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APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
60/608,113	09/09/2004	Ojas Thakor Choksi	100773.55337PV

57541
 SPRINT NEXTEL CORPORATION
 6391 SPRINT PARKWAY
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 OVERLAND PARK, KS 66251-2100

CONFIRMATION NO. 9717



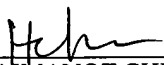
OC000000019508162

Date Mailed: 07/06/2006

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 06/16/2006.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.


 HAIMANOT CHRISTIAN
 PTOSS (703) 305-0677

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60/608,113	09/09/2004	Ojas Thakor Choksi	100773.55337PV

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CONFIRMATION NO. 9717



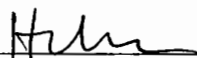
OC000000019508150

Date Mailed: 07/06/2006

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 06/16/2006.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).


 HAIMANOT CHRISTIAN
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. Nos:

60/608,113

**REVOCATION OF POWER OF ATTORNEY WITH NEW POWER OF ATTORNEY AND STATEMENT
UNDER 37 CFR 3.73(b)**

Filed herewith is a Revocation of Power of Attorney that is signed by one authorized to act on behalf of the assignee of the entire interest of the applicant (per 37 C.F.R. § 1.32(b)(4)).

Revocation of Power of Attorney with New Power of Attorney.

All previous powers of attorney given in the above-identified applications (a printed chart is attached and computer disk is enclosed) are hereby revoked, and hereby appointed are the practitioners associated with Customer Number 57541 to prosecute these Applications and transact business in the Patent and Trademark Office connected therewith. Please send all correspondence to the address associated with the same customer number.

Statement under 37 CFR 3.73(b)

Sprint Nextel Corporation. is the assignee of the entire right, title and interest of the Applications, captioned above. The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Respectfully Submitted,



Harley Ball, Vice President
Sprint Nextel Corporation

6/12/06

Date

13281 U.S. PTO
090904

PTO/SB/16 (08-03)

Approved for use through 07/31/2008. OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No.

16800 U.S. PTO
60/608113

090904

INVENTOR(S)					
Given Name (first and middle [if any])		Family Name or Surname		Residence (City and either State or Foreign Country)	
Ojas Thakor		CHOKSI		Herndon, VA	
☐ Additional inventors are being named on the <u>separately numbered sheets attached hereto</u>					
TITLE OF THE INVENTION (500 characters max)					
Architectures for Facilitating Group Sessions Across Dispatch Operators					
Direct all correspondence to: CORRESPONDENCE ADDRESS					
☒ Customer Number <u>23911</u>					
OR					
☐ Firm or Individual Name		Crowell & Moring LLP			
Address		Intellectual Property Group			
Address		PO Box 14300			
City		State	DC	Zip	20044-4300
Country		USA	Telephone	202-624-2500	Fax 202-628-8844
ENCLOSED APPLICATION PARTS (check all that apply)					
☒ Specification		Number of Pages <u>11</u>		☐ CD(s), Number _____	
☒ Drawing(s)		Number of Sheets <u>10</u>		☐ Other (specify) _____	
☒ Application Data Sheet. See 37 CFR 1.76					
METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT					
☐ Applicant claims small entity status. See 37 CFR 1.27.					
☒ A check or money order is enclosed to cover the filing fees					
☒ The Commissioner is hereby authorized to charge any deficiencies or credit any overpayment to Deposit Account Number: <u>05-1323</u> (Docket # 100773.55337PV).					
☐ Payment by credit card. Form PTO-2038 is attached.					
The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.					
☒ No					
☐ Yes, the name of the U.S. Government agency and the Government contract number are: _____					

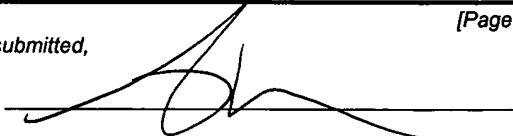
FILING FEE
Amount\$
160.00

Respectfully submitted,

[Page 1 of 1]

