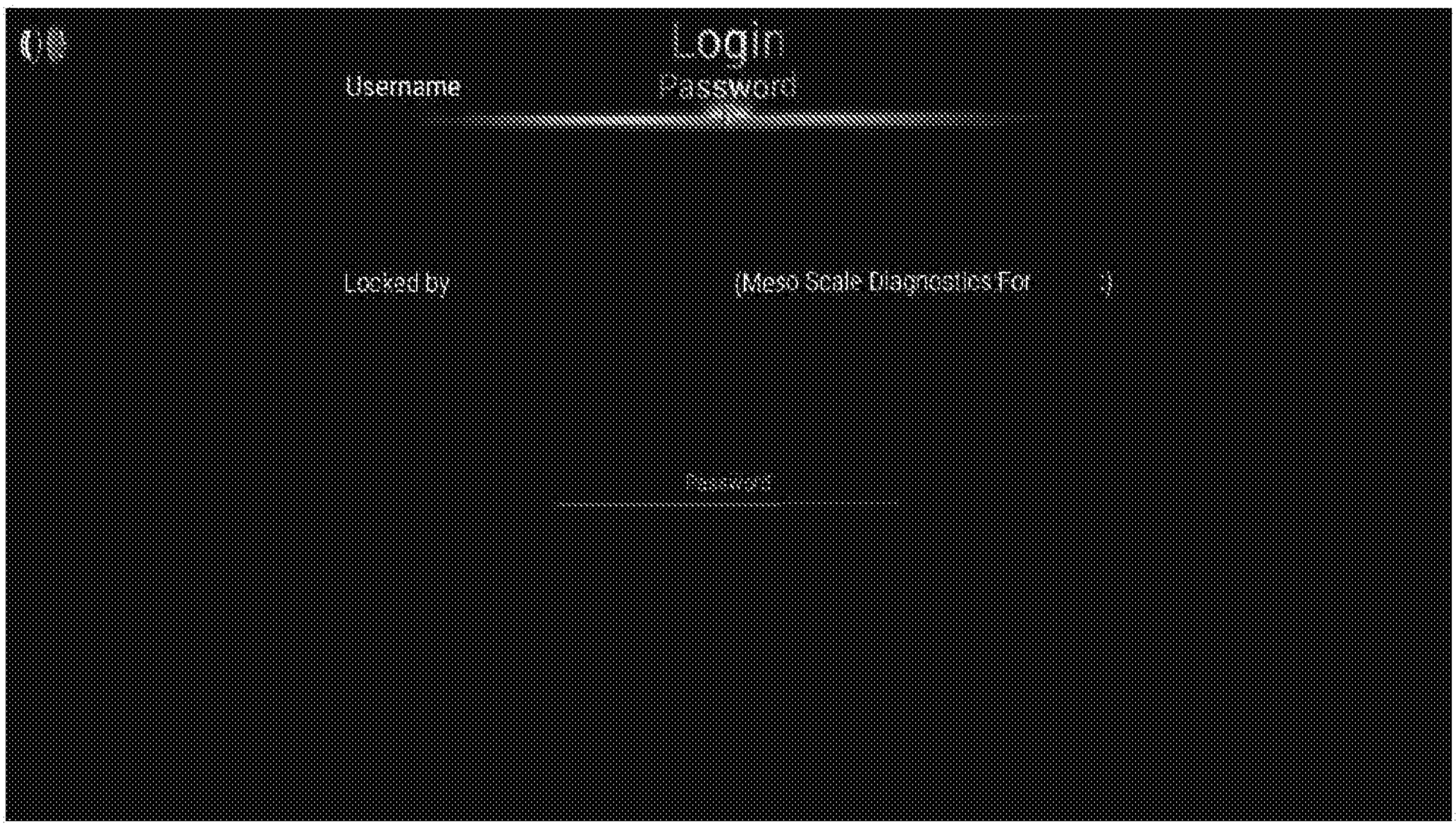


FIG. 58CC

FIG. 58DD



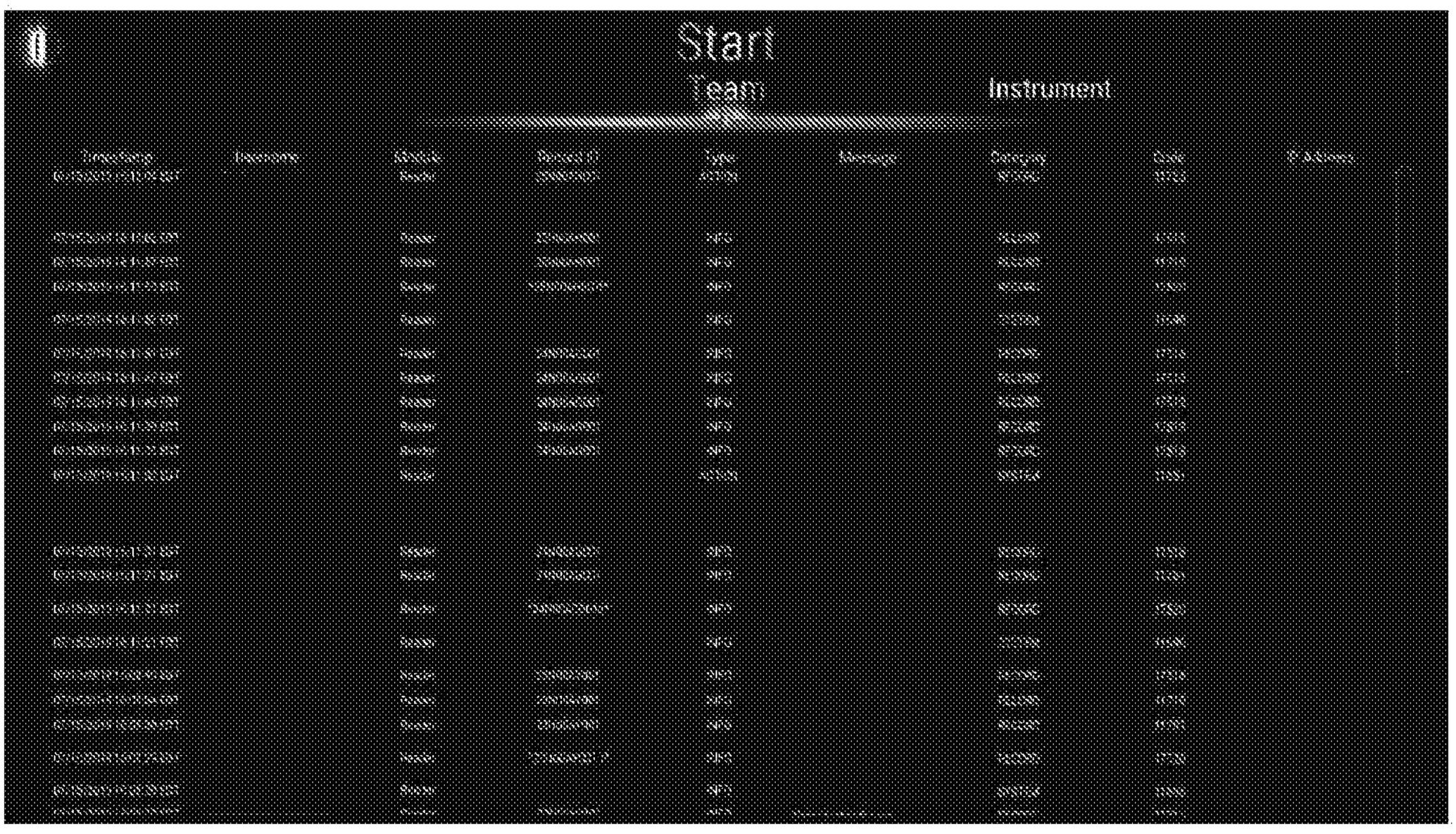


FIG. 58EE

FIG. 58FF

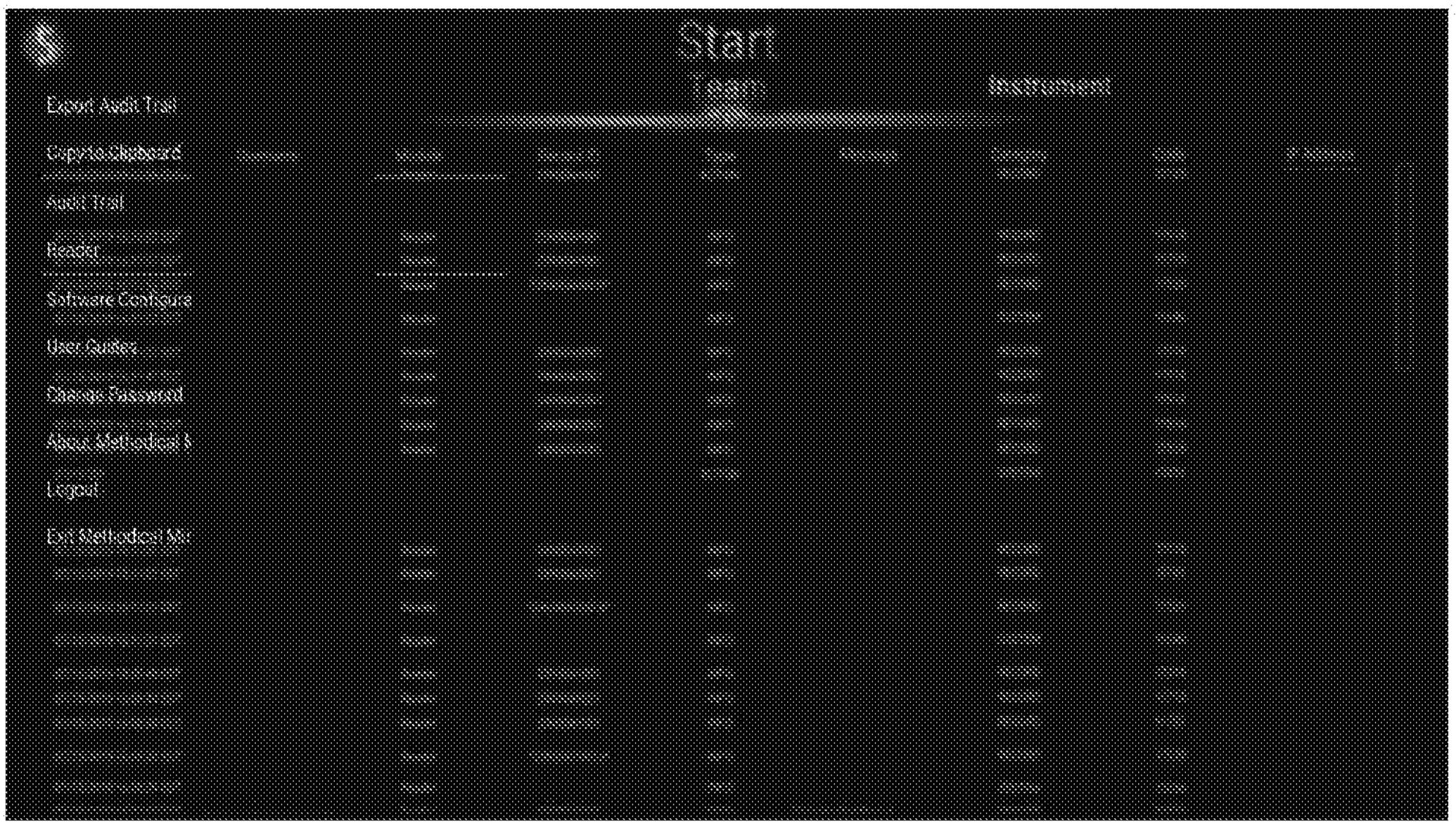
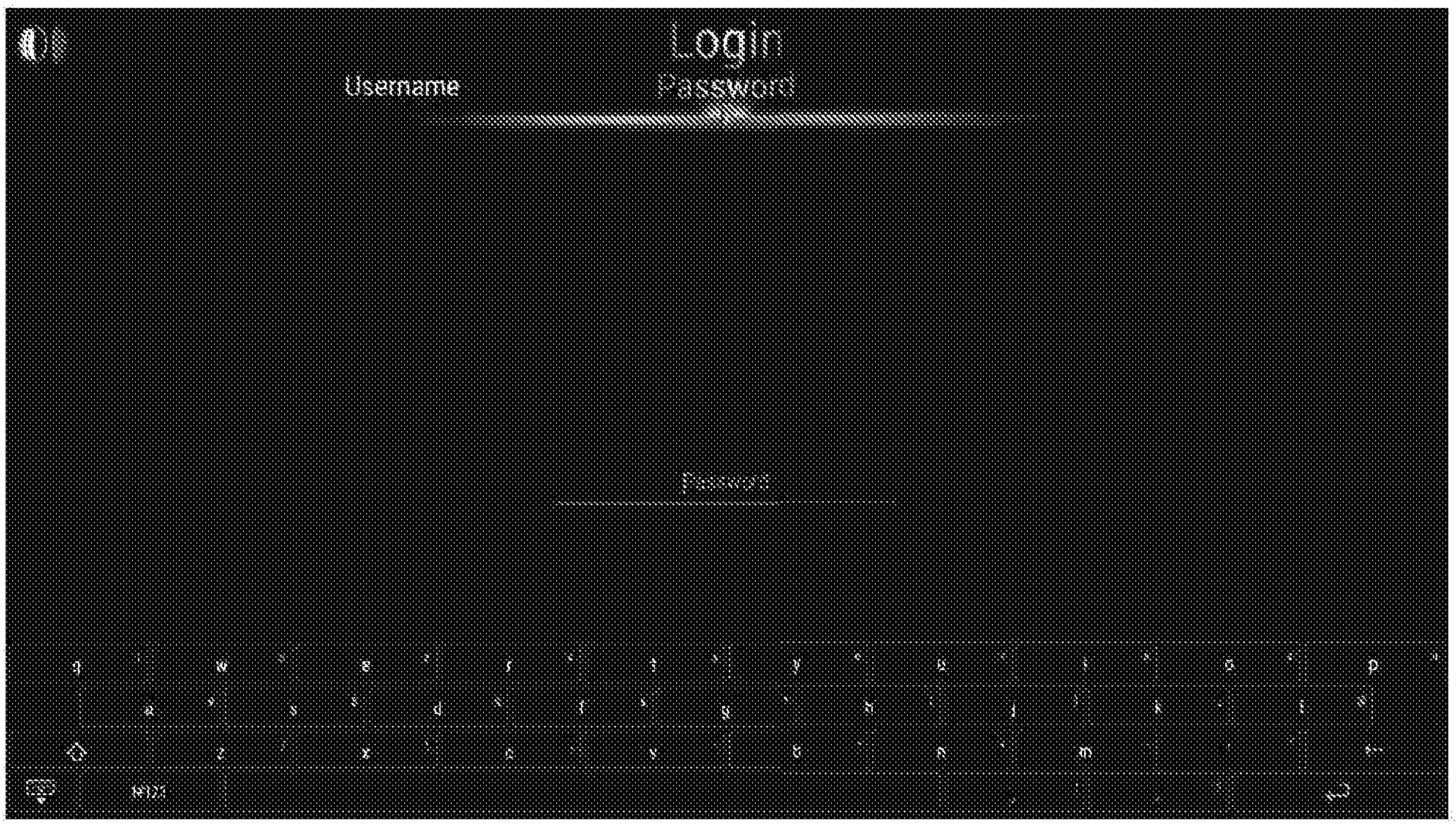




FIG. 58GG

FIG. 58HH



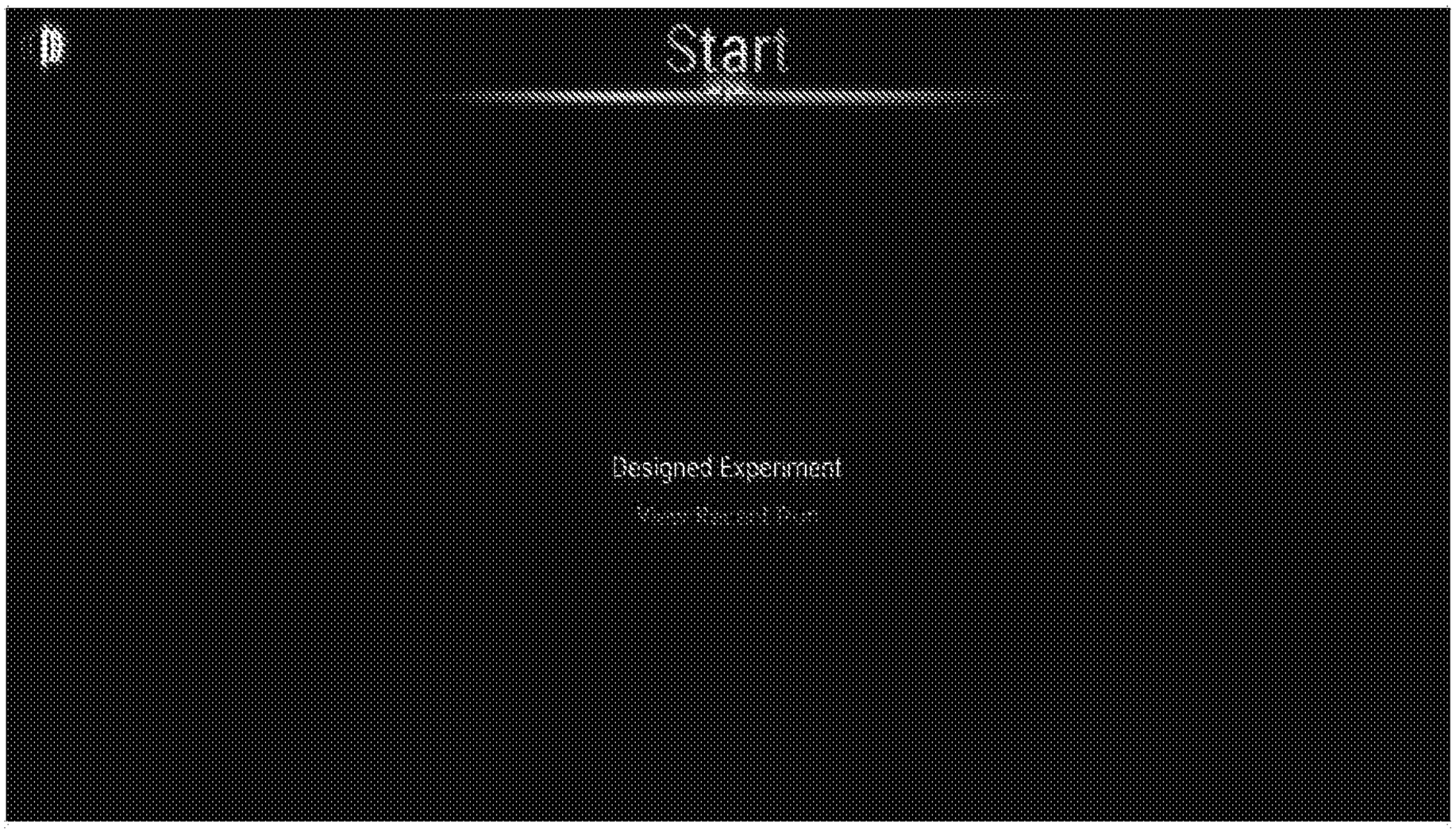


FIG. 59A

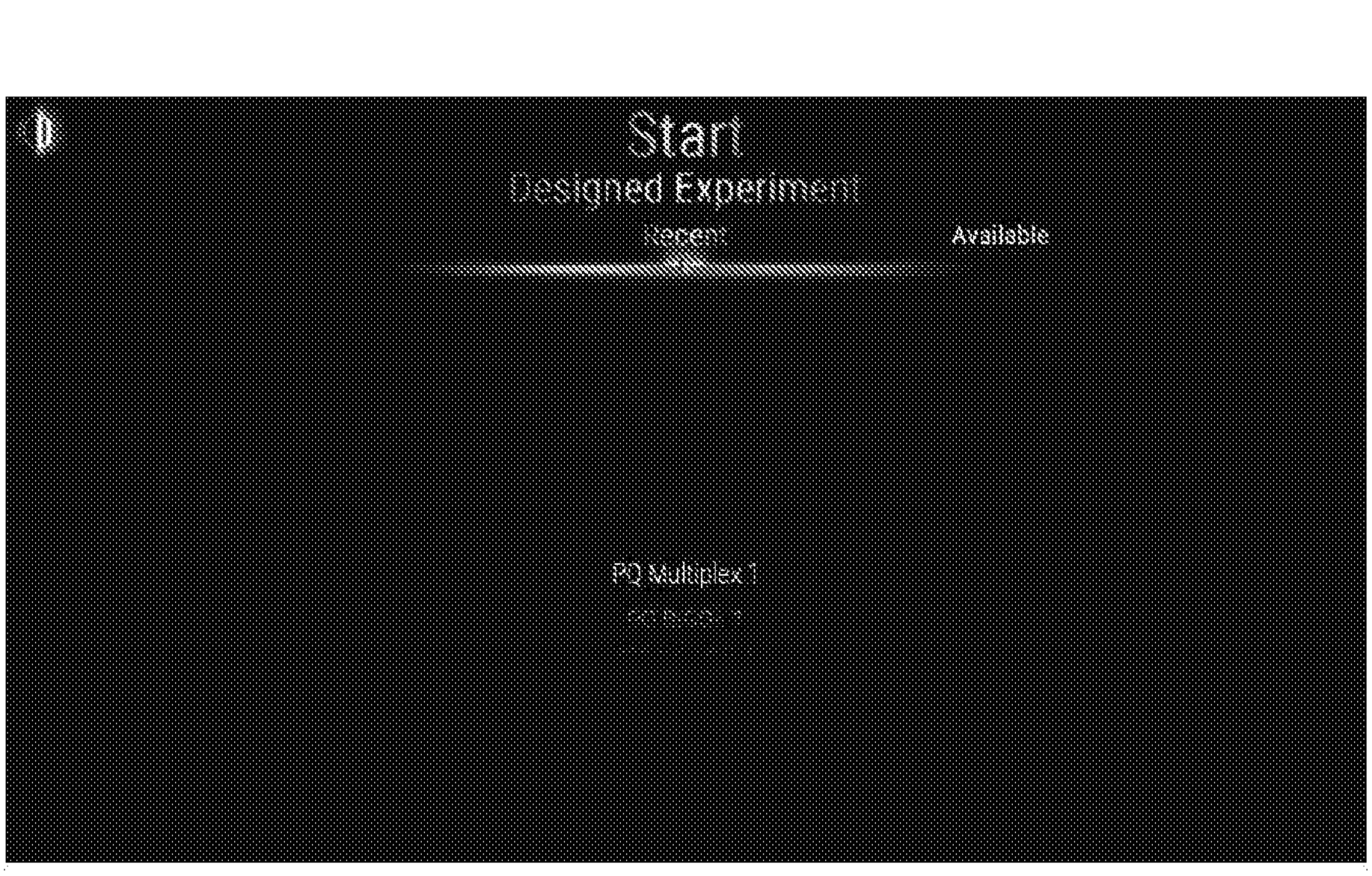


FIG. 59B



FIG. 59C

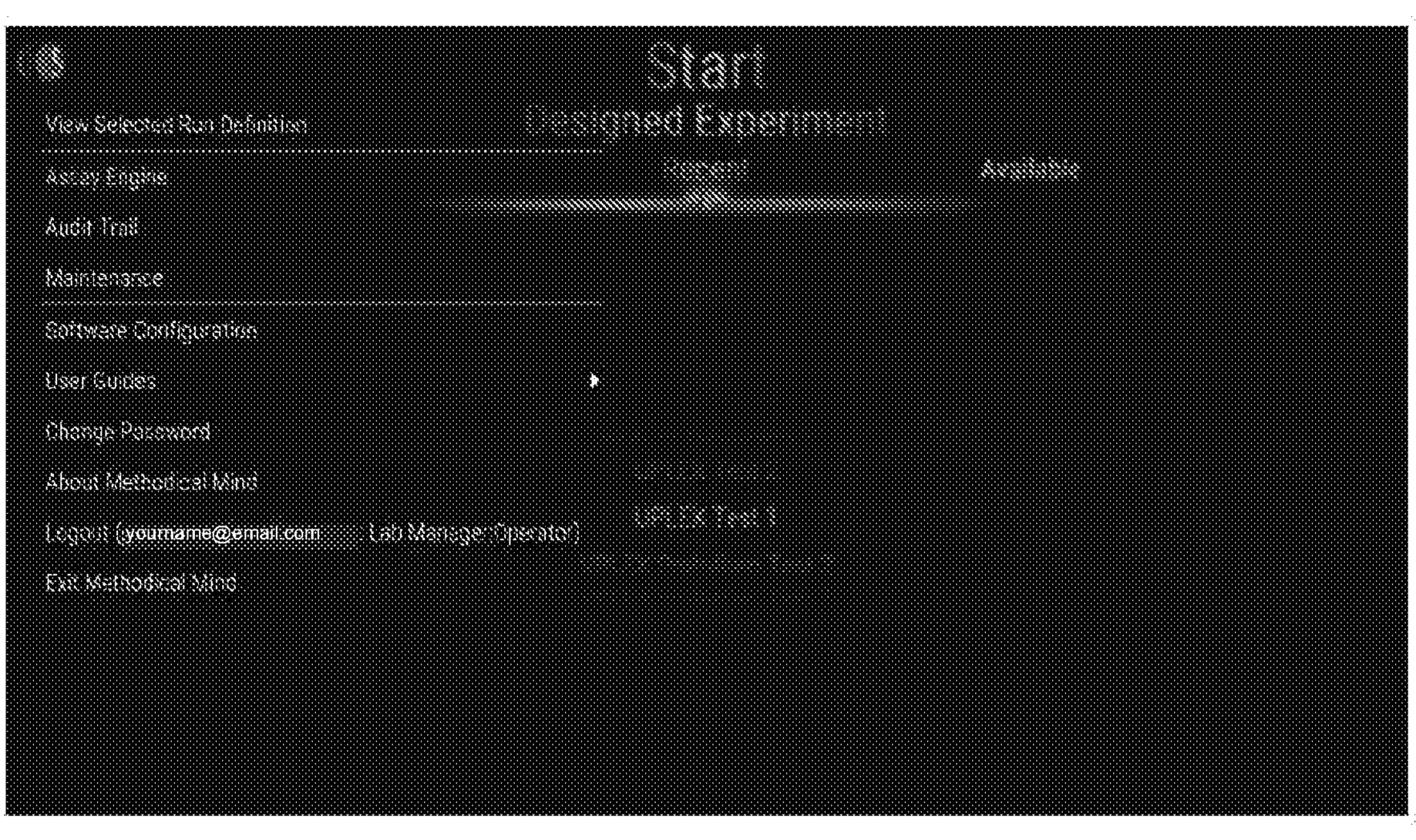
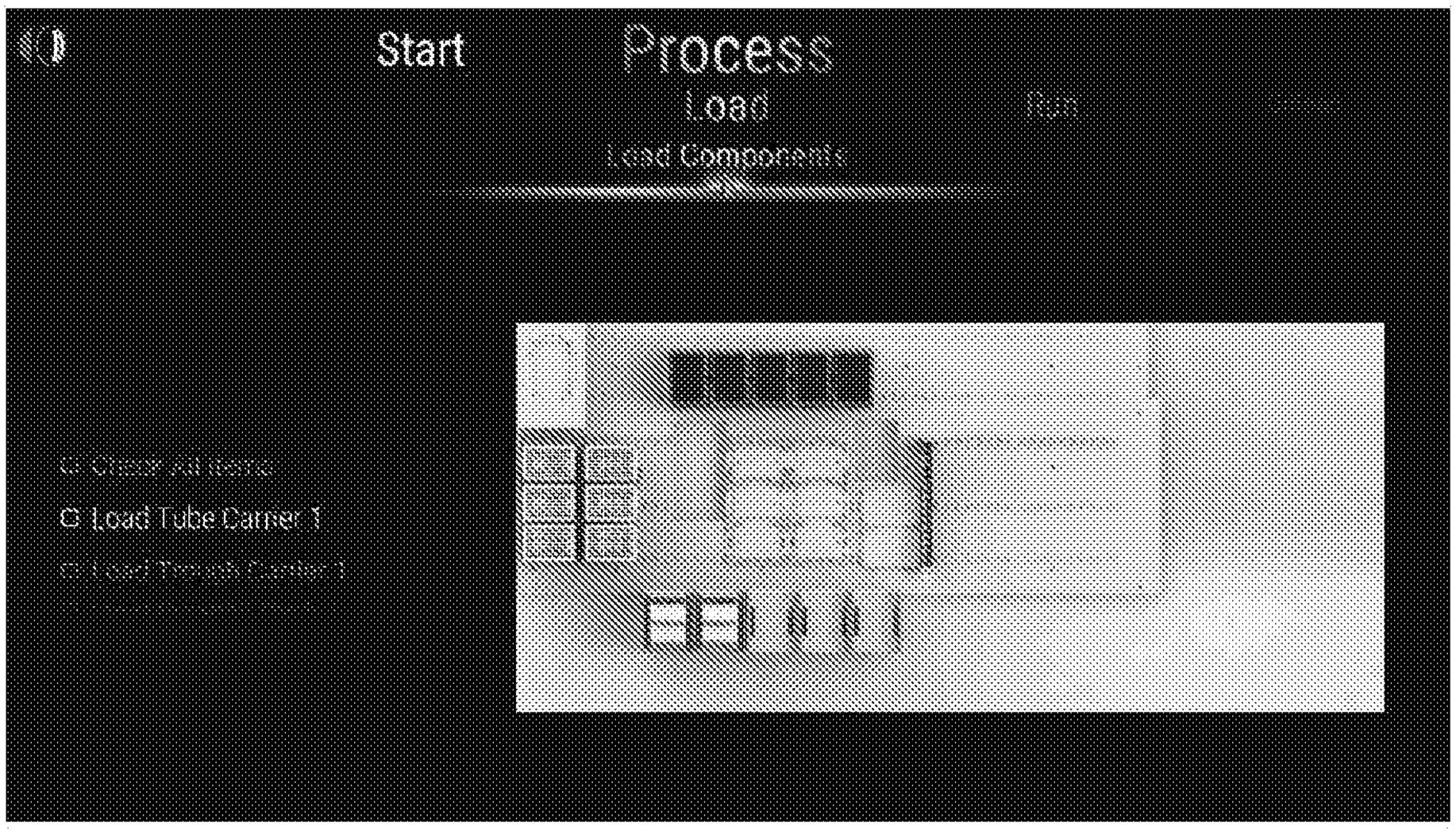


FIG. 59D

FIG. 59E



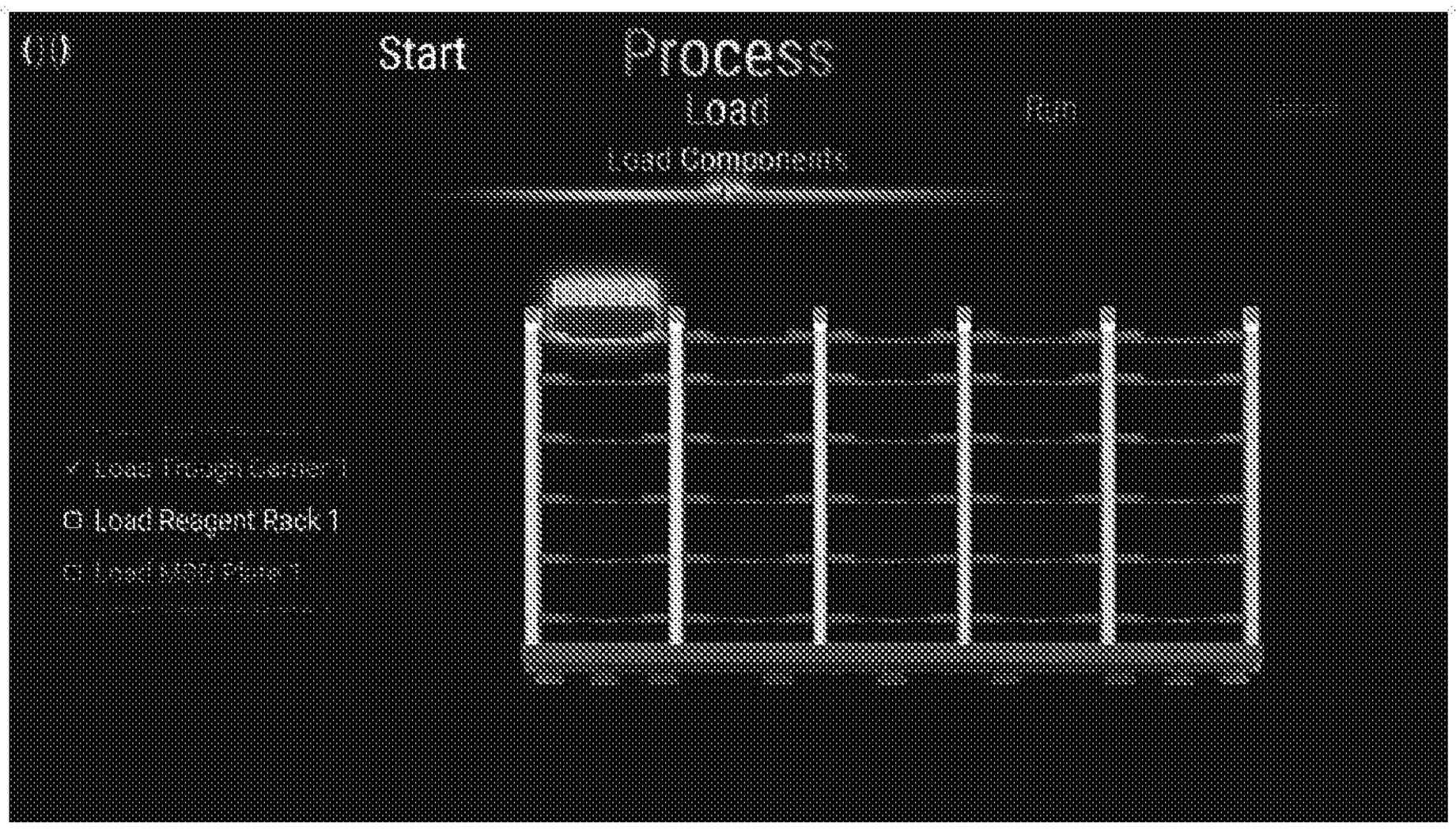
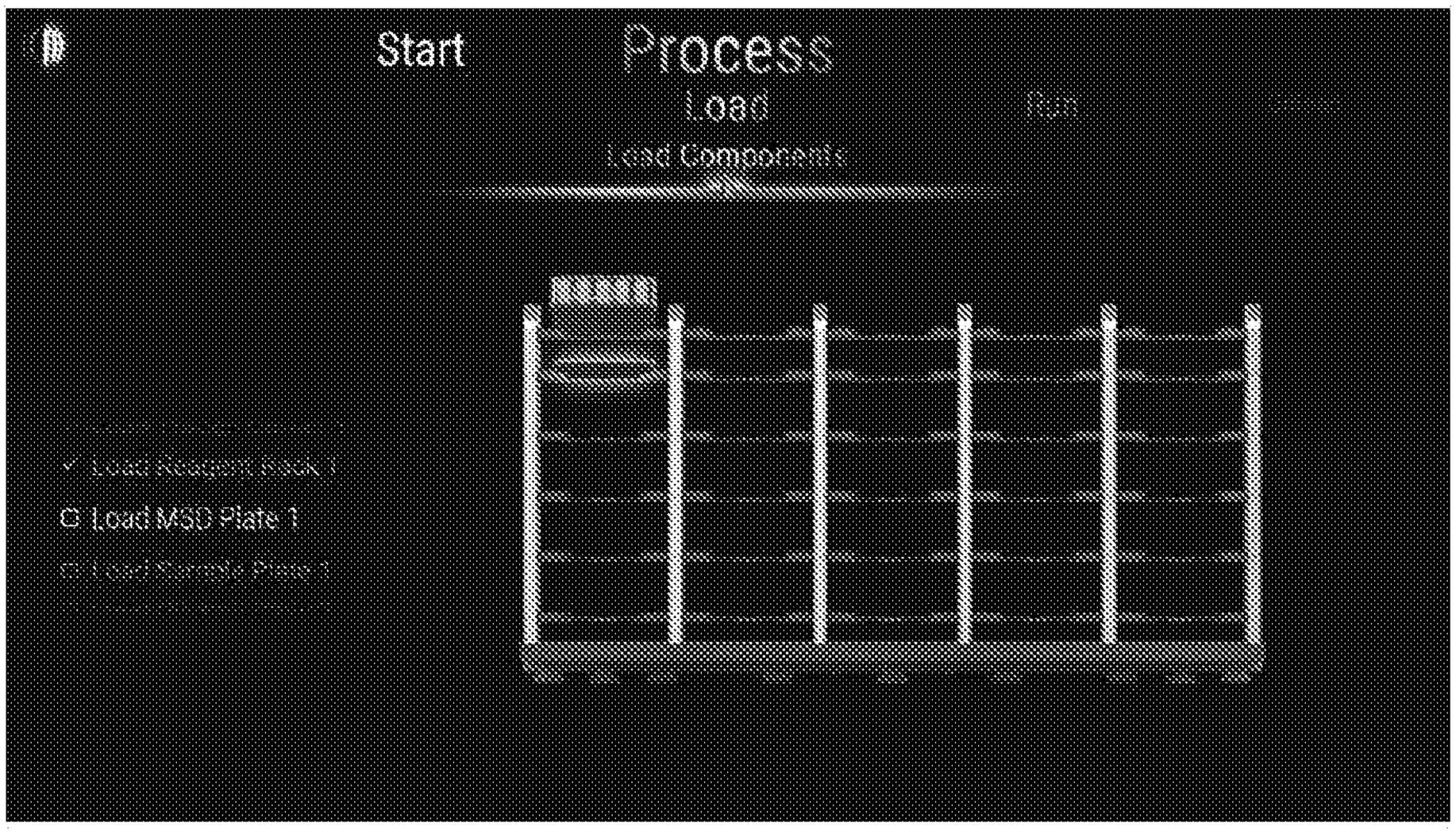


FIG. 59F

FIG. 59G



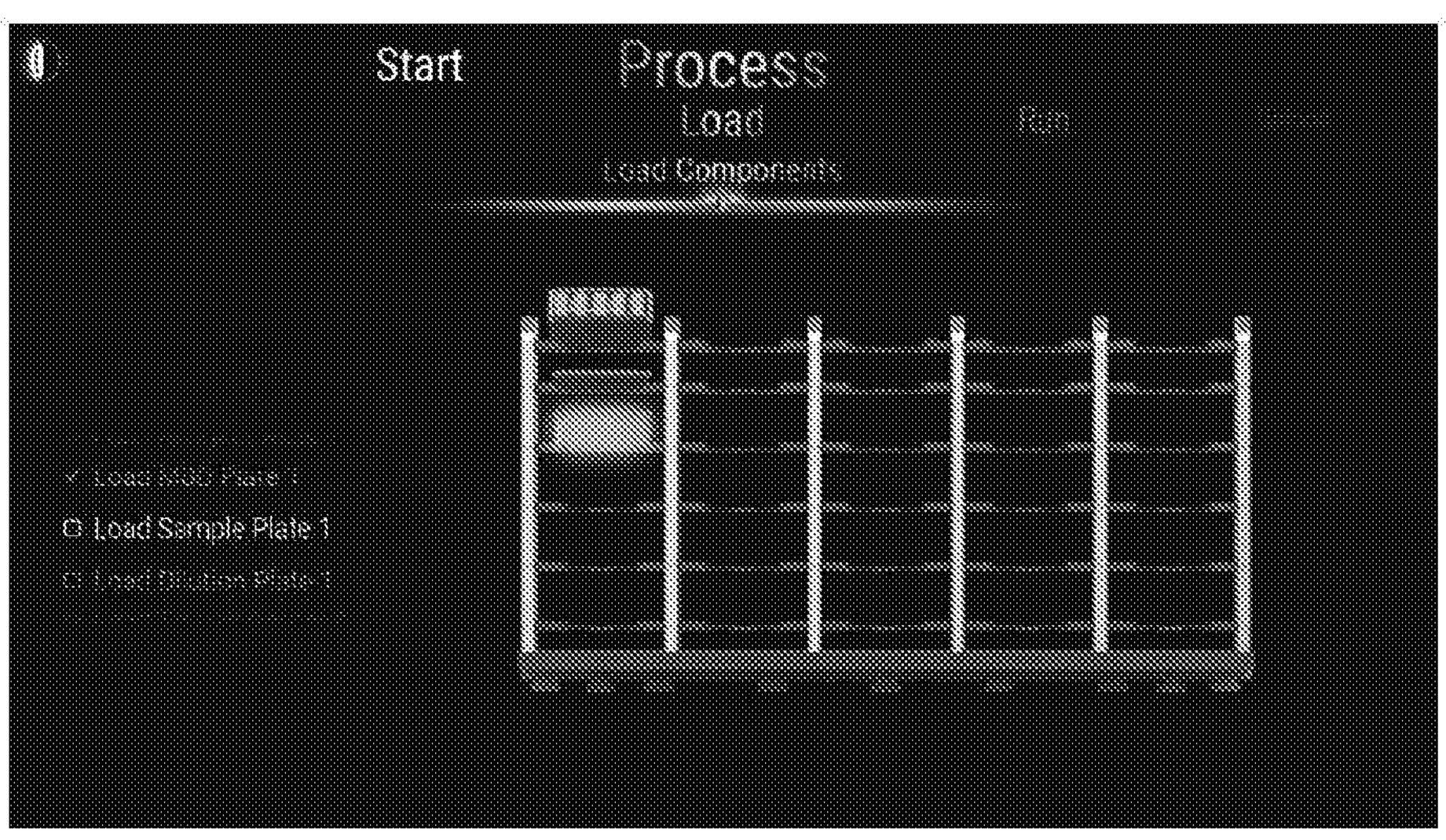
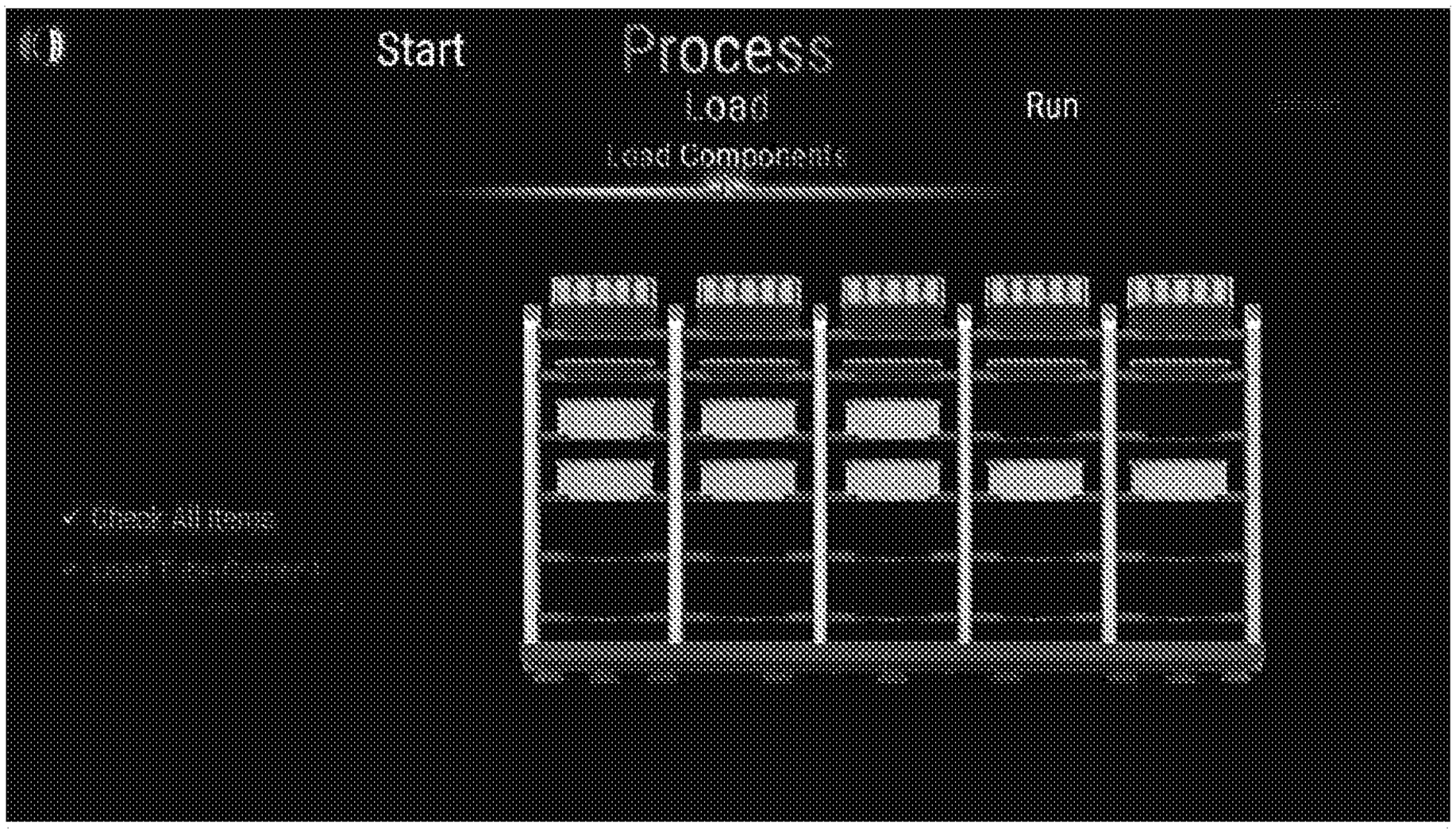


