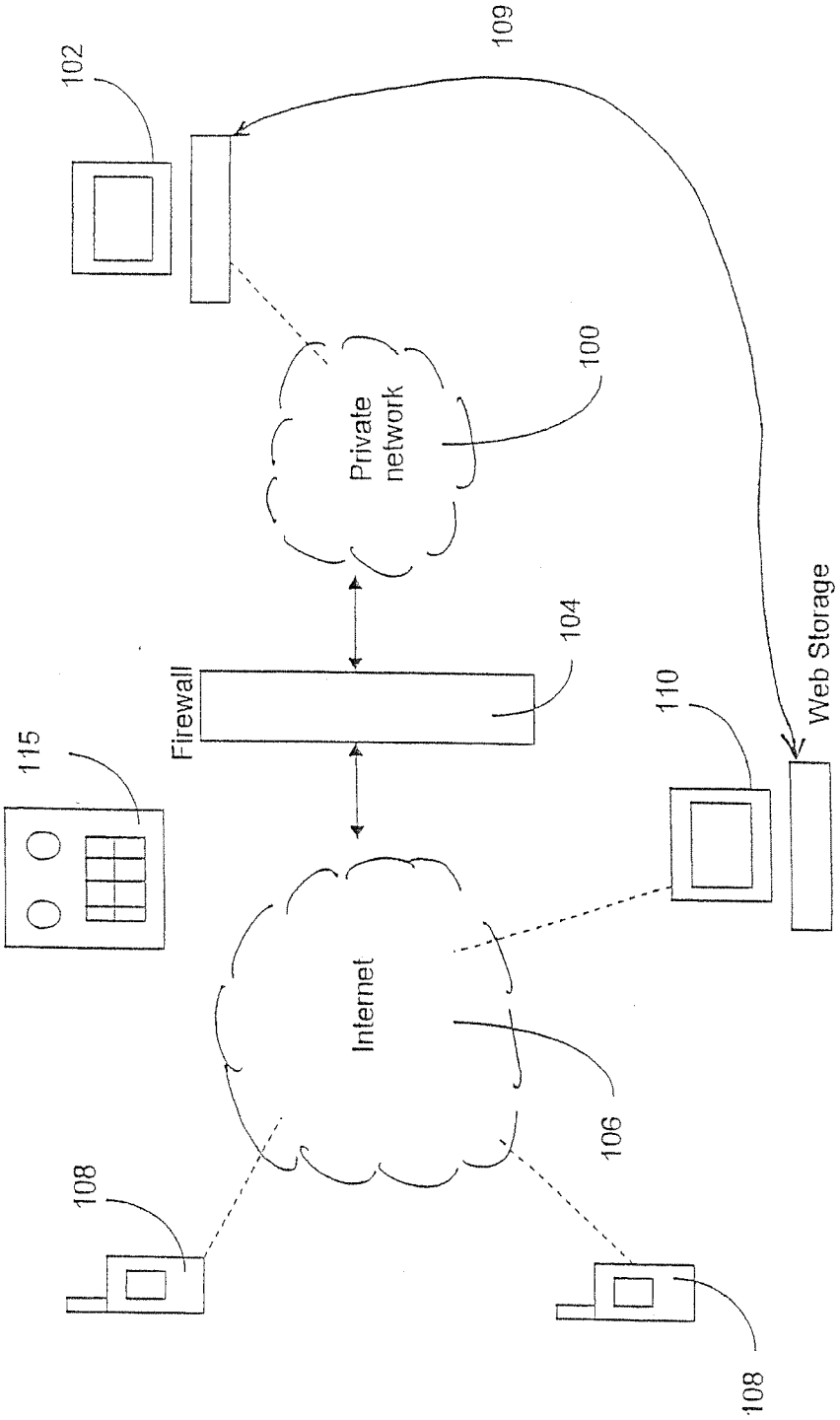

109
102
Private network
100
Firewall
104
Web Storage
110
115
Internet
106
108
108

