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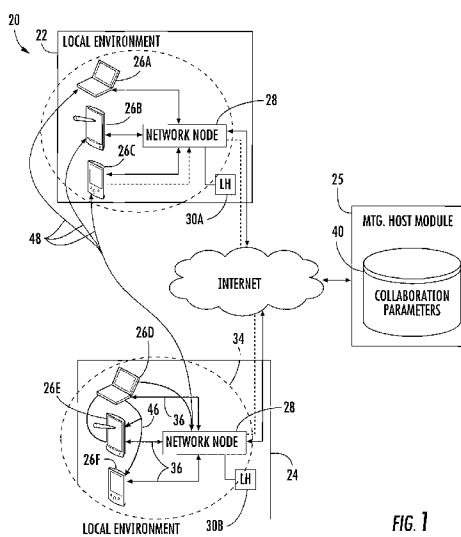


FIG. 1

(57) Abstract: Collaborations may be administered amongst first clients (26, 426, 428, 429) and amongst second clients (26, 426, 428, 429) using first and second host servers (30, 430), respectively, while sharing collaboration parameters for collaborations between the first clients (26, 426, 428, 429) and the second clients (26, 426, 428, 429).

ELECTRONIC COLLABORATION

BACKGROUND

[0001] Electronic collaborations between multiple clients at multiple sites, such as through web conferencing and video conferencing, sometimes use a central remote conference host or server. Such collaboration through a central remote conference host server may experience unacceptable latencies and data loss.

BRIEF DESCRIPTION OF THE DRAWINGS

[0002] Figure 1 is a schematic illustration of an example collaboration system.

[0003] Figure 2 is a flow diagram of an example collaboration method for use by the system of Figure 1.

[0004] Figure 3 is a schematic illustration of a first example of the collaboration system of Figure 1.

[0005] Figure 4 is a schematic illustration of a second example of the collaboration system of Figure 1.

[0006] Figure 5 is a schematic illustration of a third example of the collaboration system of Figure 1.

[0007] Figure 6 is a fragmentary side elevational view of an example local environment of the collaboration system of Figure 5.

DETAILED DESCRIPTION OF THE EXAMPLE EMBODIMENTS

[0008] Figure 1 schematically illustrates one example of an electronic collaboration system 20. Electronic collaboration system 20 facilitates electronic collaboration, such as web conferencing and video conferencing, with reduced latency and reduced data loss. Electronic collaboration system 20 comprises local environments 22, 24 and a meeting host or meeting host module 25. Although two local environments are shown, in other

examples, system 20 may comprise additional local environments having different numbers and forms of local clients.

[0009] Local environments 22, 24 each comprise a grouping of those local clients 26 which are interconnected by a same local network node 28 and which have electronic collaborations amongst one another coordinated by the same local host or local host server module 30. Local clients 26 comprise electronic devices used by different collaboration or conference participants to participate in an electronic collaboration. Figure 1 illustrates three example local clients: laptops 26A, 26D, electronic tablets 26B, 26E and personal data assistants 26C, 26F. Other examples of local clients include, but are not limited to, net book computing devices, smart phones, basic phones, input/output devices such as microphones or cameras, and other electronic devices capable of communicating as part of a collaboration.

[0010] Each local network node 28 comprises an electronic device which defines a local network 34. Examples of a network node 28 include, but are not limited to, a network switch, a network gateway, a router, a wireless access point (WAP) or some hybrid combination thereof. Local clients 26 on the local network 34 are communicatively connected to network node 28 by network links 36, each of which may be a wired (e.g., Ethernet) connection, a wireless connection (e.g., based on the IEEE 802.11 standard, or some combination of wired and wireless connection). Each network node 28 serves as an interface between local clients 26 on local network 34 and provides communication with other networks external to local network 34.

[0011] As shown by Figure 1, each network node 28 and local network 34 corresponds to a local environment 22, 24. In the example illustrated, local environments 22, 24 comprise dedicated videoconference studios or a conference rooms outfitted with videoconference equipment, wherein the associated network node 28 is located within or in close proximity to the dedicated studio or conference room. In addition to providing network access to clients 26, network node 28 may provide network access to video conference equipment such as display devices, loudspeakers, or other video conferencing computer equipment. In other implementations, each local environment 22, 24 may

comprise a number of similarly situated or located rooms, wherein network node 28 is located within one room or in close proximity to one or more of such similarly located conference rooms. In still other examples, local environments 22, 24 may correspond to one or more similarly located or situated cubicles or other areas designated, explicitly or implicitly, as being available for dedicated to a particular electronic collaboration objective.

[0012] Local host server 30 comprises a computing device server configured to follow instructions provided on a non-transient computer readable medium so as to coordinate and administer electronic collaborations directly between local clients 26 on the local network 34. In particular, local host server 30 carries out authentication operations and local media sharing. In one example, authorization is carried out by the local host server 30 requests that a new local client requesting to participate in a collaboration event provide or input one or more passwords or other identification values, wherein local host server compares the entered identification or authentication input to stored values to either allow or deny the new local client access to the collaboration event. In other examples, other authentication processes may be utilized. In addition, local host server 30 carries out the sharing of collaboration resources or media between local clients 26 on local network 34. Examples of collaboration or media that may be shared between local clients by local host server 30 includes cursor movements or graphic changes, slides, documents, video, audio and the like.

[0013] According to one example, local host server 30 comprises a computing device separate and distinct from local clients 26 but connected to each local client 26 on the local network 34 via network node 28 and links 36. In another example, local host server 30 may alternatively be provided by one of local clients 26. In such an example, the local client 26 serves as the host, coordinating and administering the collaboration event across network node 28 and links 26. Because such authentication and media sharing amongst local clients 26 all occurs across local network 34, authentication and data or media sharing is faster (less latency) and more reliable (less data packet loss during transmission).

