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Johnson

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(54) **LOCATION BASED EXCHANGE PERMISSIONS**

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See application file for complete search history.

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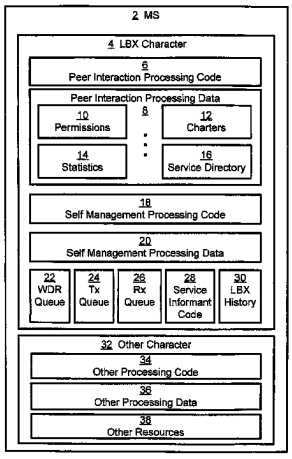
(57) **ABSTRACT**

Provided is a distributed system and method for enabling new and useful location dependent features and functionality to mobile data processing systems. Mobile data processing systems (MSs) interact with each other as peers in communications and interoperability. Data is shared between mobile data processing systems to carry out novel Location Based eXchanges (LBX) of data for new mobile applications. Information which is transmitted inbound to, transmitted outbound from, or is in process at, a mobile data processing system, is used to trigger processing of actions in accordance with user configured permissions, charters, and other configurations. In a preferred embodiment, a user configurable platform is provided for quickly building well behaving LBX applications at MSs and across a plurality of interoperating MSs.

46 Claims, 259 Drawing Sheets



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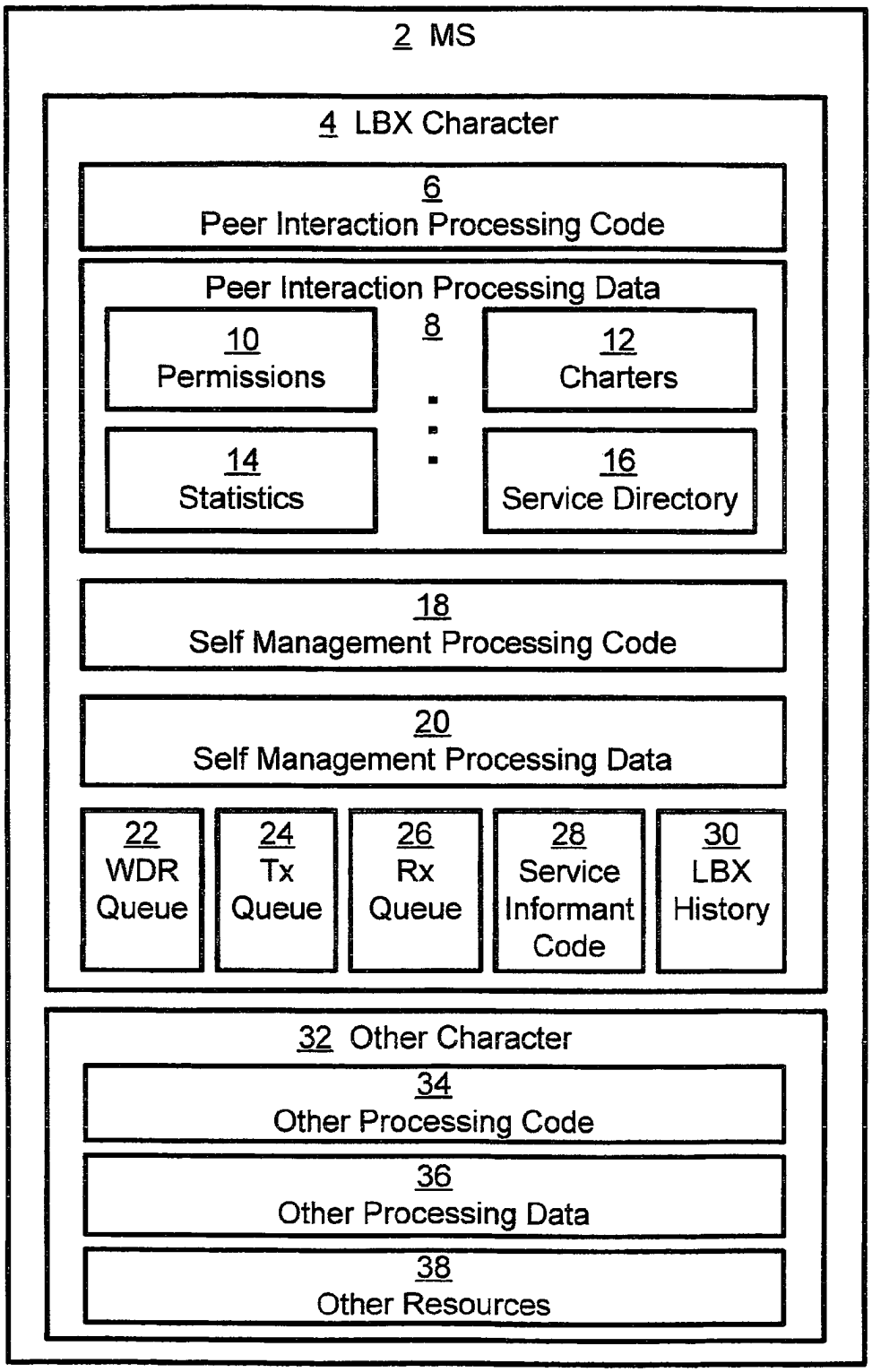

2 MS
4 LBX Character
6
Peer Interaction Processing Code
Peer Interaction Processing Data
8
10
Permissions
12
Charters
14
Statistics
16
Service Directory
18
Self Management Processing Code
20
Self Management Processing Data
22
WDR
Queue
24
Tx
Queue
26
Rx
Queue
28
Service
Informant
Code
30
LBX
History
32 Other Character
34
Other Processing Code
36
Other Processing Data
38
Other Resources

Fig. 1A

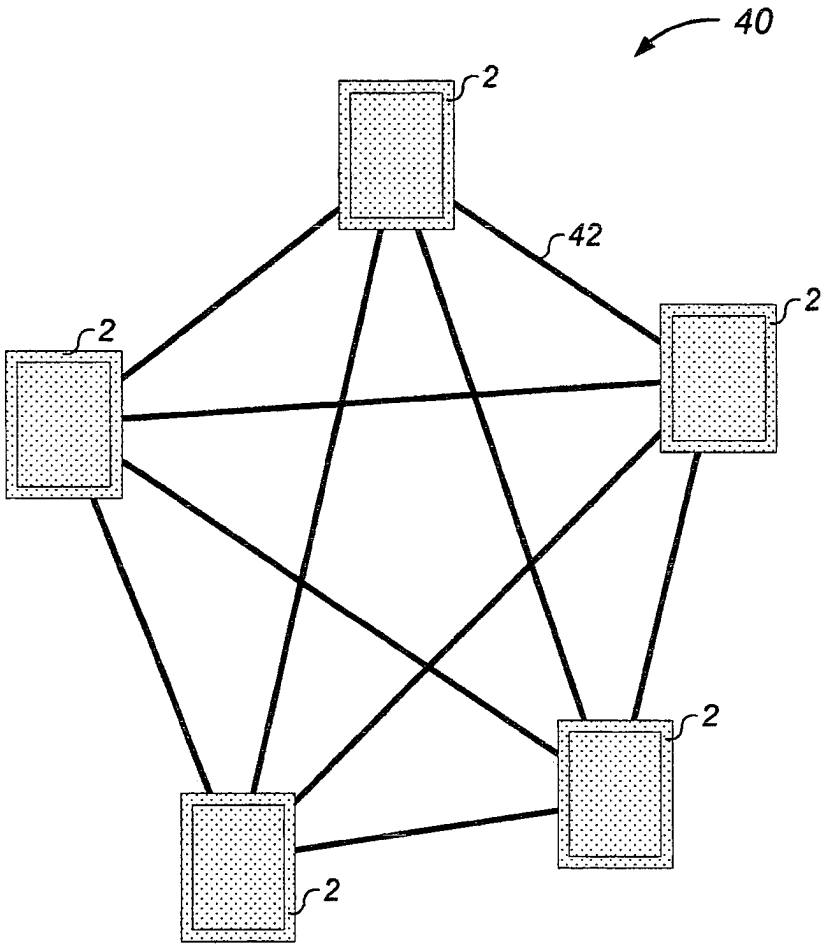


Fig. 1B

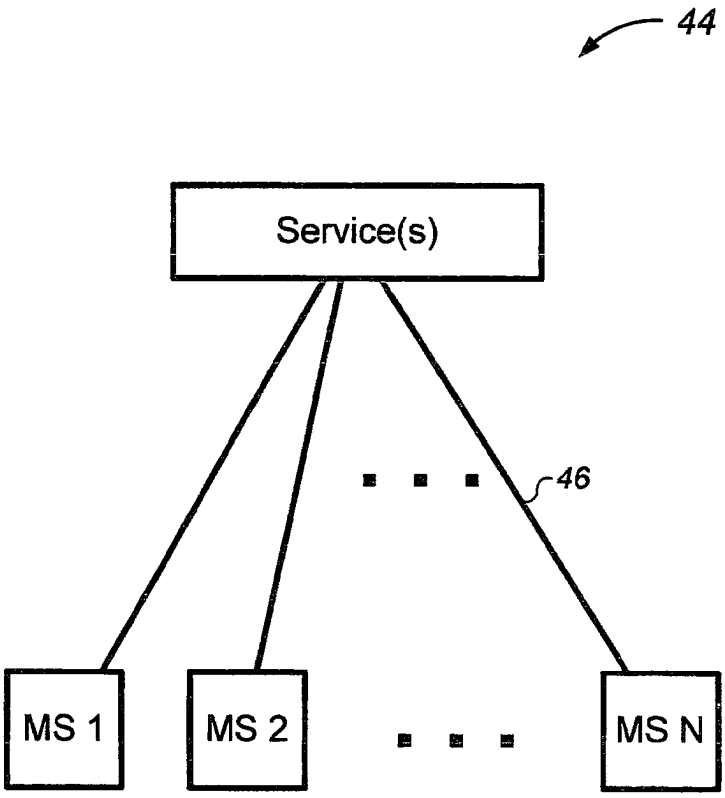


Fig. 1C

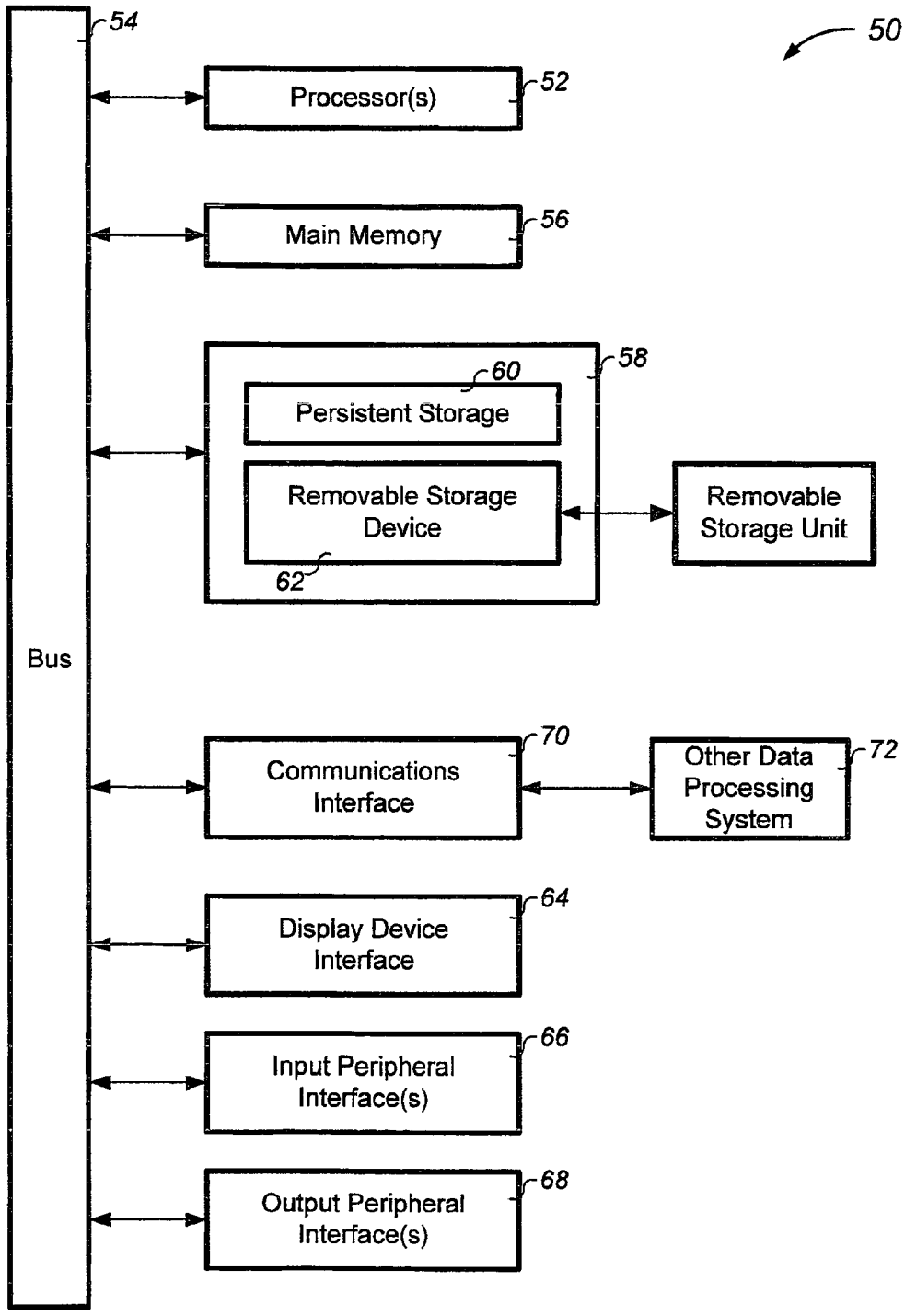
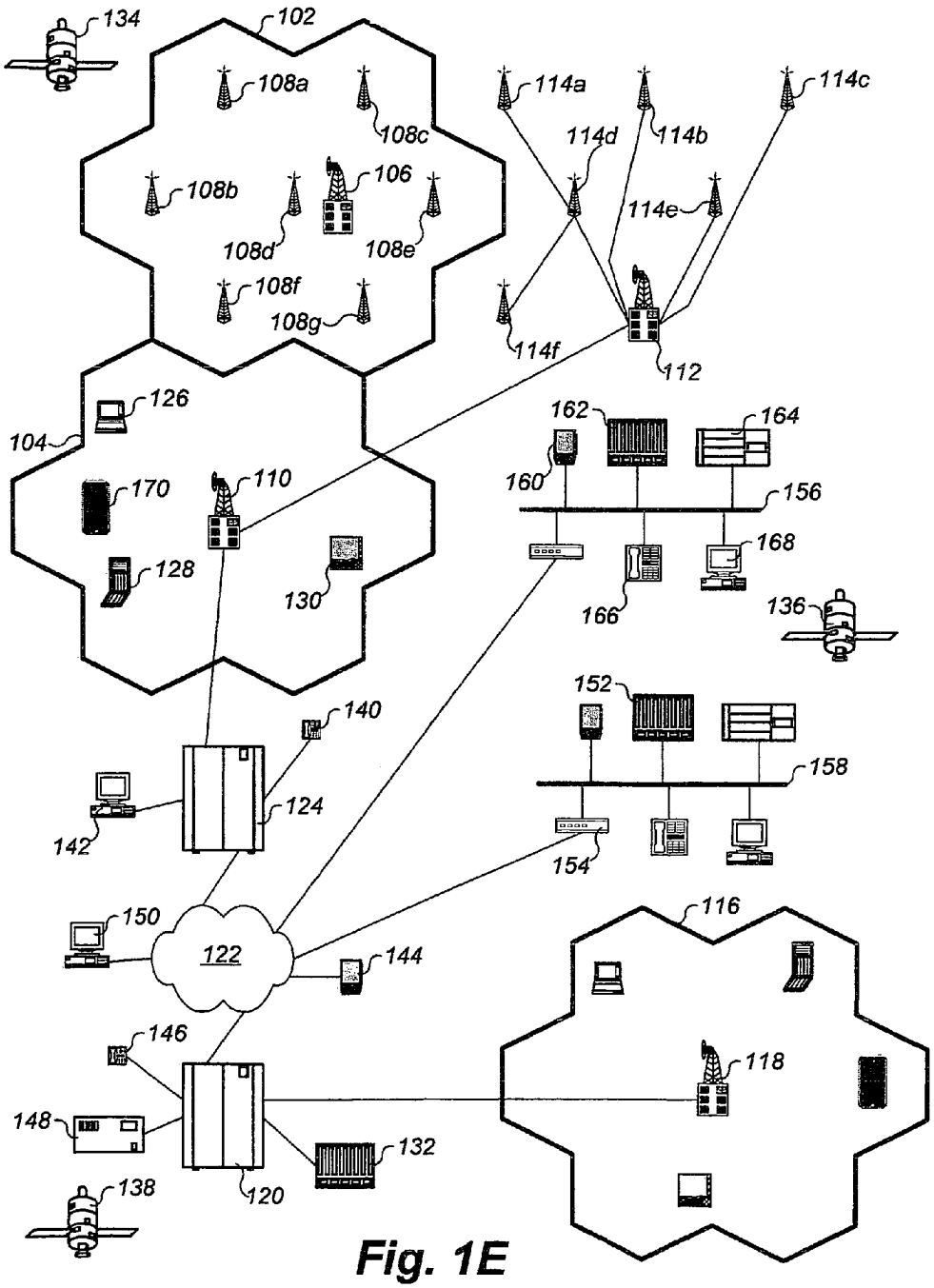

50
54
Processor(s)
52
Main Memory
56
58
60
Persistent Storage
Removable Storage Device
62
Removable Storage Unit
Bus
70
Communications Interface
Other Data Processing System
72
64
Display Device Interface
66
Input Peripheral Interface(s)
68
Output Peripheral Interface(s)

Fig. 1D


134
102
108a
108c
114a
114c
114d
114b
108b
106
114e
108d
108e
108f
108g
114f
112
126
104
162
164
160
156
170
110
168
128
130
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120
138

Fig. 1E

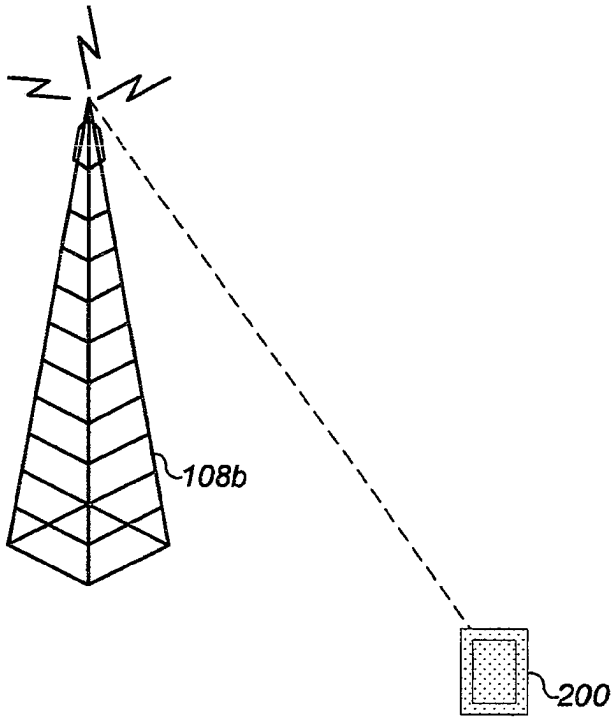


Fig. 2A

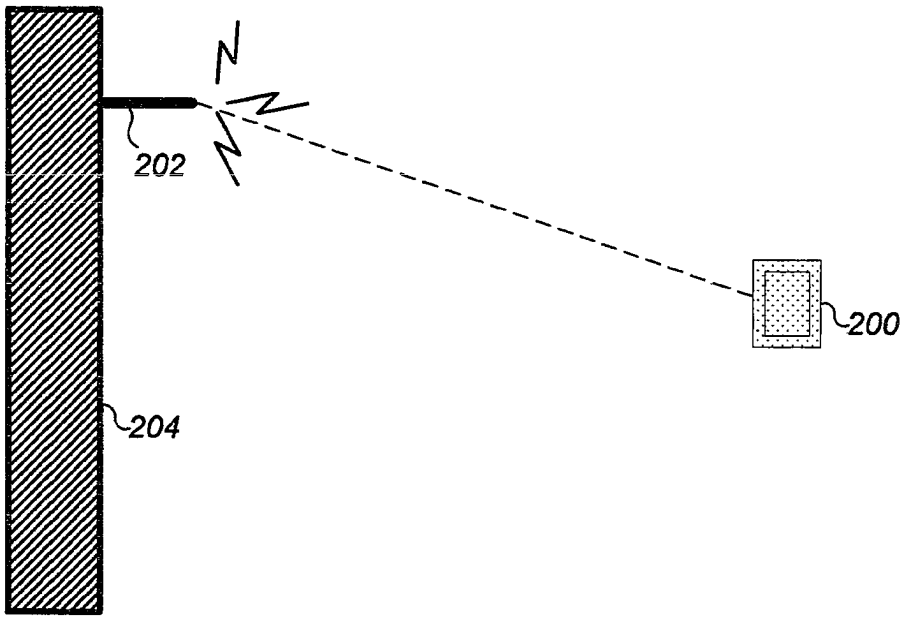


Fig. 2B

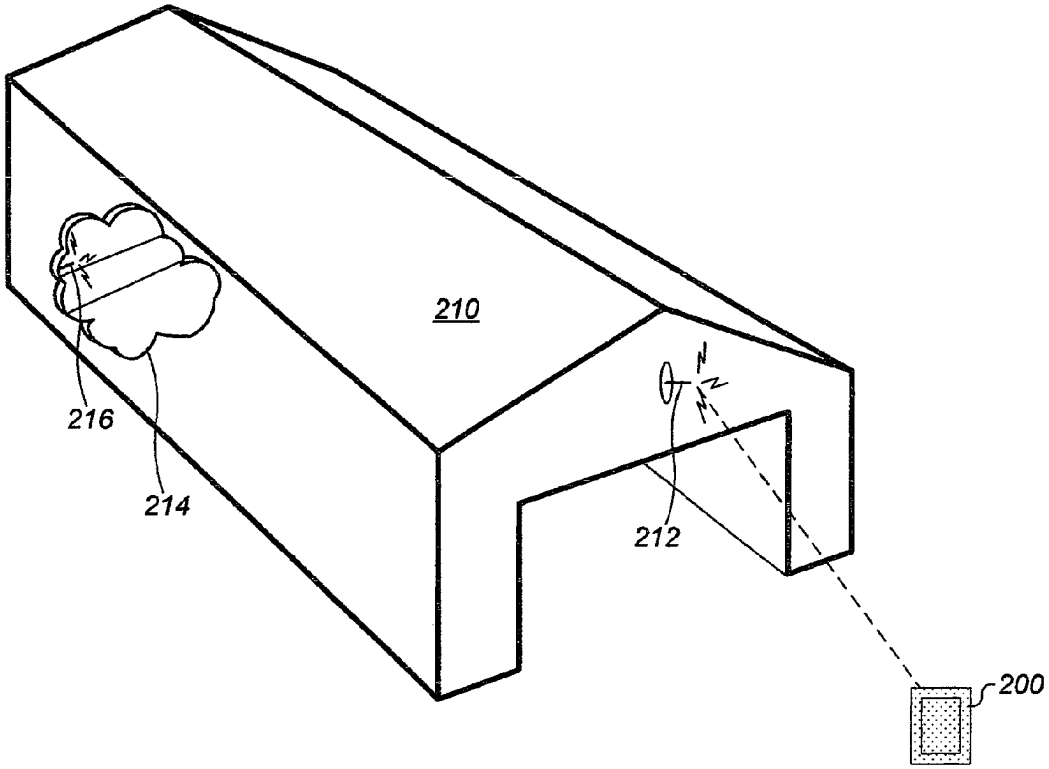


Fig. 2C

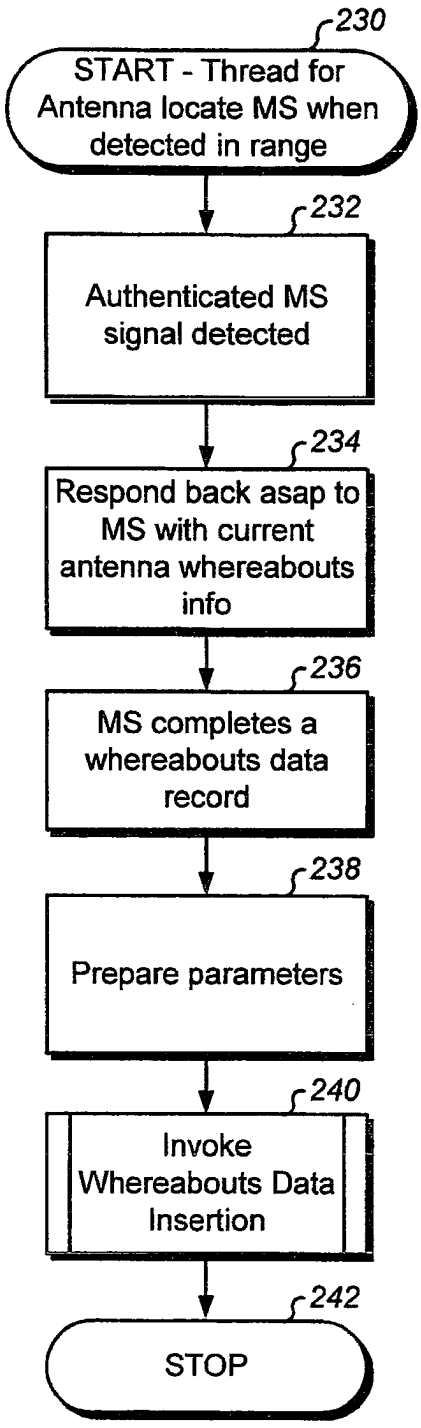

230
START - Thread for Antenna locate MS when detected in range
232
Authenticated MS signal detected
234
Respond back asap to MS with current antenna whereabouts info
236
MS completes a whereabouts data record
238
Prepare parameters
240
Invoke Whereabouts Data Insertion
242
STOP

Fig. 2D

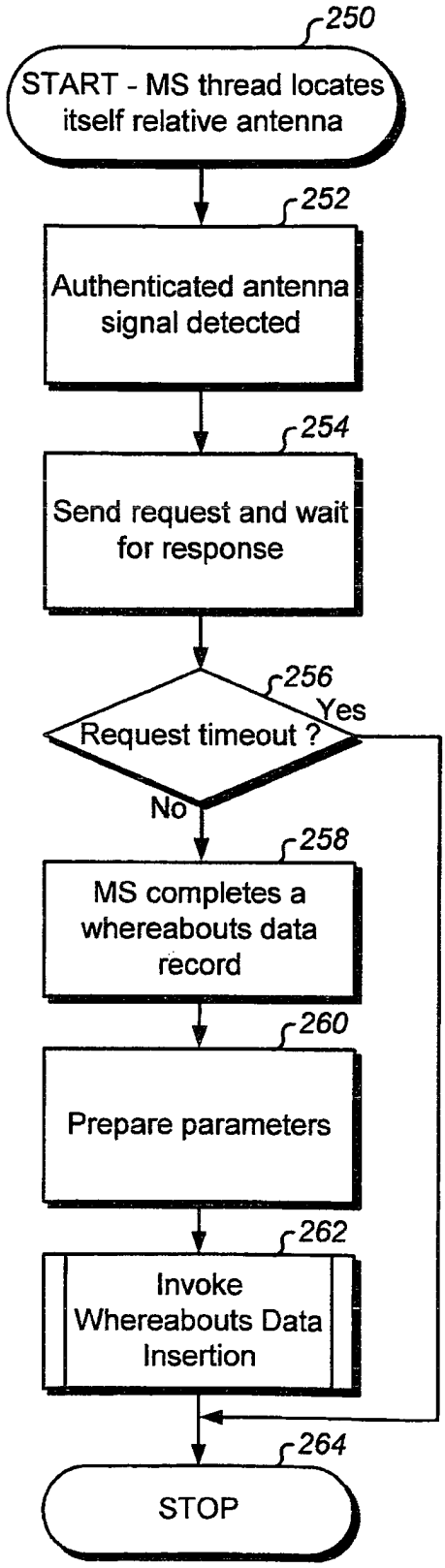

250
START - MS thread locates itself relative antenna
252
Authenticated antenna signal detected
254
Send request and wait for response
256
Request timeout ?
Yes
No
258
MS completes a whereabouts data record
260
Prepare parameters
262
Invoke Whereabouts Data Insertion
264
STOP

Fig. 2E

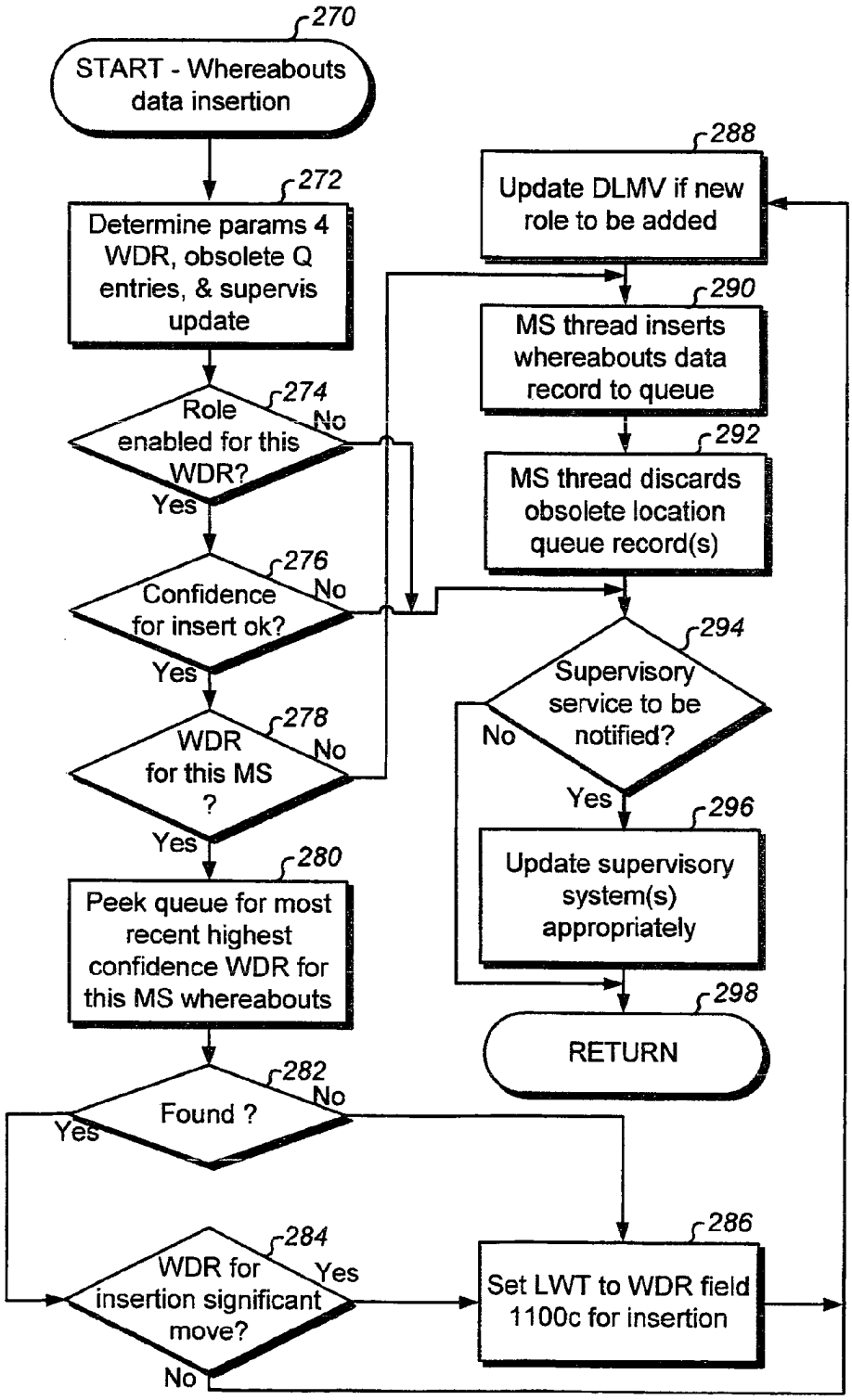

270
START - Whereabouts data insertion
272
Determine params 4 WDR, obsolete Q entries, & supervis update
274
Role enabled for this WDR?
No
Yes
276
Confidence for insert ok?
No
Yes
278
WDR for this MS ?
No
Yes
280
Peek queue for most recent highest confidence WDR for this MS whereabouts
282
Found ?
No
Yes
284
WDR for insertion significant move?
Yes
No
286
Set LWT to WDR field 1100c for insertion
288
Update DLMV if new role to be added
290
MS thread inserts whereabouts data record to queue
292
MS thread discards obsolete location queue record(s)
294
Supervisory service to be notified?
No
Yes
296
Update supervisory system(s) appropriately
298
RETURN

Fig. 2F

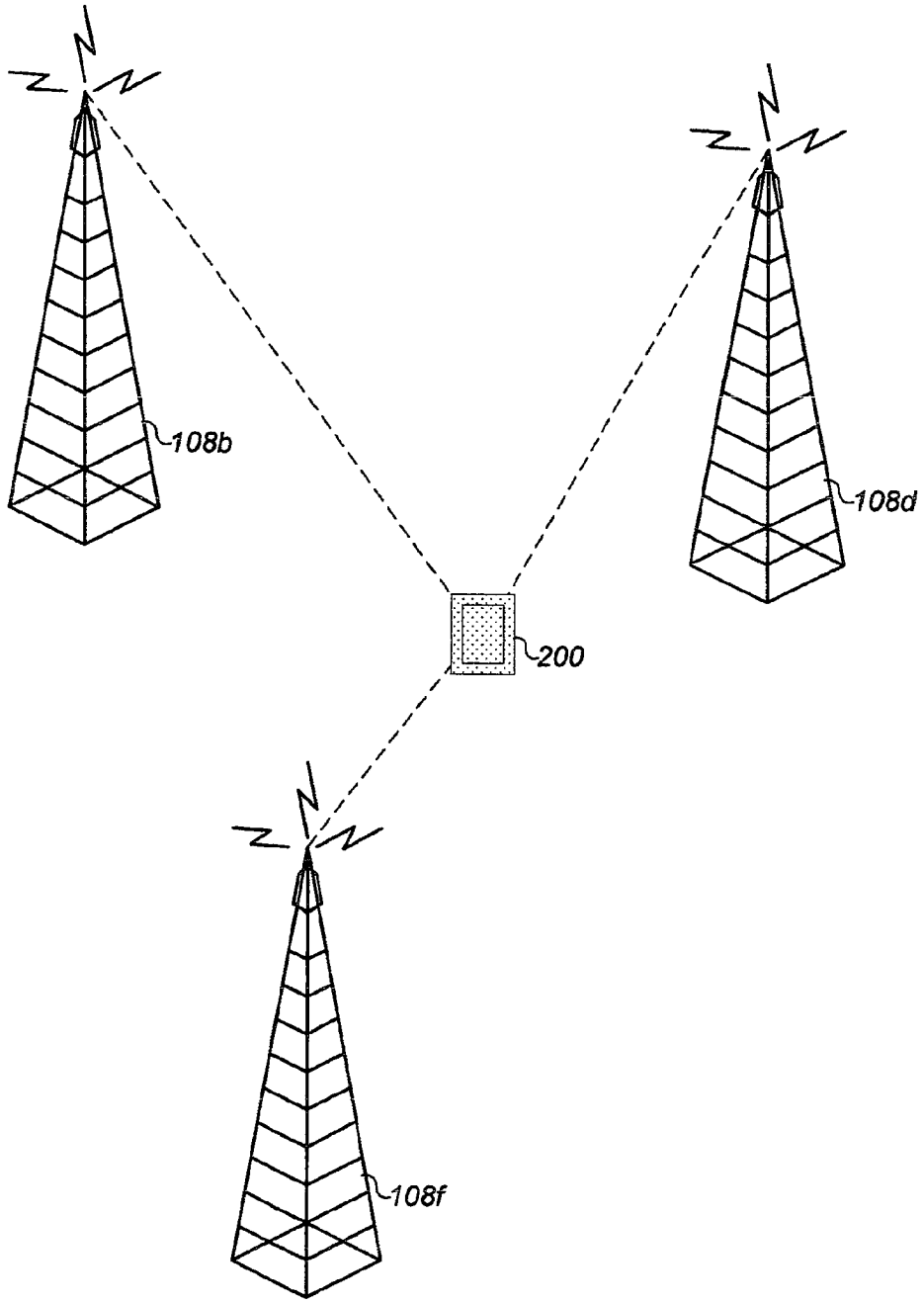


Fig. 3A

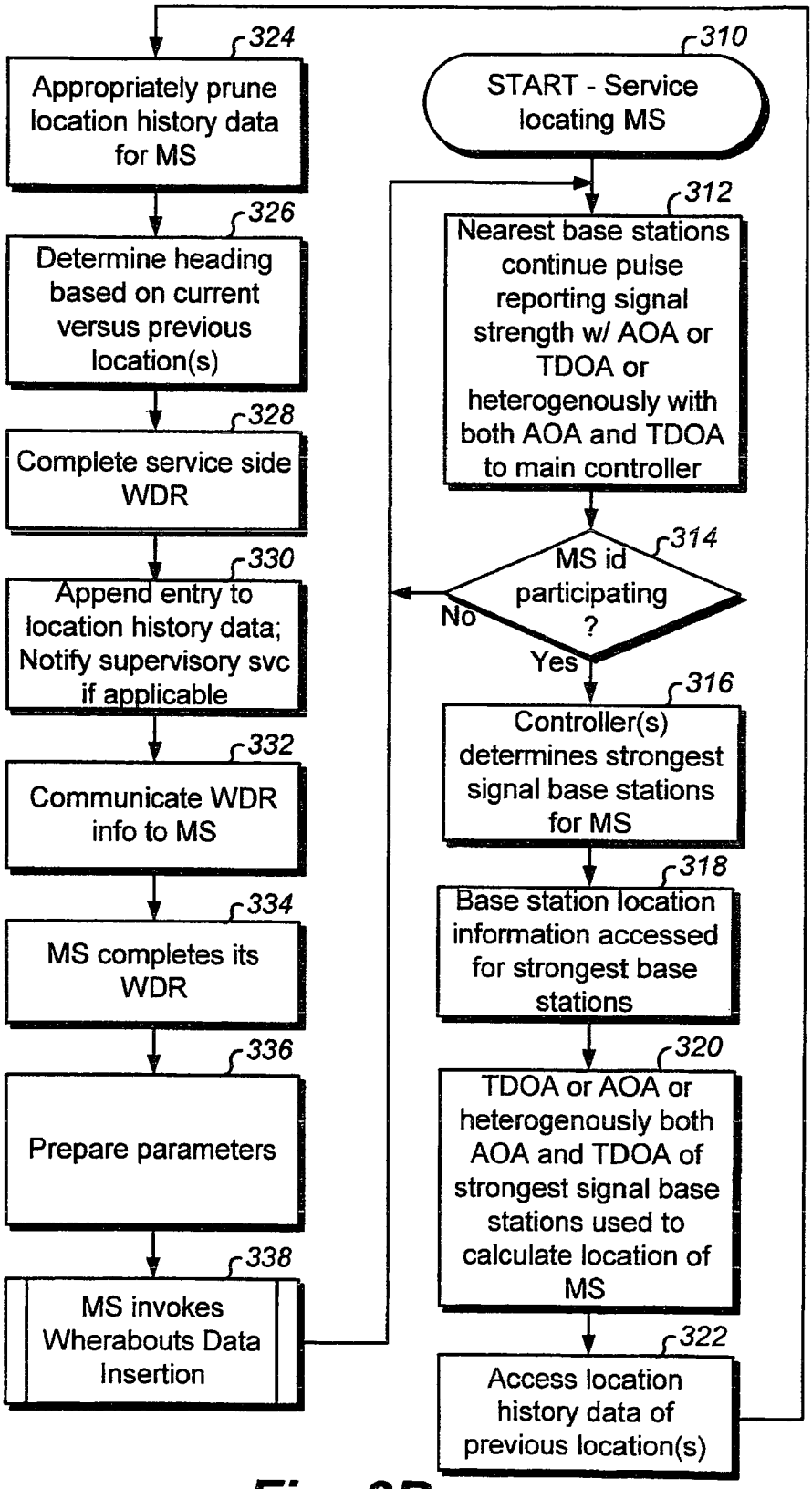

310
START - Service locating MS
312
Nearest base stations continue pulse reporting signal strength w/ AOA or TDOA or heterogenously with both AOA and TDOA to main controller
314
MS id participating ?
No
Yes
316
Controller(s) determines strongest signal base stations for MS
318
Base station location information accessed for strongest base stations
320
TDOA or AOA or heterogenously both AOA and TDOA of strongest signal base stations used to calculate location of MS
322
Access location history data of previous location(s)
324
Appropriately prune location history data for MS
326
Determine heading based on current versus previous location(s)
328
Complete service side WDR
330
Append entry to location history data; Notify supervisory svc if applicable
332
Communicate WDR info to MS
334
MS completes its WDR
336
Prepare parameters
338
MS invokes Wherabouts Data Insertion

Fig. 3B

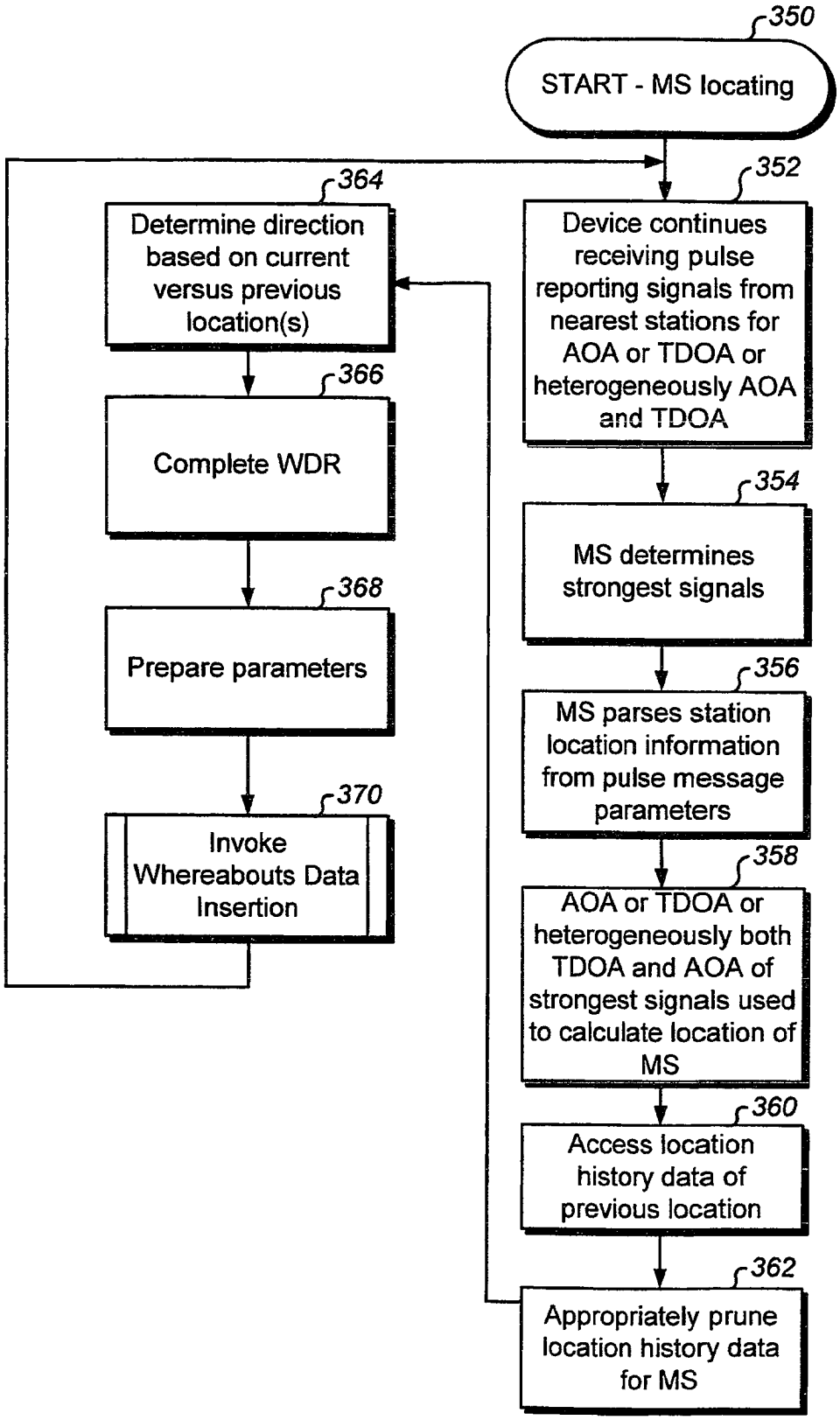

350
START - MS locating
352
Device continues receiving pulse reporting signals from nearest stations for AOA or TDOA or heterogeneously AOA and TDOA
354
MS determines strongest signals
356
MS parses station location information from pulse message parameters
358
AOA or TDOA or heterogeneously both TDOA and AOA of strongest signals used to calculate location of MS
360
Access location history data of previous location
362
Appropriately prune location history data for MS
364
Determine direction based on current versus previous location(s)
366
Complete WDR
368
Prepare parameters
370
Invoke Whereabouts Data Insertion

Fig. 3C

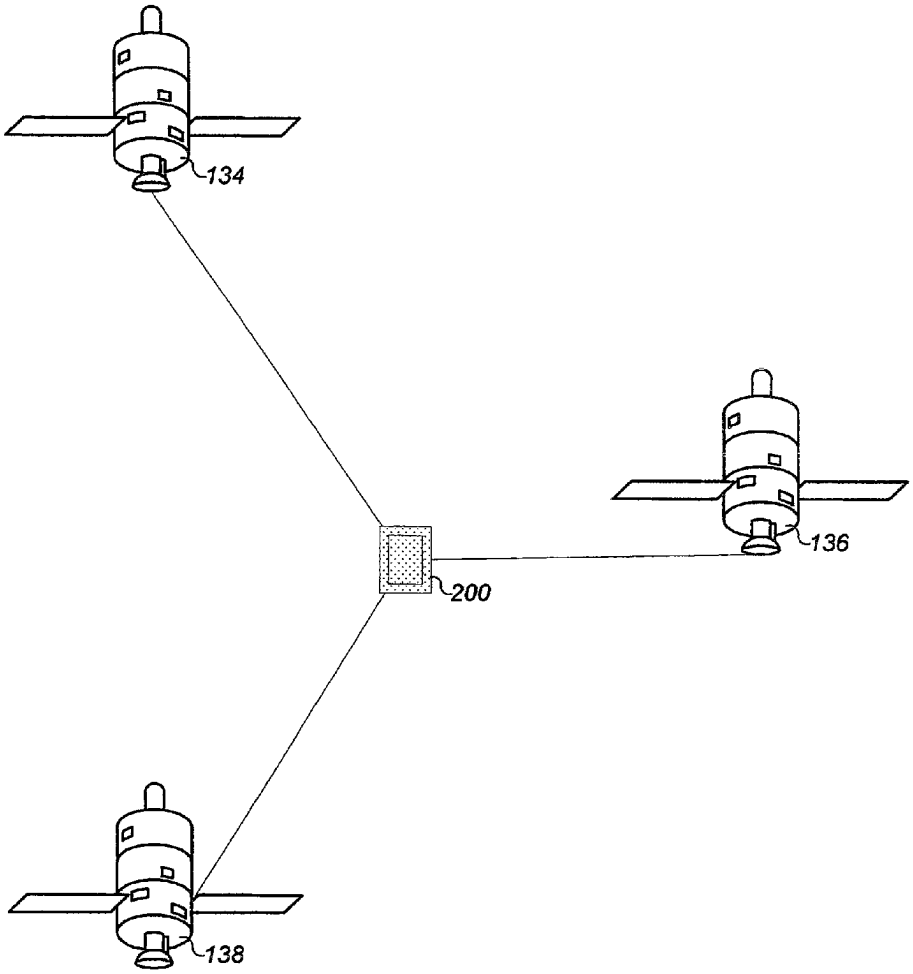


Fig. 4A

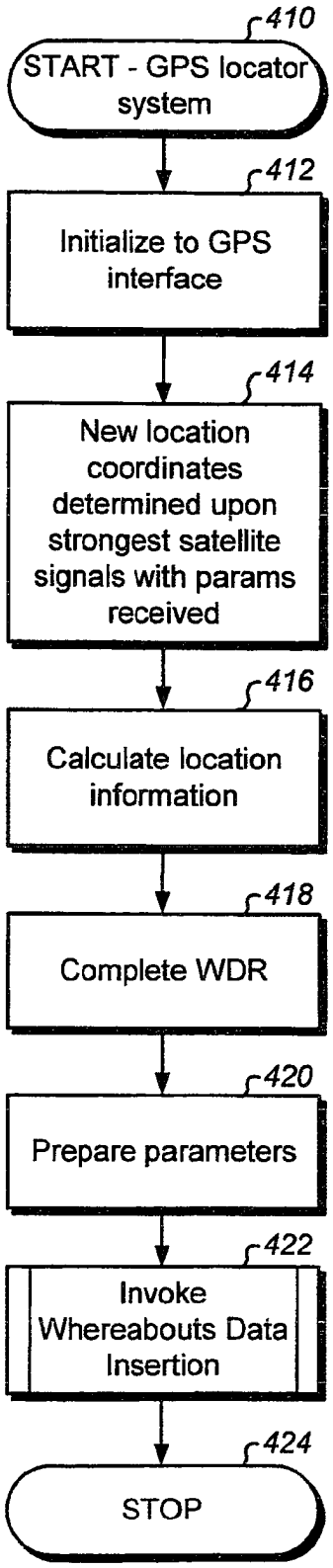

410
START - GPS locator system
412
Initialize to GPS interface
414
New location coordinates determined upon strongest satellite signals with params received
416
Calculate location information
418
Complete WDR
420
Prepare parameters
422
Invoke Whereabouts Data Insertion
424
STOP

Fig. 4B

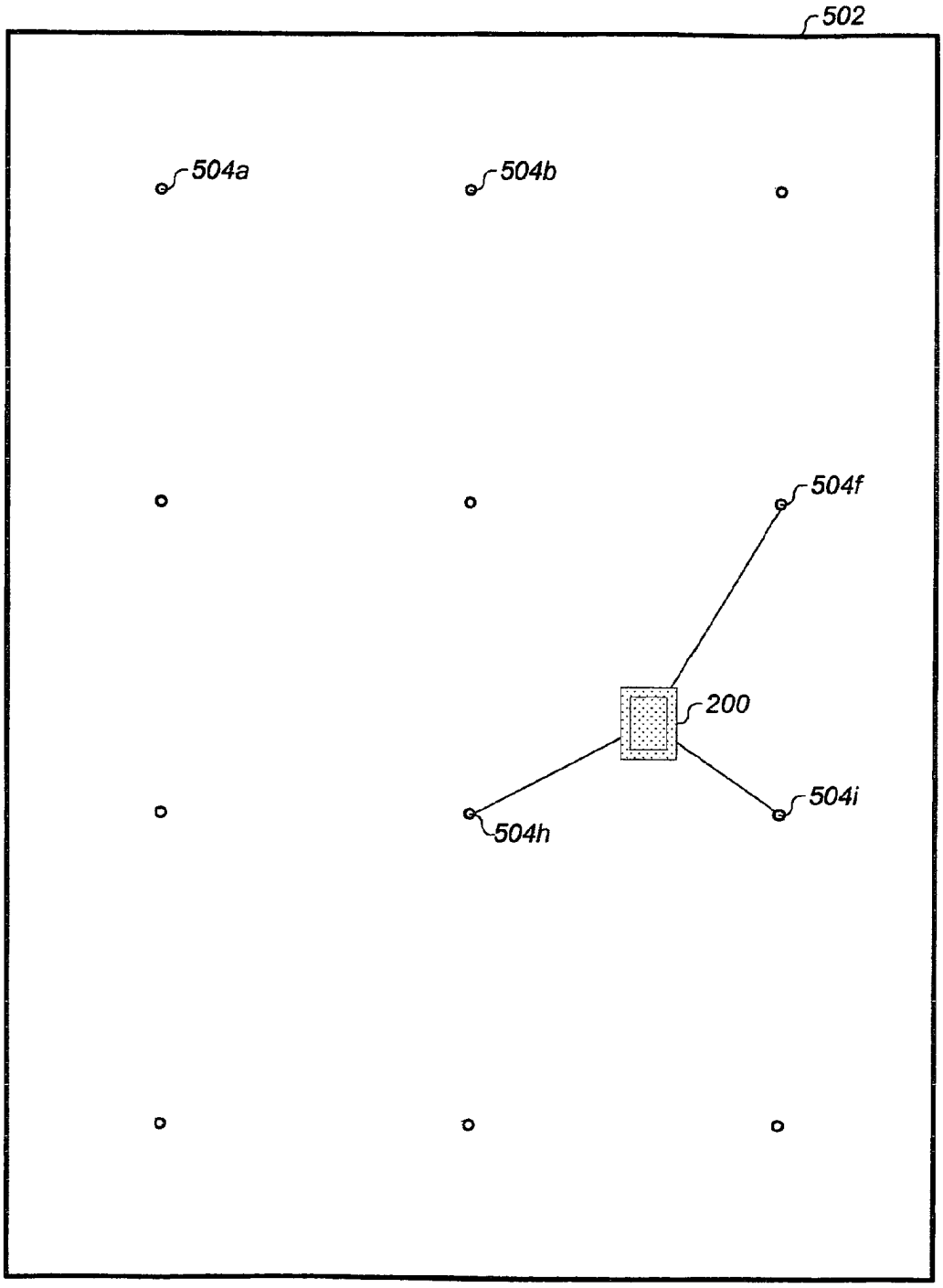


Fig. 5A

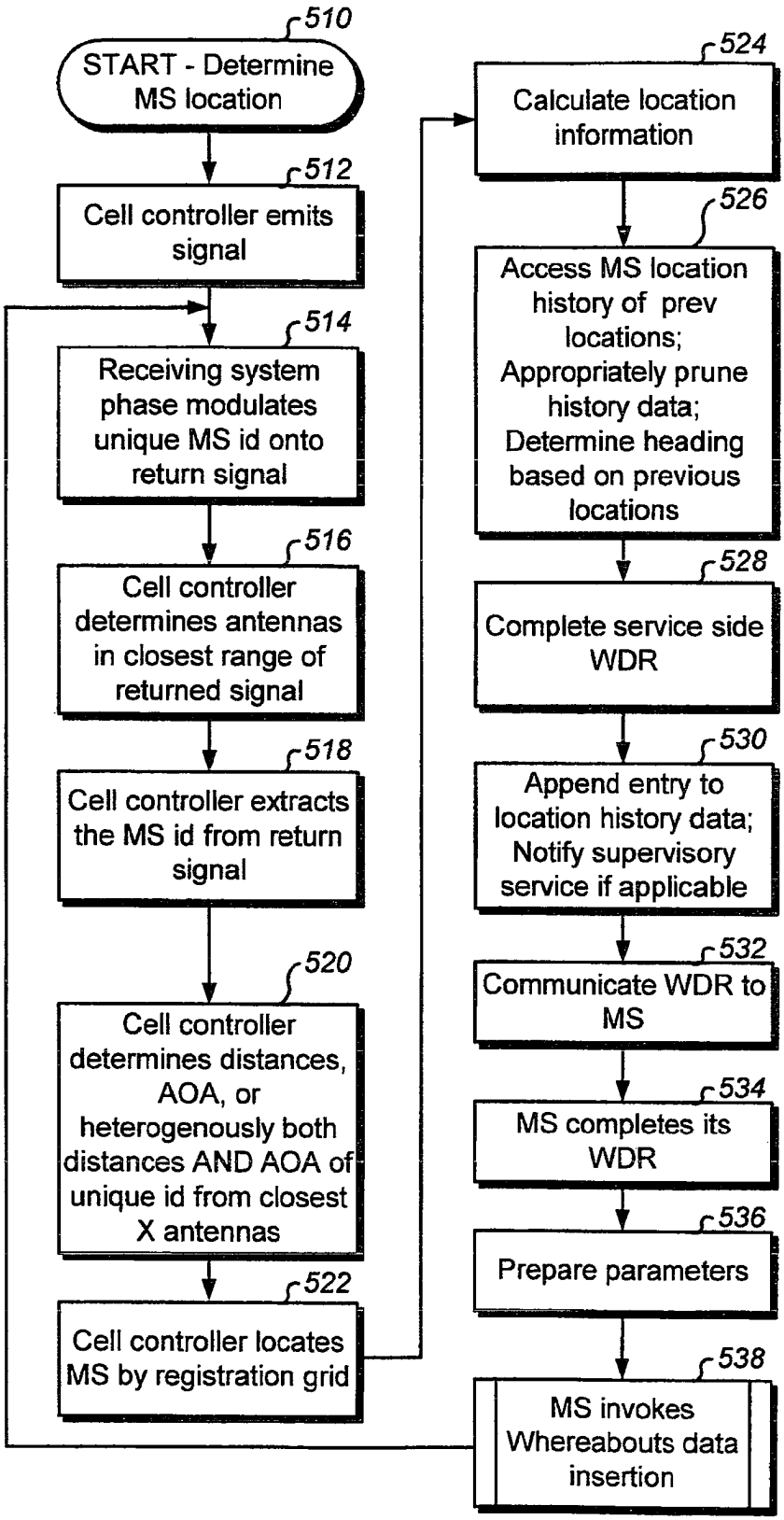

510
START - Determine MS location
512
Cell controller emits signal
514
Receiving system phase modulates unique MS id onto return signal
516
Cell controller determines antennas in closest range of returned signal
518
Cell controller extracts the MS id from return signal
520
Cell controller determines distances, AOA, or heterogenously both distances AND AOA of unique id from closest X antennas
522
Cell controller locates MS by registration grid
524
Calculate location information
526
Access MS location history of prev locations; Appropriately prune history data; Determine heading based on previous locations
528
Complete service side WDR
530
Append entry to location history data; Notify supervisory service if applicable
532
Communicate WDR to MS
534
MS completes its WDR
536
Prepare parameters
538
MS invokes Whereabouts data insertion