FIG. 59H

FIG. 59I



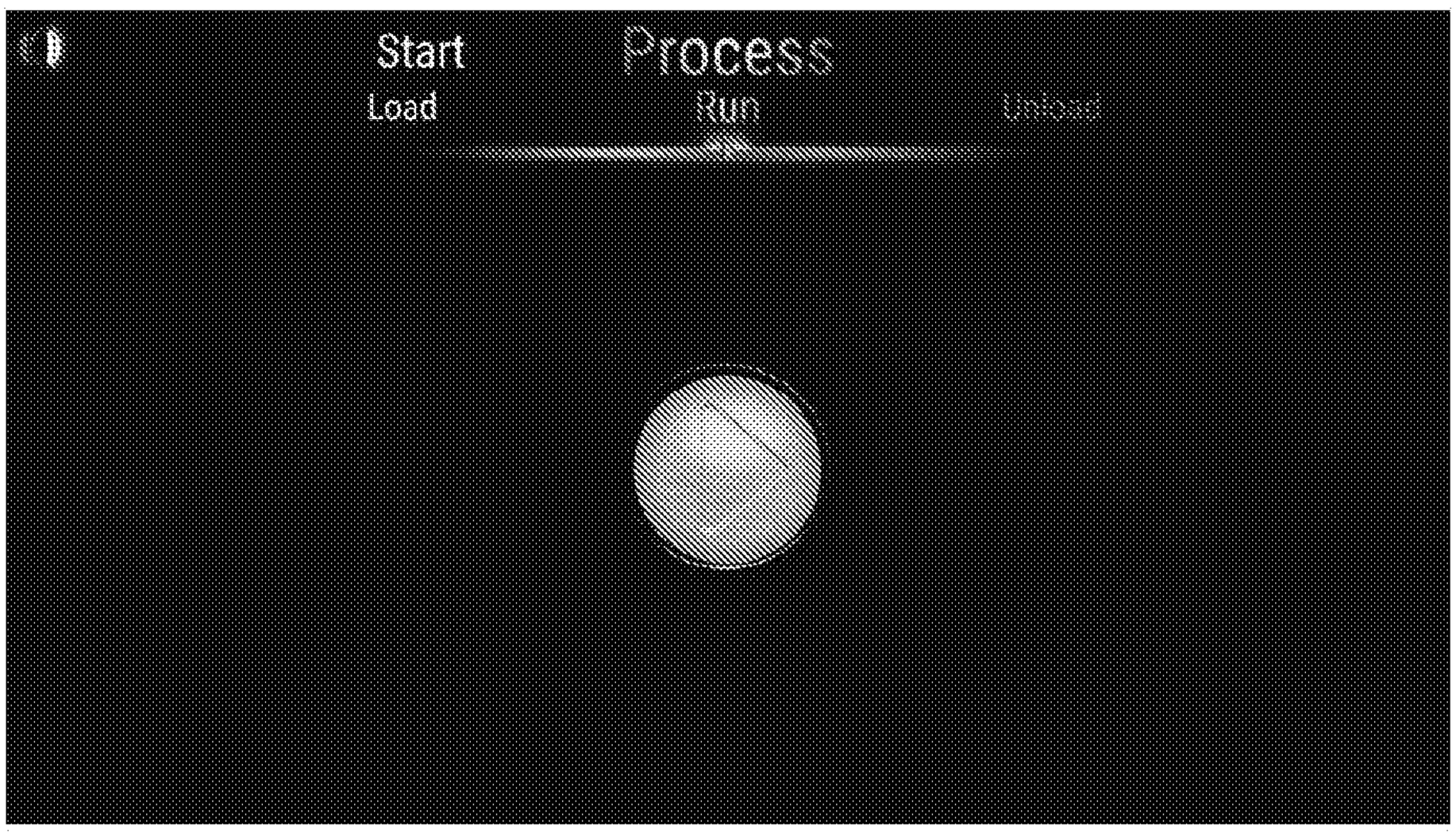
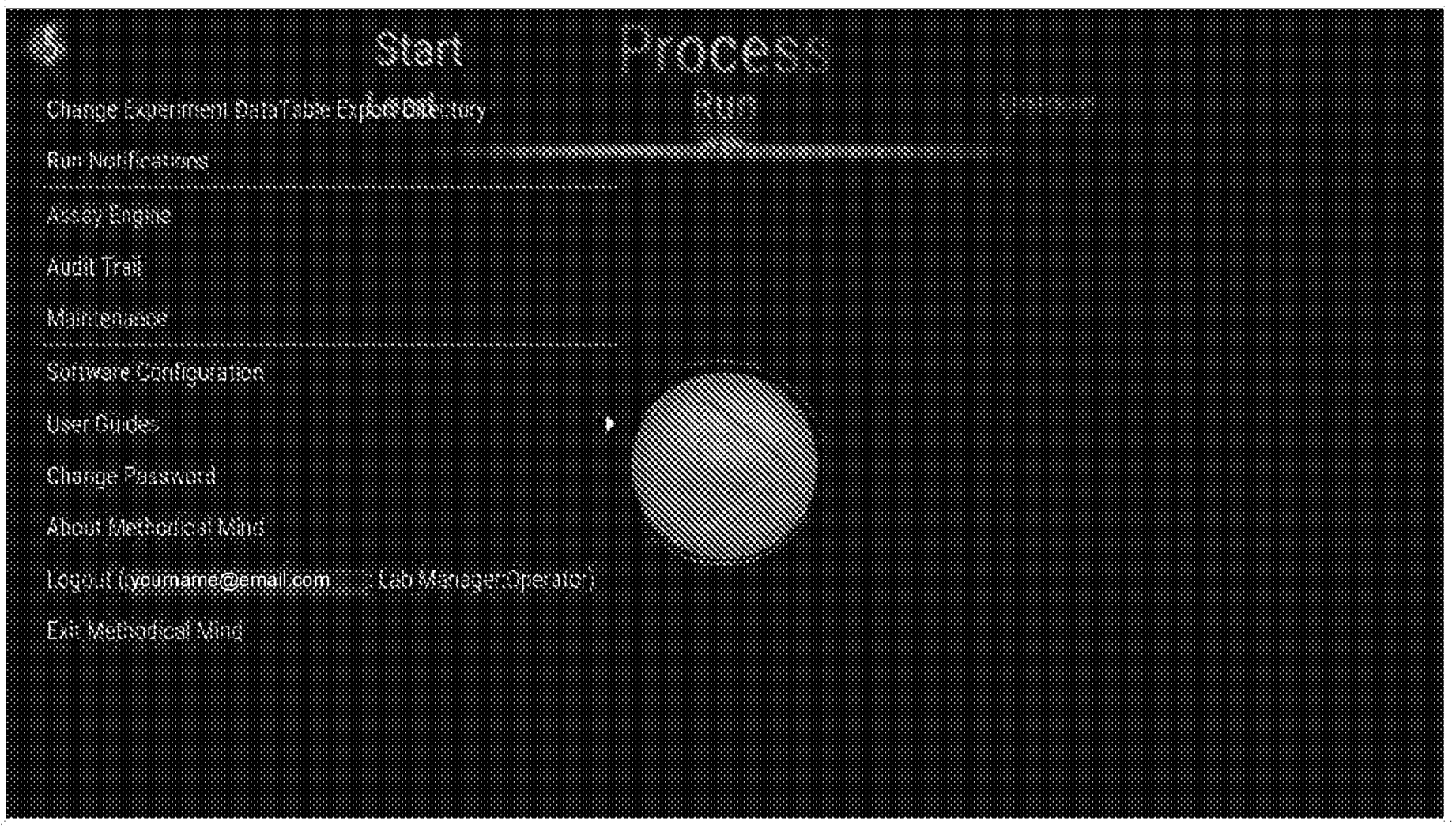


FIG. 59J

FIG. 59K



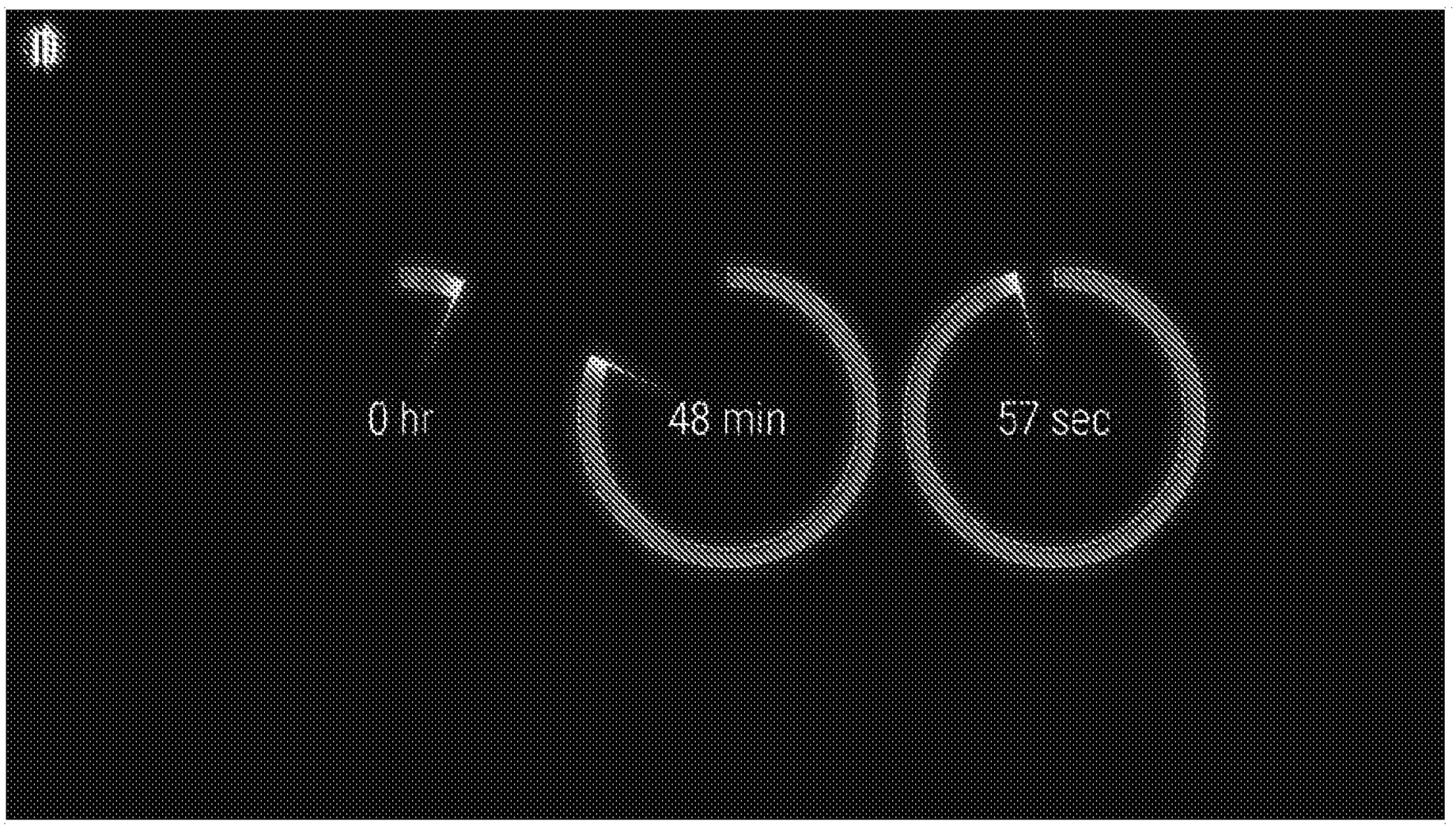


FIG. 59L

FIG. 59M

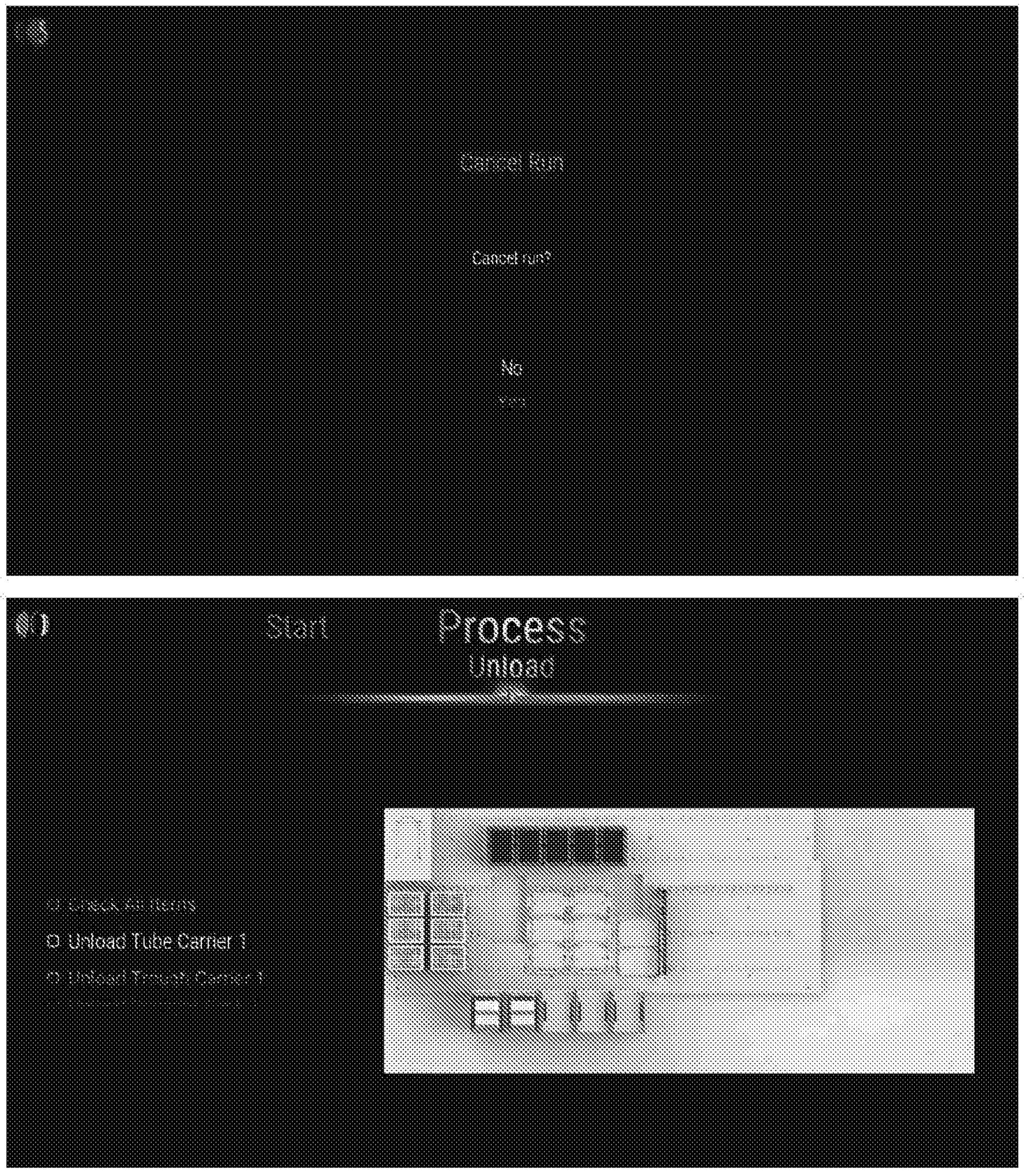
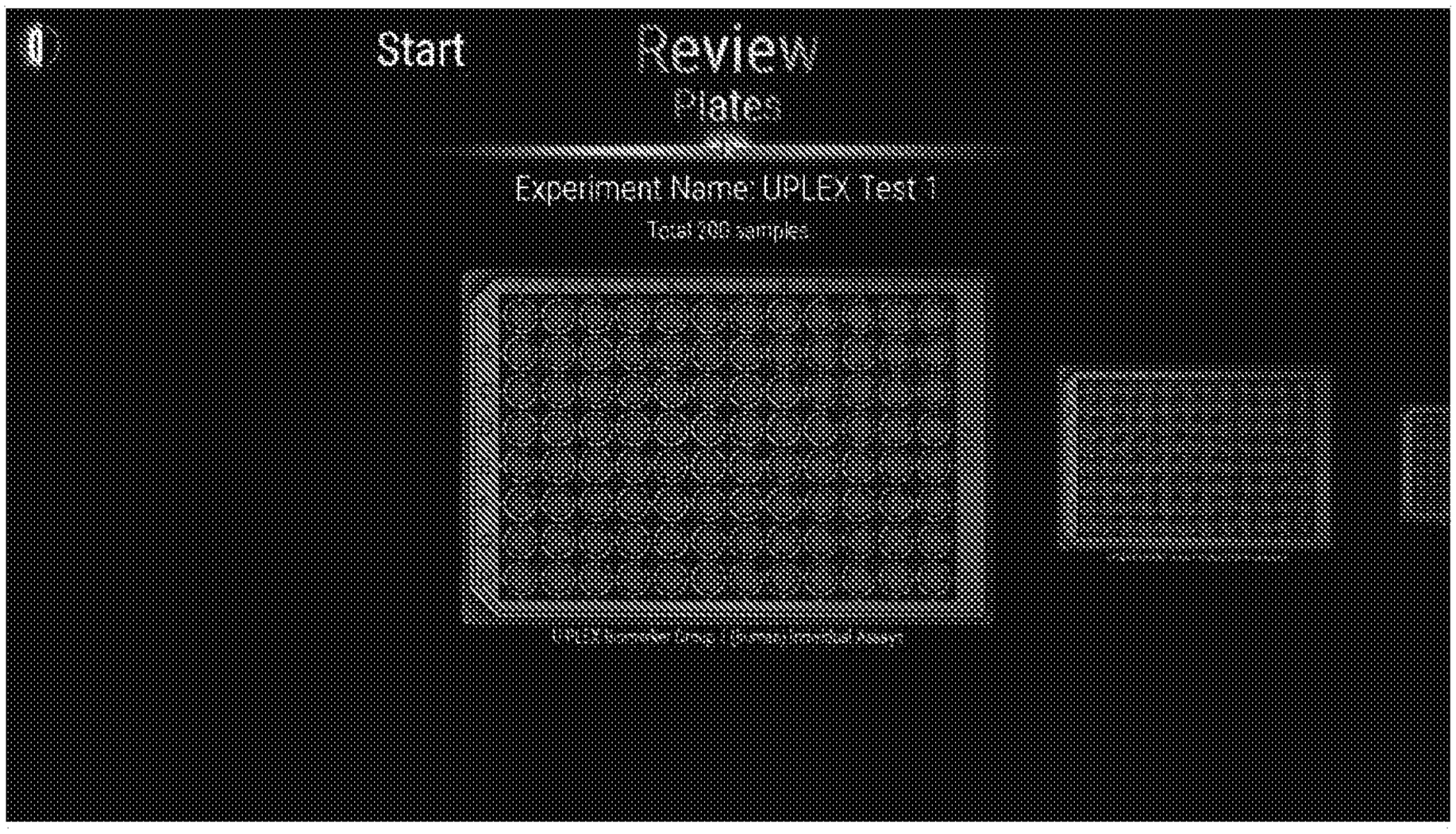


FIG. 59N

FIG. 59O



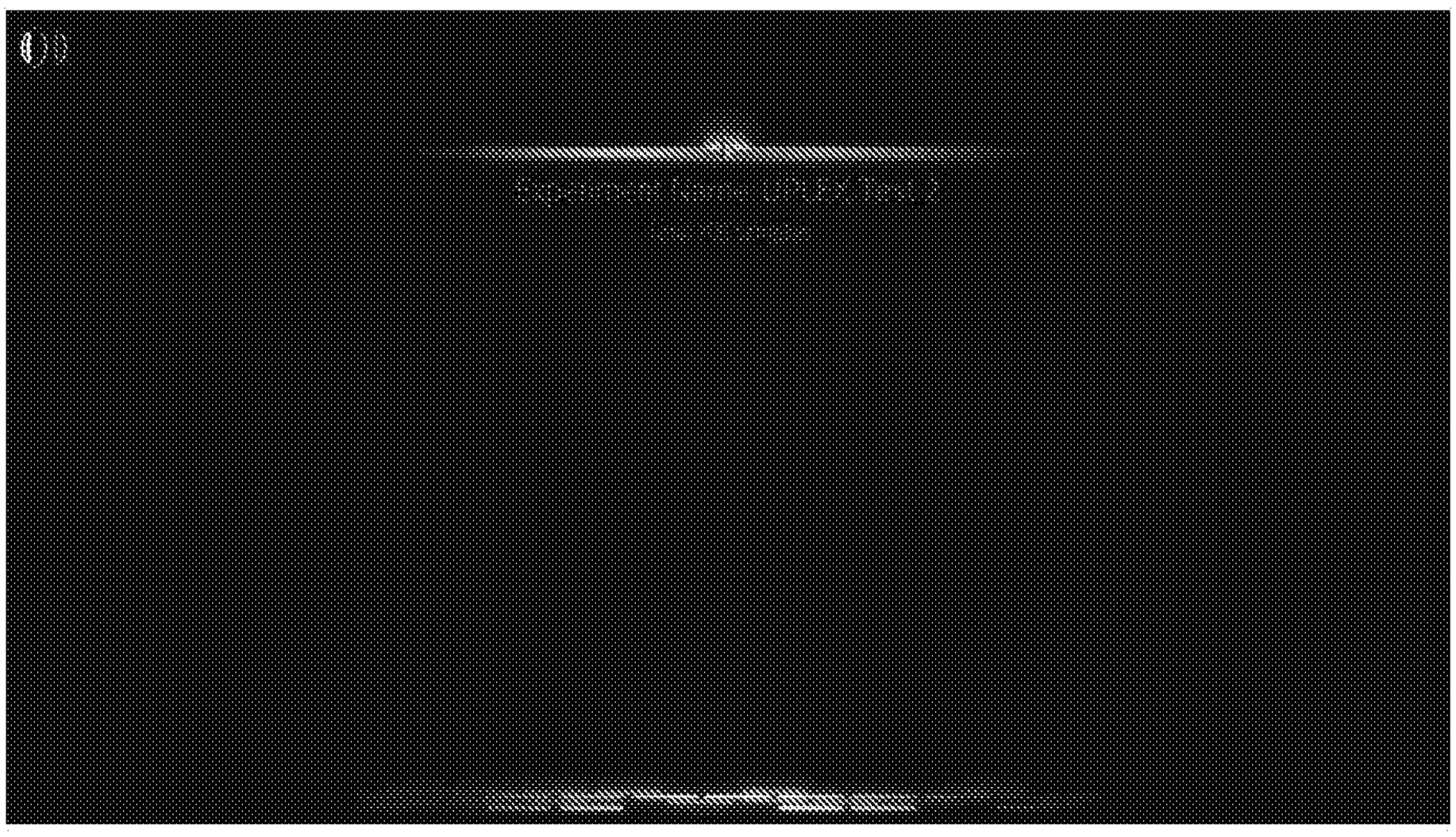


FIG. 59P

FIG. 59Q



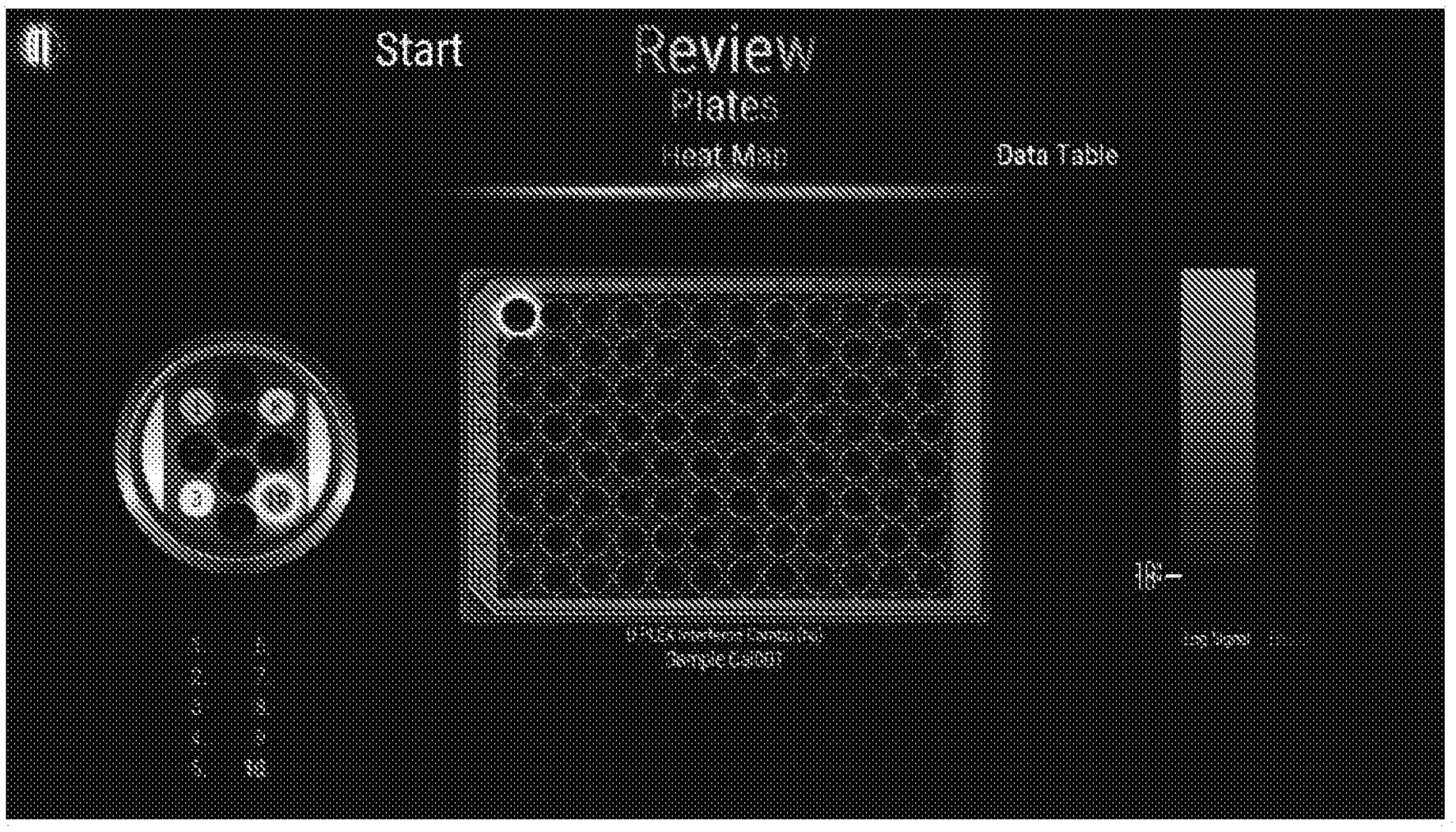
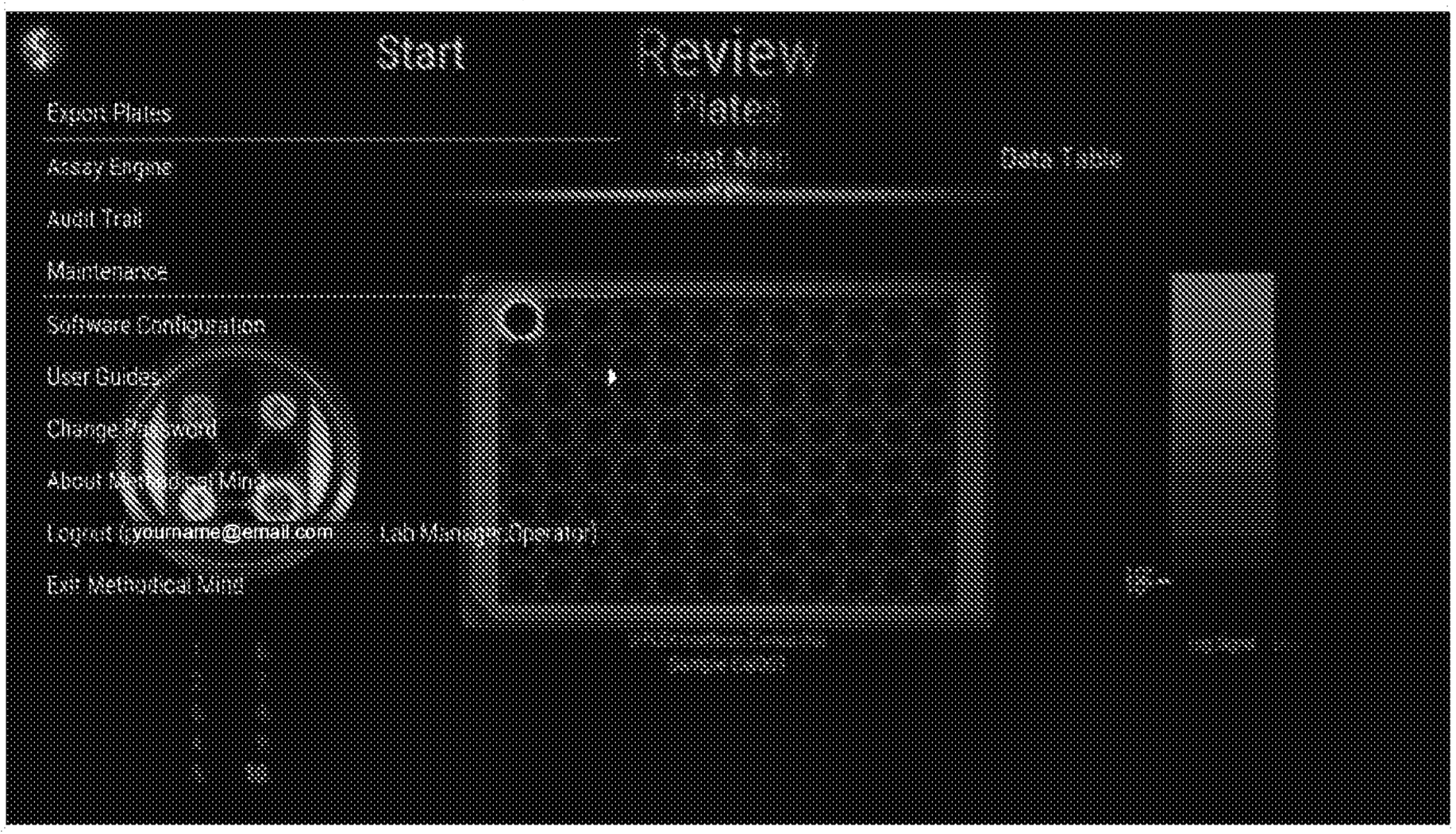