[0014] Meeting host 25 (also known as the conference host) comprises a computing device server configured to follow instructions provided on a non-transient computer readable medium so as to collect, generate and distribute or share collaboration event parameters for collaboration between local clients served by different local hosts or not served or associated with any local host. Collaboration event parameters comprise protocols and settings that define and control the sharing of data or media between local clients in different local environments. Such parameters pertain to protocols and setting that impact interaction between local clients of different local environments. Examples of such collaboration event parameters comprise: presentation control, data transmission security, a collaboration event participant roster and, in the case of video conferencing, seating order.

[0015] Presentation control parameters comprise those protocols which identify which local client or clients in a collaboration event are designated as a main presenter or main presenters. Such parameters may also distribute other conference control functions amongst different local clients.

[0016] Data transmission security parameters comprise protocols pertaining to the different security levels across different local environments. For example, one local environment may have a first level of security protocols while another local environment may have a less secure, less stringent level of security protocols. One environment may be within a company network while another environment may be within a hotel or semi-public network. Such parameters may impact how or what collaboration data may be shared or transmitted across or between different local environments.

[0017] Collaboration participation roster parameters comprise a listing of some or all local clients participating in the conference or collaboration event. Such a roster may include parameters or information such as the particular local client's data transmission and receiving capabilities or requirements, the local client's security or access authorization and the like.

[0018] Seating order parameters comprise protocols specifically relating to video conferencing collaboration events. Such seating order parameters define the order in

which visual depictions of the video conference participants are presented on the display of a particular local client. In one example, a video conference is designed to simulate a conference with participants sitting around a table. The display of the participants on each local device or local client will vary due to different perspectives of the different local clients and their users or conference participants.

[0019] In one example, meeting host 25 distributes such collaboration parameters amongst all local clients 26. Meeting host 25 additionally updates changes to such collaboration parameters on each local client 26. As a result, each local client has direct access to the collaboration parameters to facilitate direct sharing with local clients in other environments without having to communicate through an intermediary.

[0020] In another example, meeting host 25 stores and maintains or updates the collaboration parameters in a memory 40. Local clients 40 may access the stored collaboration parameters periodically or when media is to be shared. Using the obtained collaboration parameters, each local client 40 may directly communicate the information to be shared to other local clients.

[0021] Figure 1 further illustrates an example of media sharing during a collaboration event or conference. As shown by Figure 1, system 20 operates in a federated manner with those local actions and transmissions being handled or administered by a local host 30 and with those actions or transmissions that are not local in nature, but pertaining to interactions between local clients across different environments, being handled or administered based upon the collaboration parameters collected or generated and shared by meeting host 25. Figure 1 illustrates one example of the sharing or transmission of media (video, files etc.) by local client 26D of environment 24 to the other local clients 26 participating in the collaboration event. As indicated by arrows 46, media to be shared is distributed directly to other local clients in the same environment 24 across network node 28 and links 36 under the administration or control of local host 30. As indicated by arrows 48, media being shared with local clients outside environment 26, such as with local clients 26 in environment 22, is distributed directly through the local network node 28 using the collaboration parameters provided by meeting host 40. In

effect, the two network nodes 28 of the two local environments are equivalent and federated. As a result, latency times and accidental data packet losses may be reduced.

[0022] Figure 2 is a flow diagram illustrating the overall federation scheme or method 100 employed by system 20 of Figure 1. As indicated by block 102, local host 30A administers collaboration amongst local clients 26A, 26B and 26C. As noted above, such local administration may comprise authenticating local clients 26A, 26B and 26C and transmitting shared media directly between local clients 26A, 26B and 26C. As indicated by block 104, local host 30B carries out substantially the same administrative functions such as authenticating local clients 26D, 26E and 26F and transmitting shared media directly between local clients 26D, 26E and 26F. Because such administration of data or media sharing is carried out at a local level by a local host 30, latency and data loss may be reduced.

[0023] As indicated by block 106, meeting host 40 shares collaboration parameters amongst clients 26 not in the same local environment 22, 24. Examples of collaboration parameters comprise protocols and settings that define and control the sharing of data or media between local clients in different local environments. Such parameters pertain to protocols and setting that impact interaction between local clients of different local environments. Examples of such collaboration event parameters comprise: presentation control, data transmission security, a collaboration event participant roster and, in the case of video conferencing, seating order. Because meeting host 40 shares such collaboration parameters, local clients 26 may more efficiently share collaboration media to clients in other environments since the media being shared does not need to be transmitted through a middleman, another central host.

[0024] In one example, meeting host 40 distributes and maintains the collaboration parameters in the memory of each local client 26. In another example, meeting host 40 maintains the profile or collaborative parameters in a memory 40, wherein local clients 26 access the memory 40 to obtain such collaboration parameters. In another example, meeting host 40 does both, allowing local clients not having memory or sufficient memory for storing such collaborative parameters to access the memory 40 to participate

in a collaborative event while, at the same time, facilitating more efficient collaborative actions for those local clients that have sufficient memory to store such collaborative parameters.

[0025] Figure 3 schematically illustrates collaboration system 220, one particular example of collaboration system 20. Collaboration system 220 comprises local environments 222, 224 and meeting host 225. Local environments 222 and 224 are similar to local environments 22 and 24, respectively, except that meeting host module 25 is illustrated as being provided by the same electronic device 227A that serves as the local host server and includes local host module 28. Each of electronic devices 227A and 227B which serve as the local host server and which include a local host module 28 is further illustrated as including a memory 229 storing each of local parameters 231 and collaboration parameters 233.

[0026] According to one example, electronic device 227 and electronic device 227B are each dedicated host devices with device 227B serving as a local host and device 227A serving as both the local host for environment 222 and the meeting host for environments 222 and 224, as well as any other environments not shown. According to another example, one or both of electronic devices 227A and 227B may additionally serve as a local client 26. For example, electronic device 227A and/or electronic device 227B may comprise a personal electronic device such as a laptop computer, personal data assistant (PDA), tablet, smart phone or the like which may be used by a collaboration event participant to partake in the collaboration event, while also serving as the local host (device 227B) or both the local host and the meeting host (device 227A).