Fig. 5B

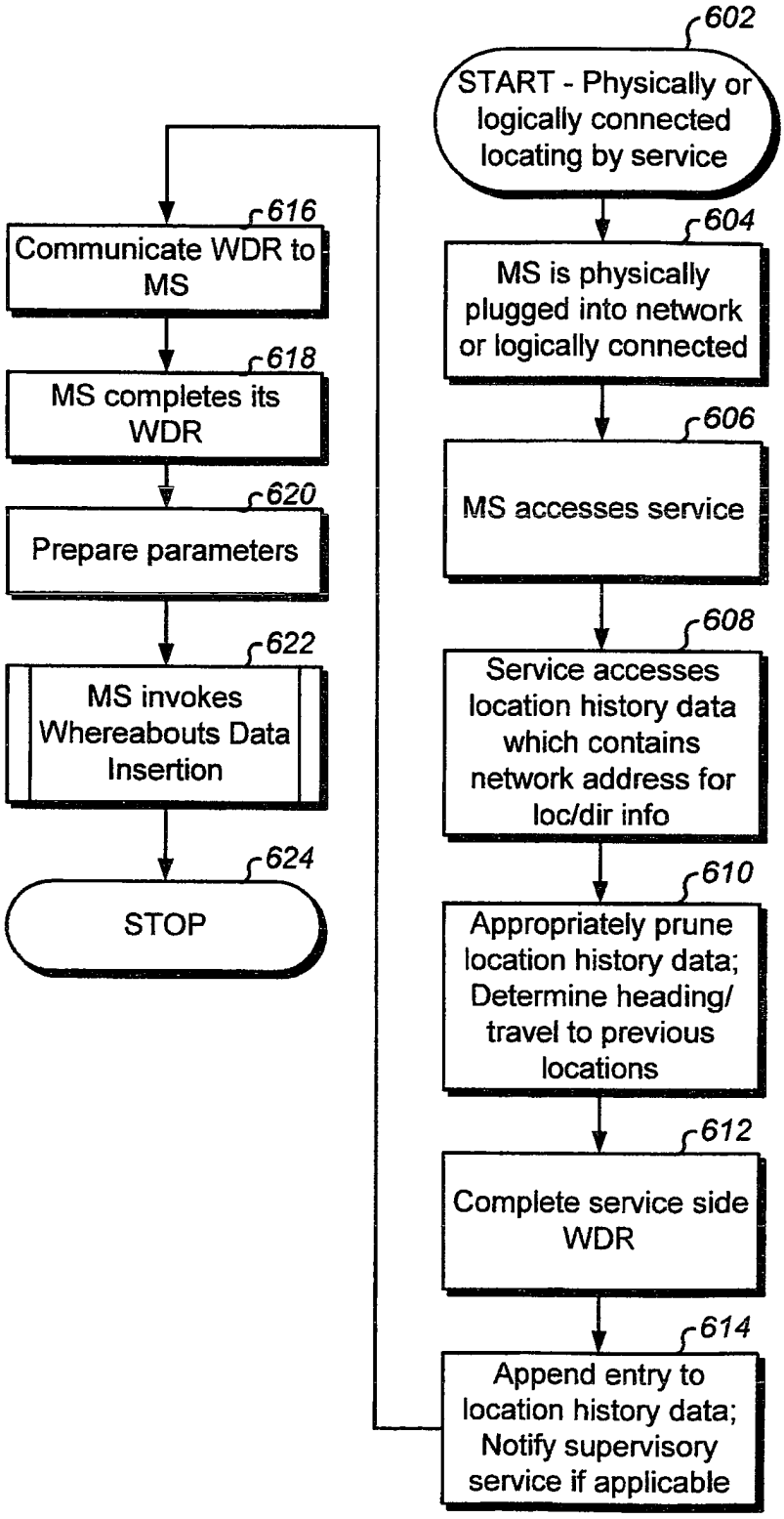

602
START - Physically or logically connected locating by service
604
MS is physically plugged into network or logically connected
606
MS accesses service
608
Service accesses location history data which contains network address for loc/dir info
610
Appropriately prune location history data; Determine heading/ travel to previous locations
612
Complete service side WDR
614
Append entry to location history data; Notify supervisory service if applicable
616
Communicate WDR to MS
618
MS completes its WDR
620
Prepare parameters
622
MS invokes Whereabouts Data Insertion
624
STOP

Fig. 6A

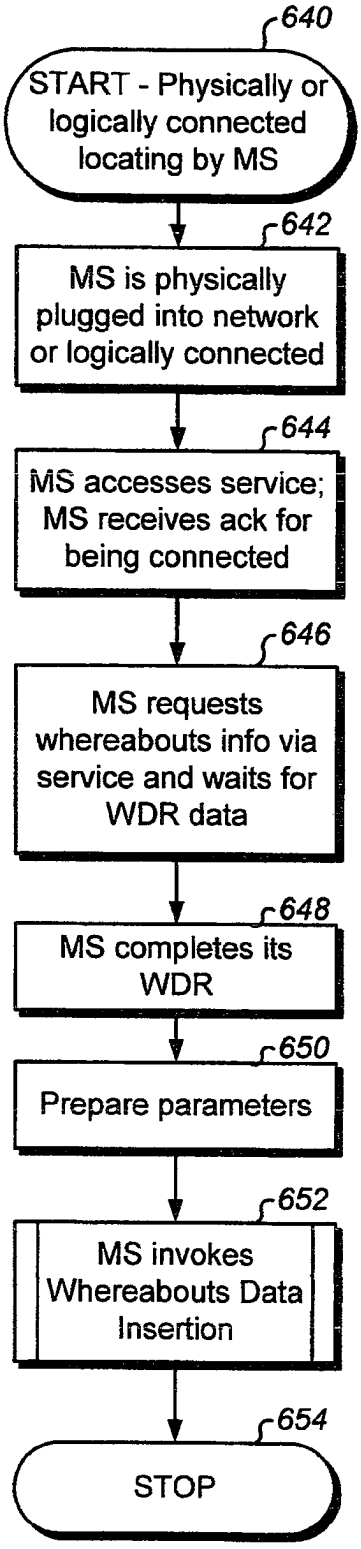

640
START - Physically or logically connected locating by MS
642
MS is physically plugged into network or logically connected
644
MS accesses service; MS receives ack for being connected
646
MS requests whereabouts info via service and waits for WDR data
648
MS completes its WDR
650
Prepare parameters
652
MS invokes Whereabouts Data Insertion
654
STOP

Fig. 6B

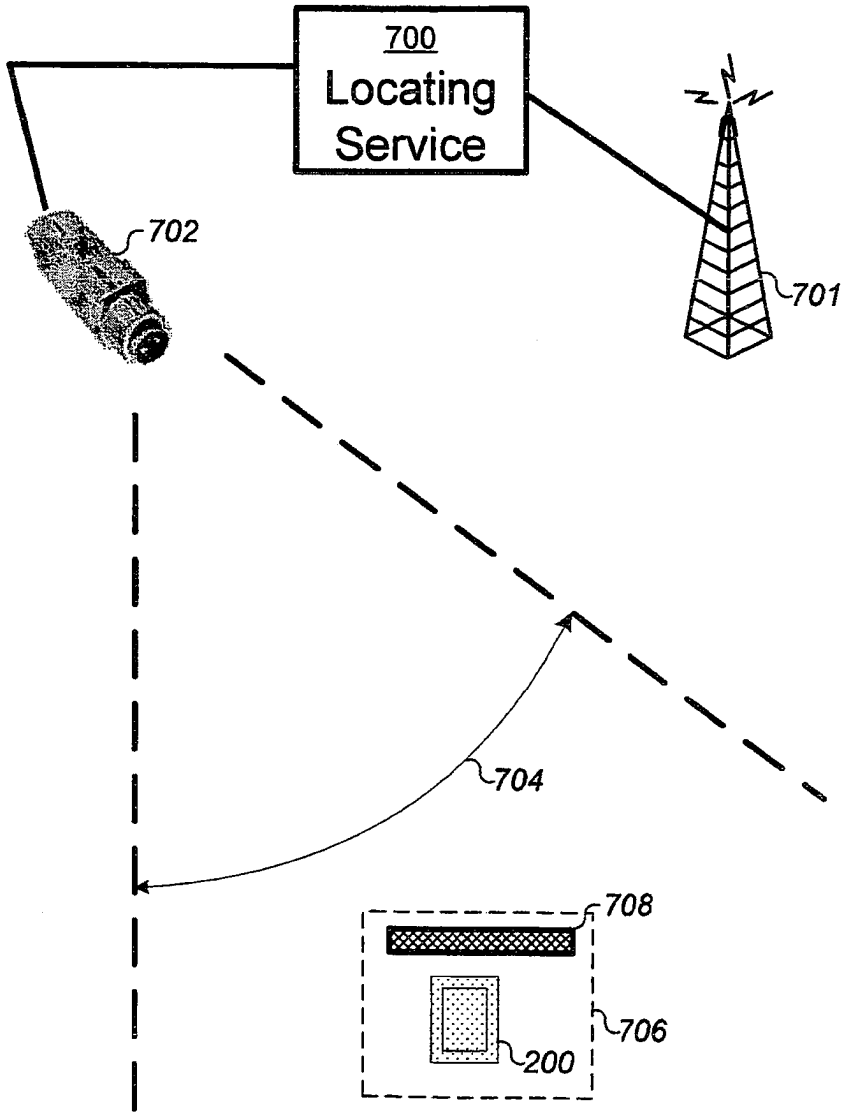


Fig. 7A

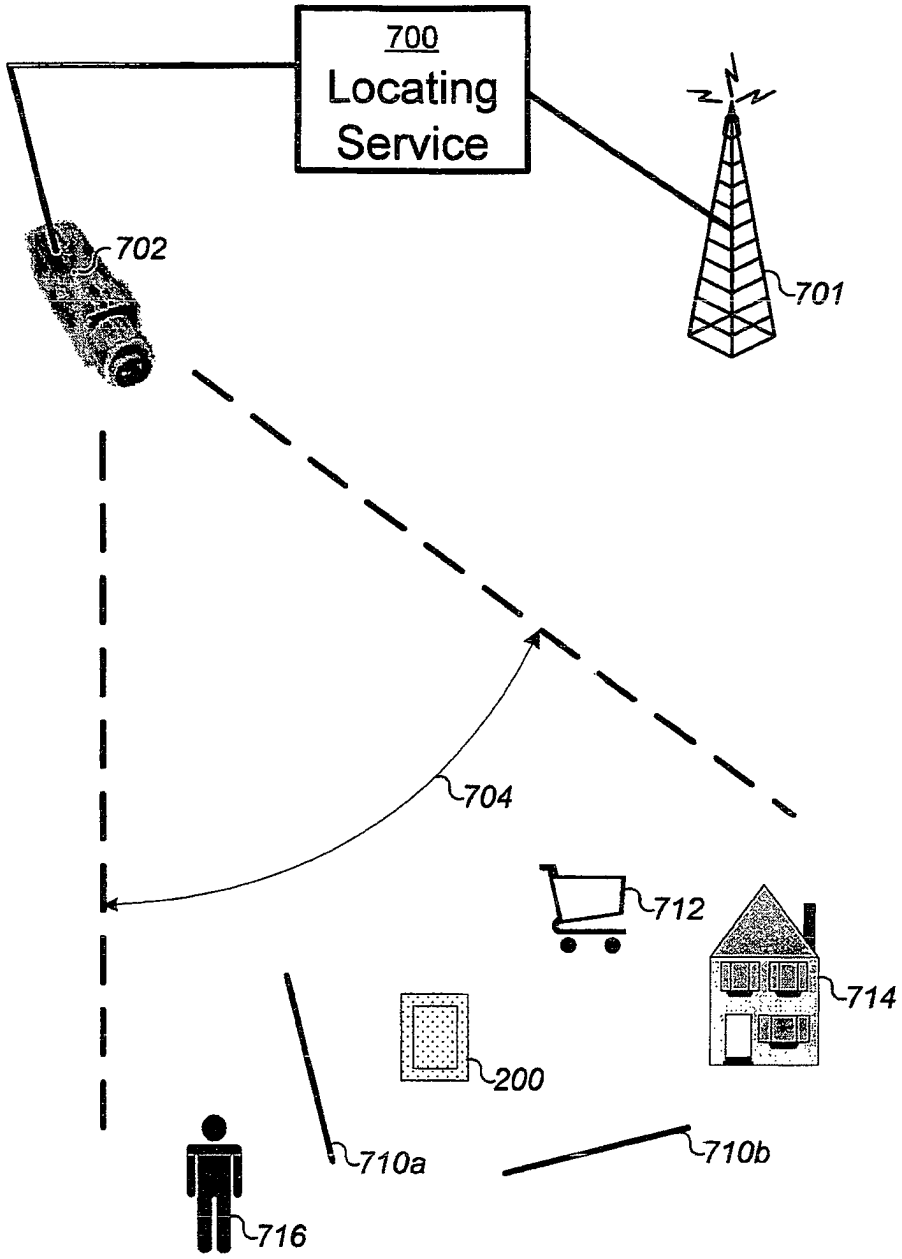


Fig. 7B

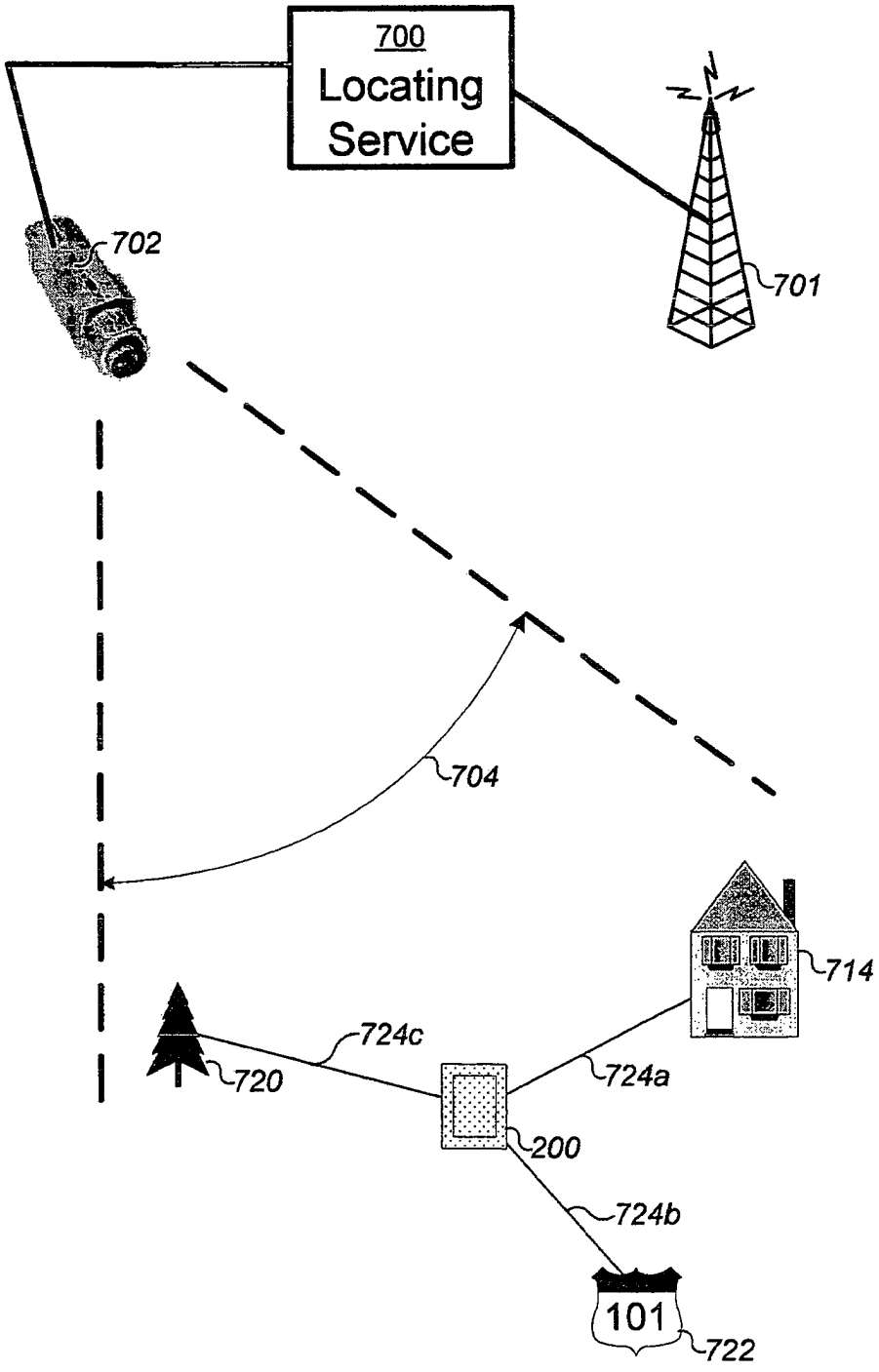

700
Locating Service
702
701
704
714
724c
720
724a
200
724b
101
722

Fig. 7C

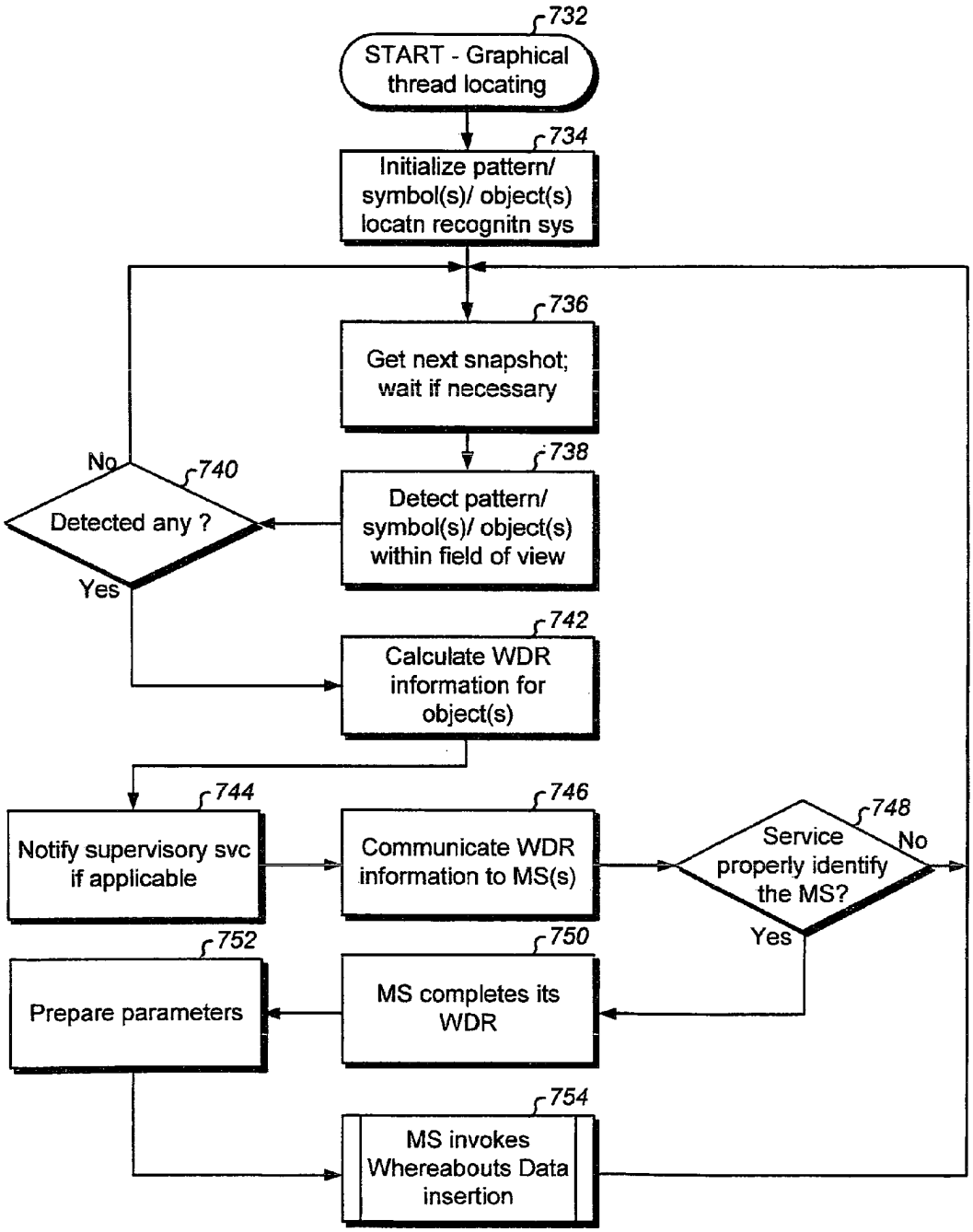

732
START - Graphical thread locating
734
Initialize pattern/ symbol(s)/ object(s) locatn recognitn sys
736
Get next snapshot; wait if necessary
738
Detect pattern/ symbol(s)/ object(s) within field of view
740
Detected any ?
No
Yes
742
Calculate WDR information for object(s)
744
Notify supervisory svc if applicable
746
Communicate WDR information to MS(s)
748
Service properly identify the MS?
No
Yes
750
MS completes its WDR
752
Prepare parameters
754
MS invokes Whereabouts Data insertion

Fig. 7D

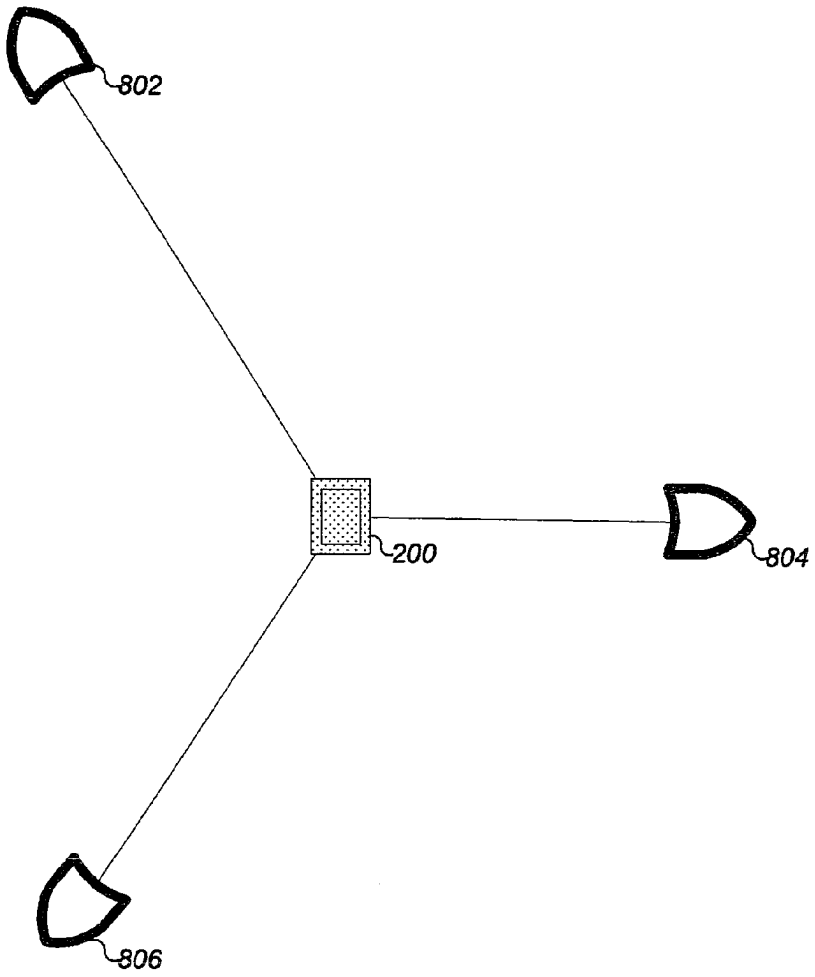


Fig. 8A

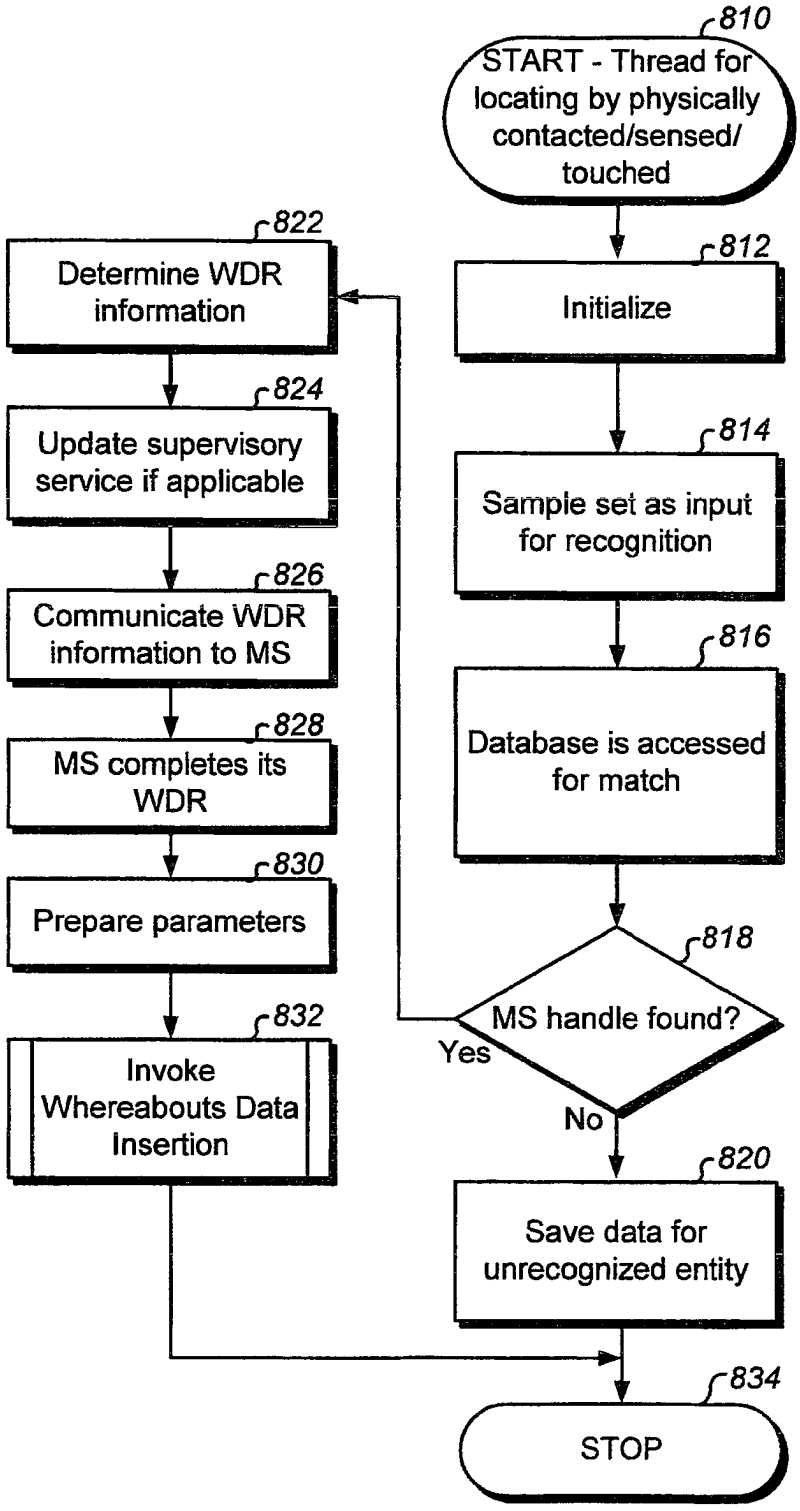

810
START - Thread for locating by physically contacted/sensed/ touched
812
Initialize
814
Sample set as input for recognition
816
Database is accessed for match
818
MS handle found?
Yes
No
820
Save data for unrecognized entity
822
Determine WDR information
824
Update supervisory service if applicable
826
Communicate WDR information to MS
828
MS completes its WDR
830
Prepare parameters
832
Invoke Whereabouts Data Insertion
834
STOP

Fig. 8B

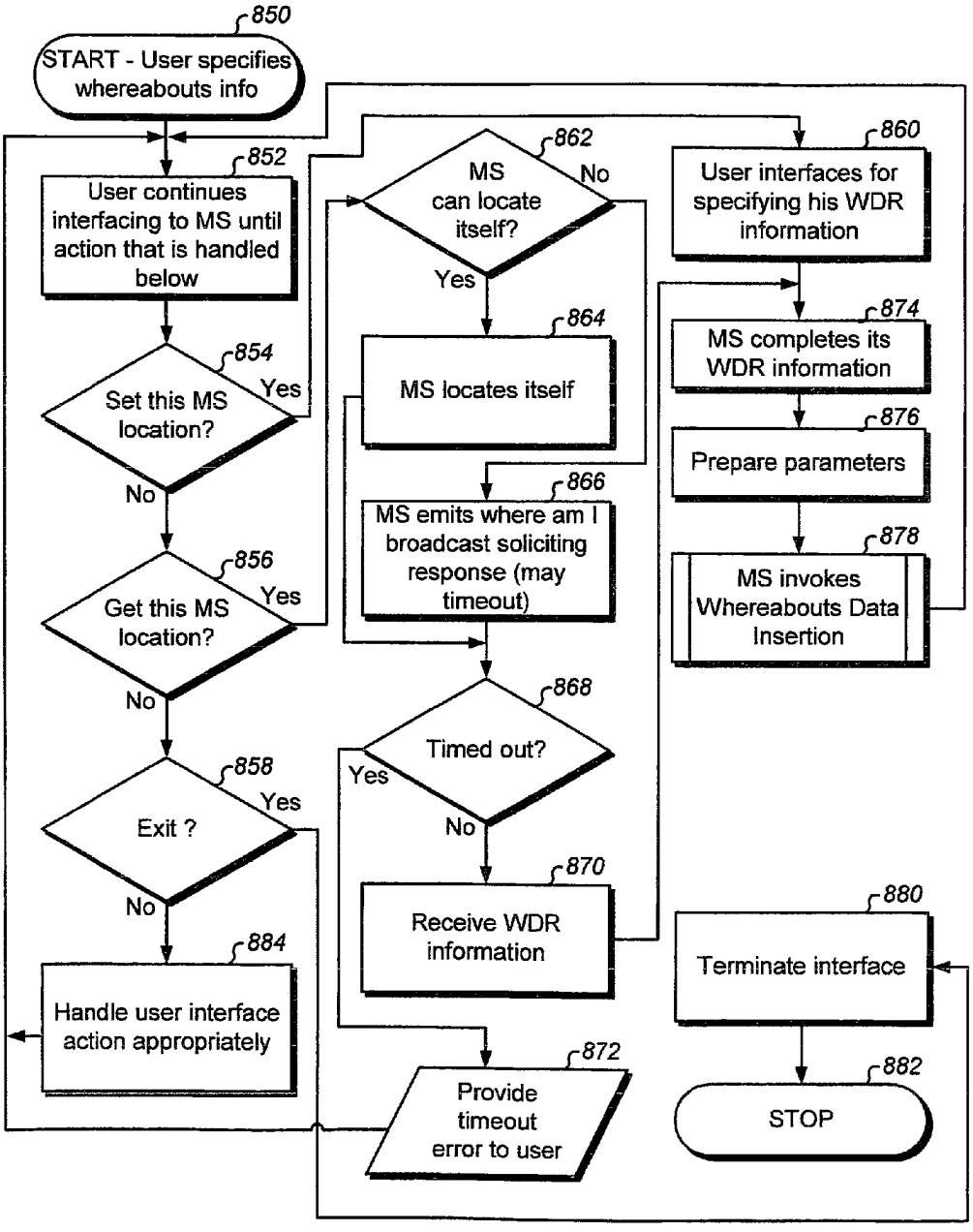

850
START - User specifies whereabouts info
852
User continues interfacing to MS until action that is handled below
854
Set this MS location?
Yes
No
856
Get this MS location?
Yes
No
858
Exit ?
Yes
No
884
Handle user interface action appropriately
862
MS can locate itself?
No
Yes
864
MS locates itself
866
MS emits where am I broadcast soliciting response (may timeout)
868
Timed out?
Yes
No
870
Receive WDR information
872
Provide timeout error to user
860
User interfaces for specifying his WDR information
874
MS completes its WDR information
876
Prepare parameters
878
MS invokes Whereabouts Data Insertion
880
Terminate interface
882
STOP

Fig. 8C

		MS (id 0A12:43EF:985B:012F)
GPS	C	x
	S	
A-GPS	C	
	S	
D-GPS	C	
	S	
Graphic-Pattern(s)	C	
	S	
Graphic-Distances	C	
	S	
Graphic-Triangulate	C	
	S	
Artificial Intelligence	C	
	S	
Cell Range	C	
	S	x
Cell AOA	C	
	S	
Cell TDOA	C	
	S	x
Cell MPT	C	
	S	x
Antenna Range	C	
	S	x
Antenna AOA	C	
	S	x
Antenna TDOA	C	
	S	x
Antenna MPT	C	
	S	x
LIDAR/optics	C	
	S	
Manual	C	
	S	
Contact	C	
	S	x
MPT	C	
	S	x
Client Logical Connect	C	
	S	
Server Logical Connect	C	
	S	
Client Physical Connect	C	
	S	
Server Physical Connect	C	
	S	
Sound/Acoustics	C	
	S	
Microdot/ RFI	C	
	S	
Transponder	C	
	S	
Others	C	
	S	
...	C	
	S	

Fig. 9A

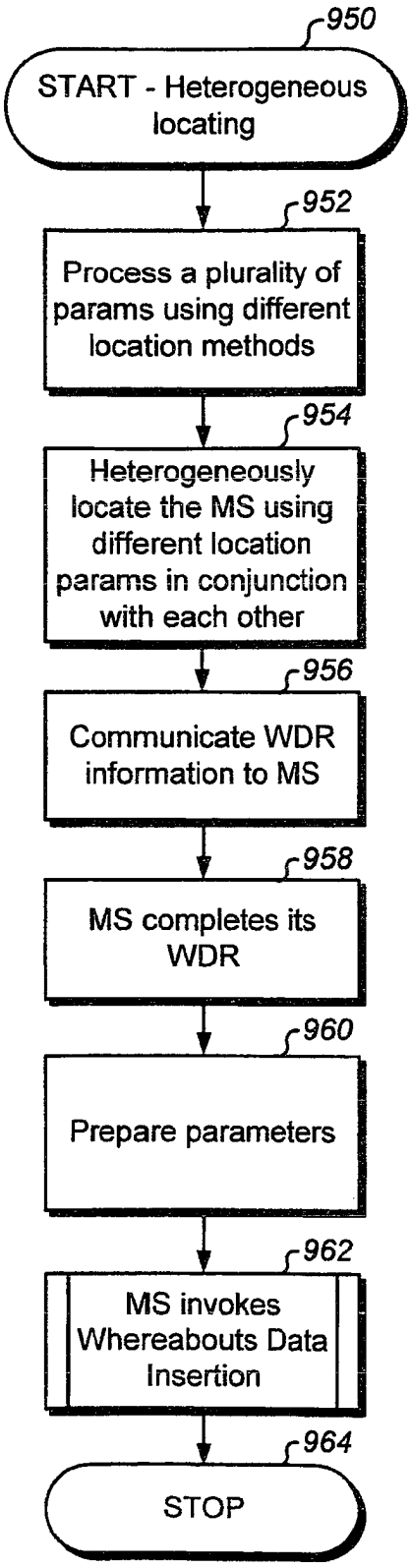

950
START - Heterogeneous locating
952
Process a plurality of params using different location methods
954
Heterogeneously locate the MS using different location params in conjunction with each other
956
Communicate WDR information to MS
958
MS completes its WDR
960
Prepare parameters
962
MS invokes Whereabouts Data Insertion
964
STOP

Fig. 9B

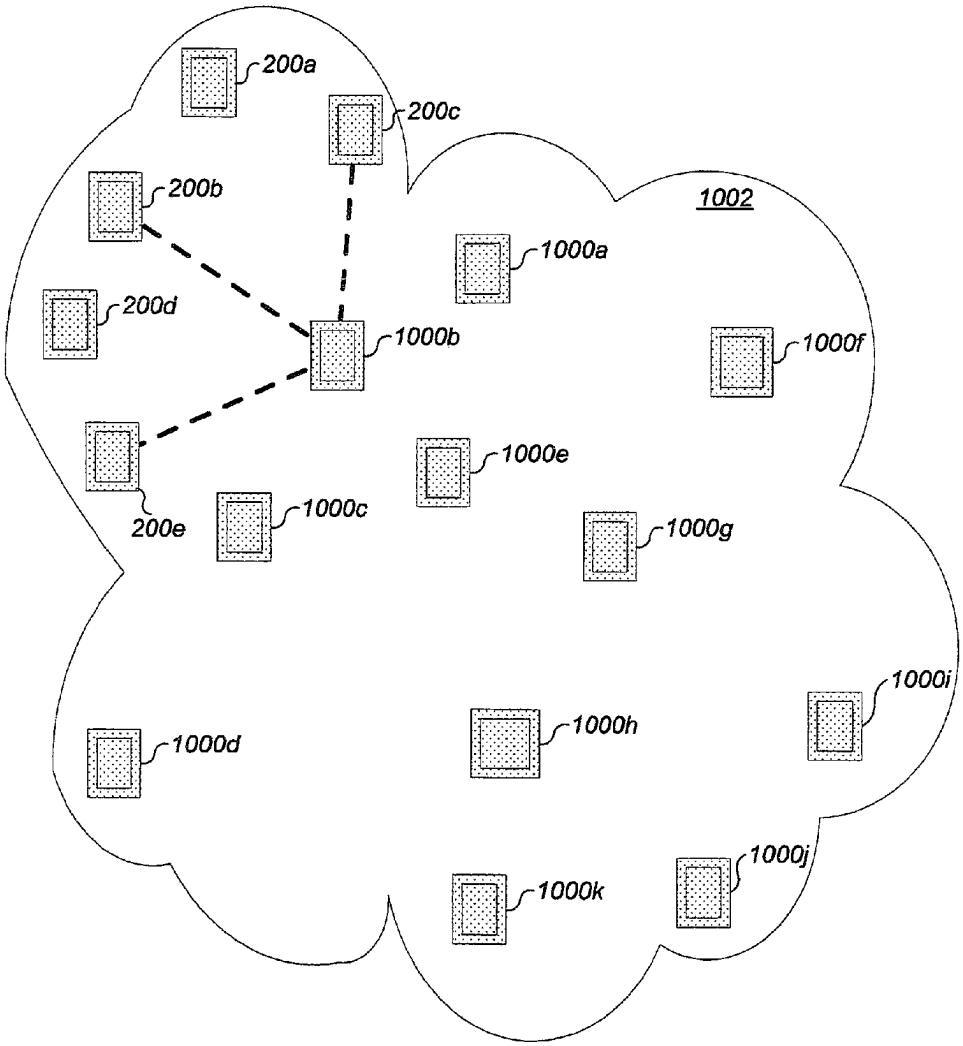

200a
200c
200b
1002
1000a
200d
1000b
1000f
1000e
200e
1000c
1000g
1000i
1000d
1000h
1000j
1000k

Fig. 10A

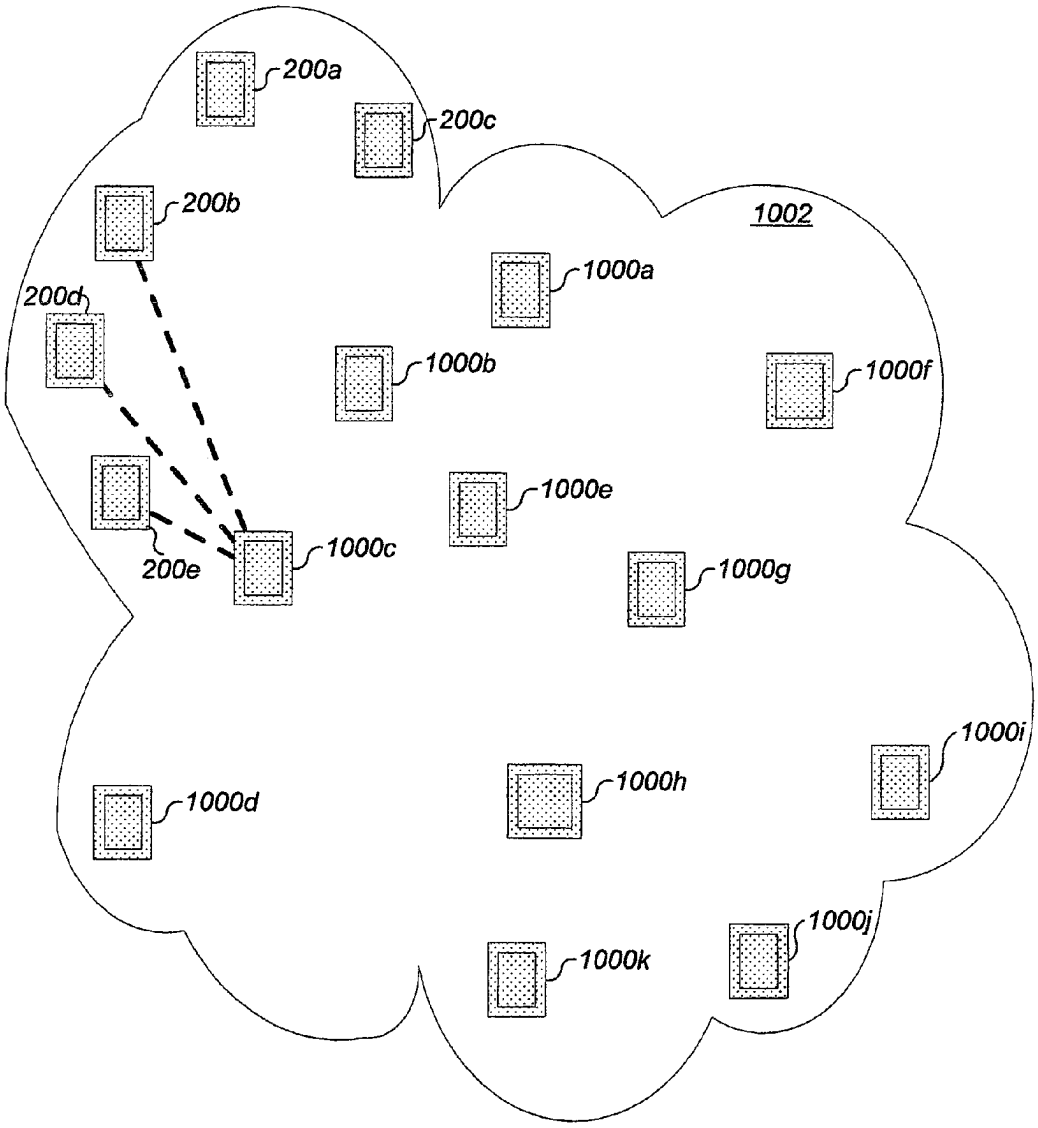

200a
200c
200b
1002
1000a
200d
1000b
1000f
1000e
200e
1000c
1000g
1000i
1000d
1000h
1000j
1000k

Fig. 10B

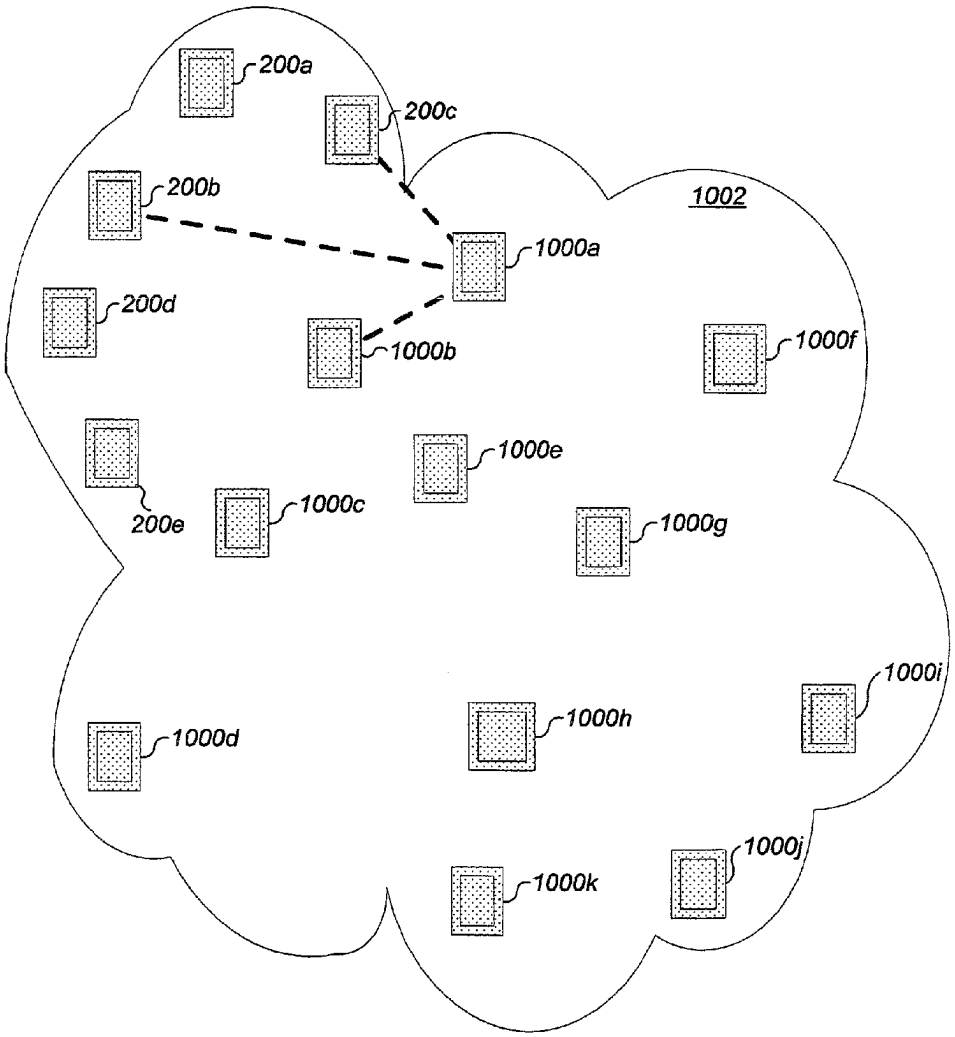

200a
200c
200b
1002
1000a
200d
1000b
1000f
1000e
200e
1000c
1000g
1000i
1000h
1000d
1000j
1000k

Fig. 10C

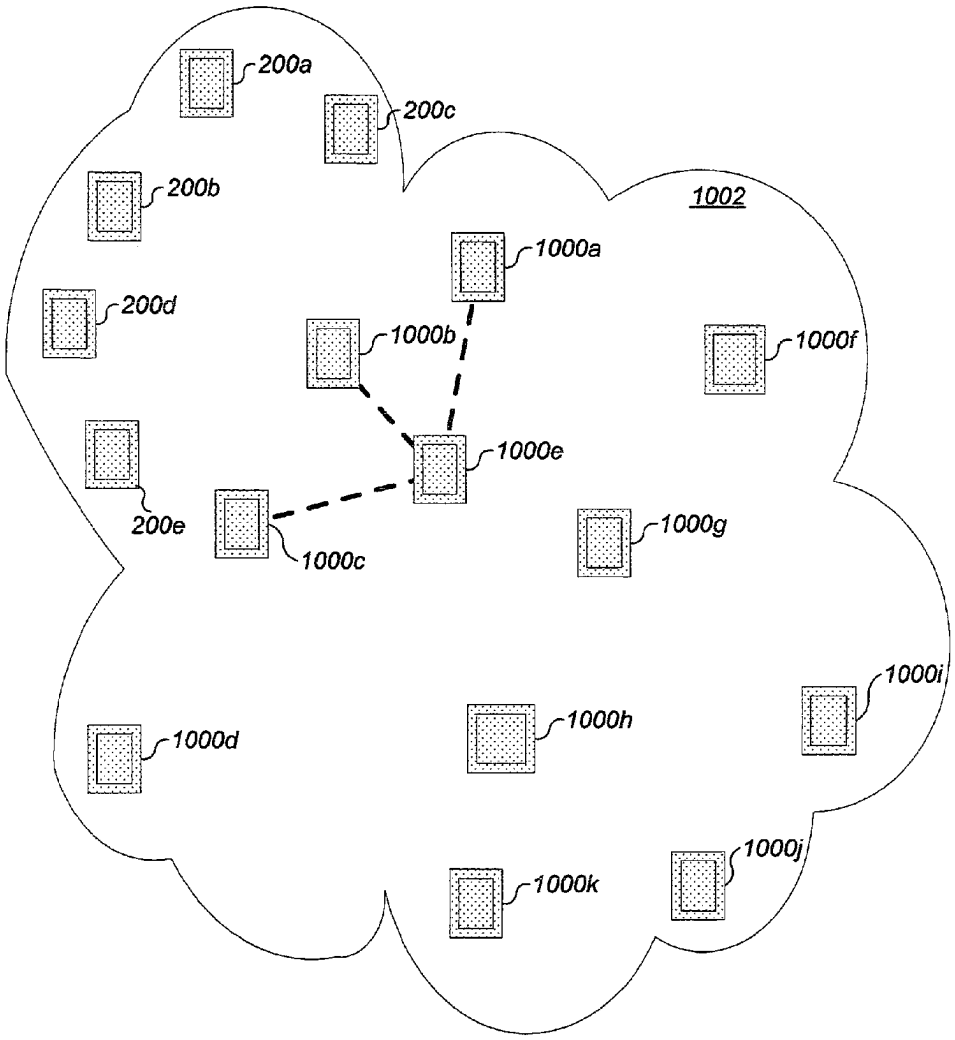

200a
200c
200b
1002
1000a
200d
1000b
1000f
1000e
200e
1000c
1000g
1000i
1000d
1000h
1000j
1000k

Fig. 10D

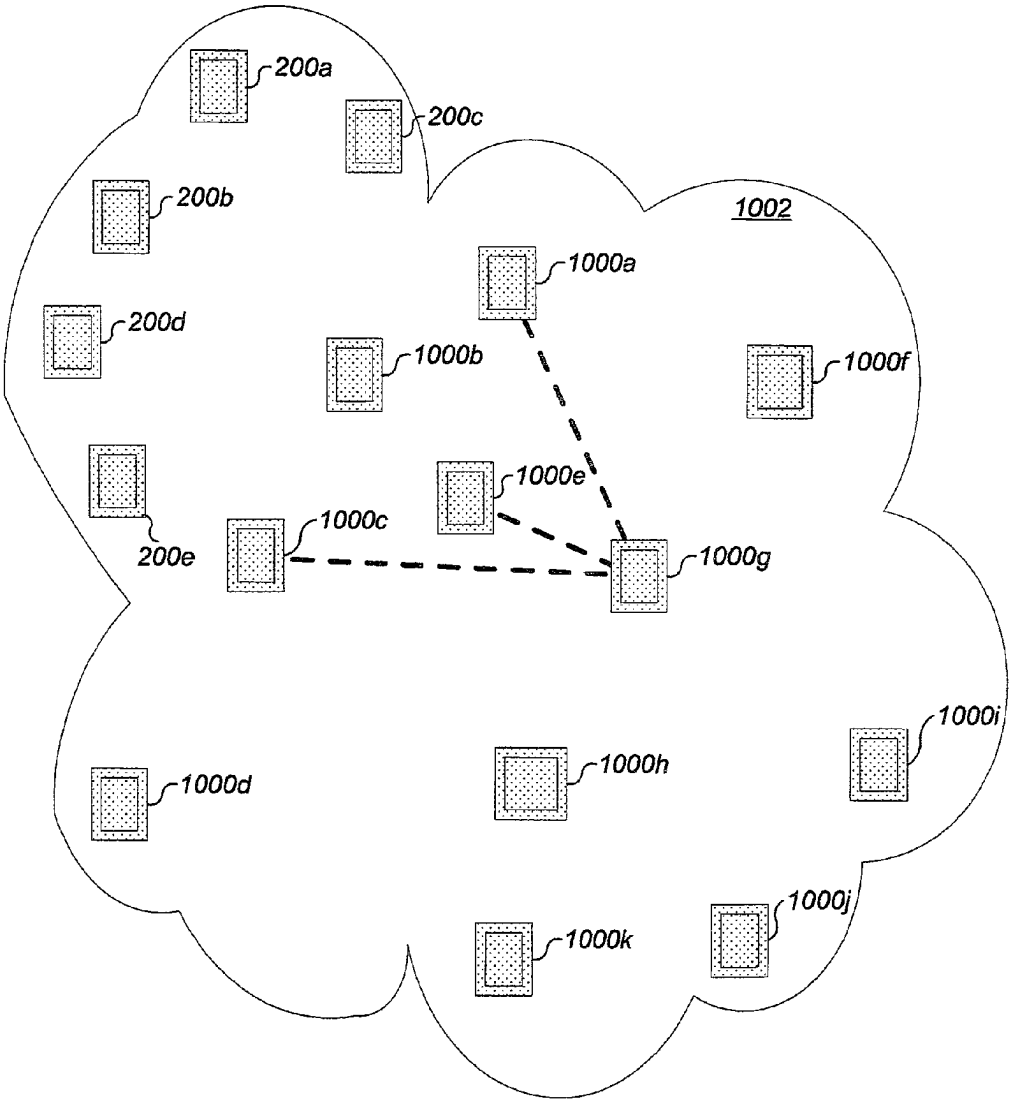

200a
200c
200b
1002
1000a
200d
1000b
1000f
1000e
1000c
200e
1000g
1000i
1000h
1000d
1000j
1000k

Fig. 10E

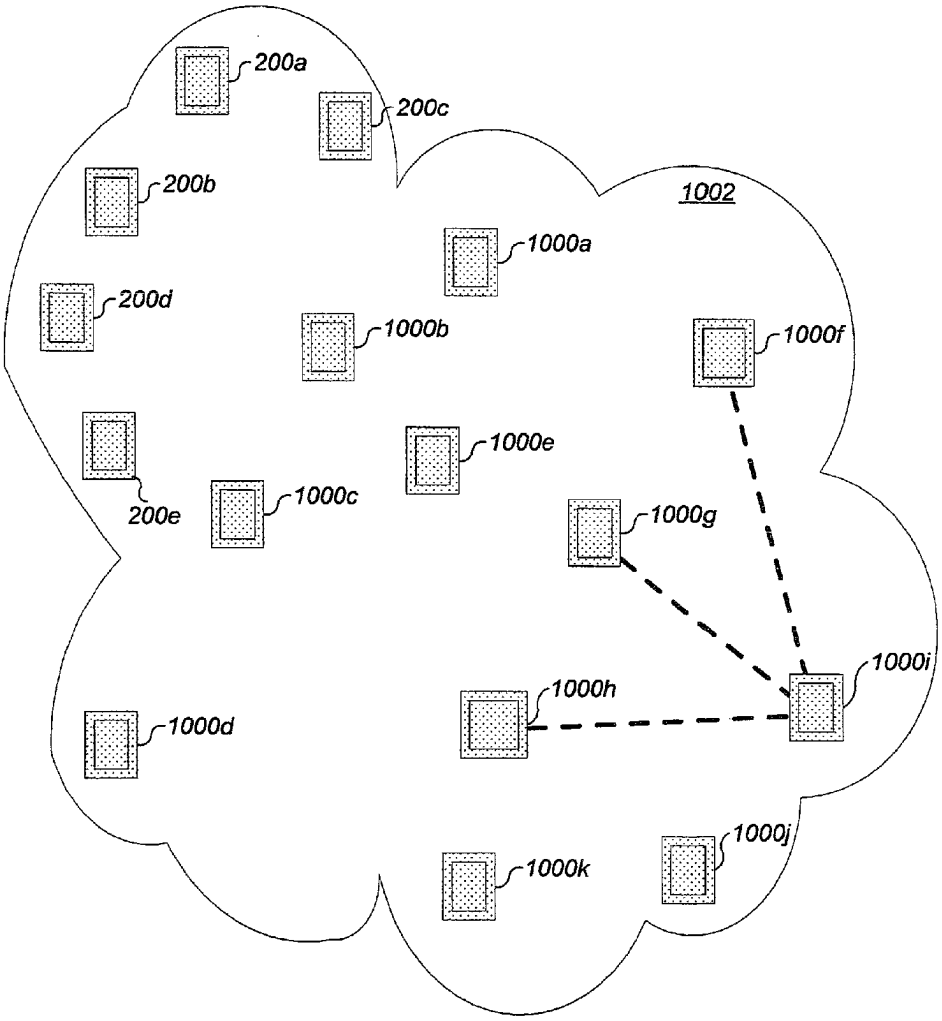

200a
200c
200b
1002
1000a
200d
1000b
1000f
1000e
200e
1000c
1000g
1000i
1000h
1000d
1000j
1000k

Fig. 10F

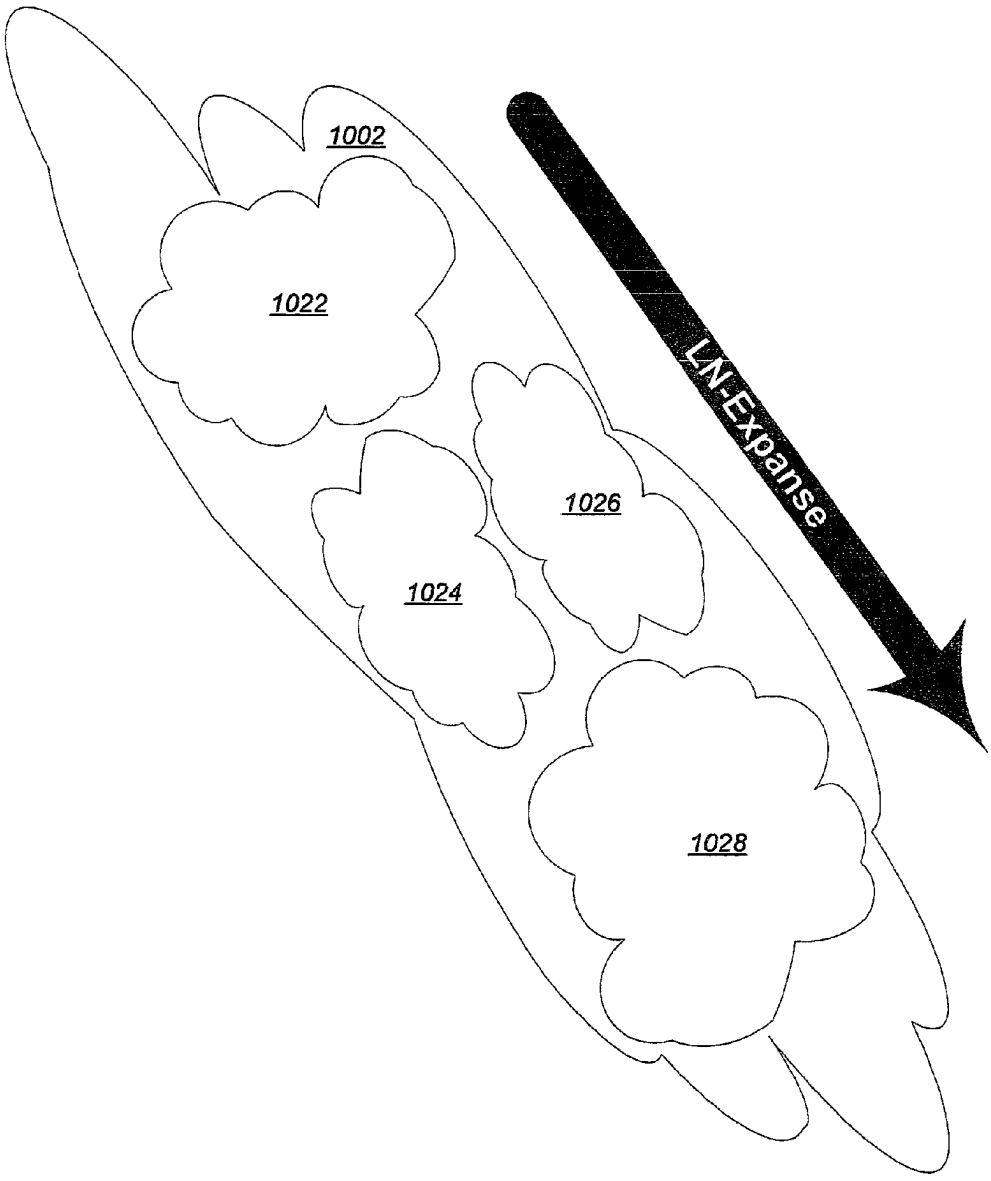


Fig. 10G

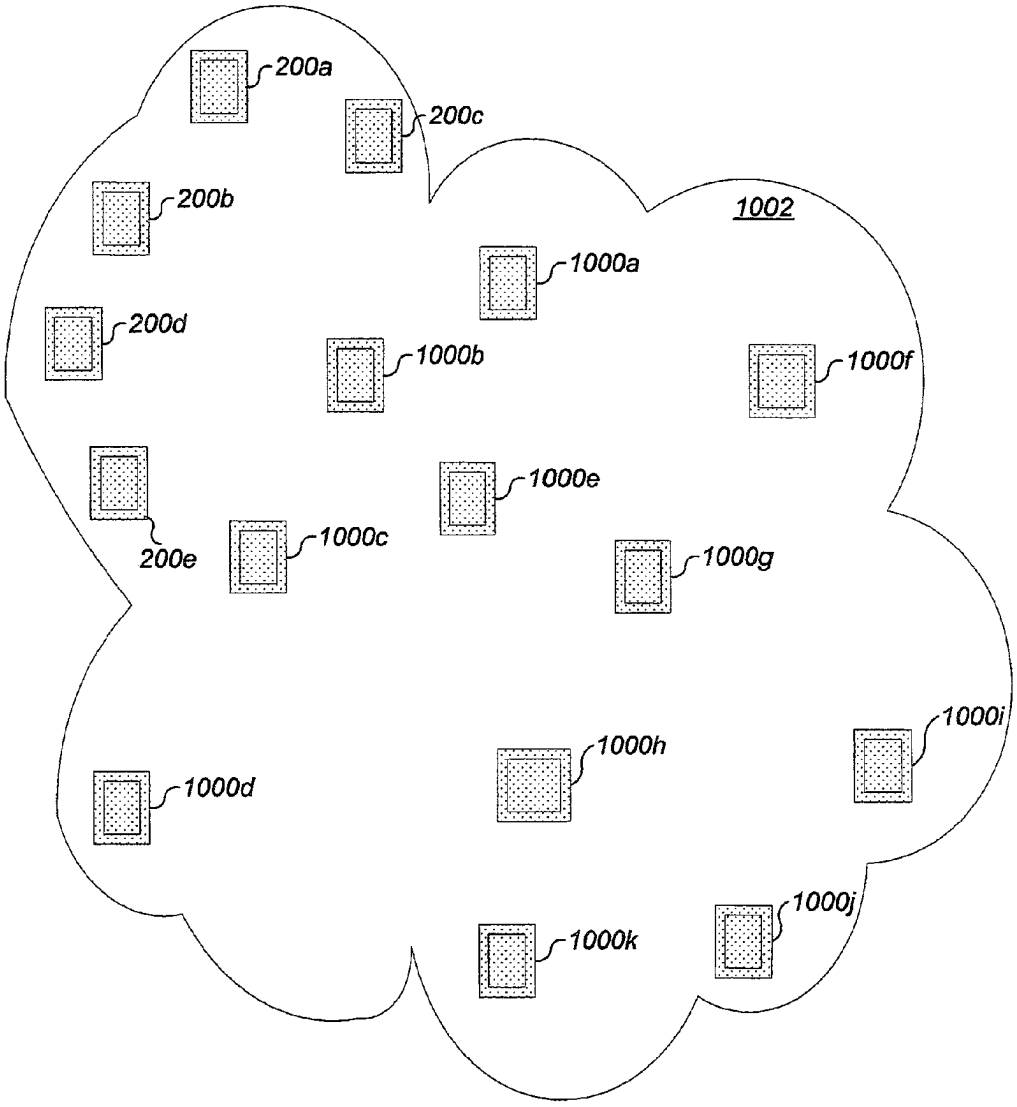

200a
200c
200b
1002
1000a
200d
1000b
1000f
1000e
200e
1000c
1000g
1000i
1000h
1000d
1000j
1000k