Figure 1

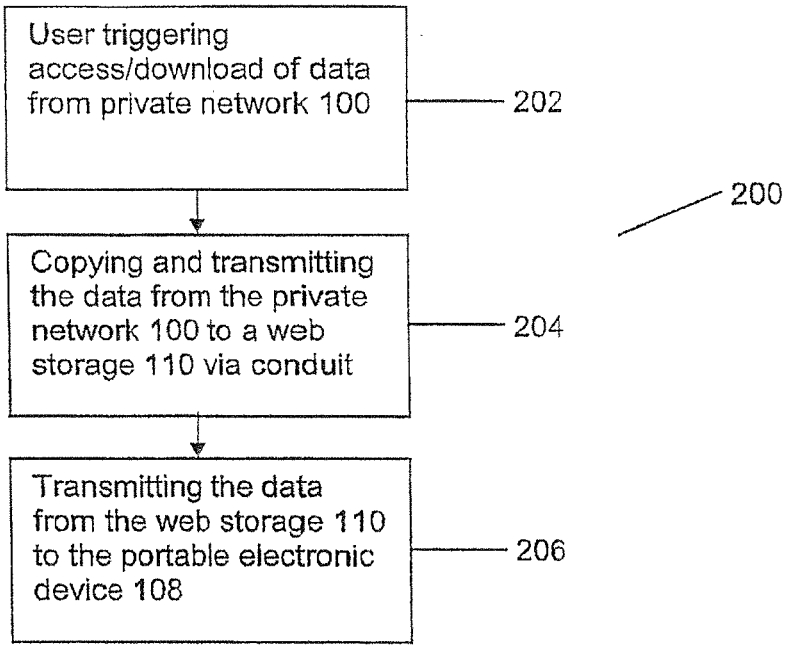


Figure 2

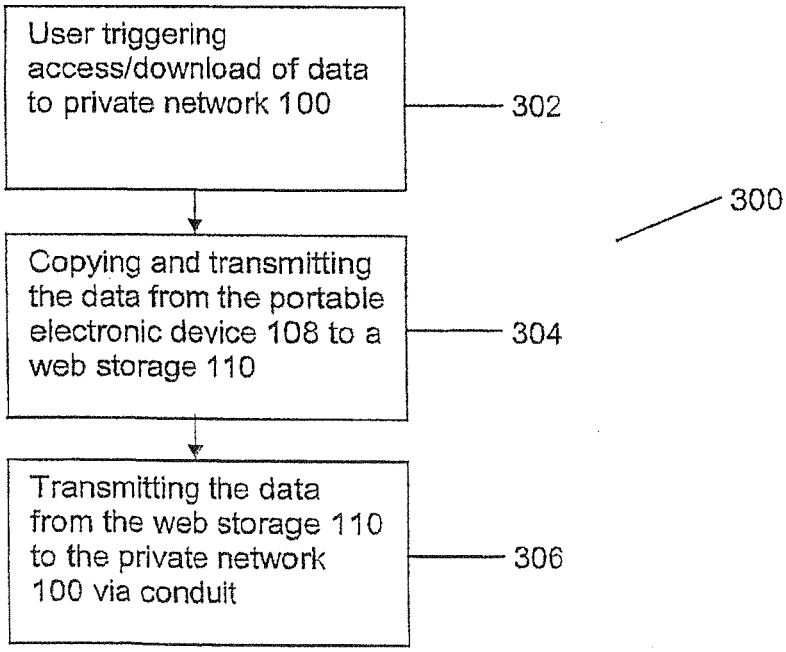


Figure 3

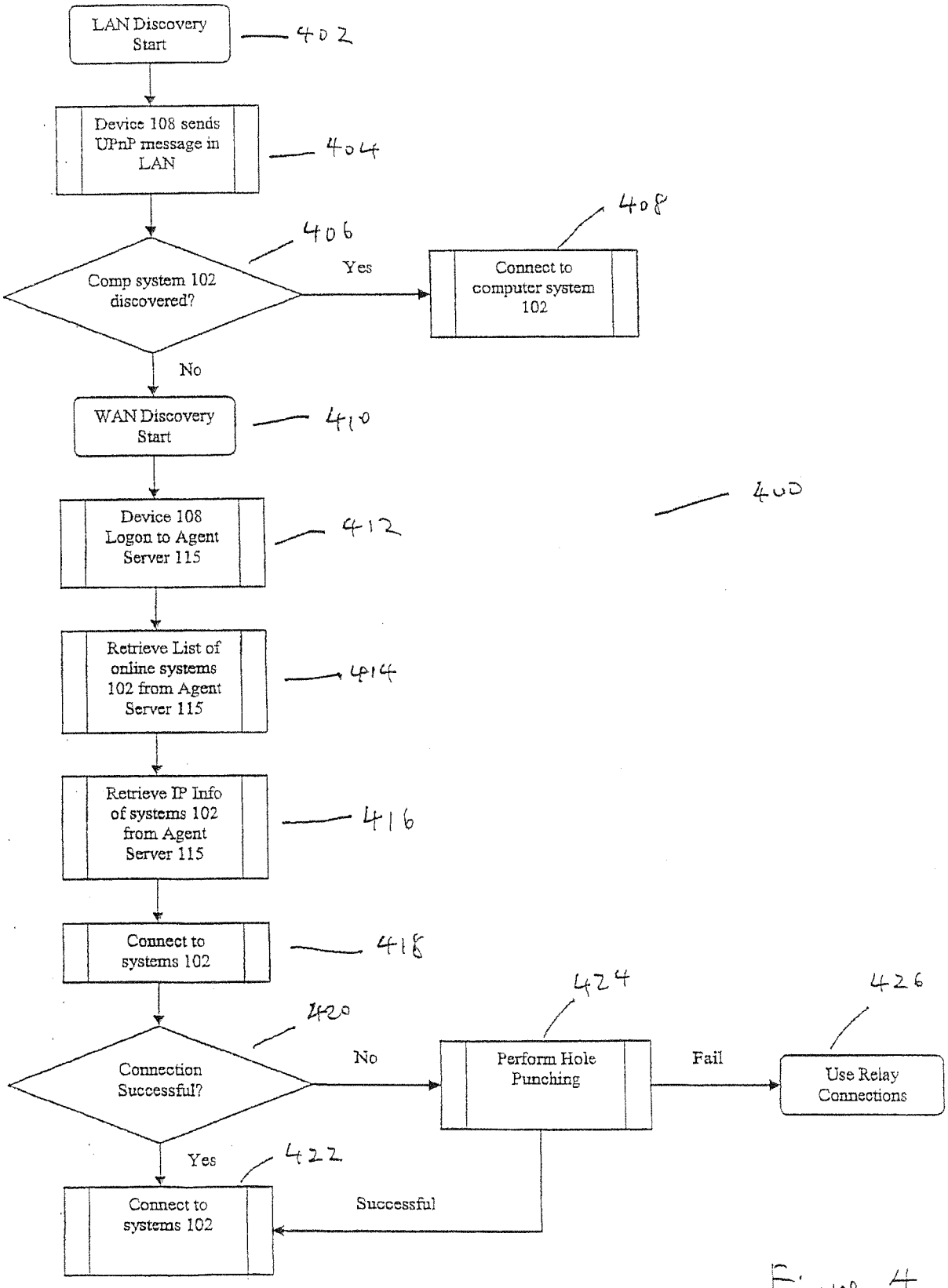

LAN Discovery Start
402
Device 108 sends UPnP message in LAN
404
406
Comp system 102 discovered?
Yes
408
Connect to computer system 102
No
WAN Discovery Start
410
400
Device 108 Logon to Agent Server 115
412
Retrieve List of online systems 102 from Agent Server 115
414
Retrieve IP Info of systems 102 from Agent Server 115
416
Connect to systems 102
418
420
Connection Successful?
No
424
Perform Hole Punching
Fail
426
Use Relay Connections
Yes
422
Connect to systems 102
Successful