FIG. 59R

FIG. 59S



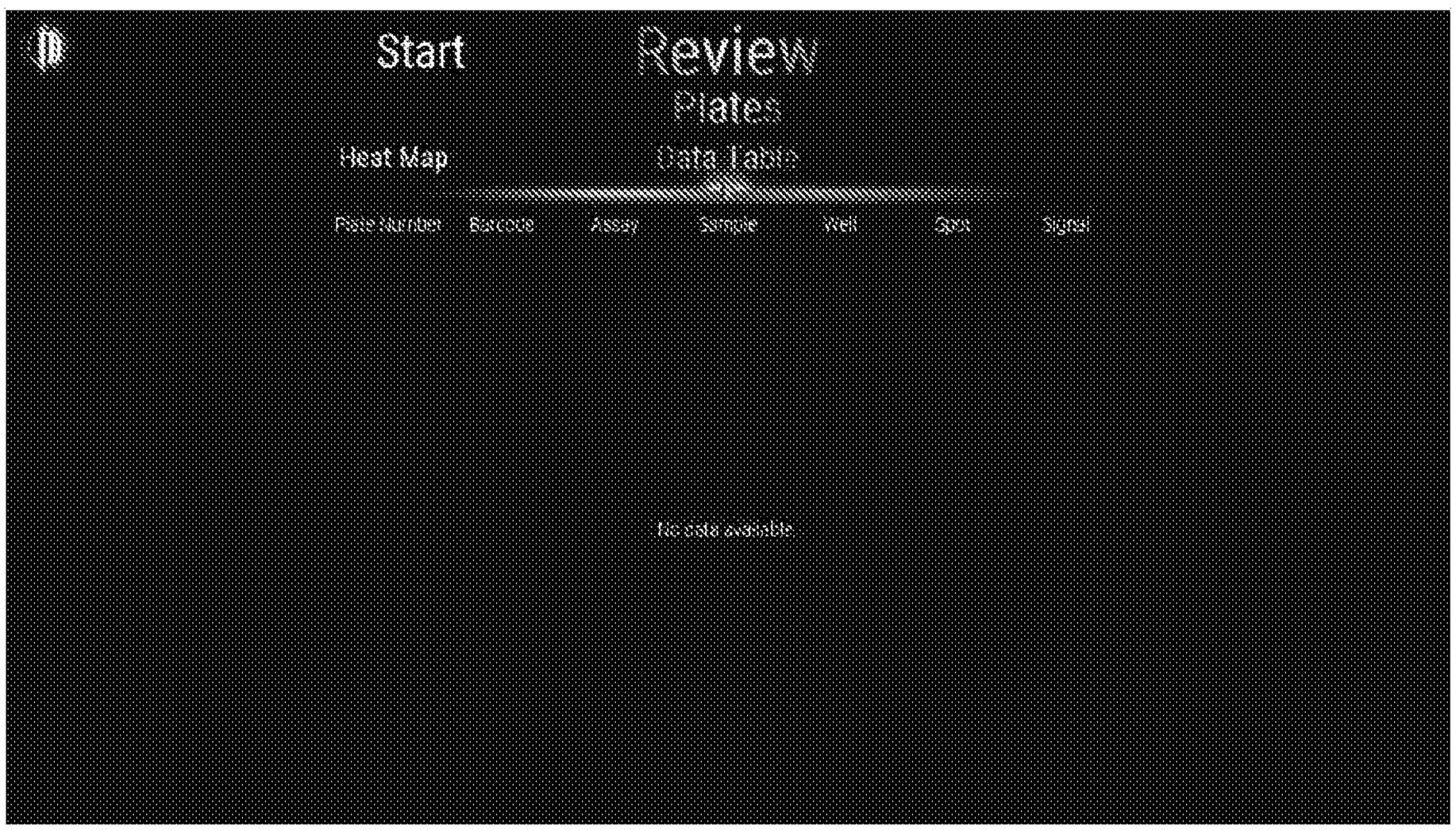


FIG. 59T

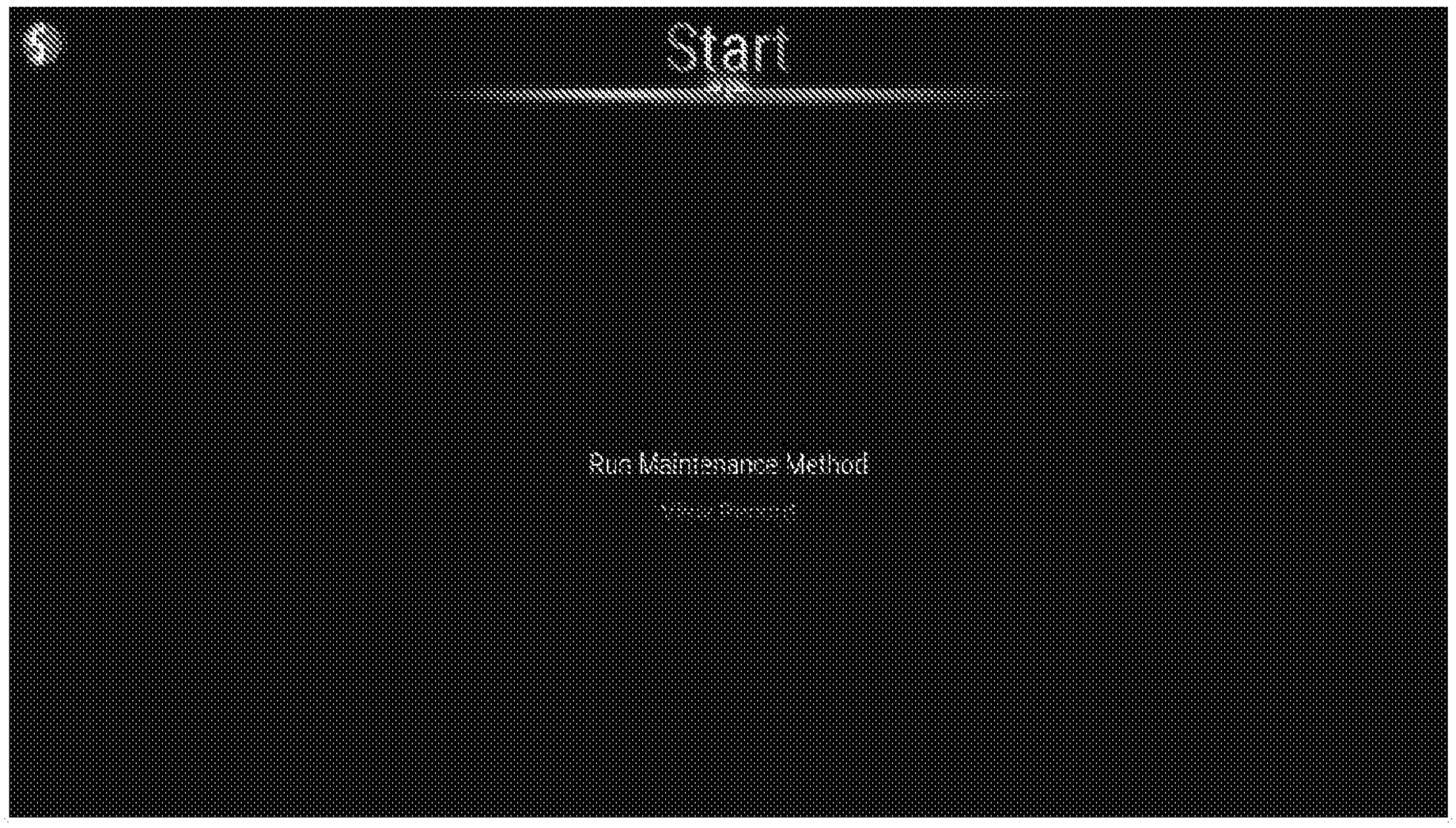


FIG. 60A

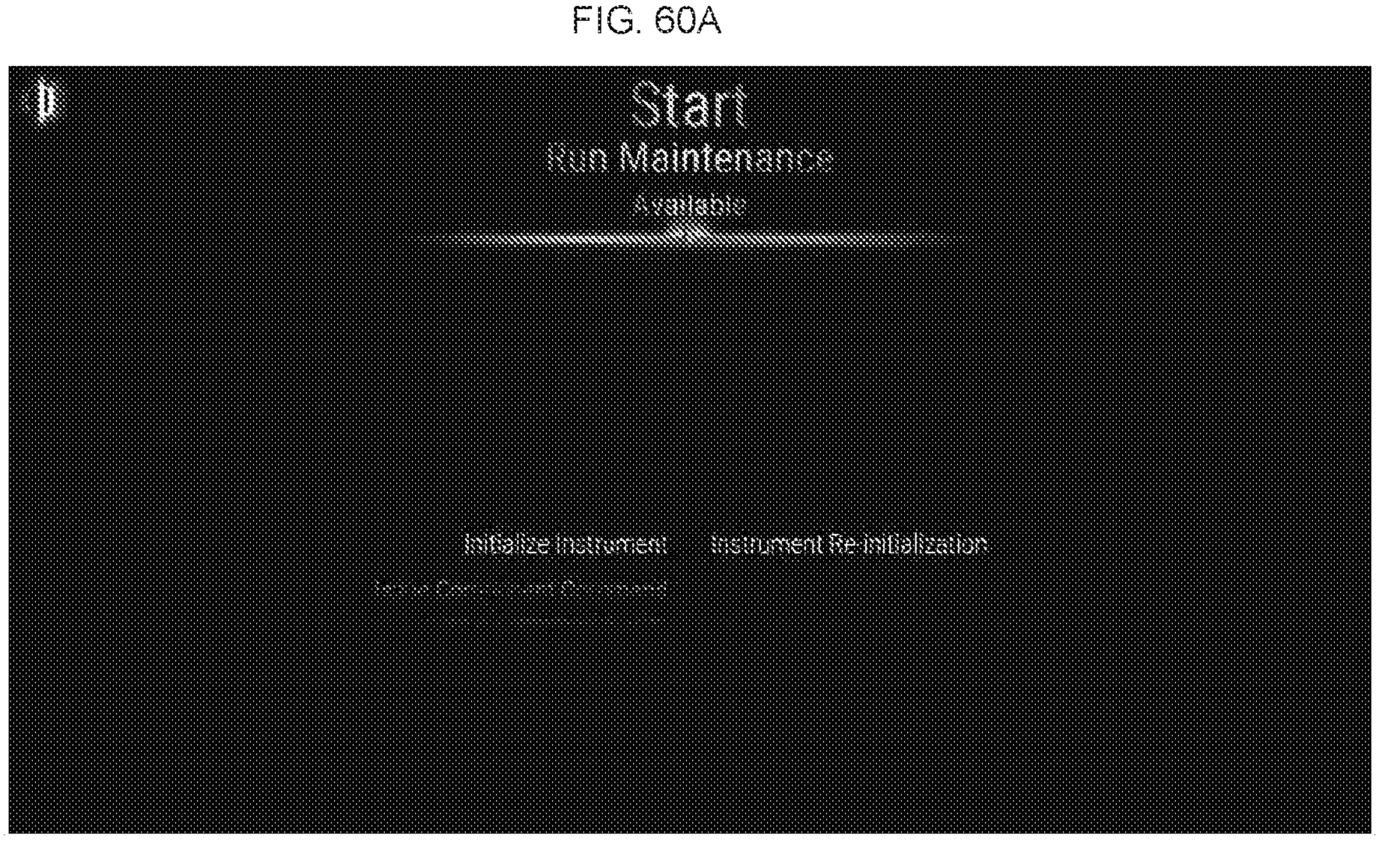


FIG. 60B

FIG. 60C

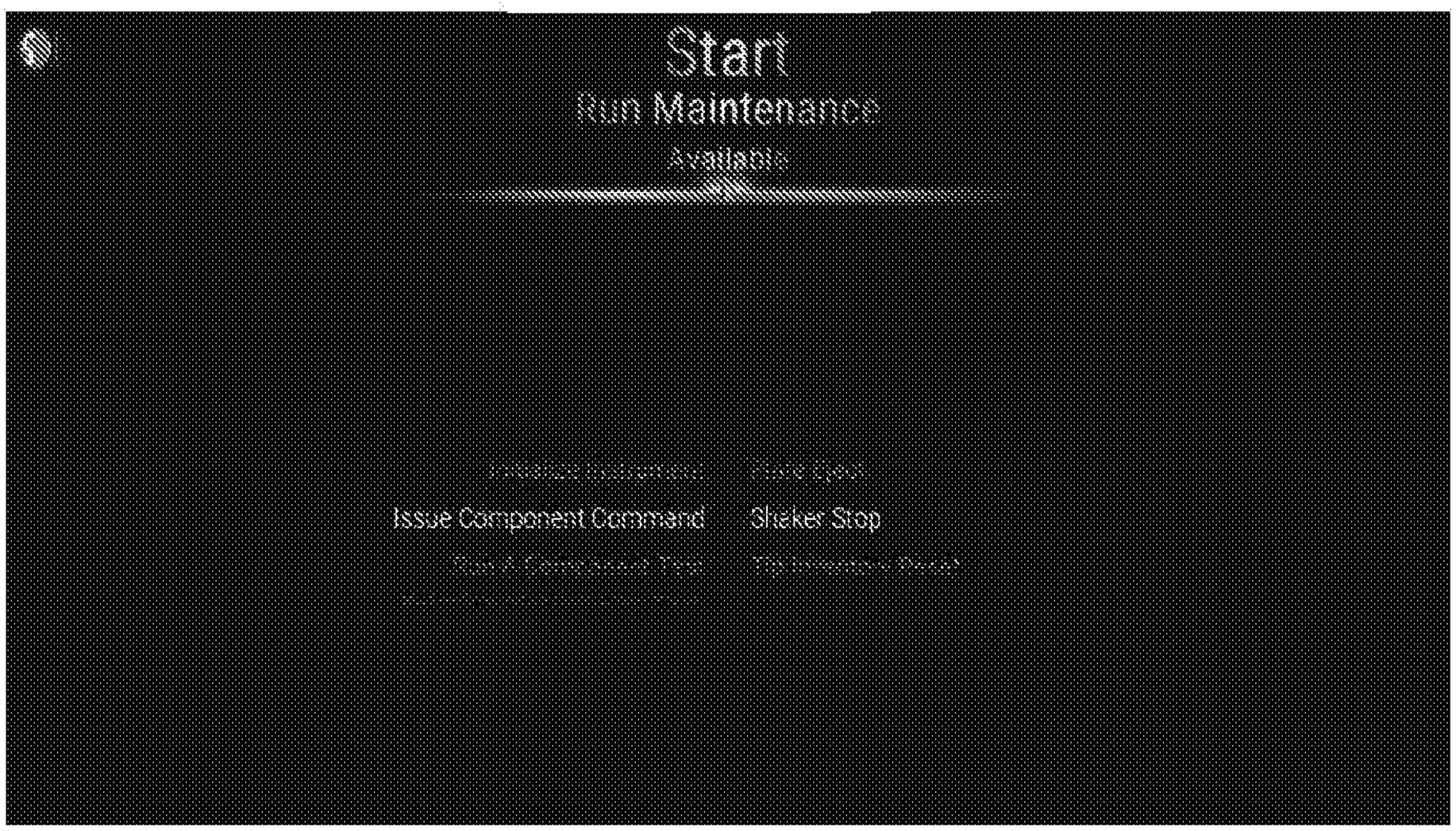




FIG. 60D

FIG. 60E



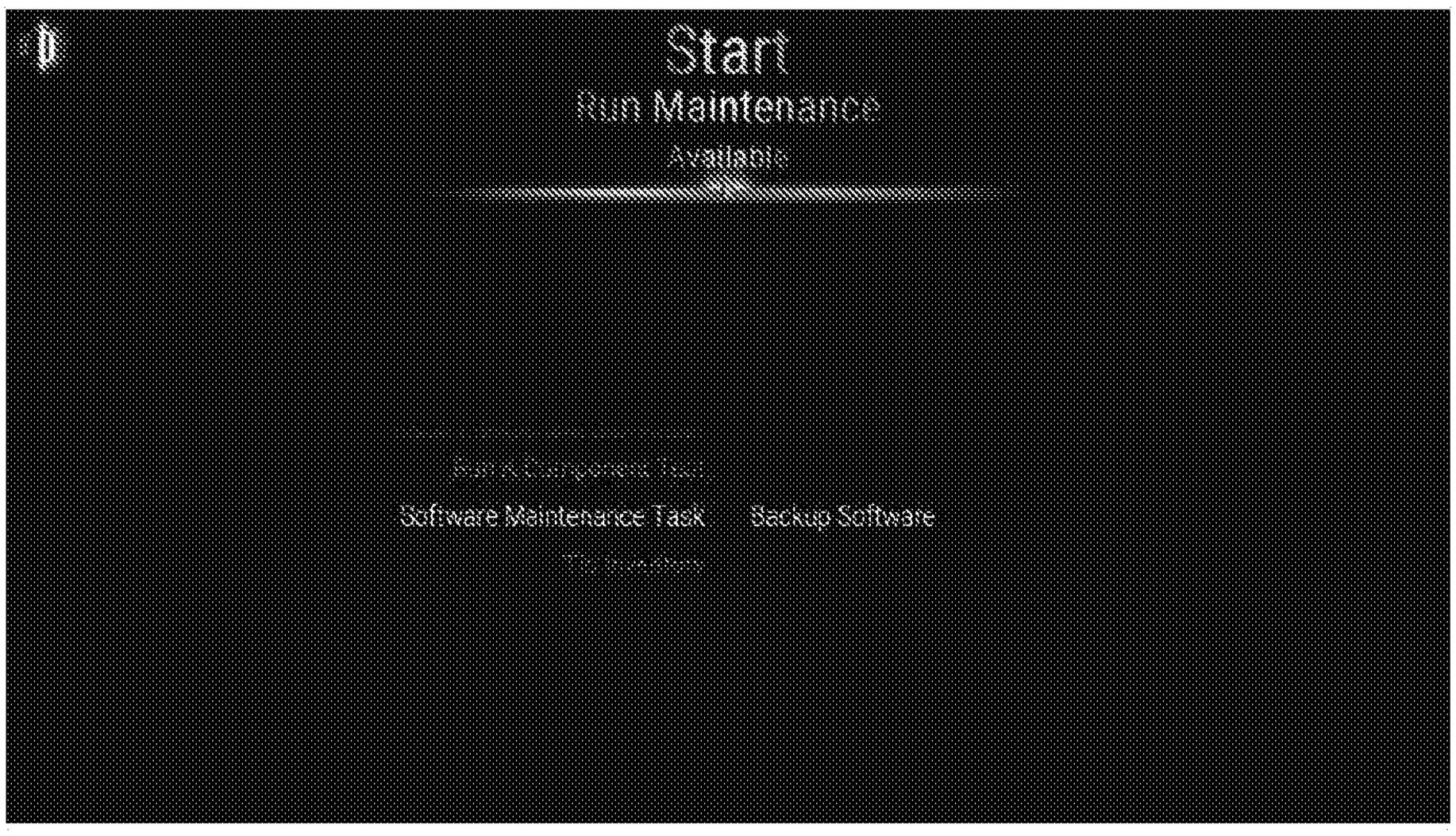


FIG. 60F

FIG. 60G

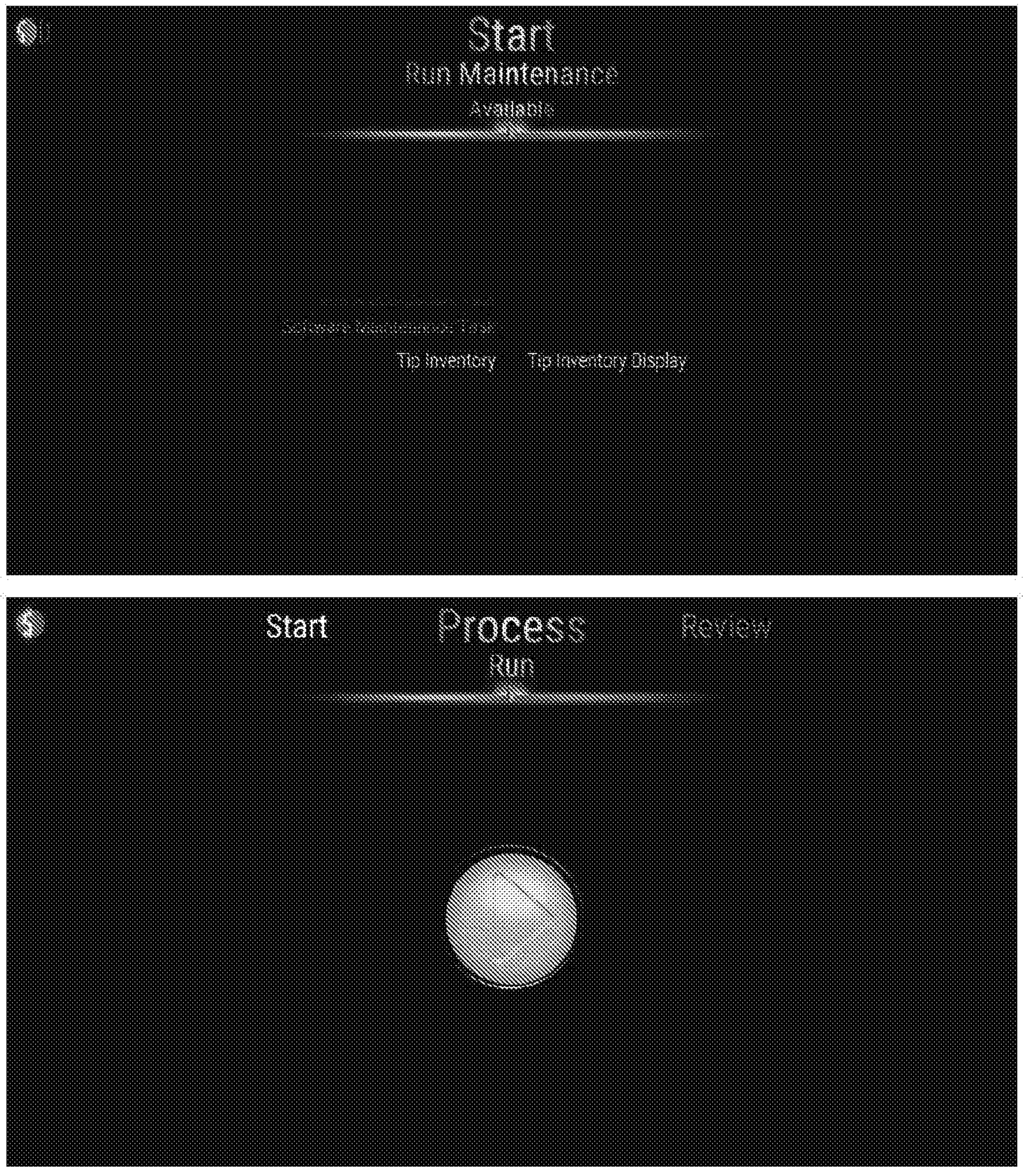


FIG. 60H

FIG. 60I


Start
Process
Review
Method
Operator
Time
Pass/Fail
yourname@email.com

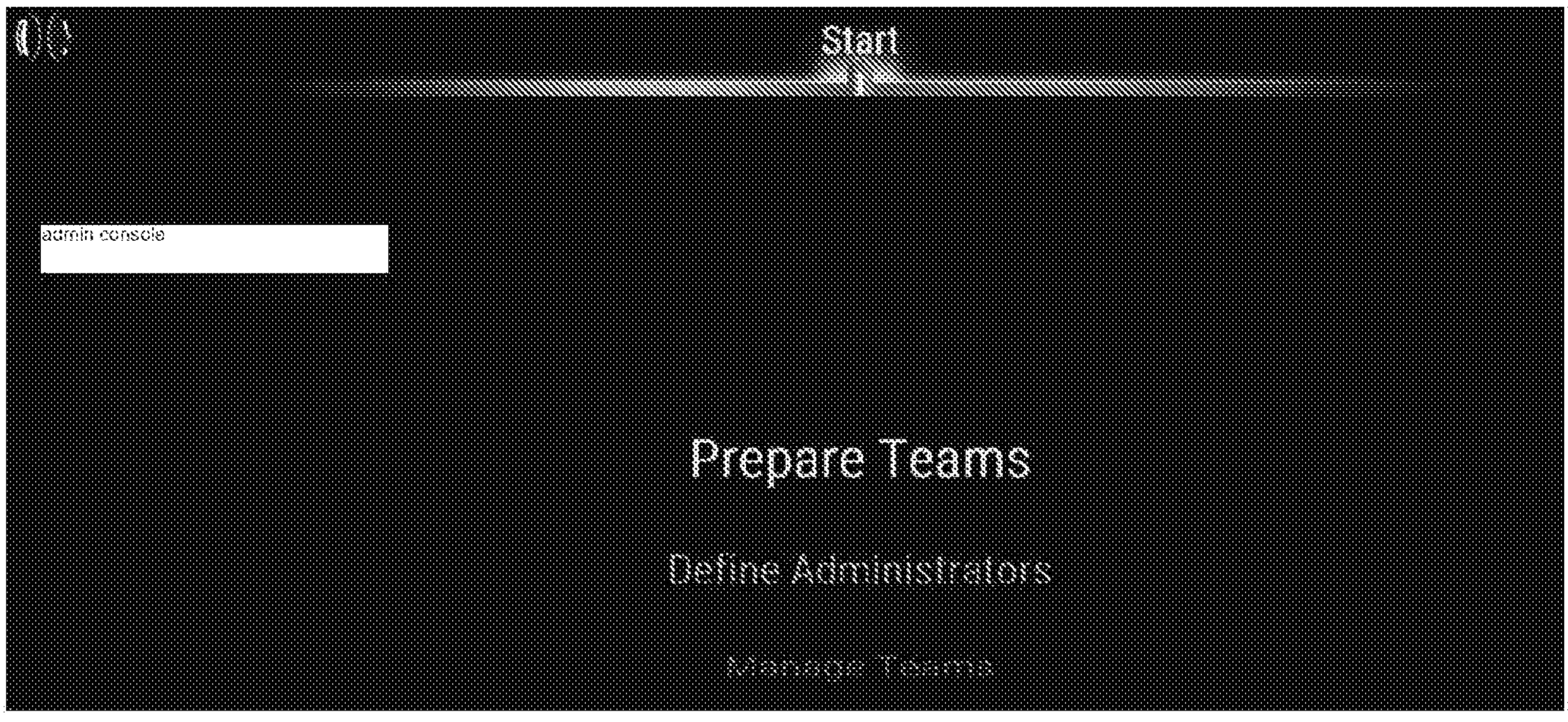


FIG. 61A

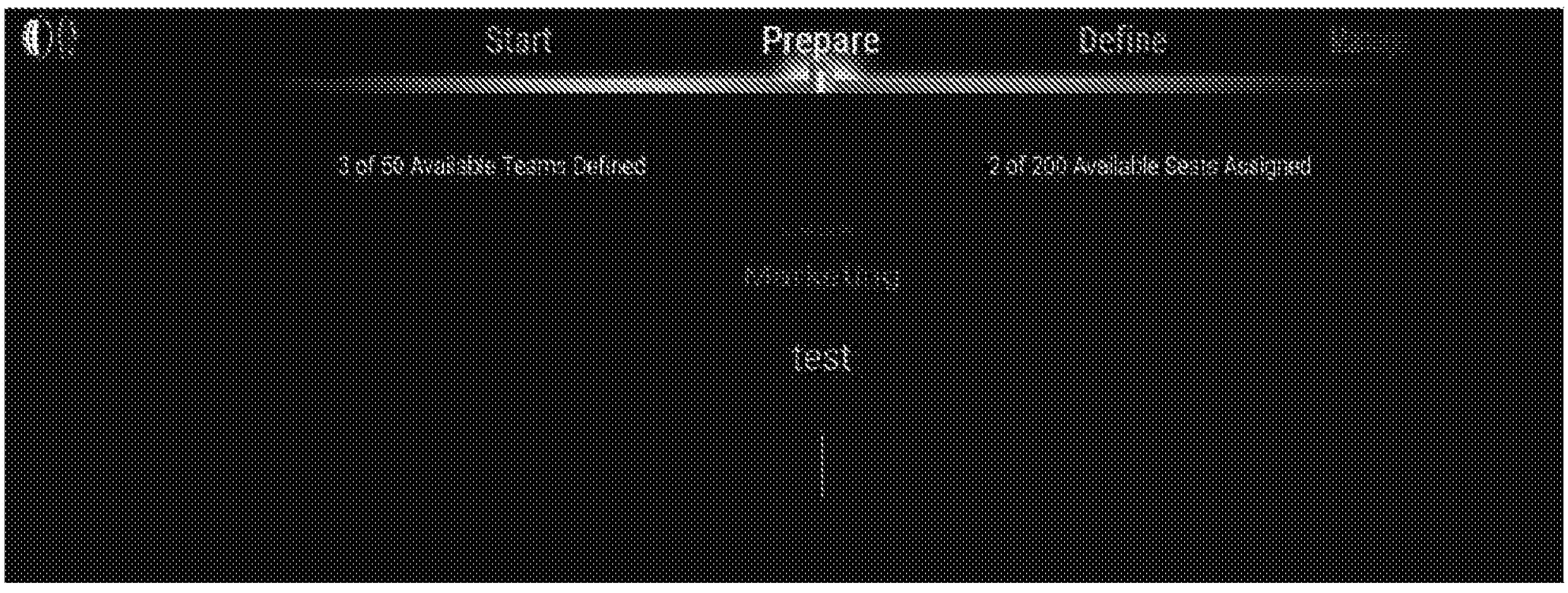


FIG. 61B

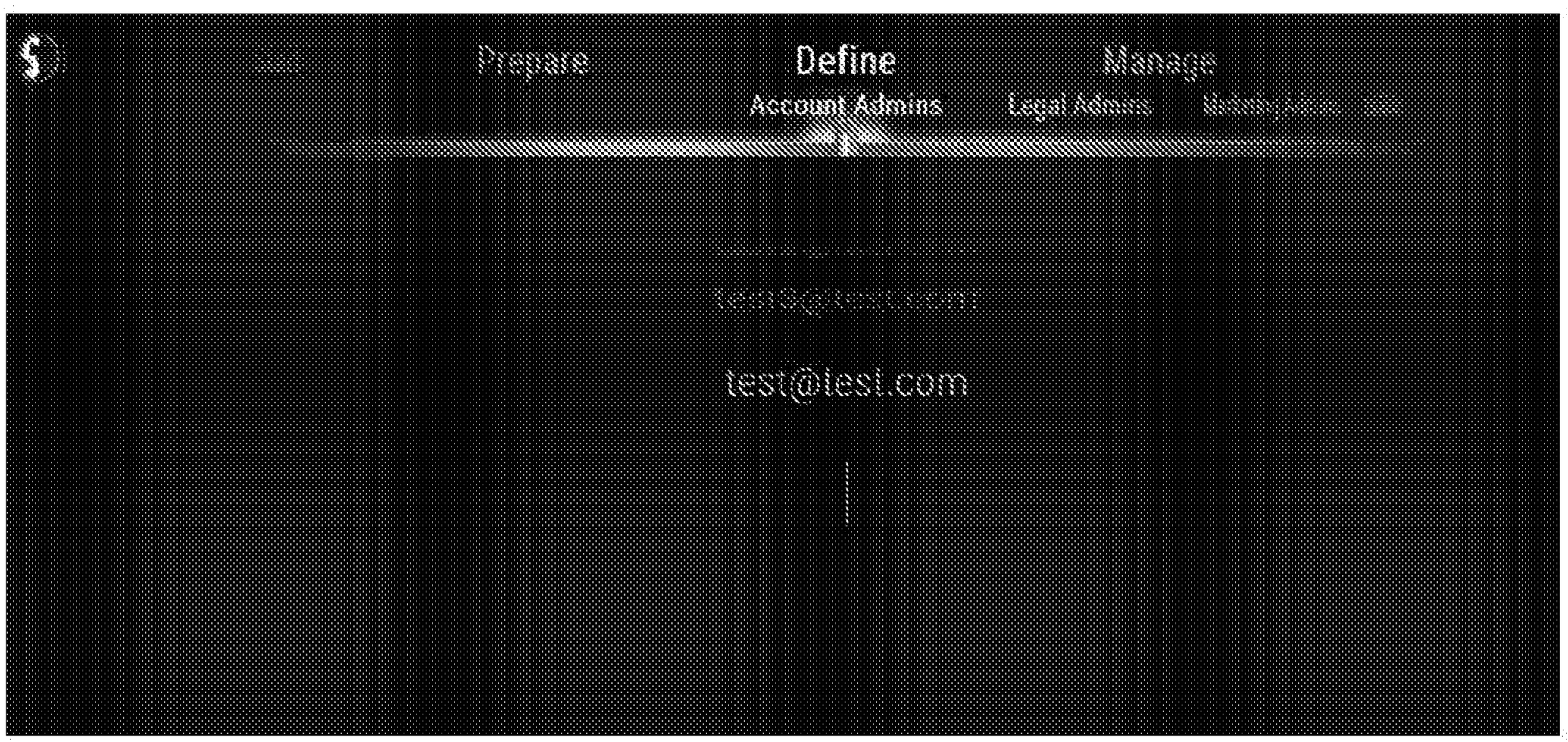


FIG. 61C



FIG. 61D

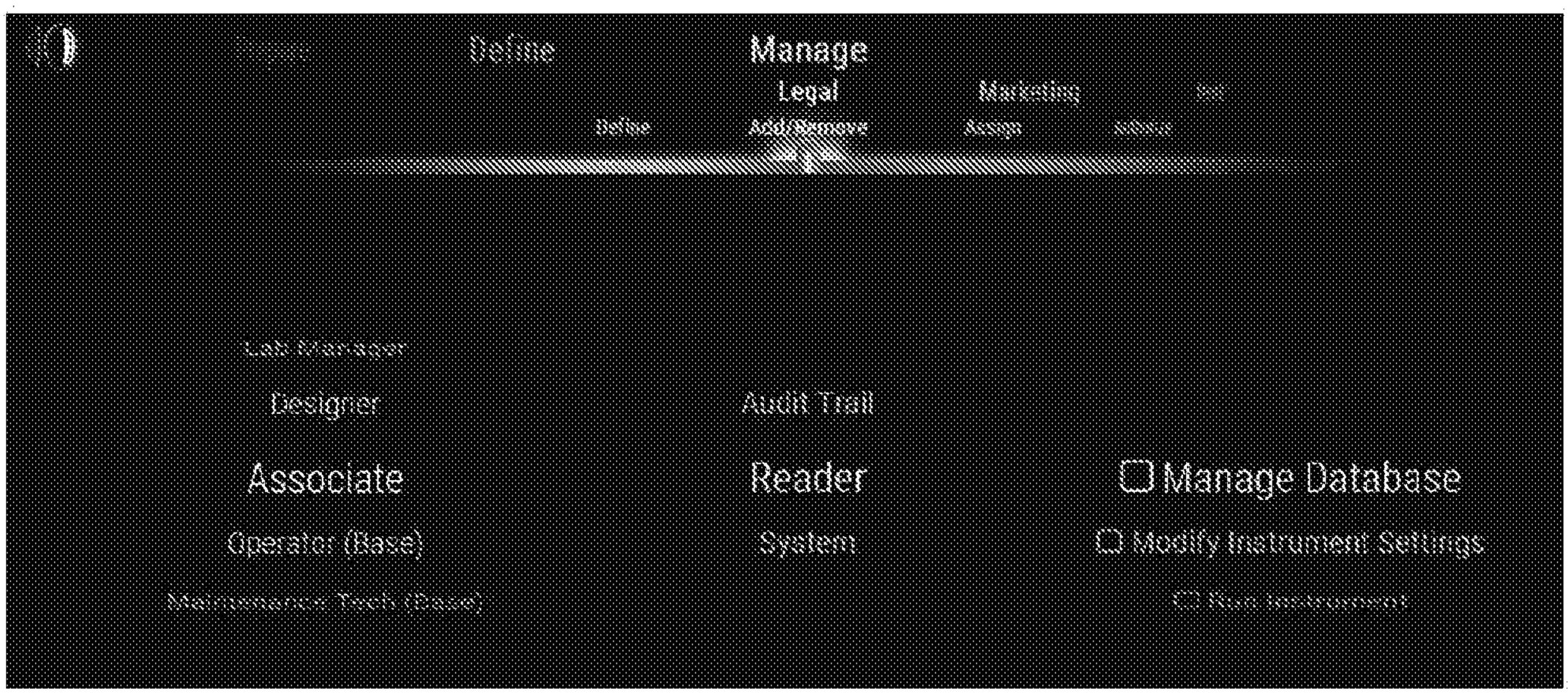


FIG. 61E

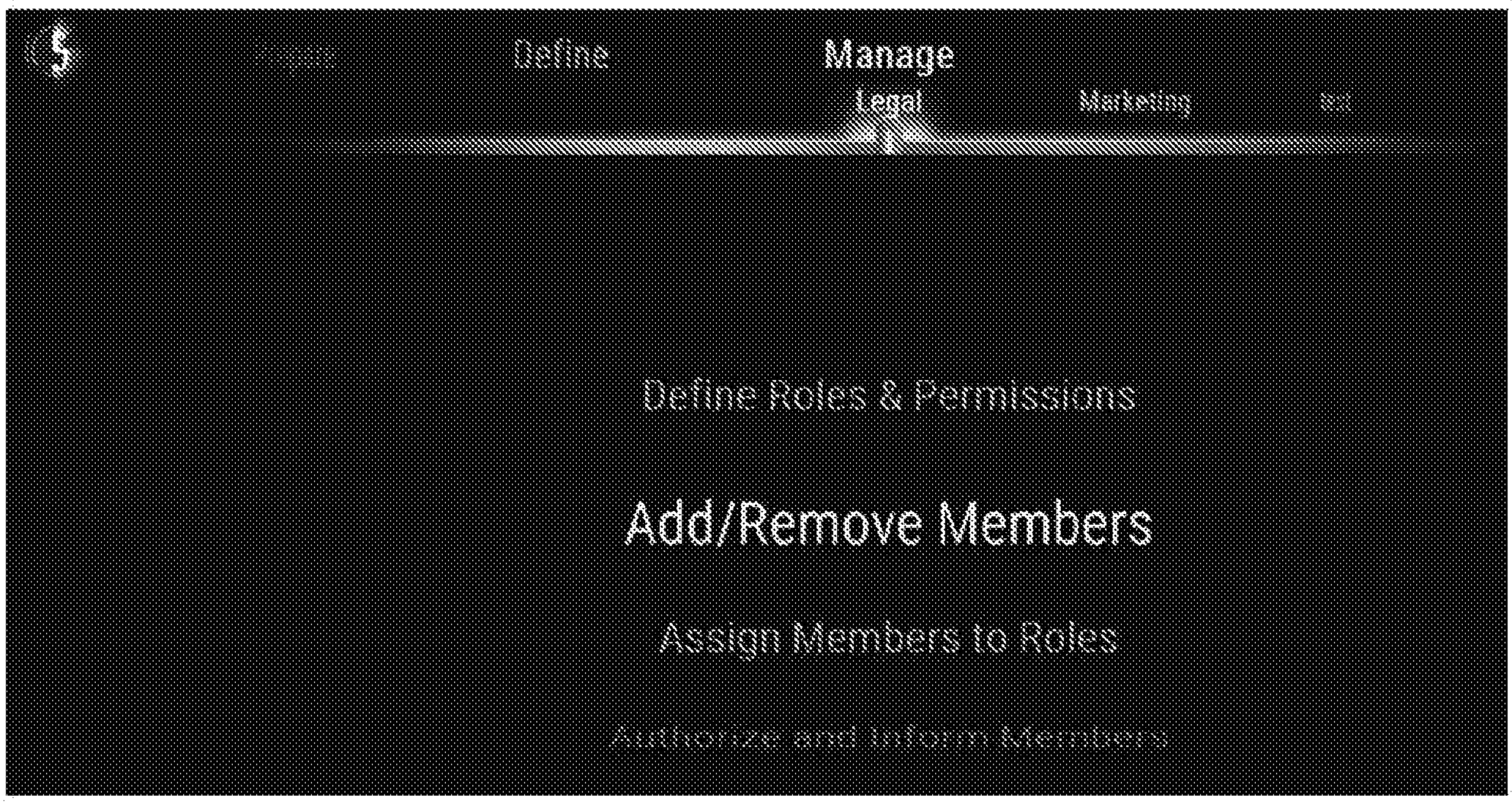


FIG. 61F

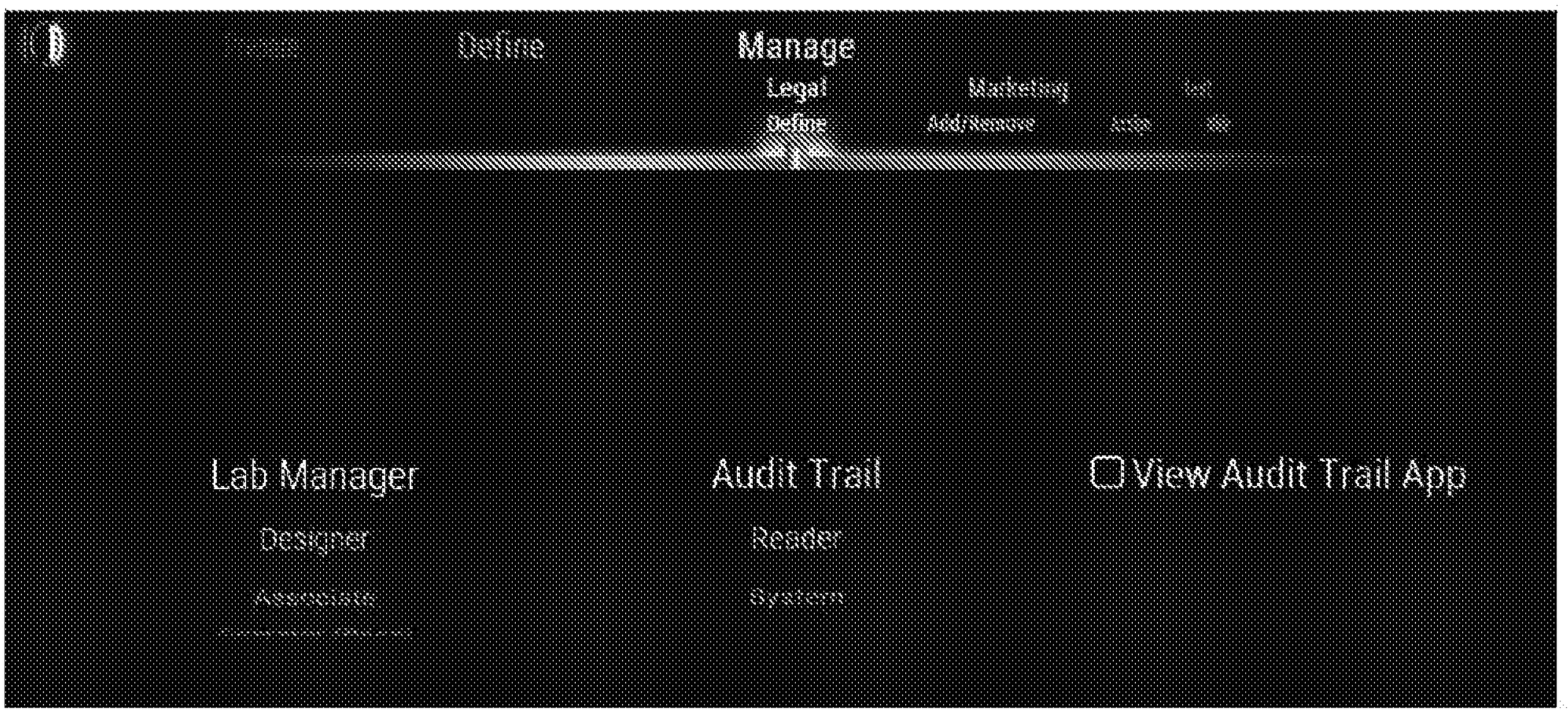


FIG. 61G



FIG. 61H

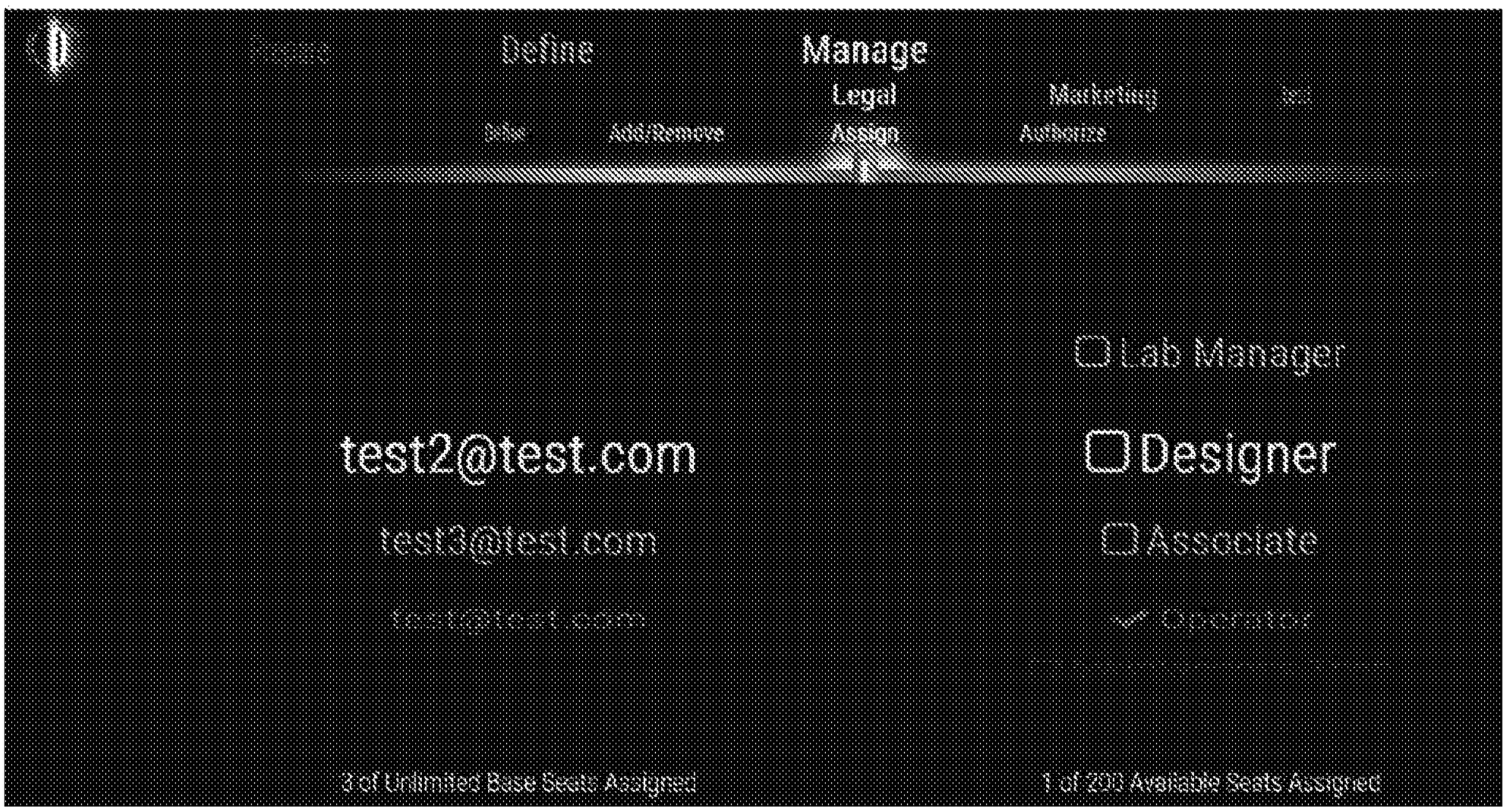


FIG. 61I

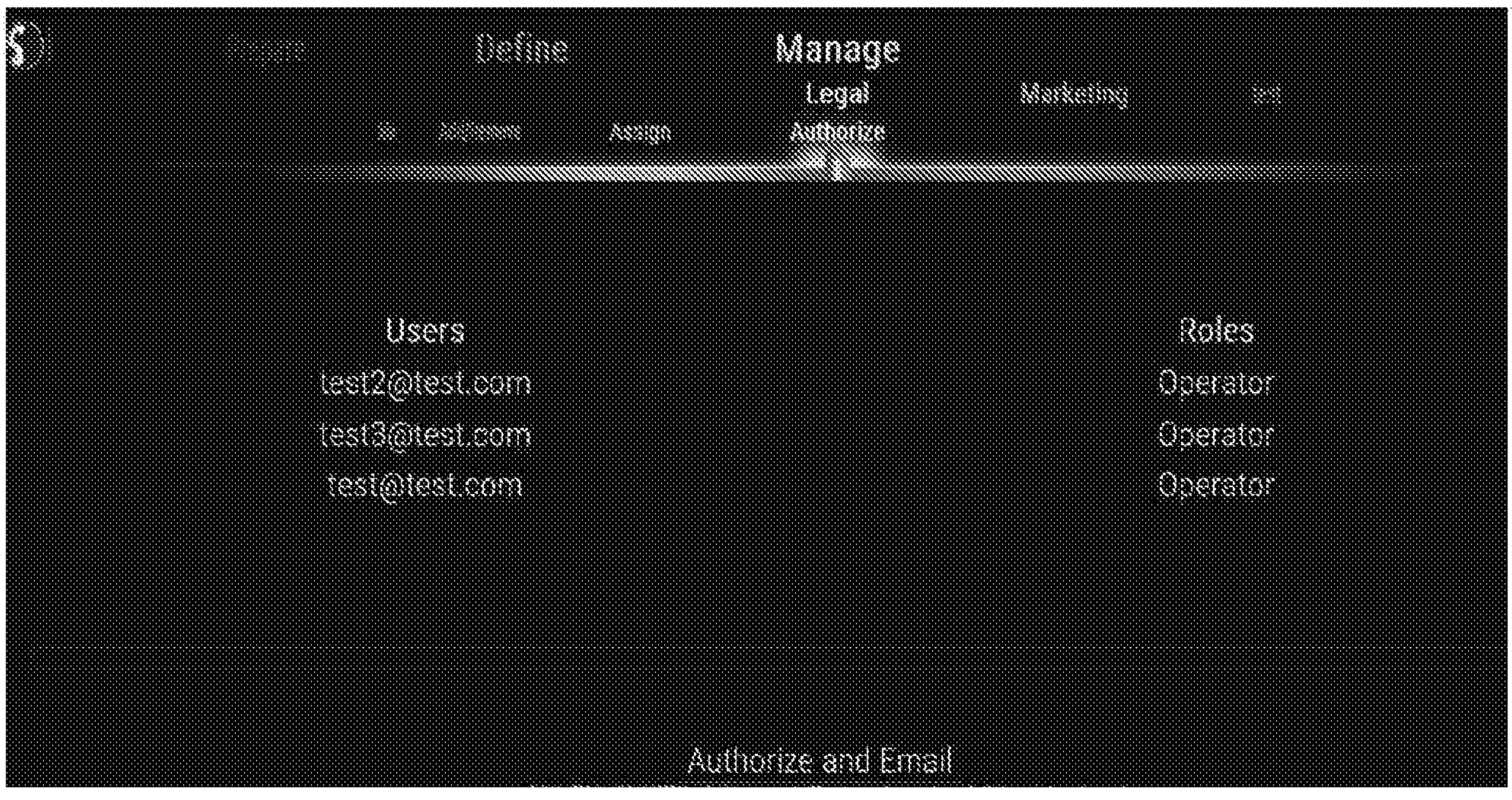


FIG. 61J