Fig. 10H

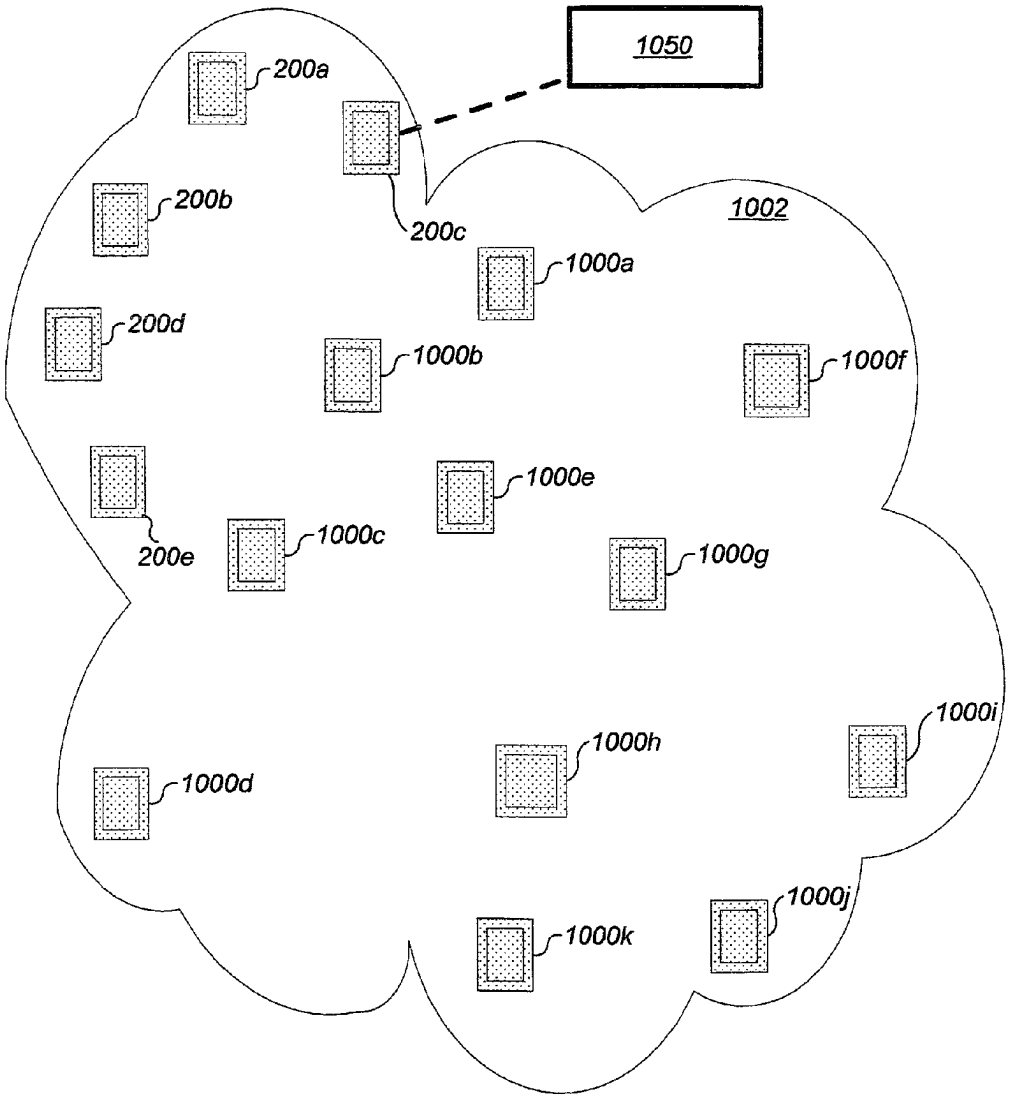

1050
200a
200b
200c
1002
1000a
200d
1000b
1000f
1000e
200e
1000c
1000g
1000i
1000h
1000d
1000j
1000k

Fig. 10I

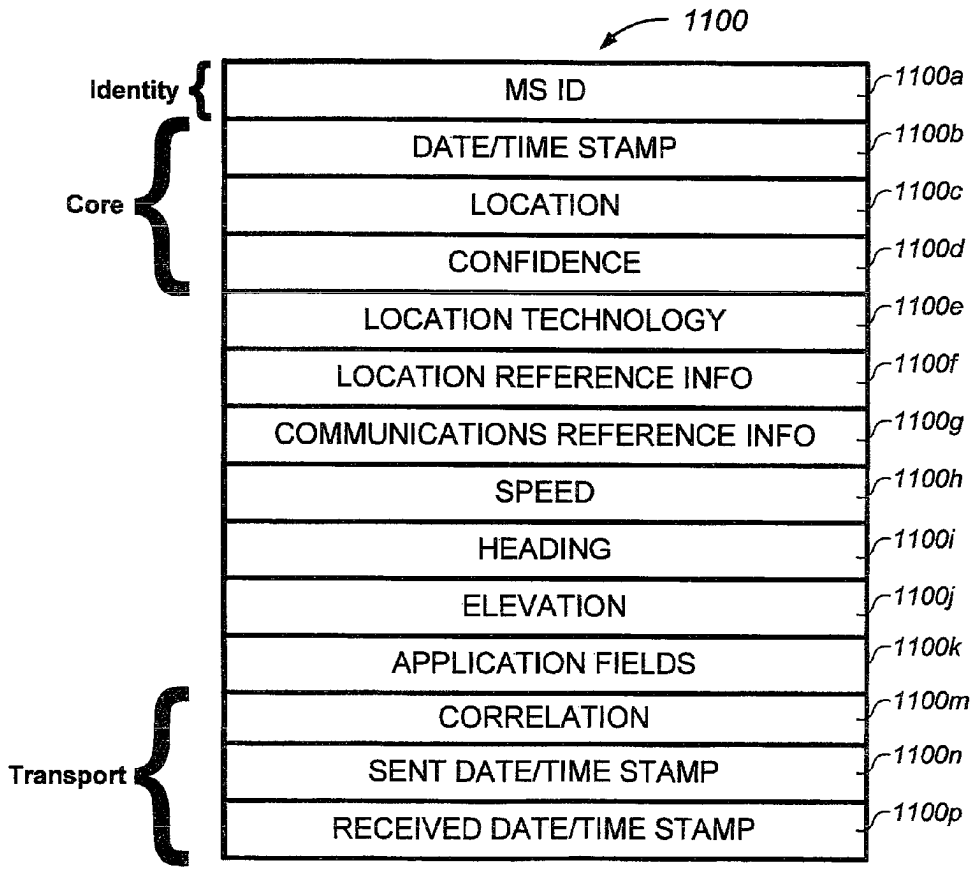

1100
Identity
Core
Transport
MS ID
DATE/TIME STAMP
LOCATION
CONFIDENCE
LOCATION TECHNOLOGY
LOCATION REFERENCE INFO
COMMUNICATIONS REFERENCE INFO
SPEED
HEADING
ELEVATION
APPLICATION FIELDS
CORRELATION
SENT DATE/TIME STAMP
RECEIVED DATE/TIME STAMP
1100a
1100b
1100c
1100d
1100e
1100f
1100g
1100h
1100i
1100j
1100k
1100m
1100n
1100p

Fig. 11A

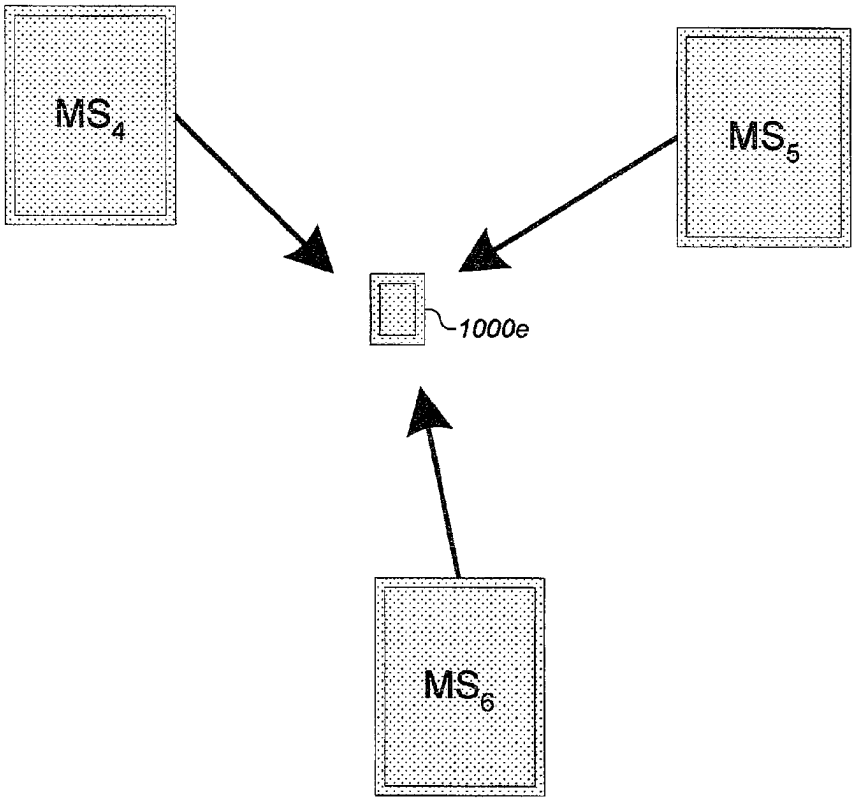


Fig. 11B

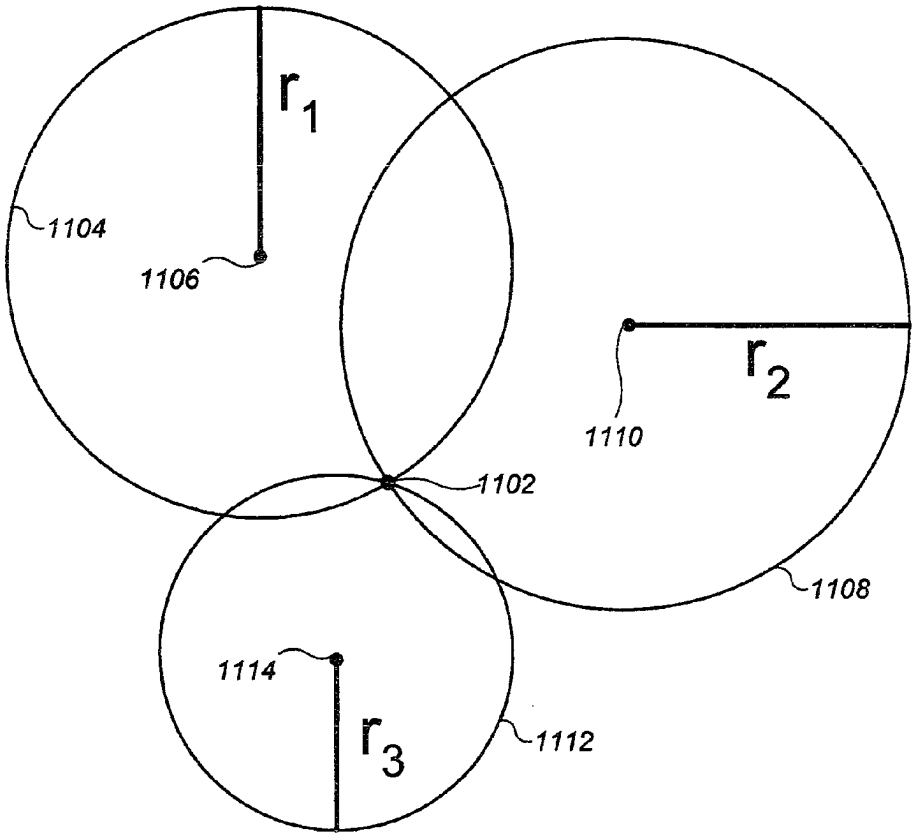


Fig. 11C

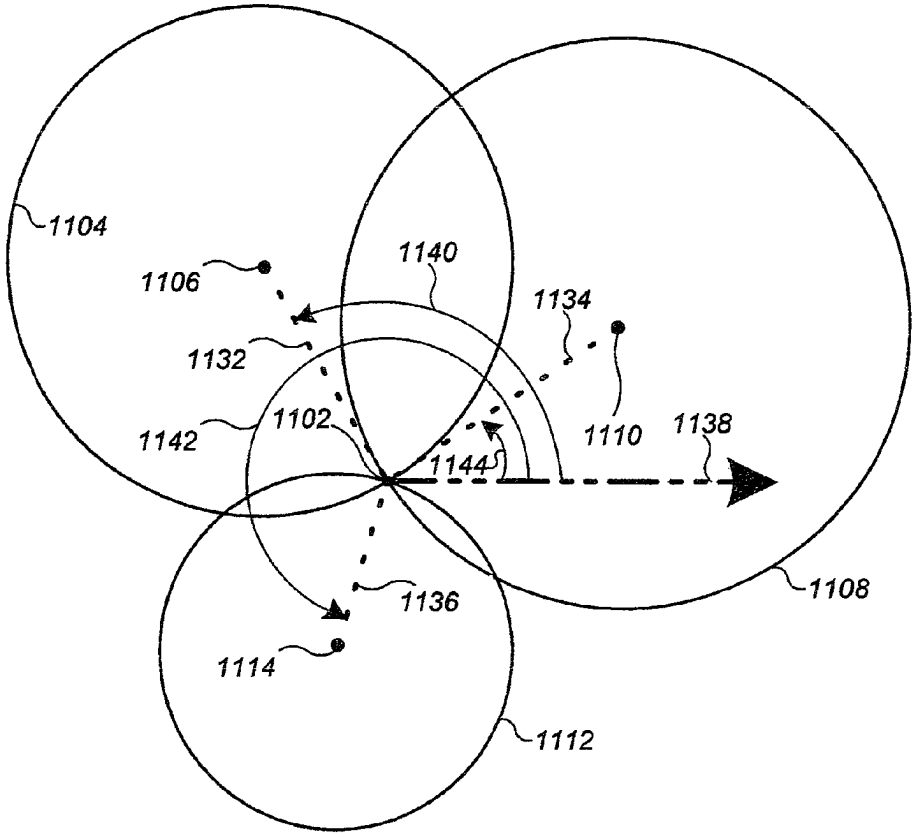

1104
1106
1140
1134
1132
1102
1142
1110
1138
1144
1136
1108
1114
1112

Fig. 11D

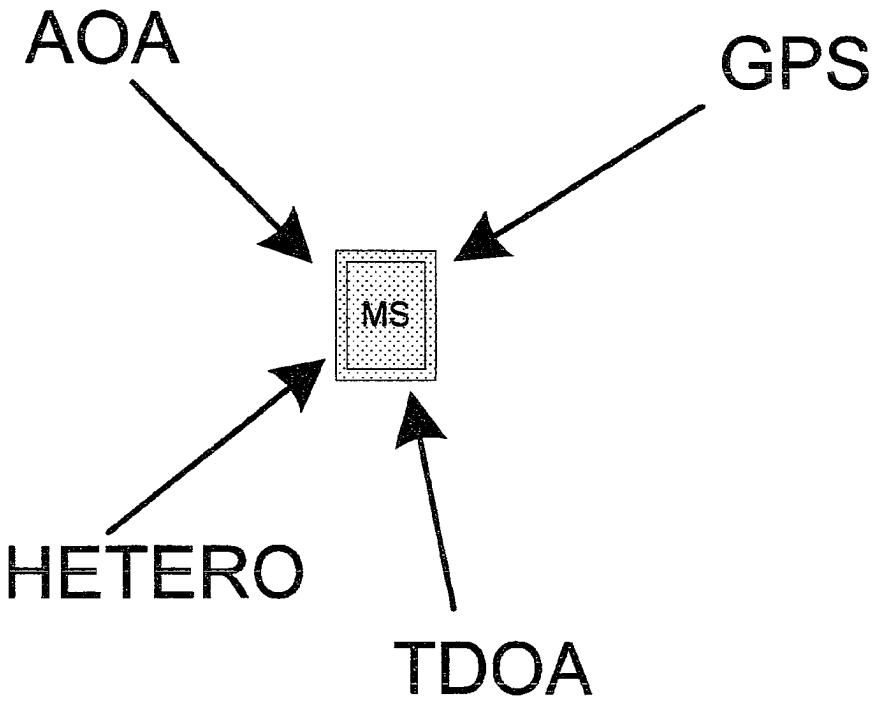


Fig. 11E

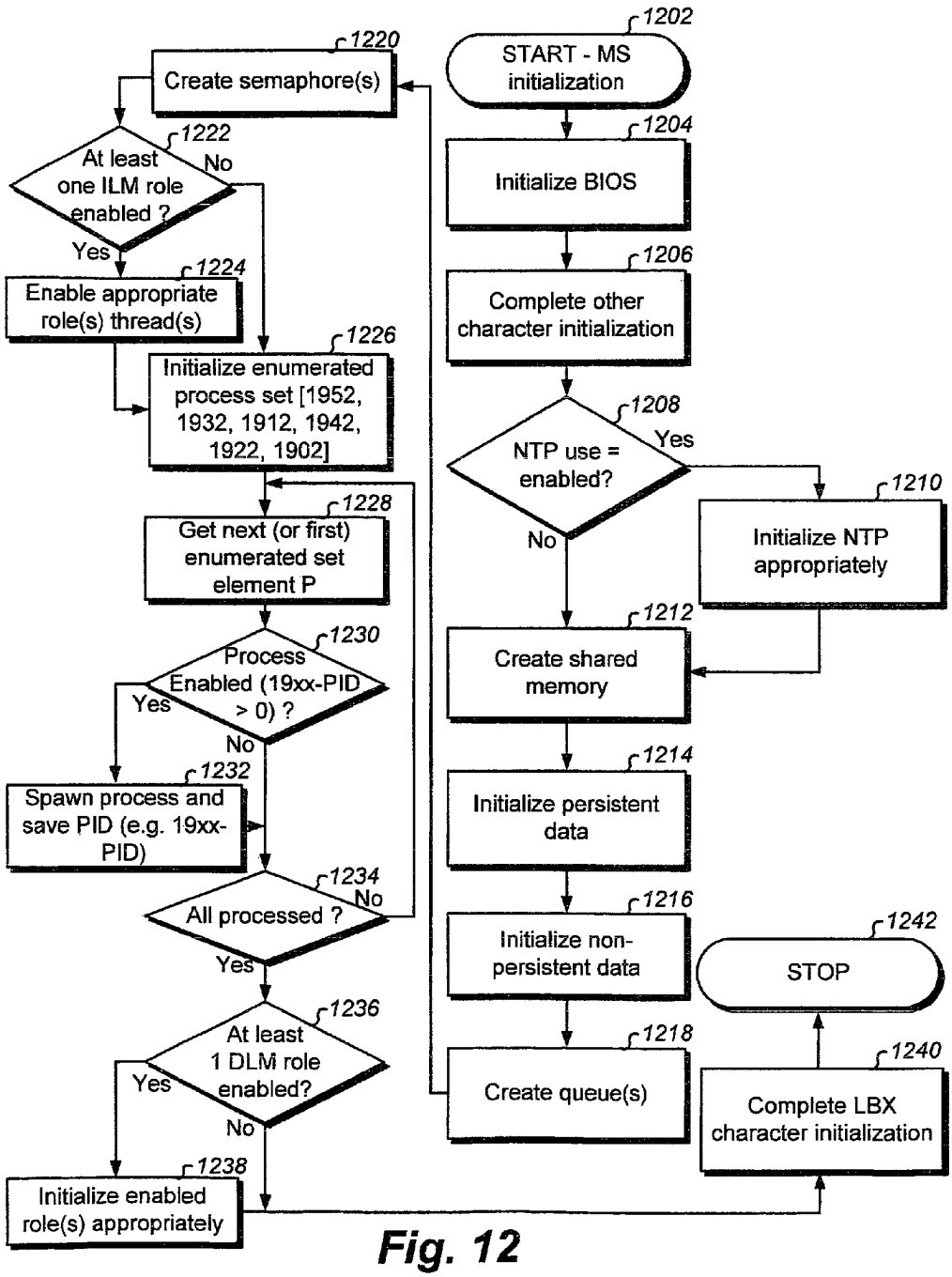

1202
START - MS initialization
1204
Initialize BIOS
1206
Complete other character initialization
1208
NTP use = enabled?
Yes
No
1210
Initialize NTP appropriately
1212
Create shared memory
1214
Initialize persistent data
1216
Initialize non-persistent data
1218
Create queue(s)
1220
Create semaphore(s)
1222
At least one ILM role enabled ?
No
Yes
1224
Enable appropriate role(s) thread(s)
1226
Initialize enumerated process set [1952, 1932, 1912, 1942, 1922, 1902]
1228
Get next (or first) enumerated set element P
1230
Process Enabled (19xx-PID > 0) ?
Yes
No
1232
Spawn process and save PID (e.g. 19xx-PID)
1234
All processed ?
No
Yes
1236
At least 1 DLM role enabled?
Yes
No
1238
Initialize enabled role(s) appropriately
1240
Complete LBX character initialization
1242
STOP

Fig. 12

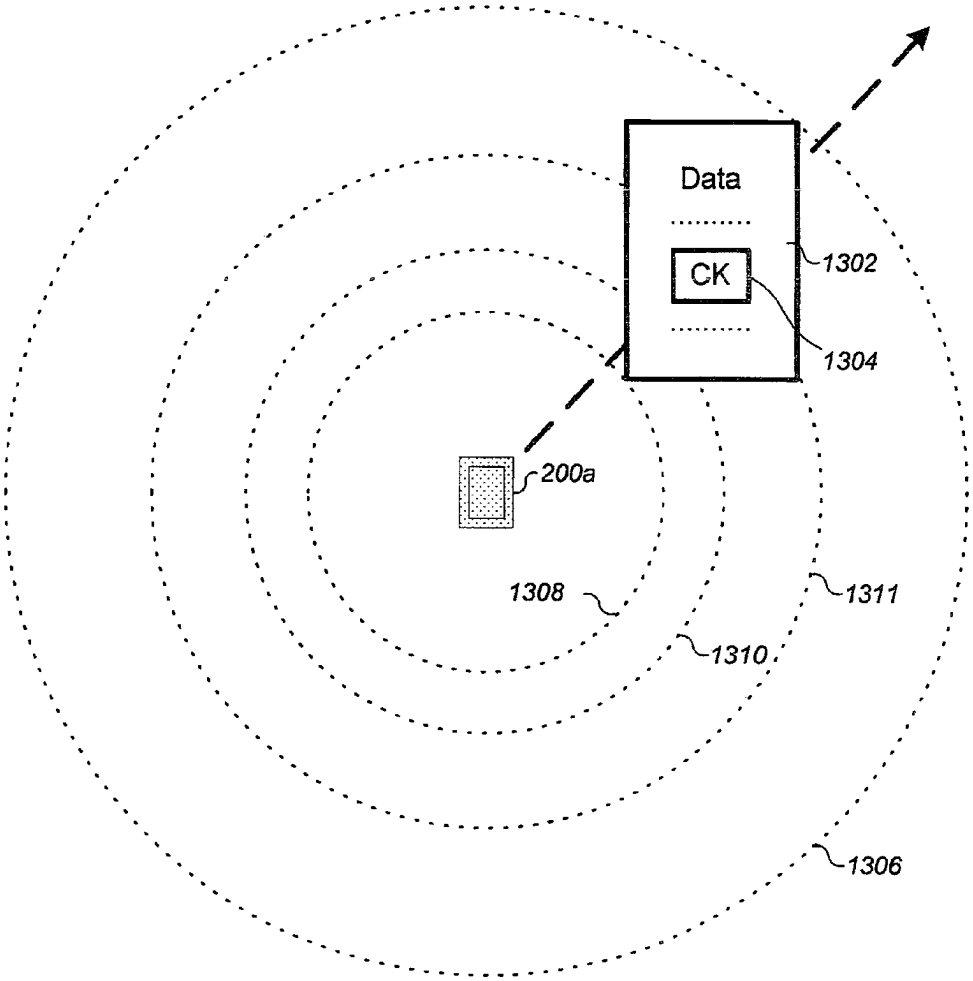


Fig. 13A

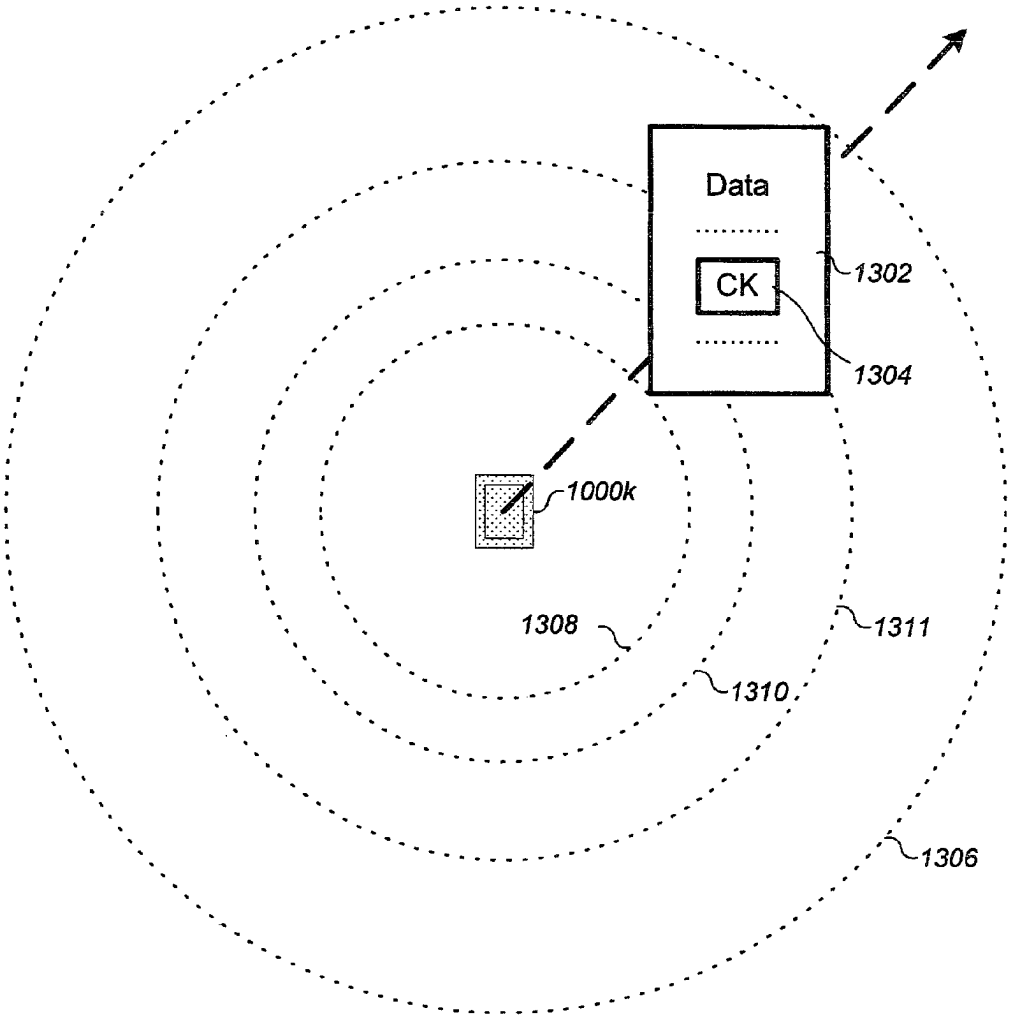


Fig. 13B

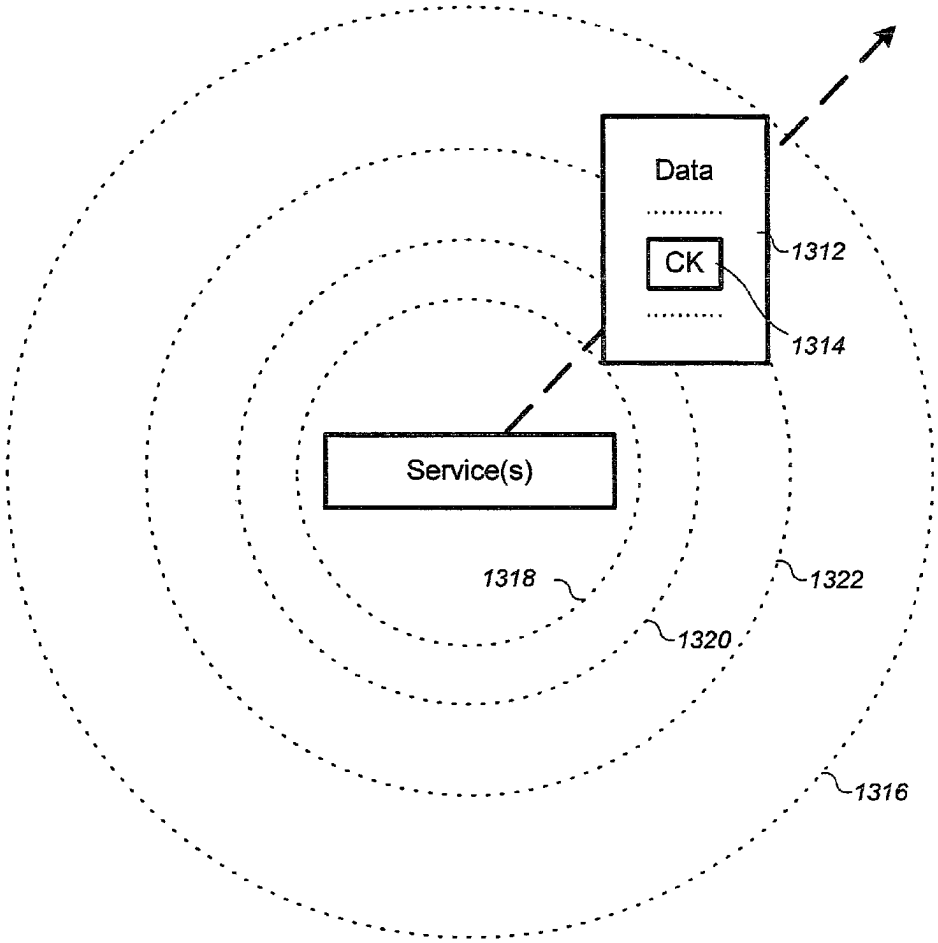


Fig. 13C

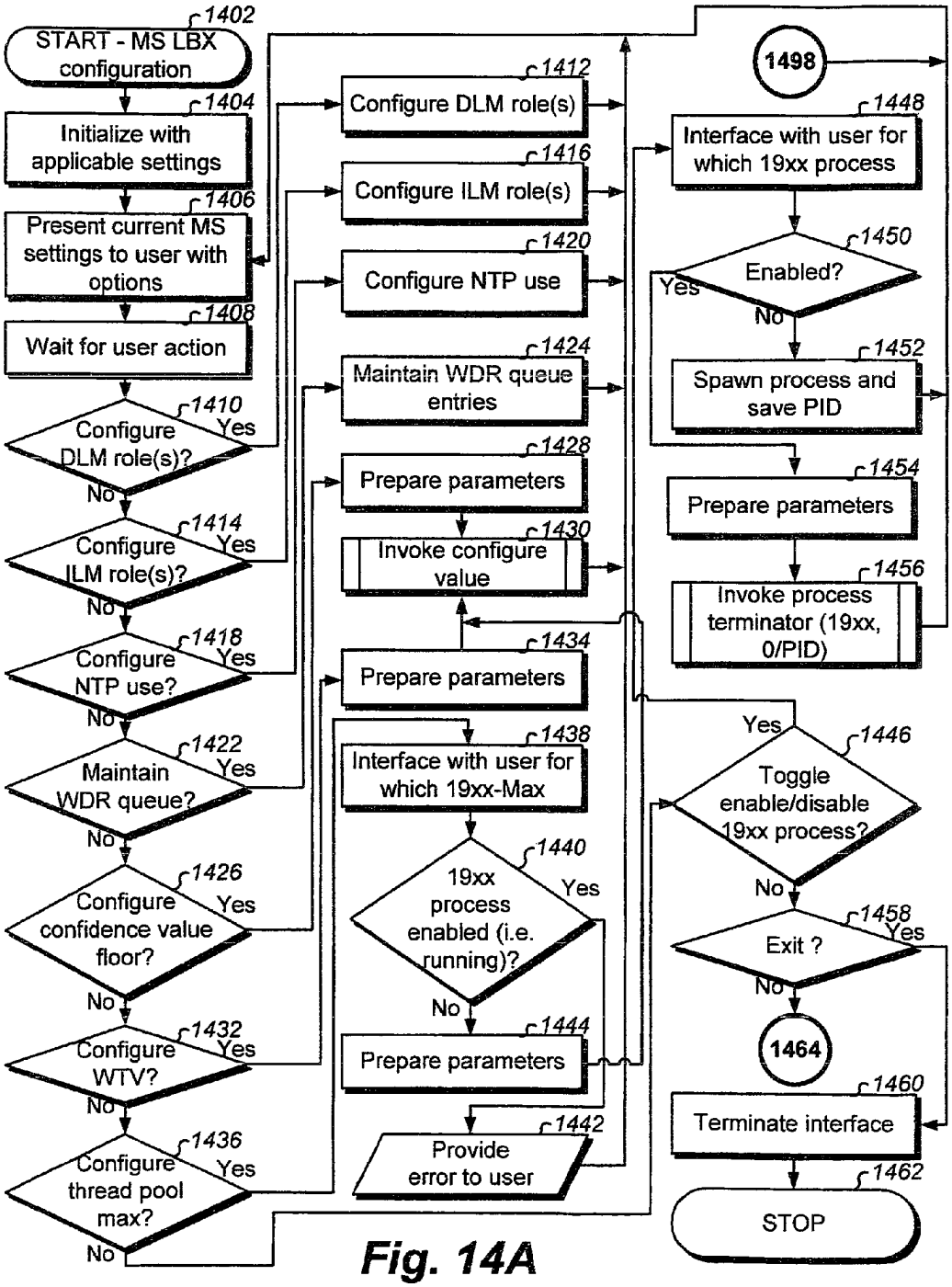

1402
START - MS LBX configuration
1404
Initialize with applicable settings
1406
Present current MS settings to user with options
1408
Wait for user action
1410
Configure DLM role(s)?
Yes
No
1414
Configure ILM role(s)?
Yes
No
1418
Configure NTP use?
Yes
No
1422
Maintain WDR queue?
Yes
No
1426
Configure confidence value floor?
Yes
No
1432
Configure WTV?
Yes
No
1436
Configure thread pool max?
Yes
No
1412
Configure DLM role(s)
1416
Configure ILM role(s)
1420
Configure NTP use
1424
Maintain WDR queue entries
1428
Prepare parameters
1430
Invoke configure value
1434
Prepare parameters
1438
Interface with user for which 19xx-Max
1440
19xx process enabled (i.e. running)?
Yes
No
1444
Prepare parameters
1442
Provide error to user
1498
1448
Interface with user for which 19xx process
1450
Enabled?
Yes
No
1452
Spawn process and save PID
1454
Prepare parameters
1456
Invoke process terminator (19xx, 0/PID)
Yes
1446
Toggle enable/disable 19xx process?
No
1458
Exit ?
Yes
No
1464
1460
Terminate interface
1462
STOP

Fig. 14A

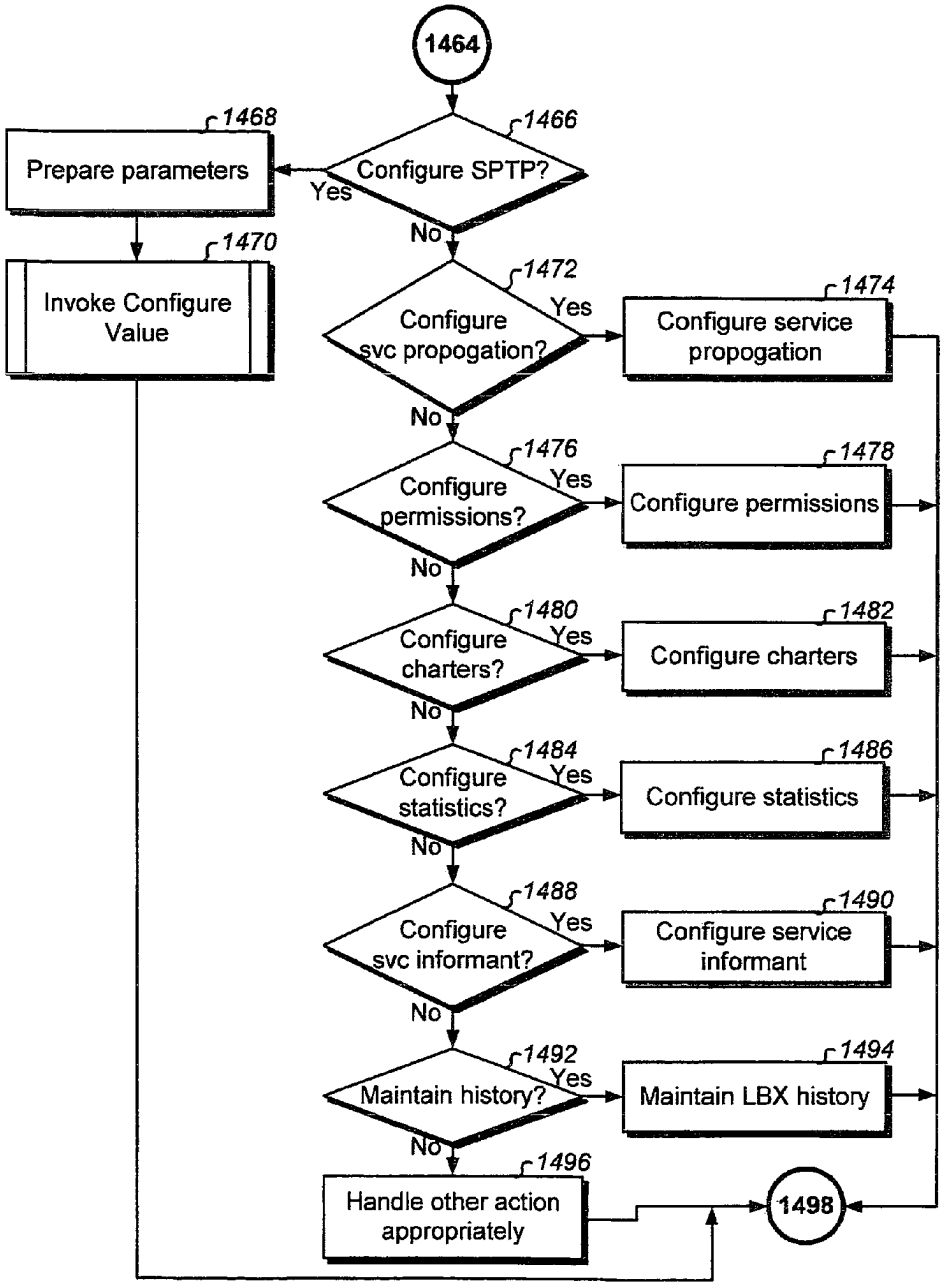

1464
1466
Configure SPTP?
Yes
1468
Prepare parameters
No
1470
Invoke Configure Value
1472
Configure svc propogation?
Yes
1474
Configure service propogation
No
1476
Configure permissions?
Yes
1478
Configure permissions
No
1480
Configure charters?
Yes
1482
Configure charters
No
1484
Configure statistics?
Yes
1486
Configure statistics
No
1488
Configure svc informant?
Yes
1490
Configure service informant
No
1492
Maintain history?
Yes
1494
Maintain LBX history
No
1496
Handle other action appropriately
1498

Fig. 14B

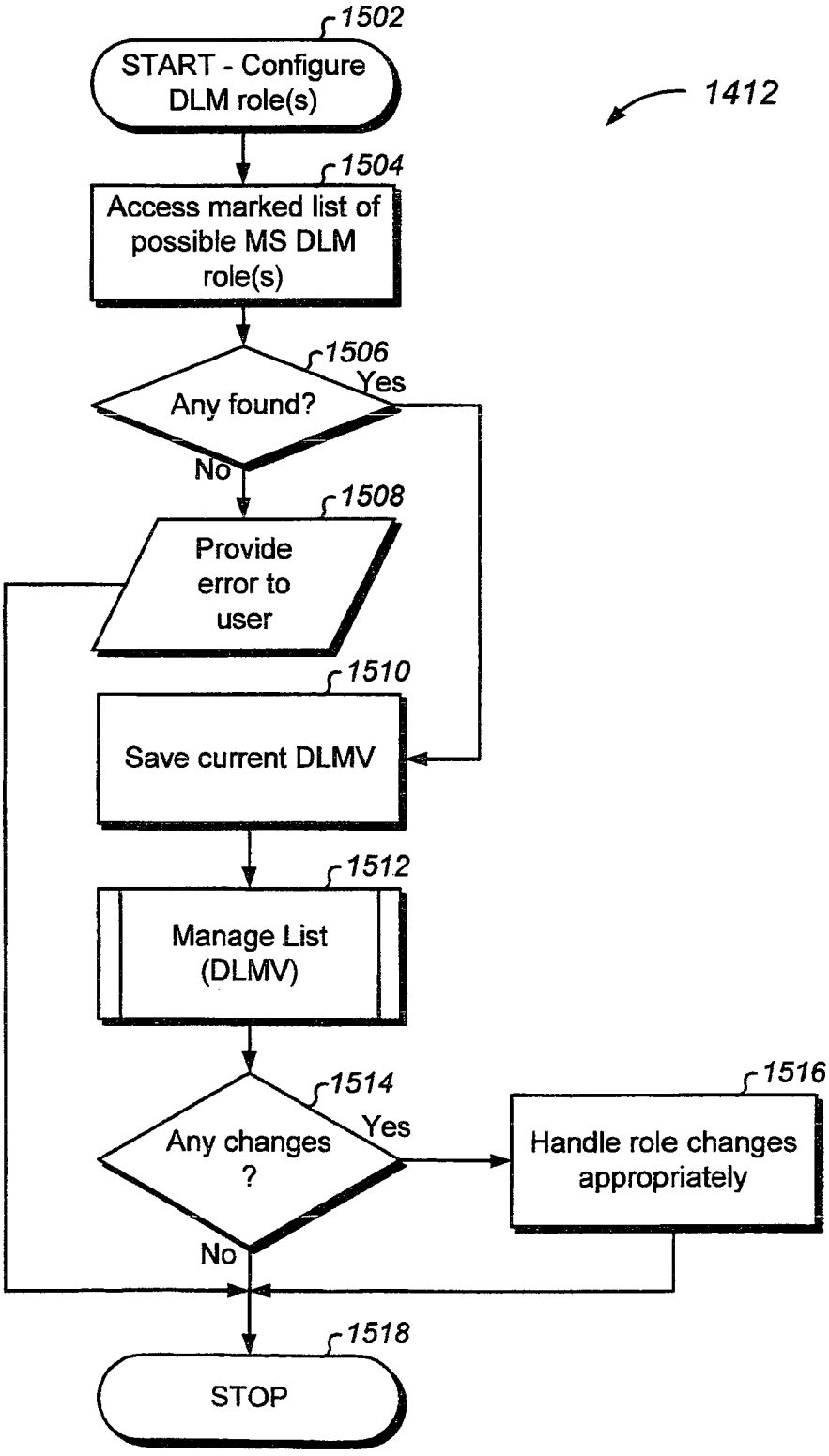

1502
START - Configure DLM role(s)
1412
1504
Access marked list of possible MS DLM role(s)
1506
Any found?
Yes
No
1508
Provide error to user
1510
Save current DLMV
1512
Manage List (DLMV)
1514
Any changes ?
Yes
No
1516
Handle role changes appropriately
1518
STOP

Fig. 15A

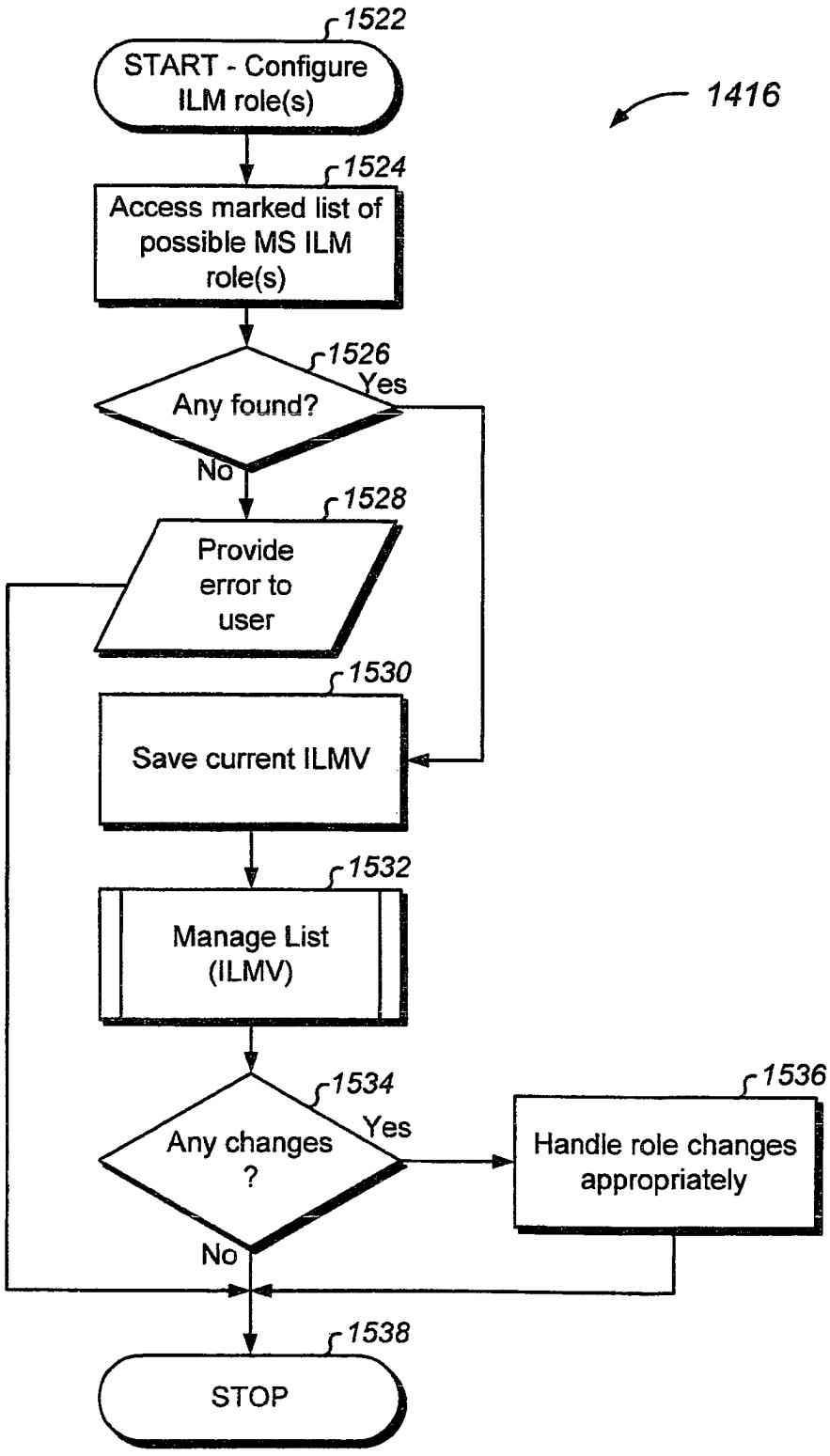

1522
START - Configure ILM role(s)
1416
1524
Access marked list of possible MS ILM role(s)
1526
Any found?
Yes
No
1528
Provide error to user
1530
Save current ILMV
1532
Manage List (ILMV)
1534
Any changes ?
Yes
No
1536
Handle role changes appropriately
1538
STOP

Fig. 15B

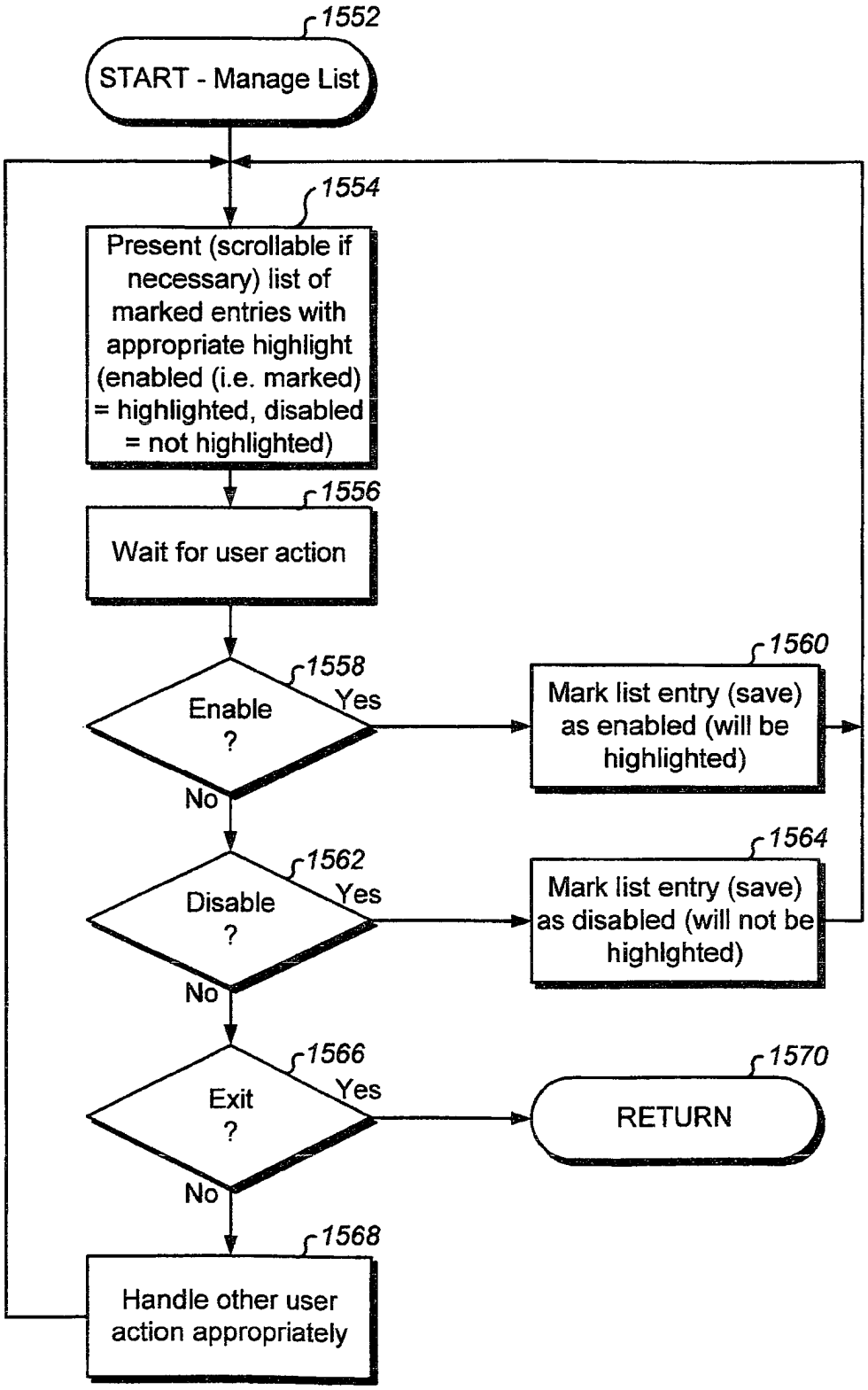

1552
START - Manage List
1554
Present (scrollable if necessary) list of marked entries with appropriate highlight (enabled (i.e. marked) = highlighted, disabled = not highlighted)
1556
Wait for user action
1558
Enable ?
Yes
No
1560
Mark list entry (save) as enabled (will be highlighted)
1562
Disable ?
Yes
No
1564
Mark list entry (save) as disabled (will not be highlighted)
1566
Exit ?
Yes
No
1570
RETURN
1568
Handle other user action appropriately

Fig. 15C

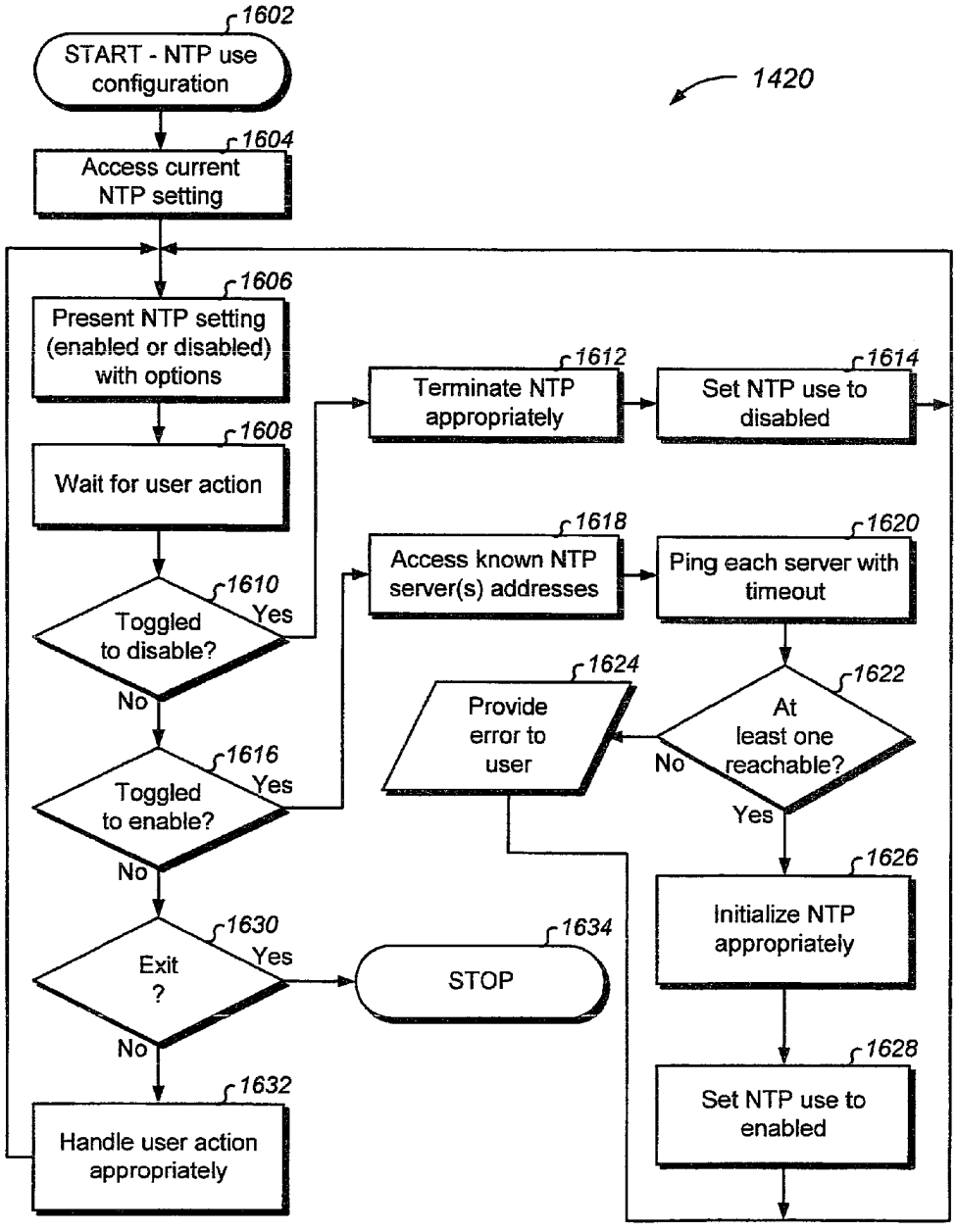

1602
START - NTP use configuration
1420
1604
Access current NTP setting
1606
Present NTP setting (enabled or disabled) with options
1608
Wait for user action
1610
Toggled to disable?
Yes
No
1612
Terminate NTP appropriately
1614
Set NTP use to disabled
1616
Toggled to enable?
Yes
No
1618
Access known NTP server(s) addresses
1620
Ping each server with timeout
1622
At least one reachable?
No
Yes
1624
Provide error to user
1626
Initialize NTP appropriately
1628
Set NTP use to enabled
1630
Exit ?
Yes
No
1634
STOP
1632
Handle user action appropriately