[0027] As noted above, collaboration parameters 233 stored in memory 229 comprise protocols and settings that define and control the sharing of data or media between local clients in different local environments. Such parameters pertain to protocols and setting that impact interaction between local clients of different local environments. Examples of such collaboration event parameters comprise: presentation control, data transmission security, a collaboration event participant roster and, in the case of video conferencing, seating order.

[0028] Local parameters 231 comprise data, settings and protocols that impact or pertain to the transmission or sharing of collaboration data between local clients 26 within a local network 34 (shown in Figure 1). Local parameters 231 are those data, settings and protocols that the associated local host module 28 uses to administer local actions or operations such as authentication operations and local media sharing (described above).

[0029] As indicated by arrows 246, local hosts 30 interact with local clients 26 in the associated local environment to carry out local operations in the local environment such as authentication and media sharing. As indicated by arrows 249, changes to the local parameters are stored in the local parameters section of memory 229. As indicated by arrows 251, local host modules 30 each communicate with meeting host module 26 to transmit data that may impact collaboration parameters 233. As indicated by arrow 253, meeting host module maintains the collaboration parameters 233 stored in each memory 239. For example, when a new local client logs in and is authenticated by local host module 30, local host module 30 transmits this event to meeting host module 26. Meeting host module 30 then updates the collaboration parameters 233 to add the new local client to the roster and to insert the new local client in the seating order (in the case of videoconferencing).

[0030] As noted above, when media (data files, cursor movements or other visible presentation changes, voice or audio transmissions) is shared, the local host 30 of the source of the media uses local parameters to share such media amongst local clients 26 in the same local environment. When the same media is to be shared to other local clients in other local environments, each local host 30 consults the current collaboration parameters 233 and transmits the media directly to the other local clients using the collaboration parameters.

[0031] By way of a first example, local client 26A may have presentation control and implement movement of a cursor. The change is transmitted to local clients 26B and 26C, the local clients 26 in the same local environment 222 by local host module 30 according to the local parameters 231. The local host module 30 further consults

collaboration parameters 233 to identify all local clients 26 of other local environments, clients 26D, 26E and 26F in this example, and then transmits the cursor movement directly to such clients. The same process occurs when other sharing of media occurs.

[0032] By way of another example, local client 26A may have presentation control and implement movement of a cursor. The change is presented on a local display (a display screen or central monitor viewed by all collaboration participants in the same local environment) by local host module 30 according to the local parameters 231 to achieve low latency. The local host module 30 further consults collaboration parameters 233 to identify all local clients 26 of other local environments, clients 26D, 26E and 26F in this example, and then transmits the cursor movement directly to such clients.

[0033] Figure 4 schematically illustrates collaboration system 320, another example of collaboration system 20 shown in Figure 1. Collaboration system 320 is similar to collaboration system 220 except that meeting host 25 is provided by a separate and distinct electronic device 327 rather than being provided as part of the same electronic device that also provides a local host 30. As shown by Figure 4, meeting host 25 has a memory 331 storing collaboration parameters 333.

[0034] In operation, collaboration system 320 operates in much the same fashion as collaboration system 220. However, in addition to maintaining collaboration parameters 233 the memory of each of electronic devices 227 providing local hosts 30, meeting host 25 additionally stores and maintains or updates the same set of collaboration parameters 333 in memory 331. As a result, additional clients not associated with a particular local host 30 may partake in a collaboration event by communicating directly with meeting host 25. In some examples, meeting host 25 may carry out authentication for such clients not associated with a local host 30. In circumstances where the client joining the collaboration event is not associated with a local host and does not have sufficient memory for storing collaboration parameters, the client may directly utilize collaboration parameters 333 stored at meeting host 25.

[0035] Figure 5 illustrates collaboration system 400, another example of collaboration system 20. As shown by Figure 5, collaboration system 400 comprises local environment

422, meeting host 425 and isolated local clients 428, 429. Local environment 422 comprises local clients 426A, 426B, 426C, 426D, 426E, display device 427, local host 430 and associated memory 431. Figure 6 illustrates local environment 422 in greater detail. As shown by Figure 6, local client 426A comprises a laptop or netbook computing device used by first collaboration participant and presentation controller 435A. In the example illustrated, local client 426A connects to the local network 434 and local host 430 (shown in Figure 5) in a wired fashion, connecting to network jack 441. In other examples, local client 426A may connect to local network 434 and local host 430 (shown in Figure 5) in a wireless fashion. Local client 426B comprises an interactive display device, such as a touch screen, used by the collaboration participant 435B and incorporated into a collaboration table 437.

[0036] Local clients 426C, 426D and 426E each comprise a camera 439 and a display 441. Camera 439 captures video of participants as well as any articles or objects to be visually shared. Display 431 visually presents other participants in the collaboration event and/or object articles presented before other cameras 439. In the example illustrated, display 431 visibly presents images of different collaboration participants 435 according to a seating order which is provided as part of collaboration parameters maintained by meeting host 425 (shown in Figure 5). As noted above, the participants and their arrangement that are visually displayed by other display devices in other local environments or on displays of other local clients may be different due to different seat perspectives.

[0037] Display device 427 comprises a public device to visibly present data and graphics or video shared by all participants 435 in the collaboration event. In the example illustrated, display device 427 is shown as presenting a shared collaboration resource 443 shared by local client 426A. The shared collaboration resource 443 includes a graph 445, topic list 447, list of collaboration locations or environments rural 449 and a current list of participants 451.