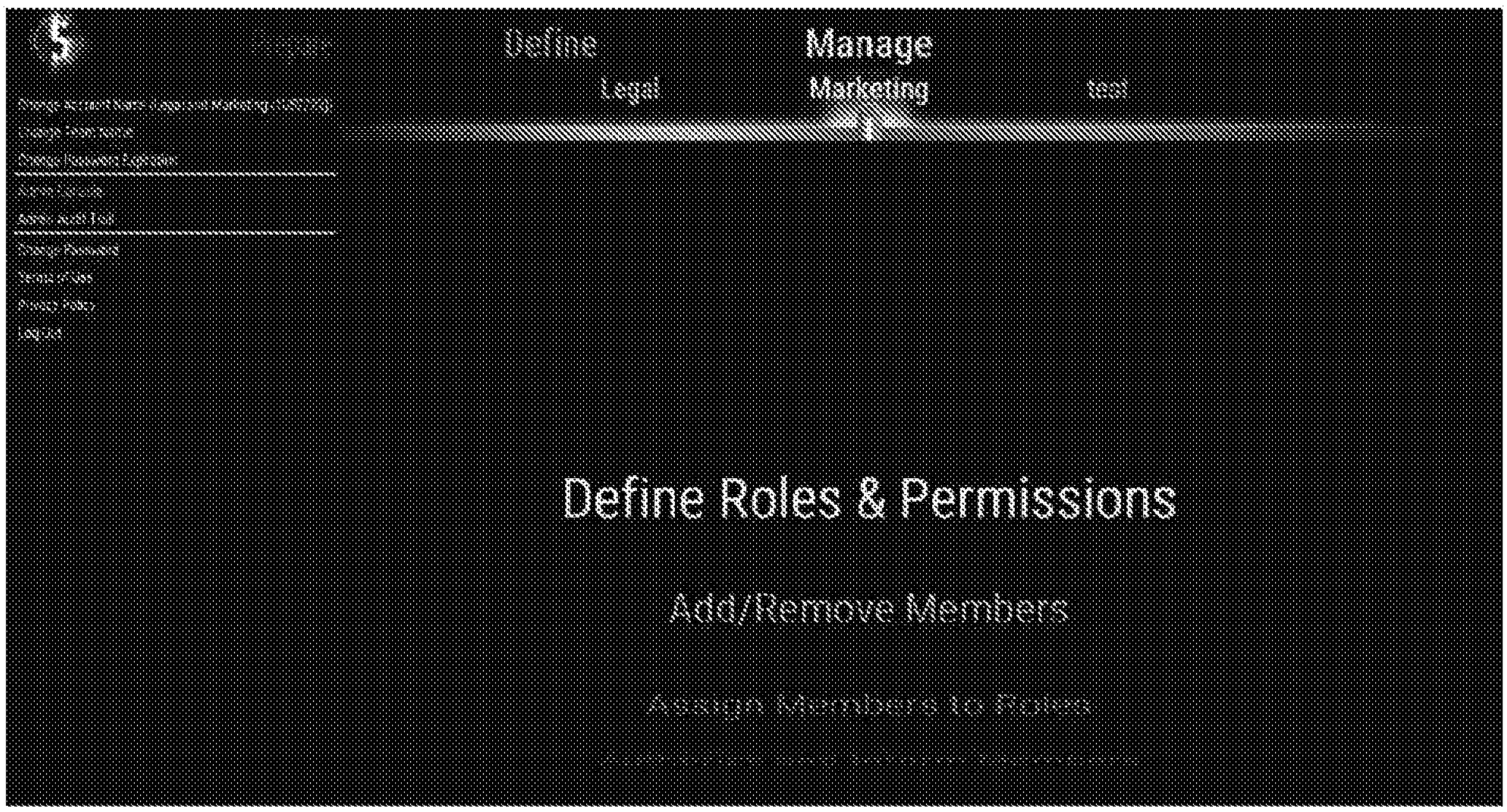


FIG. 61K

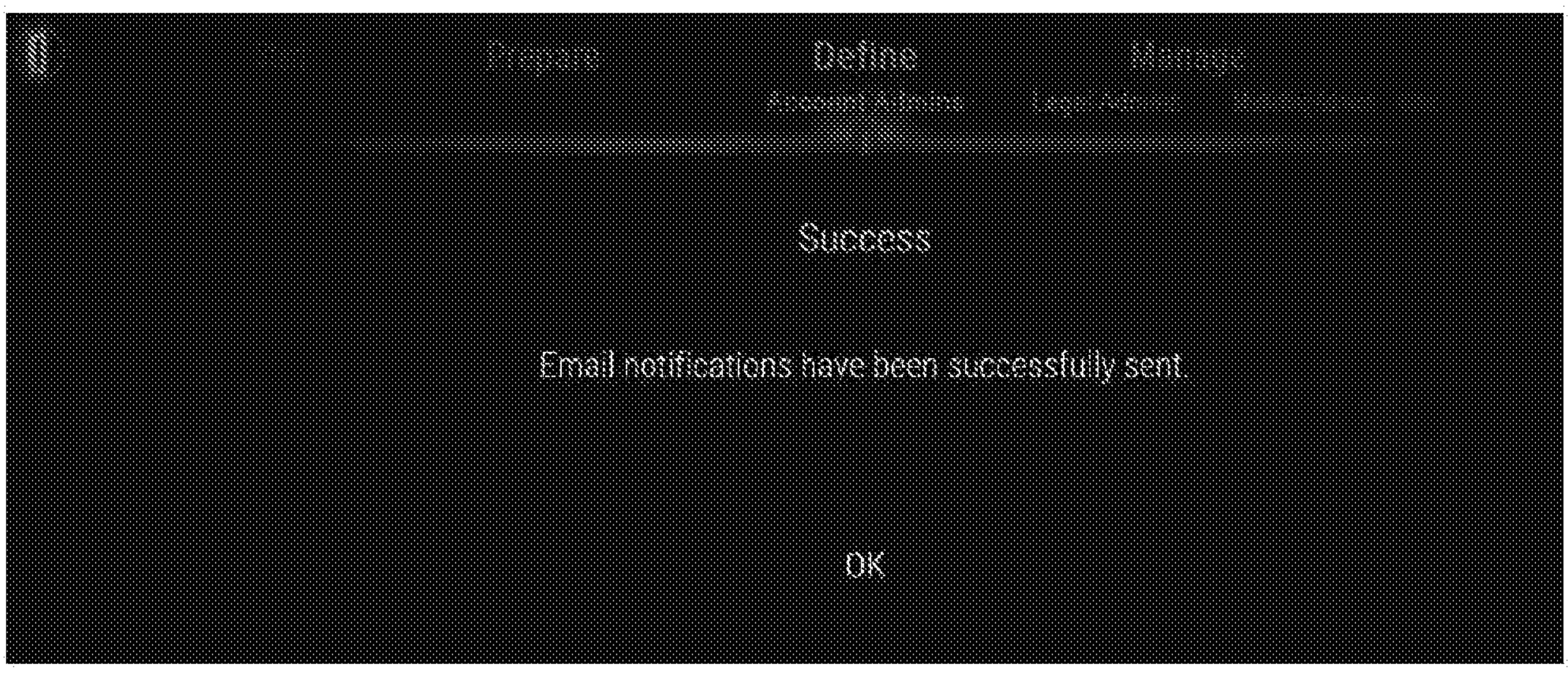


FIG. 61L

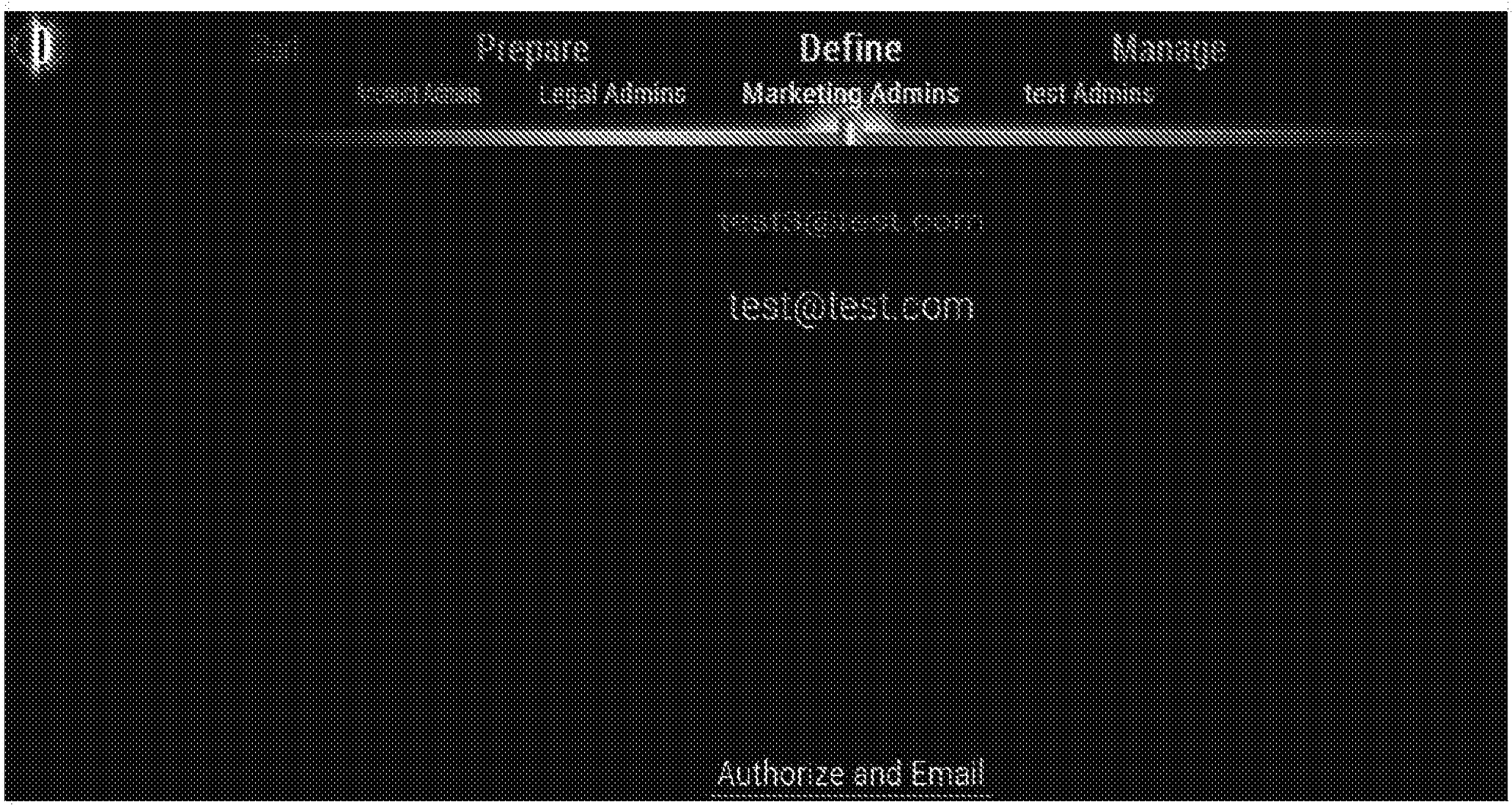


FIG. 61M

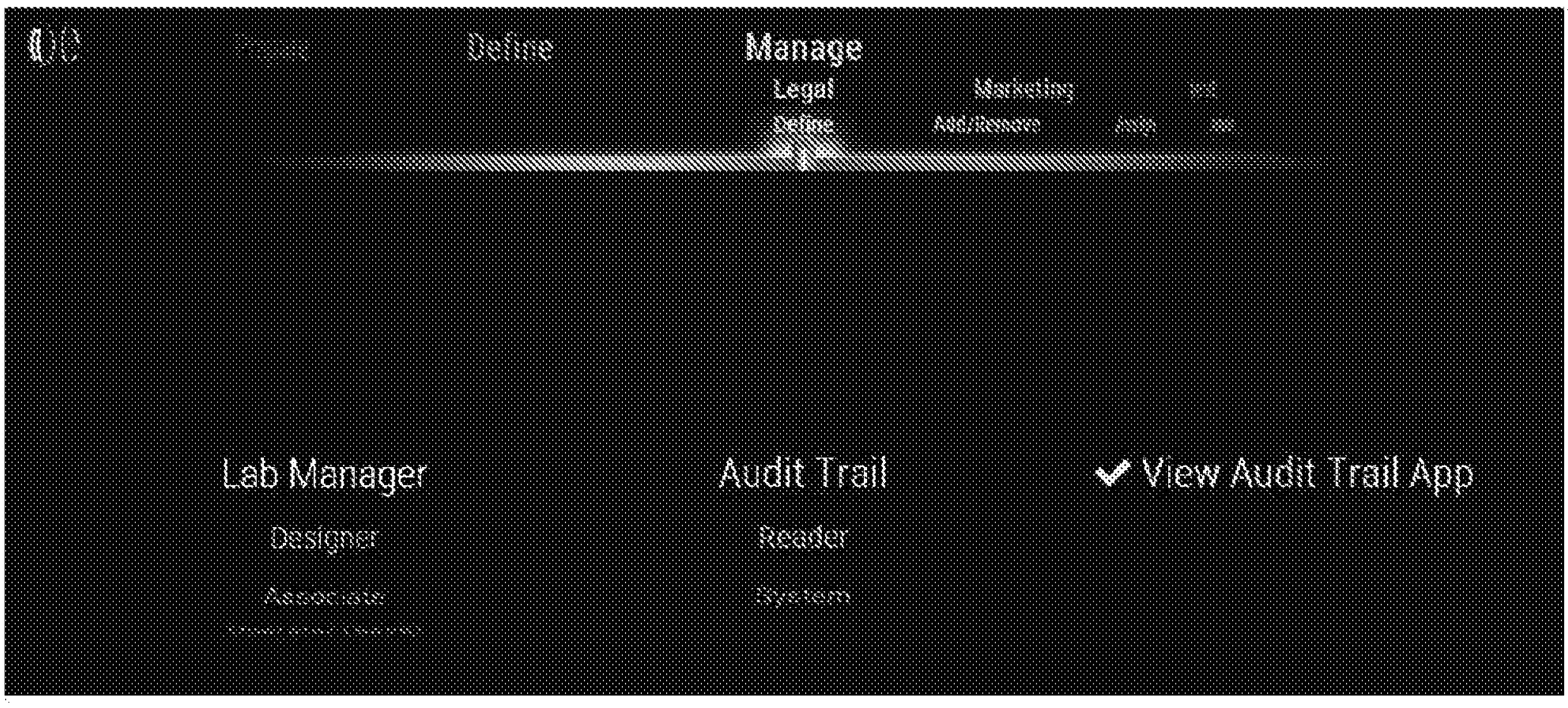


FIG. 61N

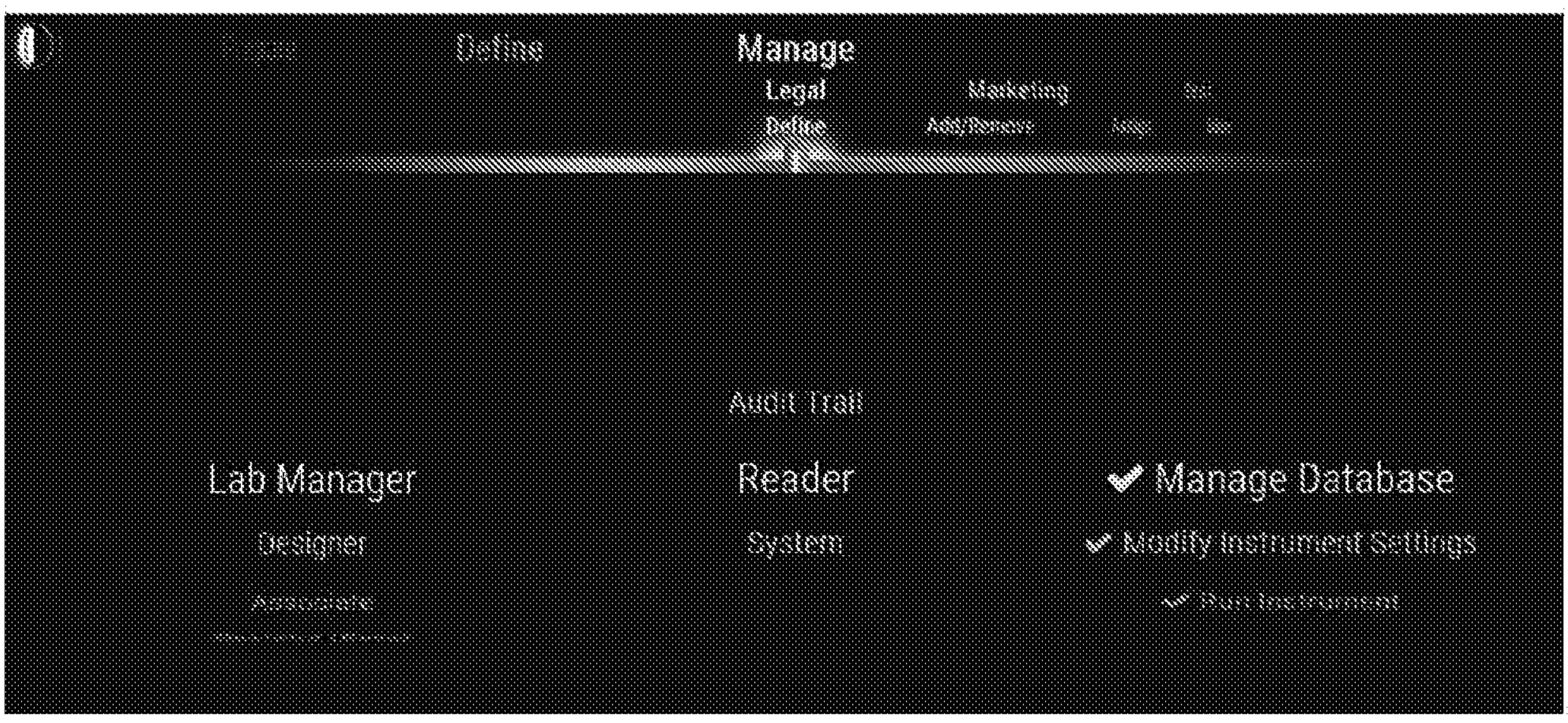


FIG. 61O

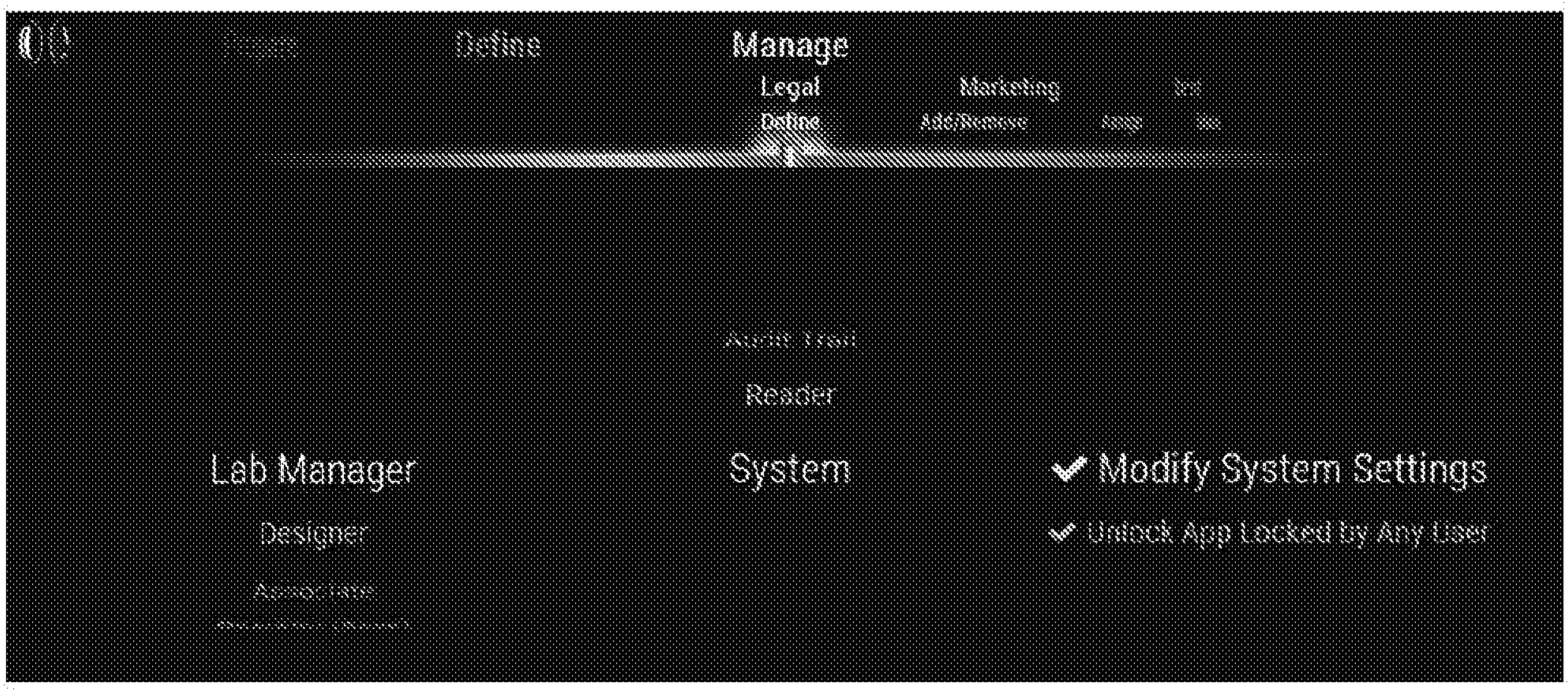


FIG. 61P

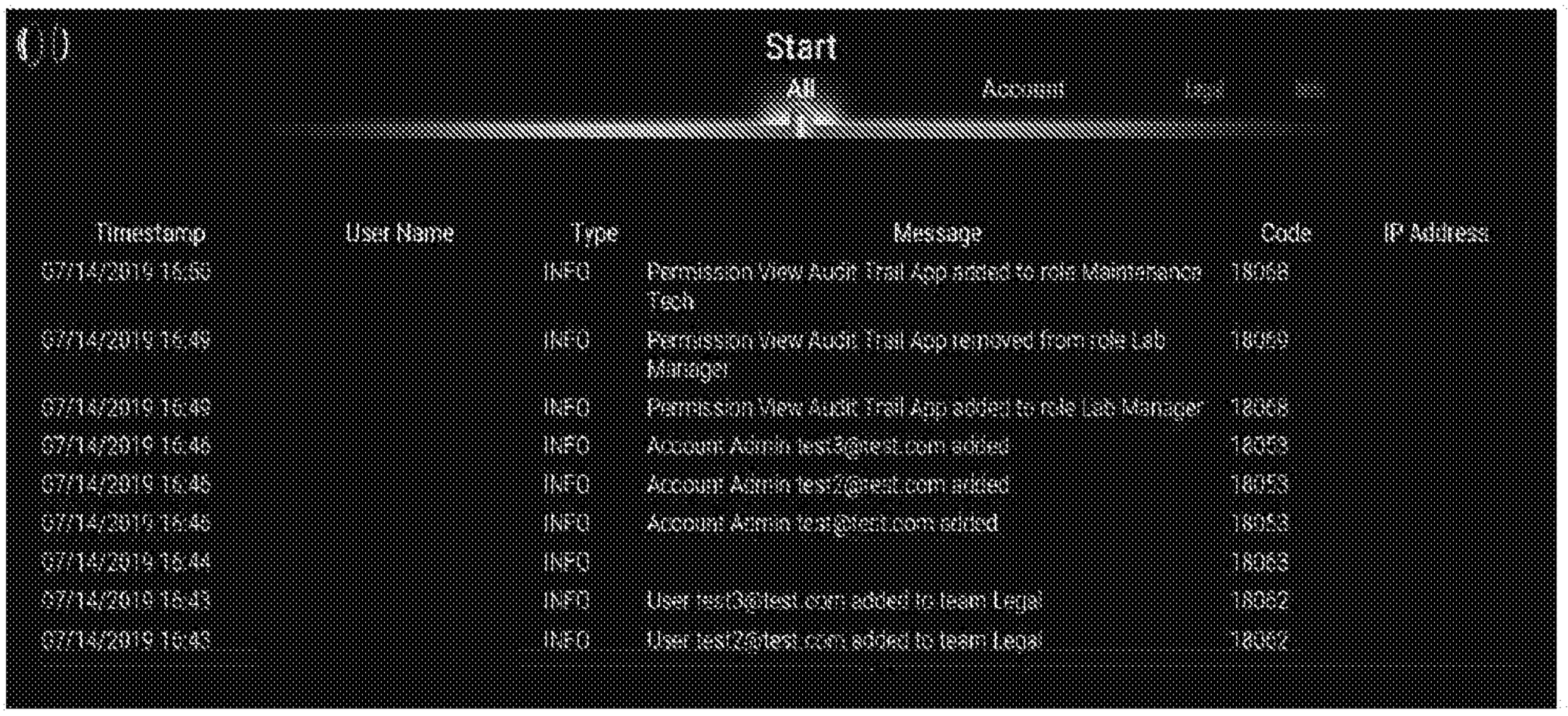

Start
All
Account
Timestamp
User Name
Type
Message
Code
IP Address
07/14/2019 16:50
INFO
Permission View Audit Trail App added to role Maintenance Tech
18058
07/14/2019 16:49
INFO
Permission View Audit Trail App removed from role Lab Manager
18059
07/14/2019 16:49
INFO
Permission View Audit Trail App added to role Lab Manager
18058
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

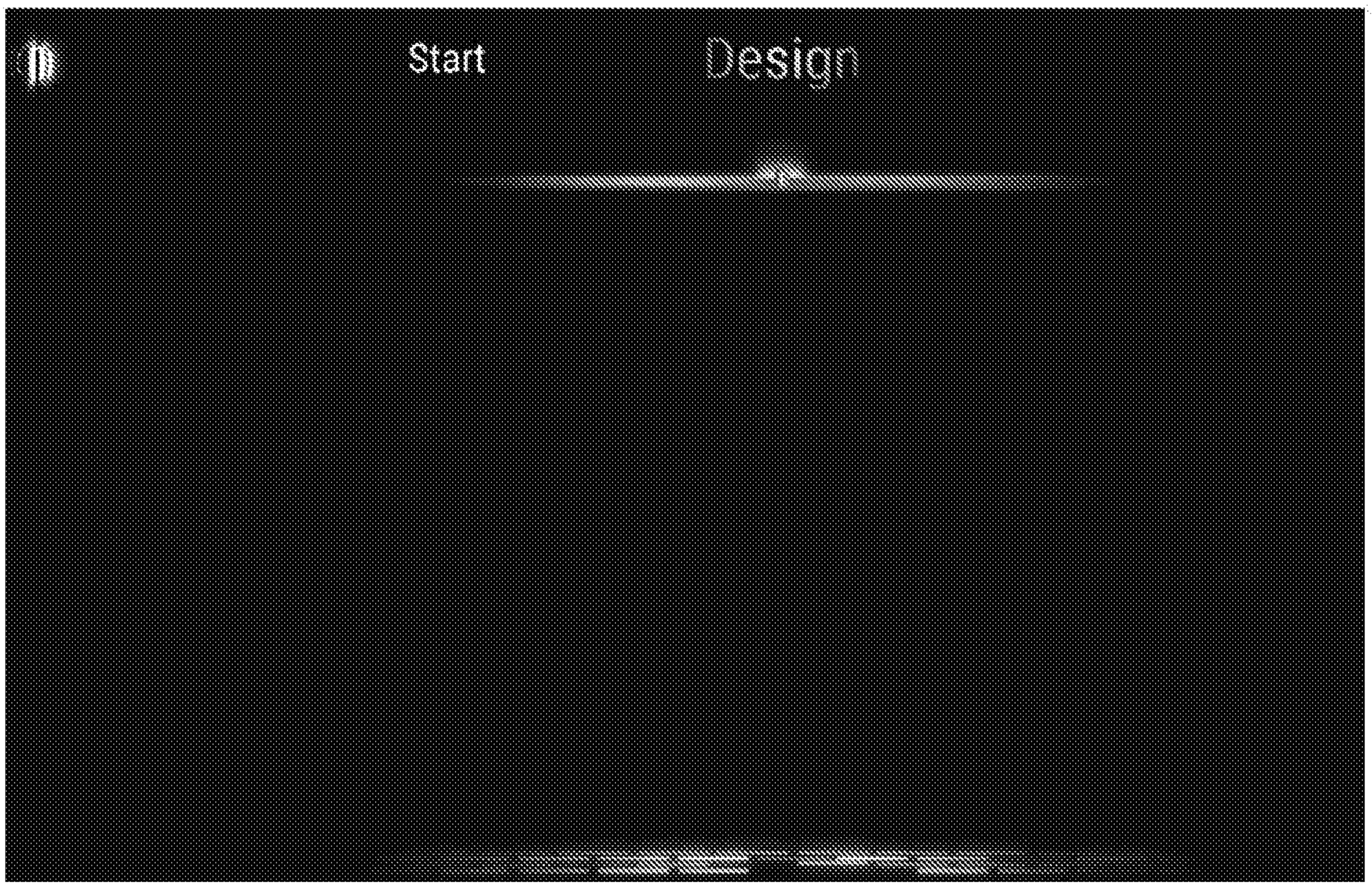


FIG. 62A

FIG. 62B



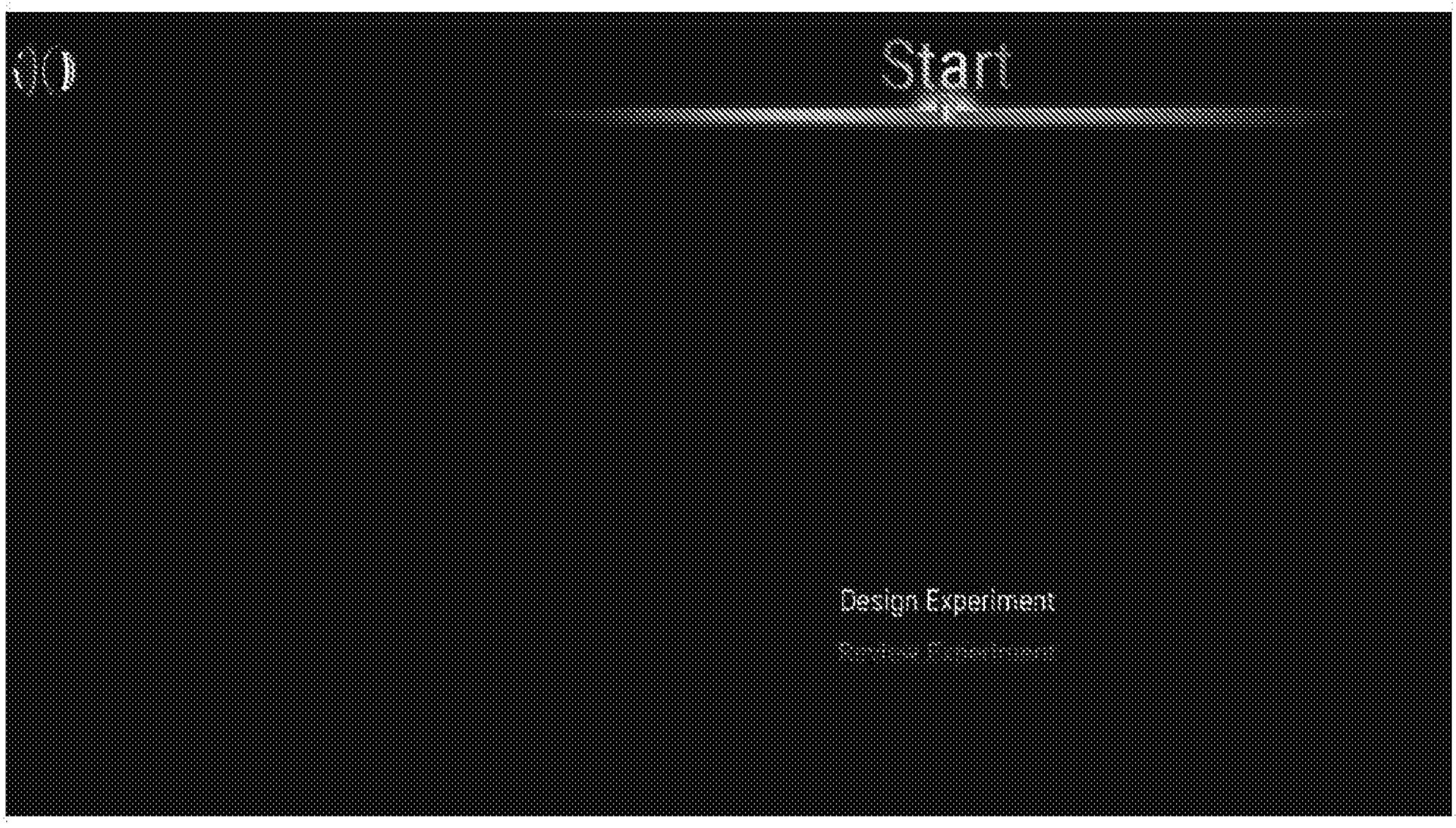
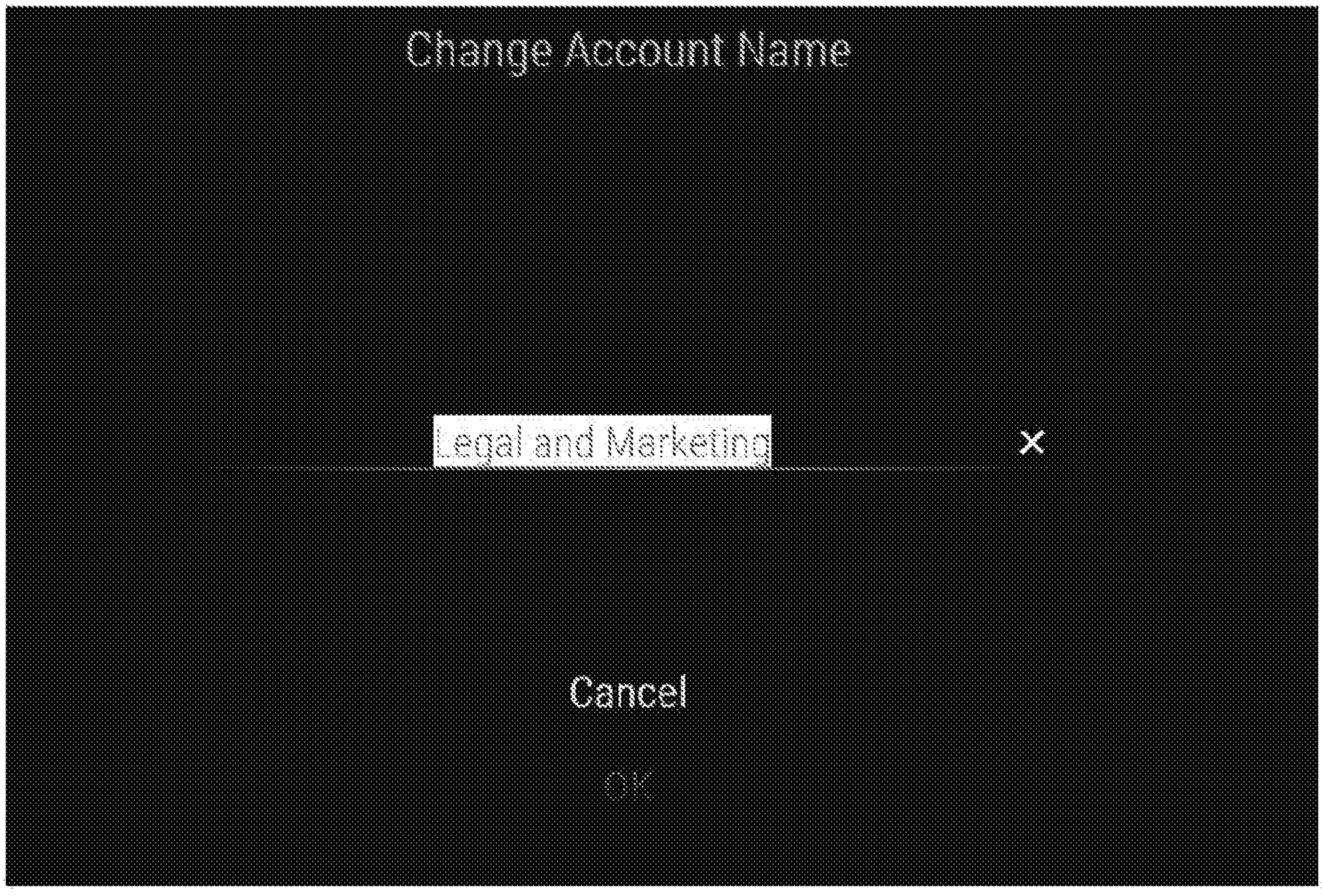