Figure 4

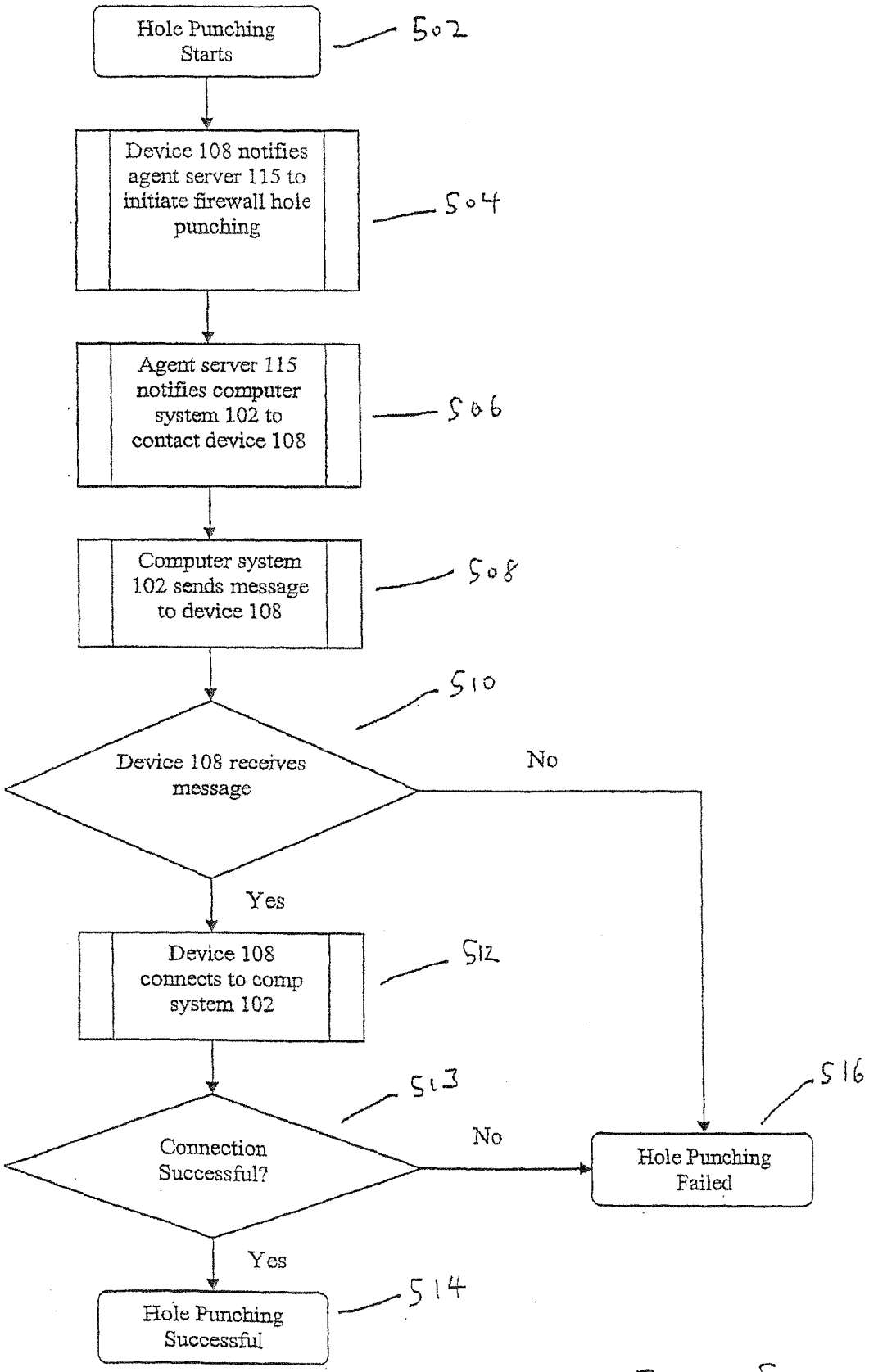

Hole Punching Starts
502
Device 108 notifies agent server 115 to initiate firewall hole punching
504
Agent server 115 notifies computer system 102 to contact device 108
506
Computer system 102 sends message to device 108
508
Device 108 receives message
510
No
Yes
Device 108 connects to comp system 102
512
Connection Successful?
513
No
Hole Punching Failed
516
Yes
Hole Punching Successful
514

Figure 5