[0038] As shown by Figure 5, local host 430 comprises a computing device server configured to follow instructions provided on a non-transient computer readable medium

so as to coordinate and administer electronic collaborations directly between local clients 426 on the local network 434. In particular, local host server 430 carries out authentication operations and local media sharing. When a new local client 426 requests to participate in a collaboration event or conference, local host server 430 carries out authentication of the new local client. In one example, local client 426 requests that the new local client provide or input one or more passwords or other identification values, wherein local host server compares the entered identification or authentication input to stored values to either allow or deny the new local client access to the collaboration event. In other examples, other authentication processes may be utilized. In addition, local host server 430 carries out the sharing of collaboration resources or media between local clients 426 on local network 434.

[0039] As shown by Figure 5, local host server 430 comprises a computing device separate and distinct from local clients 426 but connected to each on the local network 434. In another example, local host server 430 may alternatively be provided by one of local clients 426. In such an example, the local client 426 serves as the host, coordinating and administering the collaboration event 426. Because such authentication and media sharing amongst local clients 426 all occurs locally, authentication and data or media sharing is faster (less latency) and more reliable (less data packet loss during transmission).

[0040] Meeting or conference host 425 comprises a computing device server configured to follow instructions provided on a non-transient computer readable medium so as to collect, generate and distribute or share collaboration event parameters for collaboration between local clients served by different local hosts or not served or associated with any local host. Meeting host 425 maintains the profile or collaborative parameters in a memory 440 (memory cache), wherein local clients 426 access the memory 440 to obtain such collaboration parameters which are stored in memory 431. Because meeting host 440 stores collaboration parameters in memory 446, clients 428 and 429 which are not serviced by a local host may still participate in a collaborative event using collaboration parameters of meeting host 425.

[0041] In operation, local host 430 interacts with local clients 426 in local environment 400 to carry out local operations in the local environment such as authentication and media sharing. Changes to the local parameters are stored in the local parameters section of memory 431. Local host module 430 communicates with meeting host module 425 to transmit data that may impact collaboration parameters. Meeting host module maintains the collaboration parameters stored in each memory 431 and memory 440. For example, when a new local client 426 logs in and is authenticated by local host module 430, local host module 430 transmits this event to meeting host module 425. Meeting host module 430 then updates the collaboration parameters to add the new local client to the roster and to insert the new local client in the seating order (in the case of videoconferencing).

[0042] As noted above, when media (data files, cursor movements, drawing actions or other visible presentation changes, voice or audio transmissions) is shared, the local host 430 of the source of the media uses local parameters to share such media amongst local clients 426 in the same local environment. When the same media is to be shared to other clients in other local environments, the local client which is the origin of the media to be shared consults the current collaboration parameters and transmits the media directly to the other local clients using the collaboration parameters. Rather than transmitting cursor movements, files, video, audio and the like through an intermediate or central host, the shared media is transmitted directly to each client.

[0043] In some circumstances, media originating from a local client is shared with other clients 426 at the same local environment 400 as well as other clients, 428, 429 at other local environments. For example, local client 426A may have presentation control and implement movement of a cursor. The change is transmitted to local clients 426B, the local client 426 in the same local environment 422 by local host module 430 according to the local parameters. The local host module 430 further consults collaboration parameters to identify all clients participating in the collaboration event, clients 428 and 429 in this example, and then transmits the cursor movement directly to such clients were 28, 429.

[0044] By way of another example, local client 426A may have presentation control and implement movement of a cursor. The change is presented on a local display (a display screen or central monitor viewed by all collaboration participants in the same local environment) by local host module 30 according to the local parameters to achieve low latency. The local host module 430 further consults collaboration parameters to identify all local clients 426 of other local environments, clients 428, 429 in this example, and then transmits the cursor movement directly to such clients.

[0045] In other circumstances, media originating from a local client may not be transmitted to other local clients and the same local environment, but may be transmitted to clients in other environments. For example, each of cameras 439 of each of local clients 426C, 426D and 426E continuously capture video of their associated participants 435. As a result, the depiction of participants 435 on displays may continuously change. The changes are transmitted to local host 430 which consult memory 431 to identify other clients outside of environment 400 which are partaking in the collaboration event. In the example shown, the collaboration parameters would indicate that clients 428, 429 are also participating in the collaboration event. Using the seating order in the collaboration parameters, local host 430 transmits the video or images from cameras 439 to remote clients, such as clients 428, 429. Because the video is transmitted directly to remote clients 428, 429, transmission latencies and data loss may be reduced.

[0046] Overall, each of systems 20, 220, 320, and 420 form a collaboration event or conference that is defined by user interaction and media flow that exists in a distributed realization. Because such systems establish a hierarchy of federated systems, media transmission between distant and remote sites may be achieved using techniques, such as alternate encoding algorithms, not reasonable for personal devices and grabs not even room-scale systems. Because such systems utilize local authentication and private or direct client-to-client or site-to-site communications to create a collaboration overlay on top of an existing, typically private, network, established tunneling techniques may be used to traverse such isolation. As a result, clients that are not authorized to access the private network may still access the collaboration functions that exist on the network.

Because conference hosting functions are separated into multiple federated entities, instead of a single instance, individual hosting functions may be located in both public spaces and network-based deployments. When properly coordinated, the layered deployment provides universal accessibility for mobile clients while providing minimal latency required for localized public space or local environments. Because each local conference host, such as host 430, serves as a node for content distribution overlay, local environments experience immediate data visibility speeds as the data becomes available. Limited upload systems may securely stream content to the dissolution system to make it more available while maintaining control over content visibility.

[0047] Although the present disclosure has been described with reference to example implementations, workers skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the claimed subject matter. For example, although different example implementations may have been described as including one or more features providing one or more benefits, it is contemplated that the described features may be interchanged with one another or alternatively be combined with one another in the described example embodiments or in other alternative embodiments. Because the technology of the present disclosure is relatively complex, not all changes in the technology are foreseeable. The present disclosure described with reference to the example implementations and set forth in the following claims is manifestly intended to be as broad as possible. For example, unless specifically otherwise noted, the claims reciting a single particular element also encompass a plurality of such particular elements.