FIG. 62C

FIG. 62D



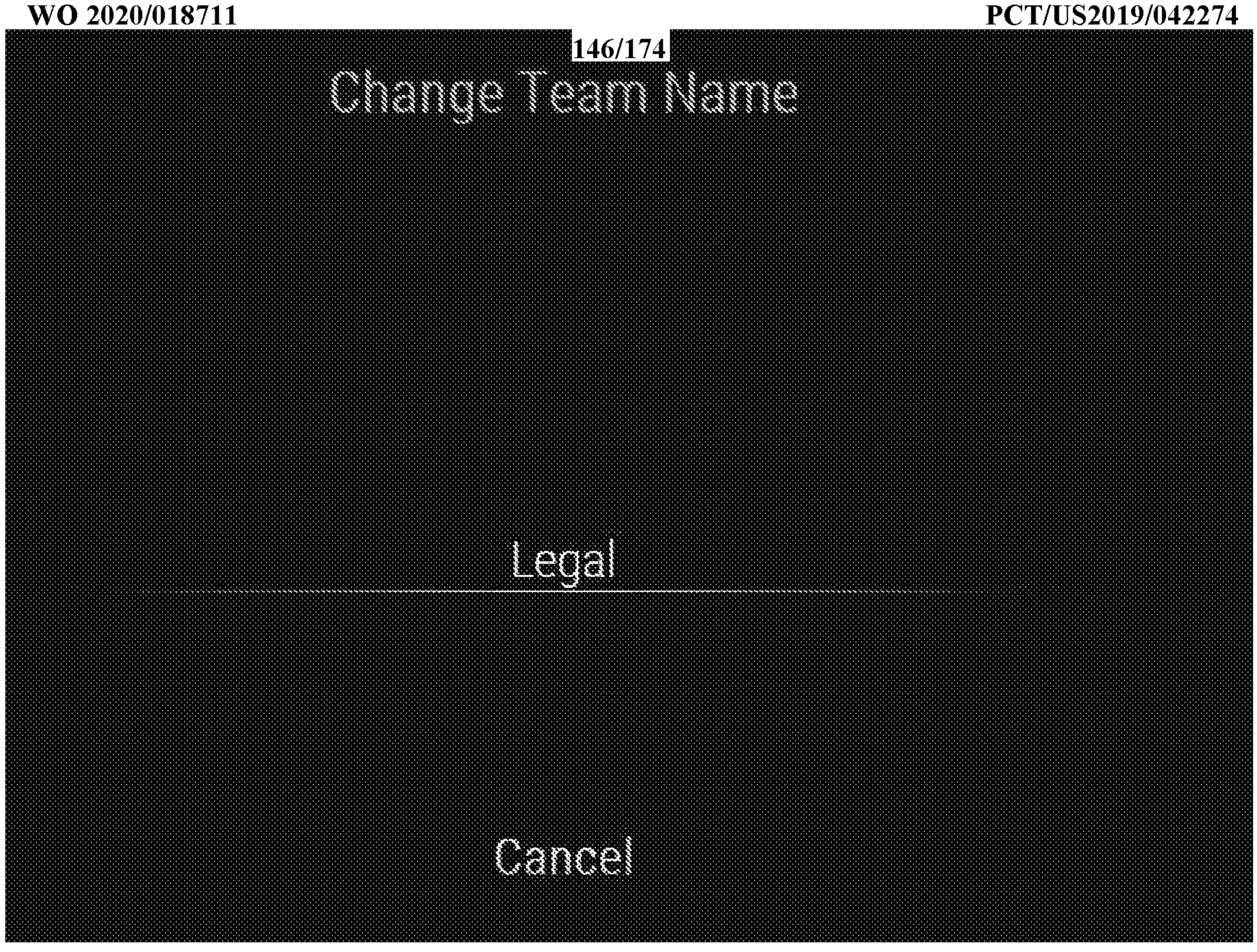


FIG. 62E

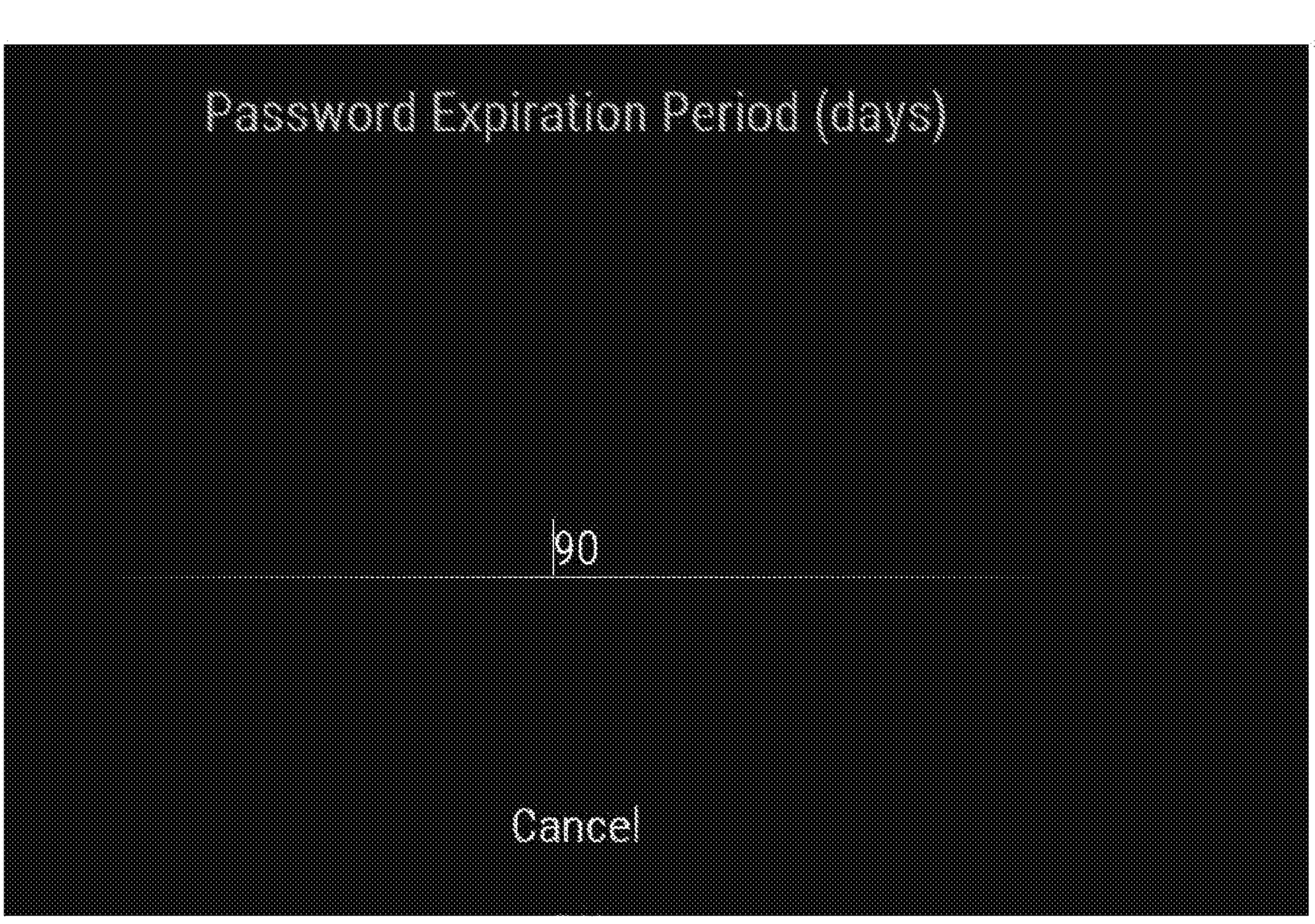


FIG. 62F

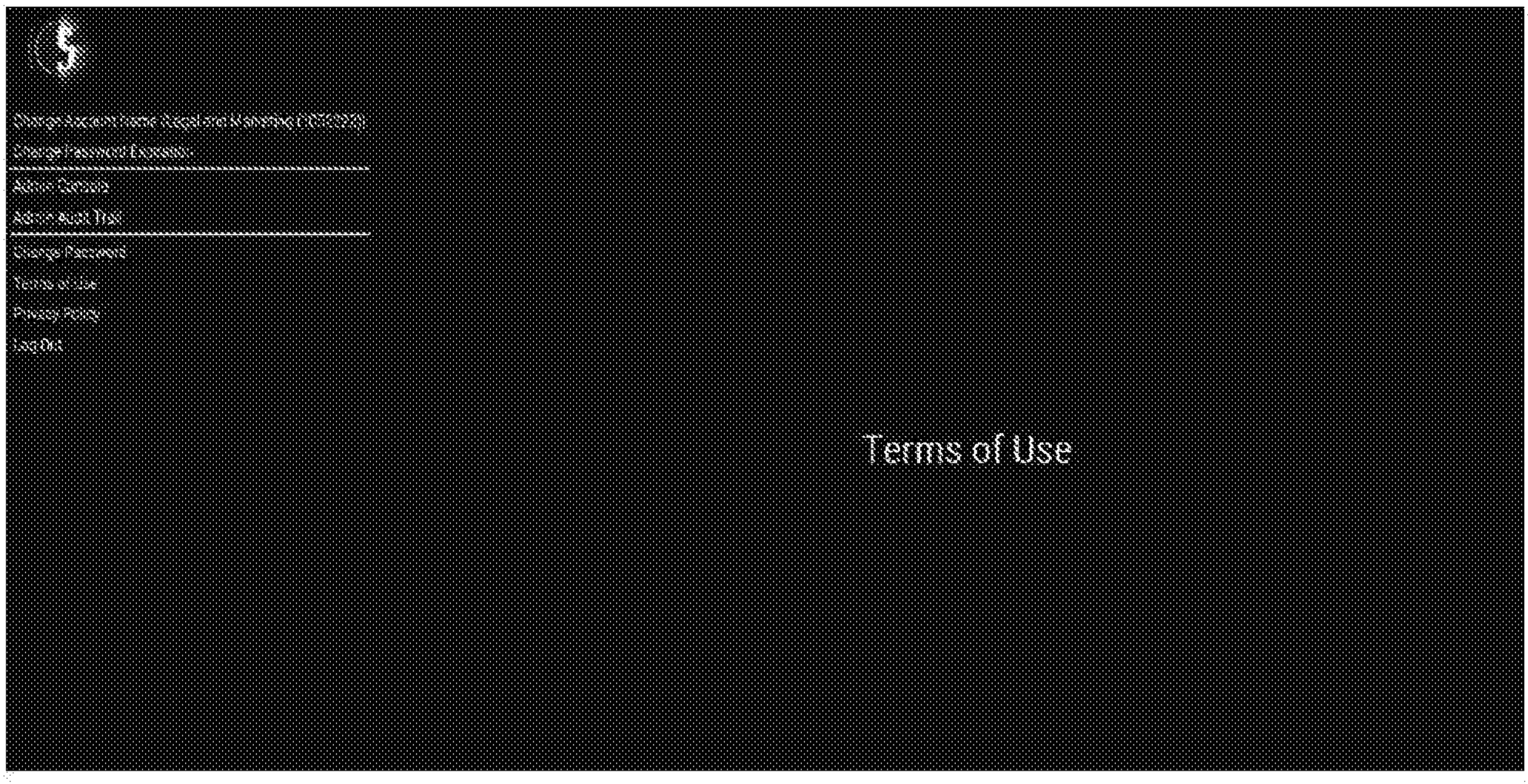


FIG. 62G

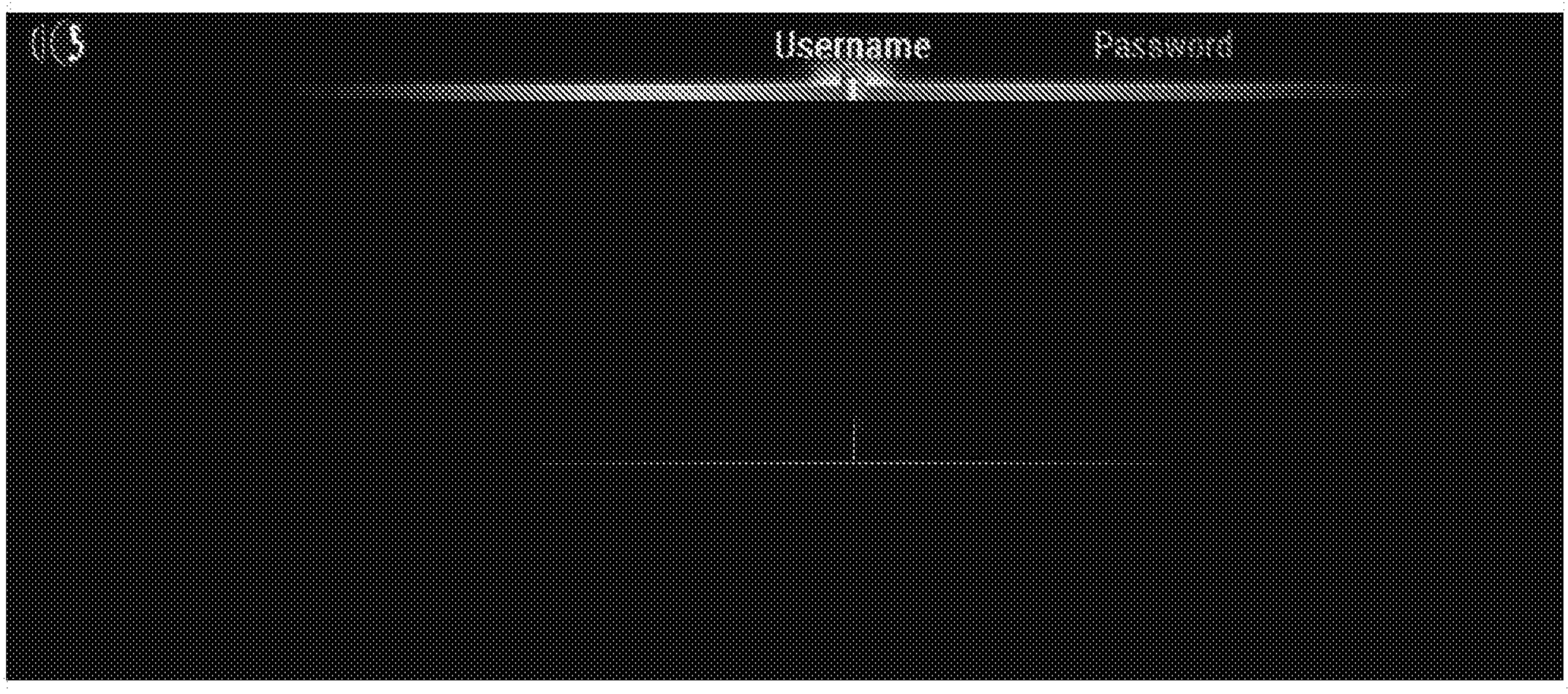


FIG. 62H

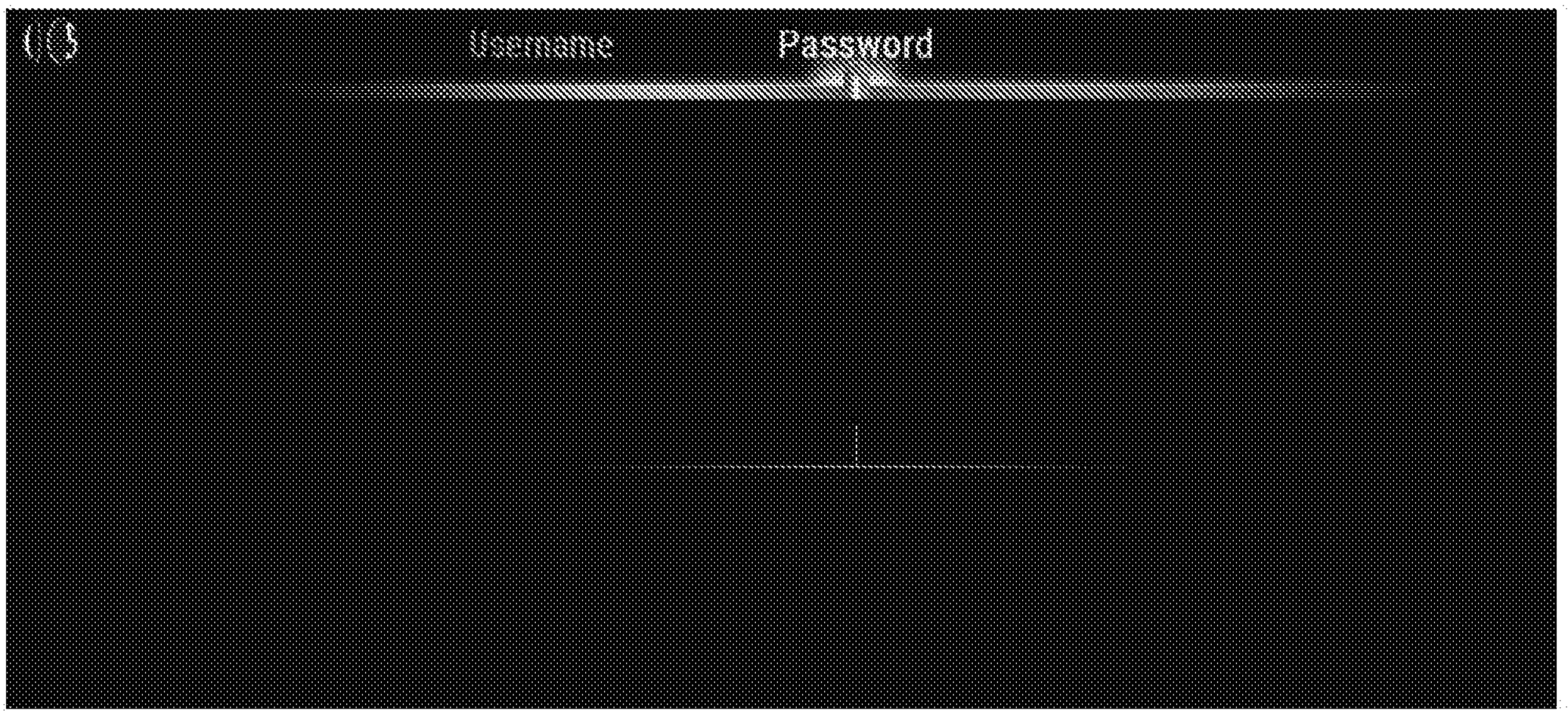


FIG. 62I

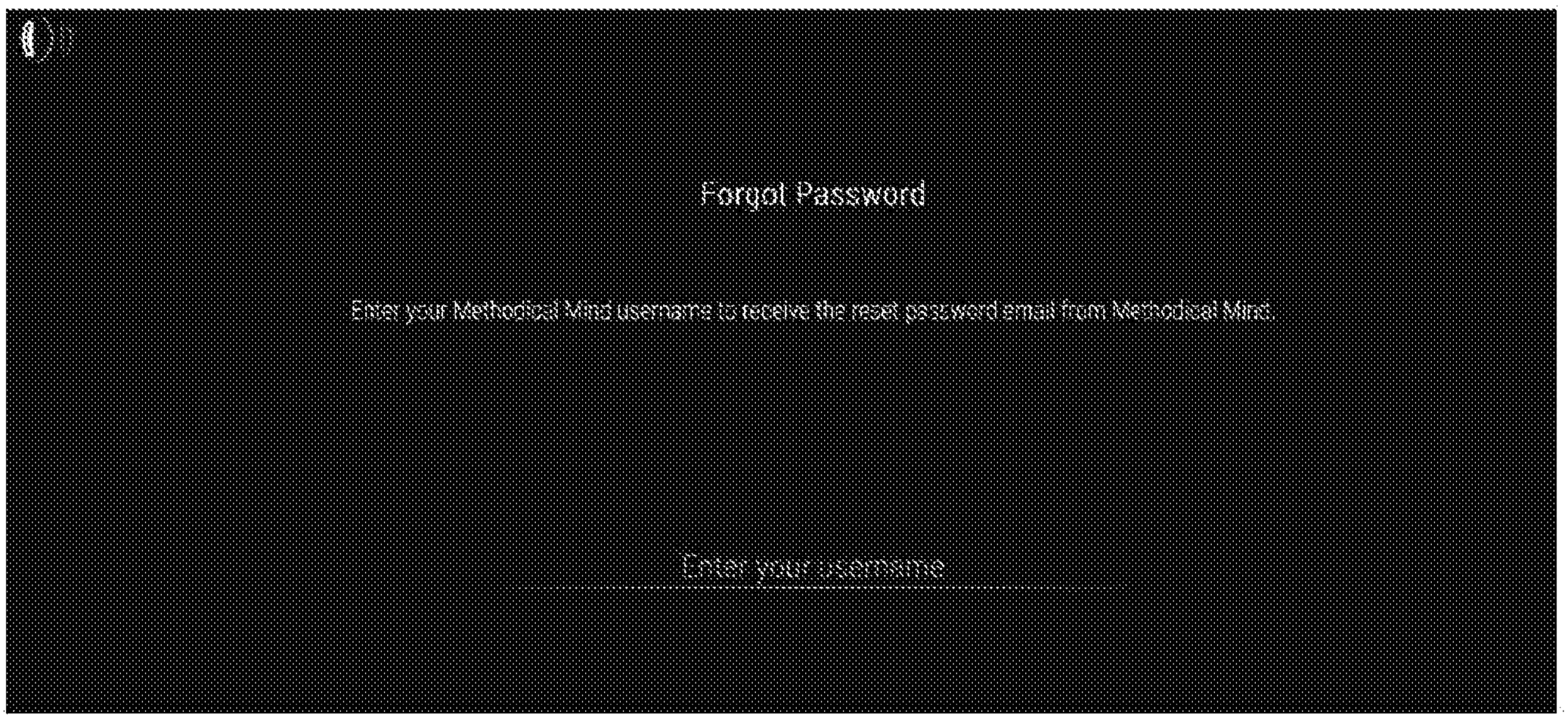


FIG. 62J

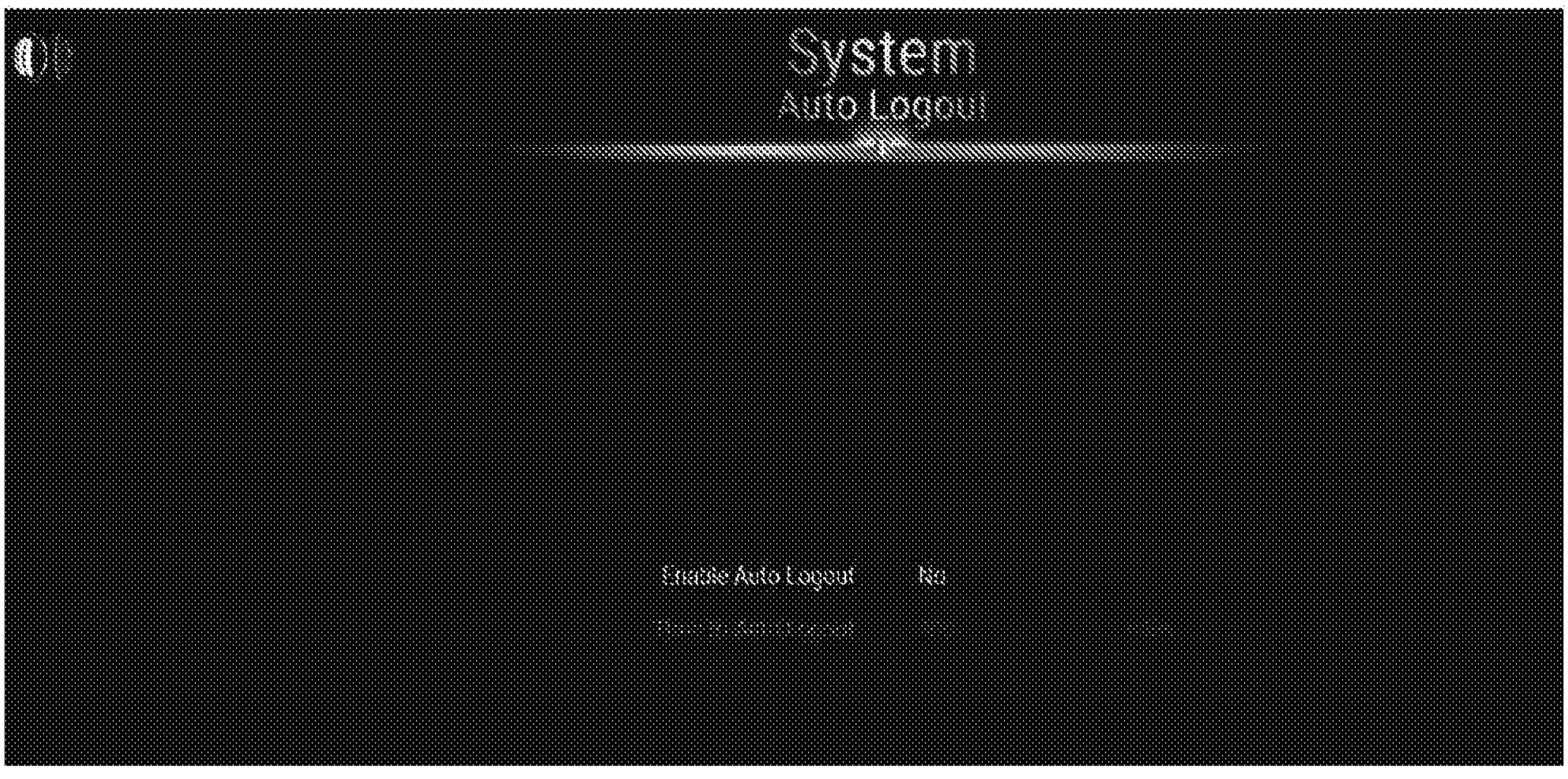


FIG. 62K

FIG. 62L



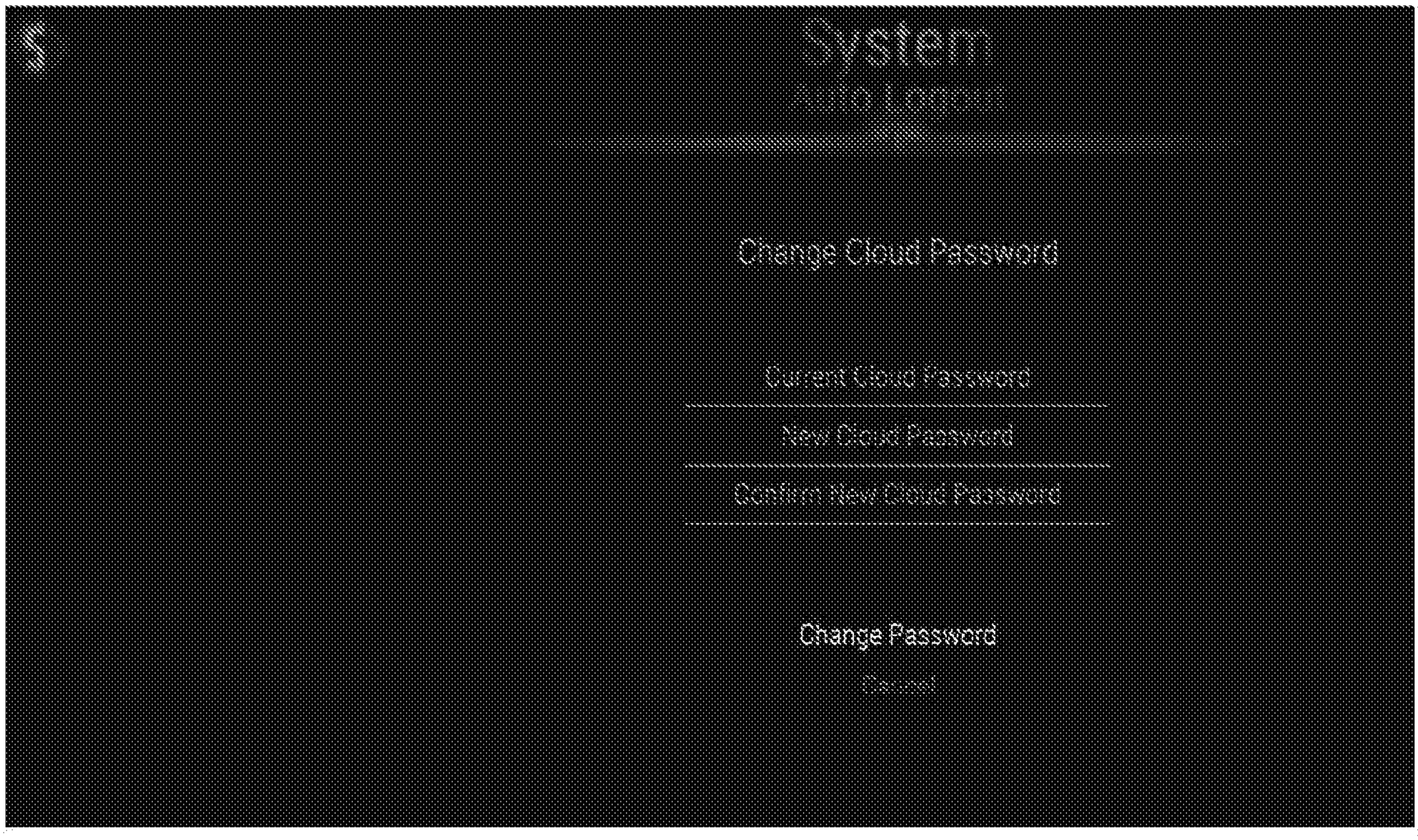
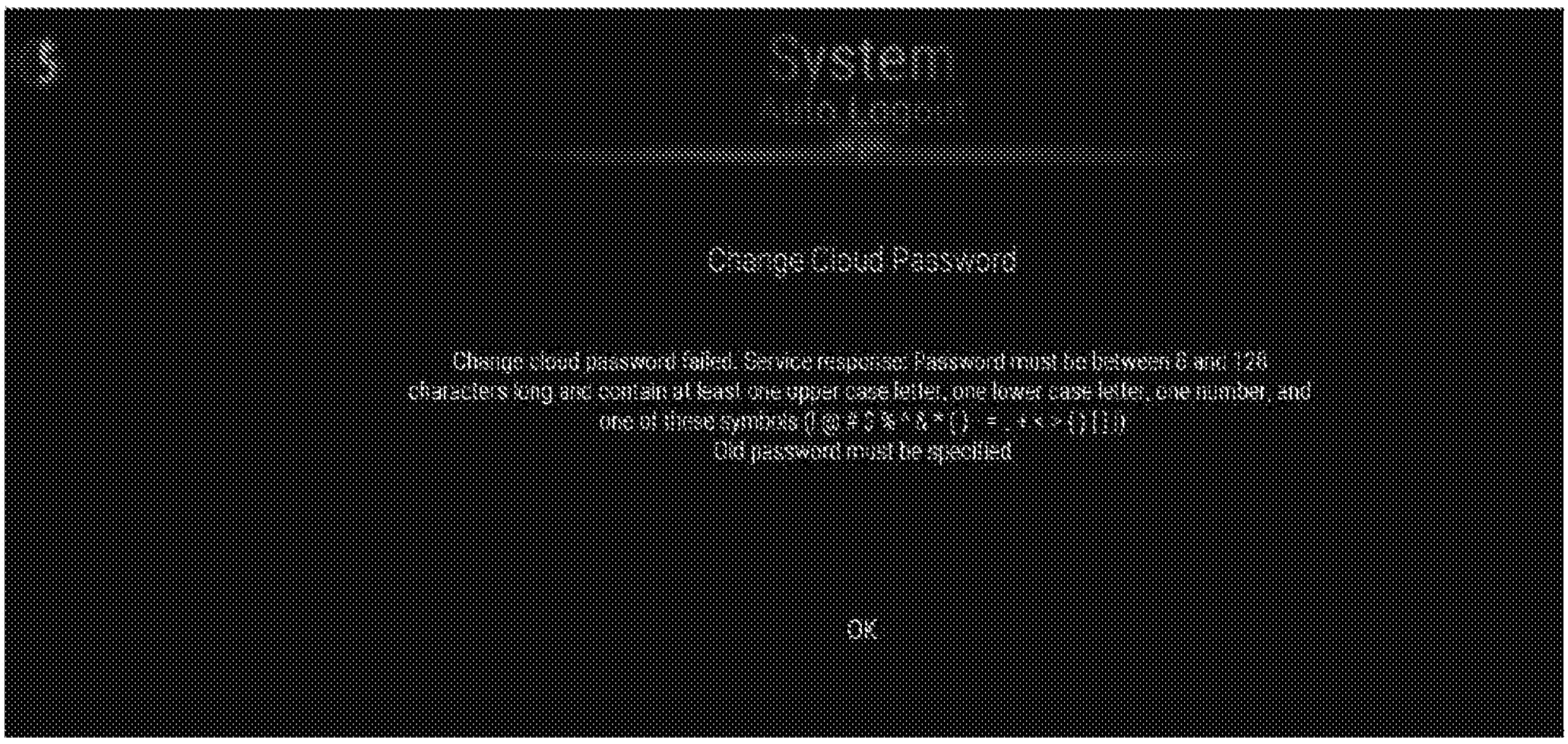