Fig. 16

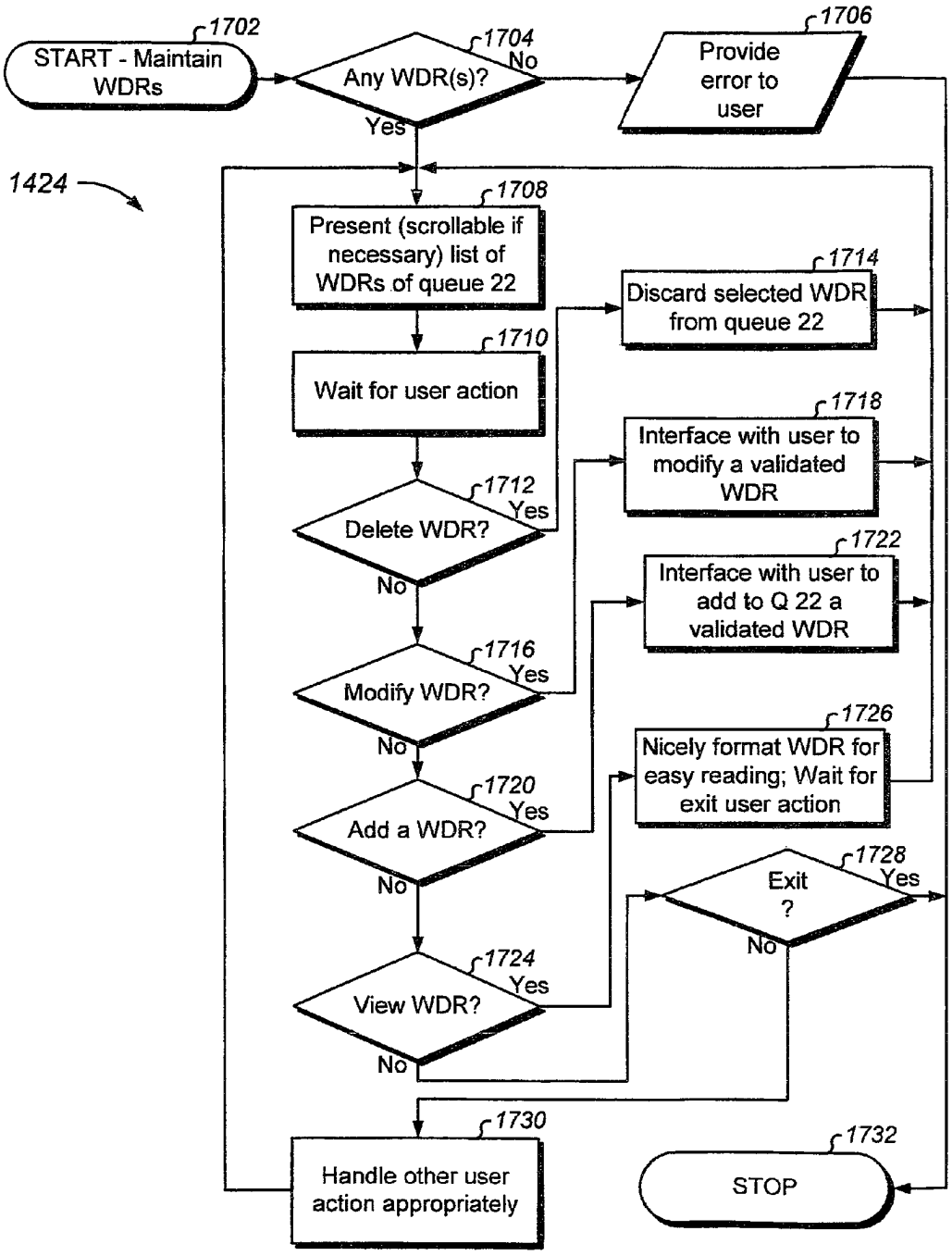

1702
START - Maintain WDRs
1704
Any WDR(s)?
No
Yes
1706
Provide error to user
1424
1708
Present (scrollable if necessary) list of WDRs of queue 22
1710
Wait for user action
1712
Delete WDR?
Yes
No
1714
Discard selected WDR from queue 22
1716
Modify WDR?
Yes
No
1718
Interface with user to modify a validated WDR
1720
Add a WDR?
Yes
No
1722
Interface with user to add to Q 22 a validated WDR
1724
View WDR?
Yes
No
1726
Nicely format WDR for easy reading; Wait for exit user action
1728
Exit ?
Yes
No
1730
Handle other user action appropriately
1732
STOP

Fig. 17

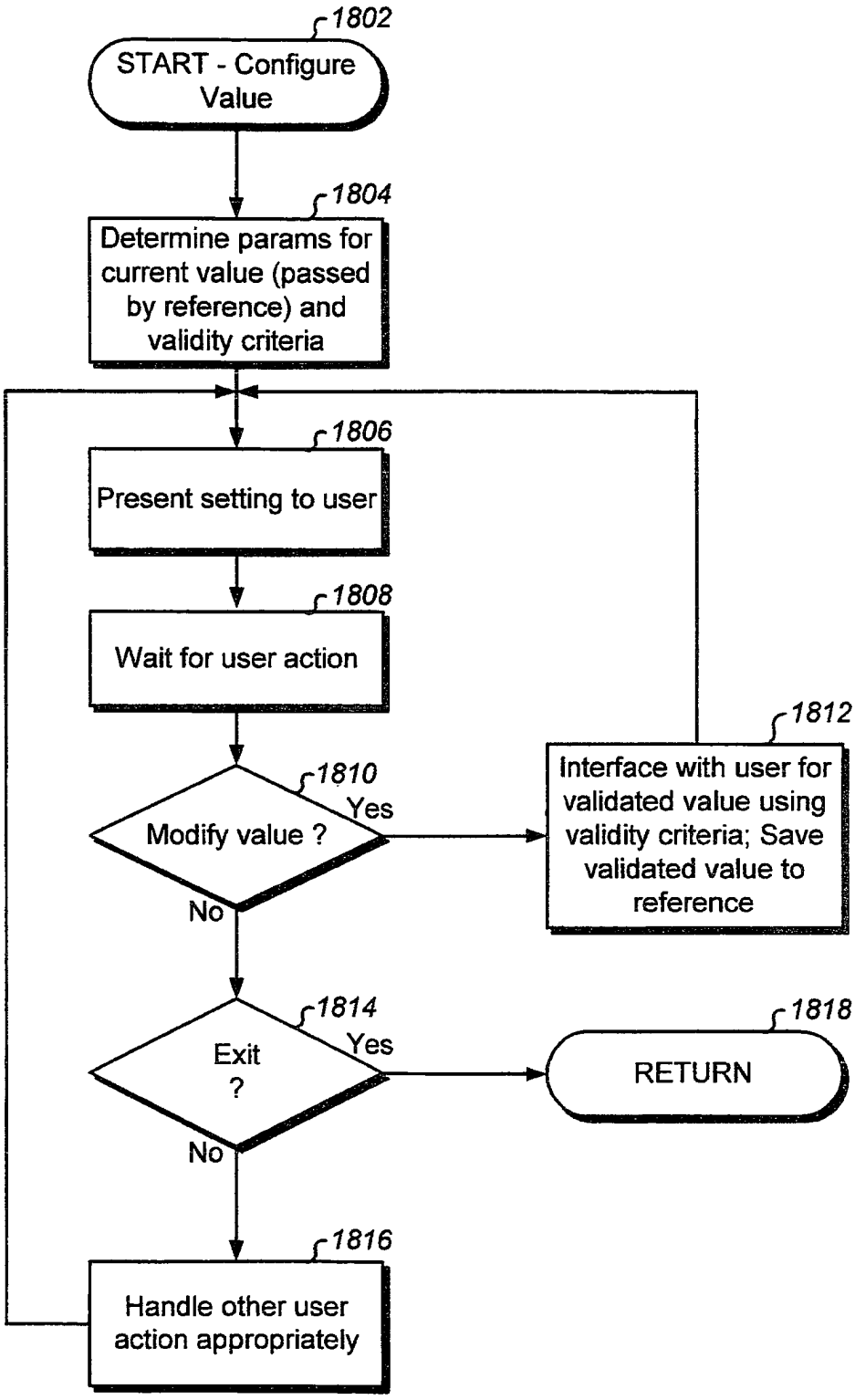

1802
START - Configure Value
1804
Determine params for current value (passed by reference) and validity criteria
1806
Present setting to user
1808
Wait for user action
1810
Modify value ?
Yes
No
1812
Interface with user for validated value using validity criteria; Save validated value to reference
1814
Exit ?
Yes
No
1818
RETURN
1816
Handle other user action appropriately

Fig. 18

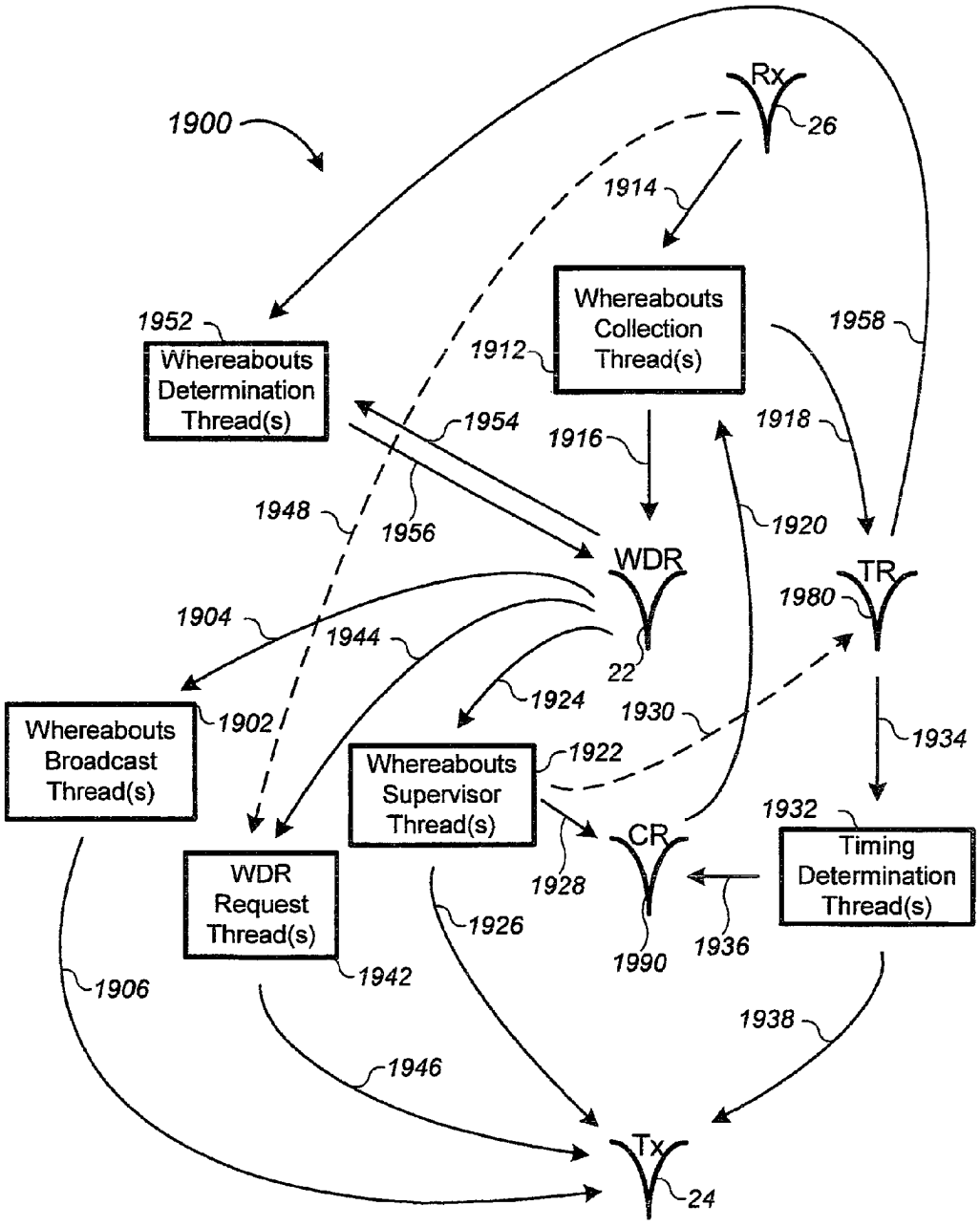

1900
Rx
26
1914
1952
Whereabouts Determination Thread(s)
1912
Whereabouts Collection Thread(s)
1958
1954
1916
1918
1948
1956
1920
WDR
TR
1980
1904
1944
22
1924
1930
1934
Whereabouts Broadcast Thread(s)
1902
1922
Whereabouts Supervisor Thread(s)
1932
CR
Timing Determination Thread(s)
WDR Request Thread(s)
1928
1926
1936
1990
1906
1942
1938
1946
Tx
24

Fig. 19

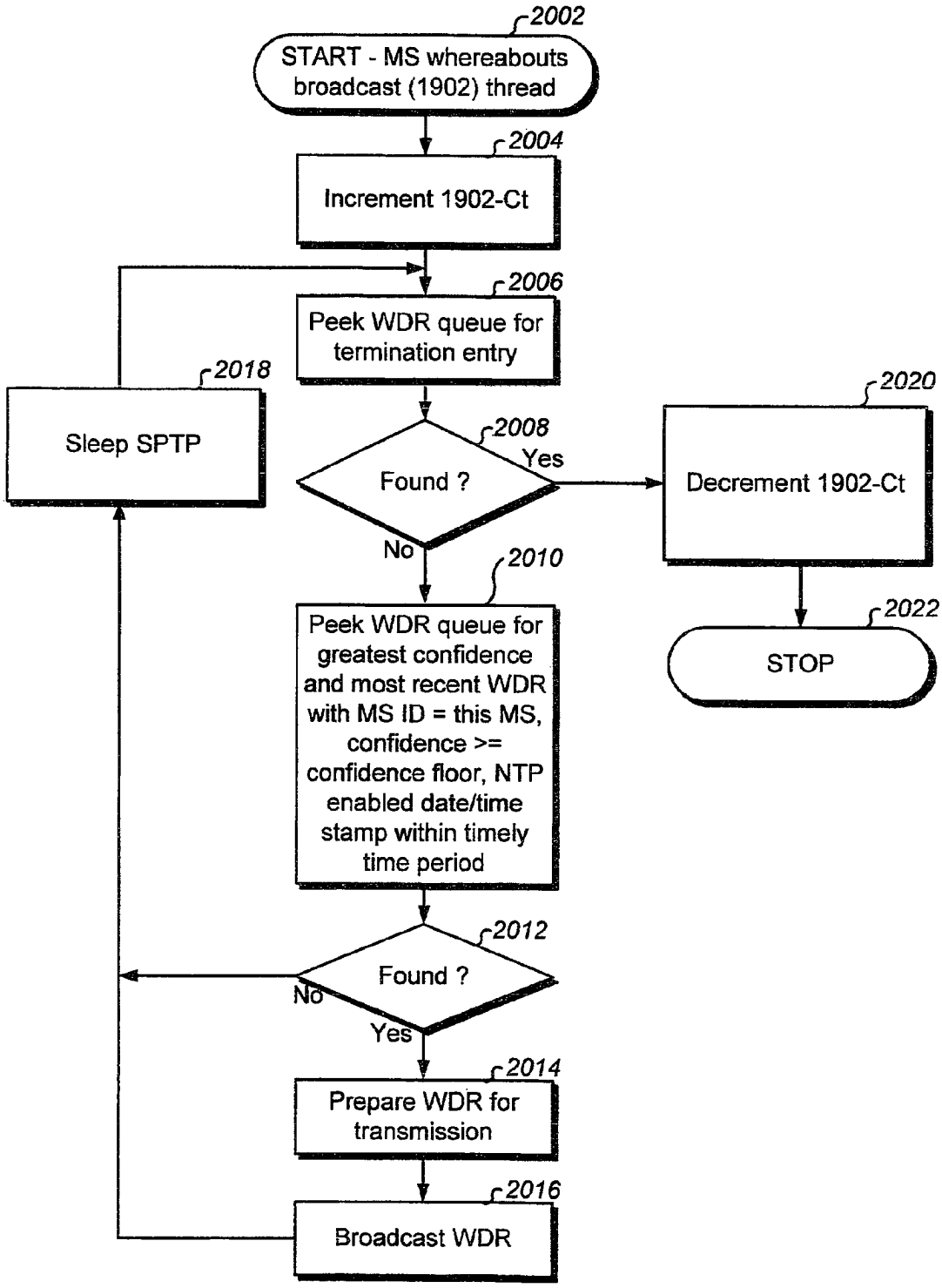

2002
START - MS whereabouts broadcast (1902) thread
2004
Increment 1902-Ct
2006
Peek WDR queue for termination entry
2018
Sleep SPTP
2008
Found ?
Yes
No
2020
Decrement 1902-Ct
2022
STOP
2010
Peek WDR queue for greatest confidence and most recent WDR with MS ID = this MS, confidence >= confidence floor, NTP enabled date/time stamp within timely time period
2012
Found ?
No
Yes
2014
Prepare WDR for transmission
2016
Broadcast WDR

Fig. 20

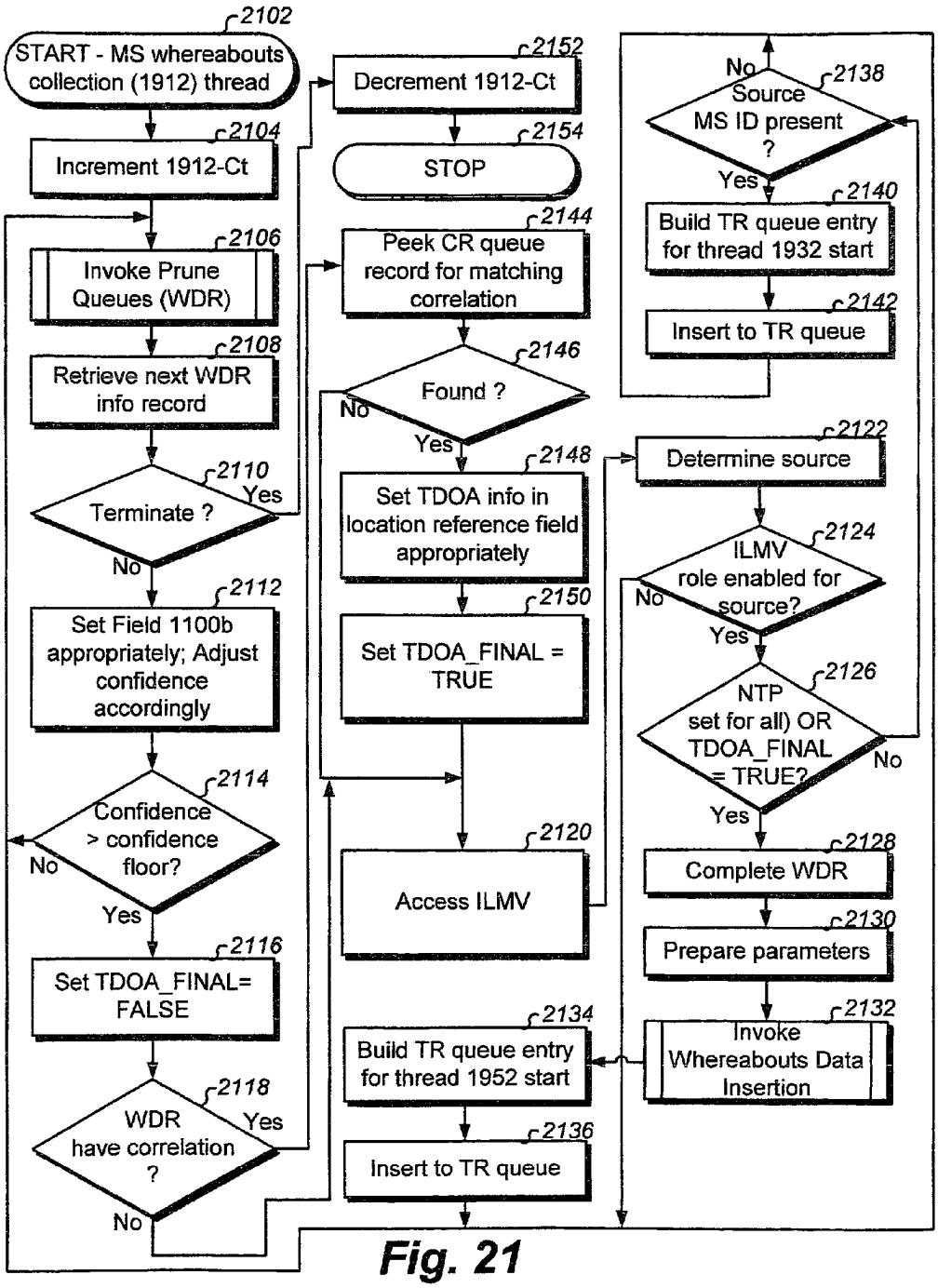

2102
START - MS whereabouts collection (1912) thread
2104
Increment 1912-Ct
2106
Invoke Prune Queues (WDR)
2108
Retrieve next WDR info record
2110
Terminate ?
Yes
No
2112
Set Field 1100b appropriately; Adjust confidence accordingly
2114
Confidence > confidence floor?
No
Yes
2116
Set TDOA_FINAL= FALSE
2118
WDR have correlation ?
Yes
No
2152
Decrement 1912-Ct
2154
STOP
2144
Peek CR queue record for matching correlation
2146
Found ?
No
Yes
2148
Set TDOA info in location reference field appropriately
2150
Set TDOA_FINAL = TRUE
2120
Access ILMV
2134
Build TR queue entry for thread 1952 start
2136
Insert to TR queue
2138
Source MS ID present ?
No
Yes
2140
Build TR queue entry for thread 1932 start
2142
Insert to TR queue
2122
Determine source
2124
ILMV role enabled for source?
No
Yes
2126
NTP set for all) OR TDOA_FINAL = TRUE?
No
Yes
2128
Complete WDR
2130
Prepare parameters
2132
Invoke Whereabouts Data Insertion

Fig. 21

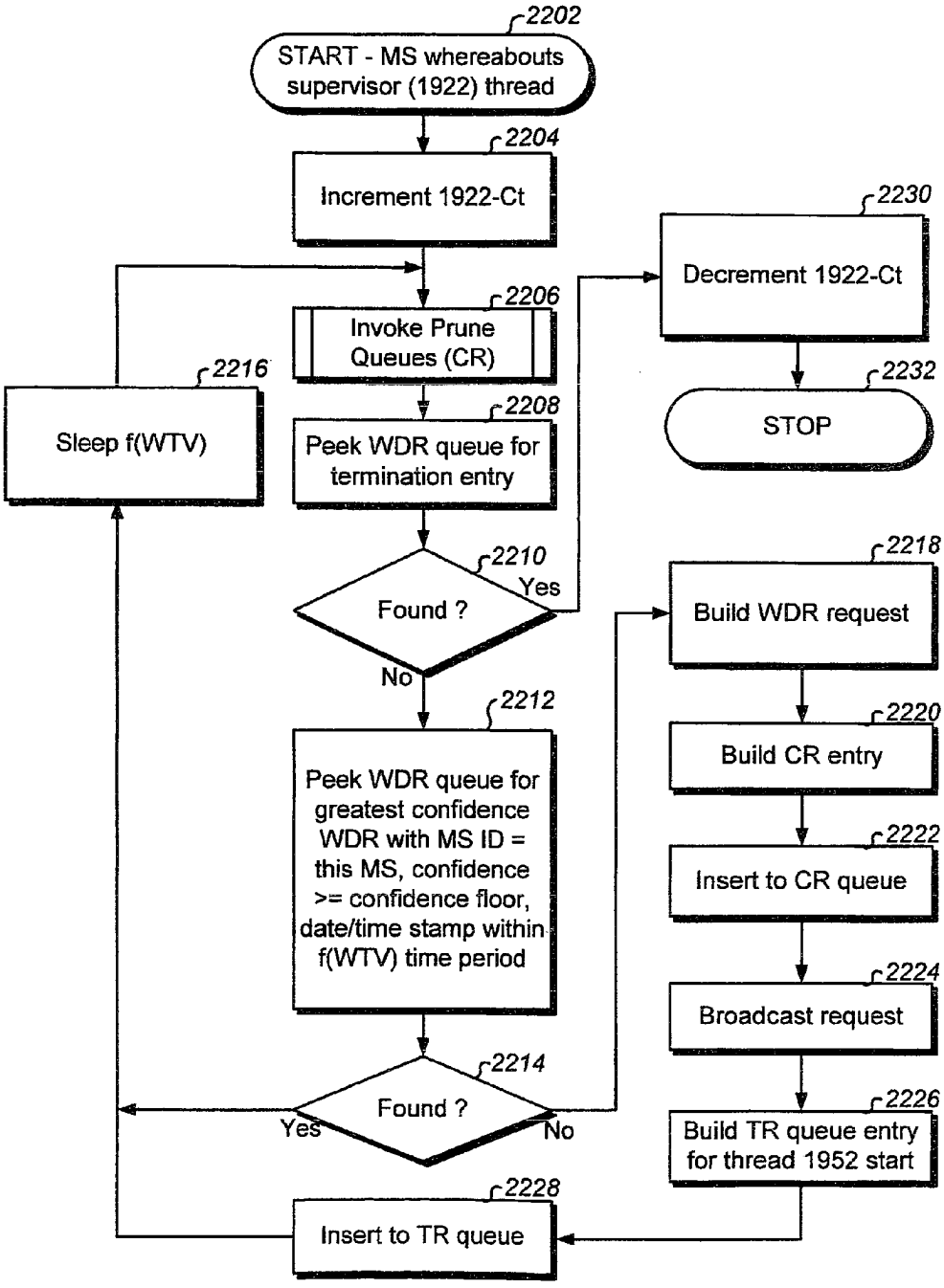

2202
START - MS whereabouts supervisor (1922) thread
2204
Increment 1922-Ct
2206
Invoke Prune Queues (CR)
2208
Peek WDR queue for termination entry
2210
Found ?
Yes
No
2212
Peek WDR queue for greatest confidence WDR with MS ID = this MS, confidence >= confidence floor, date/time stamp within f(WTV) time period
2214
Found ?
Yes
No
2216
Sleep f(WTV)
2218
Build WDR request
2220
Build CR entry
2222
Insert to CR queue
2224
Broadcast request
2226
Build TR queue entry for thread 1952 start
2228
Insert to TR queue
2230
Decrement 1922-Ct
2232
STOP

Fig. 22

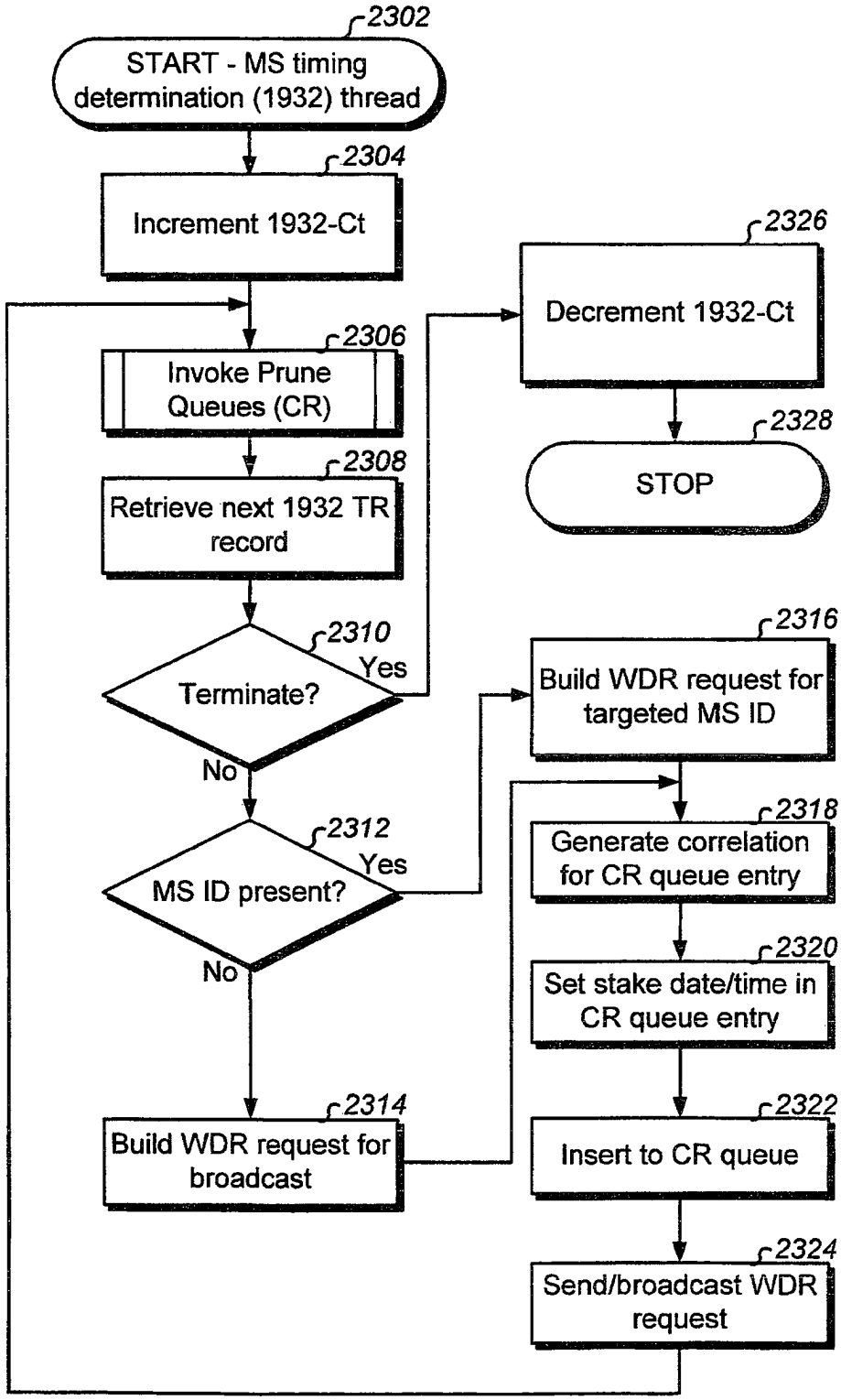

2302
START - MS timing determination (1932) thread
2304
Increment 1932-Ct
2306
Invoke Prune Queues (CR)
2308
Retrieve next 1932 TR record
2310
Terminate?
Yes
No
2312
MS ID present?
Yes
No
2314
Build WDR request for broadcast
2316
Build WDR request for targeted MS ID
2318
Generate correlation for CR queue entry
2320
Set stake date/time in CR queue entry
2322
Insert to CR queue
2324
Send/broadcast WDR request
2326
Decrement 1932-Ct
2328
STOP

Fig. 23

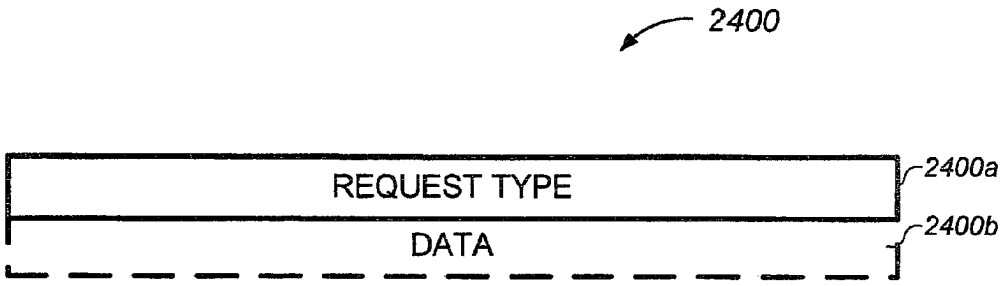


Fig. 24A

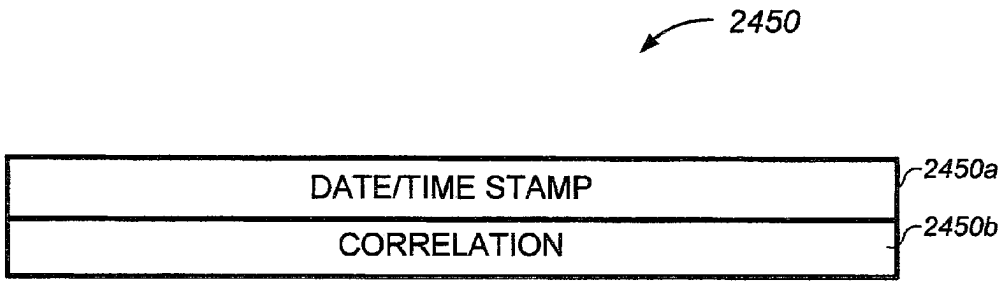


Fig. 24B

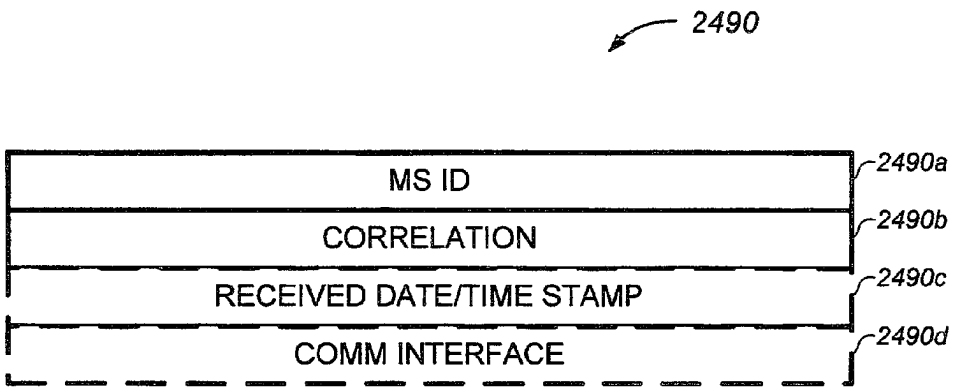

2490
MS ID
2490a
CORRELATION
2490b
RECEIVED DATE/TIME STAMP
2490c
COMM INTERFACE
2490d

Fig. 24C

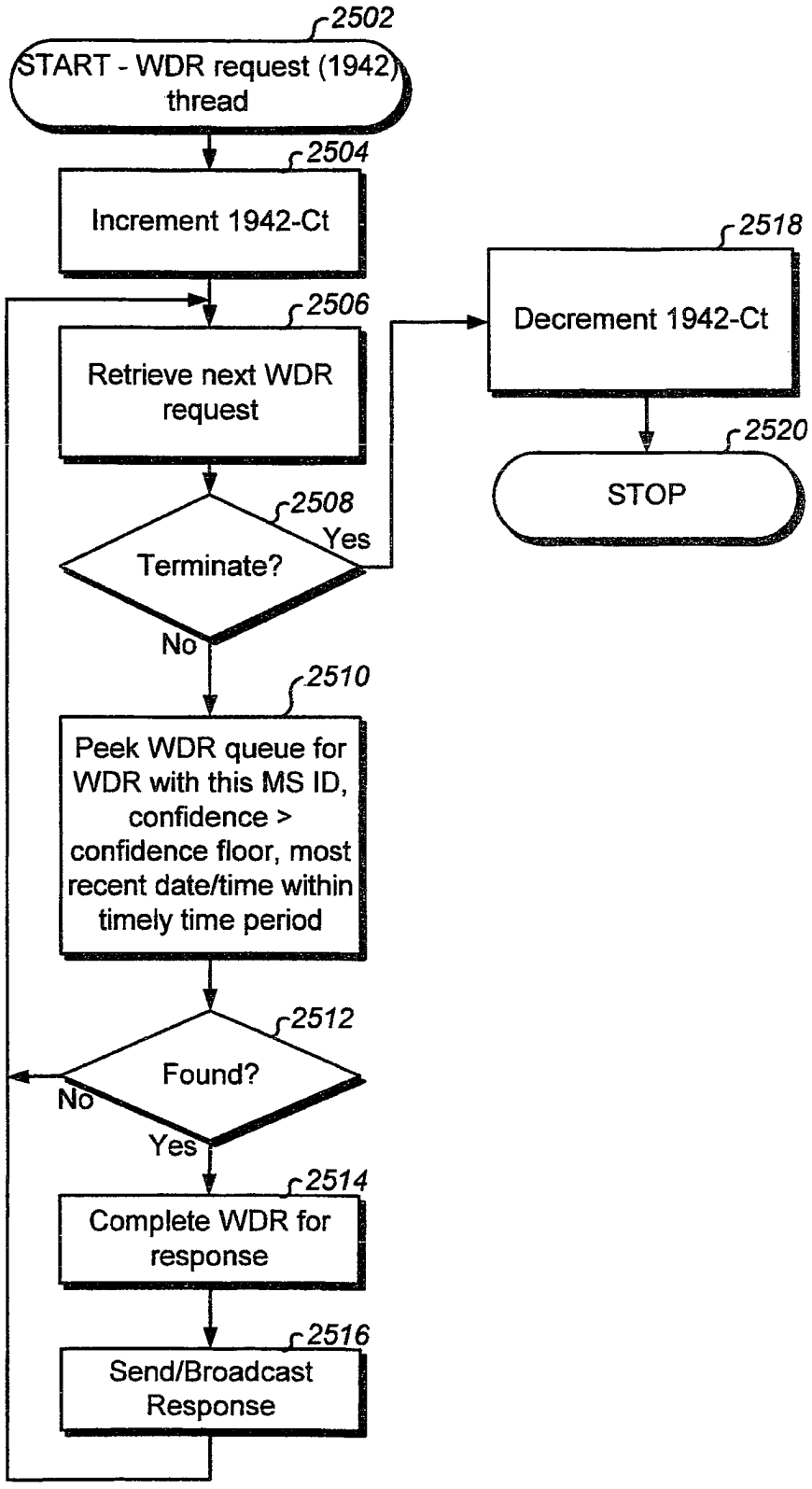

2502
START - WDR request (1942) thread
2504
Increment 1942-Ct
2506
Retrieve next WDR request
2508
Terminate?
Yes
No
2510
Peek WDR queue for WDR with this MS ID, confidence > confidence floor, most recent date/time within timely time period
2512
Found?
No
Yes
2514
Complete WDR for response
2516
Send/Broadcast Response
2518
Decrement 1942-Ct
2520
STOP

Fig. 25

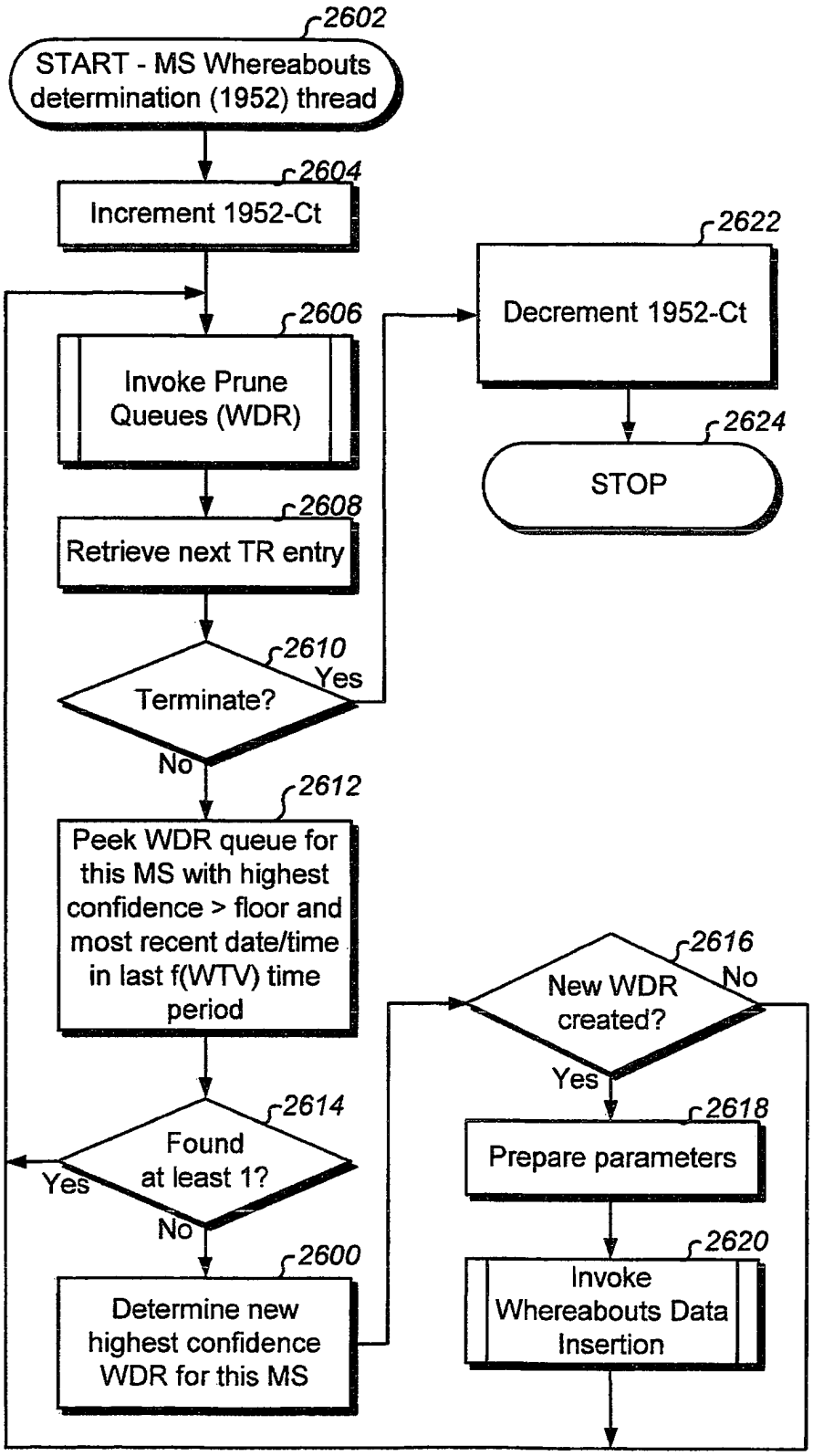

2602
START - MS Whereabouts determination (1952) thread
2604
Increment 1952-Ct
2606
Invoke Prune Queues (WDR)
2608
Retrieve next TR entry
2610
Terminate?
Yes
No
2612
Peek WDR queue for this MS with highest confidence > floor and most recent date/time in last f(WTV) time period
2614
Found at least 1?
Yes
No
2600
Determine new highest confidence WDR for this MS
2616
New WDR created?
No
Yes
2618
Prepare parameters
2620
Invoke Whereabouts Data Insertion
2622
Decrement 1952-Ct
2624
STOP

Fig. 26A

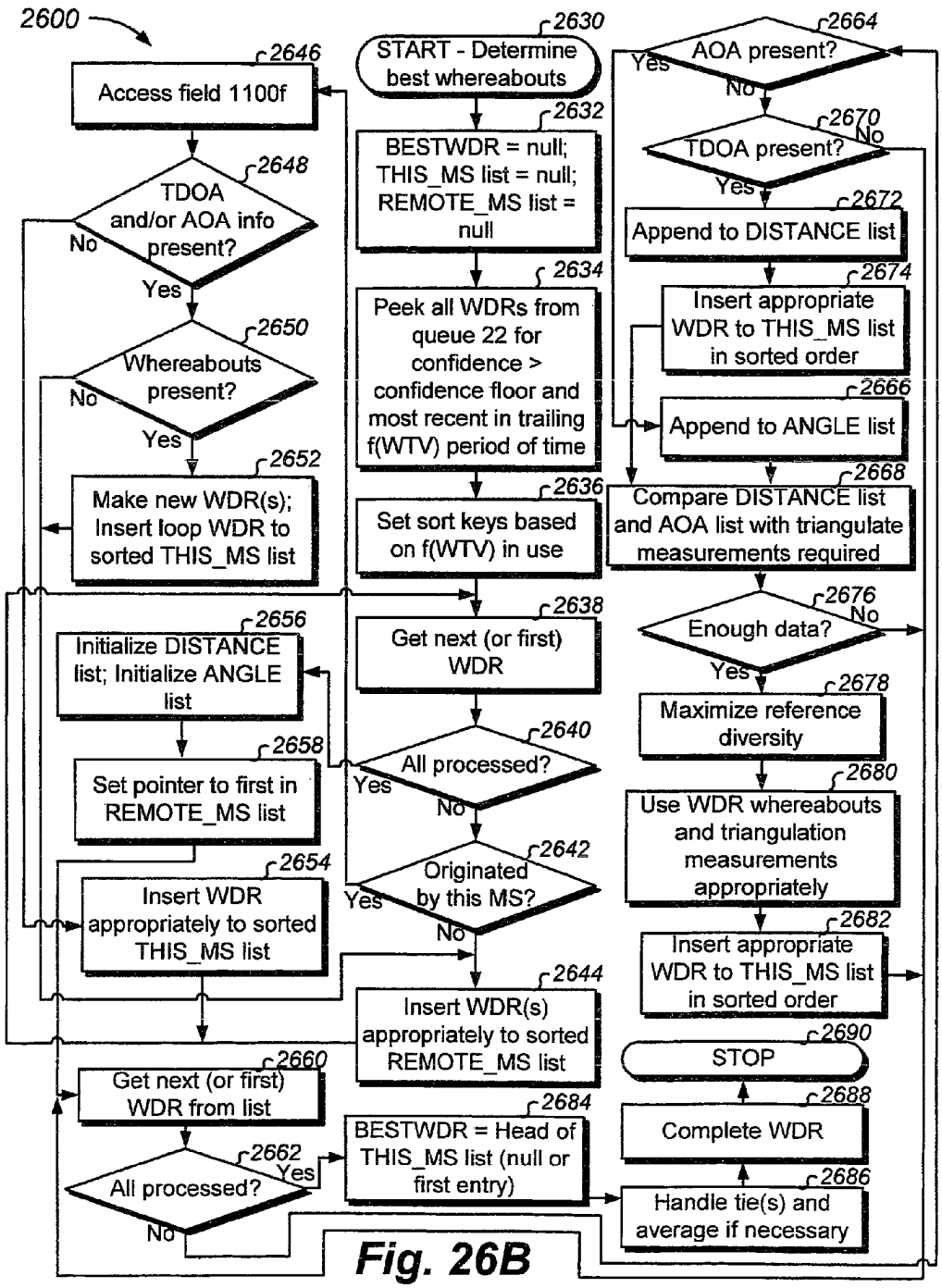

2600
2630
START - Determine best whereabouts
2632
BESTWDR = null; THIS_MS list = null; REMOTE_MS list = null
2634
Peek all WDRs from queue 22 for confidence > confidence floor and most recent in trailing f(WTV) period of time
2636
Set sort keys based on f(WTV) in use
2638
Get next (or first) WDR
2640
All processed?
Yes
No
2642
Originated by this MS?
Yes
No
2644
Insert WDR(s) appropriately to sorted REMOTE_MS list
2646
Access field 1100f
2648
TDOA and/or AOA info present?
No
Yes
2650
Whereabouts present?
No
Yes
2652
Make new WDR(s); Insert loop WDR to sorted THIS_MS list
2654
Insert WDR appropriately to sorted THIS_MS list
2656
Initialize DISTANCE list; Initialize ANGLE list
2658
Set pointer to first in REMOTE_MS list
2660
Get next (or first) WDR from list
2662
All processed?
Yes
No
2664
AOA present?
Yes
No
2666
Append to ANGLE list
2668
Compare DISTANCE list and AOA list with triangulate measurements required
2670
TDOA present?
No
Yes
2672
Append to DISTANCE list
2674
Insert appropriate WDR to THIS_MS list in sorted order
2676
Enough data?
No
Yes
2678
Maximize reference diversity
2680
Use WDR whereabouts and triangulation measurements appropriately
2682
Insert appropriate WDR to THIS_MS list in sorted order
2684
BESTWDR = Head of THIS_MS list (null or first entry)
2686
Handle tie(s) and average if necessary
2688
Complete WDR
2690
STOP

Fig. 26B

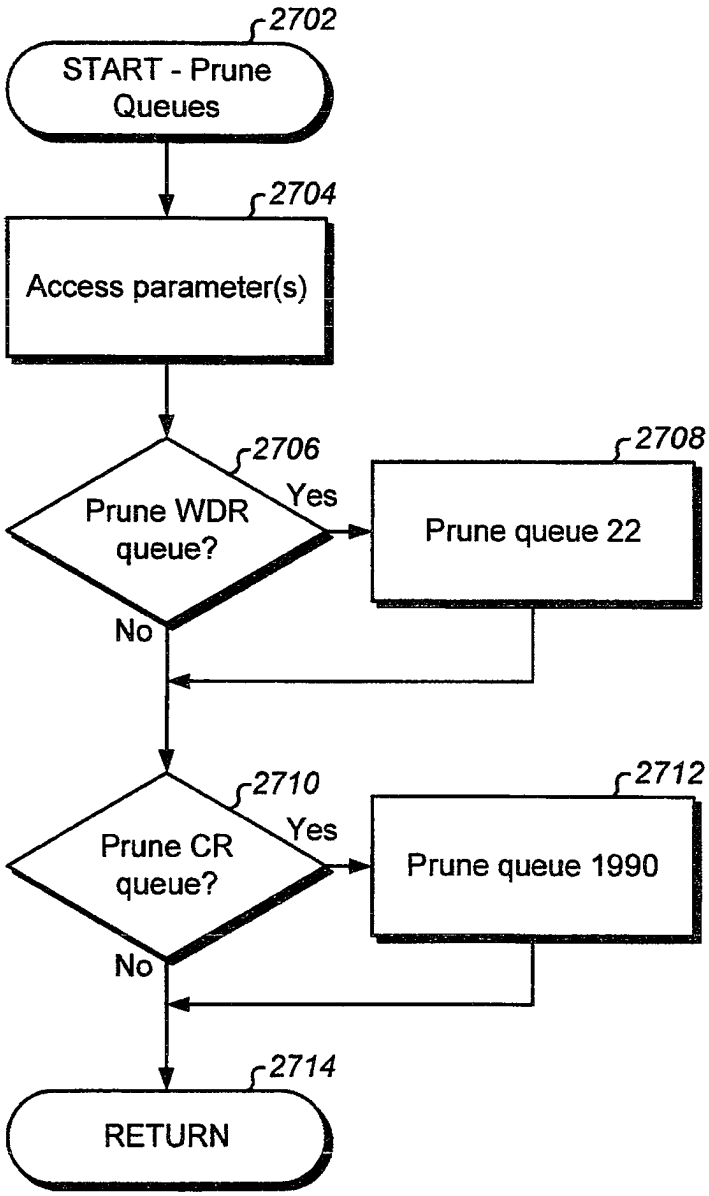

2702
START - Prune Queues
2704
Access parameter(s)
2706
Prune WDR queue?
Yes
2708
Prune queue 22
No
2710
Prune CR queue?
Yes
2712
Prune queue 1990
No
2714
RETURN

Fig. 27

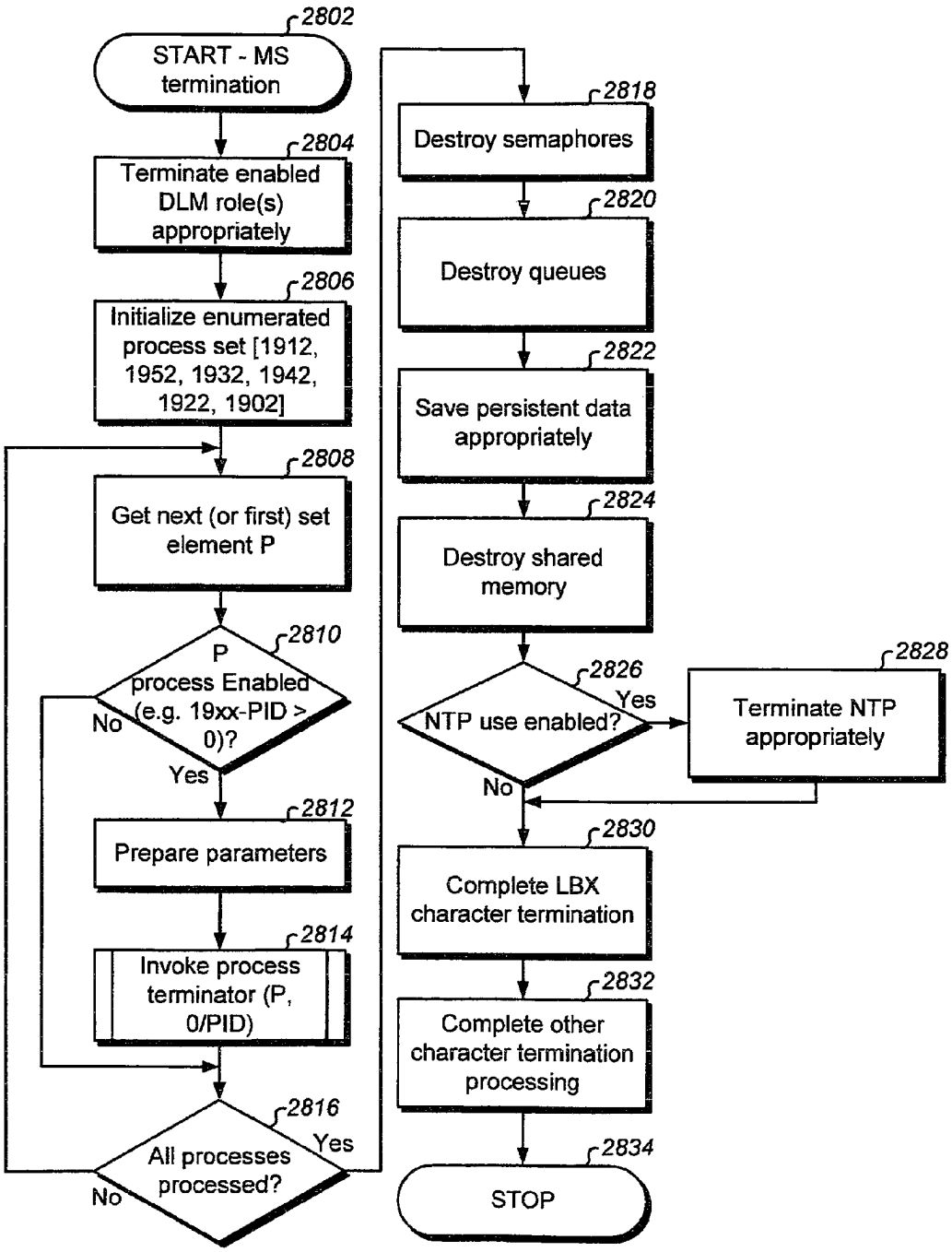

2802
START - MS termination
2804
Terminate enabled DLM role(s) appropriately
2806
Initialize enumerated process set [1912, 1952, 1932, 1942, 1922, 1902]
2808
Get next (or first) set element P
2810
P process Enabled (e.g. 19xx-PID > 0)?
No
Yes
2812
Prepare parameters
2814
Invoke process terminator (P, 0/PID)
2816
All processes processed?
Yes
No
2818
Destroy semaphores
2820
Destroy queues
2822
Save persistent data appropriately
2824
Destroy shared memory
2826
NTP use enabled?
Yes
No
2828
Terminate NTP appropriately
2830
Complete LBX character termination
2832
Complete other character termination processing
2834
STOP

Fig. 28

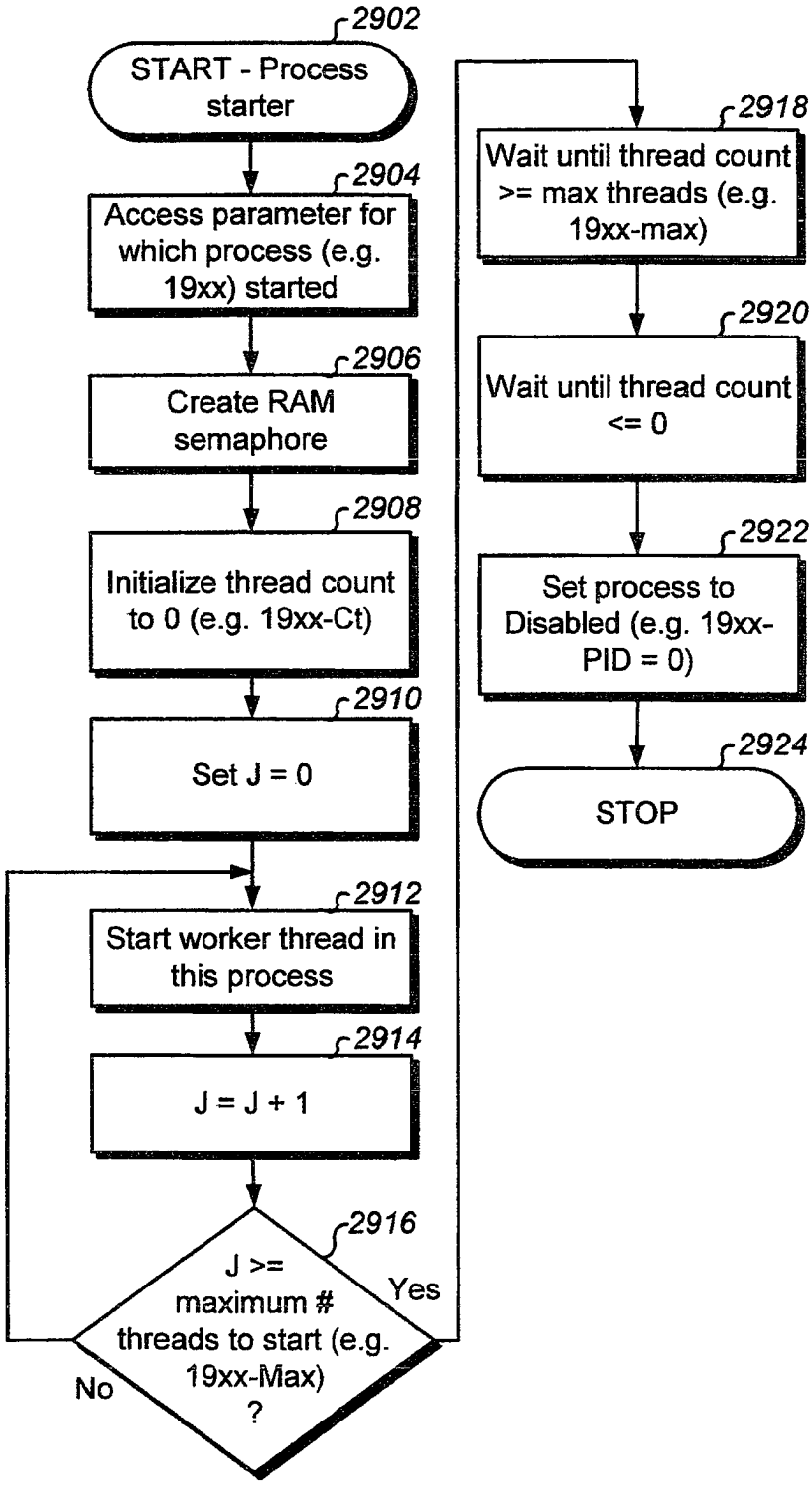

2902
START - Process starter
2904
Access parameter for which process (e.g. 19xx) started
2906
Create RAM semaphore
2908
Initialize thread count to 0 (e.g. 19xx-Ct)
2910
Set J = 0
2912
Start worker thread in this process
2914
J = J + 1
2916
J >= maximum # threads to start (e.g. 19xx-Max) ?
Yes
No
2918
Wait until thread count >= max threads (e.g. 19xx-max)
2920
Wait until thread count <= 0
2922
Set process to Disabled (e.g. 19xx-PID = 0)
2924
STOP