WHAT IS CLAIMED IS:

- 1 1. A computer implemented method comprising:
2 administrating electronic collaboration amongst first local clients (26, 426,
3 428, 429) at a first location with a first local host server (30, 430) associated with the first
4 local clients (26, 426, 428, 429);
5 administrating electronic collaboration amongst second local clients (26,
6 426, 428, 429) at a second location with a second local host server (30, 430) associated
7 with the second local clients (26, 426, 428, 429); and
8 sharing parameters for coordinated electronic collaboration between the
9 first local clients (26, 426, 428, 429) and the second local clients (26, 426, 428, 429)
10 among the first local clients (26, 426, 428, 429) and the second local clients (26, 426,
11 428, 429).
- 12 2. The method of claim 1, further comprising storing the parameters for
13 coordinated electronic collaboration between the first local clients (26, 426, 428, 429)
14 and the second local clients (26, 426, 428, 429) at one of the first local clients (26, 426,
15 428, 429).
- 16 3. The method of claim 1 further comprising storing the parameters for
17 collaboration at a conference server (25) remote from the first local host server (30, 430)
18 and the second local host server (30, 430).
- 19 4. The method of claim 1, wherein the parameters for collaboration comprise
20 a video conference seating order including the first local clients (26, 426, 428, 429) and
21 the second local clients (26, 426, 428, 429).
- 22 5. The method of claim 1, wherein the parameters for collaboration comprise
23 presentation control amongst the first local clients (26, 426, 428, 429) and the second
24 local clients (26, 426, 428, 429).

25 6. The method of claim 1, wherein the first local host server (30, 430)
26 authenticates the first local clients (26, 426, 428, 429) and wherein the second local host
27 server (30, 430) authenticates the second local clients (26, 426, 428, 429).

28 7. An apparatus comprising:
29 a non-transient computer readable medium comprising instructions to:
30 receive first collaboration parameters for first clients (26, 426, 428, 429)
31 served with a first local collaboration host server (30, 430);
32 receive second collaboration parameters for second clients (26, 426, 428,
33 429) served with a second local collaboration host server (30, 430); and
34 share the first and second collaboration parameters amongst the first local
35 clients (26, 426, 428, 429) and the second local clients (26, 426, 428, 429).

36 8. The apparatus of claim 7, wherein the computer readable medium further
37 comprises instructions to determine a video conference seating order including the first
38 clients (26, 426, 428, 429) and the second clients (26, 426, 428, 429), wherein the video
39 conference seating order is shared amongst the first local clients (26, 426, 428, 429) and
40 the second local clients (26, 426, 428, 429).

41 9. A system comprising:
42 a first local host server (30, 430) to administer collaborations by first local
43 clients (26, 426, 428, 429);
44 a second local host server (30, 430) to administer collaborations by second
45 local clients (26, 426, 428, 429); and
46 a meeting host (25) to coordinate collaborations between the first local
47 clients (26, 426, 428, 429) and the second local clients (26, 426, 428, 429).

1 10. The system of claim 9, wherein the first local host and the second local
2 host servers (30, 430) are each configured to locally cache shared content.

1 11. The system of claim 9, when the first and second local host servers (30,
2 430) are each configured to administer authentication.

1 12. The system of claim 9, wherein the first and second local host servers (30,
2 430) are configured to administer presentation control.

1 13. The system of claim 9, wherein the meeting host (25) comprises a non-
2 transient computer readable medium facilitating master-slave negotiation between the
3 first and second local host servers (30, 430).

1 14. The system of claim 9 further comprising a personal electronic device
2 (227) providing the first local host server (30, 430).

1 15. The system of claim 14, wherein the personal electronic device (227)
2 provides the meeting host (25).