FIG. 62M

FIG. 62N



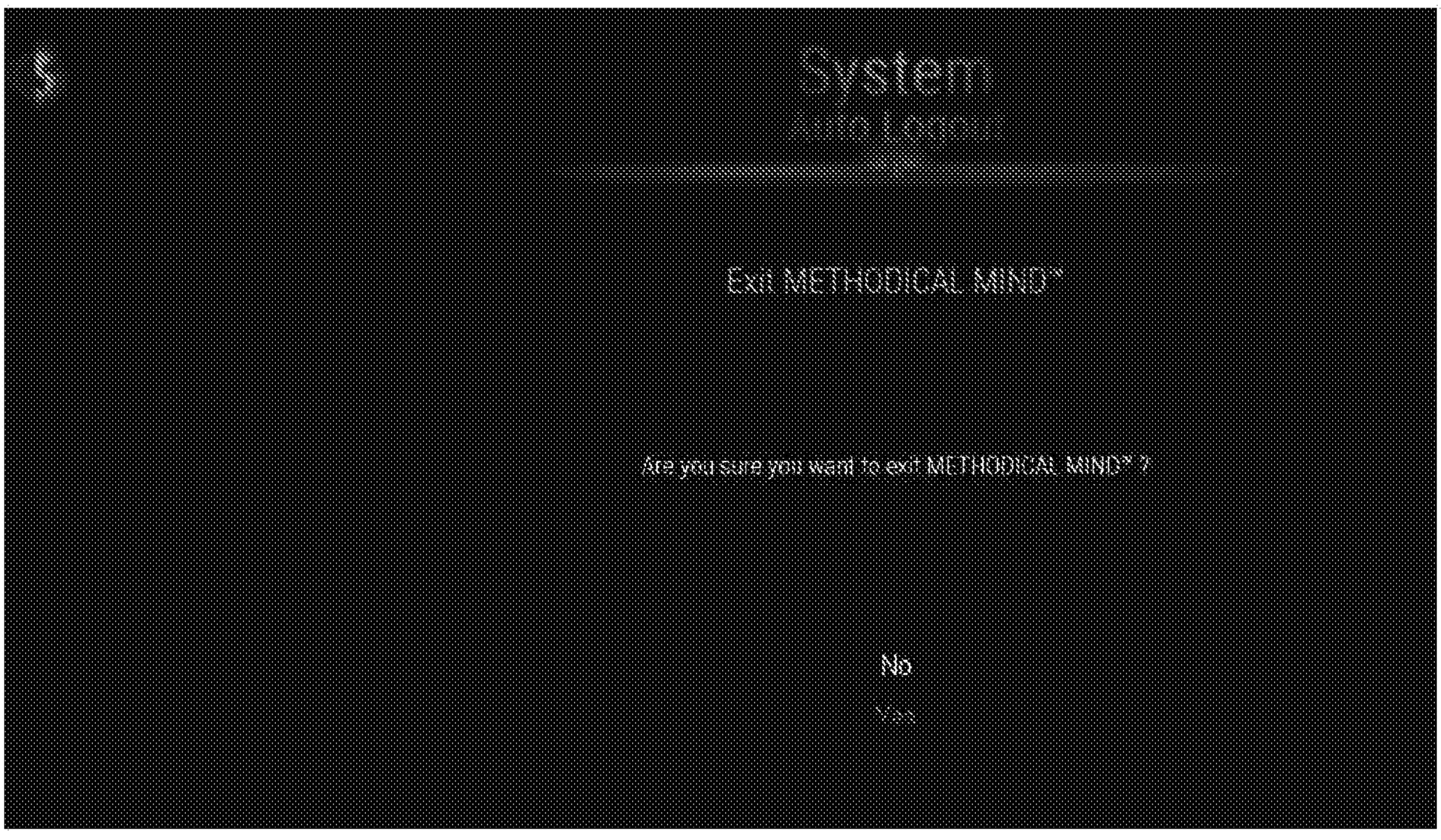


FIG. 62O

FIG. 62P

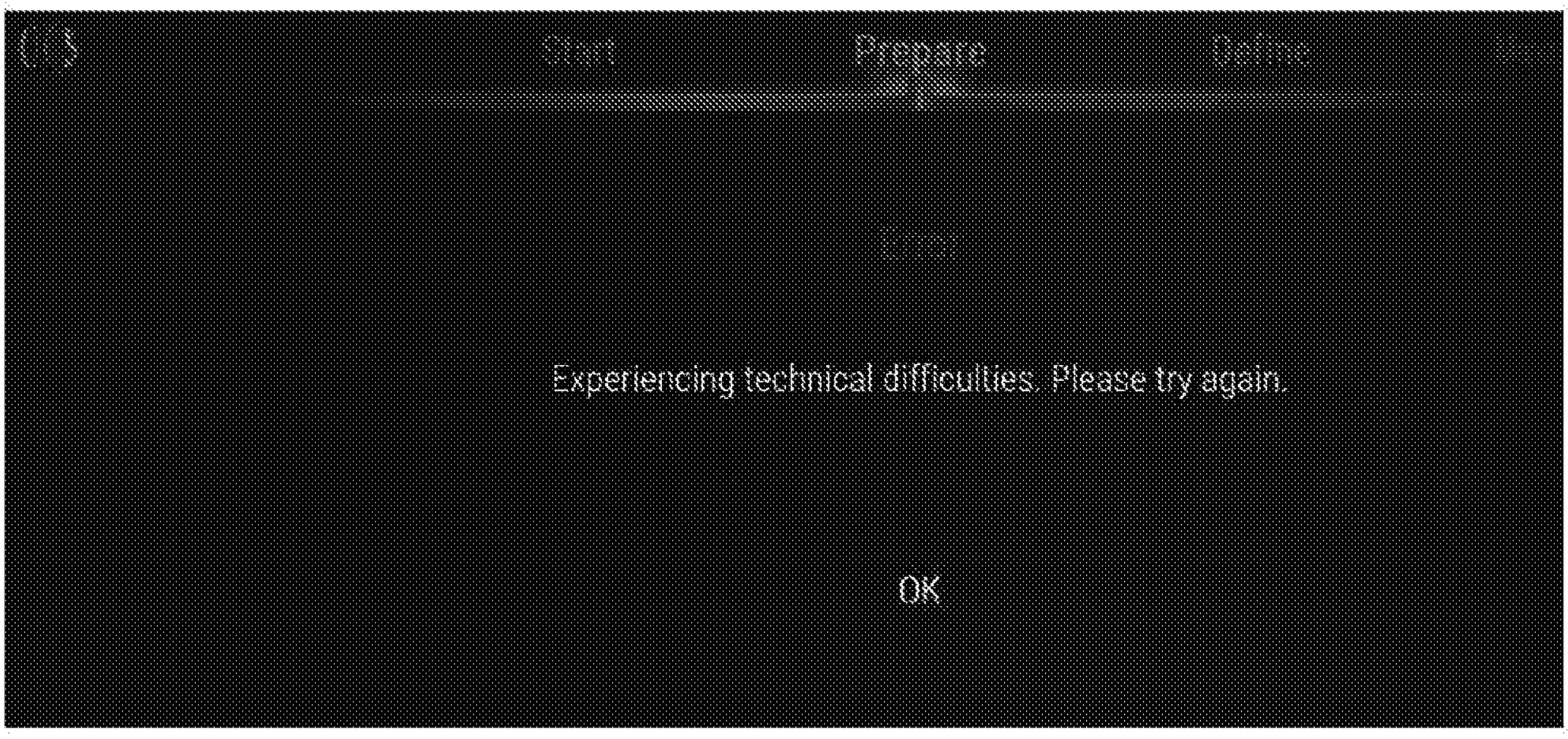




FIG. 63

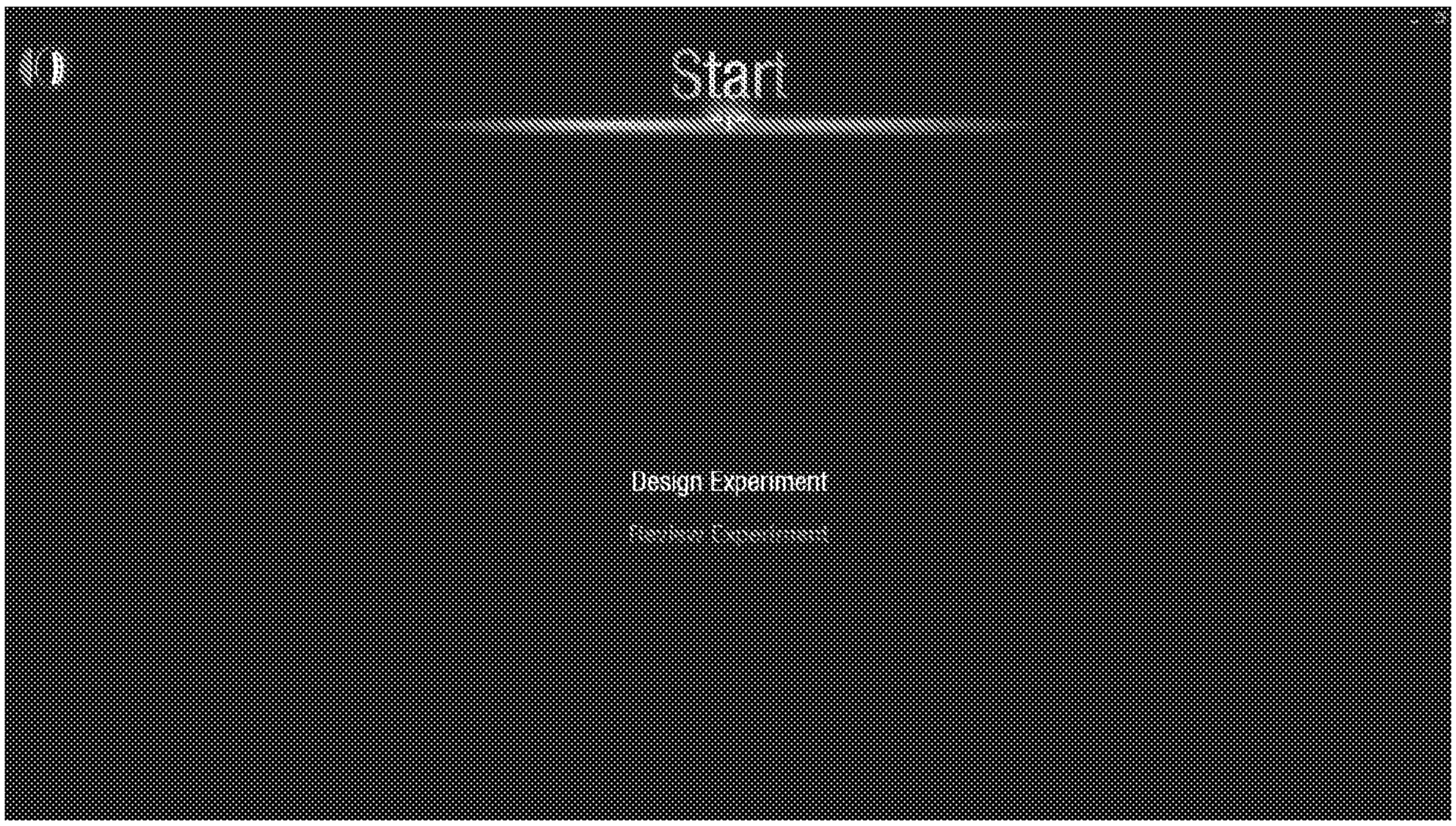


FIG. 64A

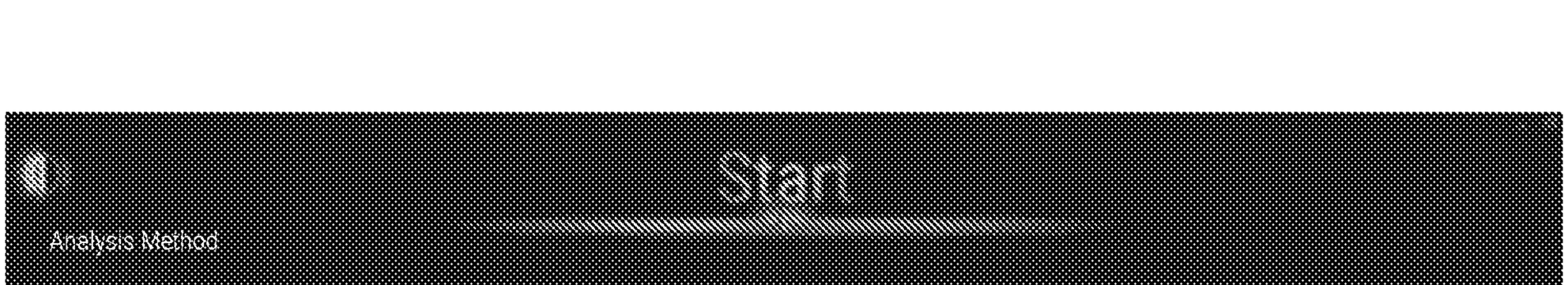


FIG. 64B

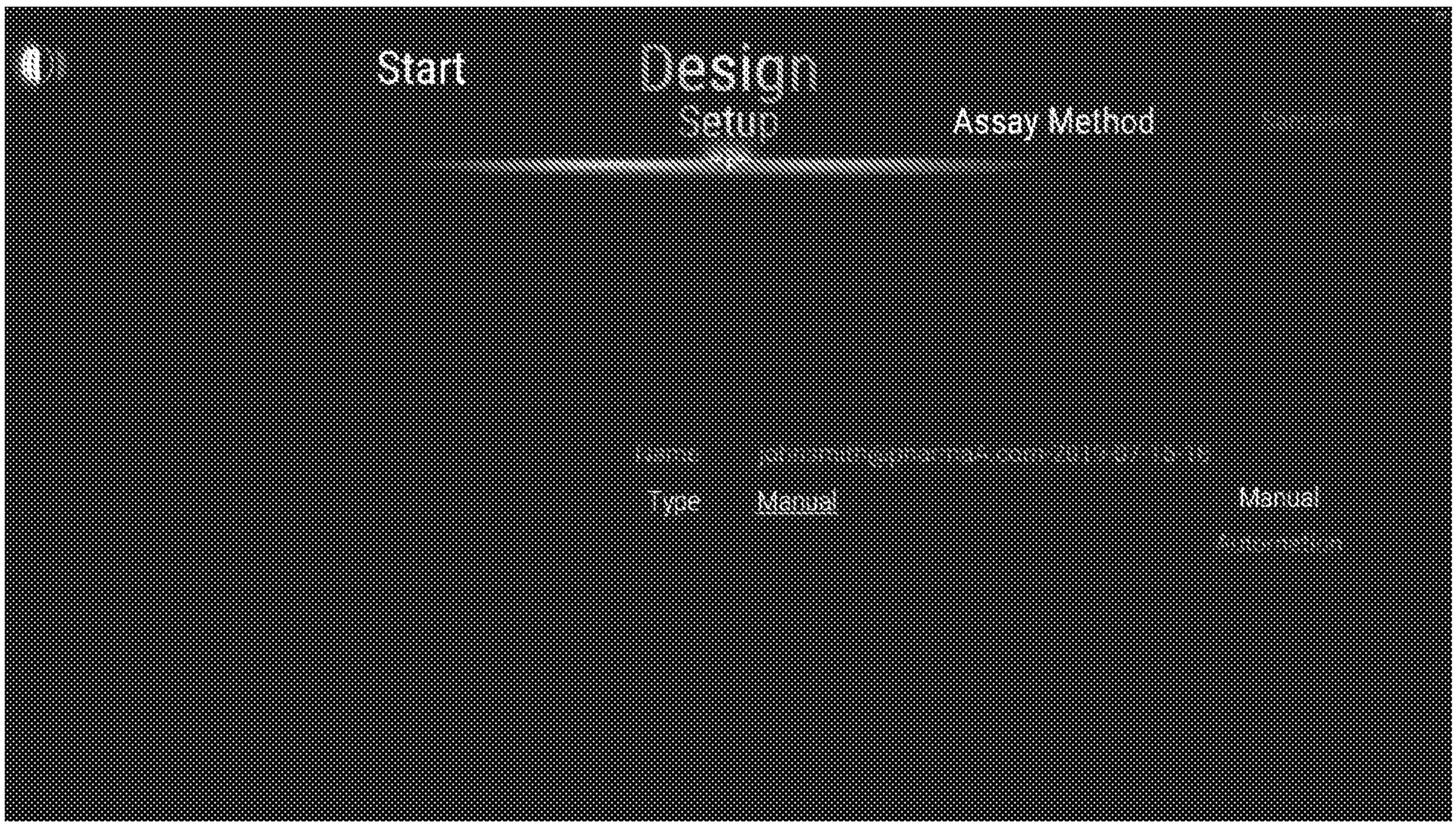


FIG. 64C

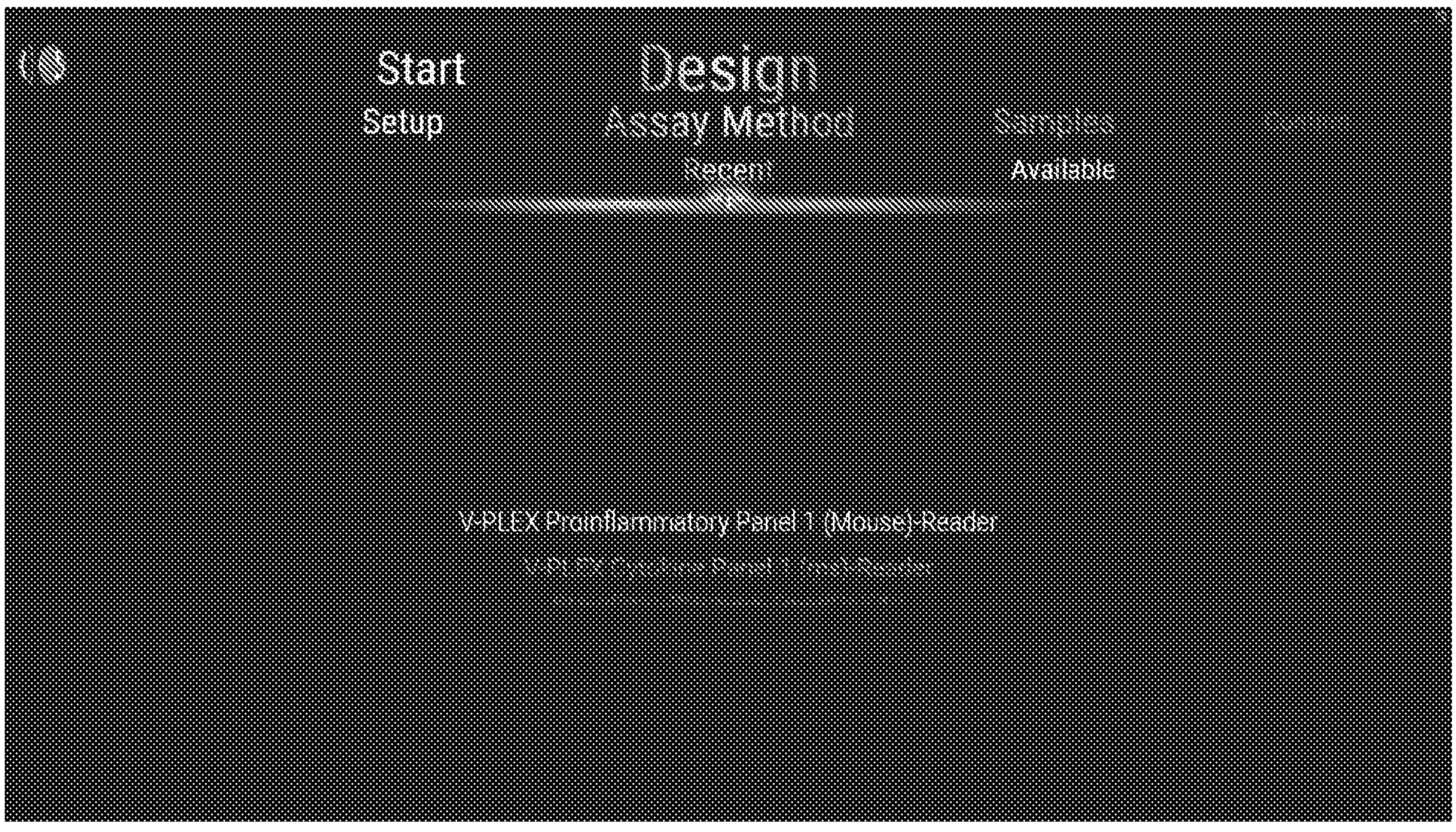


FIG. 64D



FIG. 64E

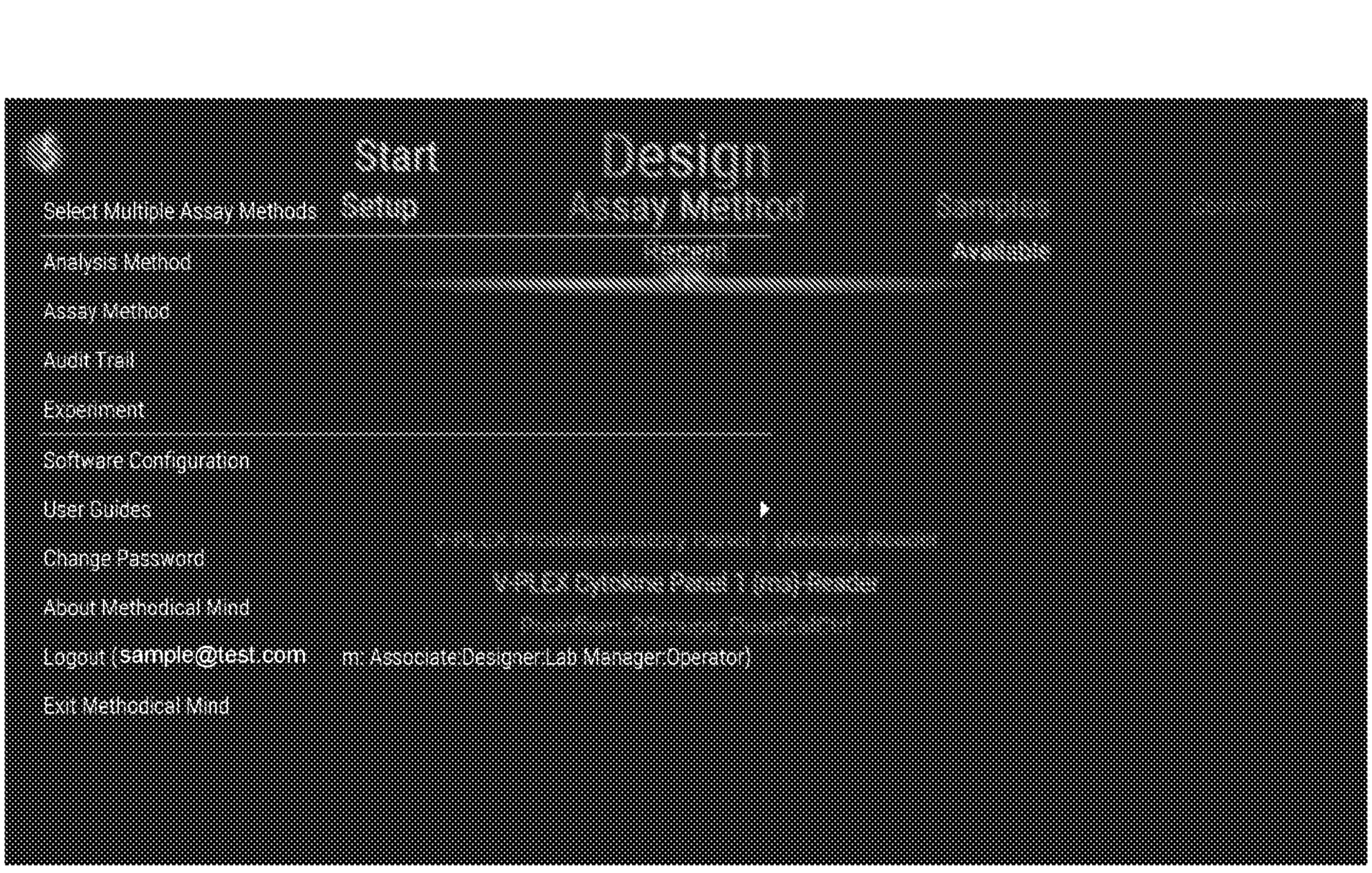


FIG. 64F

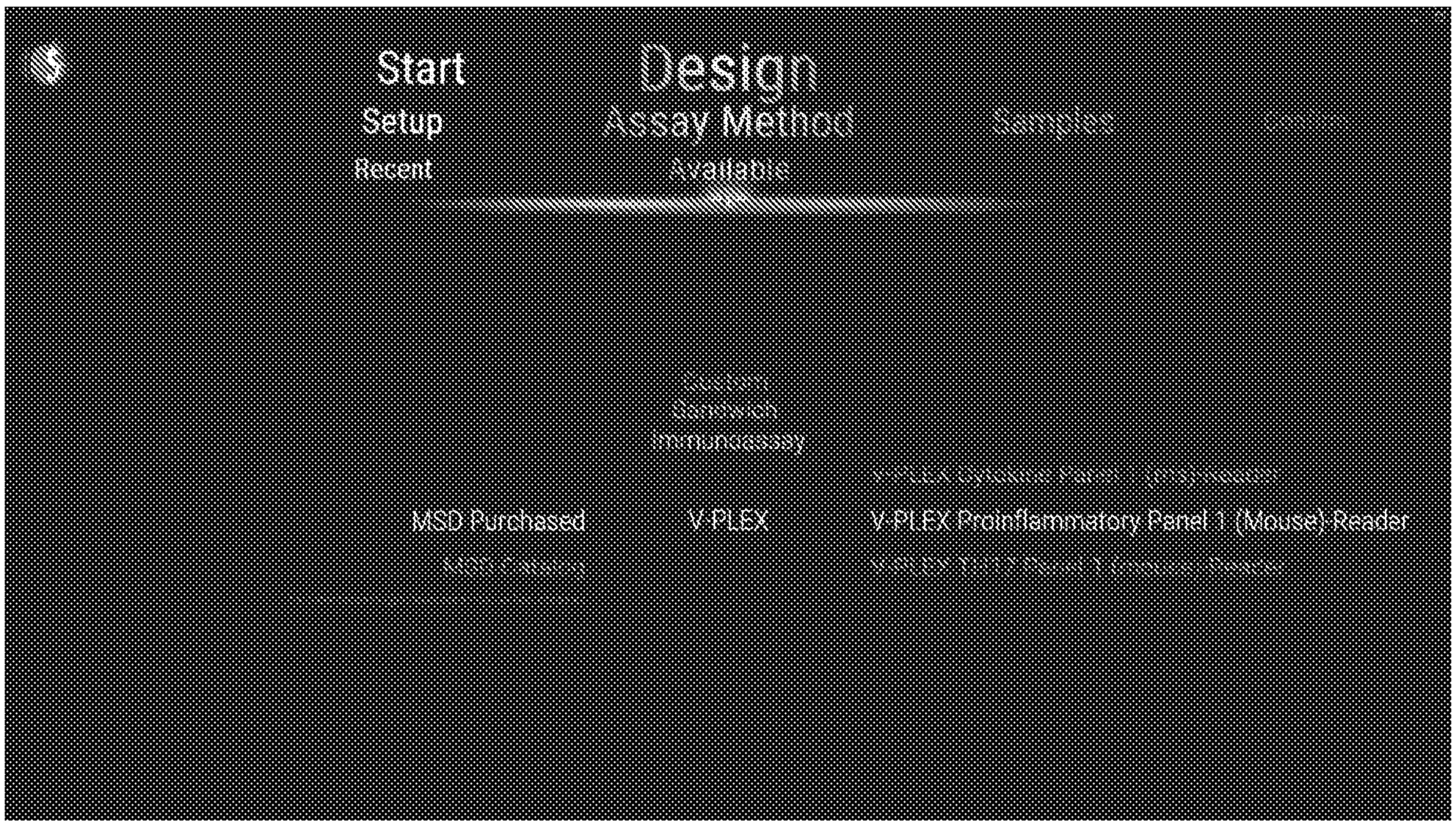


FIG. 64G

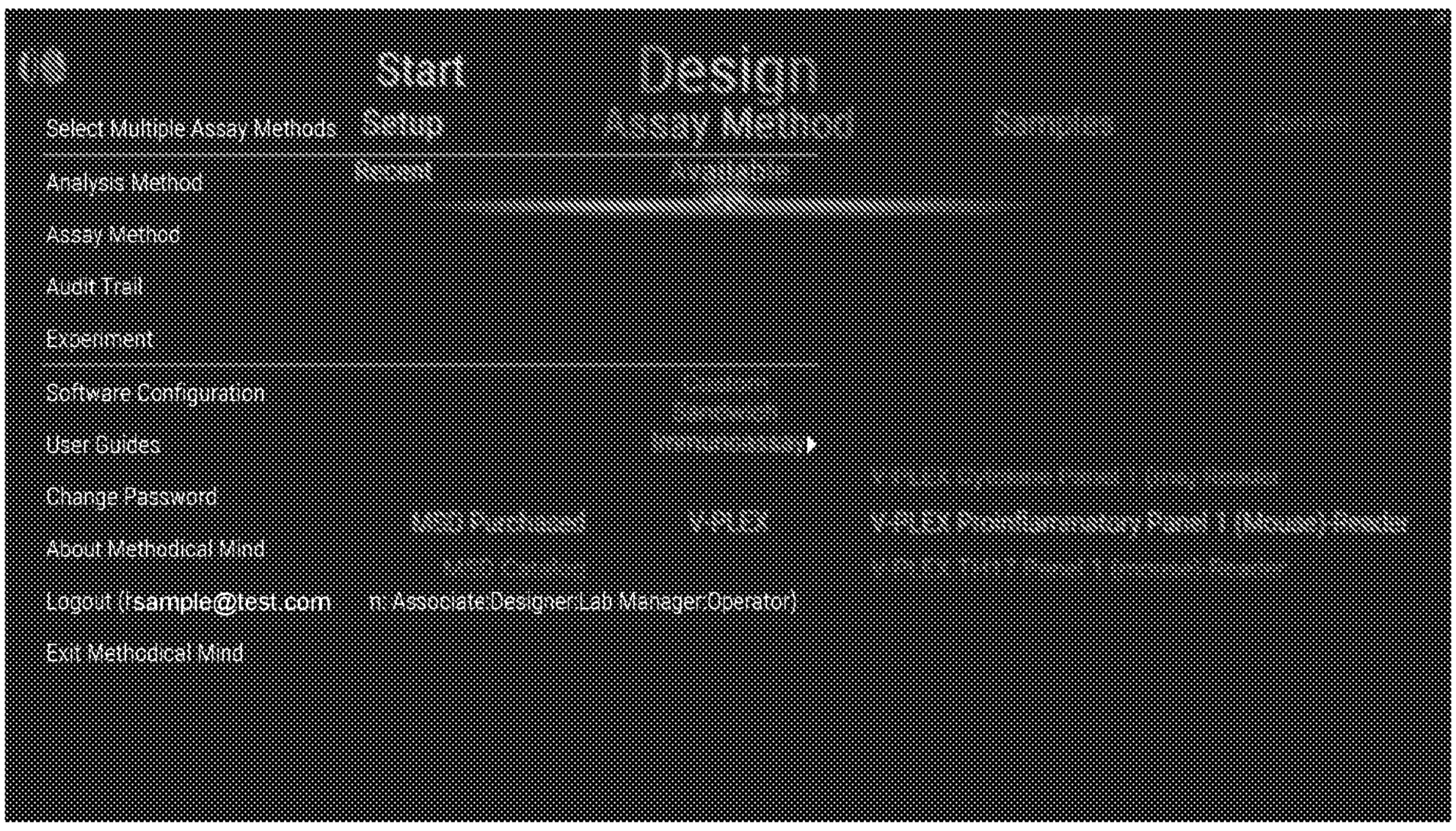


FIG. 64H

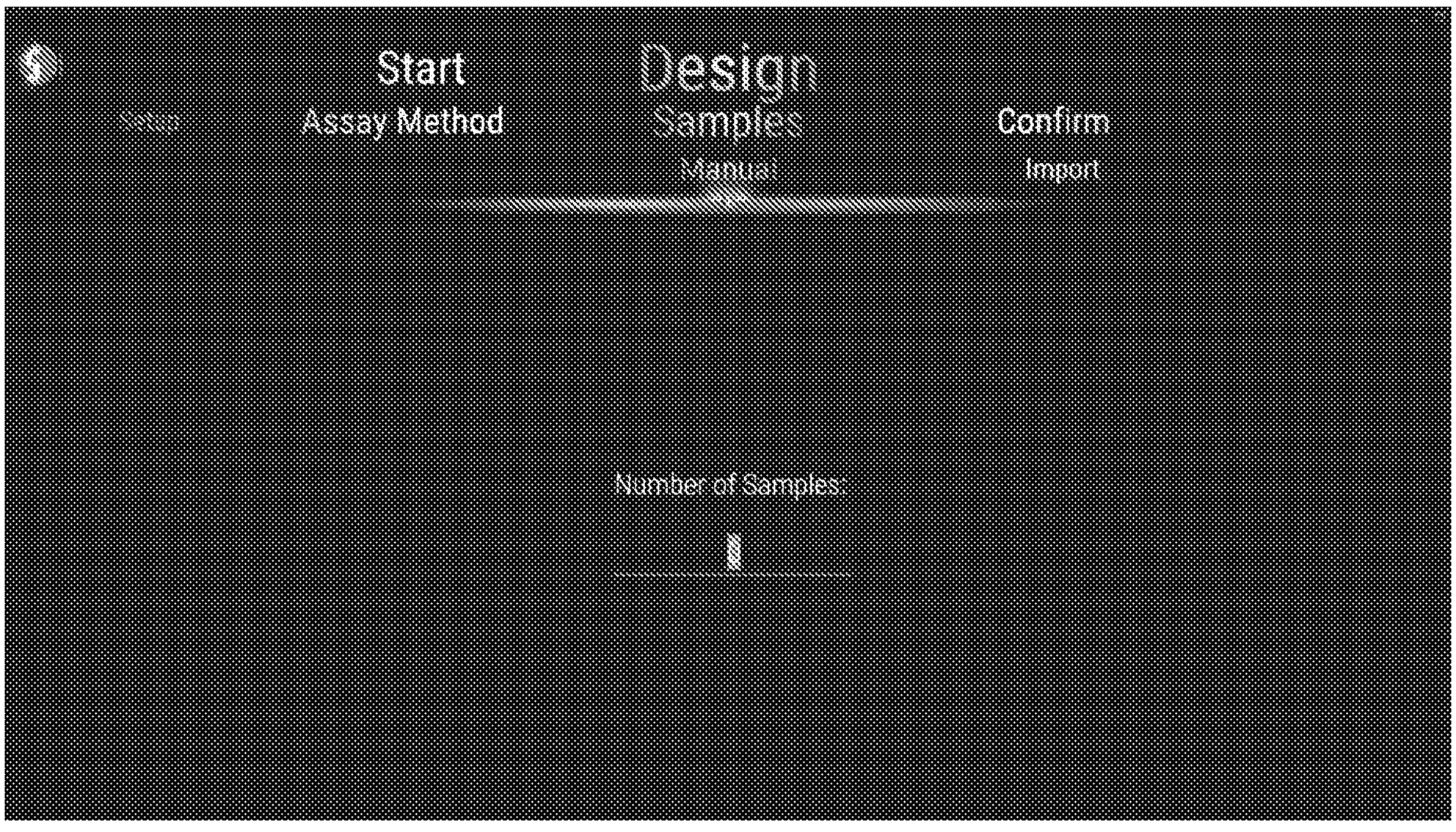


FIG. 64I

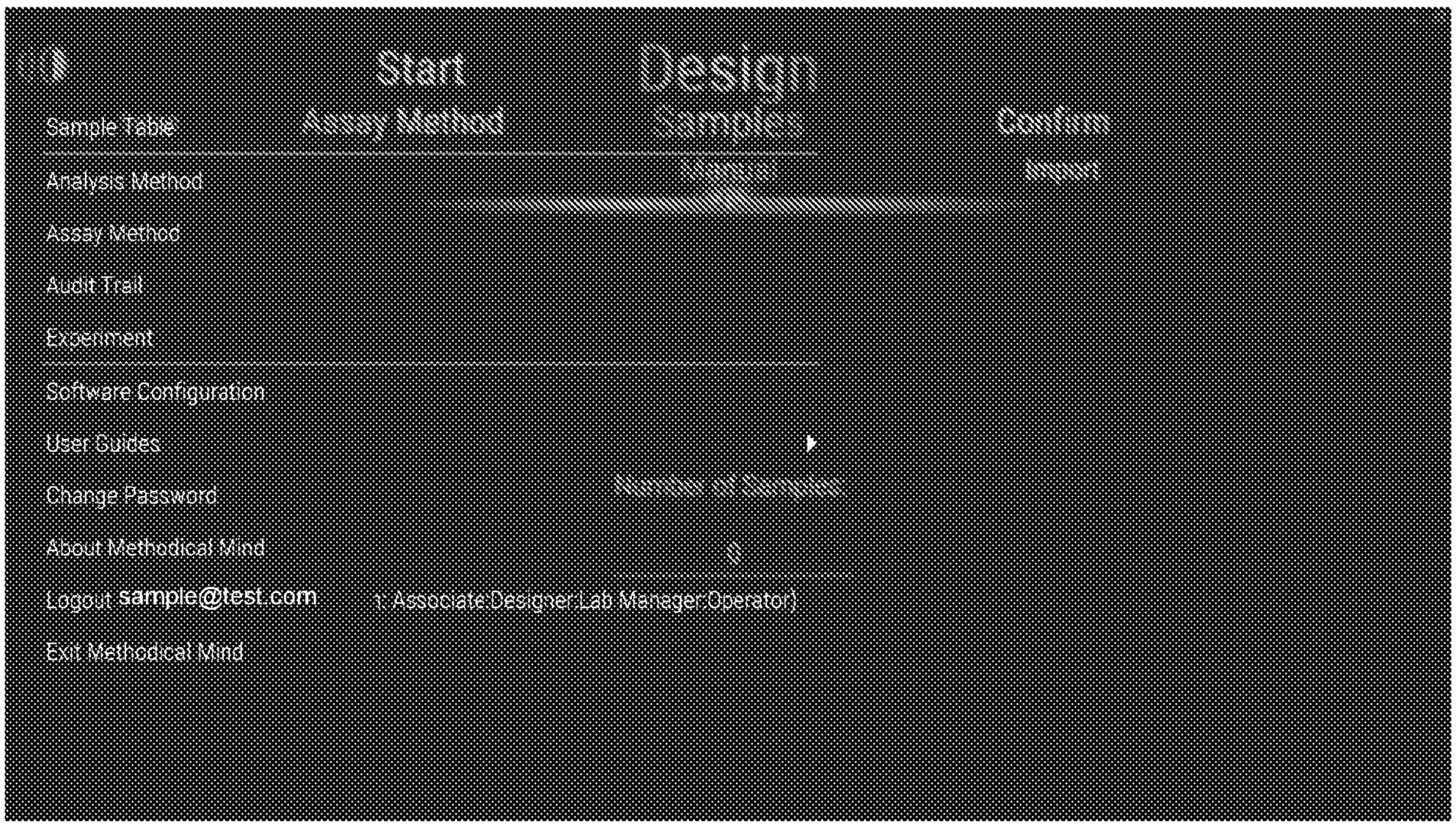


FIG. 64J

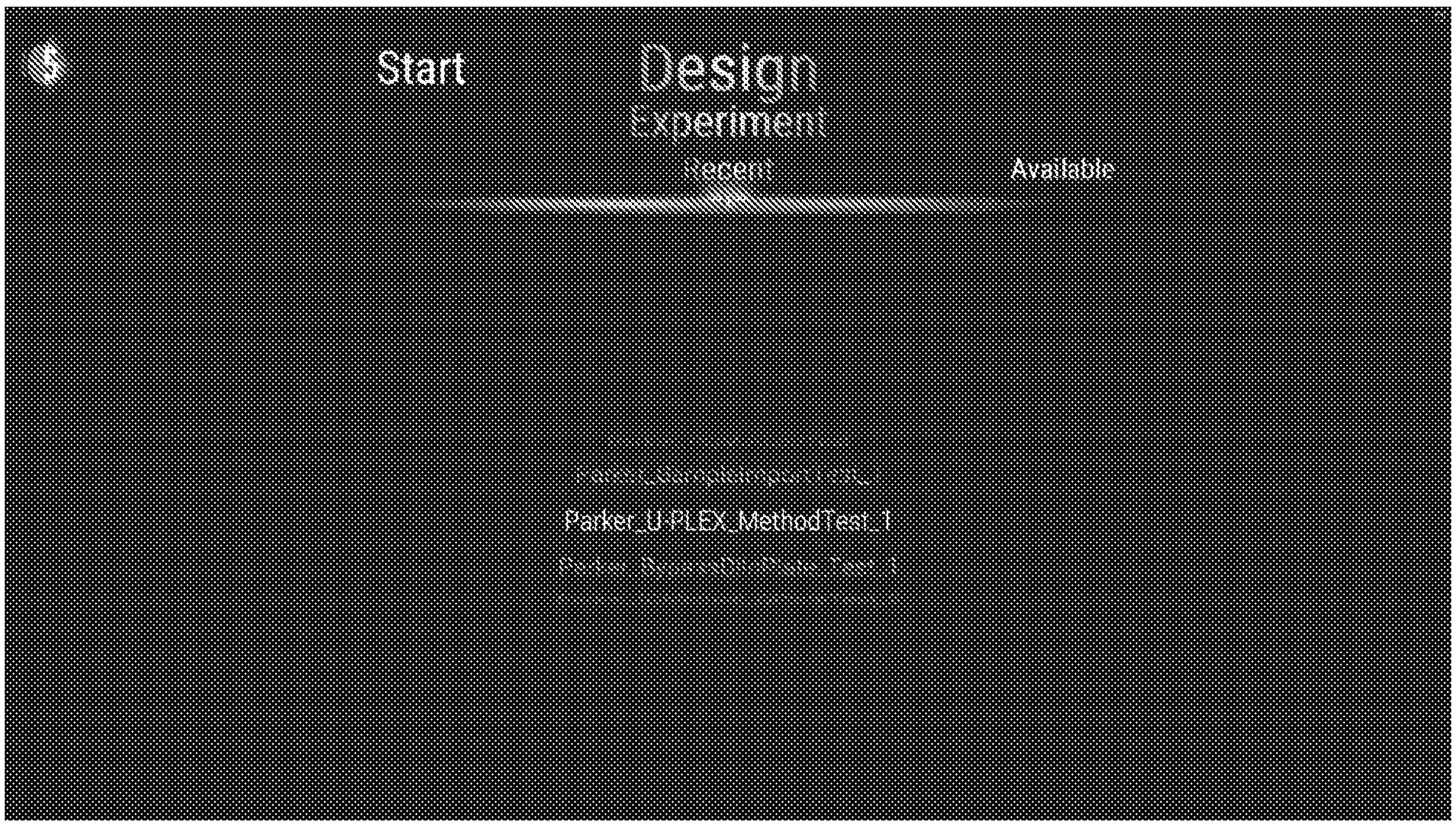


FIG. 64K

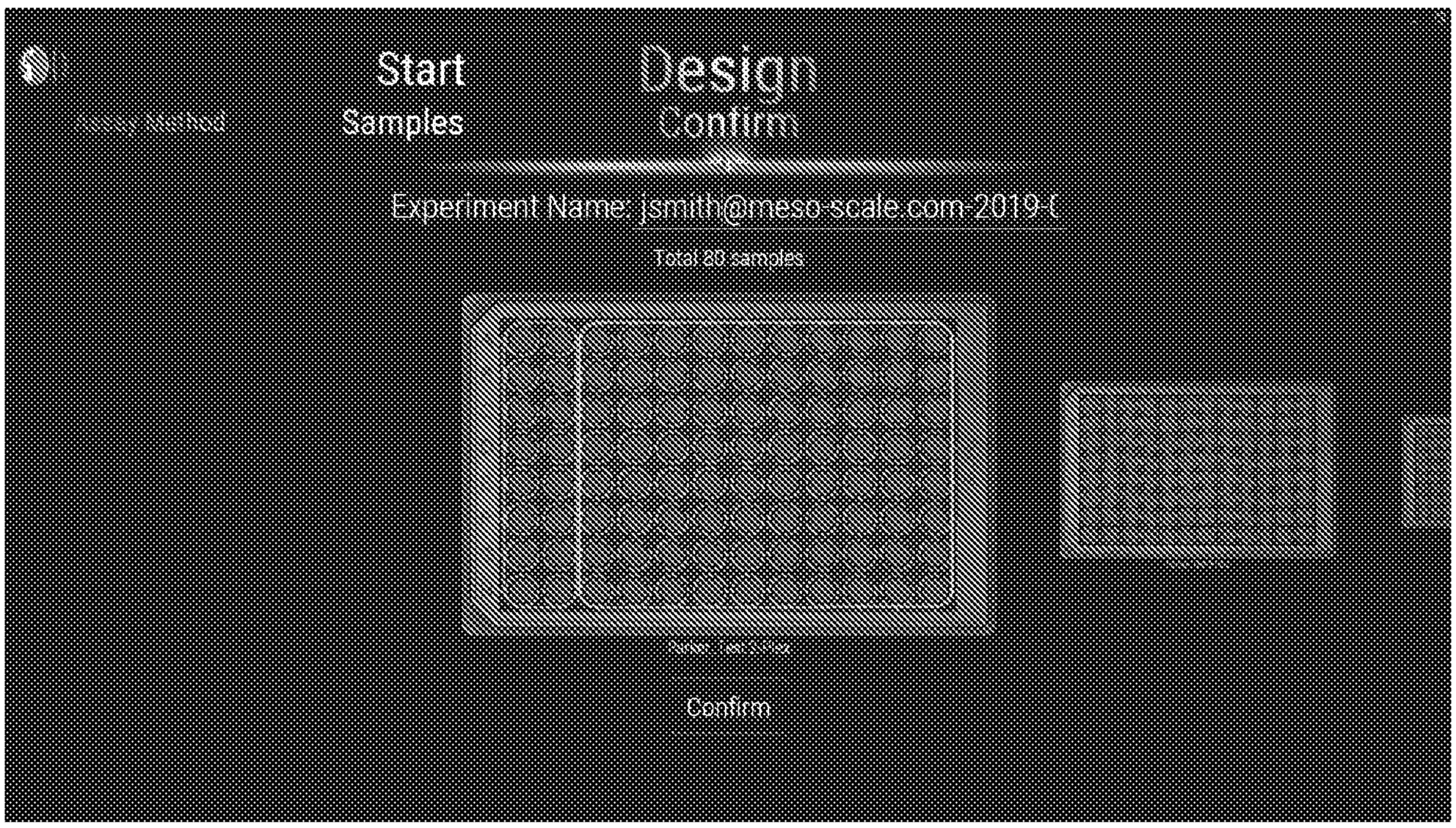