Fig. 29A

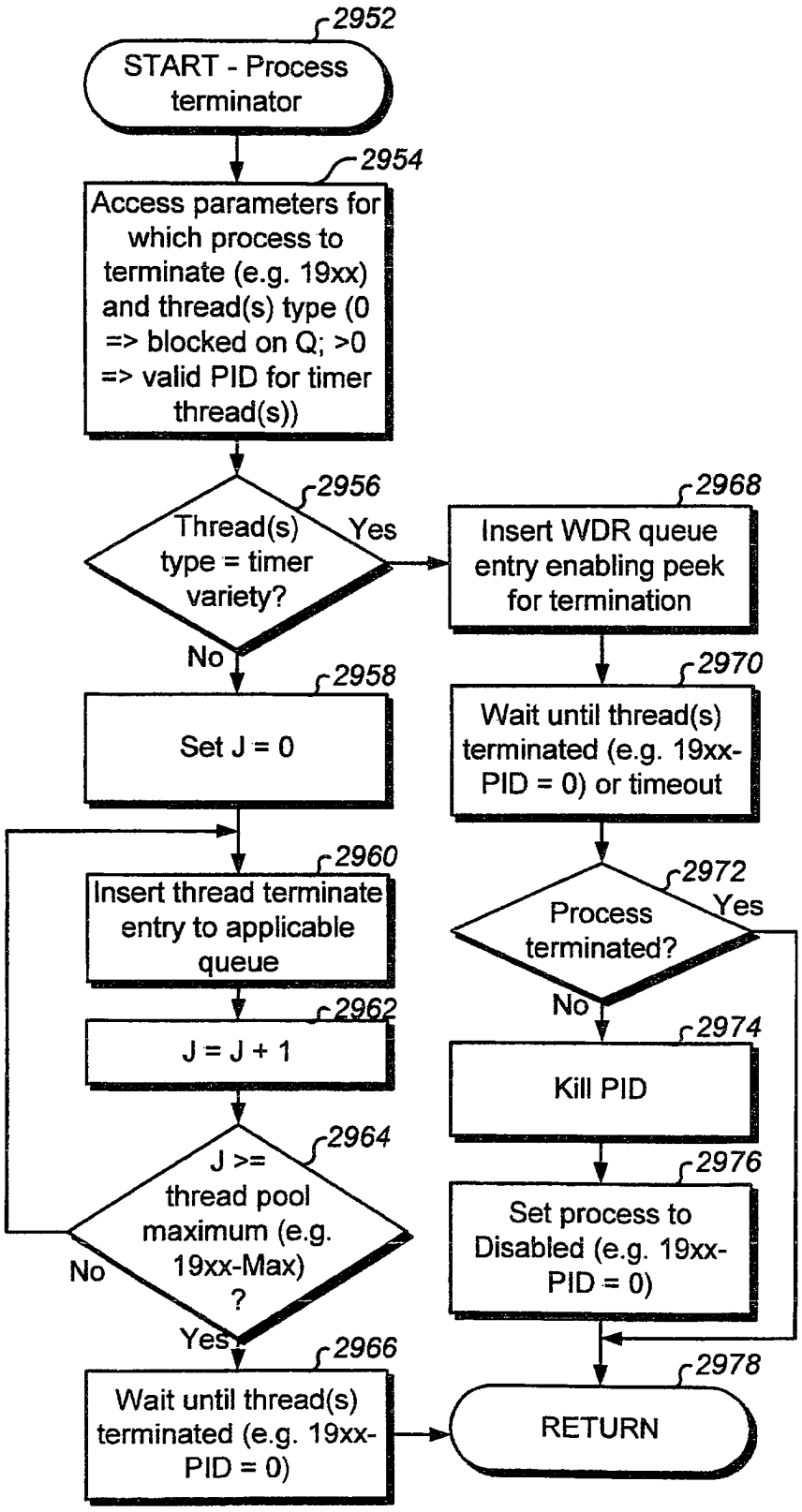

2952
START - Process terminator
2954
Access parameters for which process to terminate (e.g. 19xx) and thread(s) type (0 => blocked on Q; >0 => valid PID for timer thread(s))
2956
Thread(s) type = timer variety?
Yes
No
2958
Set J = 0
2960
Insert thread terminate entry to applicable queue
2962
J = J + 1
2964
J >= thread pool maximum (e.g. 19xx-Max) ?
No
Yes
2966
Wait until thread(s) terminated (e.g. 19xx-PID = 0)
2968
Insert WDR queue entry enabling peek for termination
2970
Wait until thread(s) terminated (e.g. 19xx-PID = 0) or timeout
2972
Process terminated?
Yes
No
2974
Kill PID
2976
Set process to Disabled (e.g. 19xx-PID = 0)
2978
RETURN

Fig. 29B

3002a

```
// Figs. 30A through 30E syntaxes (e.g. delimeters, etc) used should enforce
// appropriate unambiguous grammar parsability for Lex&Yacc, top down
// recursive parsing, XML encoding, other syntactic embodiments, applicable semantic
// representations, and any other syntactic/semantic embodiments. Figs. 30A through 30E BNF
// grammar elaborates for a corresponding interpreter, recommended syntaxes, programming
// language stuctures and/or objects, DB schemas, ANSI datastream encoding (e.g. X.409),
// flowchart processing blocks and locations in parent application flowhcharts, and any other
// analogous implementation embodiments or subsets thereof.

// ***** Common BNF grammar (e.g. in Data 8): *****

Variables          = "null" | Variables Variable
      // Variables are placed anywhere; Can be used for referencing (a="..." b=a  c=b)

Variable           = VarType(VarName) = "null" | VarType(VarName) = ...value(s)... |
                         VarType(VarName) = [ Variables ] [ VarInstantiations ] |
                         VarType(VarName) = [ VarInstantiations ]  [ Variables ]
      // Variables scope to following & descending nesting; "value" has appropriate syntax
      // per VarType; VarName can be set to other variables (e.g. indirect tree structure)

VarInstantiations  = "null" | VarInstantiations VarInstantiate

VarInstantiate     = *VarName(Param1="x1", Param2="x2", ... ParamN="xN")  for N >= 0
      // Parameters allow optionally substituting occurrences in VarName with new values
      // prior to instantiation.

VarName            = "text string"

Description        = "null" | "text string" | VarInstantiate

History            = [ CreatorInfo ] [ ModifierInfo ] | VarInstantiations

CreatorInfo        = "null" | [ CreateDateTime ] [ CreatorID] [ CreatorIDType ]
                         [ CreatorAddr ] [ CreatorSysID ] [ CreatorSysType ]
                         [ CreatorSysAddr ] | VarInstantiations

ModifierInfo       = "null" | [ LastModifyDateTime ] [ LastModifyID ]
                [ LastModifyIDType ] [ LastModifyAddr ] [ LastModifySysID ]
                [ LastModifySysType ] [ LastModifySysAddr ] | VarInstantiations

CreateDateTime     = "date/time stamp" | VarInstantiate

CreatorID          = ID

CreatorIDType      = IDType
```

Fig. 30A

3002b

```
CreatorAddr          = Address

CreatorSysID         = "text string" | VarInstantiate

CreatorSysType       = "system type" | VarInstantiate   // e.g. type of MS

CreatorSysAddr       = Address

LastModifyDateTime=  "date/time stamp" | VarInstantiate

LastModifyID         = ID

LastModifyIDType     = IDType

LastModifyAddr       = Address

LastModifySysID      = "text string" | VarInstantiate

LastModifySysType  = "system type" | VarInstantiate

LastModifySysAddr  = Address

ID                   = "MS ID" [ Description ] [ History ] |
        "MS Group ID" [ Description ] [ History ] | "User ID" [ Description ] [ History ] |
        "User Group ID" [ Description ] [ History ] | "logical handle" [ Description ] [ History ] |
        "physical handle" [ Description ] [ History ] | VarInstantiations

IDType               = "MS_ID" | "MS_Group_ID" | "User_ID" | "User_Group_ID"  |
                            "logical_handle" | "physical_handle" | VarInstantiate

Address              = "ip address" | "SNA address" | "Postal address" |
                        "point" | "logical address" | "physical address" | "situational location" |
                        "2 dimensional area" | "3 dimensional area" | VarInstantiate

TimeSpec             = "Xdate/time stamp" | "Xdate/time period" | VarInstantiate

VarType              = Description | History | ID | IDType | CreatorInfo | ModifierInfo |
        CreateDateTime | CreatorID | CreatorIDType | CreatorAddr | CreatorSysID |
        CreatorSysType | CreatorSysAddr | LastModifyDateTime | LastModifyID |
        LastModifyIDType | LastModifyAddr | LastModifySysID | LastModifySysType |
        LastModifySysAddr | Address | "Xdate/time stamp" |  "Xdate/time period" | "text string" |
        "system type" | TimeSpec | "MS ID" | "MS Group ID" | "User ID" | "User Group ID" |
        "logical handle" | physical handle" | "...Address elaborations..." |
        "...IDType elaborations..." |  Variable  // | VarInstantiate here as well (but elaborates)
```

Fig. 30B

3034

```
// ***** BNF grammar for Permissions 10: *****

PermissionBody     = "null" | [ Variables ] [ Permissions ]
      // [ Variables ] placed anywhere (not shown in constructs below to enhance readability)

Permissions        = "null" | Permissions Permission | VarInstantiations

Permission         = Grantor Grantee [ Grants ] [ TimeSpec ] [ Description ] [ History ] |
                          VarInstantiations
      // No Grants implies granting all permissions; This embodiment ensures non-null
      // Grantor and Grantee, but "null" could be used (e.g. for placeholder entries).

Grantor            = ID [ IDType ] | VarInstantiations
      // ID defaults (e.g. MS ID) when IDType not present

Grantee            = ID [ IDType ] | VarInstantiations

Grants             = "null" | Grants Grant | Privileges | VarInstantiations

Grant              = "grant name" AND (Privileges [ TimeSpec ] [ Description ] [ History ] |
                          Grants [ TimeSpec ] [ Description ] [ History ] |
                          VarInstantiations)

Privileges         = "null" | Privileges Privilege | VarInstantiations

Privilege          = "atomic privilege for assignment" [ MSRelevance ]
                          [ TimeSpec ] [ Description ] [ History ] | VarInstantiations

MSRelevance        = "MS relevance descriptor"

Groups             = "null" | Groups Group | VarInstantiations

Group              = "group name" AND (IDs [ Description ] [ History ] |
                          Groups [ Description ] [ History ] |
                          VarInstantiations)

IDs                = "null" | IDs ID [ IDType ] | VarInstantiations

VarType            = *VarType | Permissions | Permission | Grantor | Grantee | Grants |
                          Grant | Privileges | Privilege | MSRelevance | Groups | Group |
                          IDs
```

Fig. 30C

3068a

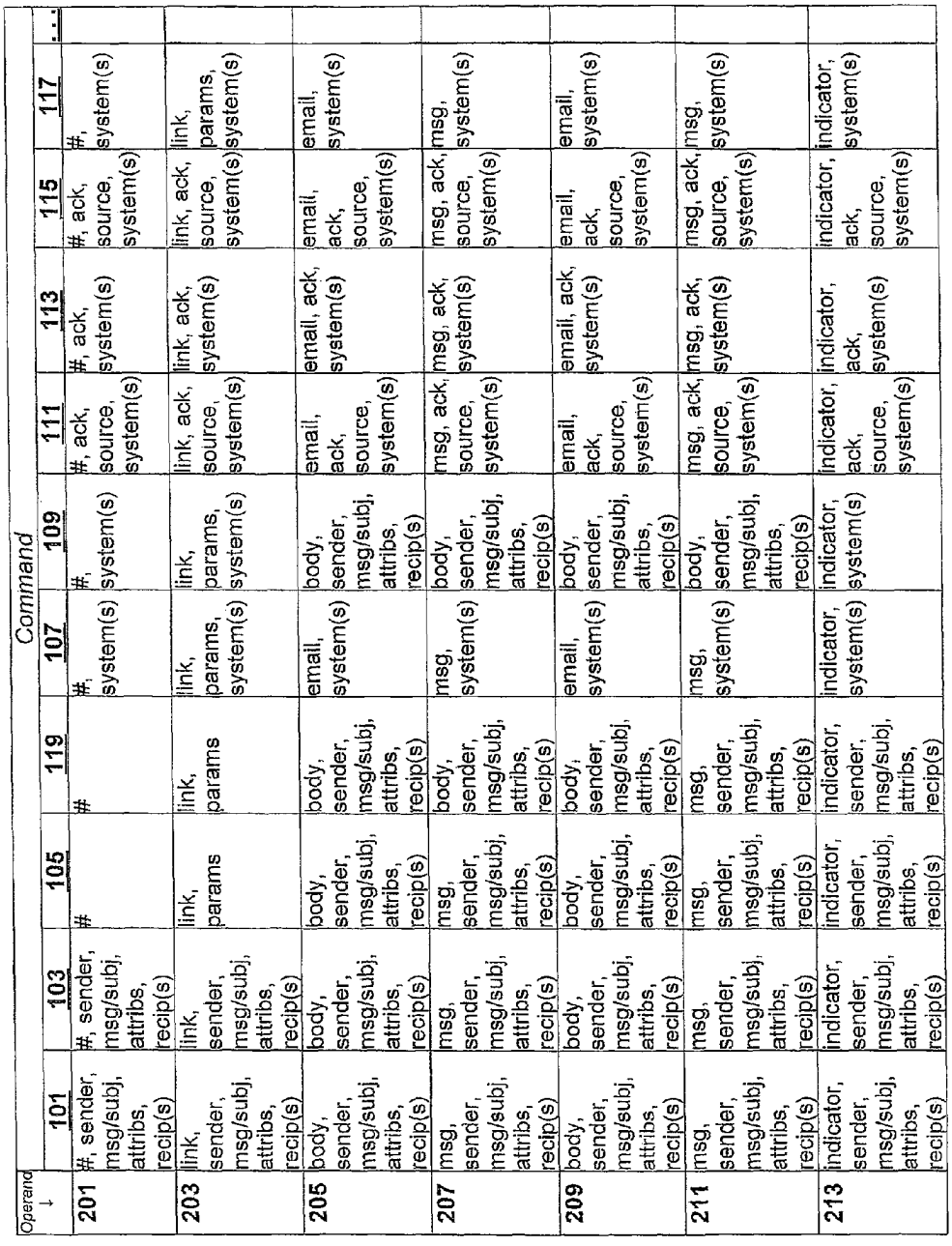
```
// ***** BNF grammar for Charters 12: *****

CharterBody        = "null" | [ Variables ] [ Charters ]
      // [ Variables ] placed anywhere (not shown in constructs below to enhance readability)

Charters           = "null" | Charters Charter | VarInstantiations

Charter            = Grantee Grantor Expression Actions [ TimeSpec ] [ Description ]
                        [ History ] | VarInstantiations

Expression         = Conditions [ TimeSpec ] | VarInstantiations
      // This embodiment ensures at least one condition to a Charter, but "null" could be
      // used (e.g. for placeholder entries).

Conditions         = Condition | Conditions CondOp Condition] | VarInstantiations

CondOp             = "and" | "or" | VarInstantiations

Condition          = Term Op Term [ TimeSpec ] [ Description ] [ History ] |
      Value [ TimeSpec ] [ Description ] [ History ] |
      Invocation [ TimeSpec ] [ Description ] [ History ] | VarInstantiations
      // Another embodiment allows unary operators (e.g. "not"), for example for boolean
      // WDR fields (e.g. Applications field(s)). Current boolean tests for "True" or "False",
      // or non-zero = "True" and zero = "False". Value & Invocation result in a boolean.

Term               = WDRTerm [ TimeSpec ] [ Description ] [ History ] |
                     AppTerm [ TimeSpec ] [ Description ] [ History ] |
                     Value [ TimeSpec ] [ Description ] [ History ] |
                     Invocation [ TimeSpec ] [ Description ] [ History ] |
                     VarInstantiate

WDRTerm            = "Any WDR 1100 field, or any subset thereof" [ Description ]
                        [ History ] | VarInstantiate

AppTerm            = "Any Application data field, or any subset thereof" [ Description ]
                        [ History ] | VarInstantiate

Value              = Data | "number" | "text string" | "value" | "True" | "False" |
                        "atomic term" | ID [ IDType ] | "null" | VarInstantiate

Data               = "typed memory pointer" | "typed memory value" | "typed file path" |
                        "typed file path and offset" | "typed DB qualifier" | VarInstantiate
      // i.e. pointer or value from stack, globals, shared memory, file data location, DB
      // pointer, DB value, or any other data.
```

Fig. 30D

3068b

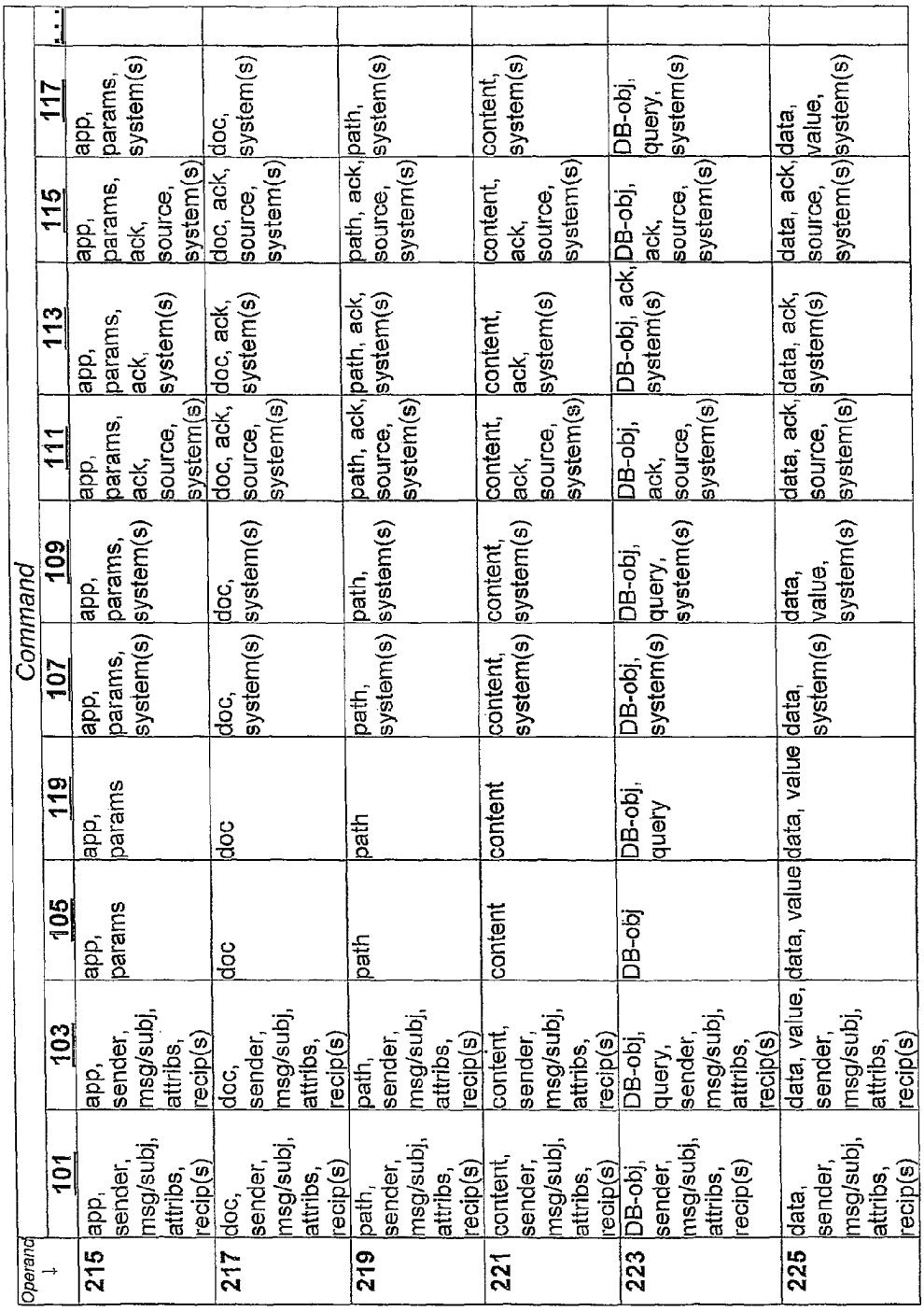
```
Invocation          = "DLL interface(optional params...)" |
                          "Linked interface(optional params...)" |
                          "executable path(optional params...)" | VarInstantiate
      // Invocation can return any value of any type, except will be converted to a boolean
      // when used as a Term (0 = False, else = True). Best to return boolean when Term use.

Op                  = [ "atomic not operator" ] "atomic operator" | ProfileMatch |
                          VarInstantiate

ProfileMatch        = "atomic profile match operator" | VarInstantiate

Actions             = "null" | Actions Action

Action              = [ Host ] Command Operand [Parameters]
                          [ TimeSpec ] [ Description ] [ History ] | VarInstantiations

Host                = "null" | ID [IDType] | VarInstantiations

Command             = "atomic command" | VarInstantiations
      // Command may map to translation member entry of natural language map

Operand             = "atomic operand" | VarInstantiations
      // Some embodiments have no need for an operand in this grammar (e.g. command file
      // reference, DLL call, self contained command, invocation callout, etc).

Parameters          = "null" | Parameters Parameter | VarInstantiations

Parameter           = WDRTerm [ Description ] [ History ] |
                          AppTerm [ Description ] [ History ] |
                          Value [ Description ] [ History ] |
                          Invocation [ Description ] [ History ] |
                          ID [ IDType ] [ Description ] [ History ] |
                          VarInstantiate [ Description ] [ History ]

VarType             = *VarType | Charters | Charter | Expression | Conditions | Condition |
                      CondOp | WDRTerm | Term | Value | Data | Invocation | Op | Actions
                      ProfileMatch | Action | Command | Operand | Parameters | Parameter |
                      Host
```

Fig. 30E



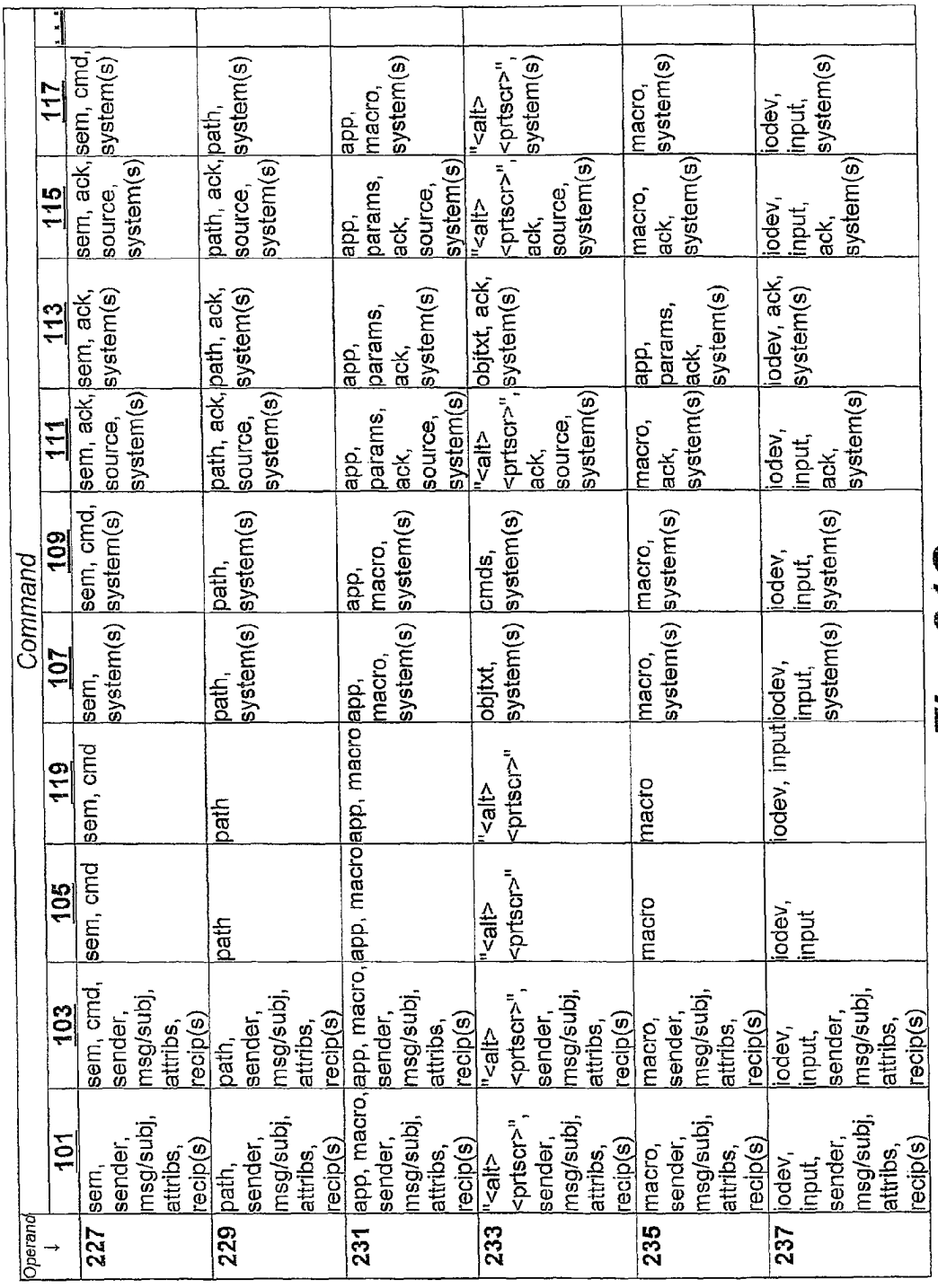
Operand ↓	Command									
	101	103	105	119	107	109	111	113	115	117	...
201	#, sender, msg/subj, attribs, recip(s)	#, sender, msg/subj, attribs, recip(s)	#	#	#, system(s)	#, system(s)	#, ack, source, system(s)	#, ack, system(s)	#, ack, source, system(s)	#, system(s)	
203	link, sender, msg/subj, attribs, recip(s)	link, sender, msg/subj, attribs, recip(s)	link, params	link, params	link, params, system(s)	link, params, system(s)	link, ack, source, system(s)	link, ack, system(s)	link, ack, source, system(s)	link, params, system(s)	
205	body, sender, msg/subj, attribs, recip(s)	body, sender, msg/subj, attribs, recip(s)	body, sender, msg/subj, attribs, recip(s)	body, sender, msg/subj, attribs, recip(s)	email, system(s)	body, sender, msg/subj, attribs, recip(s)	email, ack, source, system(s)	email, ack, system(s)	email, ack, source, system(s)	email, system(s)	
207	msg, sender, msg/subj, attribs, recip(s)	msg, sender, msg/subj, attribs, recip(s)	body, sender, msg/subj, attribs, recip(s)	body, sender, msg/subj, attribs, recip(s)	msg, system(s)	body, sender, msg/subj, attribs, recip(s)	msg, ack, source, system(s)	msg, ack, system(s)	msg, ack, source, system(s)	msg, system(s)	
209	body, sender, msg/subj, attribs, recip(s)	body, sender, msg/subj, attribs, recip(s)	body, sender, msg/subj, attribs, recip(s)	body, sender, msg/subj, attribs, recip(s)	email, system(s)	body, sender, msg/subj, attribs, recip(s)	email, ack, source, system(s)	email, ack, system(s)	email, ack, source, system(s)	email, system(s)	
211	msg, sender, msg/subj, attribs, recip(s)	msg, sender, msg/subj, attribs, recip(s)	msg, sender, msg/subj, attribs, recip(s)	msg, sender, msg/subj, attribs, recip(s)	msg, system(s)	body, sender, msg/subj, attribs, recip(s)	msg, ack, source, system(s)	msg, ack, system(s)	msg, ack, source, system(s)	msg, system(s)	
213	indicator, sender, msg/subj, attribs, recip(s)	indicator, sender, msg/subj, attribs, recip(s)	indicator, sender, msg/subj, attribs, recip(s)	indicator, sender, msg/subj, attribs, recip(s)	indicator, system(s)	indicator, system(s)	indicator, ack, source, system(s)	indicator, ack, system(s)	indicator, ack, source, system(s)	indicator, system(s)	

Fig. 31A



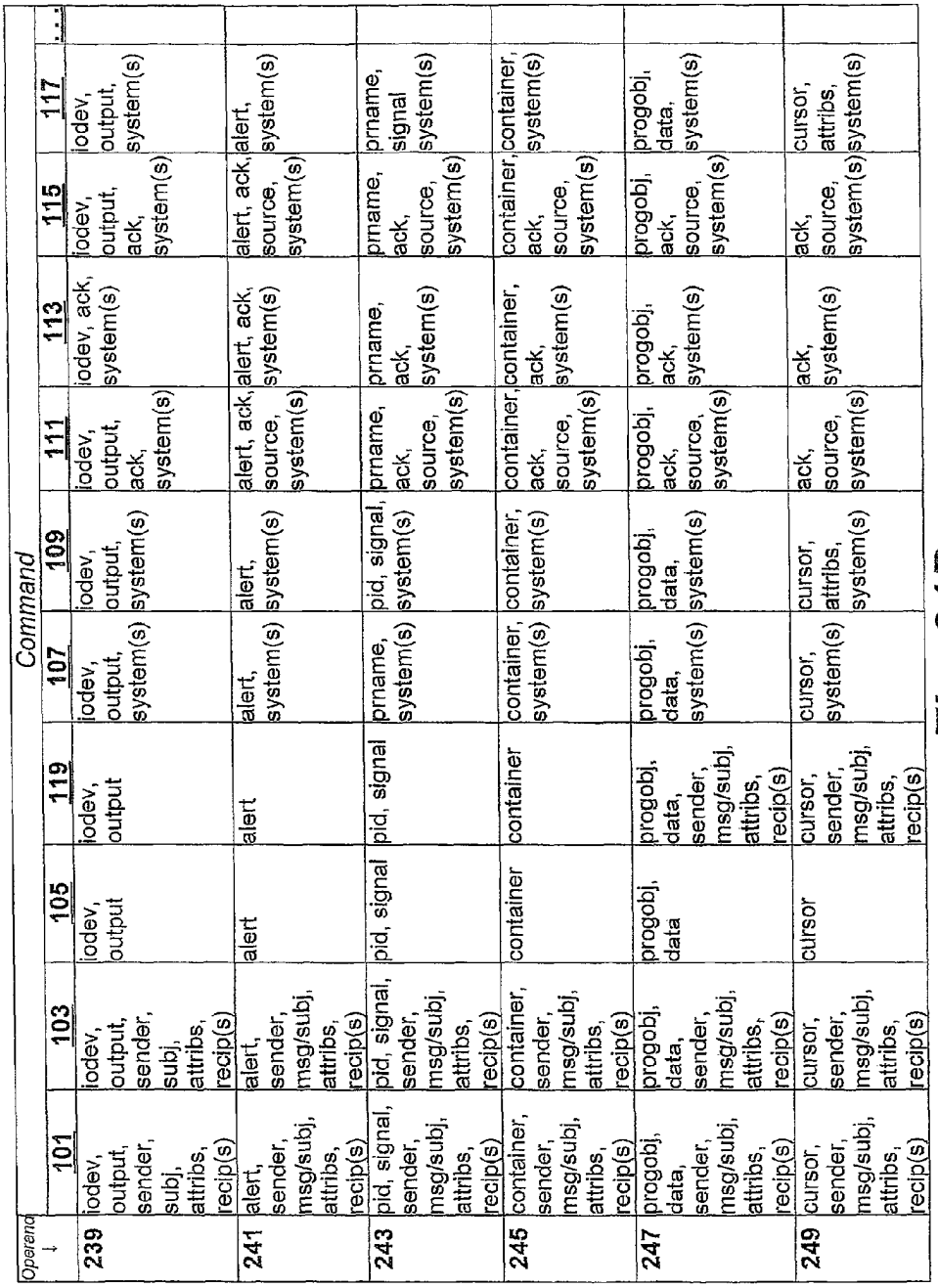
Operand ↓	Command 101	103	105	119	107	109	111	113	115	117	...
215	app, sender, msg/subj, attribs, recip(s)	app, sender, msg/subj, attribs, recip(s)	app, params	app, params	app, params, system(s)	app, params, system(s)	app, params, ack, source, system(s)	app, params, ack, system(s)	app, params, ack, source, system(s)	app, params, system(s)	
217	doc, sender, msg/subj, attribs, recip(s)	doc, sender, msg/subj, attribs, recip(s)	doc	doc	doc, system(s)	doc, system(s)	doc, ack, source, system(s)	doc, ack, system(s)	doc, ack, source, system(s)	doc, system(s)	
219	path, sender, msg/subj, attribs, recip(s)	path, sender, msg/subj, attribs, recip(s)	path	path	path, system(s)	path, system(s)	path, ack, source, system(s)	path, ack, system(s)	path, ack, source, system(s)	path, system(s)	
221	content, sender, msg/subj, attribs, recip(s)	content, sender, msg/subj, attribs, recip(s)	content	content	content, system(s)	content, system(s)	content, ack, source, system(s)	content, ack, system(s)	content, ack, source, system(s)	content, system(s)	
223	DB-obj, sender, msg/subj, attribs, recip(s)	DB-obj, query, sender, msg/subj, attribs, recip(s)	DB-obj	DB-obj, query	DB-obj, system(s)	DB-obj, query, system(s)	DB-obj, ack, source, system(s)	DB-obj, ack, system(s)	DB-obj, ack, source, system(s)	DB-obj, query, system(s)	
225	data, sender, msg/subj, attribs, recip(s)	data, value, sender, msg/subj, attribs, recip(s)	data, value	data, value	data, system(s)	data, value, system(s)	data, ack, source, system(s)	data, ack, system(s)	data, ack, source, system(s)	data, value, system(s)	

Fig. 31B



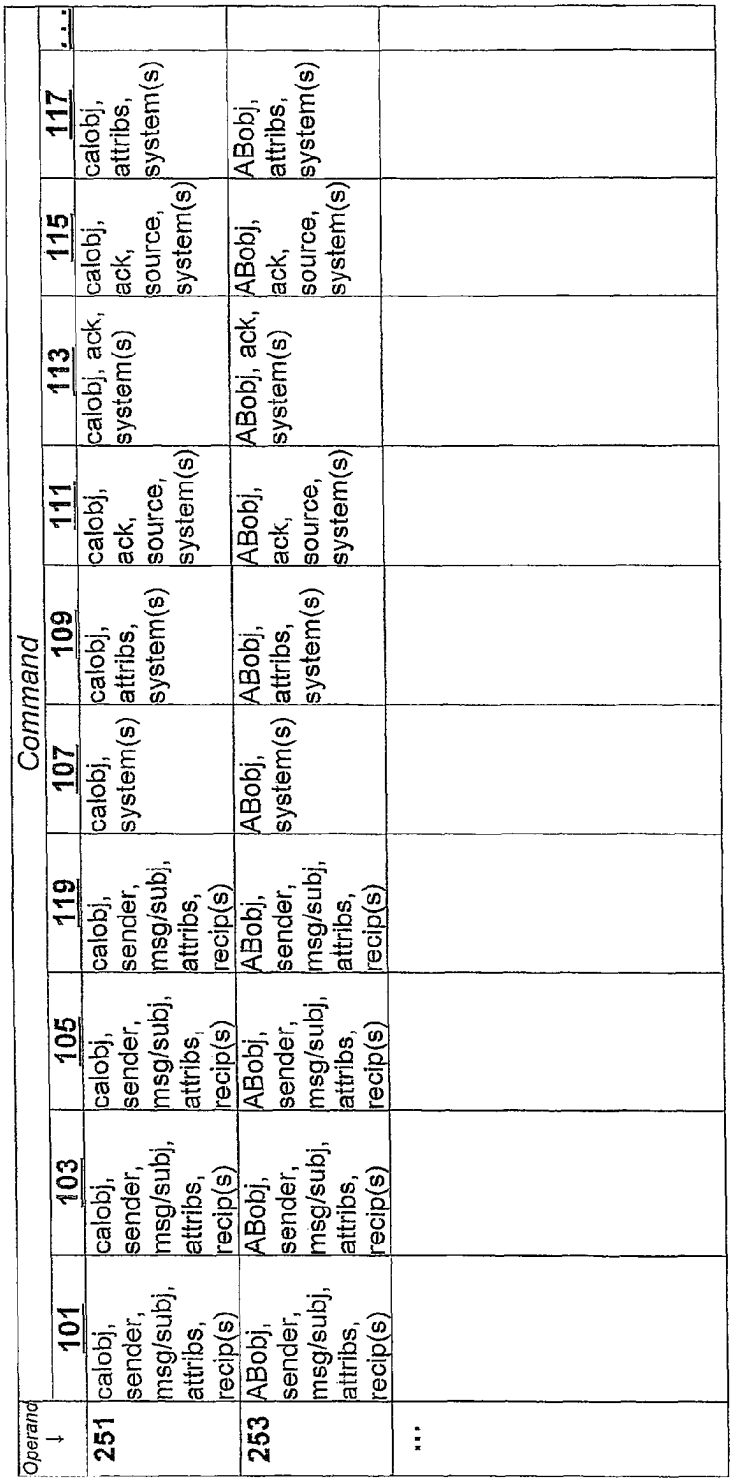
Operand ↓	Command 101	103	105	119	107	109	111	113	115	117	...
227	sem, sender, msg/subj, attribs, recip(s)	sem, cmd, sender, msg/subj, attribs, recip(s)	sem, cmd	sem, cmd	sem, system(s)	sem, cmd, system(s)	sem, ack, source, system(s)	sem, ack, system(s)	sem, ack, source, system(s)	sem, cmd, system(s)	
229	path, sender, msg/subj, attribs, recip(s)	path, sender, msg/subj, attribs, recip(s)	path	path	path, system(s)	path, system(s)	path, ack, source, system(s)	path, ack, system(s)	path, ack, source, system(s)	path, system(s)	
231	app, macro, sender, msg/subj, attribs, recip(s)	app, macro, sender, msg/subj, attribs, recip(s)	app, macro	app, macro	app, macro, system(s)	app, macro, system(s)	app, params, ack, source, system(s)	app, params, ack, system(s)	app, params, ack, source, system(s)	app, macro, system(s)	
233	"<alt> <prtscr>", sender, msg/subj, attribs, recip(s)	"<alt> <prtscr>", sender, msg/subj, attribs, recip(s)	"<alt> <prtscr>"	"<alt> <prtscr>"	objtxt, system(s)	cmds, system(s)	"<alt> <prtscr>", ack, source, system(s)	objtxt, ack, system(s)	"<alt> <prtscr>", ack, source, system(s)	"<alt> <prtscr>", system(s)	
235	macro, sender, msg/subj, attribs, recip(s)	macro, sender, msg/subj, attribs, recip(s)	macro	macro	macro, system(s)	macro, system(s)	macro, ack, system(s)	app, params, ack, system(s)	macro, ack, system(s)	macro, system(s)	
237	iodev, input, sender, msg/subj, attribs, recip(s)	iodev, input, sender, msg/subj, attribs, recip(s)	iodev, input	iodev, input	iodev, input, system(s)	iodev, input, system(s)	iodev, input, ack, system(s)	iodev, ack, system(s)	iodev, input, ack, system(s)	iodev, input, system(s)	

Fig. 31C



Operand ↓	Command									
	101	103	105	119	107	109	111	113	115	117	...
239	iodev, output, sender, subj, attribs, recip(s)	iodev, output, sender, subj, attribs, recip(s)	iodev, output	iodev, output	iodev, output, system(s)	iodev, output, system(s)	iodev, output, ack, system(s)	iodev, ack, system(s)	iodev, output, ack, system(s)	iodev, output, system(s)	
241	alert, sender, msg/subj, attribs, recip(s)	alert, sender, msg/subj, attribs, recip(s)	alert	alert	alert, system(s)	alert, system(s)	alert, ack, source, system(s)	alert, ack, system(s)	alert, ack, source, system(s)	alert, system(s)	
243	pid, signal, sender, msg/subj, attribs, recip(s)	pid, signal, sender, msg/subj, attribs, recip(s)	pid, signal	pid, signal	prname, system(s)	pid, signal, system(s)	prname, ack, source, system(s)	prname, ack, system(s)	prname, ack, source, system(s)	prname, signal system(s)	
245	container, sender, msg/subj, attribs, recip(s)	container, sender, msg/subj, attribs, recip(s)	container	container	container, system(s)	container, system(s)	container, ack, source, system(s)	container, ack, system(s)	container, ack, source, system(s)	container, system(s)	
247	progobj, data, sender, msg/subj, attribs, recip(s)	progobj, data, sender, msg/subj, attribs, recip(s)	progobj, data	progobj, data, sender, msg/subj, attribs, recip(s)	progobj, data, system(s)	progobj, data, system(s)	progobj, ack, source, system(s)	progobj, ack, system(s)	progobj, ack, source, system(s)	progobj, data, system(s)	
249	cursor, sender, msg/subj, attribs, recip(s)	cursor, sender, msg/subj, attribs, recip(s)	cursor	cursor, sender, msg/subj, attribs, recip(s)	cursor, system(s)	cursor, attribs, system(s)	ack, source, system(s)	ack, system(s)	ack, source, system(s)	cursor, attribs, system(s)	

Fig. 31D



Operand ↓	Command									
	101	103	105	119	107	109	111	113	115	117	...
251	calobj, sender, msg/subj, attribs, recip(s)	calobj, sender, msg/subj, attribs, recip(s)	calobj, sender, msg/subj, attribs, recip(s)	calobj, sender, msg/subj, attribs, recip(s)	calobj, system(s)	calobj, attribs, system(s)	calobj, ack, source, system(s)	calobj, ack, system(s)	calobj, ack, source, system(s)	calobj, attribs, system(s)	
253	ABobj, sender, msg/subj, attribs, recip(s)	ABobj, sender, msg/subj, attribs, recip(s)	ABobj, sender, msg/subj, attribs, recip(s)	ABobj, sender, msg/subj, attribs, recip(s)	ABobj, system(s)	ABobj, attribs, system(s)	ABobj, ack, source, system(s)	ABobj, ack, system(s)	ABobj, ack, source, system(s)	ABobj, attribs, system(s)	
...											

Fig. 31E

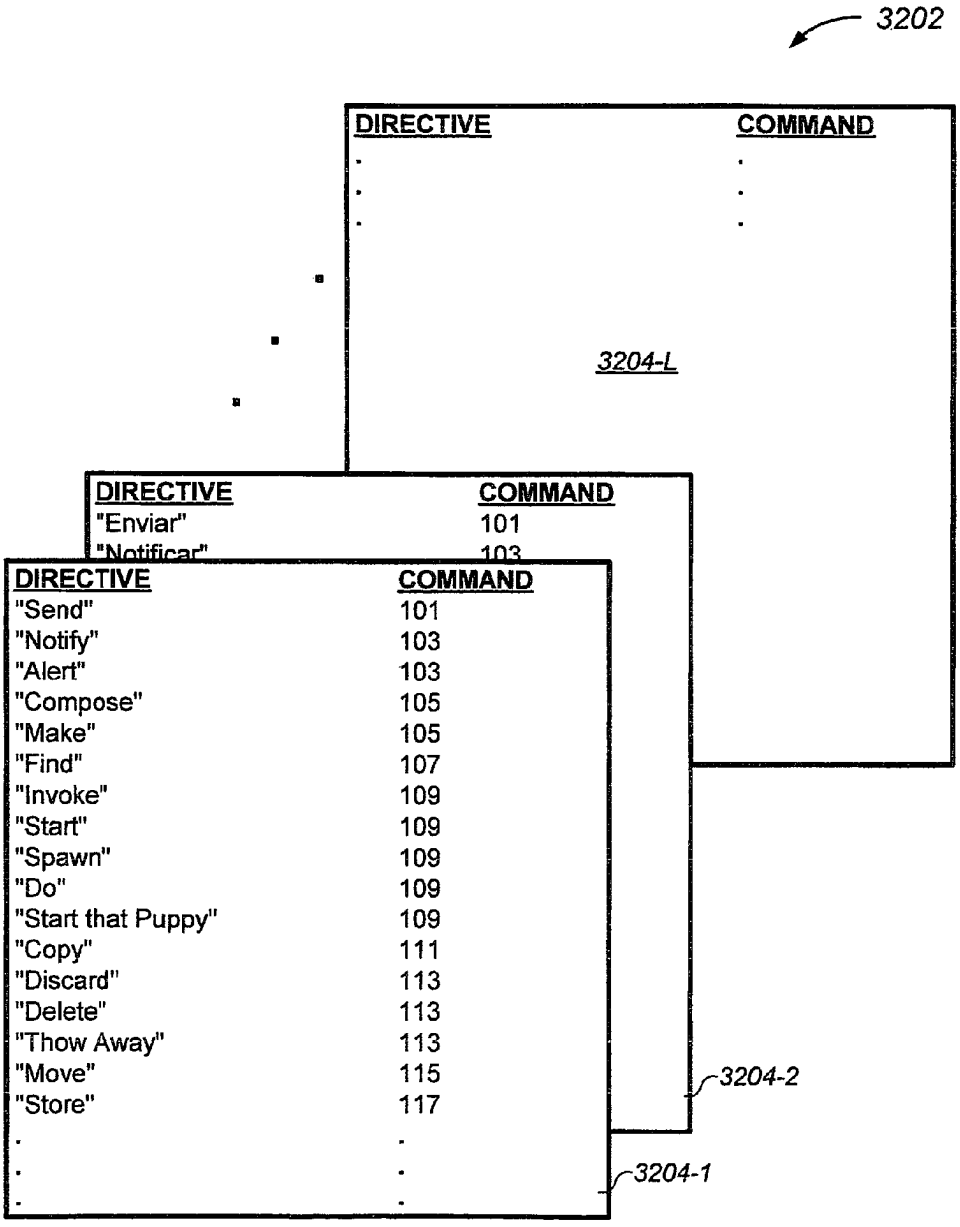

3202
DIRECTIVE
COMMAND
3204-L
DIRECTIVE
COMMAND
"Enviar"
101
"Notificar"
103
DIRECTIVE
COMMAND
"Send" 101
"Notify" 103
"Alert" 103
"Compose" 105
"Make" 105
"Find" 107
"Invoke" 109
"Start" 109
"Spawn" 109
"Do" 109
"Start that Puppy" 109
"Copy" 111
"Discard" 113
"Delete" 113
"Thow Away" 113
"Move" 115
"Store" 117
3204-2
3204-1

Fig. 32A

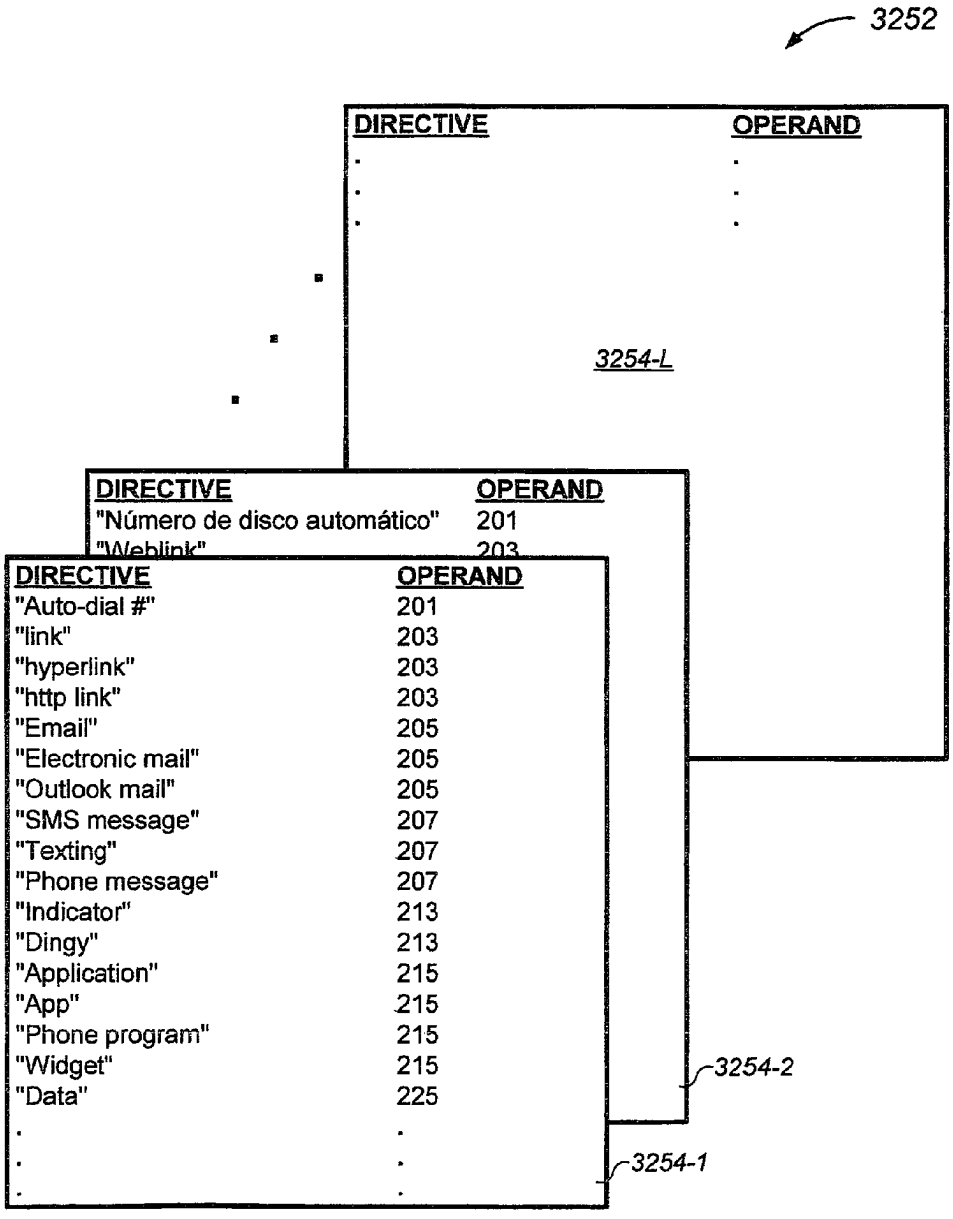

3252
DIRECTIVE
OPERAND
3254-L
DIRECTIVE
OPERAND
"Número de disco automático"
201
"Weblink"
203
DIRECTIVE
OPERAND
"Auto-dial #"
201
"link"
203
"hyperlink"
203
"http link"
203
"Email"
205
"Electronic mail"
205
"Outlook mail"
205
"SMS message"
207
"Texting"
207
"Phone message"
207
"Indicator"
213
"Dingy"
213
"Application"
215
"App"
215
"Phone program"
215
"Widget"
215
"Data"
225
3254-2
3254-1

Fig. 32B

Token	Length	Value
Variables[1]	L	complex ([Variable] ... [Variable]).
Variable	L	complex (First 2 bytes = VarType; VarName; value(s)); this can be present in any complex datastream for scope within current complex datastream thereafter and all descending contructs to it.
VarInstantiations[1]	L	complex ([VarInstatiate] ... [VarInstantiate]).
VarInstantiate	L	instantiation variable name and optional parameters; this can be subordinate to any other construct (e.g. {Description,8,{VarInstantiate,2,x}} where x is variable of string type (e.g. x = "Very long description text here"). Note the savings in TLV datastream size by using variables defined in 1 place for multiple subsequent instantiations thereafter).
VarName	L	text string for variable name.
Description	L	text string for description.
History	L	complex ([CreatorInfo] [ModifierInfo])
CreatorInfo	L	complex ([CreateDateTime] [CreatorID] [CreatorIDType] [CreatorAddr] [CreatorSysID] [CreatorSysType] [CreatorSysAddr]).
ModifierInfo	L	complex ([LastModifyDateTime] [LastModifyID] [LastModifyIDType] [LastModifyAddr] [LastModifySysID] [LastModifySysType] [LastModifySysAddr]).
CreateDateTime	L	date/time stamp (i.e. YYYYMMDDHHMMSS.12..J).
CreatorID	L	complex (ID).
CreatorIDType	1	Atomic element of IDType.
CreatorAddr	L	complex (Address).
CreatorSysID	L	Text string for system ID.
CreatorSysType	L	Text string for system type.
CreatorSysAddr	L	complex (Address).
LastModifyDateTime	L	date/time stamp.
LastModifyID	L	complex (ID).
LastModifyIDType	L	Atomic element of IDType.
LastModifyAddr	L	complex (Address).
LastModifySysID	L	Text string for system ID.
LastModifySysType	L	Text string for system type.
LastModifySysAddr	L	complex (Address).
ID	L	complex (first 2 bytes = length of the identifier;followed by identifier;[Description] [History]).
IDType	1	Atomic element of IDType.
Address	L	First 2 bytes = address type; next L-2 bytes = address info.
TimeSpec	L	First byte = spec type (stamp, period); Next bytes = the time spec(s) (e.g. preferably in syntax described).

Fig. 33A

Token	Length	Value
PermissionBody	L	complex ([Variables] [Permissions]).
Permissions[1]	L	complex ([Permission] ... [Permisson]).
Permission	L	complex (Grantor Grantee [Grants] [TimeSpec] [Description] [History]).
Grantor	L	complex (ID [IDType]).
Grantee	L	complex (ID [IDType]).
Grants[1]	L	complex ([Grant] ... [Grant] | [Privileges]).
Grant	L	First 2 bytes = length of Grant name; following bytes = grant name string; then complex: (Privileges [TimeSpec] [Description] [History] | Grants [TimeSpec] [Description] [History]).
Privileges[1]	L	complex ([Privilege] ... [Privilege]).
Privilege	L	first 4 bytes = unsigned integer for atomic privilege assigned; following bytes (L-4) are complex: ([MSRelevance] [TimeSpec] [Description] [History]).
MSRelevance	8	64 bits for up to 64 different MS types of different capabilities.
Groups[1]	L	complex ([Group] ... [Group]).
Group	L	First 2 bytes = length of Group name; following bytes = group name string; then complex: (IDs [Description] [History] | Groups [Description] [History]).
IDs[1]	L	complex (ID [IDType] ... ID [IDType]).

Fig. 33B

Token	Length	Value
CharterBody	L	complex ([Variables] [Charters]).
Charters[1]	L	complex ([Charter] ... [Charter]).
Charter	L	complex (Grantee Grantor Expression Actions [TimeSpec] [Description] [History]).
Expression	L	complex (Conditions [TimeSpec]).
Conditions	L	complex (Condition | Conditions CondOp Condition]).
CondOp	1	"&" or "|".
Condition	L	complex (Term Op Term [TimeSpec] [Description] [History] | Value [TimeSpec] [Description] [History] | Invocation [TimeSpec] [Description] [History]).
Term	L	complex (WDRTerm [TimeSpec] [Description] [History] | AppTerm [TimeSpec] [Description] [History] | Value [TimeSpec] [Description] [History] | Invocation [TimeSpec] [Description] [History]).
WDRTerm	L	first 2 bytes for WDR 1100 field/subfield length; following bytes are __name syntactical reference; then, if any, is complex = [Description] [History]).
AppTerm	L	first 2 bytes for Application field length; following bytes are Prefix_name syntactical reference; then, if any, is complex = [Description] [History]).
Value	L	first byte indicates Value type; following bytes (L-1), if any, is the "number", "text string", "value", "Boolean", "null", "atomic term" or complex = (Data | ID [IDType]).
Data	L	first byte = atomic element data type; L-1 following bytes are the data syntactical reference.
Invocation	L	first byte = atomic element data type; L-1 following bytes = atomic element invocation with optional parameters.
Op	2	the operator reference (not clarifier simply provides unique operator (e.g. = and != are two operators; ProfileMatch here too). Numeric values used instead of characters here.
Actions[1]	L	complex ([Action] ... [Action]).
Action	L	complex ([Host] Command Operand [Parameters] [TimeSpec] [Description] [History]).
Host	L	complex (ID [IDType]).
Command	2	the command reference.
Operand	2	the operand reference.
Parameters[1]	L	complex ([Parameter] ... [Parameter]).
Parameter	L	complex (WDRTerm [Description] [History] | AppTerm [Description] [History] | Value [Description] [History] | Invocation [Description] [History] ID [IDType] [Description] [History]).