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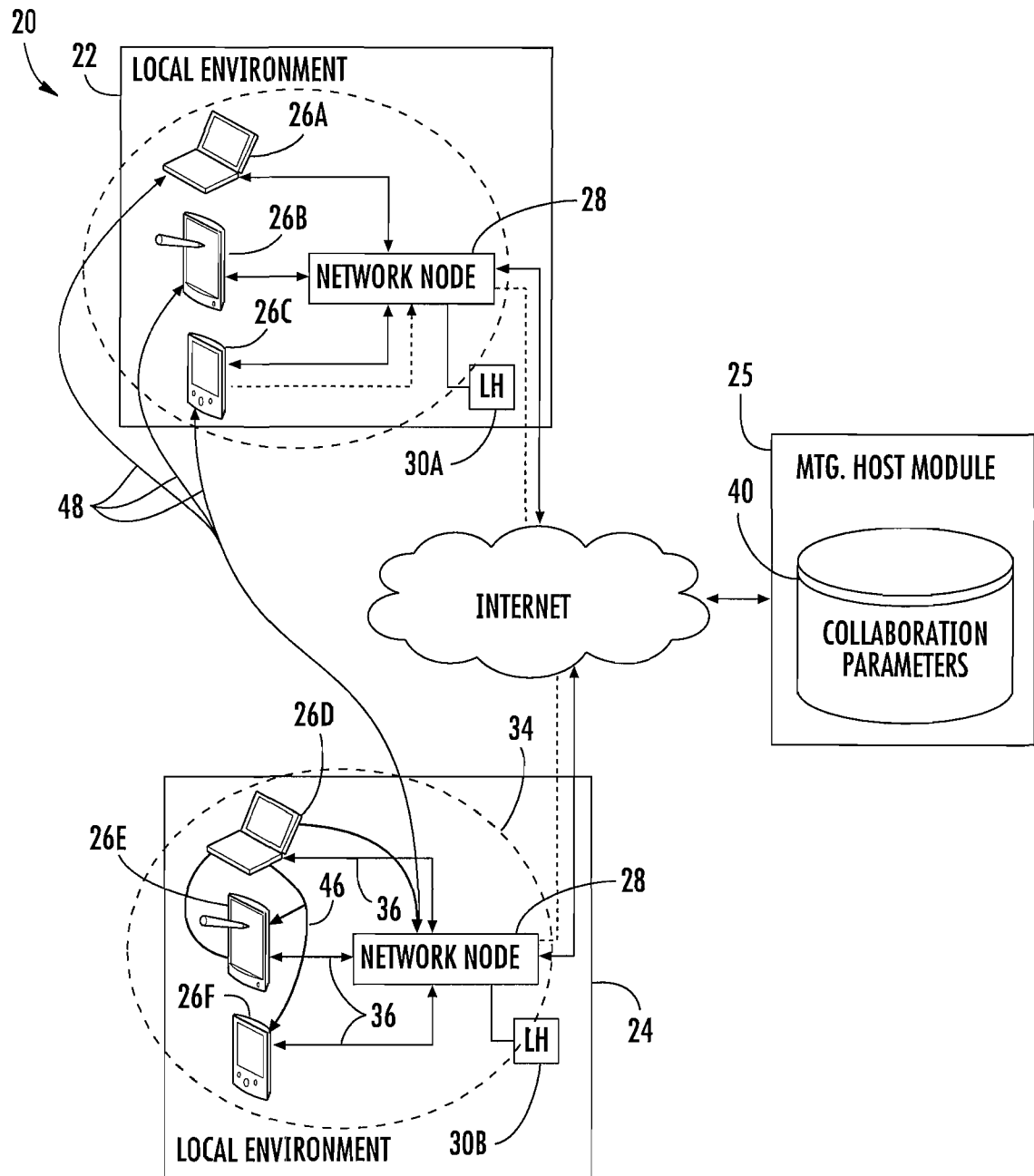