FIG. 64L

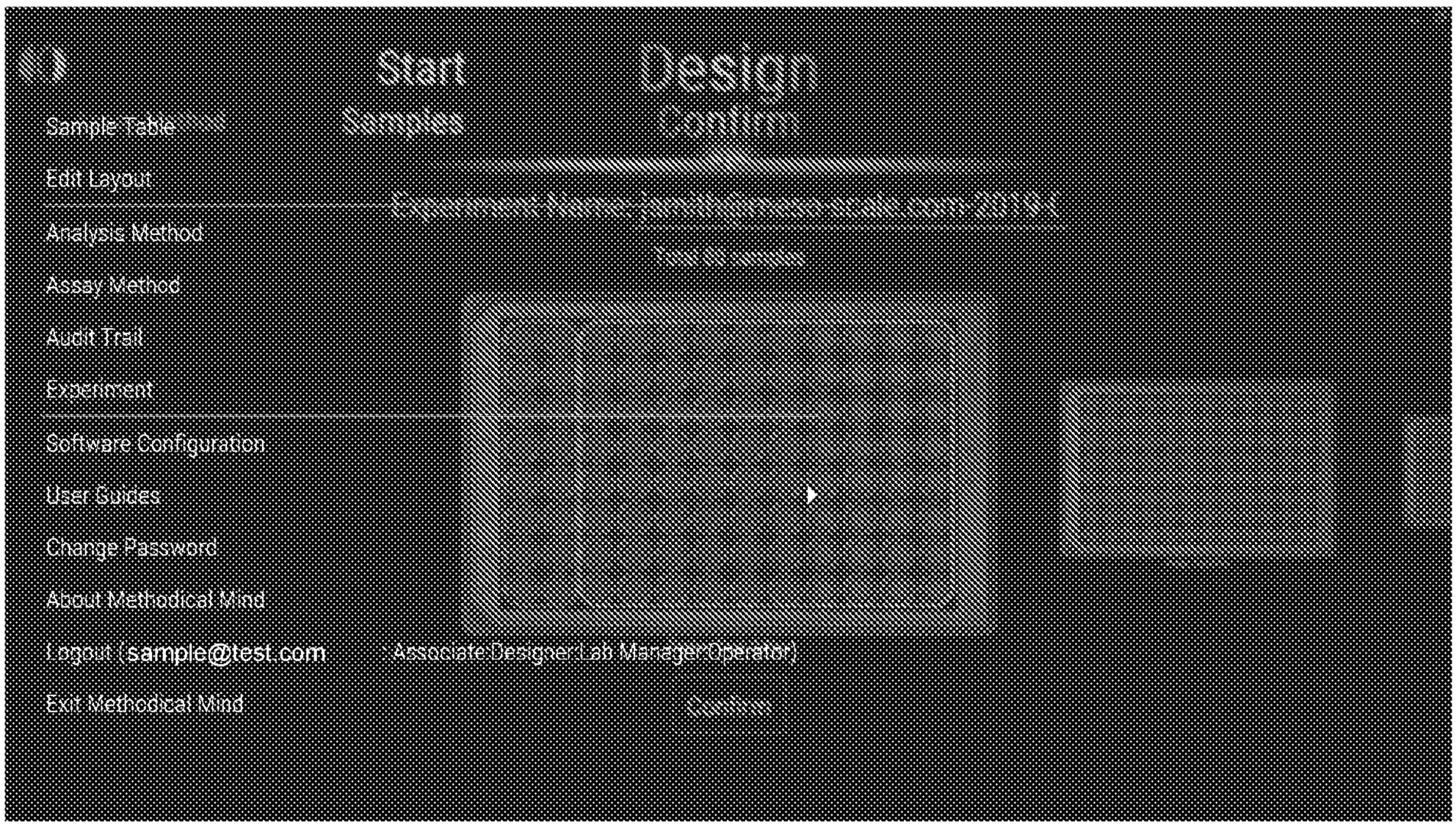


FIG. 64M

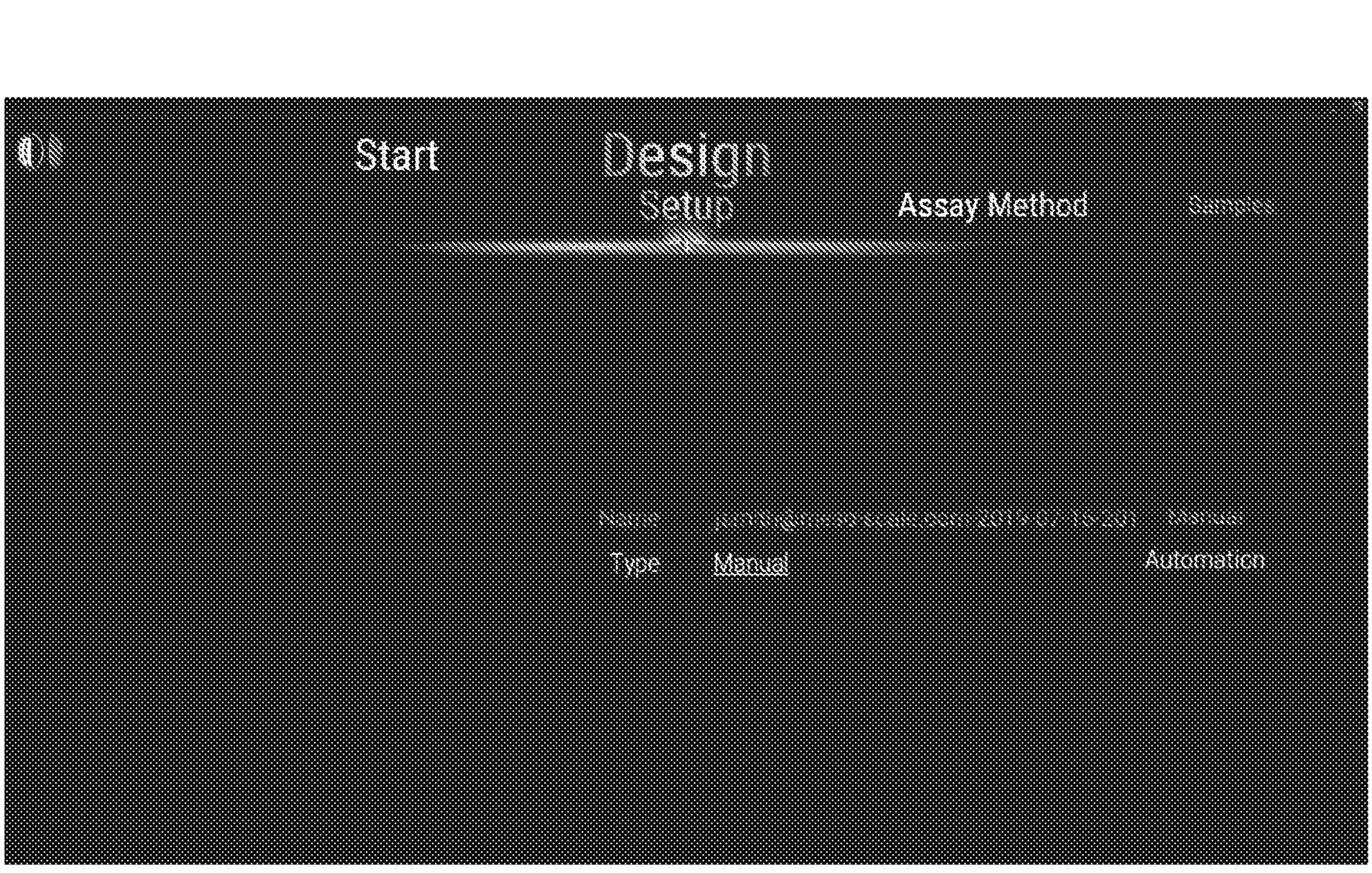


FIG. 64N

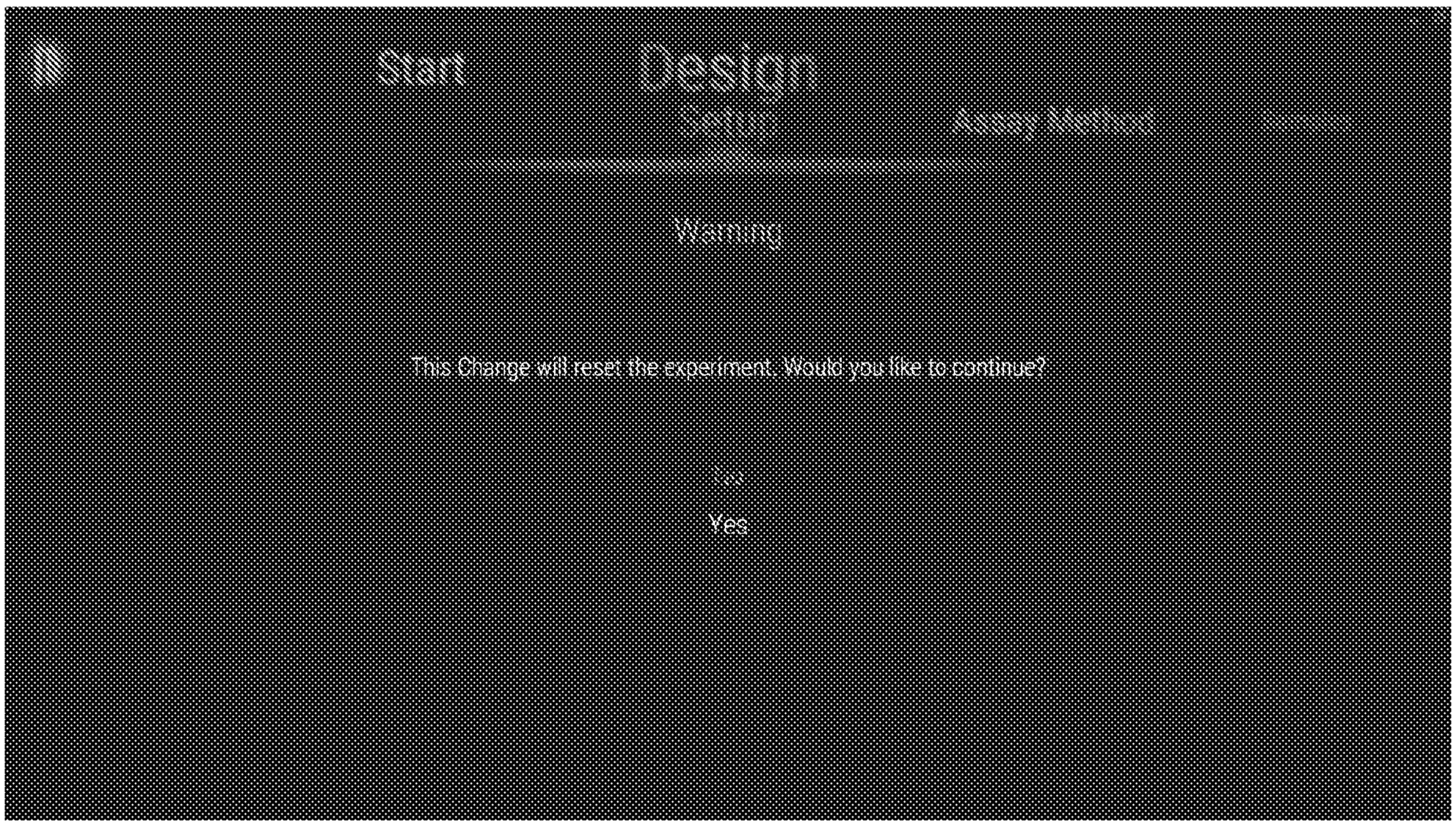


FIG. 64O

FIG. 64P

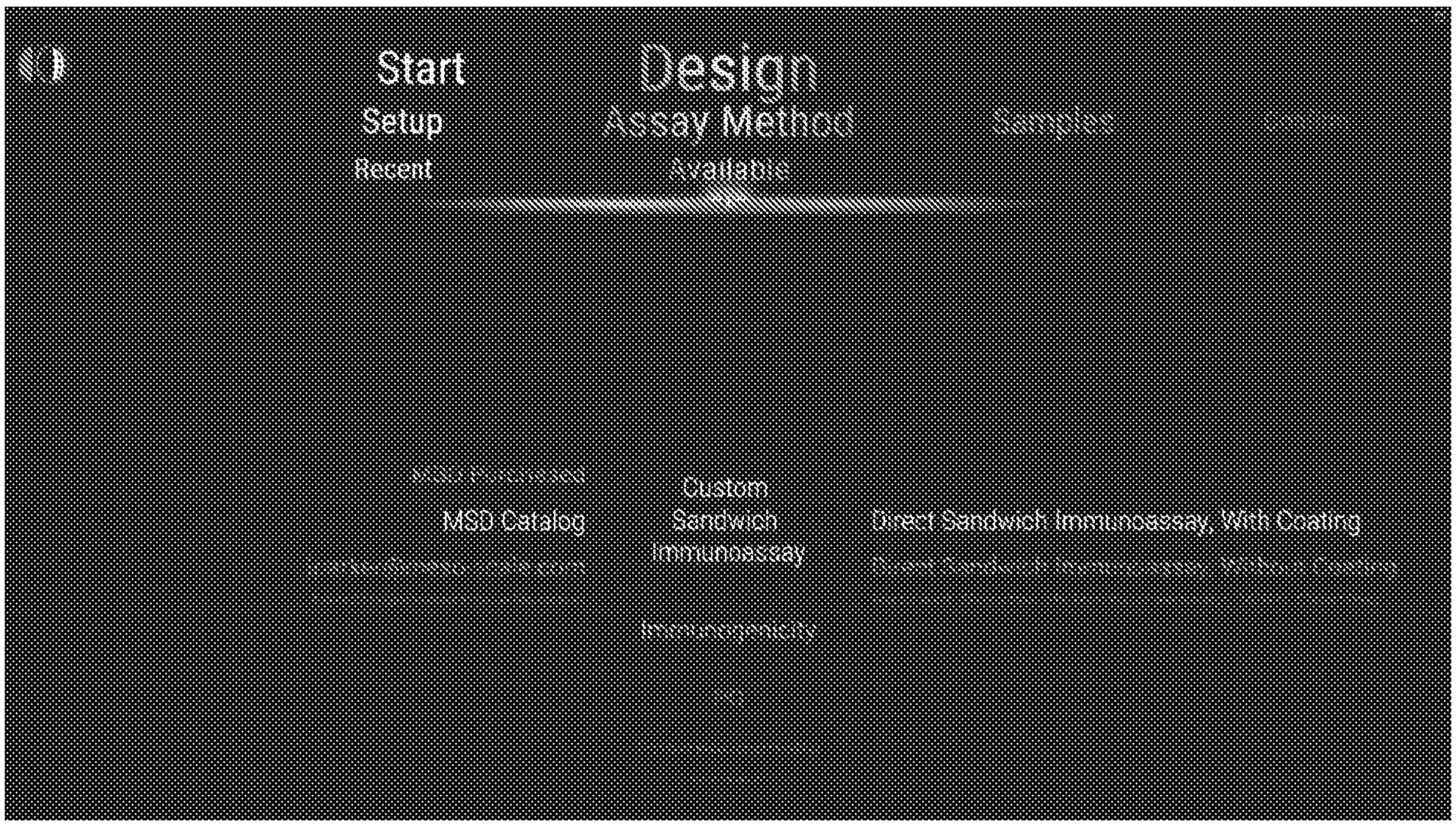


FIG. 64Q

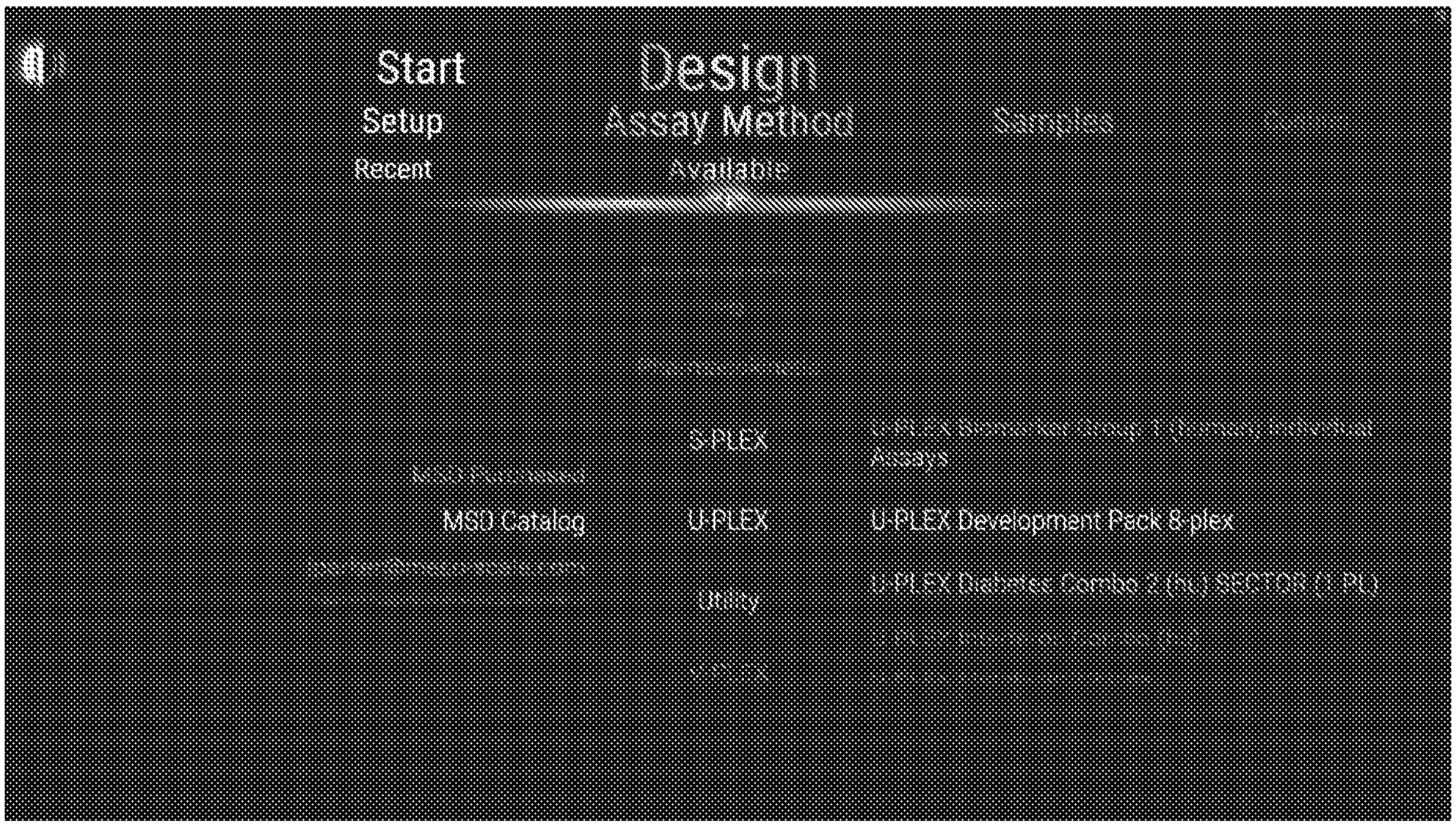


FIG. 64R

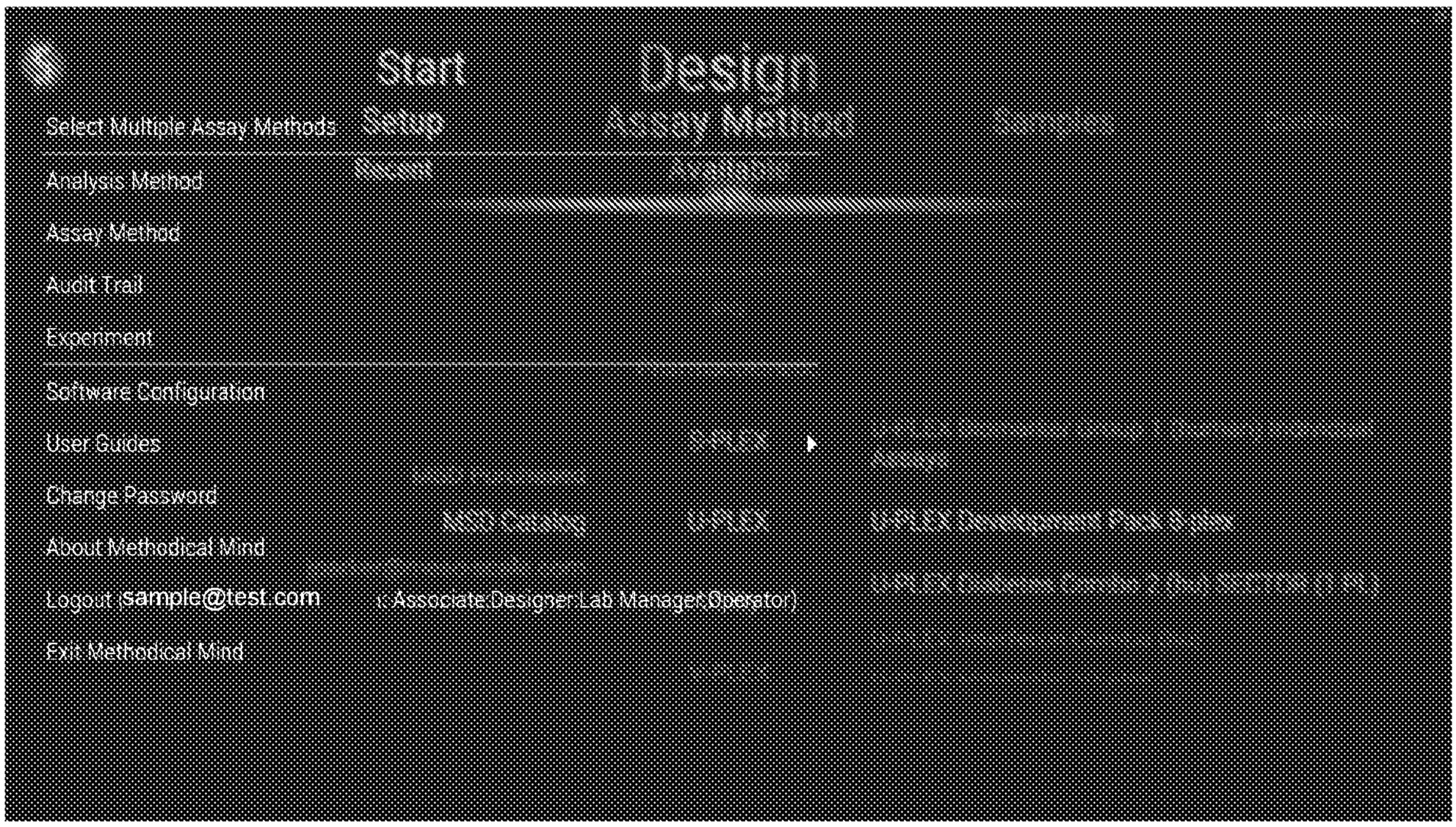


FIG. 64S

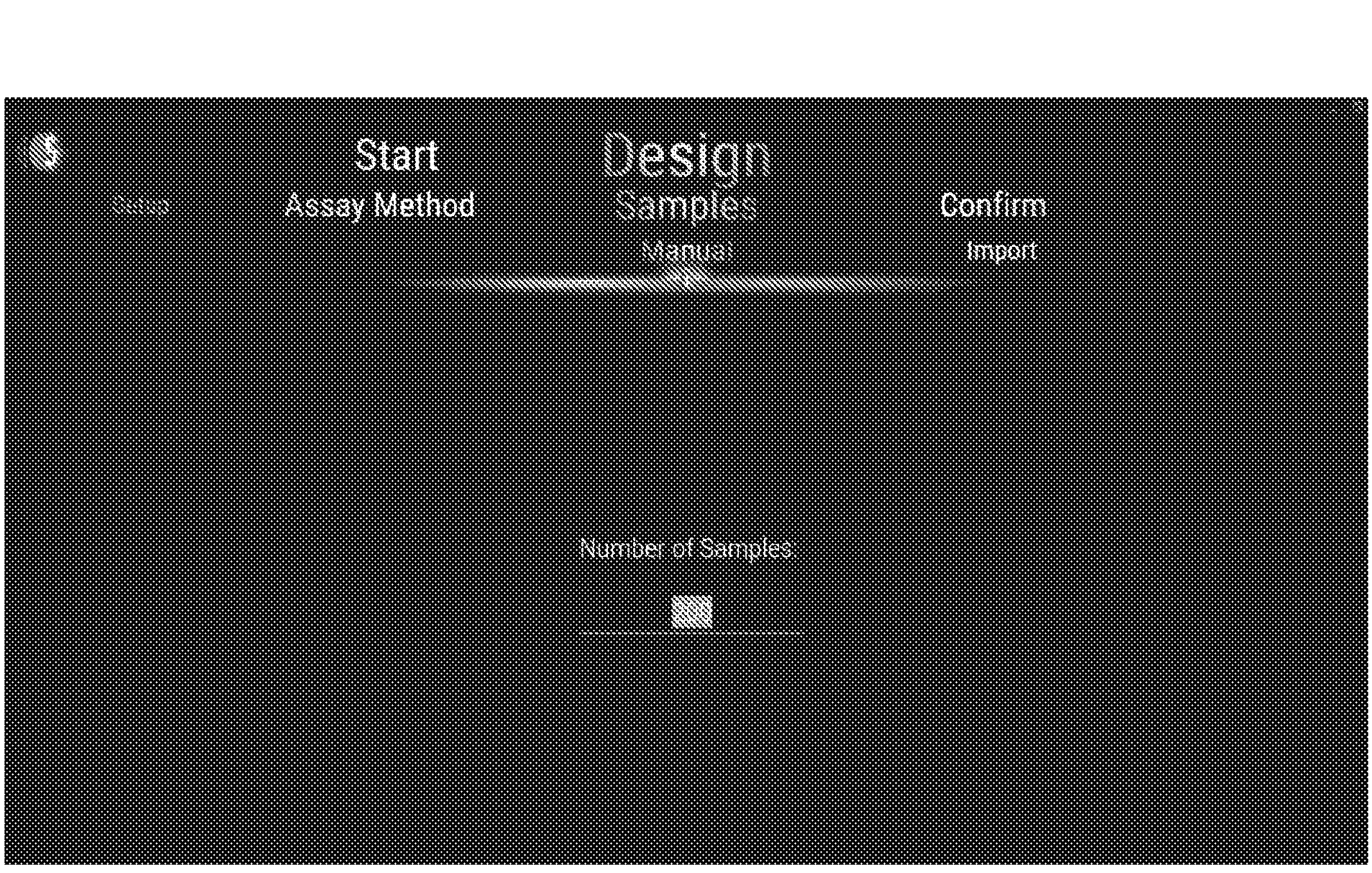


FIG. 64T

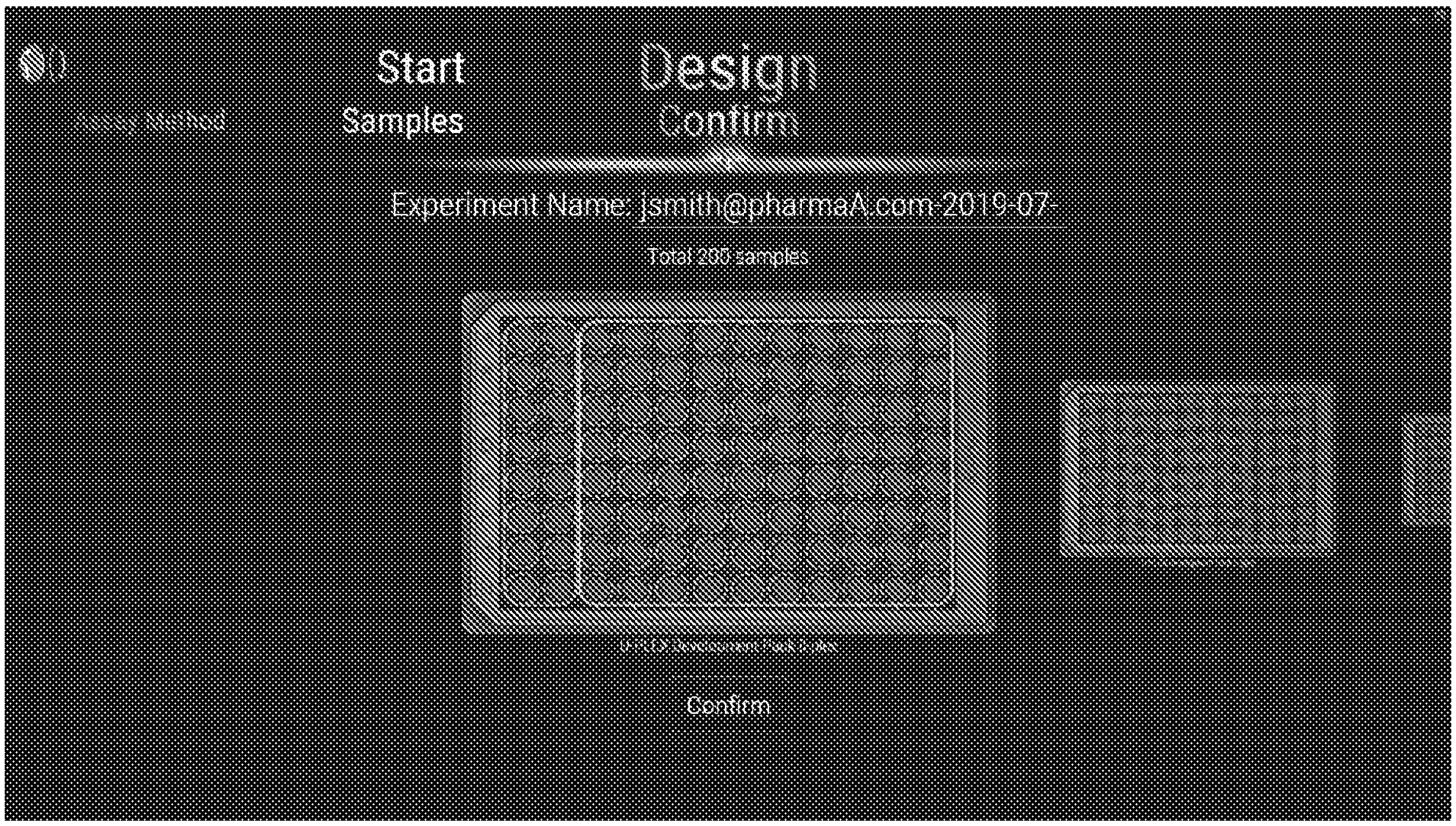


FIG. 64U

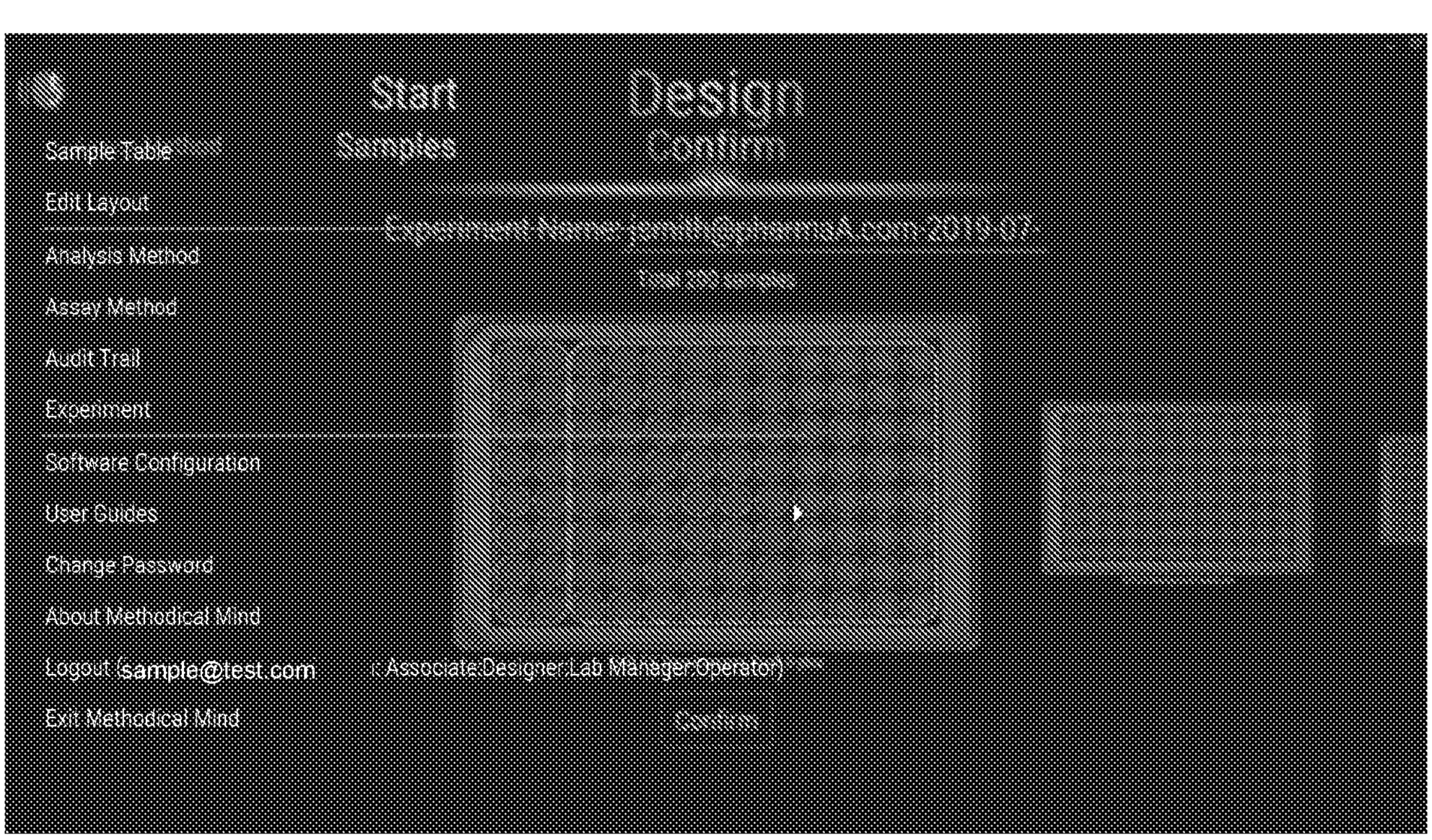


FIG. 64V

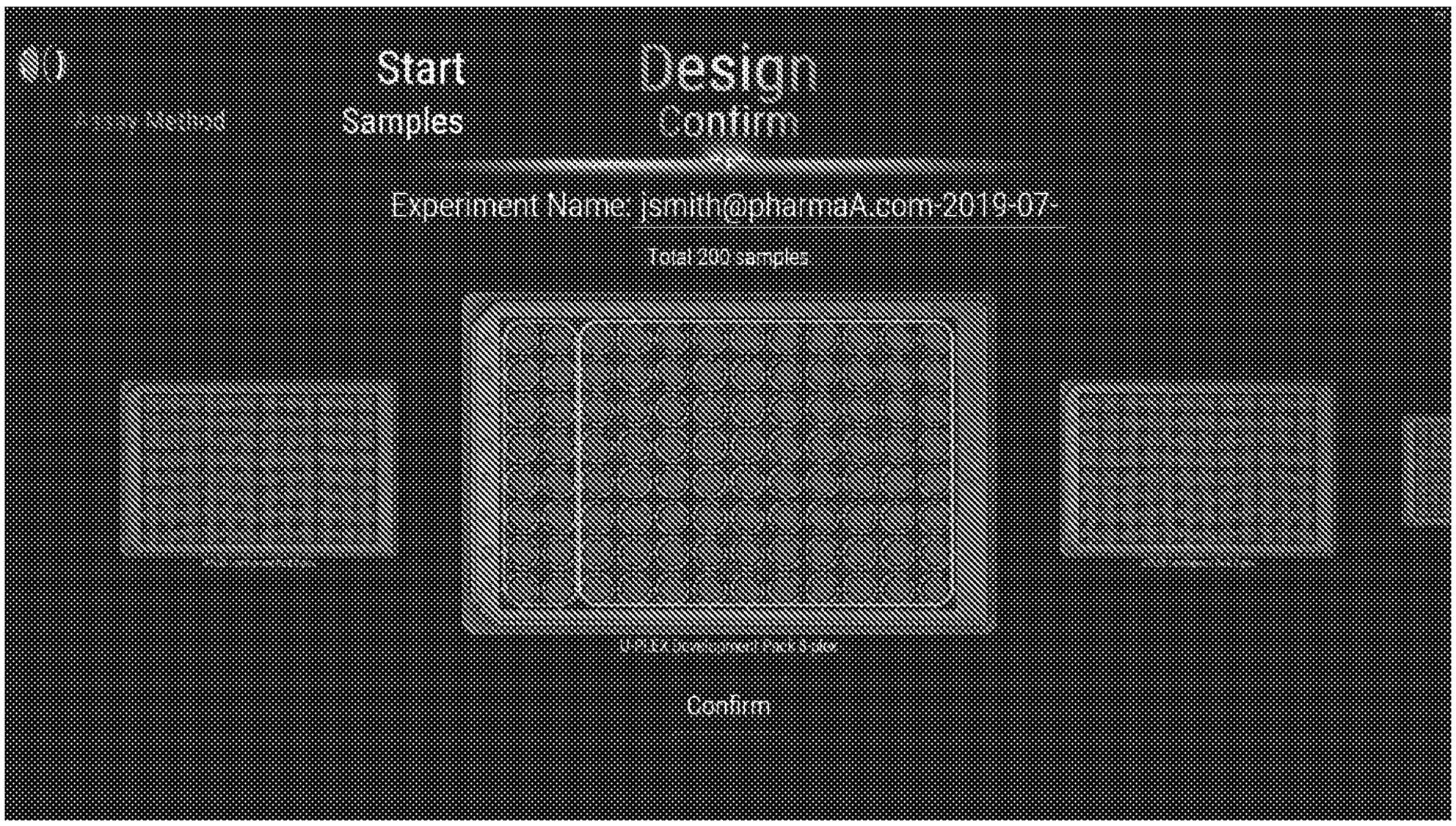


FIG. 64W

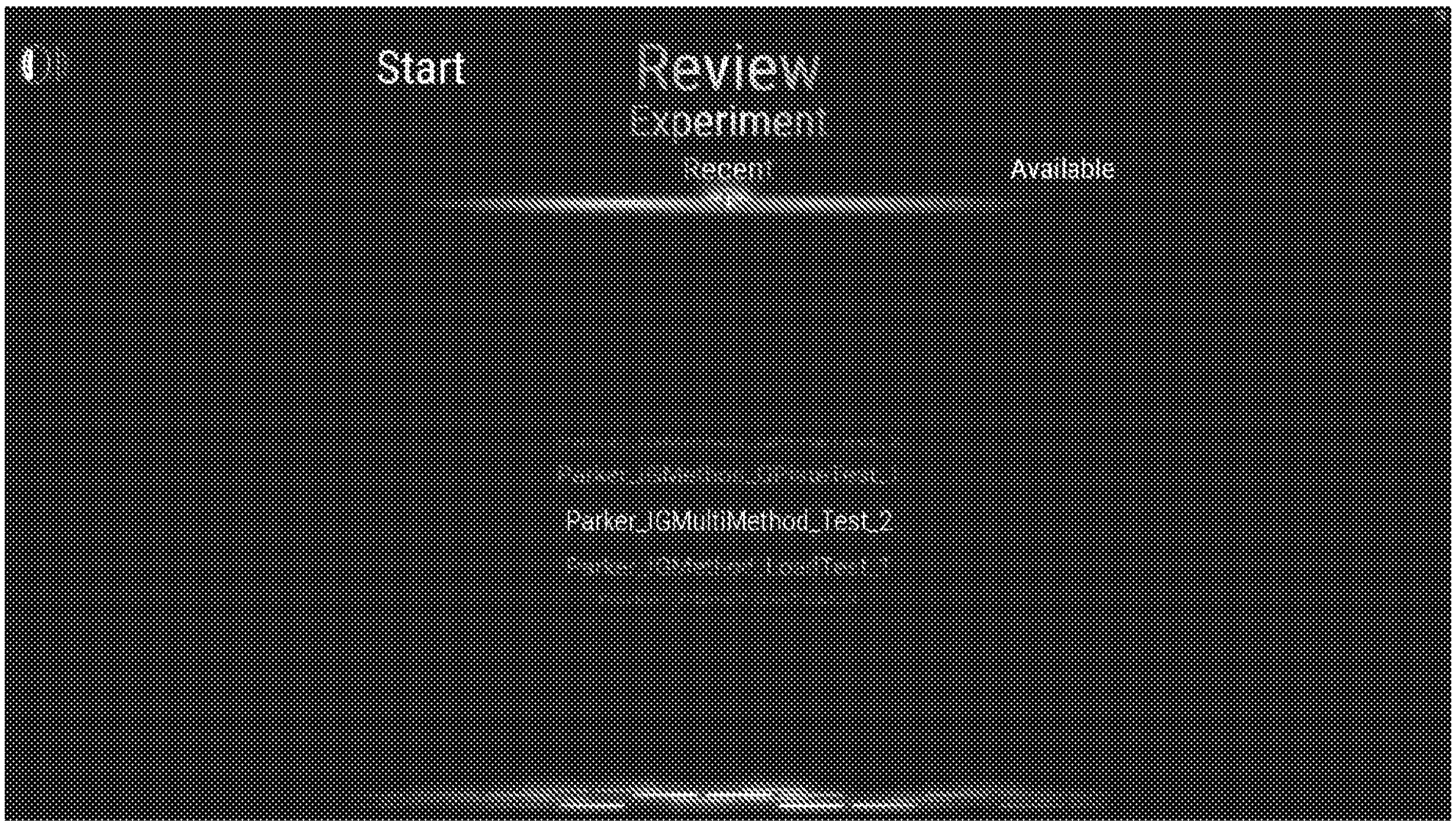


FIG. 64X

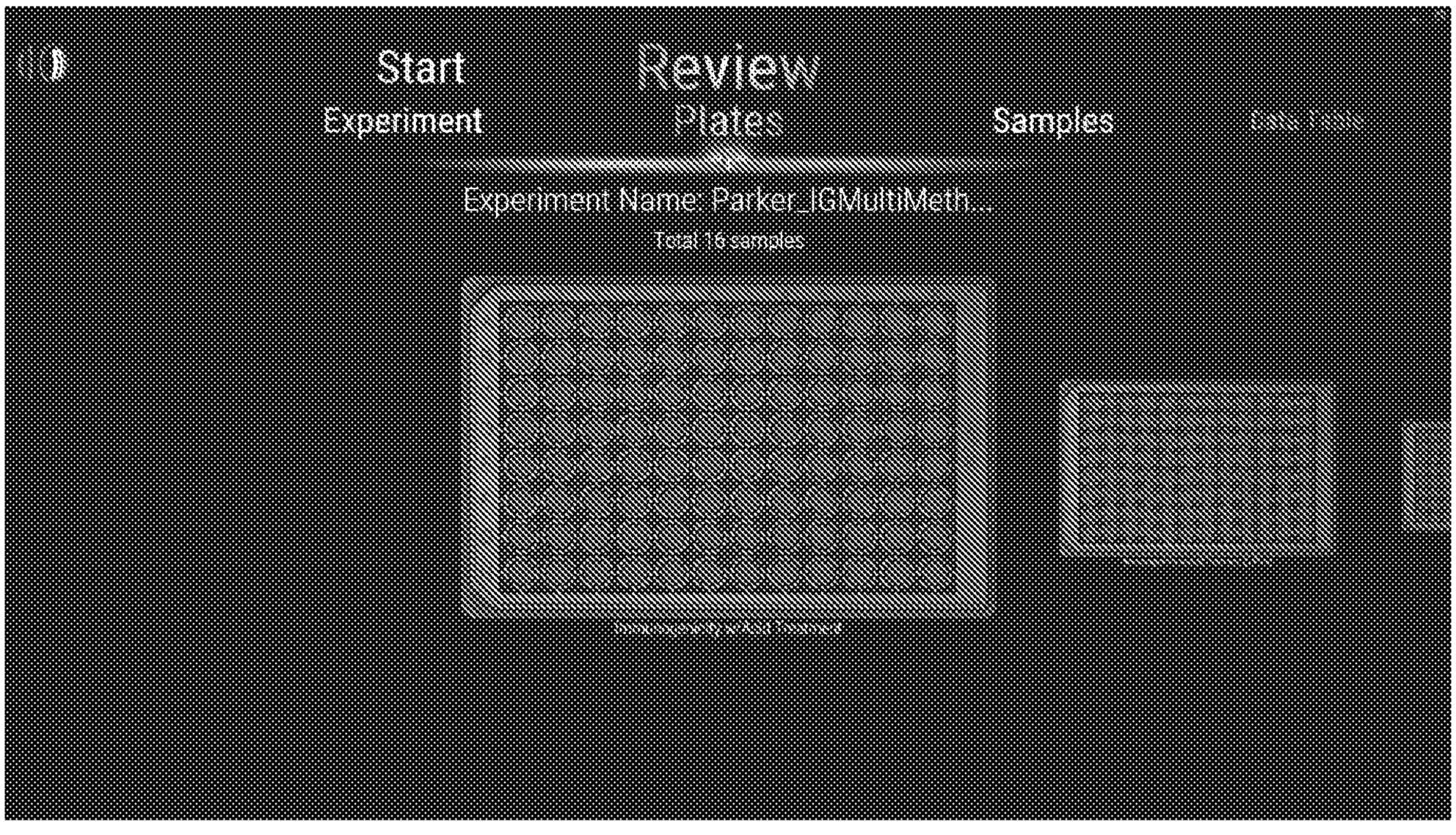


FIG. 64Y

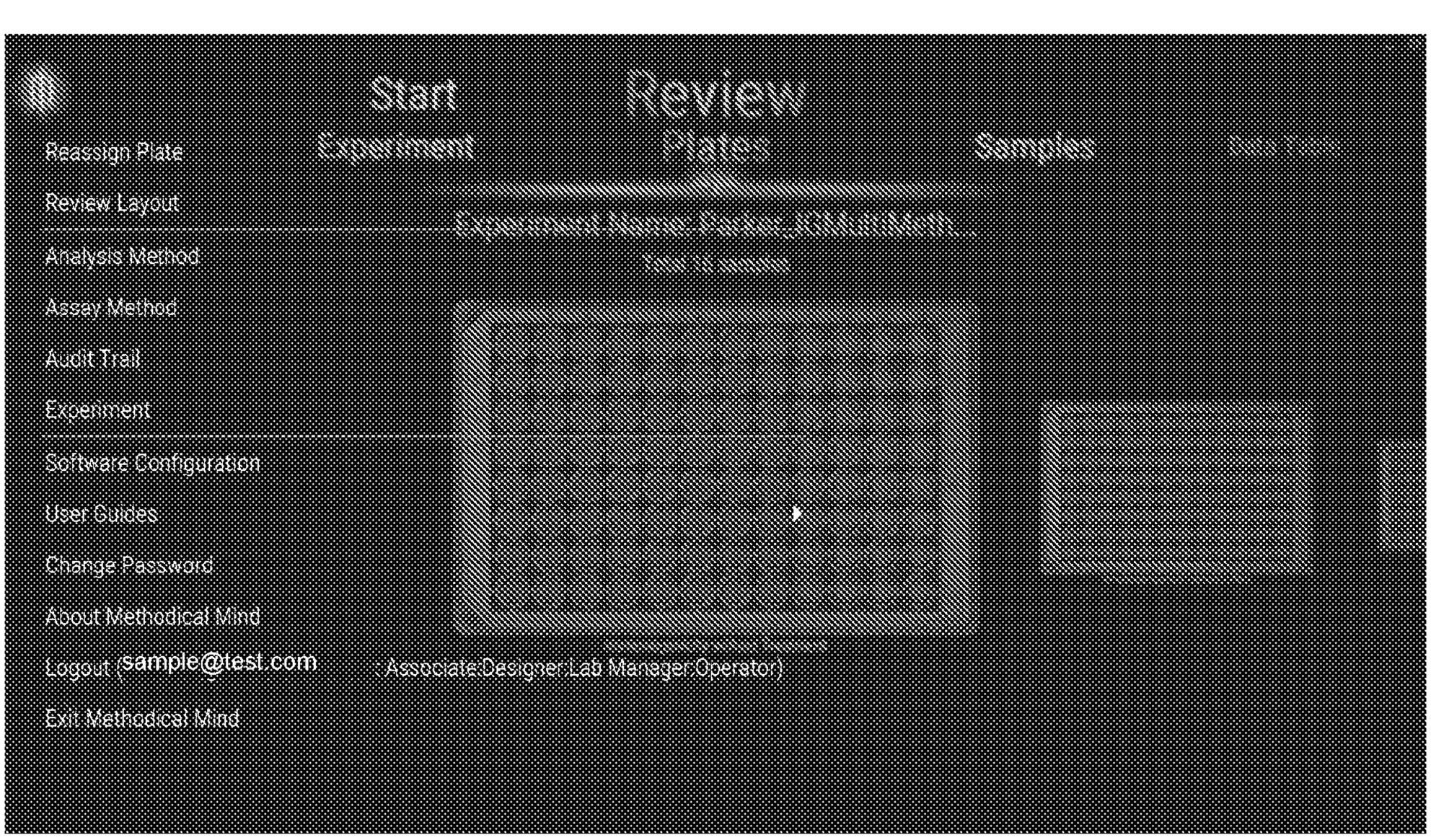