Fig. 33C

```
//********* Grammar Common Definitions: *********
//
#define     TOKEN_LENGTH                    2
#define     LENGTH_LENGTH                   4


// #define  VARTYPE_x       Use Token Definitions for VarType

#define     IDTYPE_MSID                     11
#define     IDTYPE_MSGRPID                  12
#define     IDTYPE_USERID                   13
#define     IDTYPE_USERGRPID                14
#define     IDTYPE_LOGICAL                  15
            // e.g. ip address and socket; e.g. inetd.cfg invocation (e.g. 23.56.232.2:34002)
#define     IDTYPE_PHYSICAL                 16 // MS serial #

#define     ADDRTYPE_LOGICAL                21 // e.g. ip address
#define     ADDRTYPE_PHYSICAL               22 // e.g. MS serial #
#define     ADDRTYPE_POSTAL                 23
#define     ADDRTYPE_POINT                  24
#define     ADDRTYPE_SL                     25
#define     ADDRTYPE_2D                     26
#define     ADDRTYPE_3D                     27

#define     TIMESPECTYPE_STAMP              31
#define     TIMESPECTYPE_PERIOD             32
```

Fig. 34A

```
//********* Grammar Common Construct Token Definitions: *********
//
// #define    VARIABLES                10001
#define       VARIABLE                 10002
// #define    VARINSTANTIATIONS        10003
#define       VARINSTANTIATE           10004
#define       VARNAME                  10005
#define       DESCRIPTION              10006
#define       HISTORY                  10007
#define       CREATORINFO              10008
#define       MODIFIERINFO             10009
#define       CREATEDATETIME           10010
#define       CREATORID                10011
#define       CREATORIDTYPE            10012
#define       CREATORADDR              10013
#define       CREATORSYSID             10014
#define       CREATORSYSTYPE           10015
#define       CREATORSYSADDR           10016
#define       LASTMODIFYDATETIME       10017
#define       LASTMODIFYID             10018
#define       LASTMODIFYIDTYPE         10019
#define       LASTMODIFYADDR           10020
#define       LASTMODIFYSYSID          10021
#define       LASTMODIFYSYSTYPE        10022
#define       LASTMODIFYSYSADDR        10023
#define       ID                       10024
#define       IDTYPE                   10025
#define       ADDRESS                  10026
#define       TIMESPEC                 10027

//********* Grammar Permission Construct Token Definitions: *********
//
#define       PERMISSIONBODY           12001
// #define    PERMISSIONS              12002
#define       PERMISSION               12003
#define       GRANTOR                  12004
#define       GRANTEE                  12005
#define       GRANTS                   12006
#define       GRANT                    12007
// #define    PRIVILEGES               12008
#define       PRIVILEGE                12009
#define       MSRELEVANCE              12010
```

Fig. 34B

```
#define     GROUPS                          12011
#define     GROUP                           12012
#define     IDS                             12013

//********* Grammar Charter Construct Token Definitions: *********
//
#define     CHARTERBODY                     14001
// #define  CHARTERS                        14002
#define     CHARTER                         14003
#define     EXPRESSION                      14004
#define     CONDITIONS                      14005
#define     CONDOP                          14006
#define     CONDITION                       14007
#define     TERM                            14008
#define     WDRTERM                         14009
#define     APPTERM                         14010
#define     VALUE                           14011
#define     DATA                            14012
#define     INVOCATION                      14013
#define     OP                              14014
// #define  ACTIONS                         14015
#define     ACTION                          14016
#define     HOST                            14017
#define     COMMAND                         14018
#define     OPERAND                         14019
// #define  PARAMETERS                      14020
#define     PARAMETER                       14021

//********* Grammar Charter Definitions: *********
//
// atomic terms (e.g. \loc_my), WDR field terms (e.g. __location),
// Application terms (e.g. M_source), Invocation (e.g. fcn(p1,p2)), CondOp (e.g. "&") and
// Data atomic elements (e.g. c:\dir1\fname:58/LONGINT) are recognized syntaxes.
#define     VALUE_NUMBER                    41
#define     VALUE_TEXT                      42
#define     VALUE_ENUM                      43 // "value"
#define     VALUE_BOOLEAN                   44 // 1 = True, 0 = False
#define     VALUE_ID                        45
```

Fig. 34C

```
//********* Atomic Commands : *********
//
#define     CMD_SEND                    101
#define     CMD_NOTIFY                  103
#define     CMD_COMPOSE                 105
#define     CMD_FIND                    107
#define     CMD_INVOKE                  109
#define     CMD_COPY                    111
#define     CMD_DISCARD                 113
#define     CMD_MOVE                    115
#define     CMD_STORE                   117
#define     CMD_CONNECT                 119
#define     CMD_ADMINISTRATE            121
#define     CMD_CHANGE                  123

//********* Atomic Operands : *********
//
#define     OPERAND_AUTODIALNUMBER      201
#define     OPERAND_WEBLINK             203
#define     OPERAND_EMAIL               205
#define     OPERAND_SMSMSG              207
#define     OPERAND_BRDEMAIL            209
#define     OPERAND_BRDSMSMSG           211
#define     OPERAND_INDICATOR           213
#define     OPERAND_APP                 215
#define     OPERAND_DOCUMENT            217
#define     OPERAND_FILE                219
#define     OPERAND_CONTENT             221
#define     OPERAND_DBOBJ               223
#define     OPERAND_DATA                225
#define     OPERAND_SEMAPHORE           227
#define     OPERAND_DIRECTORY           229
#define     OPERAND_APPCONTEXT          231
#define     OPERAND_UIFOBJ              233
#define     OPERAND_UIFCTL              235
#define     OPERAND_INPUT               237
#define     OPERAND_OUTPUT              239
#define     OPERAND_ALERT               241
#define     OPERAND_PROC                243
#define     OPERAND_CONTAINER           245
#define     OPERAND_PROGOBJ             247
#define     OPERAND_CURSOR              249
#define     OPERAND_CALENDAR            251
#define     OPERAND_ADDRESSBOOK         253
```

Fig. 34D

```
// TIMESPEC date/time stamps for open ended periods are set with no start/end spec:
//  >=YYYMMDDHHMMSS.1..J ==> set x.endDT to DT_NOENDSPEC;
//  <=YYYMMDDHHMMSS.1..J ==> set x.startDT to DT_NOSTARTSPEC;
// <YYYMMDDHHMMSS.1..J and >YYYMMDDHHMMSS.1..J subtracts/adds min precision
// from specified date/time stamp (i.e. TIMESPEC periods are preferably inclusive).
#define DT_NOENDSPEC            -1.0
#define DT_NOSTARTSPEC          -2.0

typedef struct timespec { // specifications converted to a Julian period form
        double          startDT;    // converted to Julian format (1ms precision)
        double          endDT;      // converted to Julian format (1ms precision)
        struct timespec *nextTS;    // linked list of sibling timespecs
        } TIMESPEC;

typedef struct {
        double          *dt;        // Julian date/time
        unsigned char   id[MAX_IDLENGTH];
        unsigned short  idtype;     // for IDTYPE_x values
        // unsigned short cadr_type; // Assume 1 format here
        unsigned char   *c_address;
        char            *sysid;
        char            *systype;
        // unsigned short sysadr_type; // Assume 1 format here
        unsigned char   *sys_address;
        } BOOKKEEP;

typedef struct {
        BOOKKEEP *creation;
        BOOKKEEP *modify;
        } HISTRY;

typedef struct {
        unsigned short  vartype;
        char            name[MAX_VARNAME];
        unsigned char   *value;     // may be complex or series of complex
        } VAR;
```

Fig. 34E

```
typedef struct privilege {
        unsigned long       priv;          // constant value of known privilege
        unsigned char       relevance[MAX_RELEVANCEMASK];
        TIMESPEC            *tspec;
        char                *desc;
        HISTRY              *hist;
        struct privilege    *nextPriv;     // linked list of sibling privileges
        } PRIVILEGE;

typedef struct grant {
        char                name[MAX_GRNAMLENGTH];
        char                permtype;      // 'P' = Privilege(s), 'G' = Grant(s)
        union {
              struct grant  *grants;       // linked list subordinate/descending grant(s)
              PRIVILEGE     *privileges;   // linked list of privilege(s)
              } assigned;
        TIMESPEC            *tspec;
        char                *desc;
        HISTRY              *hist;
        struct grant        *nextGrant;    // linked list of sibling grants
        } GRANT;

typedef struct permission {
        unsigned char       grantor[MAX_IDLENGTH];
        unsigned short      gortype;             // for IDTYPE_x values
        unsigned char       grantee[MAX_IDLENGTH];
        unsigned short      geetype;             // for IDTYPE_x values
        char                permtype;            // 'P' = Privilege(s), 'G' = Grant(s)
        union {
              GRANT         *grants;             // linked list of grant(s)
              PRIVILEGE     *privileges;         // linked list of privilege(s)
              } assigned;
        TIMESPEC            *tspec;
        char                *desc;
        HISTRY              *hist;
        struct permission   *nextPerm;           // linked list of permissions
        } PERMISSION;
```

Fig. 34F

```
typedef struct identity {
        unsigned char       id[MAX_IDLENGTH];
        unsigned short      idtype;       // for IDTYPE_x values
        struct identity     *nextID;      // linked list of sibling IDs
        } IDENTITY;

typedef struct group {
        char                name[MAX_GRPNAMELENGTH];
        char                grptype;      // 'B' = Branch, 'L' = Leaf
        union  {
              struct group  *groups;      // linked list subordinate/descending group(s)
              IDENTITY      *ids;         // linked list of IDs in this group
              } assigned;
        char                *desc;
        HISTRY              *hist;
        struct grant        *nextGroup;   // linked list of sibling groups
        } GROUP;

typedef struct action {
        IDENTITY            host;  // .idtype = 0 = no host spec)
        unsigned short      cmd;
        unsigned short      operand;
        unsigned char       *params;          // maintained in syntax for flexibility
                                              // and for stack processing
        TIMESPEC            *tspec;
        char                *desc;
        HISTRY              *hist;
        struct action       *nextActn;        // linked list of sibling actions
        } ACTION;

typedef struct charter {
        unsigned char       grantee[MAX_IDLENGTH];
        unsigned short      geetype;          // for IDTYPE_x values
        unsigned char       grantor[MAX_IDLENGTH];
        unsigned short      gortype;          // for IDTYPE_x values
        TIMESPEC            *exprTS;
        unsigned char       *cond;            // at least 1 condition maintained in
                                              // syntax for proper stack processing
        ACTION              *actn;
        char                *desc;
        HISTRY              *hist;
        struct charter      *nextCharter;     // linked list of charters
        } CHARTER;
```

Fig. 34G

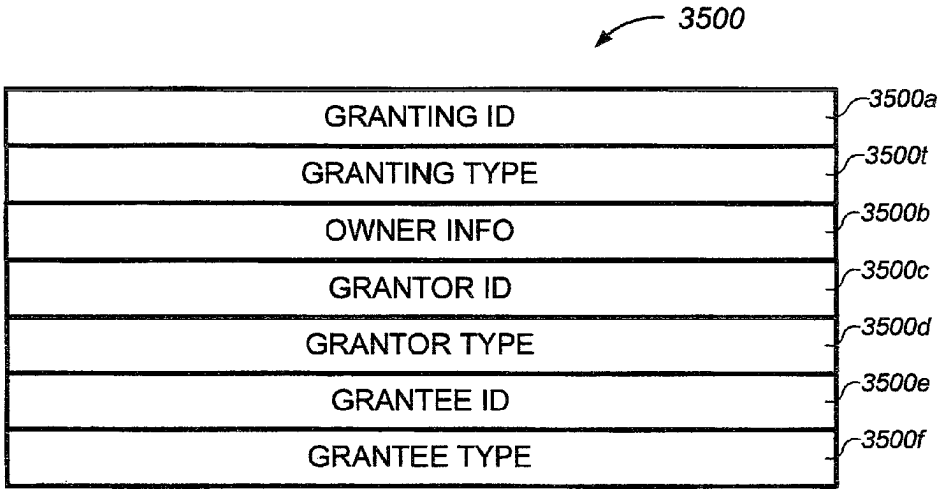

3500
GRANTING ID
3500a
GRANTING TYPE
3500t
OWNER INFO
3500b
GRANTOR ID
3500c
GRANTOR TYPE
3500d
GRANTEE ID
3500e
GRANTEE TYPE
3500f

Fig. 35A

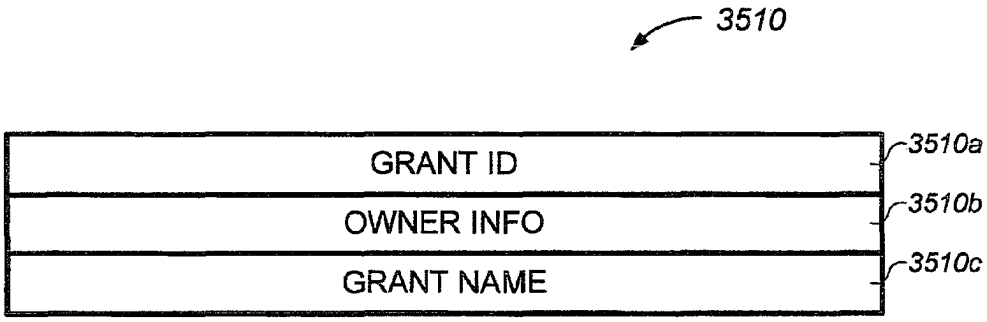


Fig. 35B

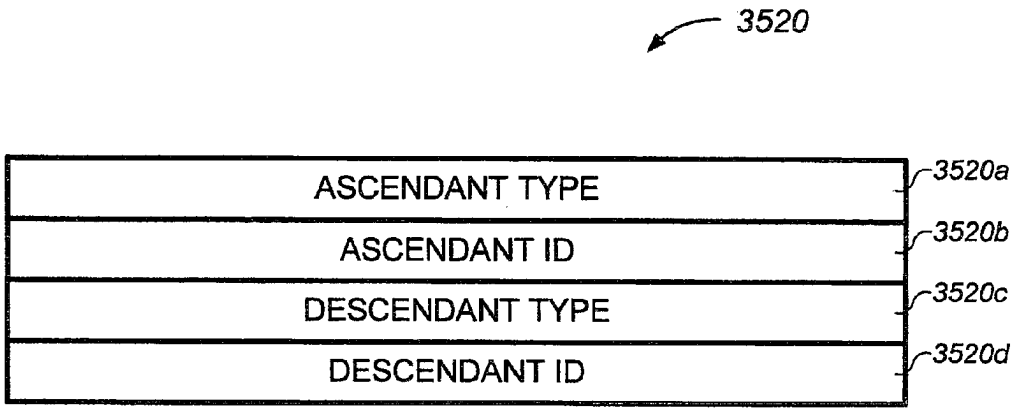

3520
ASCENDANT TYPE
3520a
ASCENDANT ID
3520b
DESCENDANT TYPE
3520c
DESCENDANT ID
3520d

Fig. 35C

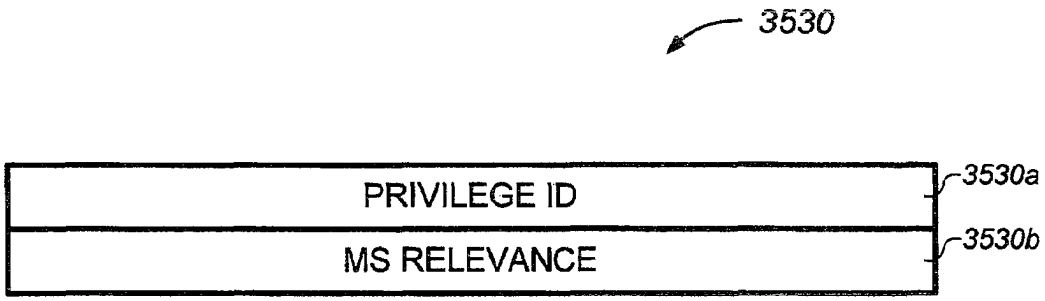


Fig. 35D

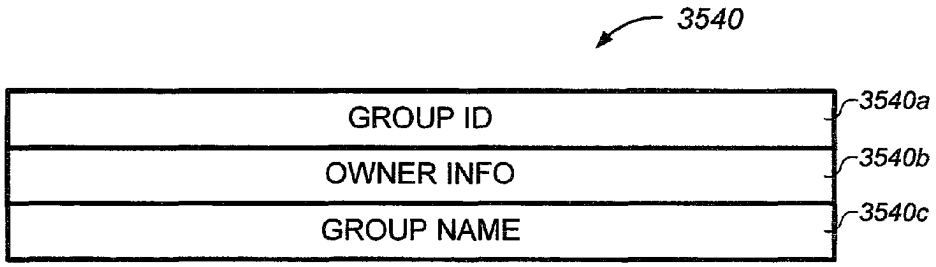


Fig. 35E

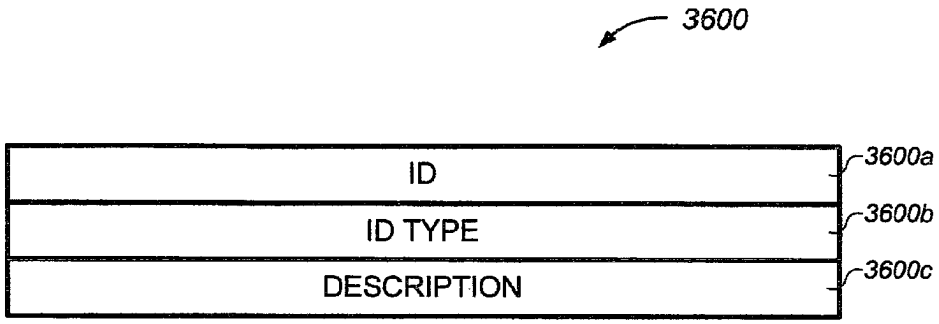


Fig. 36A

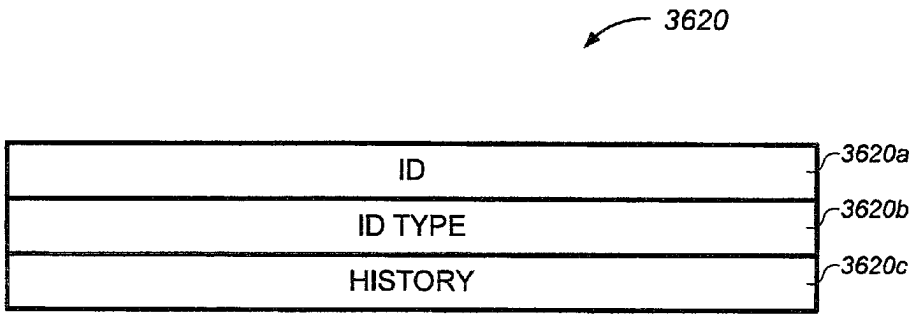


Fig. 36B

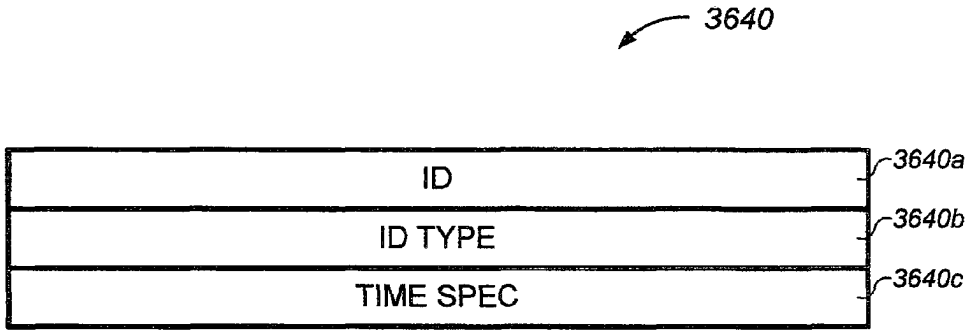


Fig. 36C

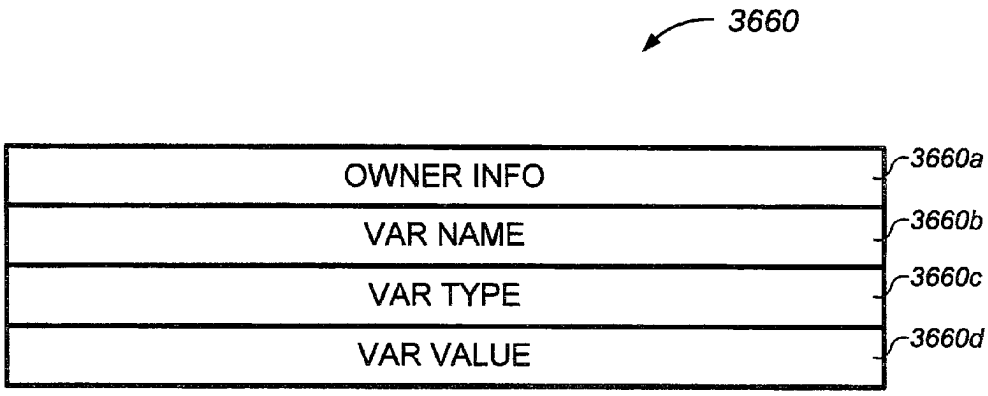

3660
OWNER INFO
VAR NAME
VAR TYPE
VAR VALUE
3660a
3660b
3660c
3660d

Fig. 36D

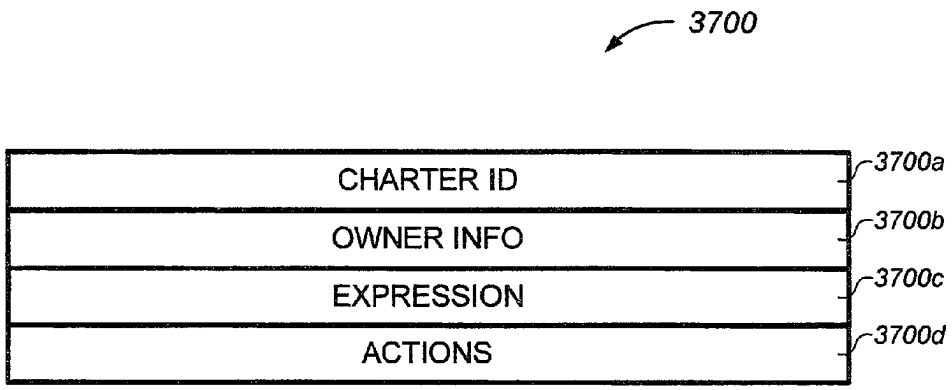

3700
CHARTER ID
OWNER INFO
EXPRESSION
ACTIONS
3700a
3700b
3700c
3700d

Fig. 37A

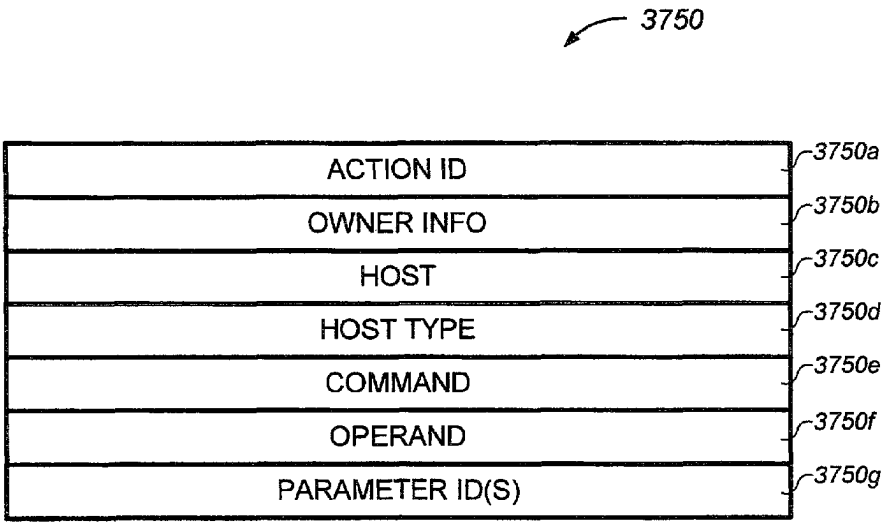

3750
ACTION ID
3750a
OWNER INFO
3750b
HOST
3750c
HOST TYPE
3750d
COMMAND
3750e
OPERAND
3750f
PARAMETER ID(S)
3750g

Fig. 37B

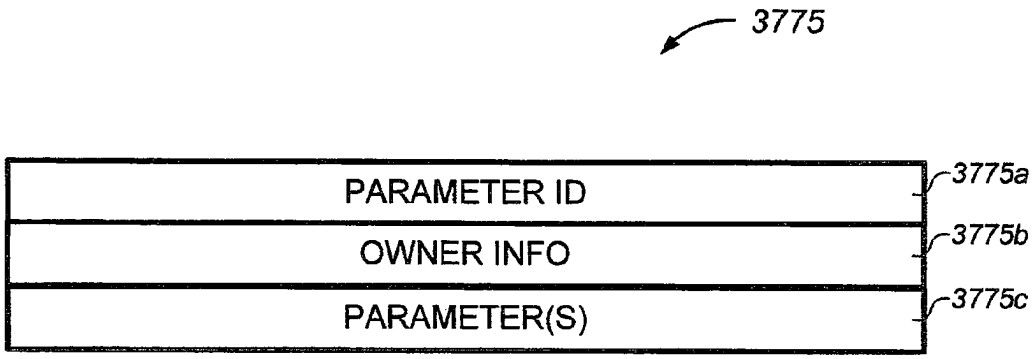


Fig. 37C

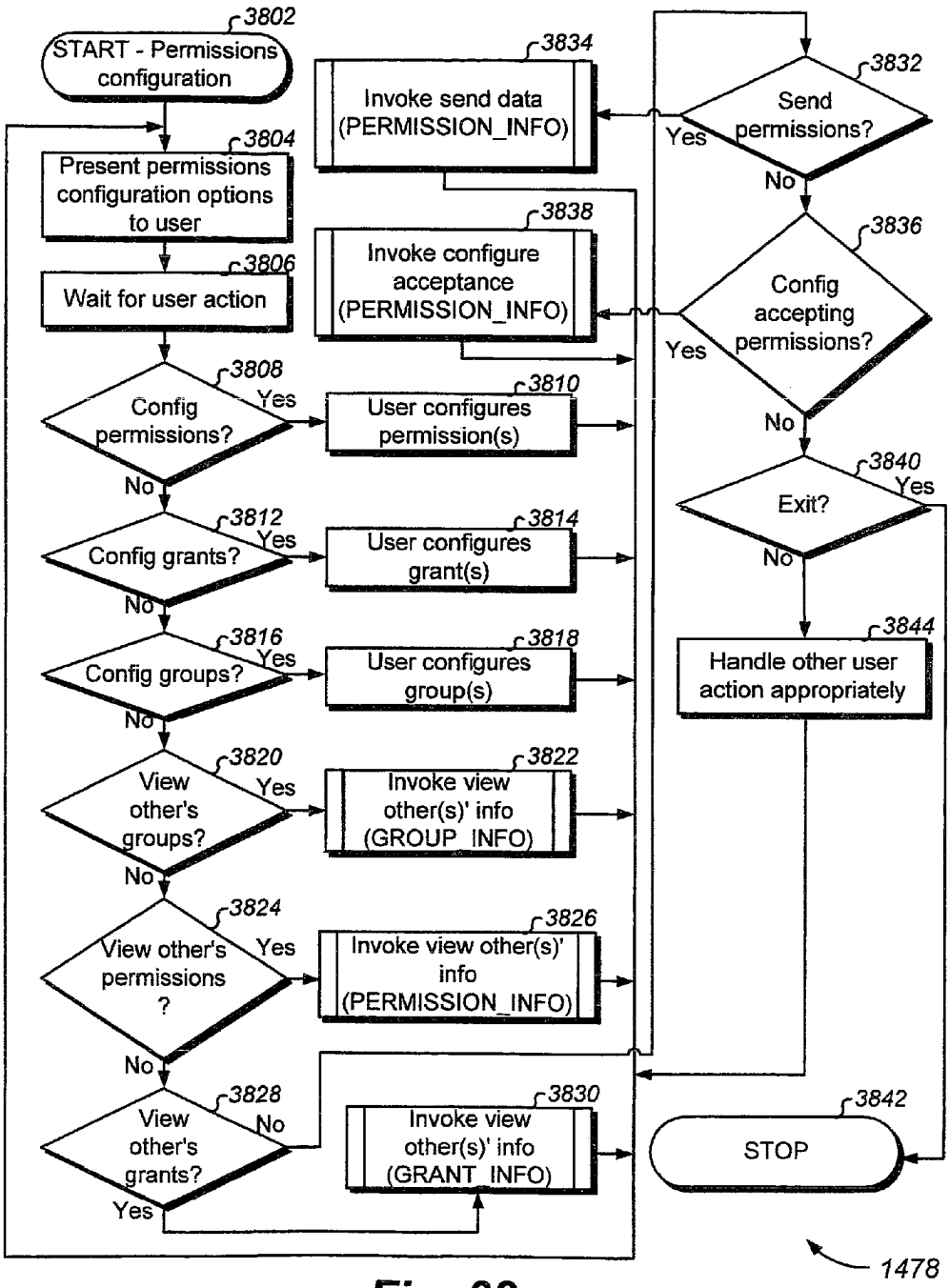

3802
START - Permissions configuration
3804
Present permissions configuration options to user
3806
Wait for user action
3808
Config permissions?
Yes
No
3810
User configures permission(s)
3812
Config grants?
Yes
No
3814
User configures grant(s)
3816
Config groups?
Yes
No
3818
User configures group(s)
3820
View other's groups?
Yes
No
3822
Invoke view other(s)' info (GROUP_INFO)
3824
View other's permissions ?
Yes
No
3826
Invoke view other(s)' info (PERMISSION_INFO)
3828
View other's grants?
No
Yes
3830
Invoke view other(s)' info (GRANT_INFO)
3834
Invoke send data (PERMISSION_INFO)
3838
Invoke configure acceptance (PERMISSION_INFO)
3832
Send permissions?
Yes
No
3836
Config accepting permissions?
Yes
No
3840
Exit?
Yes
No
3844
Handle other user action appropriately
3842
STOP
1478

Fig. 38

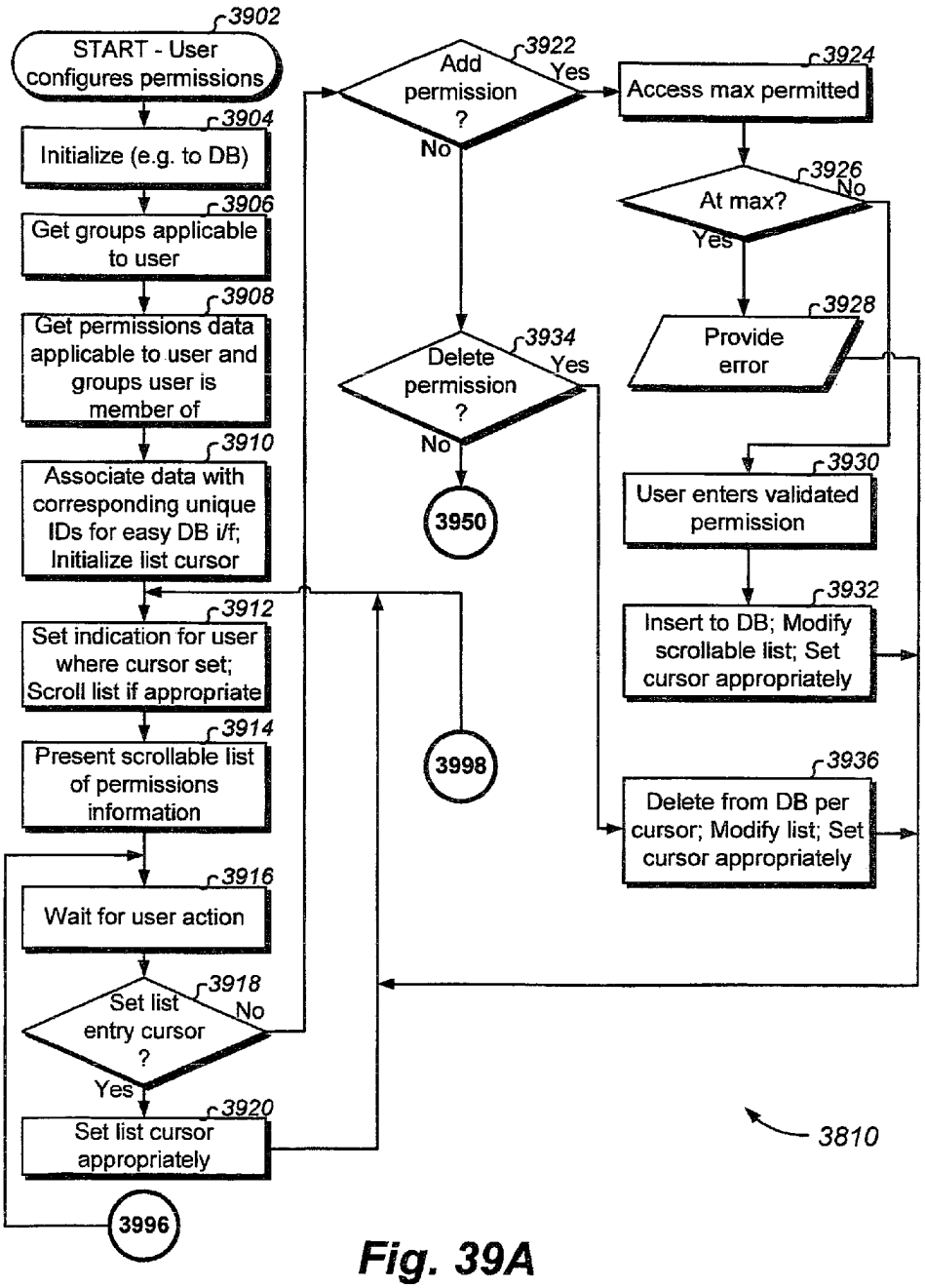

3902
START - User configures permissions
3904
Initialize (e.g. to DB)
3906
Get groups applicable to user
3908
Get permissions data applicable to user and groups user is member of
3910
Associate data with corresponding unique IDs for easy DB i/f; Initialize list cursor
3912
Set indication for user where cursor set; Scroll list if appropriate
3914
Present scrollable list of permissions information
3916
Wait for user action
3918
Set list entry cursor ?
No
Yes
3920
Set list cursor appropriately
3996
3922
Add permission ?
Yes
No
3924
Access max permitted
3926
At max?
No
Yes
3928
Provide error
3930
User enters validated permission
3932
Insert to DB; Modify scrollable list; Set cursor appropriately
3934
Delete permission ?
Yes
No
3936
Delete from DB per cursor; Modify list; Set cursor appropriately
3950
3998
3810

Fig. 39A

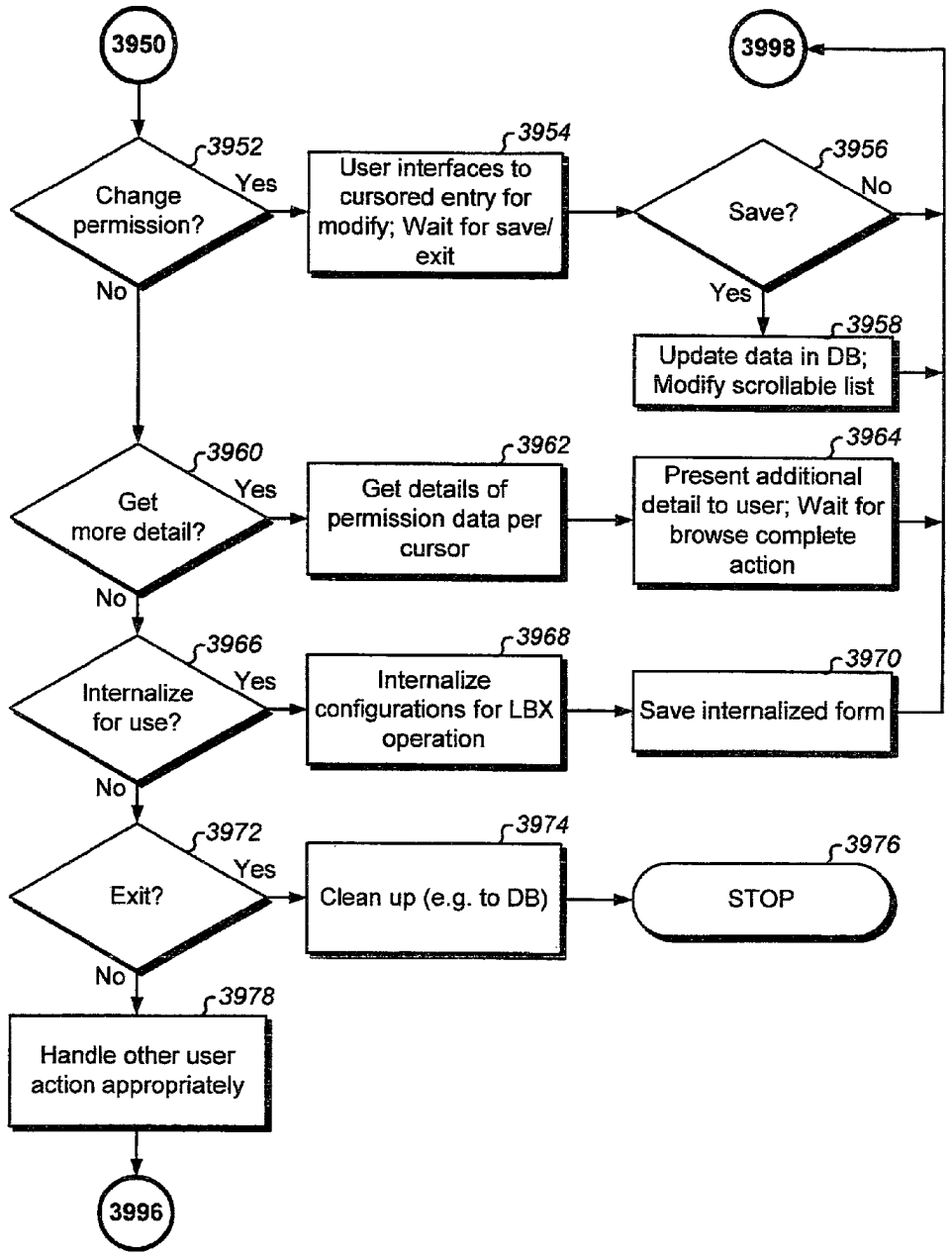

3950
3998
3952
Change permission?
Yes
No
3954
User interfaces to cursored entry for modify; Wait for save/ exit
3956
Save?
No
Yes
3958
Update data in DB; Modify scrollable list
3960
Get more detail?
Yes
No
3962
Get details of permission data per cursor
3964
Present additional detail to user; Wait for browse complete action
3966
Internalize for use?
Yes
No
3968
Internalize configurations for LBX operation
3970
Save internalized form
3972
Exit?
Yes
No
3974
Clean up (e.g. to DB)
3976
STOP
3978
Handle other user action appropriately
3996

Fig. 39B

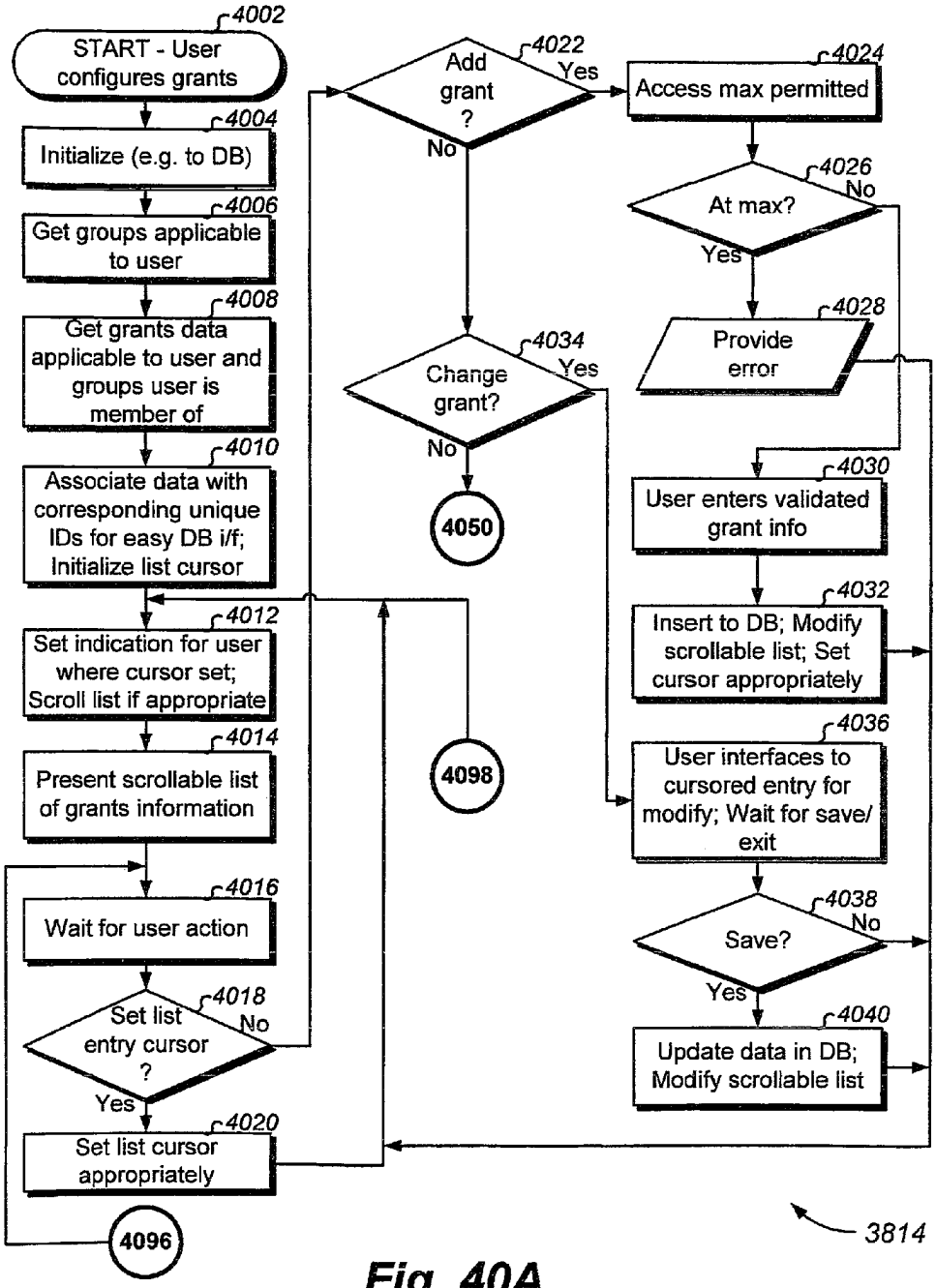

4002
START - User configures grants
4004
Initialize (e.g. to DB)
4006
Get groups applicable to user
4008
Get grants data applicable to user and groups user is member of
4010
Associate data with corresponding unique IDs for easy DB i/f; Initialize list cursor
4012
Set indication for user where cursor set; Scroll list if appropriate
4014
Present scrollable list of grants information
4016
Wait for user action
4018
Set list entry cursor ?
No
Yes
4020
Set list cursor appropriately
4096
4022
Add grant ?
Yes
No
4024
Access max permitted
4026
At max?
No
Yes
4028
Provide error
4034
Change grant?
Yes
No
4050
4030
User enters validated grant info
4032
Insert to DB; Modify scrollable list; Set cursor appropriately
4036
User interfaces to cursored entry for modify; Wait for save/ exit
4098
4038
Save?
No
Yes
4040
Update data in DB; Modify scrollable list
3814

Fig. 40A

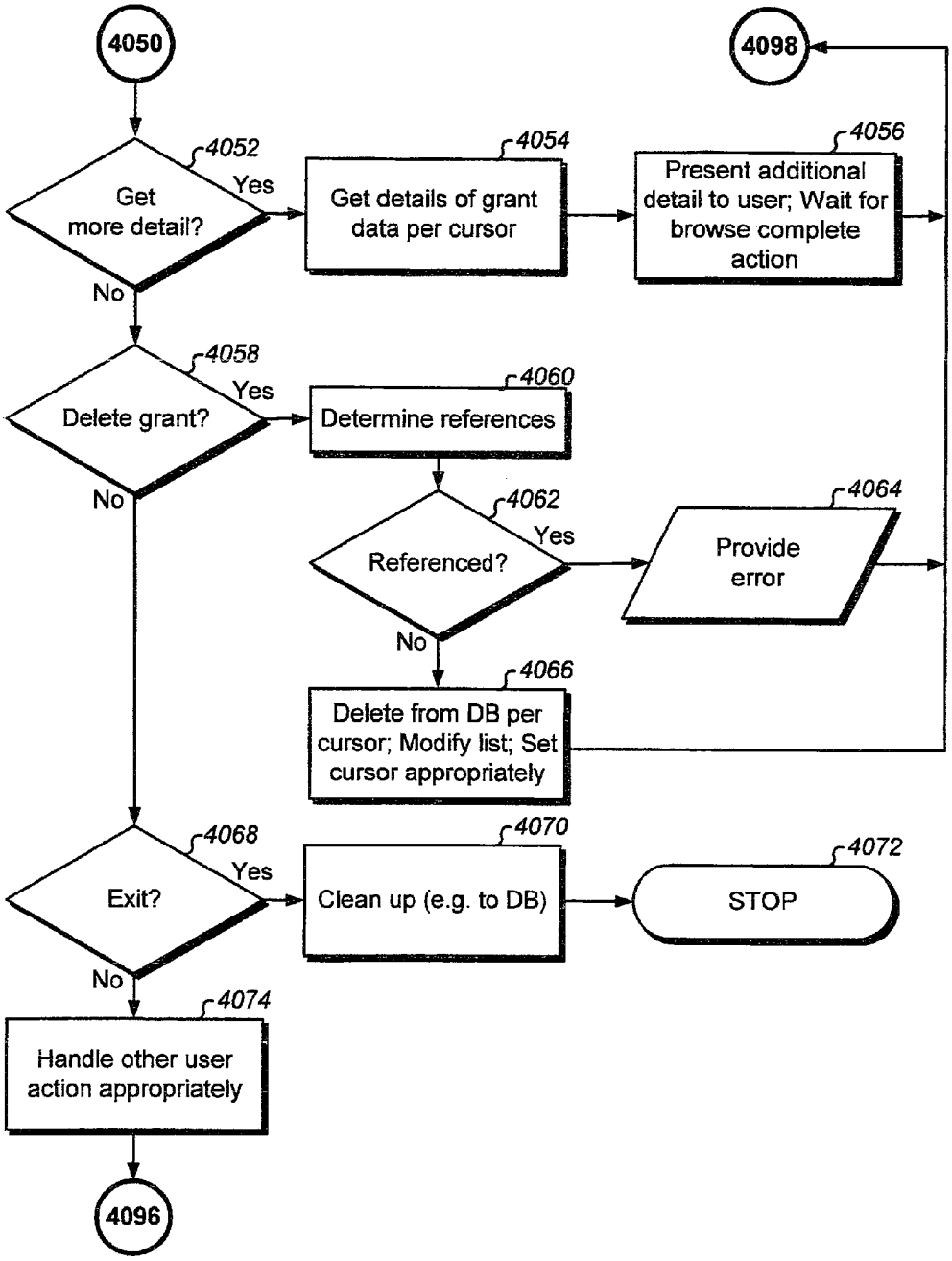

4050
4098
4052
Get more detail?
Yes
No
4054
Get details of grant data per cursor
4056
Present additional detail to user; Wait for browse complete action
4058
Delete grant?
Yes
No
4060
Determine references
4062
Referenced?
Yes
No
4064
Provide error
4066
Delete from DB per cursor; Modify list; Set cursor appropriately
4068
Exit?
Yes
No
4070
Clean up (e.g. to DB)
4072
STOP
4074
Handle other user action appropriately
4096

Fig. 40B

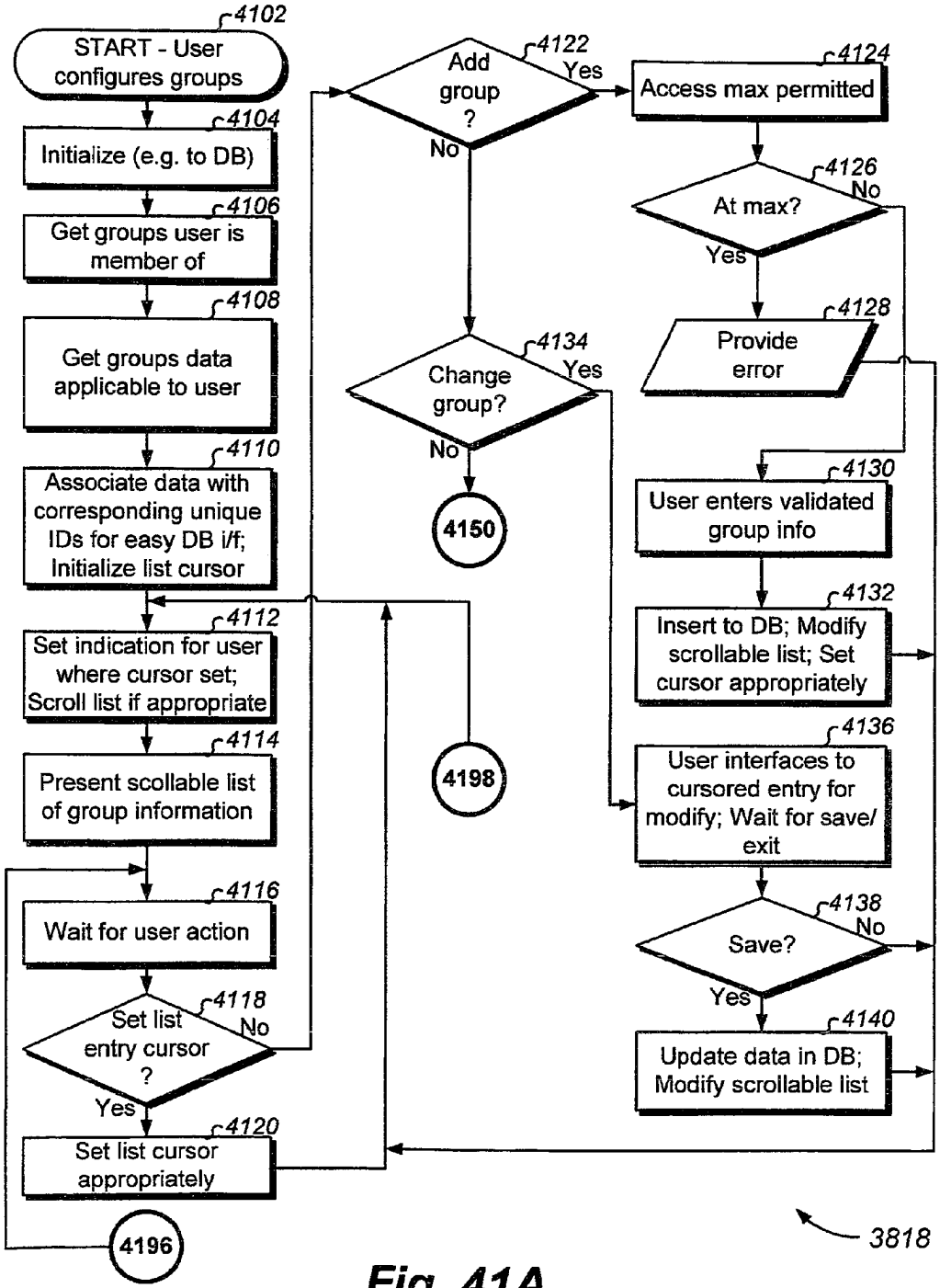

4102
START - User configures groups
4104
Initialize (e.g. to DB)
4106
Get groups user is member of
4108
Get groups data applicable to user
4110
Associate data with corresponding unique IDs for easy DB i/f; Initialize list cursor
4112
Set indication for user where cursor set; Scroll list if appropriate
4114
Present scollable list of group information
4116
Wait for user action
4118
Set list entry cursor ?
No
Yes
4120
Set list cursor appropriately
4196
4122
Add group ?
Yes
No
4124
Access max permitted
4126
At max?
No
Yes
4128
Provide error
4134
Change group?
Yes
No
4150
4130
User enters validated group info
4132
Insert to DB; Modify scrollable list; Set cursor appropriately
4198
4136
User interfaces to cursored entry for modify; Wait for save/ exit
4138
Save?
No
Yes
4140
Update data in DB; Modify scrollable list
3818

Fig. 41A

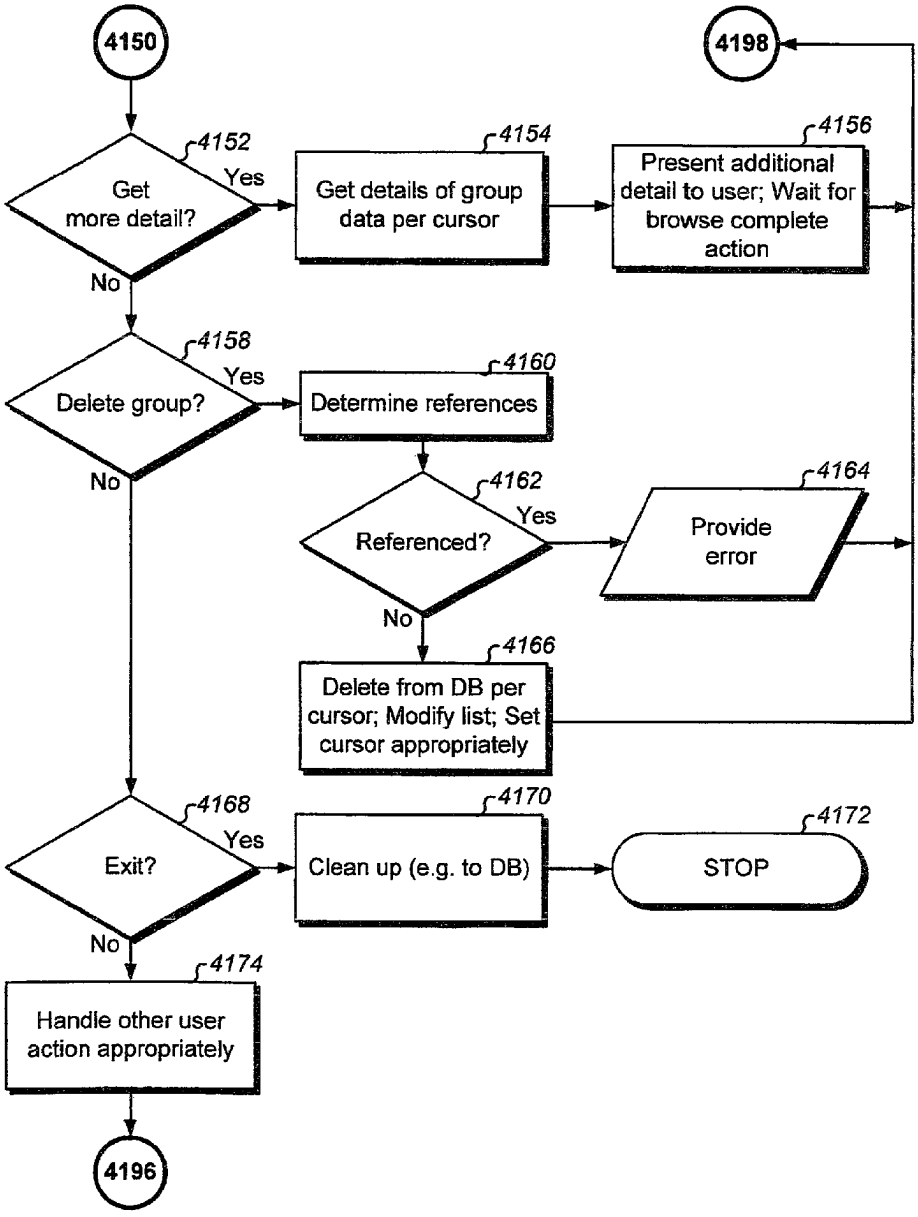

4150
4198
4152
Get more detail?
Yes
No
4154
Get details of group data per cursor
4156
Present additional detail to user; Wait for browse complete action
4158
Delete group?
Yes
No
4160
Determine references
4162
Referenced?
Yes
No
4164
Provide error
4166
Delete from DB per cursor; Modify list; Set cursor appropriately
4168
Exit?
Yes
No
4170
Clean up (e.g. to DB)
4172
STOP
4174
Handle other user action appropriately
4196

Fig. 41B

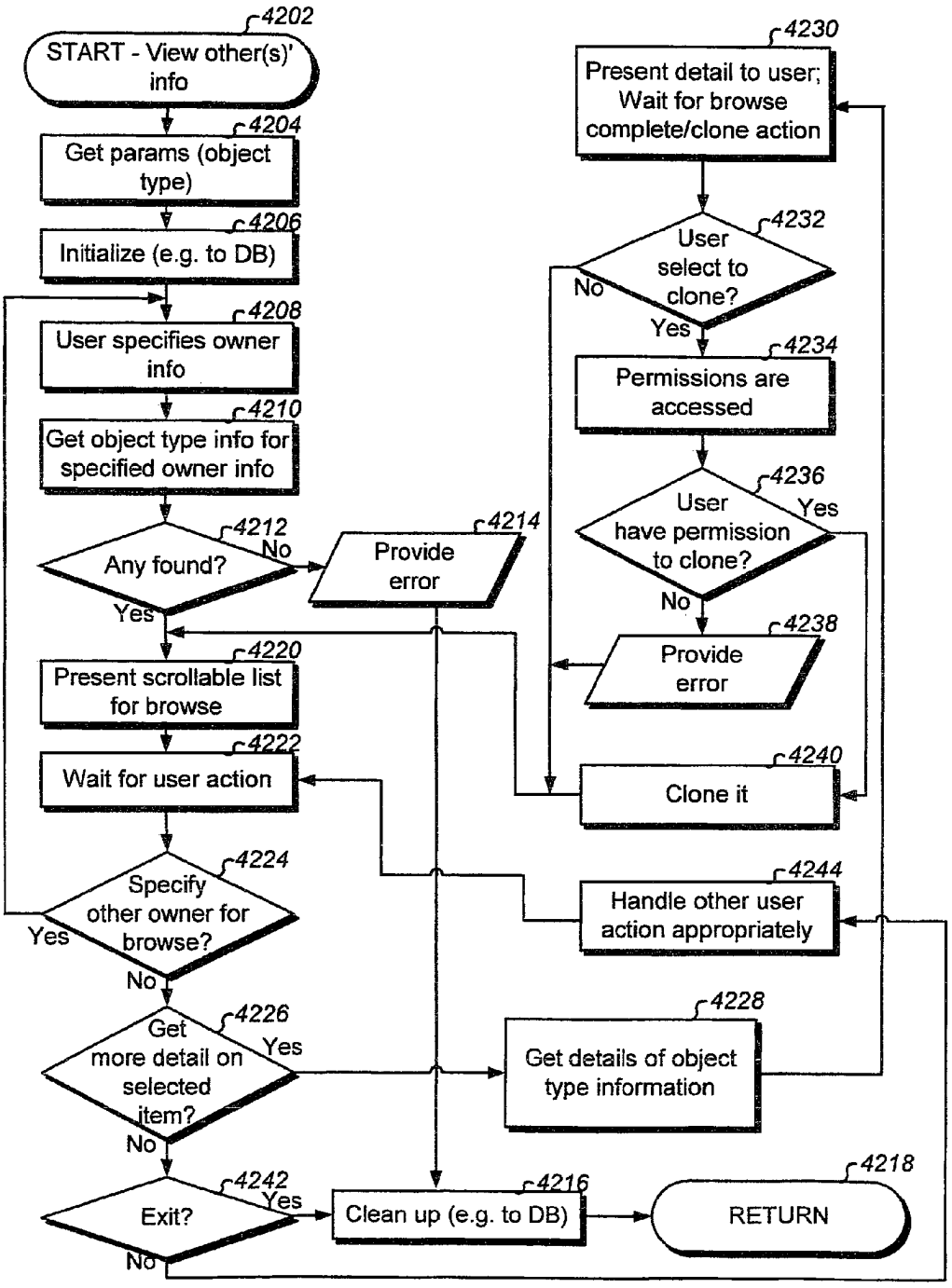

4202
START - View other(s)' info
4204
Get params (object type)
4206
Initialize (e.g. to DB)
4208
User specifies owner info
4210
Get object type info for specified owner info
4212
Any found?
No
Yes
4214
Provide error
4220
Present scrollable list for browse
4222
Wait for user action
4224
Specify other owner for browse?
Yes
No
4226
Get more detail on selected item?
Yes
No
4228
Get details of object type information
4242
Exit?
Yes
No
4216
Clean up (e.g. to DB)
4218
RETURN
4230
Present detail to user; Wait for browse complete/clone action
4232
User select to clone?
No
Yes
4234
Permissions are accessed
4236
User have permission to clone?
Yes
No
4238
Provide error
4240
Clone it
4244
Handle other user action appropriately

Fig. 42

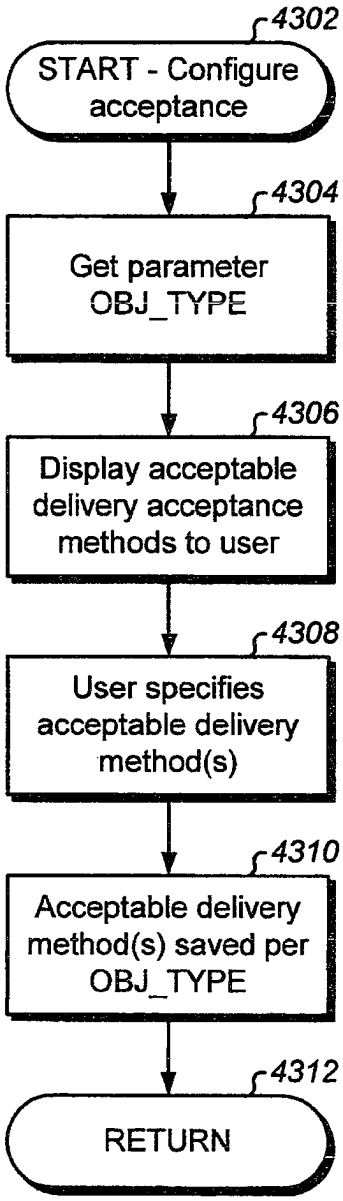

4302
START - Configure acceptance
4304
Get parameter OBJ_TYPE
4306
Display acceptable delivery acceptance methods to user
4308
User specifies acceptable delivery method(s)
4310
Acceptable delivery method(s) saved per OBJ_TYPE
4312
RETURN

Fig. 43

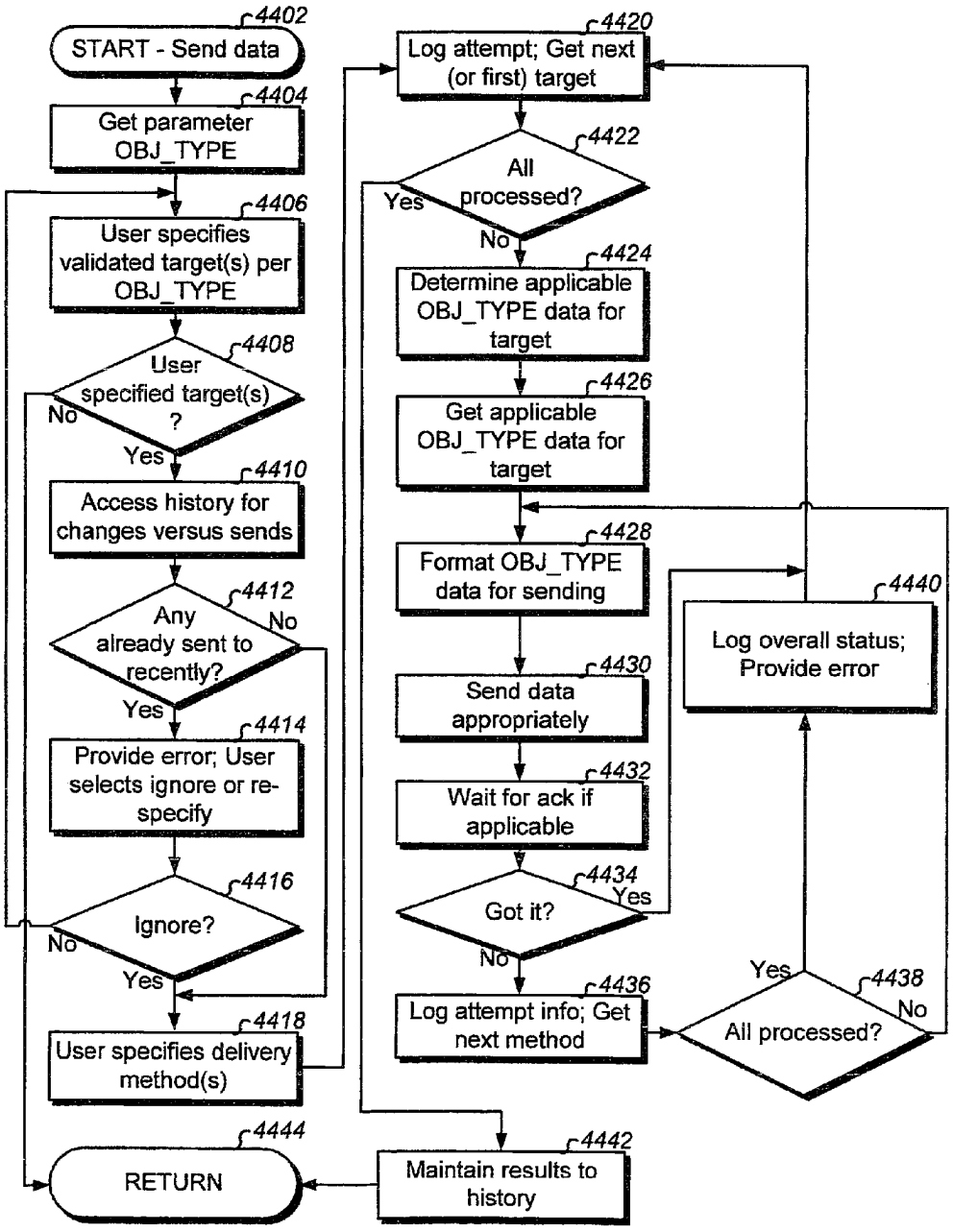

4402
START - Send data
4404
Get parameter OBJ_TYPE
4406
User specifies validated target(s) per OBJ_TYPE
4408
User specified target(s) ?
No
Yes
4410
Access history for changes versus sends
4412
Any already sent to recently?
No
Yes
4414
Provide error; User selects ignore or re-specify
4416
Ignore?
No
Yes
4418
User specifies delivery method(s)
4420
Log attempt; Get next (or first) target
4422
All processed?
Yes
No
4424
Determine applicable OBJ_TYPE data for target
4426
Get applicable OBJ_TYPE data for target
4428
Format OBJ_TYPE data for sending
4430
Send data appropriately
4432
Wait for ack if applicable
4434
Got it?
Yes
No
4436
Log attempt info; Get next method
4438
All processed?
Yes
No
4440
Log overall status; Provide error
4442
Maintain results to history
4444
RETURN