FIG. 1

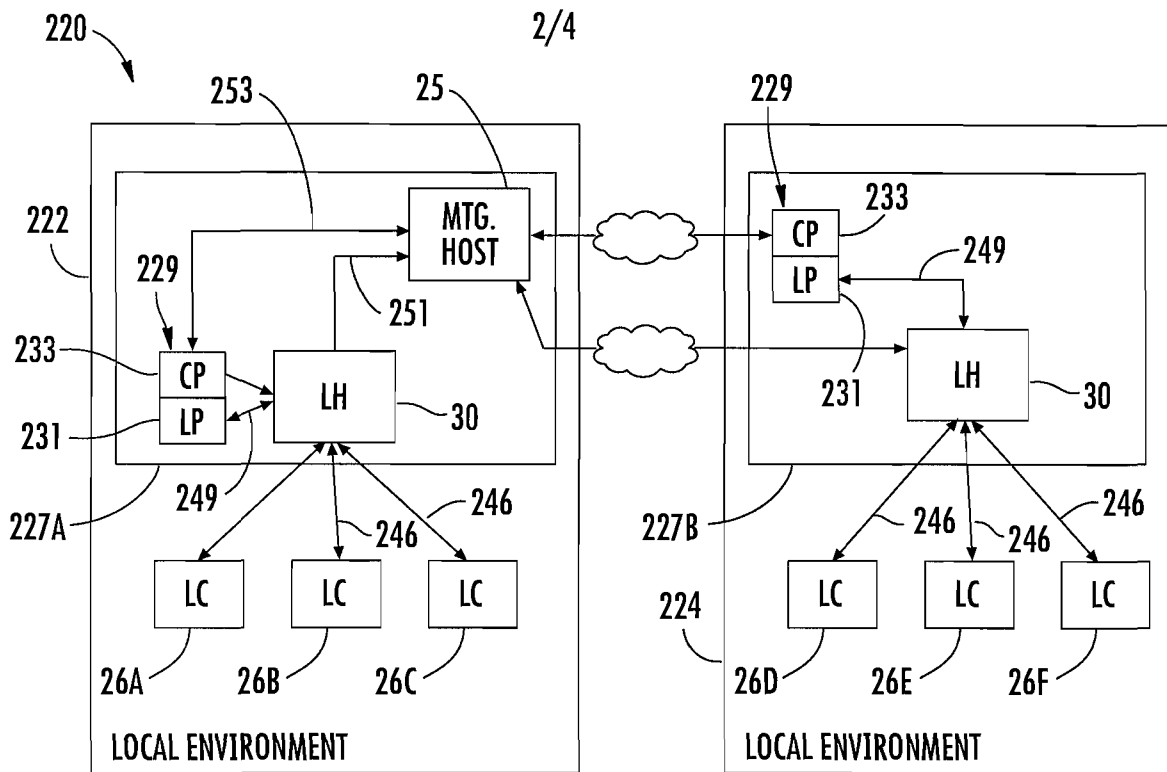


FIG. 3

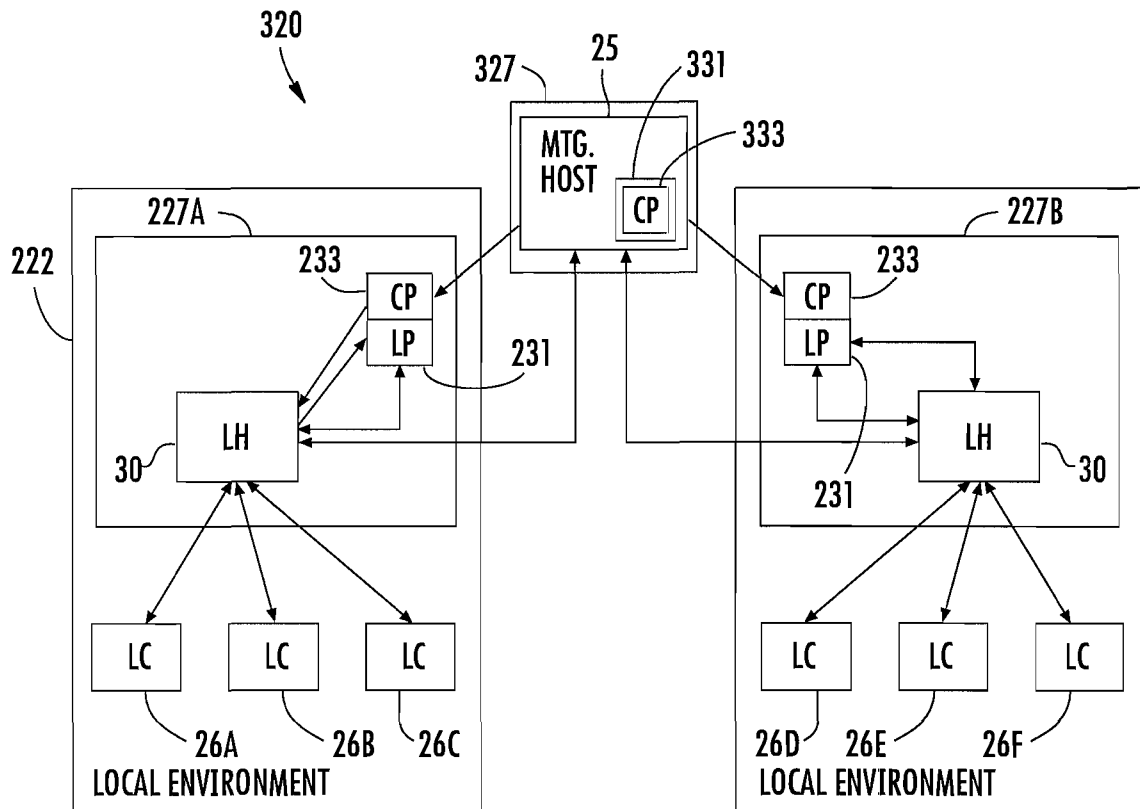


FIG. 4

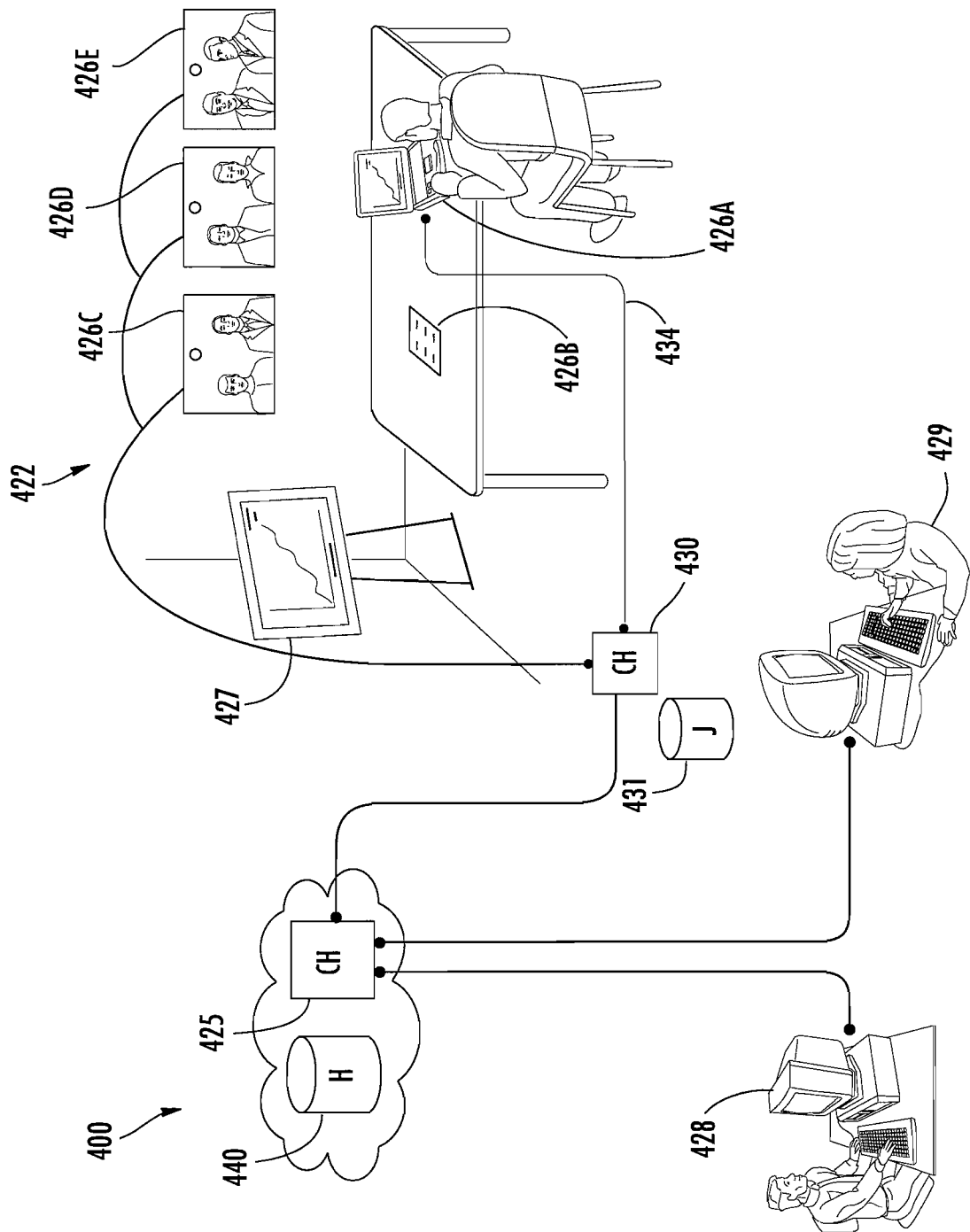


FIG. 5

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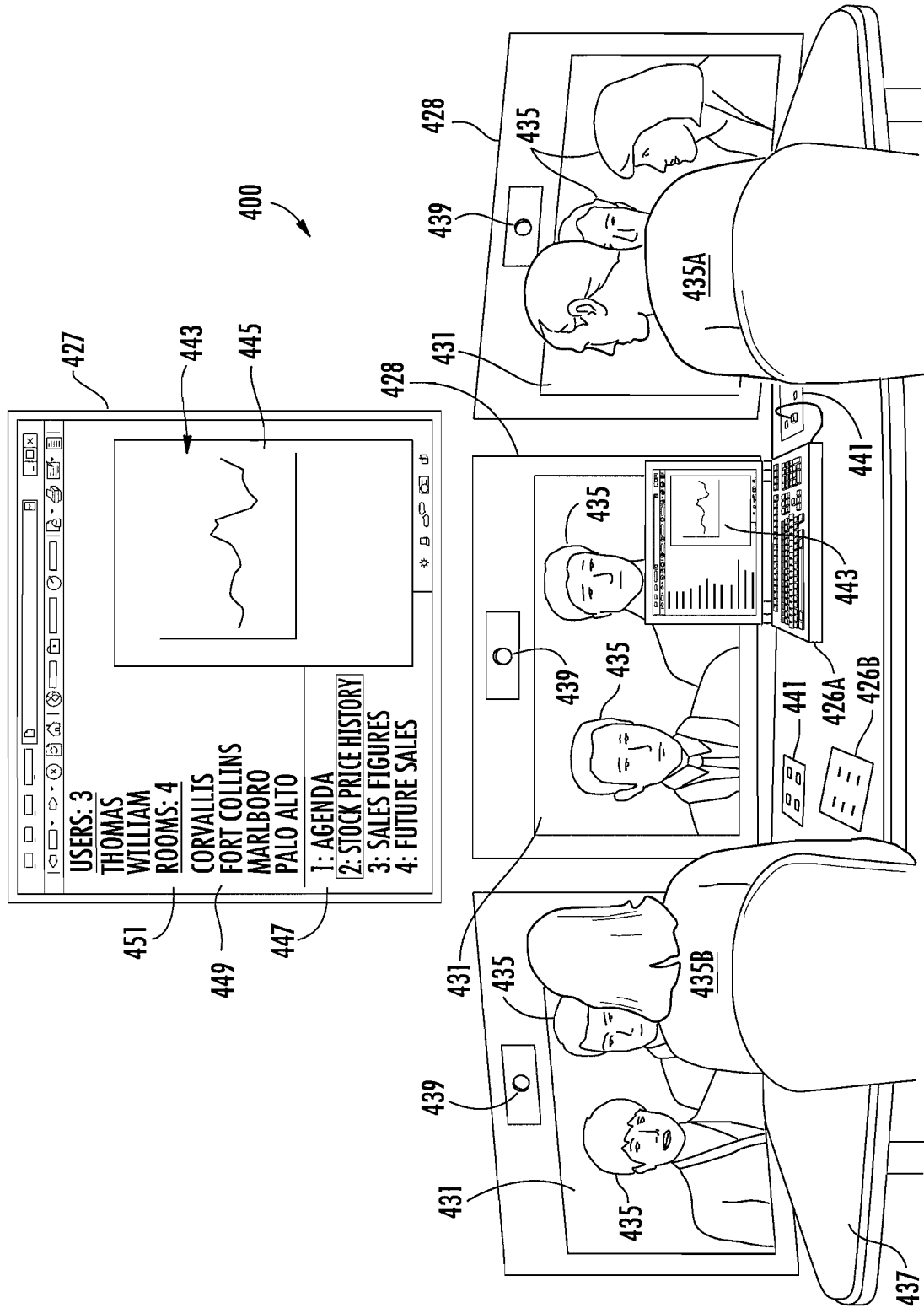


FIG. 6

A. CLASSIFICATION OF SUBJECT MATTER**G06F 15/16(2006.01)i, G06F 9/06(2006.01)i, H04L 12/18(2006.01)i, H04N 7/15(2006.01)i**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G06F 15/16; H04N 9/74; H04N 7/15; G06F 17/30; H04N 5/262; H04N 7/00; G06F 3/01

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Virtual Meeting, Remote Conference

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2011-0025819 A1 (GORZYNSKI MARK E. et al.) 03 February 2011	1-5, 7-10, 12, 14-15
Y	See paragraph 0018 - paragraph 0053; paragraph 0069 - paragraph 0078; figures 4A-4C, 7, 8	6, 11
Y	US 2010-0251140 A1 (TIPIRNENI KISHORE) 30 September 2010	6, 11
A	See paragraph 0010 - paragraph 0011; paragraph 0041 - paragraph 0042; figures 1, 2	1-5, 7-10, 12, 14-15
A	US 2004-0158586 A1 (MINGTAR TSAI) 12 August 2004	1-15
	See paragraph 0024 - paragraph 0035; figures 2-4	
A	US 2004-0263636 A1 (CUTLER ROSS et al.) 30 December 2004	1-15
	See paragraph 0009 - paragraph 0022; paragraph 0083 - paragraph 0104; figures 2-4, 6	



Further documents are listed in the continuation of Box C.



See patent family annex.

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

30 MAY 2012 (30.05.2012)

Date of mailing of the international search report

31 MAY 2012 (31.05.2012)

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/056437

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US 2004-0158586 A1	12.08.2004	CN 1551567 A	01.12.2004
US 2004-0263636 A1	30.12.2004	US 2009-046139 A1 US 7428000 B2	19.02.2009 23.09.2008