FIG. 64Z

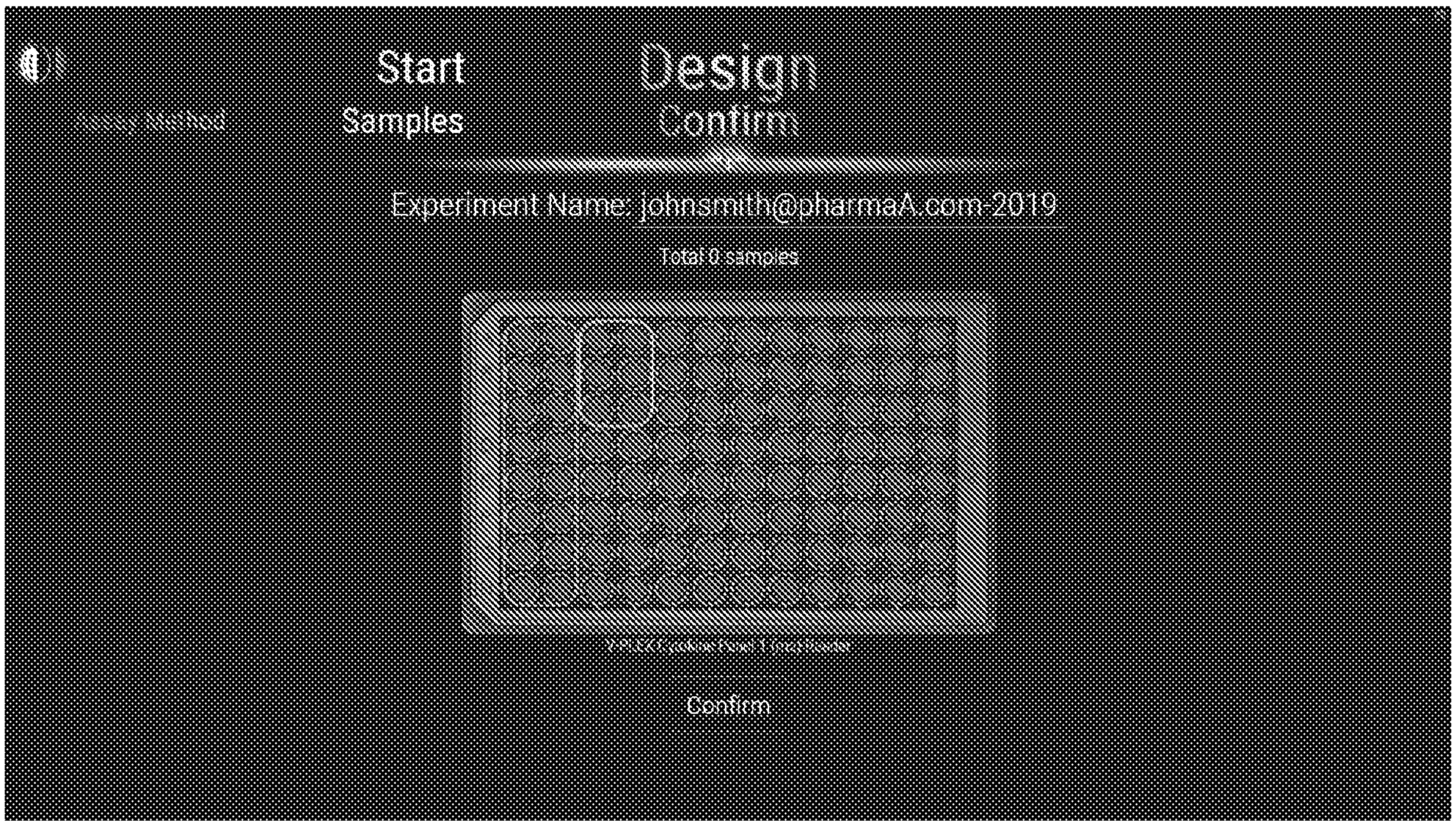


FIG. 64AA

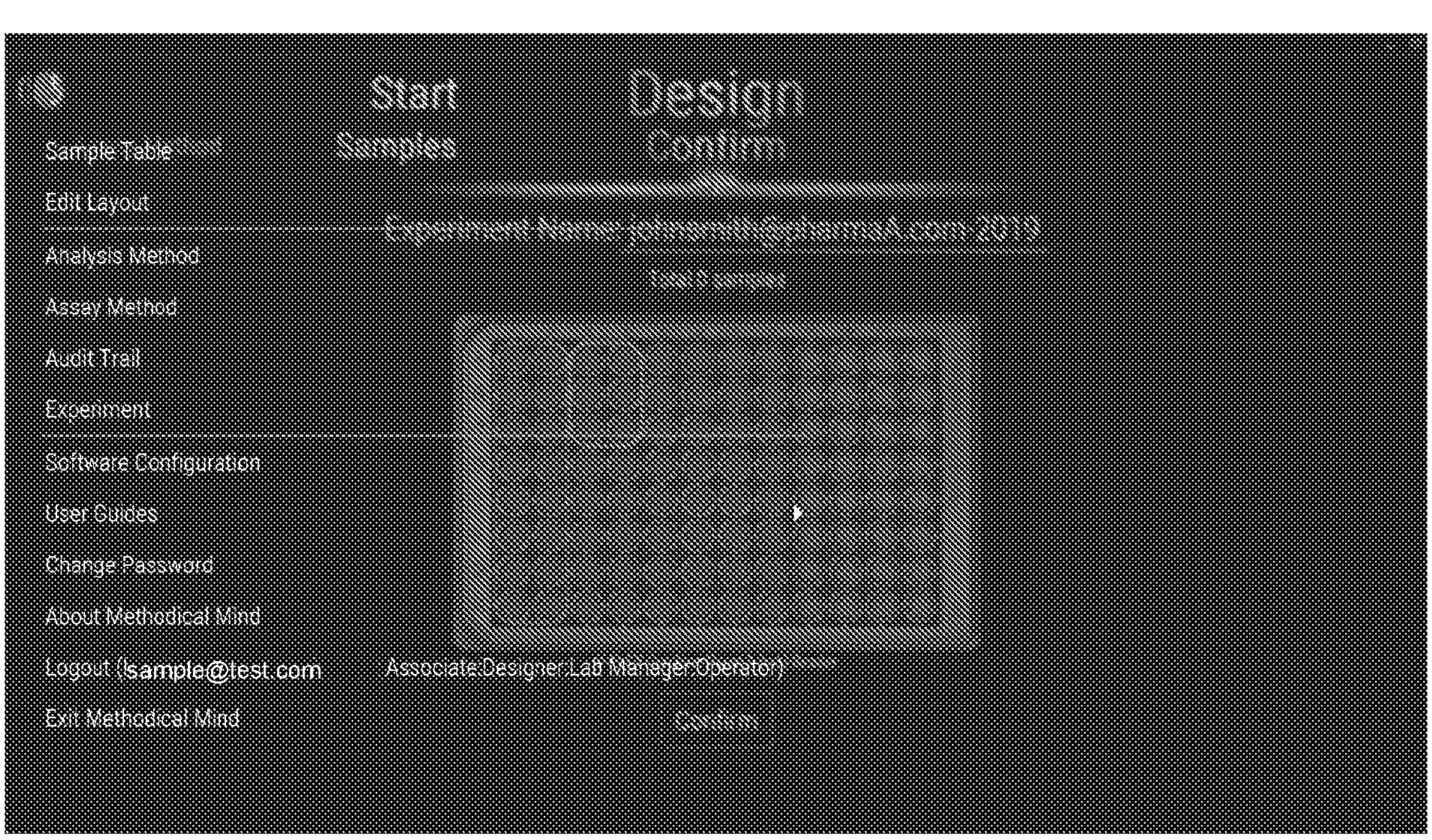


FIG. 64BB



FIG. 64CC

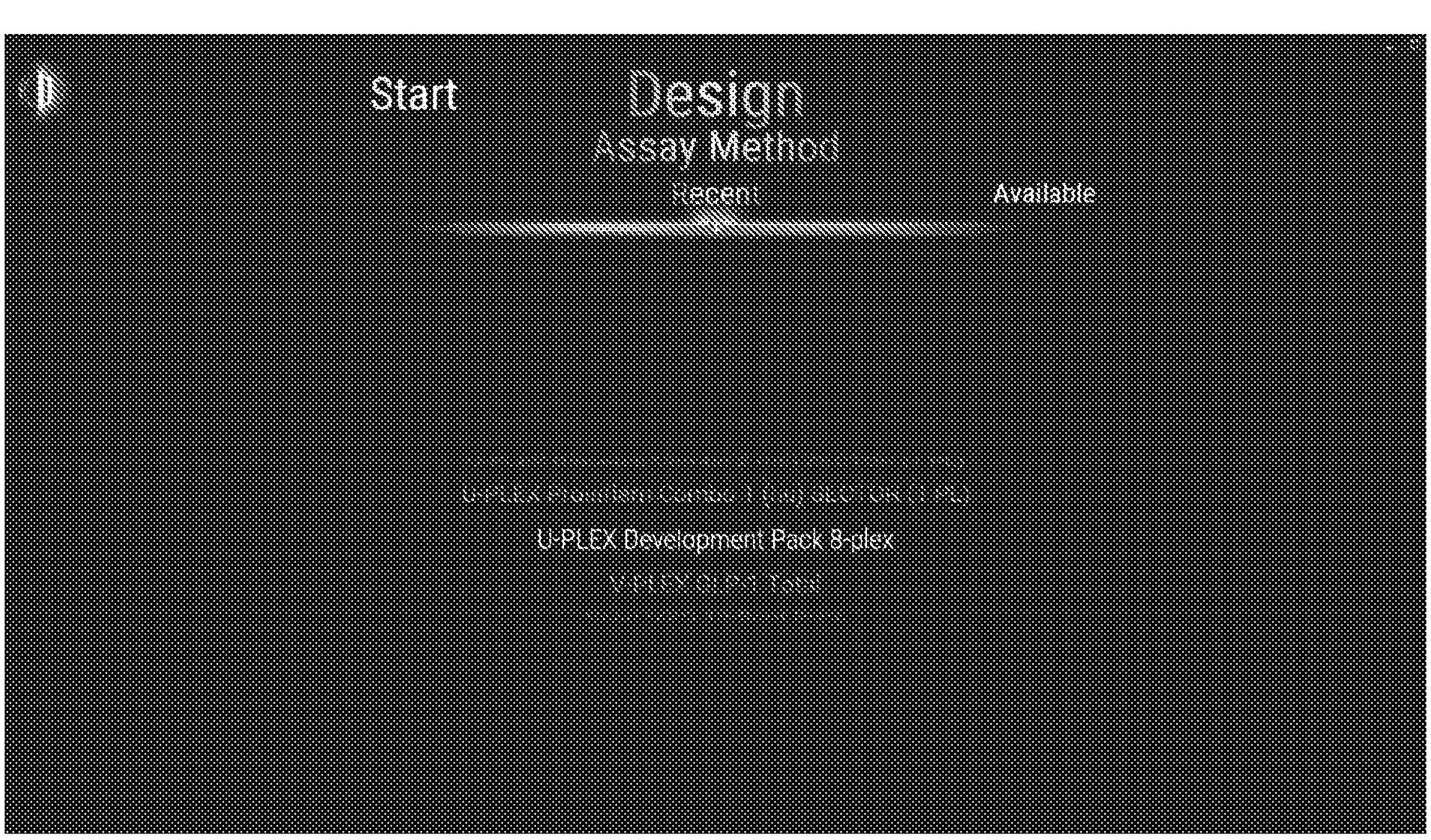


FIG. 64DD



FIG. 64EE



FIG. 64FF

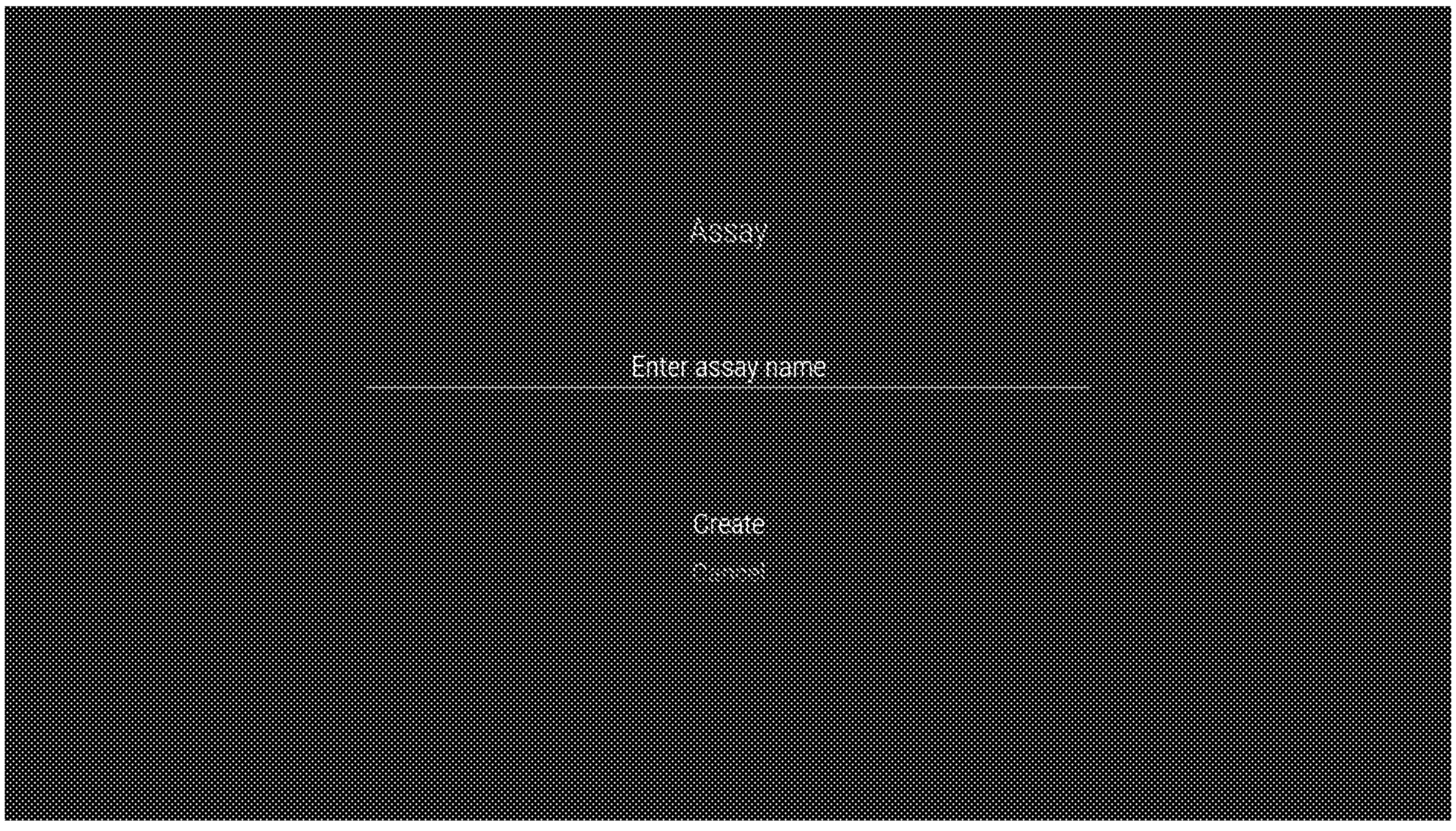


FIG. 64GG

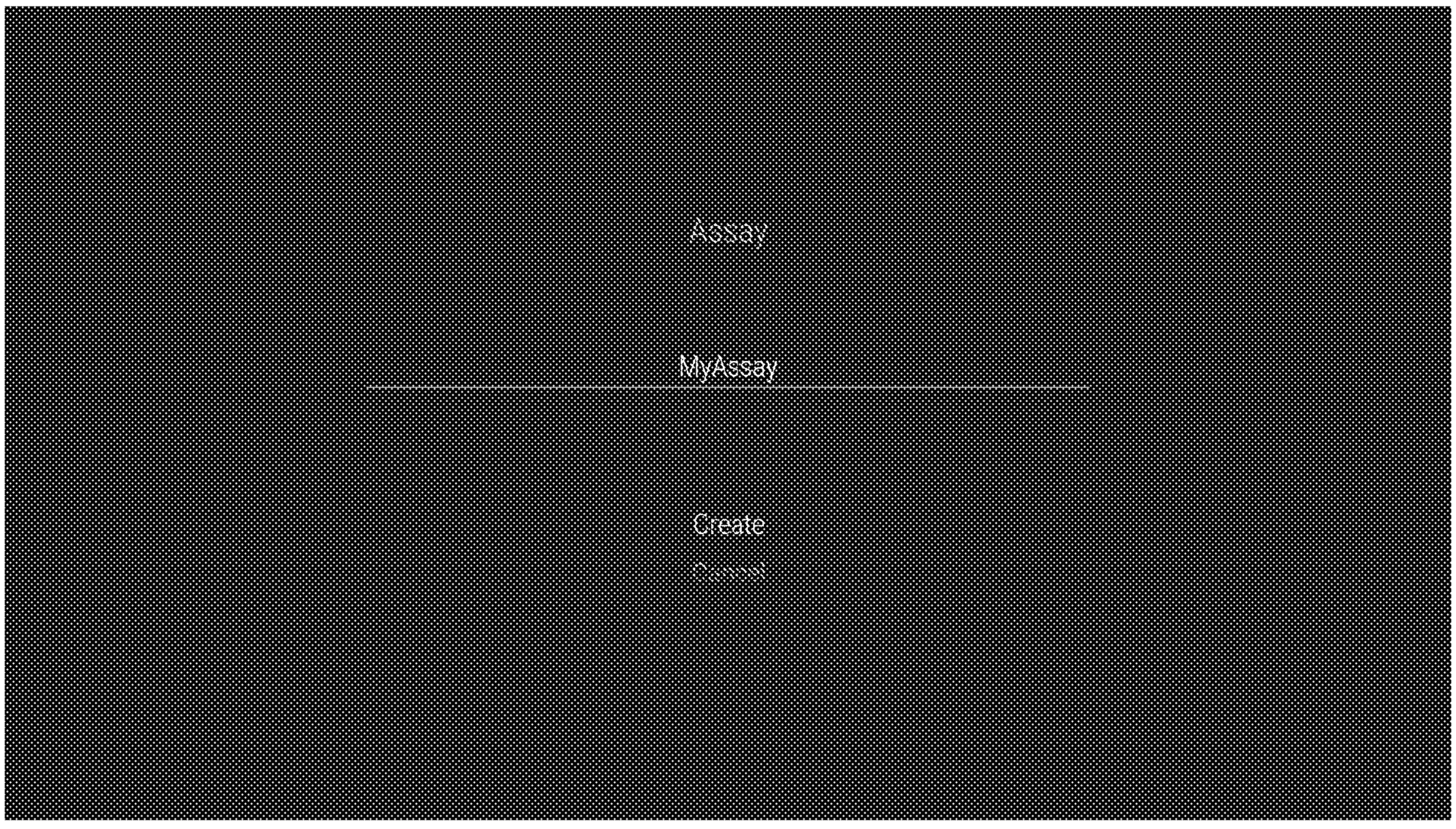


FIG. 64HH

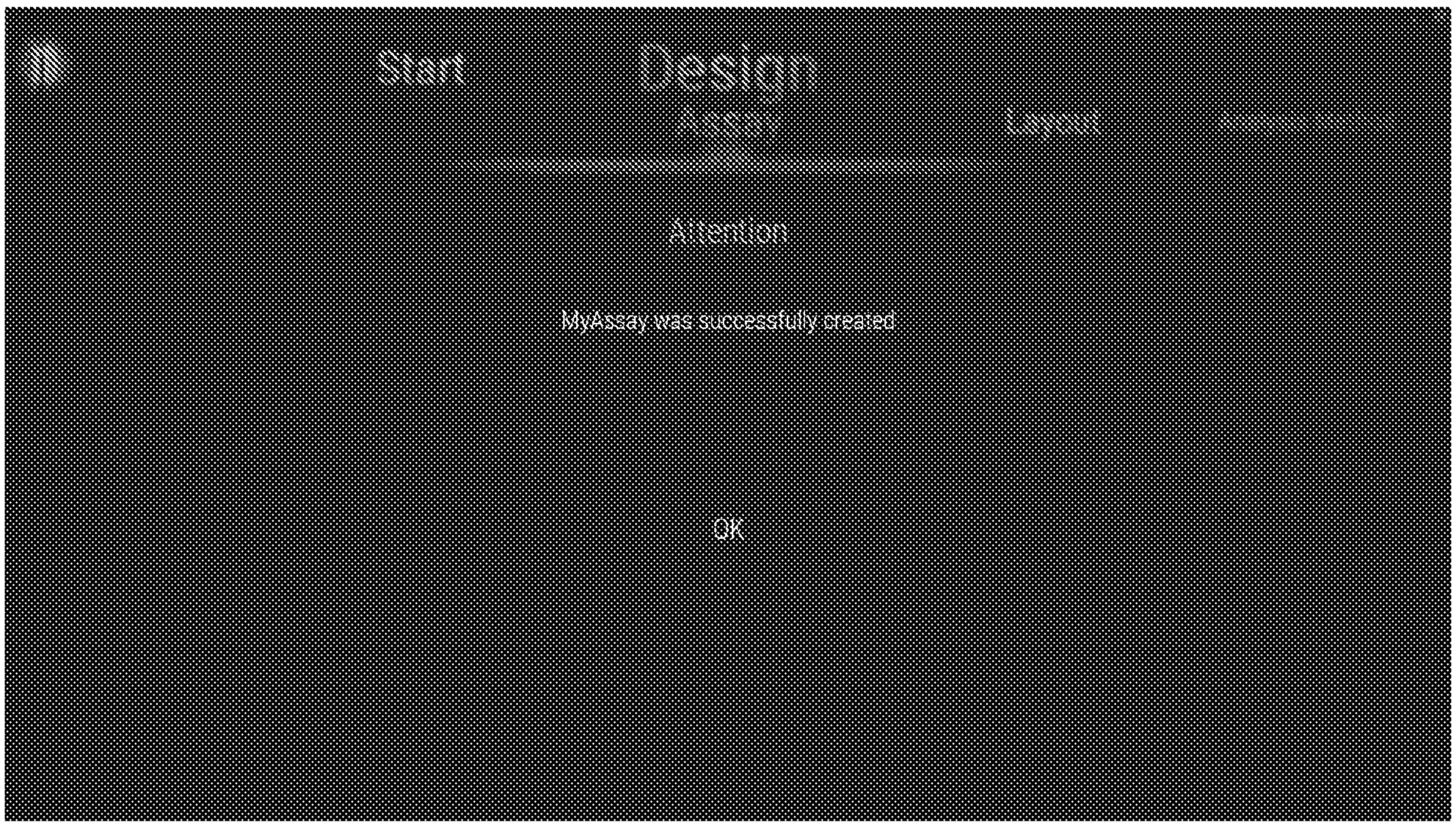


FIG. 64II



FIG. 64JJ

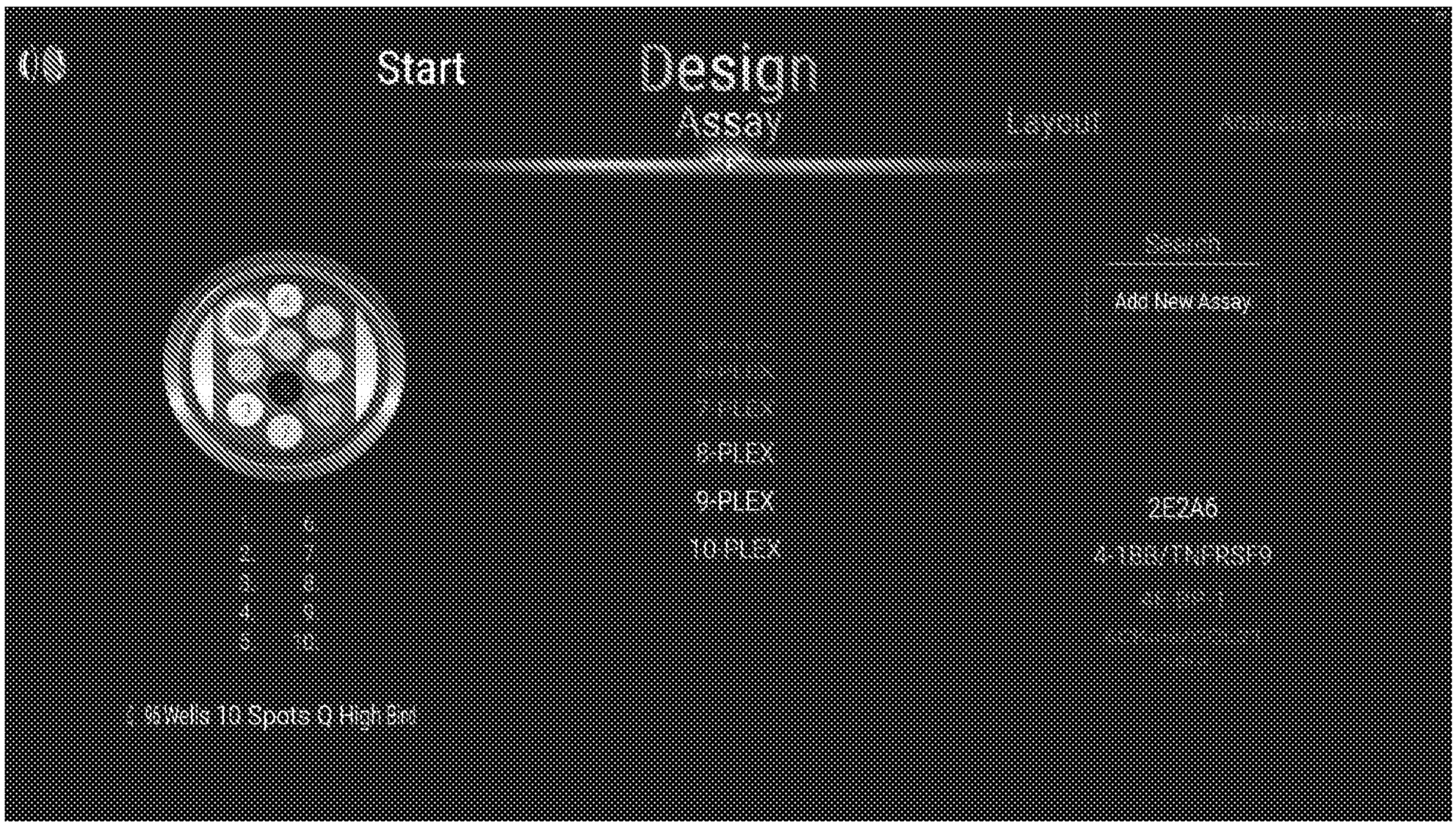


FIG. 64KK



FIG. 64LL



FIG. 64MM

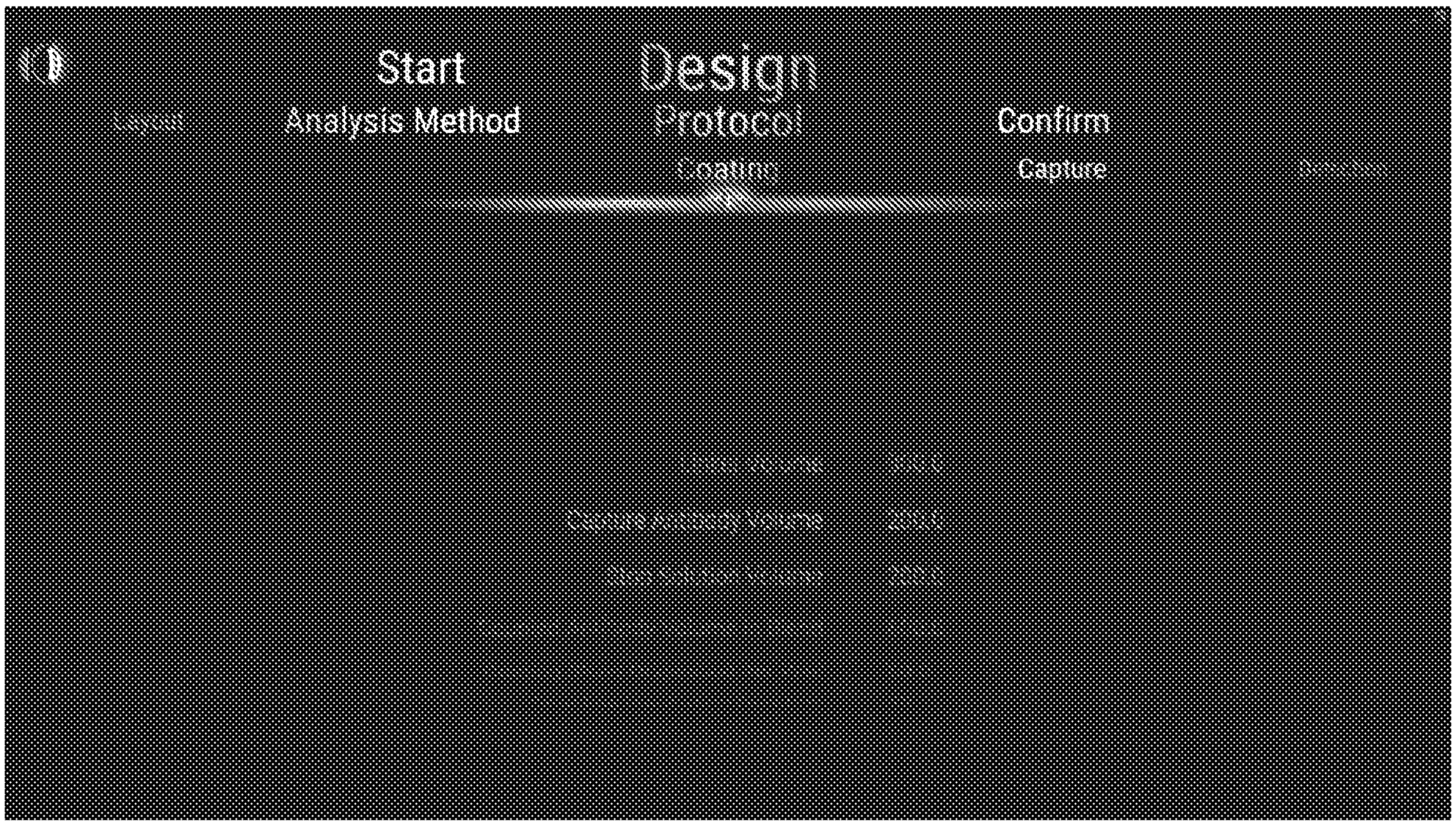


FIG. 64NN

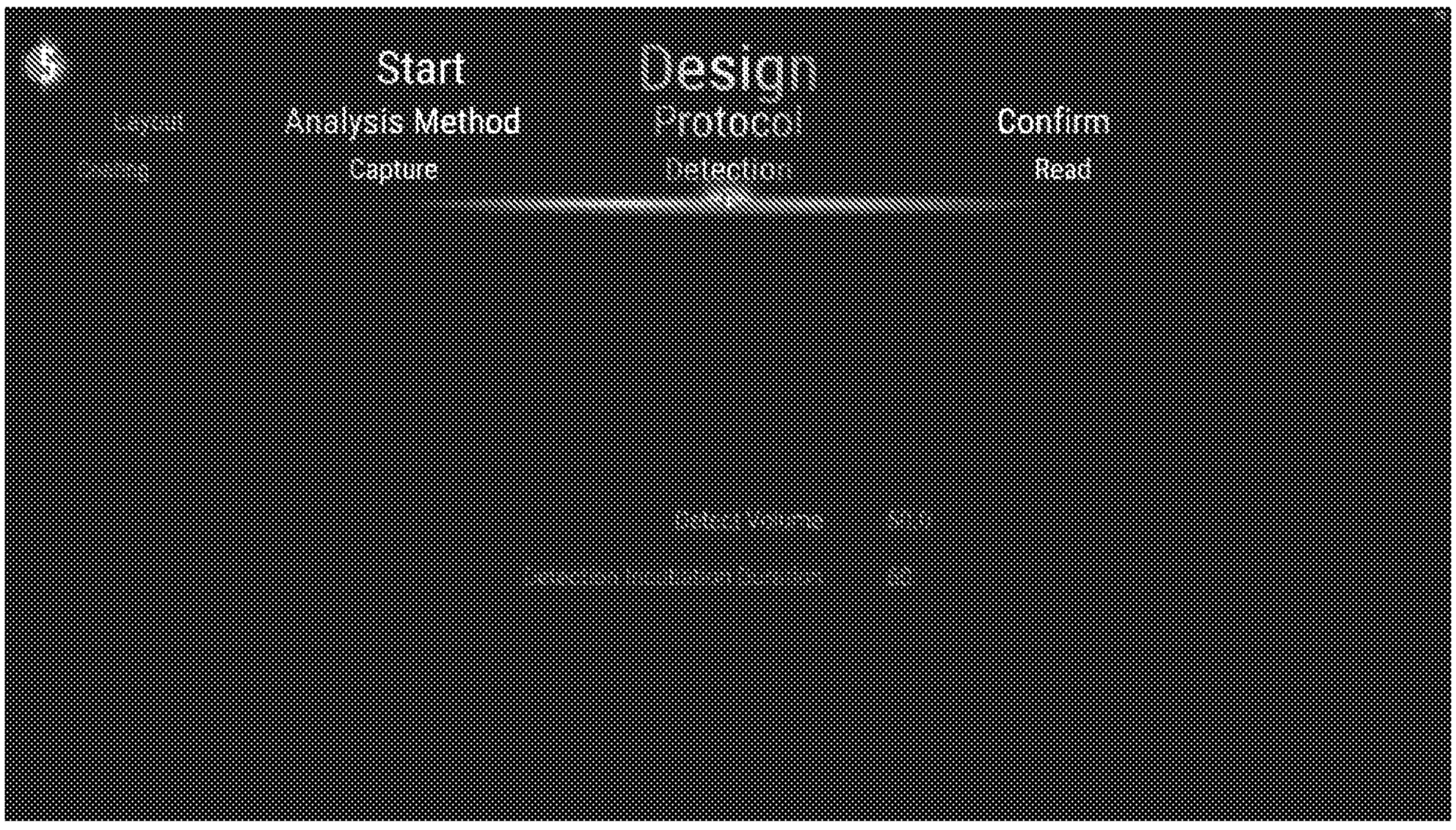


FIG. 64OO

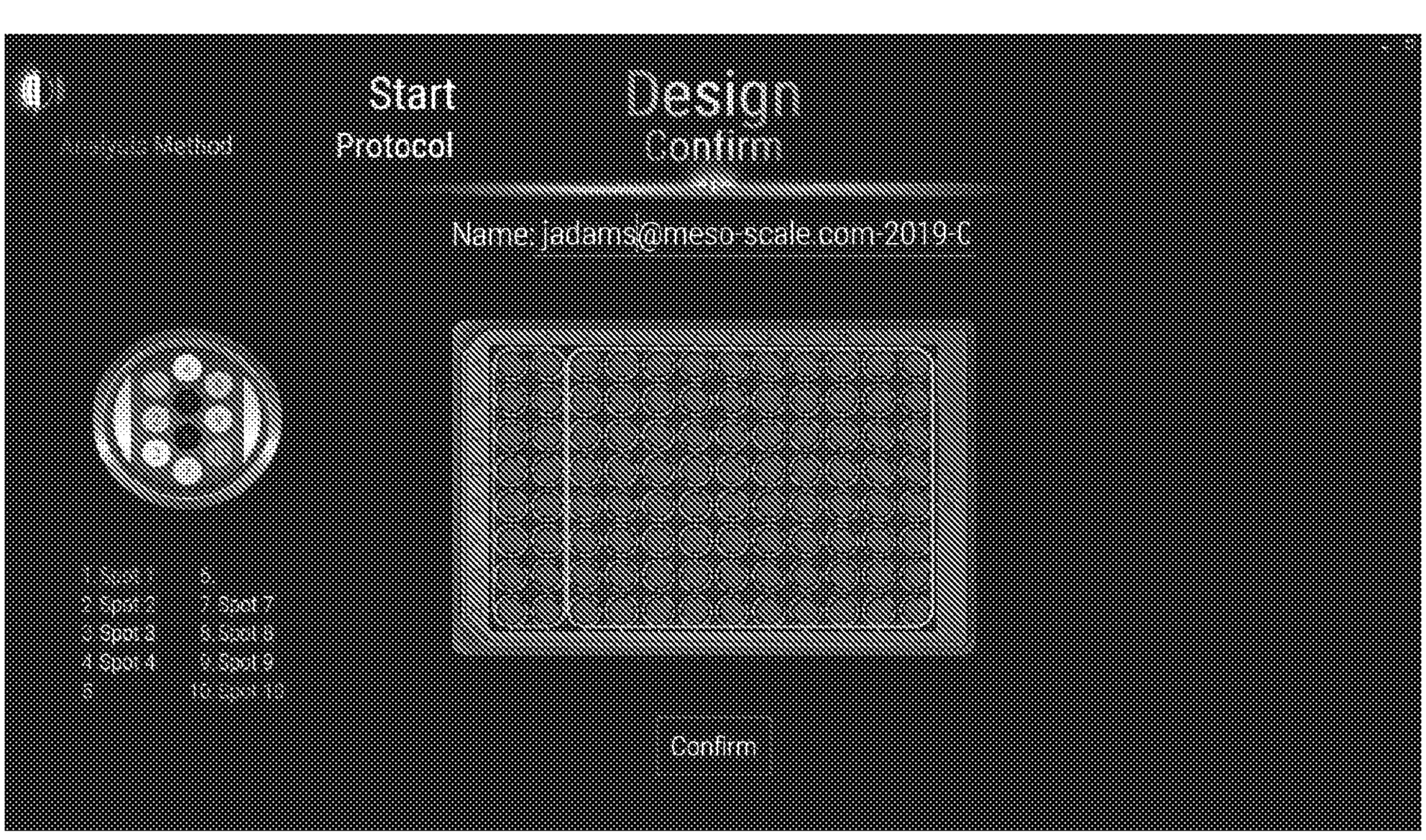


FIG. 64PP



FIG. 64QQ

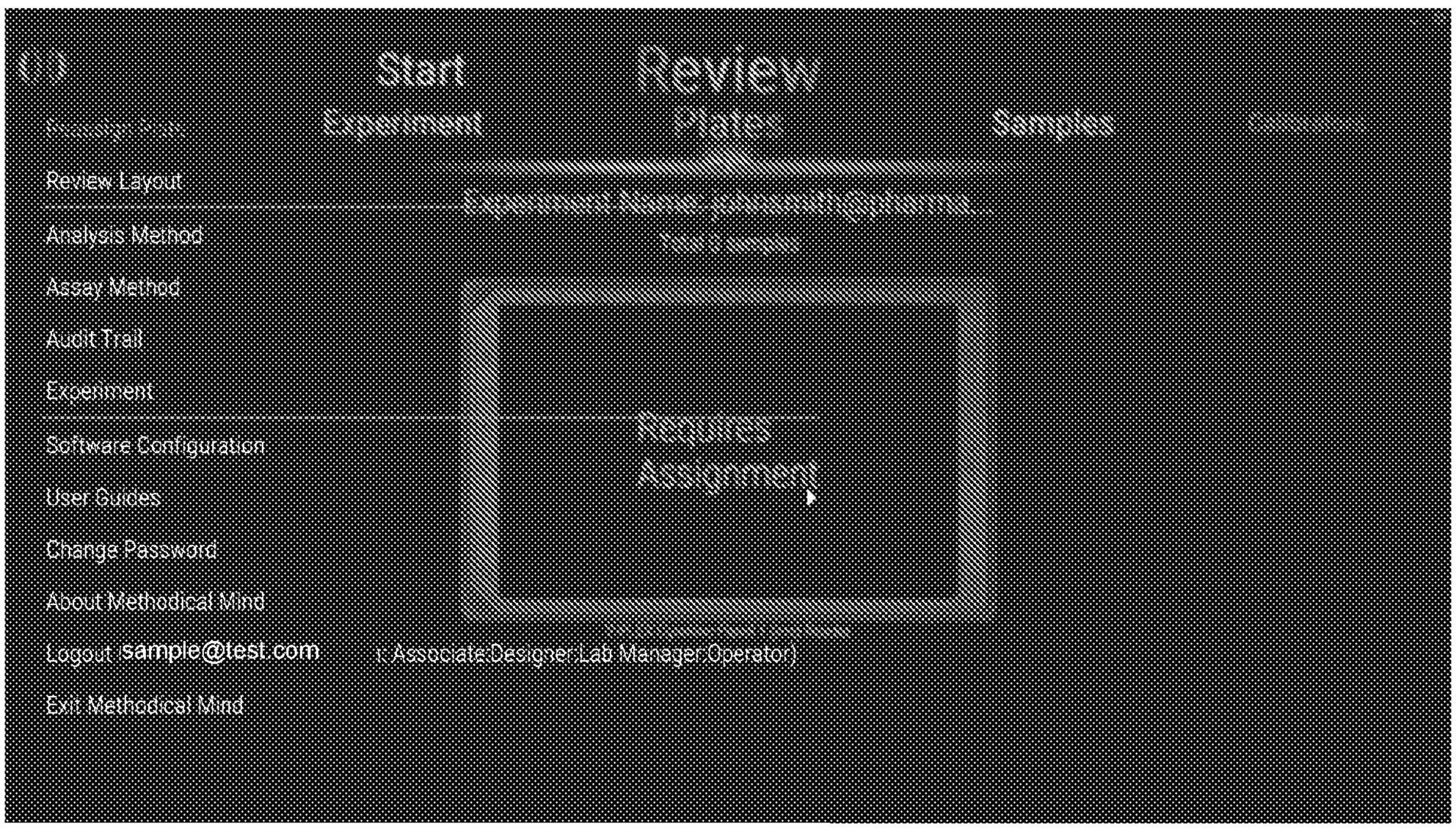


FIG. 64RR