Fig. 44A

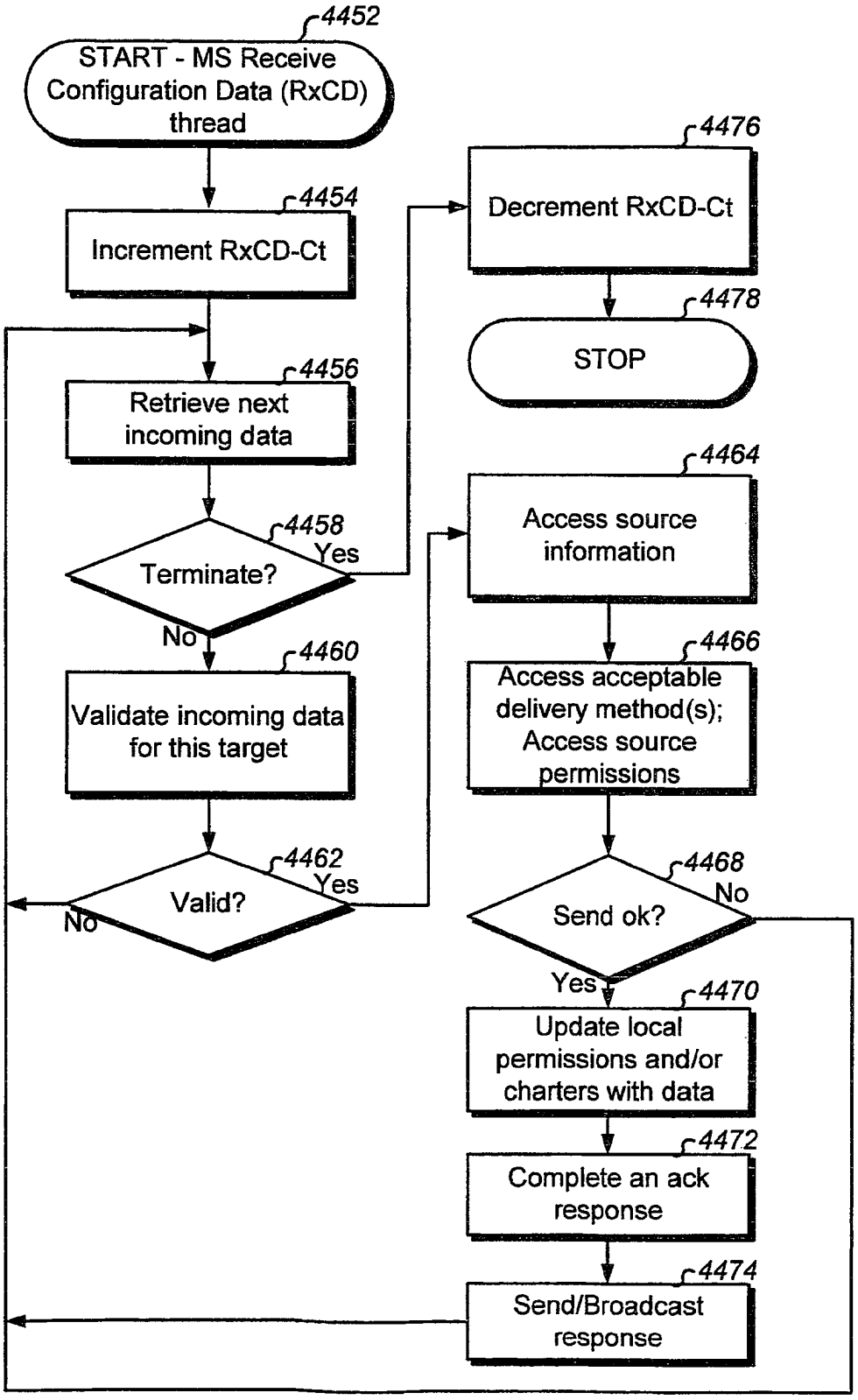

4452
START - MS Receive Configuration Data (RxCD) thread
4454
Increment RxCD-Ct
4456
Retrieve next incoming data
4458
Terminate?
Yes
No
4460
Validate incoming data for this target
4462
Valid?
Yes
No
4476
Decrement RxCD-Ct
4478
STOP
4464
Access source information
4466
Access acceptable delivery method(s); Access source permissions
4468
Send ok?
No
Yes
4470
Update local permissions and/or charters with data
4472
Complete an ack response
4474
Send/Broadcast response

Fig. 44B

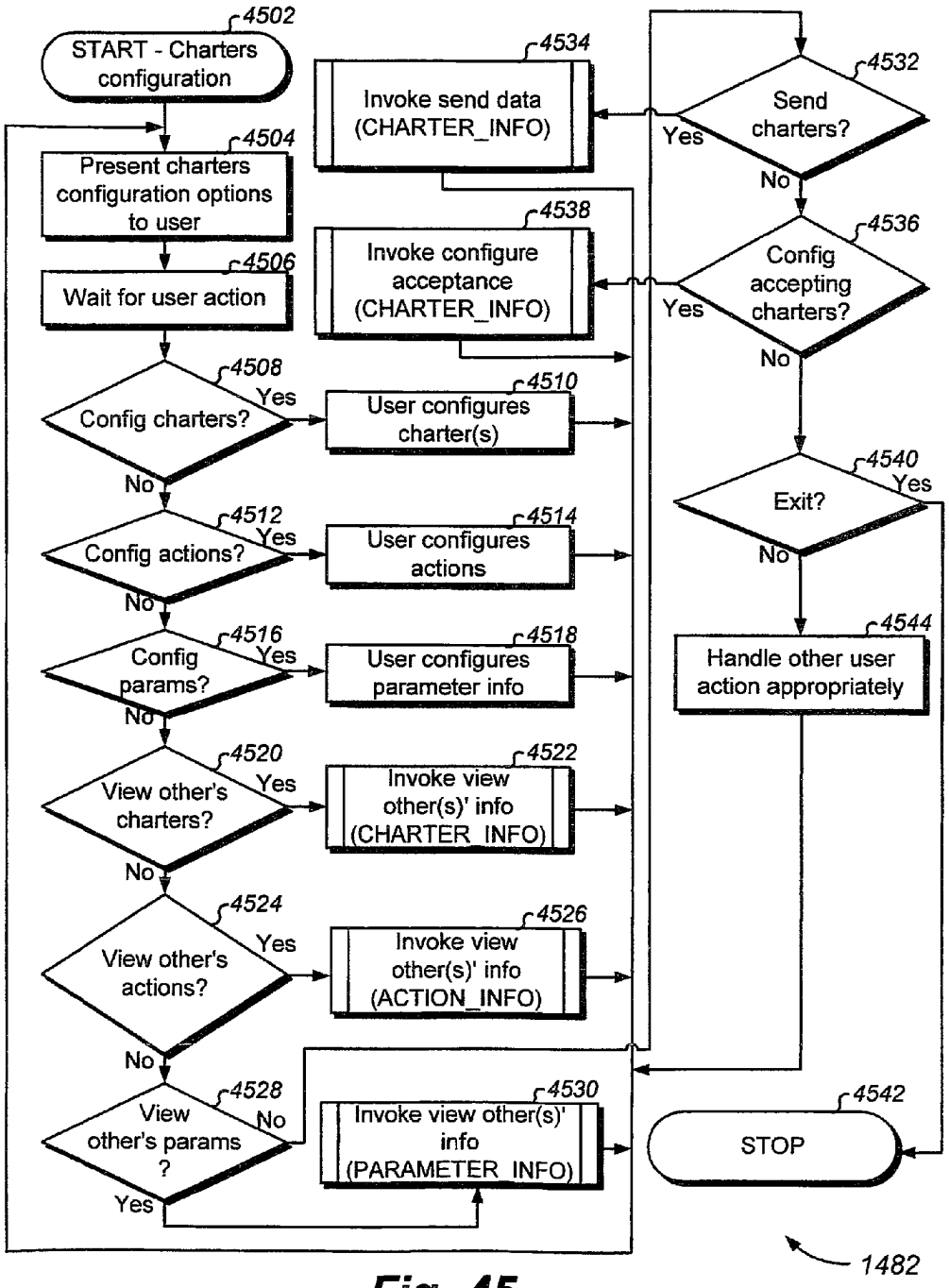

4502
START - Charters configuration
4504
Present charters configuration options to user
4506
Wait for user action
4508
Config charters?
Yes
No
4510
User configures charter(s)
4512
Config actions?
Yes
No
4514
User configures actions
4516
Config params?
Yes
No
4518
User configures parameter info
4520
View other's charters?
Yes
No
4522
Invoke view other(s)' info (CHARTER_INFO)
4524
View other's actions?
Yes
No
4526
Invoke view other(s)' info (ACTION_INFO)
4528
View other's params ?
No
Yes
4530
Invoke view other(s)' info (PARAMETER_INFO)
4534
Invoke send data (CHARTER_INFO)
4538
Invoke configure acceptance (CHARTER_INFO)
4532
Send charters?
Yes
No
4536
Config accepting charters?
Yes
No
4540
Exit?
Yes
No
4544
Handle other user action appropriately
4542
STOP
1482

Fig. 45

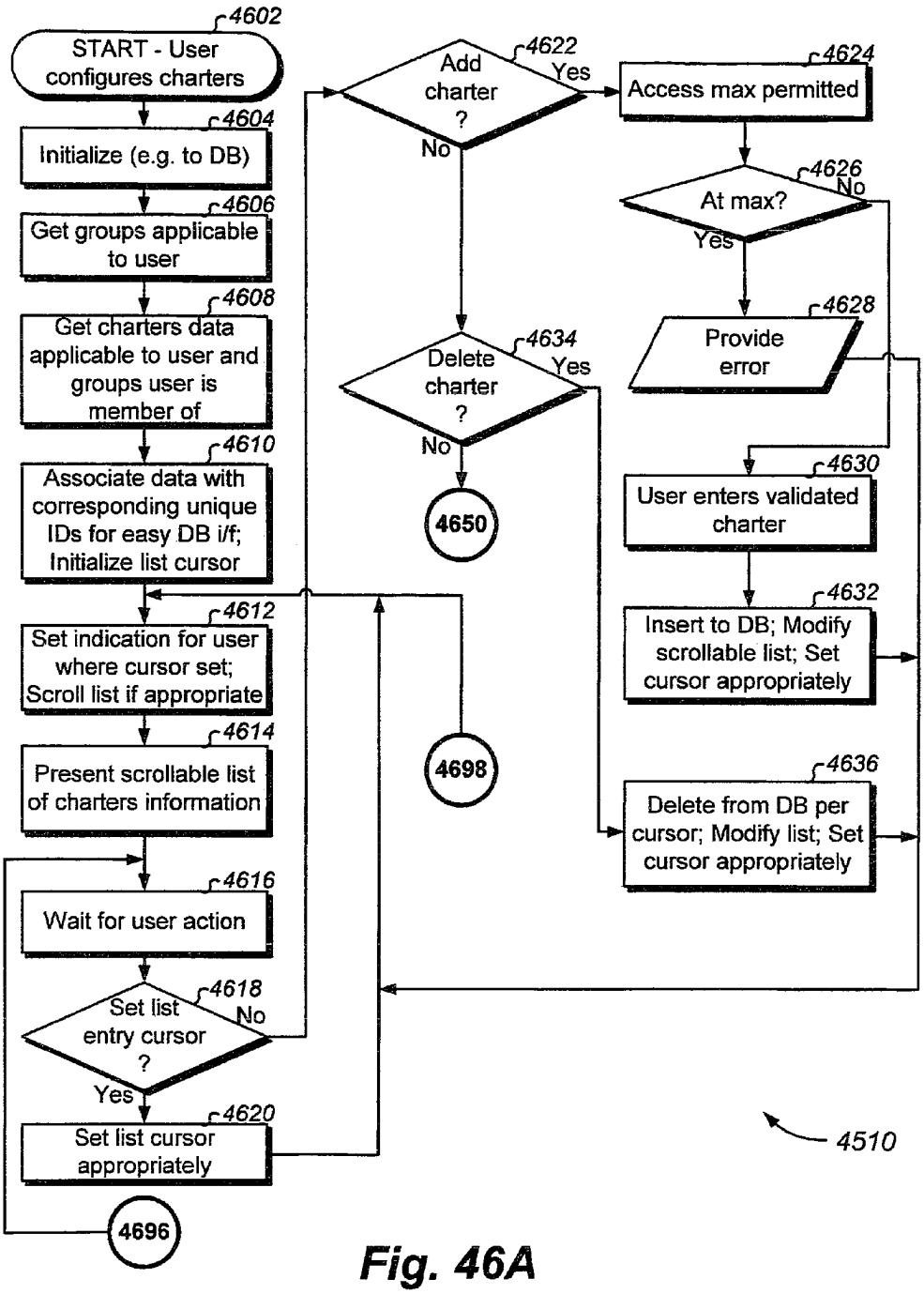

4602
START - User configures charters
4604
Initialize (e.g. to DB)
4606
Get groups applicable to user
4608
Get charters data applicable to user and groups user is member of
4610
Associate data with corresponding unique IDs for easy DB i/f; Initialize list cursor
4612
Set indication for user where cursor set; Scroll list if appropriate
4614
Present scrollable list of charters information
4616
Wait for user action
4618
Set list entry cursor ?
No
Yes
4620
Set list cursor appropriately
4696
4622
Add charter ?
Yes
No
4624
Access max permitted
4626
At max?
No
Yes
4628
Provide error
4634
Delete charter ?
Yes
No
4650
4630
User enters validated charter
4632
Insert to DB; Modify scrollable list; Set cursor appropriately
4636
Delete from DB per cursor; Modify list; Set cursor appropriately
4698
4510

Fig. 46A

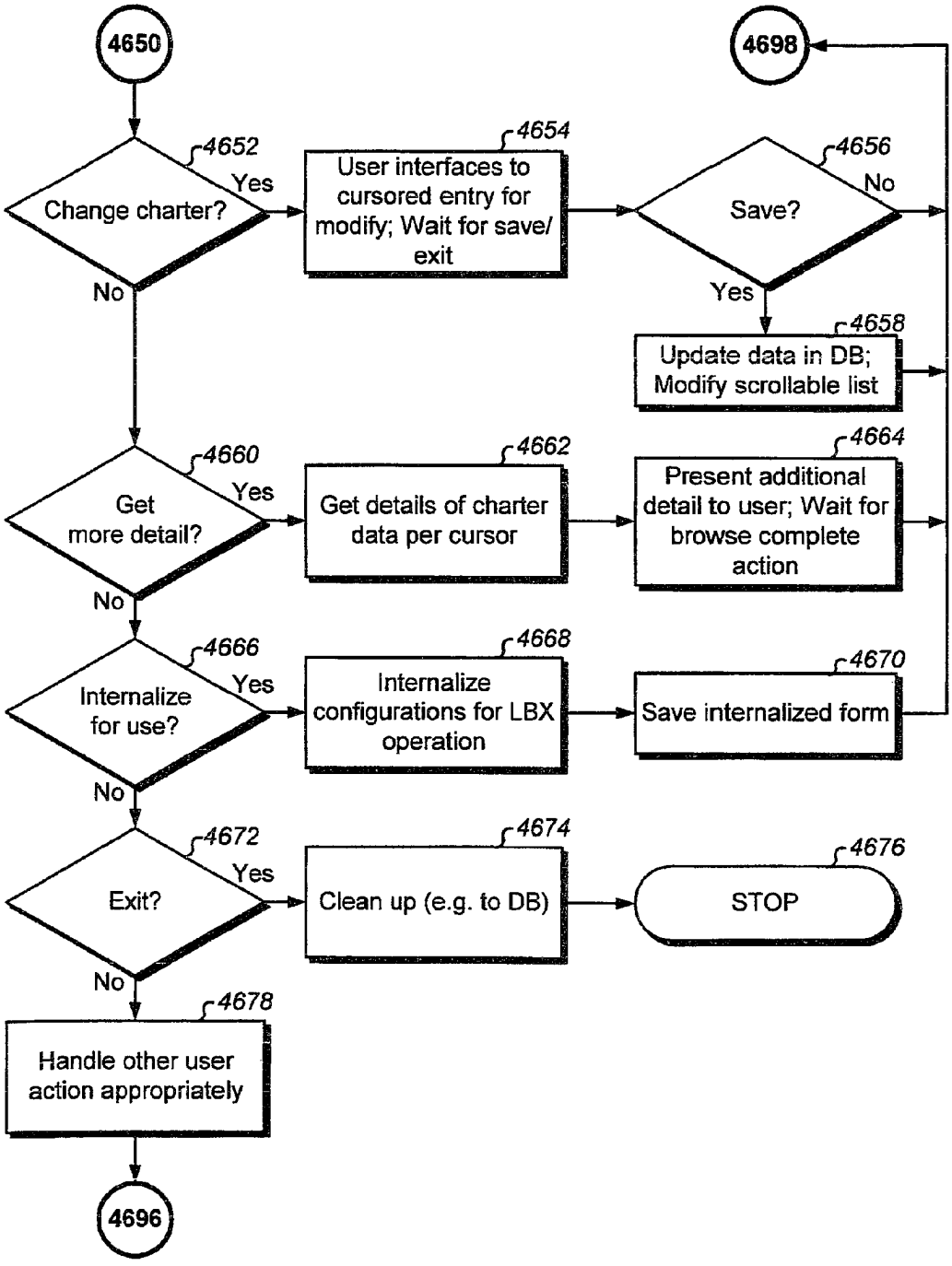

4650
4652
Change charter?
Yes
No
4654
User interfaces to cursored entry for modify; Wait for save/ exit
4656
Save?
No
Yes
4658
Update data in DB; Modify scrollable list
4698
4660
Get more detail?
Yes
No
4662
Get details of charter data per cursor
4664
Present additional detail to user; Wait for browse complete action
4666
Internalize for use?
Yes
No
4668
Internalize configurations for LBX operation
4670
Save internalized form
4672
Exit?
Yes
No
4674
Clean up (e.g. to DB)
4676
STOP
4678
Handle other user action appropriately
4696

Fig. 46B

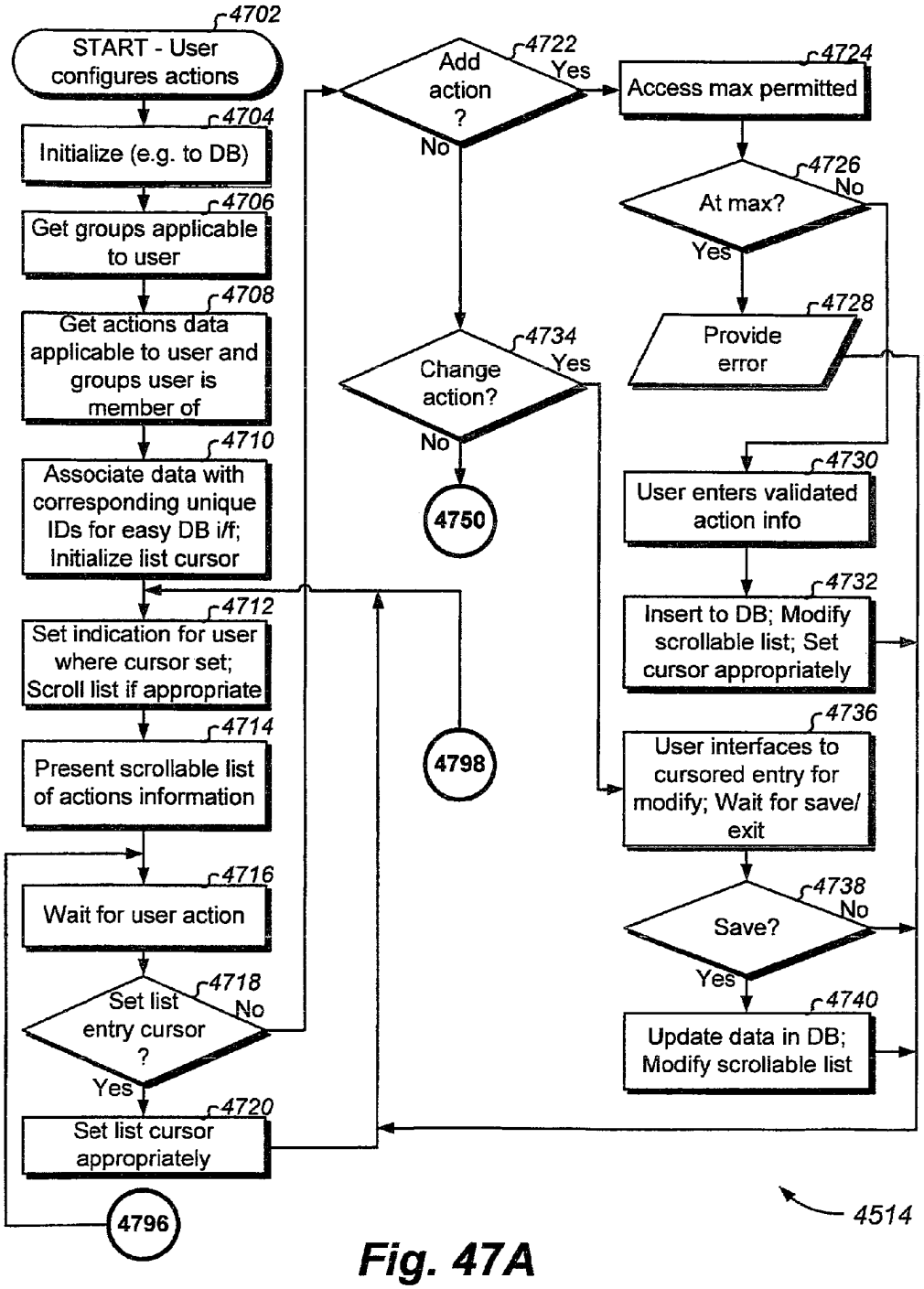

4702
START - User configures actions
4704
Initialize (e.g. to DB)
4706
Get groups applicable to user
4708
Get actions data applicable to user and groups user is member of
4710
Associate data with corresponding unique IDs for easy DB i/f; Initialize list cursor
4712
Set indication for user where cursor set; Scroll list if appropriate
4714
Present scrollable list of actions information
4716
Wait for user action
4718
Set list entry cursor ?
No
Yes
4720
Set list cursor appropriately
4796
4722
Add action ?
Yes
No
4724
Access max permitted
4726
At max?
No
Yes
4728
Provide error
4730
User enters validated action info
4732
Insert to DB; Modify scrollable list; Set cursor appropriately
4734
Change action?
Yes
No
4750
4798
4736
User interfaces to cursored entry for modify; Wait for save/ exit
4738
Save?
No
Yes
4740
Update data in DB; Modify scrollable list
4514

Fig. 47A

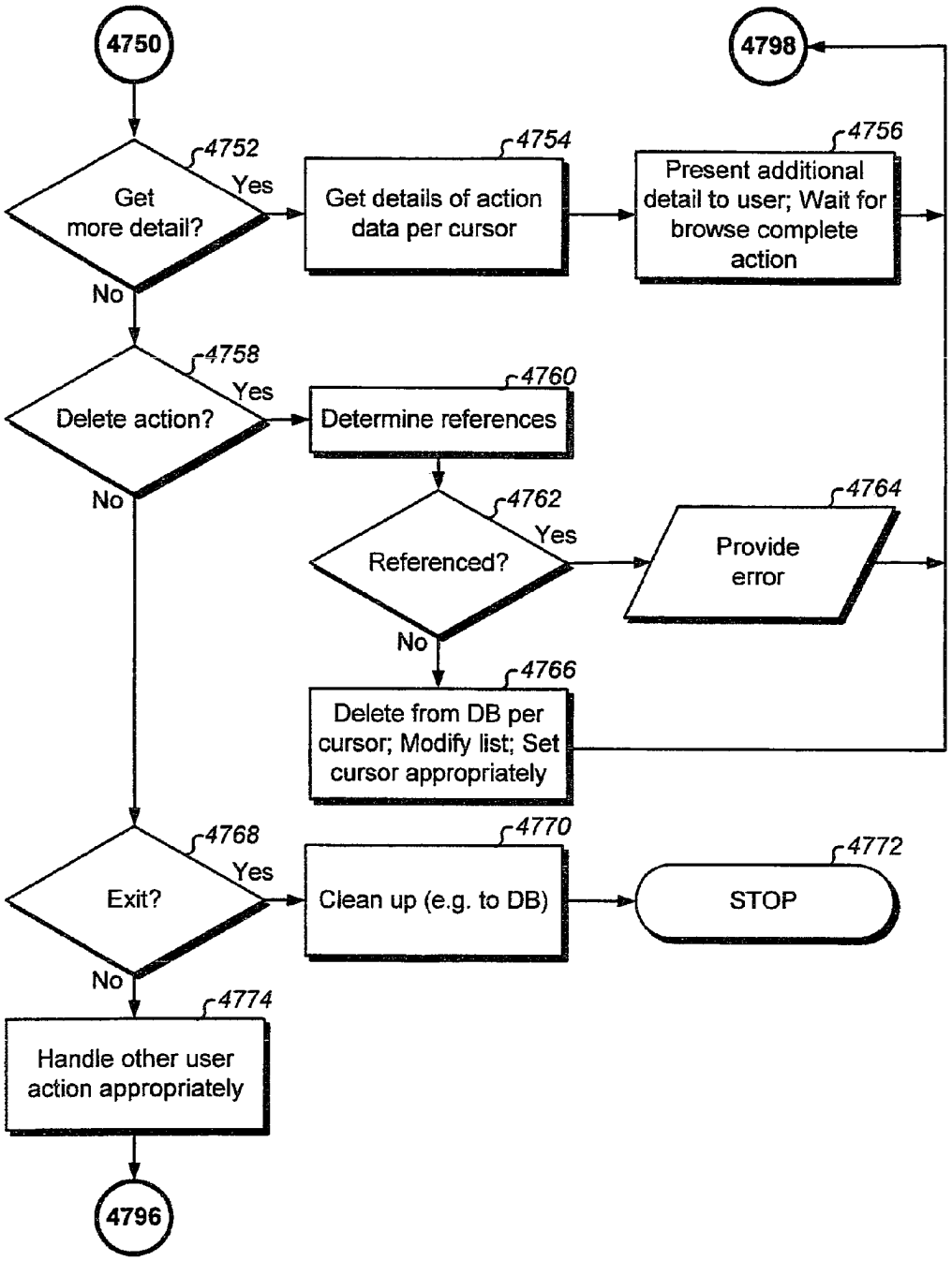

4750
4798
4752
Get more detail?
Yes
No
4754
Get details of action data per cursor
4756
Present additional detail to user; Wait for browse complete action
4758
Delete action?
Yes
No
4760
Determine references
4762
Referenced?
Yes
No
4764
Provide error
4766
Delete from DB per cursor; Modify list; Set cursor appropriately
4768
Exit?
Yes
No
4770
Clean up (e.g. to DB)
4772
STOP
4774
Handle other user action appropriately
4796

Fig. 47B

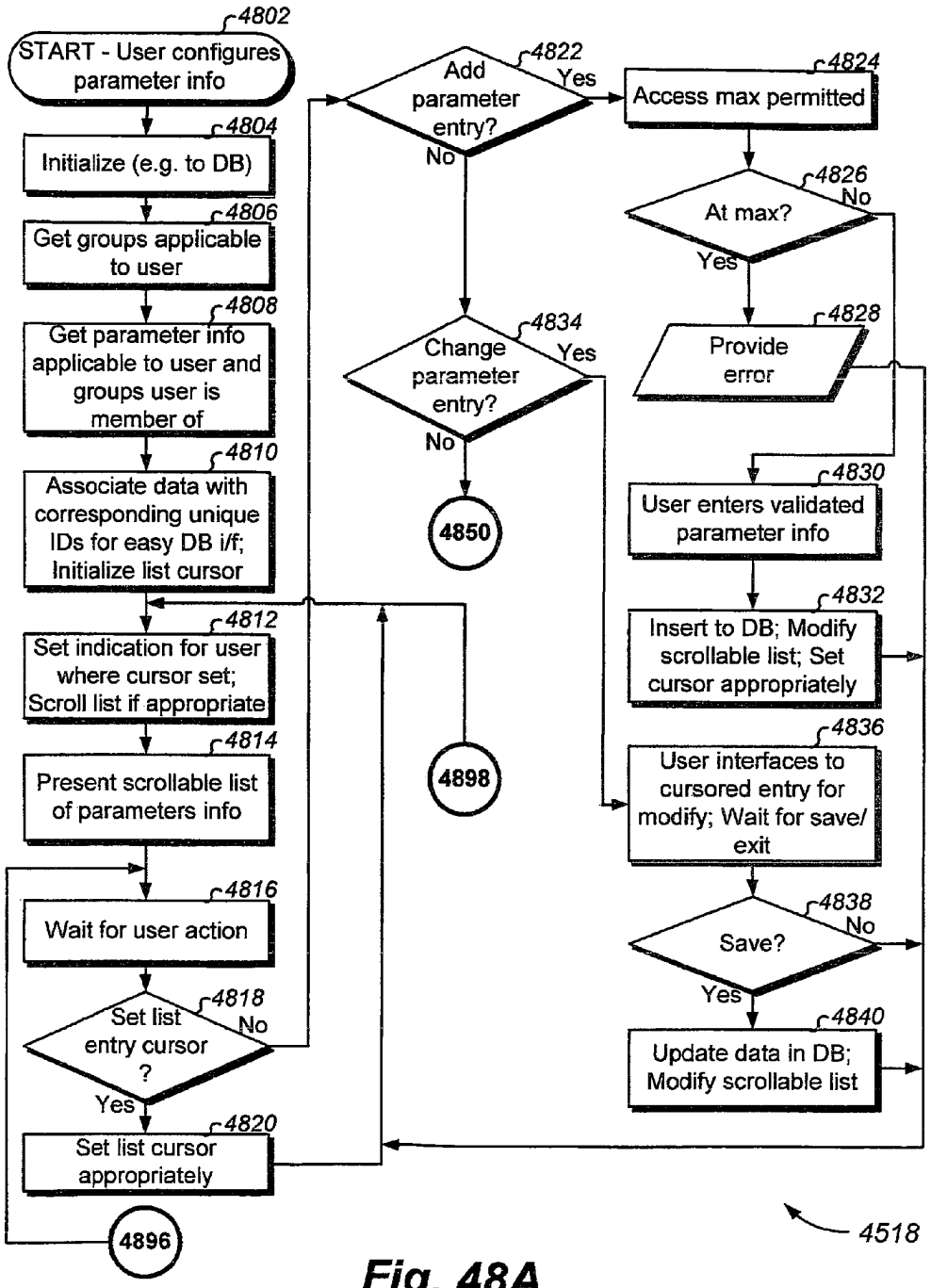

4802
START - User configures parameter info
4804
Initialize (e.g. to DB)
4806
Get groups applicable to user
4808
Get parameter info applicable to user and groups user is member of
4810
Associate data with corresponding unique IDs for easy DB i/f; Initialize list cursor
4812
Set indication for user where cursor set; Scroll list if appropriate
4814
Present scrollable list of parameters info
4816
Wait for user action
4818
Set list entry cursor ?
No
Yes
4820
Set list cursor appropriately
4896
4822
Add parameter entry?
Yes
No
4824
Access max permitted
4826
At max?
No
Yes
4828
Provide error
4834
Change parameter entry?
Yes
No
4850
4830
User enters validated parameter info
4832
Insert to DB; Modify scrollable list; Set cursor appropriately
4836
User interfaces to cursored entry for modify; Wait for save/ exit
4838
Save?
No
Yes
4840
Update data in DB; Modify scrollable list
4898
4518

Fig. 48A

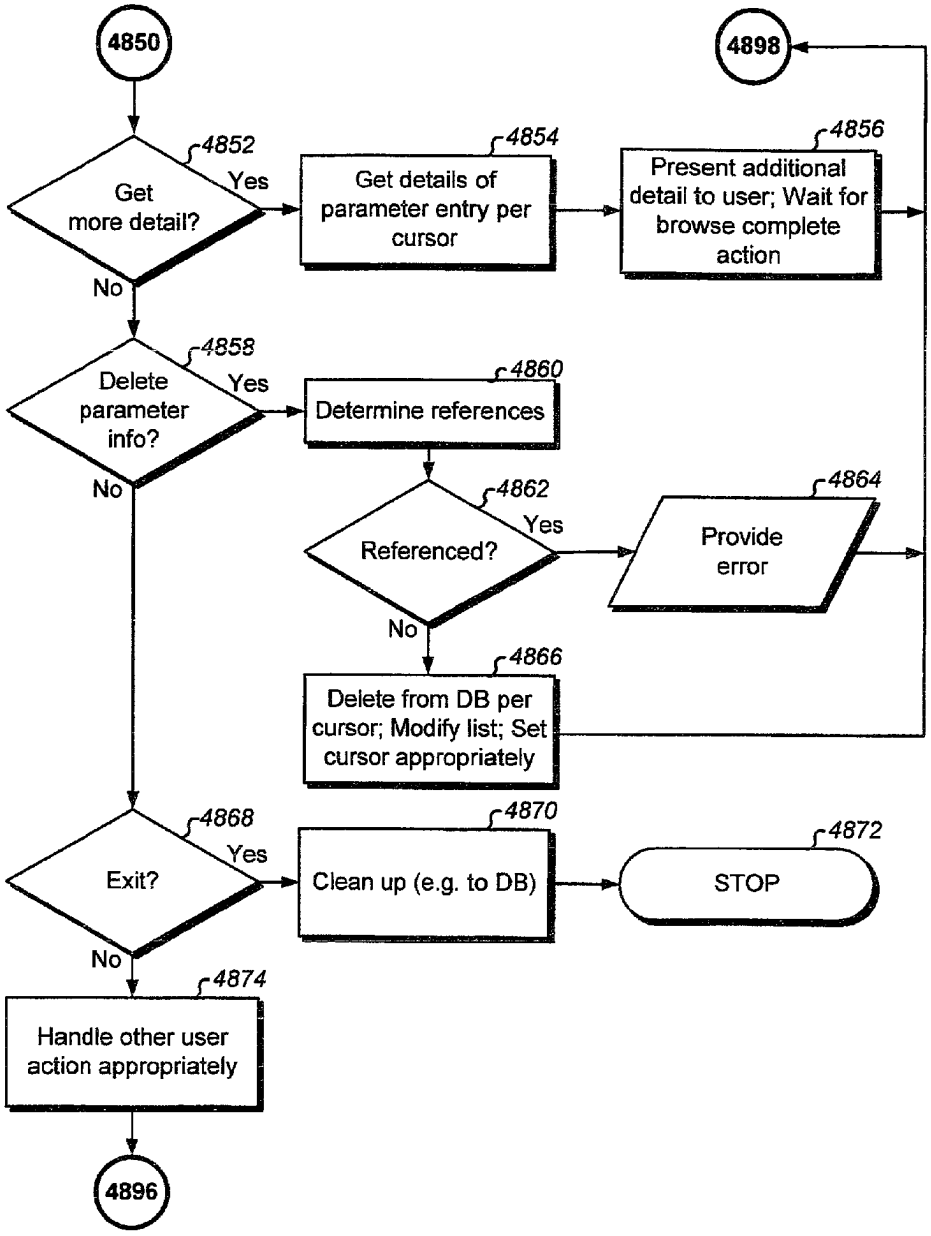

4850
4898
4852
Get more detail?
Yes
No
4854
Get details of parameter entry per cursor
4856
Present additional detail to user; Wait for browse complete action
4858
Delete parameter info?
Yes
No
4860
Determine references
4862
Referenced?
Yes
No
4864
Provide error
4866
Delete from DB per cursor; Modify list; Set cursor appropriately
4868
Exit?
Yes
No
4870
Clean up (e.g. to DB)
4872
STOP
4874
Handle other user action appropriately
4896

Fig. 48B

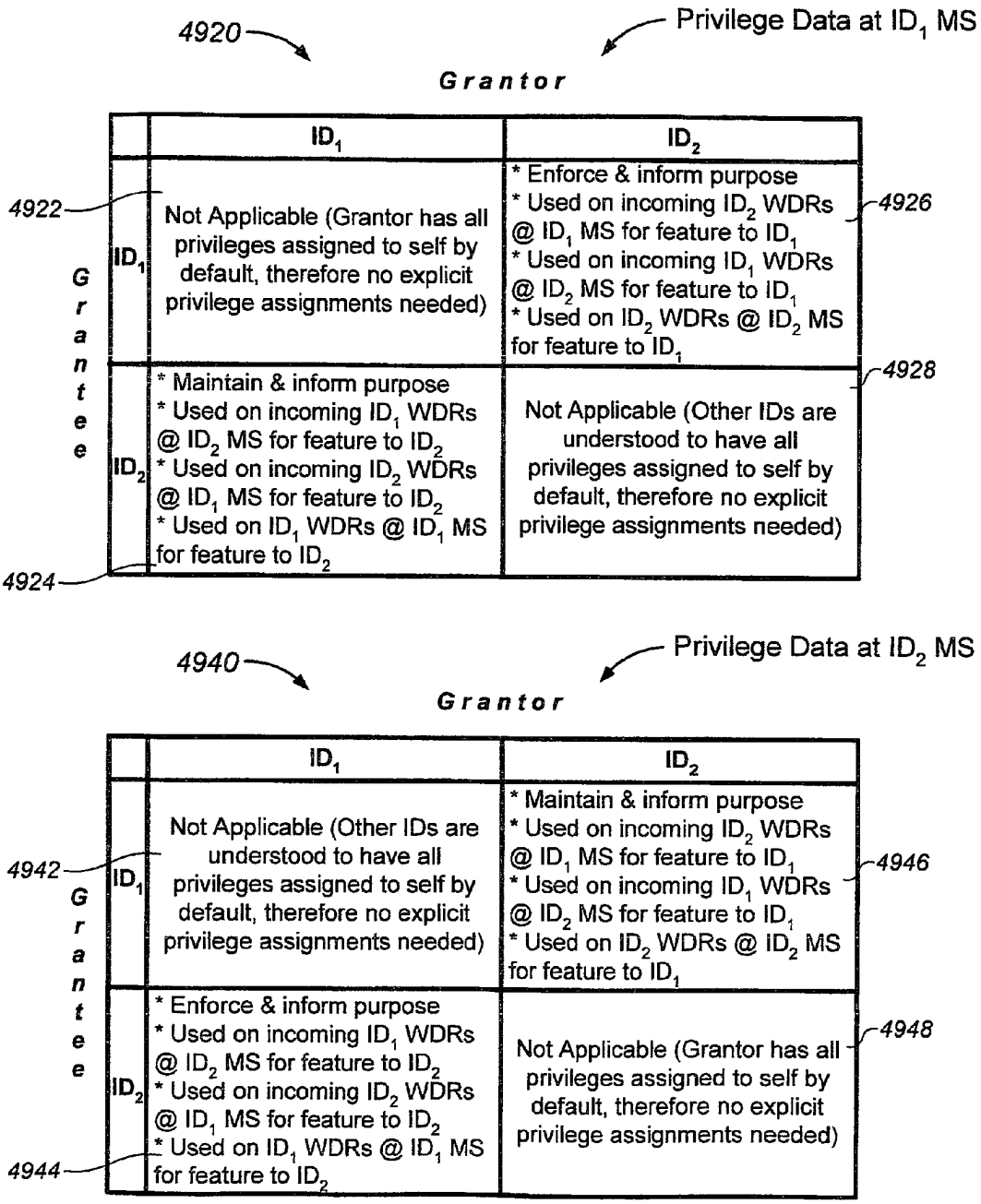

4920
Privilege Data at ID1 MS
Grantor
ID1
ID2
Grantee
4922
4924
4926
4928
Not Applicable (Grantor has all privileges assigned to self by default, therefore no explicit privilege assignments needed)
* Enforce & inform purpose
* Used on incoming ID2 WDRs @ ID1 MS for feature to ID1
* Used on incoming ID1 WDRs @ ID2 MS for feature to ID1
* Used on ID2 WDRs @ ID2 MS for feature to ID1
* Maintain & inform purpose
* Used on incoming ID1 WDRs @ ID2 MS for feature to ID2
* Used on incoming ID2 WDRs @ ID1 MS for feature to ID2
* Used on ID1 WDRs @ ID1 MS for feature to ID2
Not Applicable (Other IDs are understood to have all privileges assigned to self by default, therefore no explicit privilege assignments needed)
4940
Privilege Data at ID2 MS
Grantor
ID1
ID2
Grantee
4942
4944
4946
4948
Not Applicable (Other IDs are understood to have all privileges assigned to self by default, therefore no explicit privilege assignments needed)
* Maintain & inform purpose
* Used on incoming ID2 WDRs @ ID1 MS for feature to ID1
* Used on incoming ID1 WDRs @ ID2 MS for feature to ID1
* Used on ID2 WDRs @ ID2 MS for feature to ID1
* Enforce & inform purpose
* Used on incoming ID1 WDRs @ ID2 MS for feature to ID2
* Used on incoming ID2 WDRs @ ID1 MS for feature to ID2
* Used on ID1 WDRs @ ID1 MS for feature to ID2
Not Applicable (Grantor has all privileges assigned to self by default, therefore no explicit privilege assignments needed)

Fig. 49A

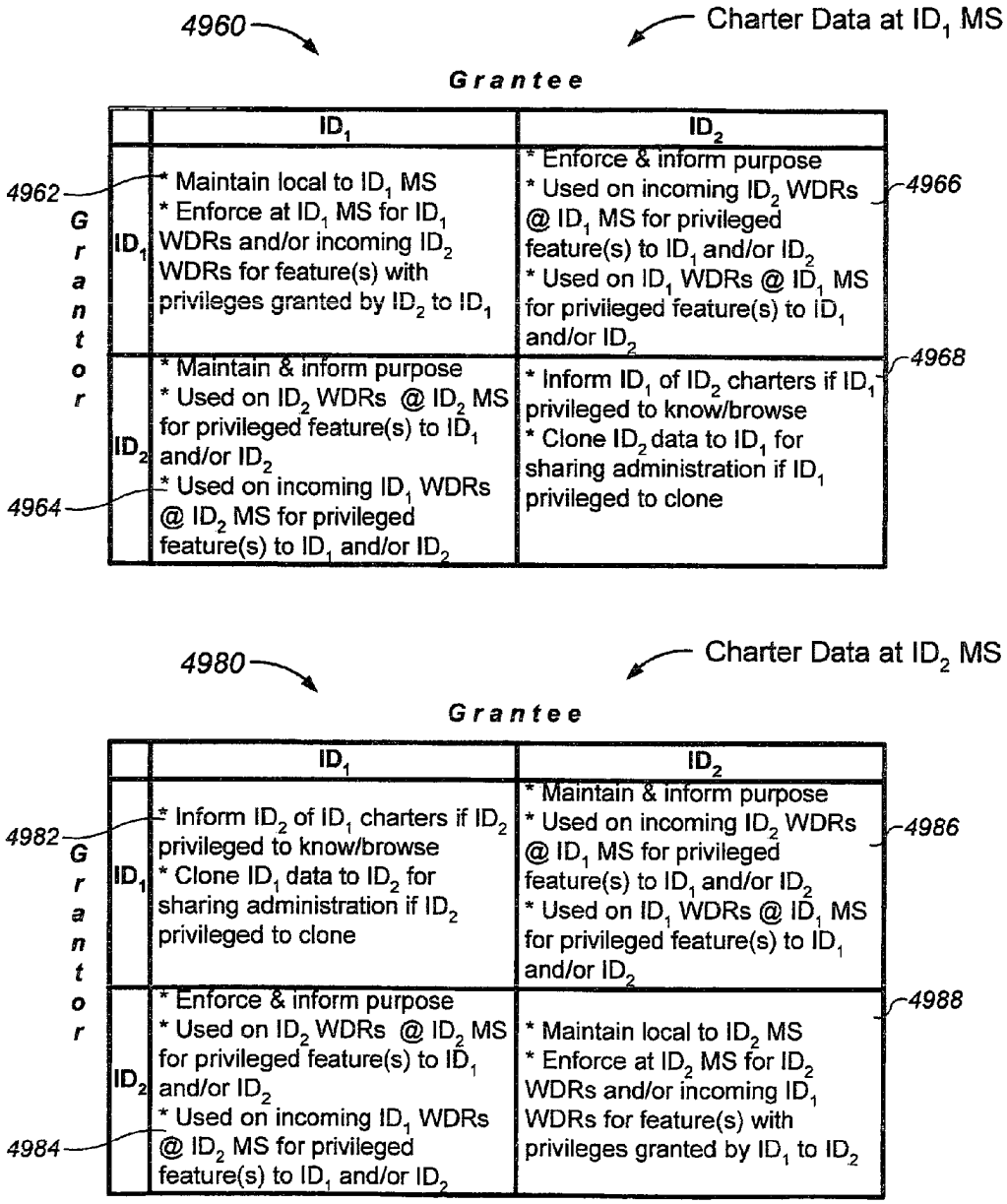

4960
Charter Data at ID1 MS
Grantee
Grantor
ID1
ID2
* Maintain local to ID1 MS
* Enforce at ID1 MS for ID1 WDRs and/or incoming ID2 WDRs for feature(s) with privileges granted by ID2 to ID1
* Enforce & inform purpose
* Used on incoming ID2 WDRs @ ID1 MS for privileged feature(s) to ID1 and/or ID2
* Used on ID1 WDRs @ ID1 MS for privileged feature(s) to ID1 and/or ID2
* Maintain & inform purpose
* Used on ID2 WDRs @ ID2 MS for privileged feature(s) to ID1 and/or ID2
* Used on incoming ID1 WDRs @ ID2 MS for privileged feature(s) to ID1 and/or ID2
* Inform ID1 of ID2 charters if ID1 privileged to know/browse
* Clone ID2 data to ID1 for sharing administration if ID1 privileged to clone
4962
4964
4966
4968
4980
Charter Data at ID2 MS
Grantee
Grantor
ID1
ID2
* Inform ID2 of ID1 charters if ID2 privileged to know/browse
* Clone ID1 data to ID2 for sharing administration if ID2 privileged to clone
* Maintain & inform purpose
* Used on incoming ID2 WDRs @ ID1 MS for privileged feature(s) to ID1 and/or ID2
* Used on ID1 WDRs @ ID1 MS for privileged feature(s) to ID1 and/or ID2
* Enforce & inform purpose
* Used on ID2 WDRs @ ID2 MS for privileged feature(s) to ID1 and/or ID2
* Used on incoming ID1 WDRs @ ID2 MS for privileged feature(s) to ID1 and/or ID2
* Maintain local to ID2 MS
* Enforce at ID2 MS for ID2 WDRs and/or incoming ID1 WDRs for feature(s) with privileges granted by ID1 to ID2
4982
4984
4986
4988

Fig. 49B

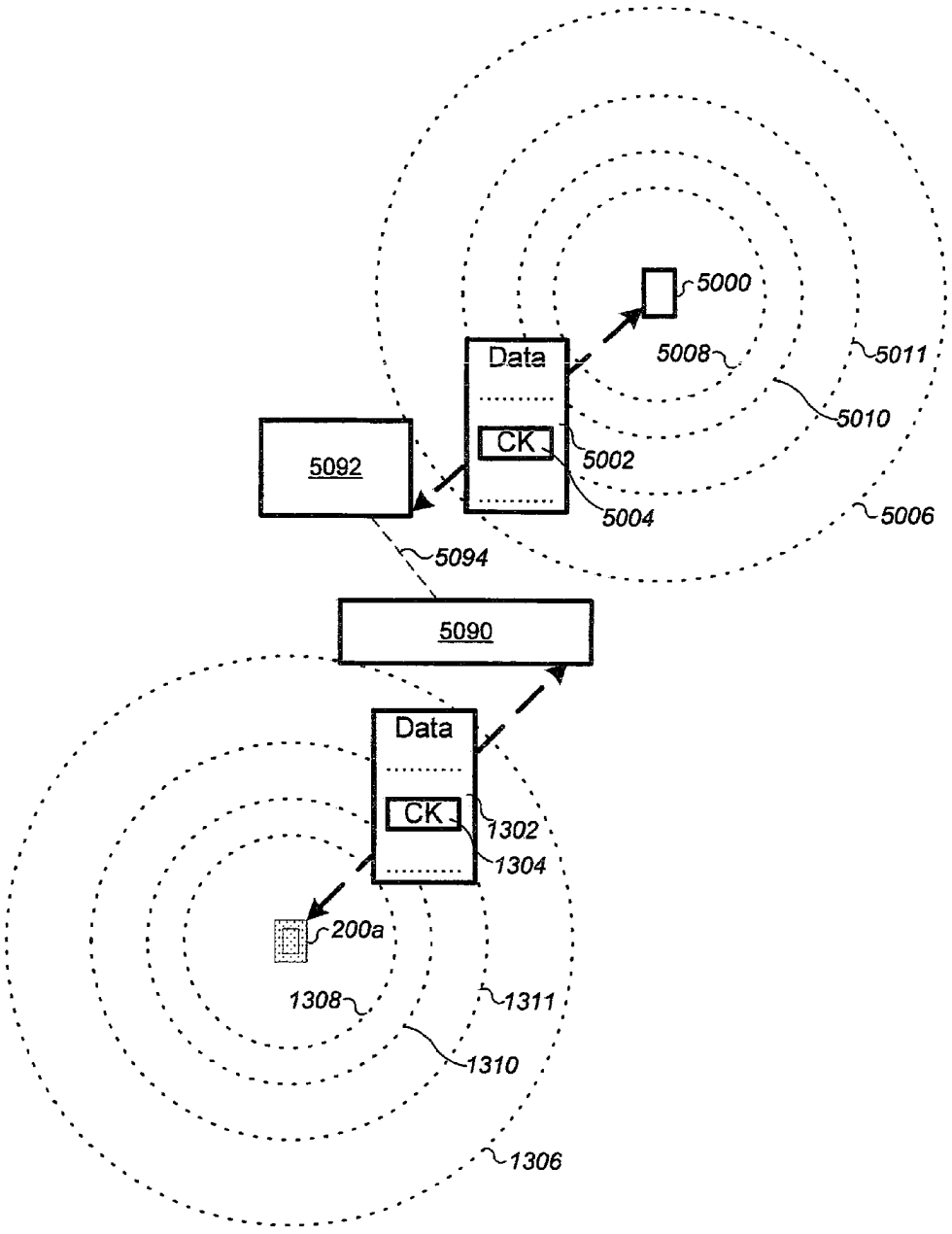

5000
Data
5008
5011
5010
CK
5002
5092
5004
5006
5094
5090
Data
CK
1302
1304
200a
1308
1311
1310
1306

Fig. 50A

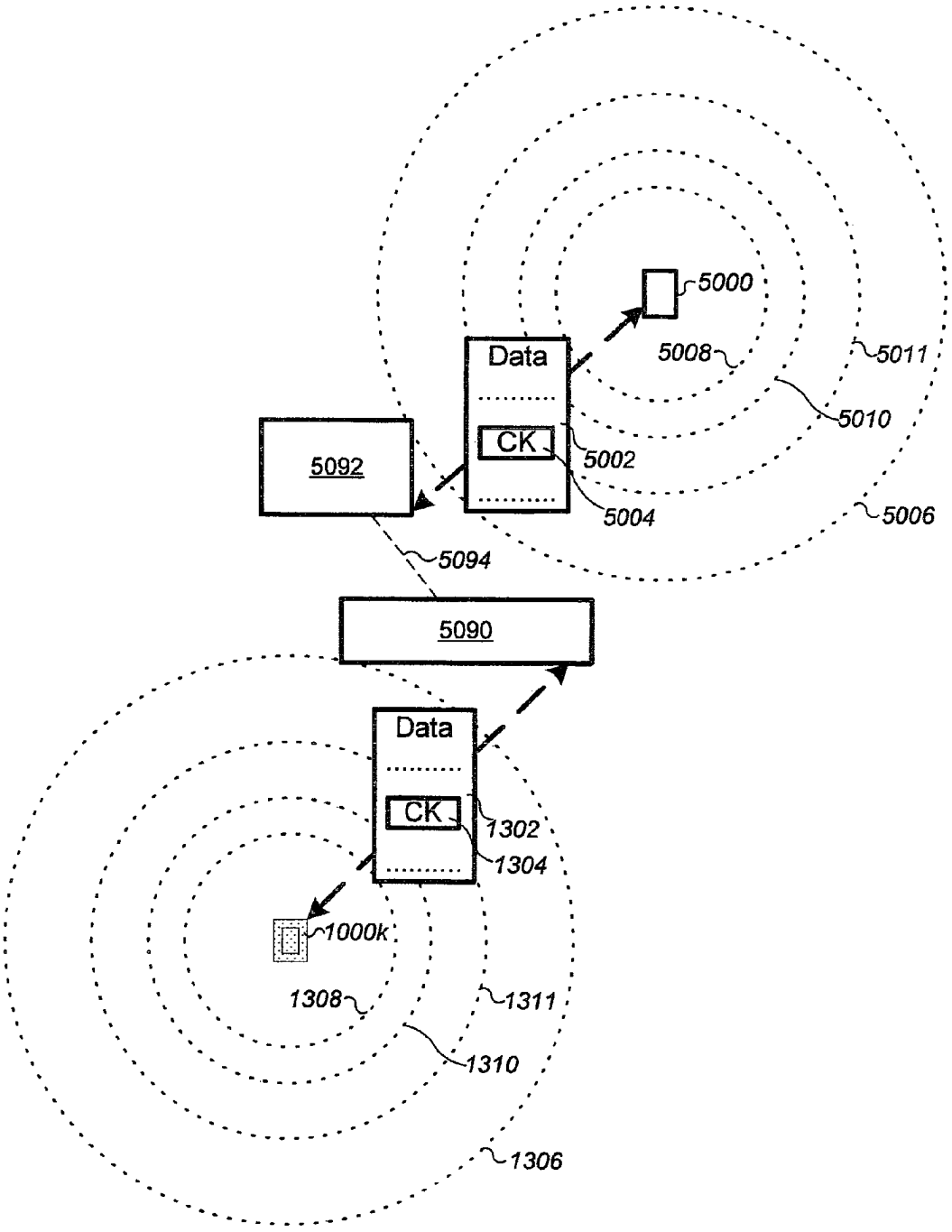

5000
Data
5008
5011
5010
CK
5002
5092
5004
5006
5094
5090
Data
CK
1302
1304
1000k
1308
1311
1310
1306

Fig. 50B

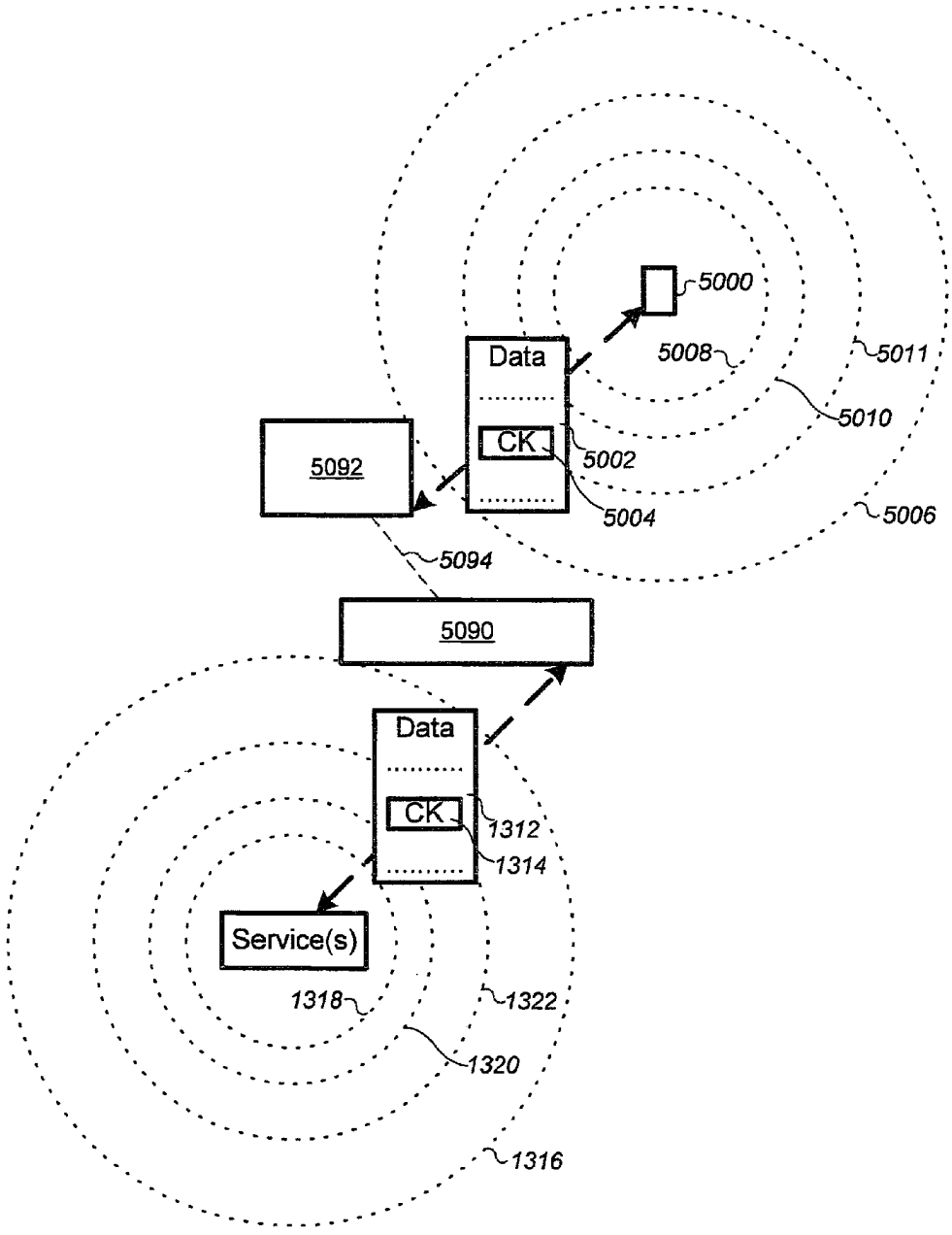

5000
Data
5008
5011
5010
CK
5002
5092
5004
5006
5094
5090
Data
CK
1312
1314
Service(s)
1318
1322
1320
1316

Fig. 50C

```
Permissions {

        Text(str) = "Test Case #106729 (context)";
        Generic(assignPrivs) = "G=Family,Work,\vuloc [T=>20080402000130.24,<20080428;
                D=*str; H;]";
        Groups {
                LBXPHONE_USERS = Austin, Davood, Jane, Kris, Mark, Ravi, Sam, Tim;
                "SW Components" = "SM 1.0", "PIP 1.0", "PIPGUI 1.0", "SMGUI 1.0",
                                "COMM 1.0", "KERNEL 1.1";
        }

        Grants /* Can define Grant structure(s) prior to assignment */ {
                Family= \lbxall[R=0xFFFFFFFF;] [D=*str(context="Family")];
                Work = [T=YYYYMMDD08:YYYYMMDD17;D=*str(context="Work");H;] {
                        "Department 232"=\geoar,\geode,\nearar,\nearde;
                        "Department 458" = [D="Davood Iyadi's mgt scope";] {
                                "Server Development Team" = ;
                                "lbxPhone Development Team" ={
                                        "Comm Layer Guys" = \mssys;\msbios;
                                        "GUI girls" = \msguiload;
                                        "Mark and Tim" = \msapps;
                                };
                        };
                        "Accounting Department" [H;] = \track;
                };
                Parents = { Mom=\lbxall; Dad=\lbxall; };
                Michael-Friends=\geoarr;\geode;
                Jason-Friends=\nearar;\nearde;
        }

        // Permissions are granted here:
        Bill: LBXPHONE_USERS [G=\caller;\callee;\trkall;];
        LBXPHONE_USERS: Bill [G=\callee;\caller;];
        Bill:Sophia;
        Bill:Brian [*assignPrivs];
        Bill:George [G=\geoall,\nearall;];
        Michael : Bill [G=Parents,Michael-Friends;];
        Jason: Bill [G=Parents,Jason-Friends;];

}
```

Fig. 51A

```
Charters {

        Condition(cond1) = "(__location @@ \loc_my) [D="Test Case #104223 (v)";]";
        "ms group"  =  { "Jane", "George", "Sally" };

        (  ((__msid = "Michael") & *cond1(v="Michael")) |
                ((__msid = "Jason") & *cond1(v="'Jason"))  ):
                Invoke App myscript.cmd ("S"), Notify Autodial 214-405-6733;

        ((_I_msid = "Brian") & (_I_location @ \loc_my) [D="multi-cond text";H;]):
                        Invoke App (myscript.cmd ("B")) [T=20080302;],
                        Notify Autodial (214-405-5422);

        (M_sender  = ~emailAddrVar [T=<YYYYMMDD18]):
                Notify Indicator (M_sender, \thisMS) [D="Test Case #104223"; H;];

        (B_srchSubj ^ M_subject) & !(_fcnTest(B_srchSubj)) :
                "ms group"[G].Store DBobject(JOESDB.LBXTABS.TEST,
                        "INSERT INTO TABLESAV (" && \thisMS && ", " && \timestamp &&
                                ", 9);", \thisMS);

        ( _I_msid = "Sophia" & \loc_my (30M)$$(25M) _I_location ) :
                "ms group".Invoke App (alert.cmd);

        (%c:\myprofs\interests.chk > 90):
                Send Email ("Howdy " && _I_msid && " !!\n\nOur profiles matched > 90%.\n\n"
                        && "Call me at " && \appfld.phone.id && ". We are " &&
                        (_I_location - \loc_my)F && " feet apart\n", \appfld.source.id, "Call Me!",
                        , _I_appfld.email.source);

}
```

Fig. 51B

```
typedef struct privilege {
        unsigned long       priv;
        unsigned char       relevance[MAX_RELEVANCEMASK];
        TIMESPEC            *tspec;     // merged with permission level (if permission
                                        // level was present)
        struct privilege    *nextPriv;
        } PRIVILEGE;

typedef struct permission {
        unsigned char       grantor[MAX_IDLENGTH];
        unsigned short      grantor_idtype;
        unsigned char       grantee[MAX_IDLENGTH];
        unsigned short      grantee_idtype;
        PRIVILEGE           *privileges;
        struct permission   *nextPerm;
        } PERMISSION;

typedef struct action {
        IDENTITY            host;
        unsigned short      cmd;
        unsigned short      operand;
        unsigned char       *params;
        TIMESPEC            *tspec;             // merged with charter level (if charter
                                                // level was present)
        struct action       *nextActn;
        } ACTION;

typedef struct charter {
        unsigned char       grantee[MAX_IDLENGTH];
        unsigned short      grantee_idtype;
        unsigned char       grantor[MAX_IDLENGTH];
        unsigned short      grantor_idtype;
        unsigned char       *expression;
        ACTION              *actn;
        struct charter      *nextCharter;
        } CHARTER;
```

Fig. 52

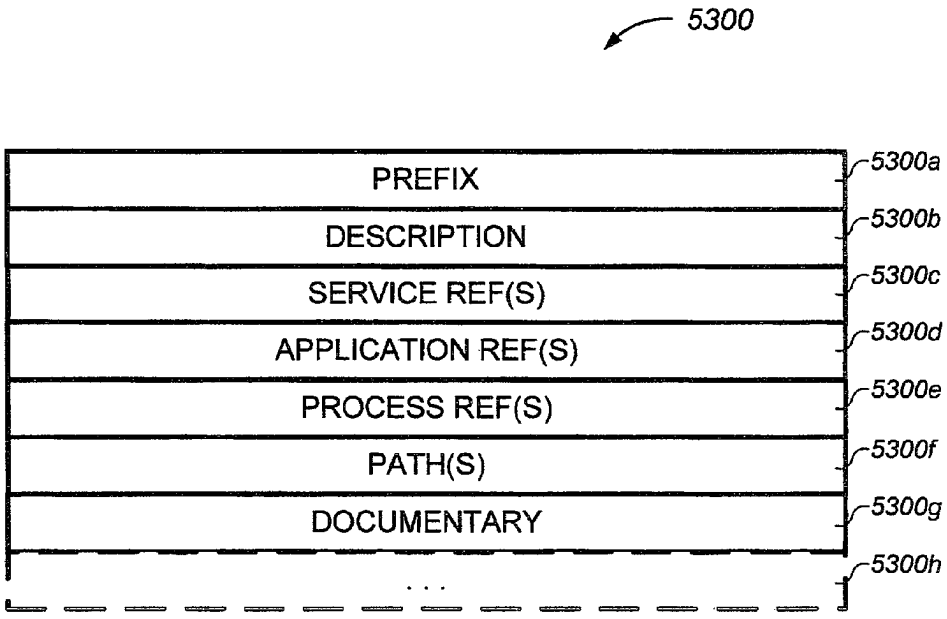

5300
PREFIX
DESCRIPTION
SERVICE REF(S)
APPLICATION REF(S)
PROCESS REF(S)
PATH(S)
DOCUMENTARY
. . .
5300a
5300b
5300c
5300d
5300e
5300f
5300g
5300h

Fig. 53

```
...
x = "this is a textual description"
...
z="timespec=""200802030000:200812312359"" description=""test98341;Permission"""
...
<permission grantor="Jimbob" grantee="Henry" <%=z%> >
        <grant name="grant1" >
                <privilege id="\lbxcpy" relevance="FFFFFFFF"
                        timespec="YYYMMDD09:YYMMDD17" description="<%=x%>" />
                <privilege id="\lbxflt" />
                ...
        </grant>
        ...
</permission>
...
<group name="group123" >
        <member="Jim" />
        <member="Sue" />
        ...
</group>
...
<charter grantee="Henry" grantor="Jimbob" timespec="200802030000:200812312359"
        description="test98341;Charter" >
        <expression>
                <condition trigger="true"
                        specification="(__msid = ""Michael"") & __location $(300M) \loc_my" />
                <condition trigger="true"
                        specification="(__msid = "Jason") & __location $(300M) \loc_my" />
        </expression>
        <action host="George" cmd="Invoke" operand="App" param="alert.cmd" />
        <action host="George" cmd="Notify" operand="Indicator" param="test98341 Fired!" />
</charter>
...
```

Fig. 54

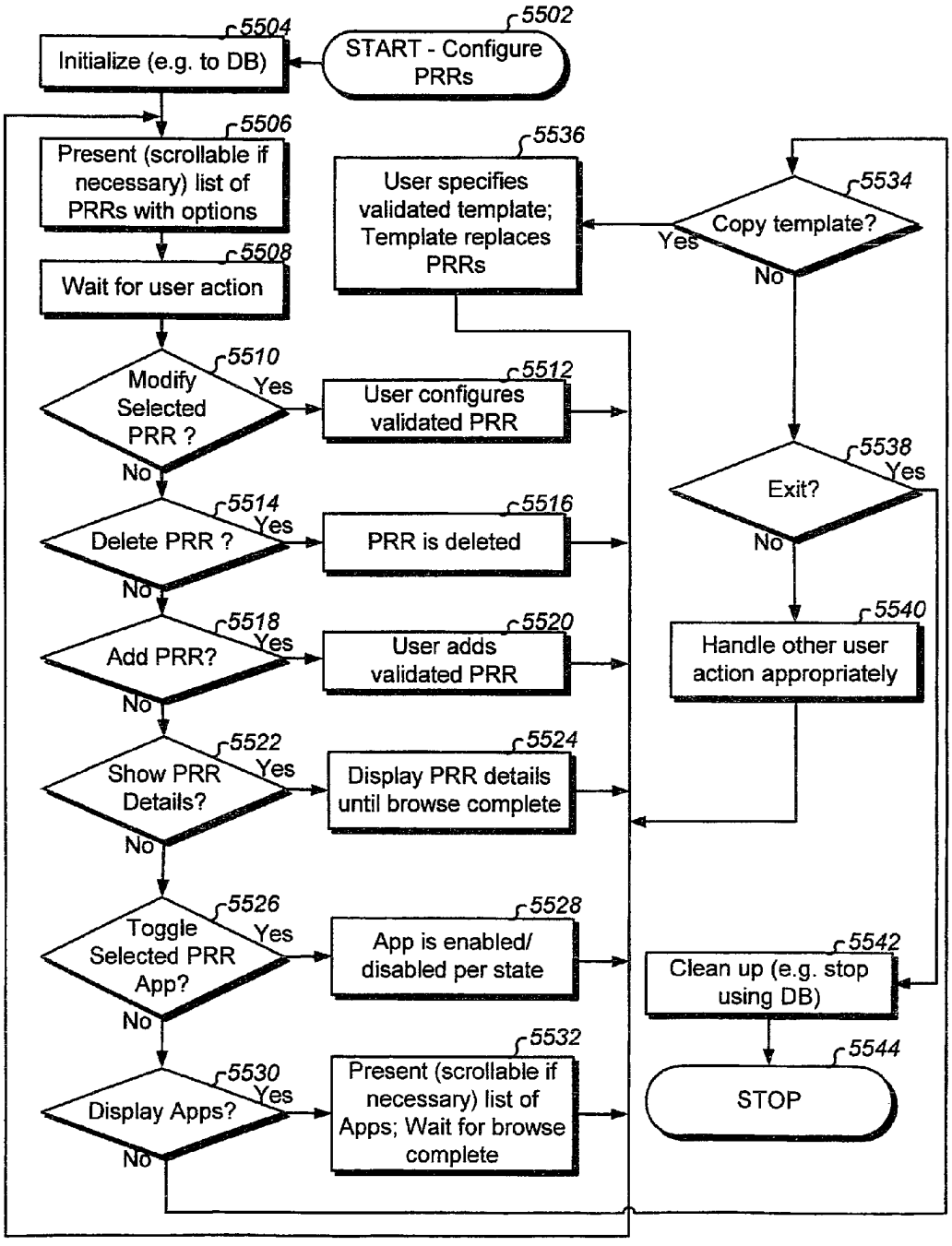

5502
START - Configure PRRs
5504
Initialize (e.g. to DB)
5506
Present (scrollable if necessary) list of PRRs with options
5508
Wait for user action
5510
Modify Selected PRR ?
Yes
No
5512
User configures validated PRR
5514
Delete PRR ?
Yes
No
5516
PRR is deleted
5518
Add PRR?
Yes
No
5520
User adds validated PRR
5522
Show PRR Details?
Yes
No
5524
Display PRR details until browse complete
5526
Toggle Selected PRR App?
Yes
No
5528
App is enabled/ disabled per state
5530
Display Apps?
Yes
No
5532
Present (scrollable if necessary) list of Apps; Wait for browse complete
5534
Copy template?
Yes
No
5536
User specifies validated template; Template replaces PRRs
5538
Exit?
Yes
No
5540
Handle other user action appropriately
5542
Clean up (e.g. stop using DB)
5544
STOP

Fig. 55A

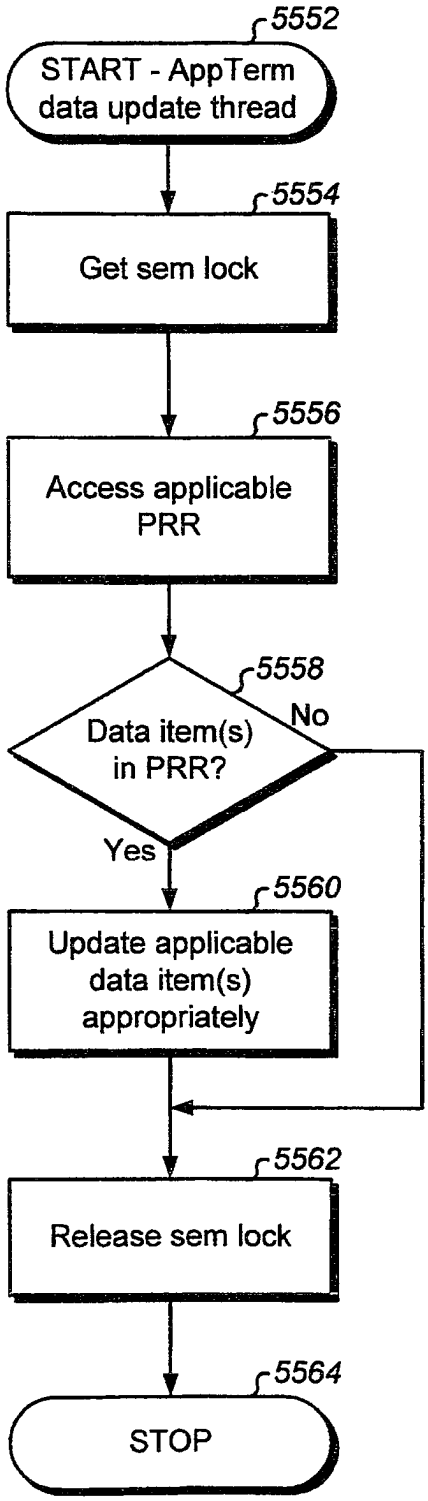

5552
START - AppTerm data update thread
5554
Get sem lock
5556
Access applicable PRR
5558
Data item(s) in PRR?
No
Yes
5560
Update applicable data item(s) appropriately
5562
Release sem lock
5564
STOP

Fig. 55B

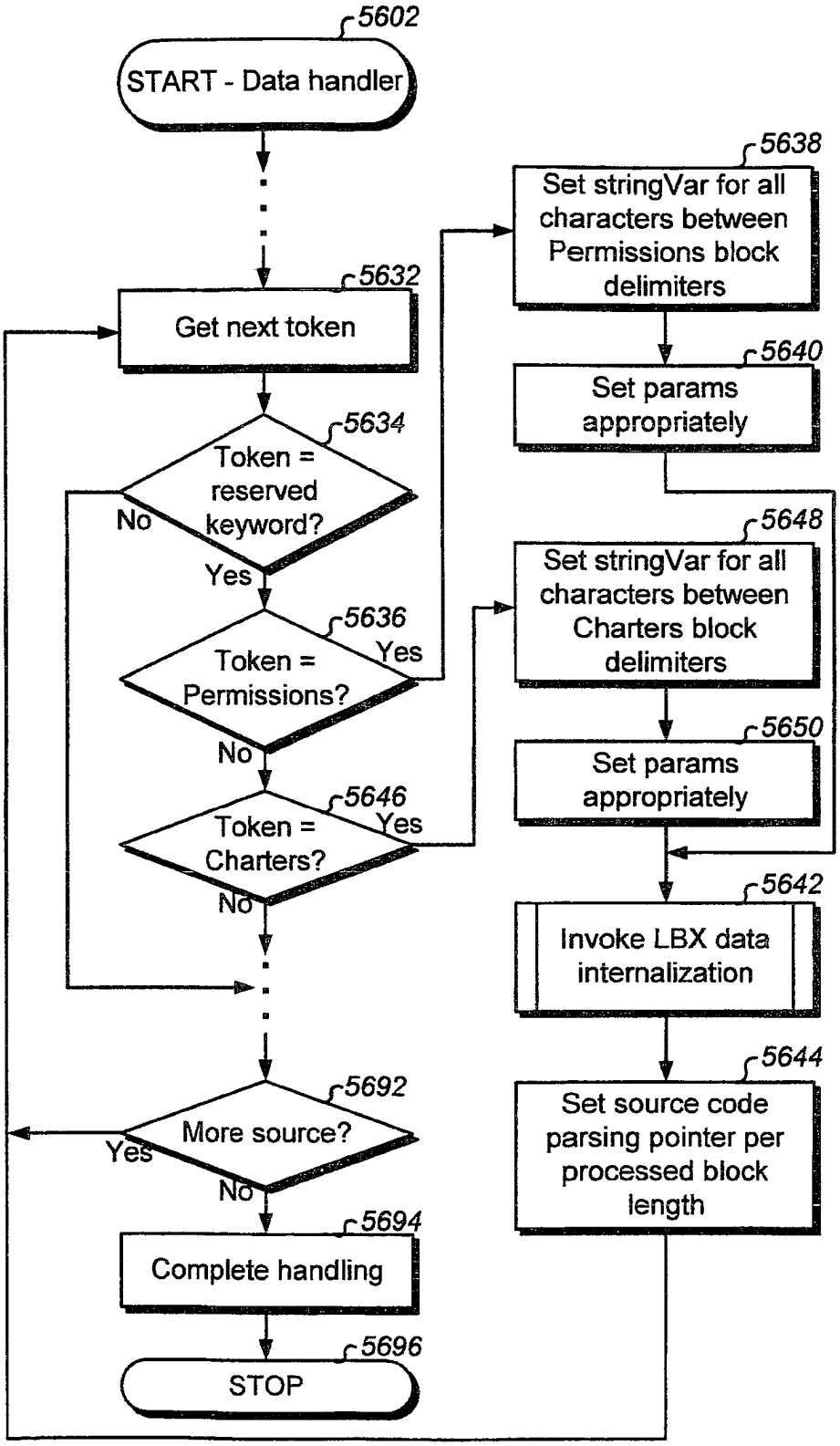

5602
START - Data handler
5632
Get next token
5634
Token = reserved keyword?
No
Yes
5636
Token = Permissions?
Yes
No
5646
Token = Charters?
Yes
No
5692
More source?
Yes
No
5694
Complete handling
5696
STOP
5638
Set stringVar for all characters between Permissions block delimiters
5640
Set params appropriately
5648
Set stringVar for all characters between Charters block delimiters
5650
Set params appropriately
5642
Invoke LBX data internalization
5644
Set source code parsing pointer per processed block length

Fig. 56

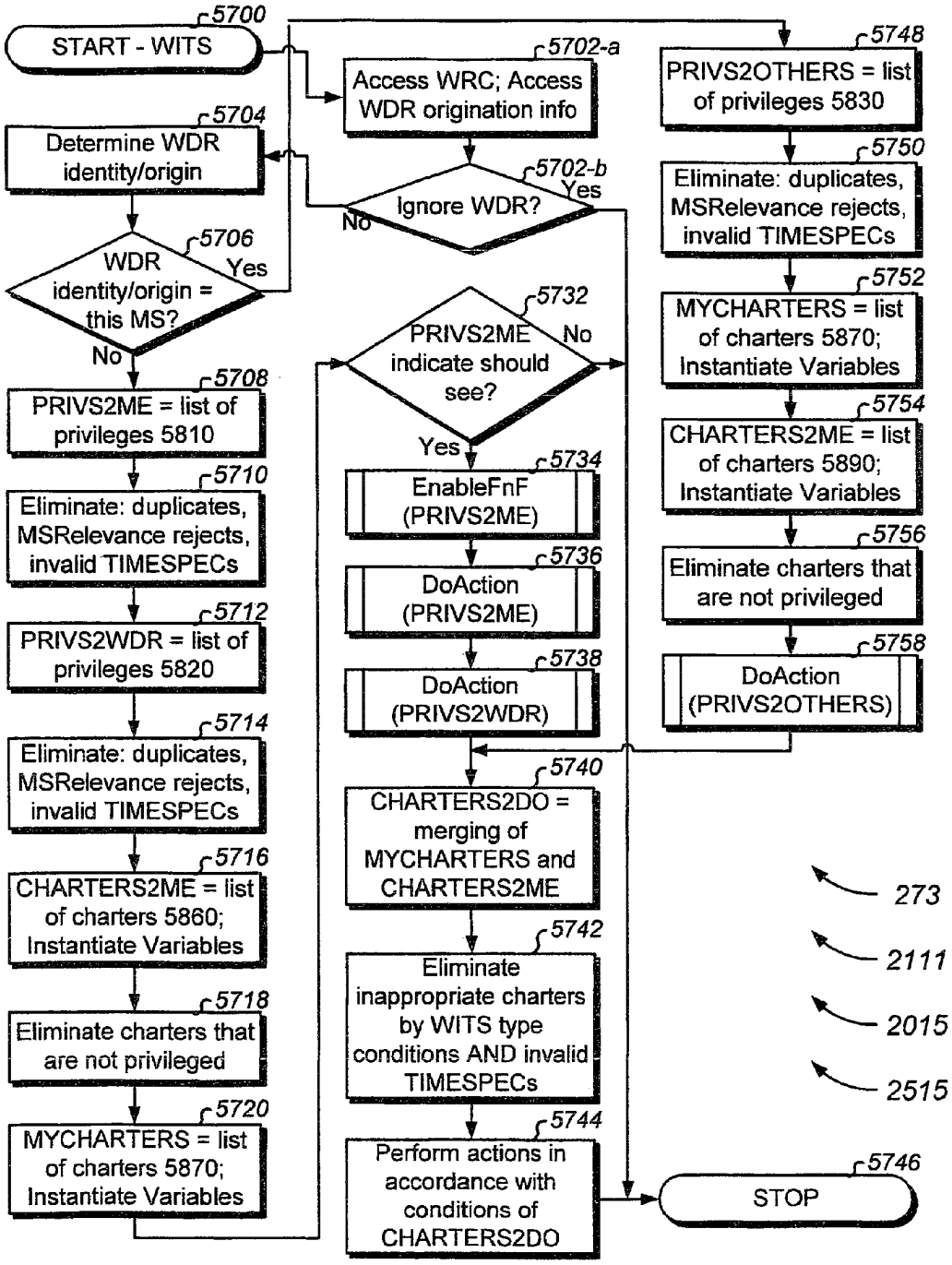

5700
START - WITS
5702-a
Access WRC; Access WDR origination info
5748
PRIVS2OTHERS = list of privileges 5830
5704
Determine WDR identity/origin
5702-b
Ignore WDR?
Yes
No
5750
Eliminate: duplicates, MSRelevance rejects, invalid TIMESPECs
5706
WDR identity/origin = this MS?
Yes
No
5732
PRIVS2ME indicate should see?
No
Yes
5752
MYCHARTERS = list of charters 5870; Instantiate Variables
5754
CHARTERS2ME = list of charters 5890; Instantiate Variables
5708
PRIVS2ME = list of privileges 5810
5734
EnableFnF (PRIVS2ME)
5756
Eliminate charters that are not privileged
5710
Eliminate: duplicates, MSRelevance rejects, invalid TIMESPECs
5736
DoAction (PRIVS2ME)
5758
DoAction (PRIVS2OTHERS)
5712
PRIVS2WDR = list of privileges 5820
5738
DoAction (PRIVS2WDR)
5714
Eliminate: duplicates, MSRelevance rejects, invalid TIMESPECs
5740
CHARTERS2DO = merging of MYCHARTERS and CHARTERS2ME
5716
CHARTERS2ME = list of charters 5860; Instantiate Variables
5742
Eliminate inappropriate charters by WITS type conditions AND invalid TIMESPECs
5718
Eliminate charters that are not privileged
5744
Perform actions in accordance with conditions of CHARTERS2DO
5746
STOP
5720
MYCHARTERS = list of charters 5870; Instantiate Variables
273
2111
2015
2515

Fig. 57

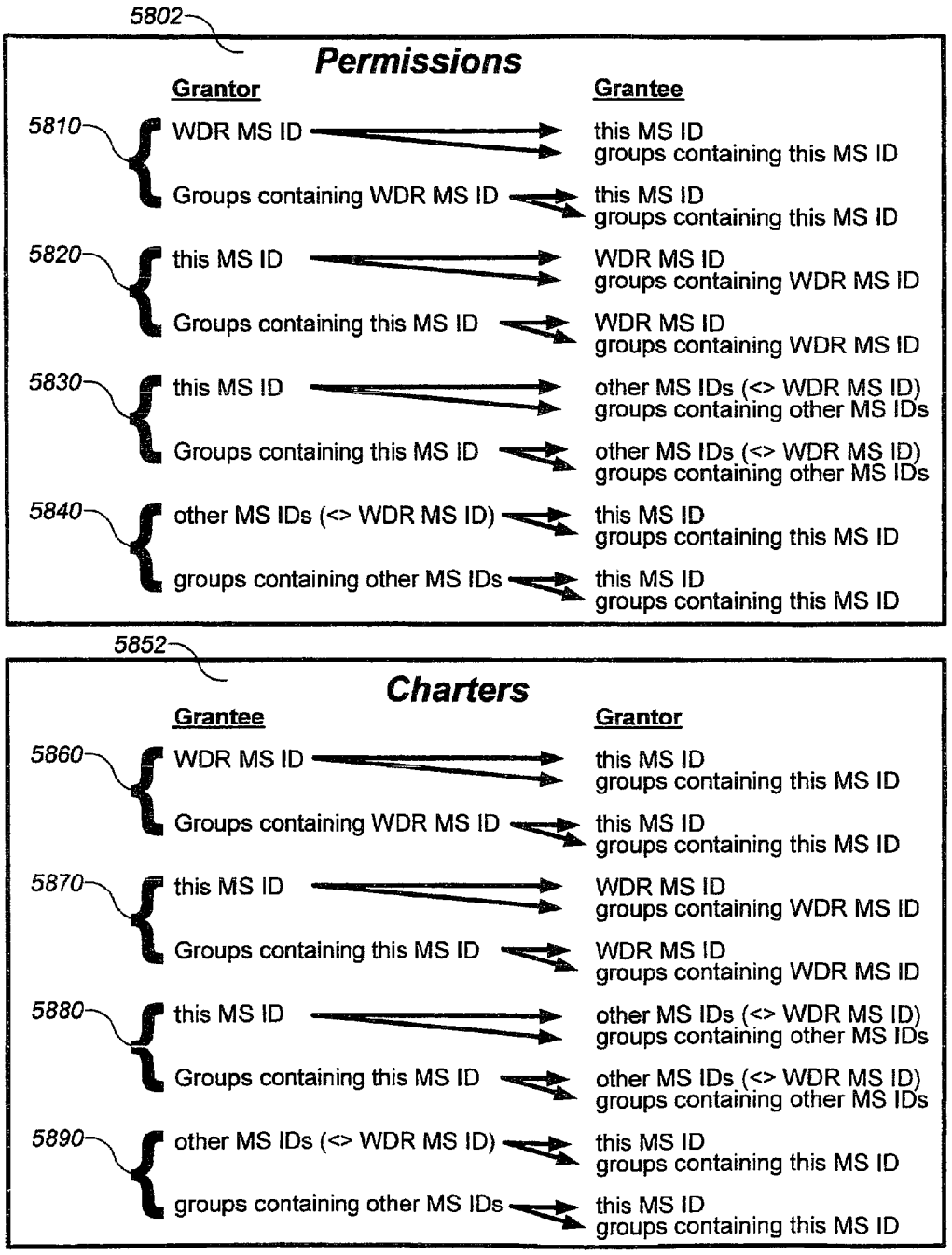

5802
Permissions
Grantor
Grantee
5810
WDR MS ID
this MS ID
groups containing this MS ID
Groups containing WDR MS ID
this MS ID
groups containing this MS ID
5820
this MS ID
WDR MS ID
groups containing WDR MS ID
Groups containing this MS ID
WDR MS ID
groups containing WDR MS ID
5830
this MS ID
other MS IDs (<> WDR MS ID)
groups containing other MS IDs
Groups containing this MS ID
other MS IDs (<> WDR MS ID)
groups containing other MS IDs
5840
other MS IDs (<> WDR MS ID)
this MS ID
groups containing this MS ID
groups containing other MS IDs
this MS ID
groups containing this MS ID
5852
Charters
Grantee
Grantor
5860
WDR MS ID
this MS ID
groups containing this MS ID
Groups containing WDR MS ID
this MS ID
groups containing this MS ID
5870
this MS ID
WDR MS ID
groups containing WDR MS ID
Groups containing this MS ID
WDR MS ID
groups containing WDR MS ID
5880
this MS ID
other MS IDs (<> WDR MS ID)
groups containing other MS IDs
Groups containing this MS ID
other MS IDs (<> WDR MS ID)
groups containing other MS IDs
5890
other MS IDs (<> WDR MS ID)
this MS ID
groups containing this MS ID
groups containing other MS IDs
this MS ID
groups containing this MS ID

Fig. 58

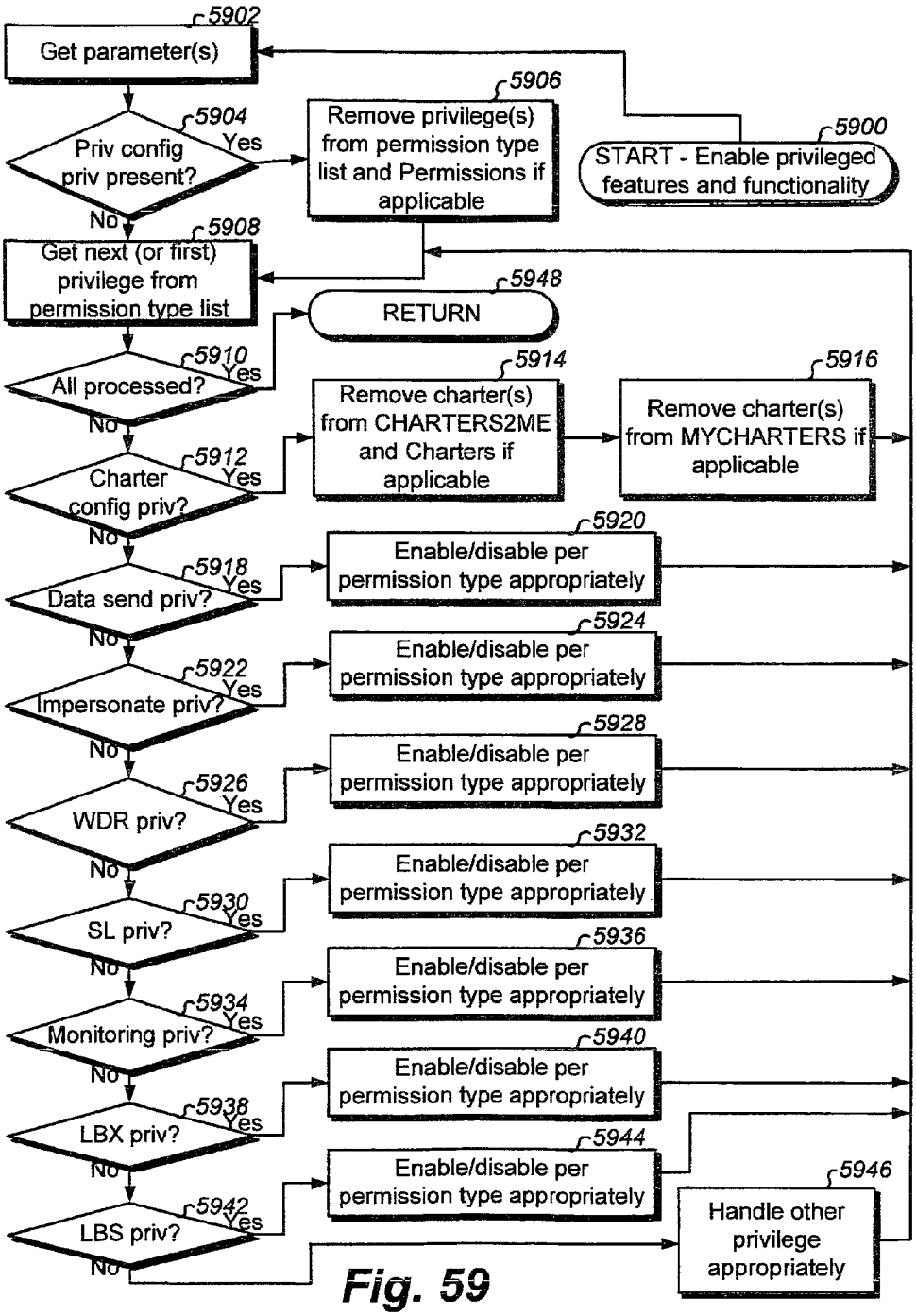

5902
Get parameter(s)
5904
Priv config priv present?
Yes
No
5906
Remove privilege(s) from permission type list and Permissions if applicable
5900
START - Enable privileged features and functionality
5908
Get next (or first) privilege from permission type list
5948
RETURN
5910
All processed?
Yes
No
5914
Remove charter(s) from CHARTERS2ME and Charters if applicable
5916
Remove charter(s) from MYCHARTERS if applicable
5912
Charter config priv?
Yes
No
5920
Enable/disable per permission type appropriately
5918
Data send priv?
Yes
No
5924
Enable/disable per permission type appropriately
5922
Impersonate priv?
Yes
No
5928
Enable/disable per permission type appropriately
5926
WDR priv?
Yes
No
5932
Enable/disable per permission type appropriately
5930
SL priv?
Yes
No
5936
Enable/disable per permission type appropriately
5934
Monitoring priv?
Yes
No
5940
Enable/disable per permission type appropriately
5938
LBX priv?
Yes
No
5944
Enable/disable per permission type appropriately
5946
Handle other privilege appropriately
5942
LBS priv?
Yes
No

Fig. 59

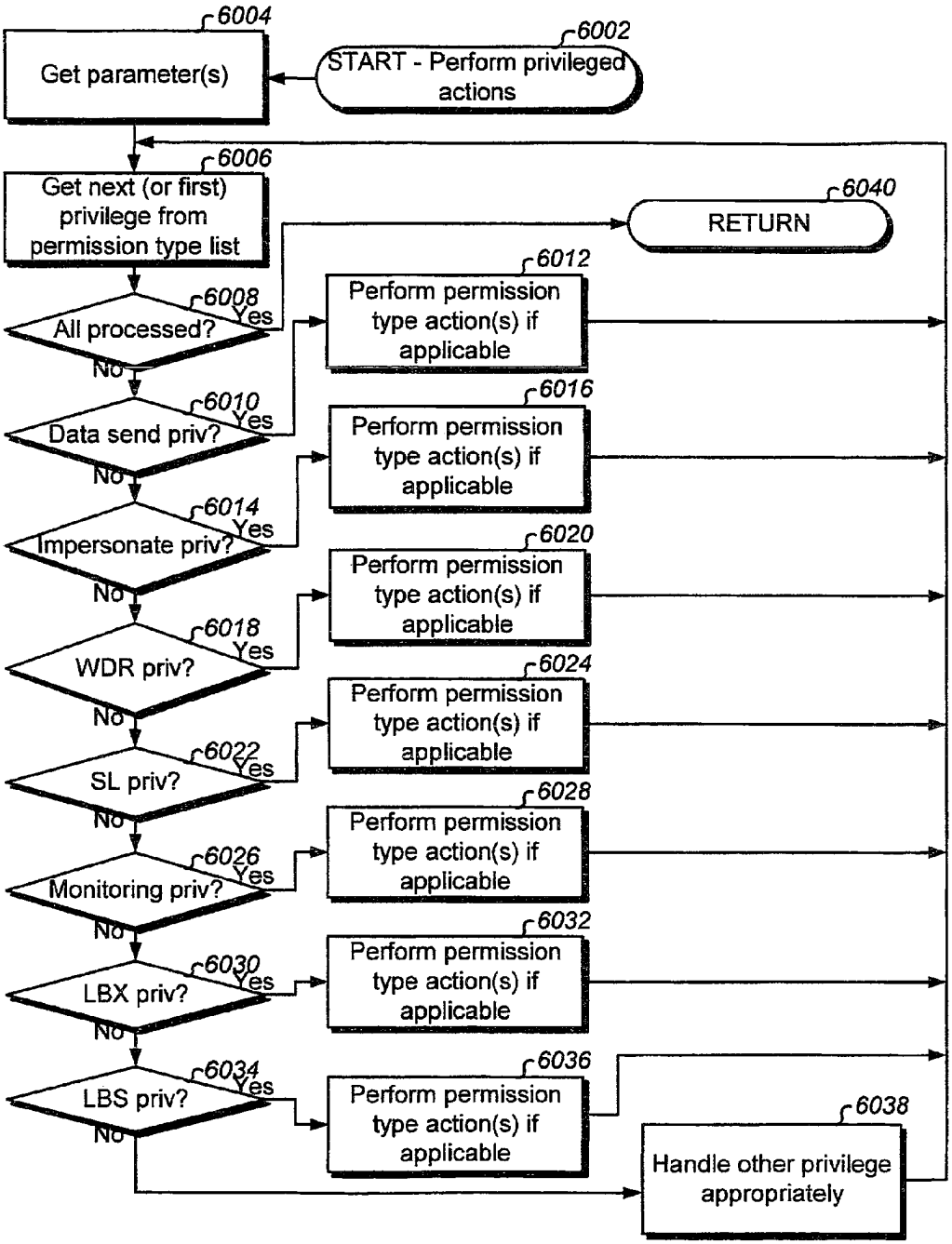

6004
Get parameter(s)
6002
START - Perform privileged actions
6006
Get next (or first) privilege from permission type list
6040
RETURN
6008
All processed?
Yes
No
6012
Perform permission type action(s) if applicable
6010
Data send priv?
Yes
No
6016
Perform permission type action(s) if applicable
6014
Impersonate priv?
Yes
No
6020
Perform permission type action(s) if applicable
6018
WDR priv?
Yes
No
6024
Perform permission type action(s) if applicable
6022
SL priv?
Yes
No
6028
Perform permission type action(s) if applicable
6026
Monitoring priv?
Yes
No
6032
Perform permission type action(s) if applicable
6030
LBX priv?
Yes
No
6036
Perform permission type action(s) if applicable
6034
LBS priv?
Yes
No
6038
Handle other privilege appropriately

Fig. 60

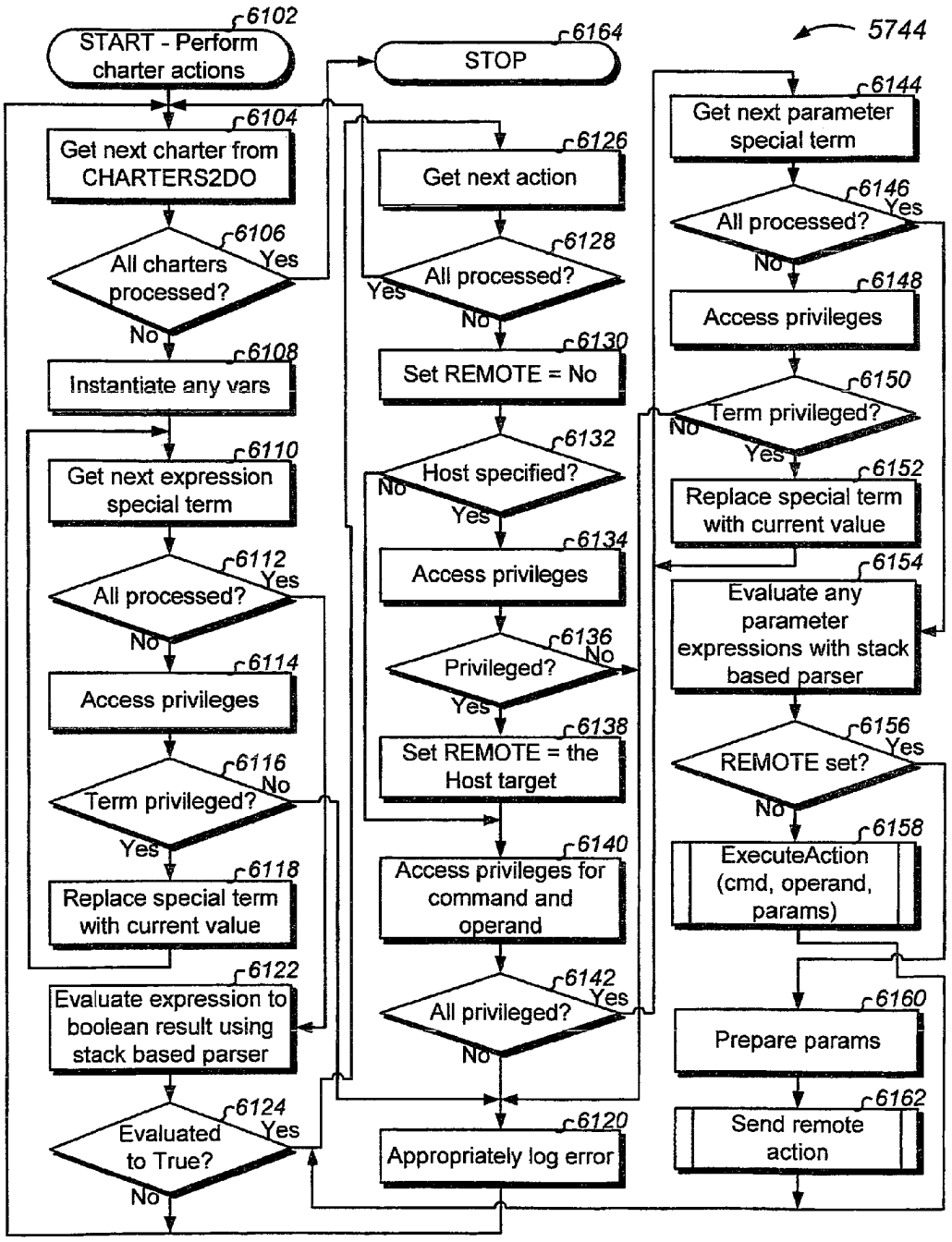

6102
START - Perform charter actions
6104
Get next charter from CHARTERS2DO
6106
All charters processed?
Yes
No
6108
Instantiate any vars
6110
Get next expression special term
6112
All processed?
Yes
No
6114
Access privileges
6116
Term privileged?
No
Yes
6118
Replace special term with current value
6122
Evaluate expression to boolean result using stack based parser
6124
Evaluated to True?
Yes
No
6164
STOP
6126
Get next action
6128
All processed?
Yes
No
6130
Set REMOTE = No
6132
Host specified?
No
Yes
6134
Access privileges
6136
Privileged?
No
Yes
6138
Set REMOTE = the Host target
6140
Access privileges for command and operand
6142
All privileged?
Yes
No
6120
Appropriately log error
5744
6144
Get next parameter special term
6146
All processed?
Yes
No
6148
Access privileges
6150
Term privileged?
No
Yes
6152
Replace special term with current value
6154
Evaluate any parameter expressions with stack based parser
6156
REMOTE set?
Yes
No
6158
ExecuteAction (cmd, operand, params)
6160
Prepare params
6162
Send remote action

Fig. 61

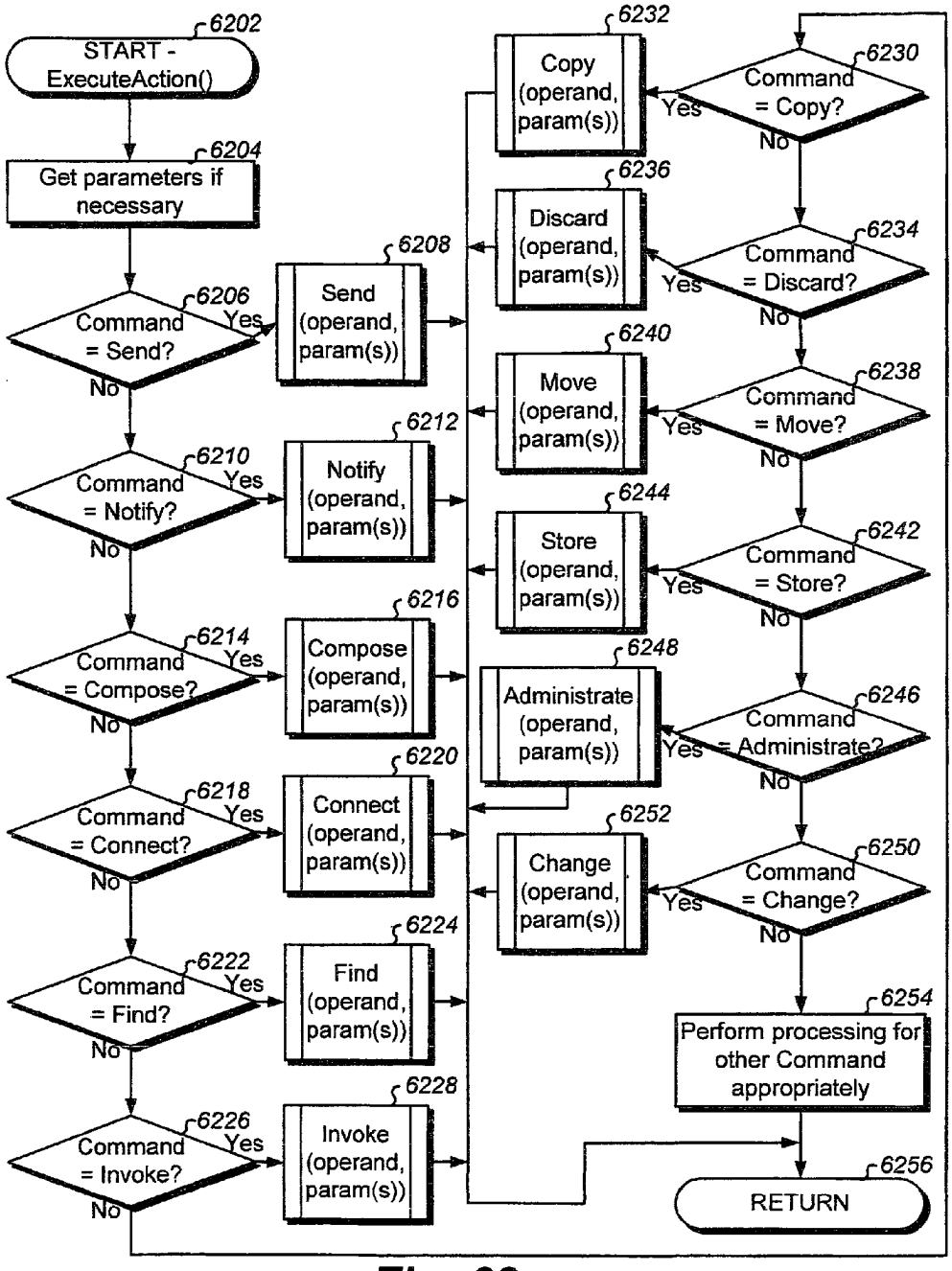

6202
START - ExecuteAction()
6204
Get parameters if necessary
6206
Command = Send?
Yes
No
6208
Send (operand, param(s))
6210
Command = Notify?
Yes
No
6212
Notify (operand, param(s))
6214
Command = Compose?
Yes
No
6216
Compose (operand, param(s))
6218
Command = Connect?
Yes
No
6220
Connect (operand, param(s))
6222
Command = Find?
Yes
No
6224
Find (operand, param(s))
6226
Command = Invoke?
Yes
No
6228
Invoke (operand, param(s))
6230
Command = Copy?
Yes
No
6232
Copy (operand, param(s))
6234
Command = Discard?
Yes
No
6236
Discard (operand, param(s))
6238
Command = Move?
Yes
No
6240
Move (operand, param(s))
6242
Command = Store?
Yes
No
6244
Store (operand, param(s))
6246
Command = Administrate?
Yes
No
6248
Administrate (operand, param(s))
6250
Command = Change?
Yes
No
6252
Change (operand, param(s))
6254
Perform processing for other Command appropriately
6256
RETURN

Fig. 62

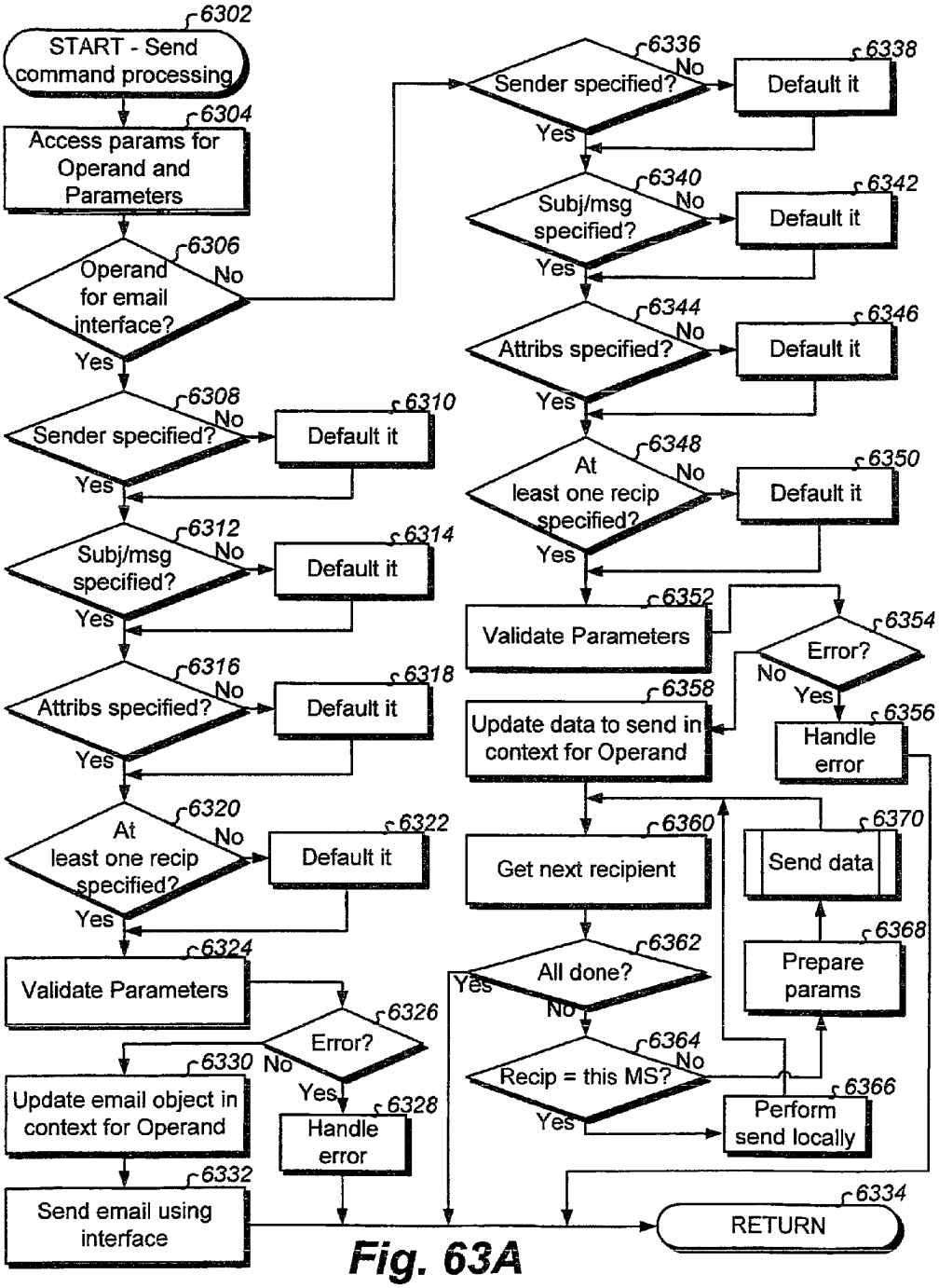

6302
START - Send command processing
6304
Access params for Operand and Parameters
6306
Operand for email interface?
No
Yes
6308
Sender specified?
No
Yes
6310
Default it
6312
Subj/msg specified?
No
Yes
6314
Default it
6316
Attribs specified?
No
Yes
6318
Default it
6320
At least one recip specified?
No
Yes
6322
Default it
6324
Validate Parameters
6326
Error?
No
Yes
6328
Handle error
6330
Update email object in context for Operand
6332
Send email using interface
6334
RETURN
6336
Sender specified?
No
Yes
6338
Default it
6340
Subj/msg specified?
No
Yes
6342
Default it
6344
Attribs specified?
No
Yes
6346
Default it
6348
At least one recip specified?
No
Yes
6350
Default it
6352
Validate Parameters
6354
Error?
No
Yes
6356
Handle error
6358
Update data to send in context for Operand
6360
Get next recipient
6362
All done?
Yes
No
6364
Recip = this MS?
No
Yes
6366
Perform send locally
6368
Prepare params
6370
Send data

Fig. 63A

Operand ↓	PM	Preferred embodiment Send processing
201	O	Sending an auto-dial # updates appropriate recipient MS storage so that a recipient user can subsequently auto-dial the auto-dial # with a minimal user interface action. Preferably, the recipient MS user is appropriately and immediately notified of the receipt. Preferably, the send command data is maintained to LBX History, a historical call log (e.g. incoming), or other useful storage for subsequent user browse of the accompanying message and a date/time stamp of when sent, and for automated speed dialing of the # in response to a user action to auto-dial. Various embodiments will save to LBX History how many times, and when, the auto-dial # was used to perform automated speed dialing.
203	O	Sending a web link updates appropriate recipient MS storage so a recipient user can subsequently invoke (transpose to) the link, for example in a browser, with a minimal user interface action. Preferably, the recipient MS user is appropriately and immediately notified of the receipt. Preferably, the send command data is maintained to LBX History, a historical call log (e.g. incoming), browser history data, browser favorites, or other useful storage for subsequent user browse of the accompanying message and a date/time stamp of when sent, and for invocation of the link within a MS browser in response to a user action to use the link. Various embodiments will save to LBX History how many times, and when, the weblink was invoked.
205	E	Sending an email causes interface to the email delivery system (e.g. SMTP API) for sending the email body parameter. In one embodiment, the body is assumed to be the body of the email. In another embodiment, the body is attached with or without attachment(s). Attachments are preferably referenced with an appropriate syntax in the body specified. In another embodiment, the body is parsed for determining and using the best delivery options. The email will arrive to a recipient like other emails. Attributes can be set as is customary for email attributes (e.g. confirmation of delivery status, special handling, NLS considerations, etc).
207	E	Sending an SMS message causes interface to the sms message delivery system (e.g. SMTP API) for sending the sms message. The email interface can be used provided the sms message length maximum is observed. In one embodiment, the message parameter is identical to the msg/subj parameter. In another embodiment, the two parameters are concatenated, or formed in a complimentary manner, to highlight the subj/msg parameter from the sms message. In another embodiment, only a null subj/msg is supported. The message will arrive to a recipient like other sms messages. Various attributes can be set (e.g. confirmation of delivery status, special handling, NLS considerations, etc).

Fig. 63B-1

Operand 1	PM	Preferred embodiment Send processing
209	E	Sending a broadcast email causes interface to the email delivery system (e.g. SMTP API) for sending the email body parameter. In one embodiment, the body is assumed to be the body of the email. In another embodiment, the body is attached with or without attachment(s). Attachments are preferably referenced with an appropriate syntax in the body specified. In another embodiment, the body is parsed for determining and using the best delivery options. The email will arrive to a recipient like other emails. Various attributes can be set (e.g. special handling, NLS considerations, etc), but preferably, no confirmation of delivery is set since this is a broadcast.
211	E	Sending an SMS broadcast message causes interface to the sms message delivery system (e.g. SMTP API) for sending the sms message parameter. The email interface can be used provided the sms message length maximum is observed. In one embodiment, the message parameter is identical to the msg/subj parameter. In another embodiment, the two parameters are concatenated, or formed in a complimentary manner, to highlight the subj/msg parameter from the sms message. In another embodiment, only a null subj/msg is supported. The message will arrive to a recipient like other messages. Various attributes can be set (e.g. special handling, NLS considerations, etc), but preferably, no confirmation of delivery status is set since this is a broadcast.
213	O	Sending an indicator updates appropriate recipient MS storage so that the currently focused user interface object (e.g. window titlebar) of the MS user interface is modified with the indicator. If there are no active user interface objects in the current MS user interface, then an appropriate alert area of the currently focused interface is to display the indicator. The user can clear (remove) the indicator when desired. Preferably, the indicator is used for modifying other focused objects (e.g. titlebars) or other focused areas in the user interface so as to not get overlooked. For example, as the user navigates and surfaces/focuses new user interface objects, the indicator remains visible on the newly focused object. Preferably, the indicator is selectable by the user of the MS for showing all other send command parameters associated, as well as a date/time stamp of when sent. In other embodiments, the most recently displayed indicator is displayed in the appropriate focused area, but the user can conveniently select any indicators which were sent in history at some point in time for sought indicator information by selecting the currently displayed indicator and then requesting to browse/scroll history of previously delivered indicators (with options to see details). Preferably, the send command data is maintained to LBX History, a historical log (web page load history), or other useful storage for subsequent use. Some title bar management methods include various IBM Technical Disclosure Bulletins from 1991 through 1995 (e.g. DA8-92-0910 "Originator Identified Direct Access Mail Basket Title Bar Mechanism", DA8-93-0061 "Roving Title Bar", DA8-93-0223 "Roving Title Bar Status", etc).

Fig. 63B-2

Operand ↓	PM	Preferred embodiment Send processing
215	O	Sending an application causes invocation of the application at the recipient MS. The app parameter is preferably a fully qualified path name to the executable to start. In another embodiment, the app parameter is indirect: a path name to a "shortcut" (like a MS Windows shortcut). In another embodiment, the app parameter is an identifier string for the underlying operating system to know which application to start. The attributes parameter can be used for how to start the application, for example to flag whether to start an additional instance if the application is already running at the MS (provided multiple instances are supported). The msg/subject parameter may be useful for maintaining to LBX history useful information, along with a date/time stamp when sent, with record of the application invocation reference. An error is logged if the app parameter is not found for launch. Preferably, the invoke command data is maintained to LBX History, a historical log (web page load history), or other useful storage for subsequent use.
217	E	Sending a document causes interface to the email delivery system (e.g. SMTP API) for appropriately sending the document. The doc parameter is preferably a fully qualified path name, or suitable reference, to the document which may have a document type (e.g. by file extension, document parse, or document location). The document type is used for setting proper email attachment settings and perhaps the attributes parameter. Depending on the document type, the document may form the email body or be an attachment. The email will arrive to a recipient like other emails. Various attributes can be set (e.g. confirmation of delivery status, special handling, NLS considerations, etc).
219	E	Sending a file causes interface to the email delivery system (e.g. SMTP API) for appropriately sending the file. The path parameter is preferably a fully qualified path name, or suitable reference, to the file which should have a file type (e.g. by file extension, file parse, or file location). The file type is used for setting proper email attachment settings and perhaps the attributes parameter. Depending on the file type, the file may form the email body or be an attachment. The email will arrive to a recipient like other emails. Various attributes can be set (e.g. confirmation of delivery status, special handling, NLS considerations, etc).
221	O	Sending content causes the content to be sent to the recipient MS in a manner which is appropriate for where the content is stored and how it is to be subsequently presented. The content parameter is one that cannot be classified in the other operands, but is content for presentation nevertheless. Examples include special data records (e.g. extern variable name), content data memory locations (e.g. programmatic variable), or files containing a customizably processed format. Methods of displaying the content include audio and/or visual using applicable MS capabilities. Preferably, the send command data is maintained to LBX History, a historical content log, or other useful storage for subsequent user browse of the accompanying content and a date/time stamp of when sent, and for presentation of the content in response to an applicable user action. Attributes may be set for special content handling.

Fig. 63B-3