Date September 9, 2004

SIGNATURE



REGISTRATION NO. 43,420
(if appropriate)

Docket Number: 100773.55337PV

TYPED or PRINTED NAME Stephen W. Palan

TELEPHONE 202-624-2710

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop Provisional Application, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

**ARCHITECTURES FOR FACILITATING GROUP
SESSIONS ACROSS DISPATCH OPERATORS**

BACKGROUND OF THE INVENTION

[0001] Cellular communications systems typically provide interconnect and/or dispatch voice communication services. Interconnect voice communication services are those typically provided by most cellular carriers as circuit-switched communications. Dispatch communication services are commonly known as a walkie-talkie type of call such as Nextel's service identified by the trade names Push-To-Talk or Direct Connect. Interconnect voice communication services provided by most cellular carriers can be provided between sources and destinations of different cellular carriers. However, dispatch communication services are typically implemented in a proprietary manner which prevents dispatch calls from originating in one cellular carrier's network and terminating in another cellular carrier's network.

SUMMARY OF THE INVENTION

[0002] Methods and systems for facilitating group dispatch session across dispatch network operators are provided. In accordance with exemplary embodiments of the present invention, a group management server brokers propagation of group definitions across carriers and provides a root repository for all group definitions spanning multiple carriers. In accordance with exemplary

embodiments of the present invention, the QuickConnect network provides inter-working across multiple dispatch carriers. To support group calls the QuickConnect network can act as a pass-through, act as a controller or as an intelligent replicator.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] Figure 1 illustrates an exemplary group management architecture in accordance with the present invention;

[0004] Figure 2 illustrates an exemplary call flow for group definition in accordance with the present invention;

[0005] Figure 3 illustrates an exemplary group management architecture in accordance with a first embodiment of the present invention;

[0006] Figure 4 illustrates an exemplary signaling diagram for a group call in accordance with the first embodiment of the present invention;

[0007] Figure 5 illustrates an exemplary group management architecture in accordance with a second embodiment of the present invention;

[0008] Figure 6 illustrates an exemplary signaling diagram for a group call in accordance with the second embodiment of the present invention;

[0009] Figure 7 illustrates an exemplary group management architecture in accordance with a third embodiment of the present invention;

[0010] Figure 8 illustrates an exemplary signaling diagram for a group call in accordance with the third embodiment of the present invention;

[0011] Figure 9 illustrates an exemplary group management architecture in accordance with a fourth embodiment of the present invention; and

[0012] Figure 10 illustrates an exemplary signaling diagram for a group call in accordance with the fourth embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] In accordance with exemplary embodiments of the present invention, two architecture components are provided to support group calls, group management and supporting group dispatch sessions

[0014] Figure 1 illustrates an exemplary architecture for managing groups spanning multiple carriers and dispatch technologies. The QuickConnect group management server brokers propagation of the group definitions across domains (carriers) and provides a root repository for all group definitions spanning multiple domains. The QuickConnect group server maintains a trust relationship with each carrier's group server and will disseminate requests for group creation, updates and deletions from other carriers.

[0015] Figure 2 depicts the conceptual flow for creation of a group, a group update and deletion of a member within a group. The signaling illustrated in

Figure 2 uses a generic protocol. The actual protocol used will depend upon implementation and can be either session initiation protocol (SIP) based or a variant thereof.

[0016] In a typical group call spanning multiple servers, there is a master/slave relationship between the originating and the terminating call controllers. The master maintains the overall control over of the session and directs the slaves based on user events (like floor requests) to forward the events to the user and update the session as needed.

[0017] Figure 3 illustrates an exemplary system in accordance with the first embodiment of the present invention. In Figure 3 the QuickConnect network is used as a pass-through. In accordance with this embodiment, the dispatch controller in the originating carrier is the master controller. It manages talker arbitration, floor allocation and media duplication. The QuickConnect network is responsible for translating and routing the session signaling and media to the appropriate terminating carrier.

[0018] The user selects members from the phone book and initiates a group call. The dispatch server in the originating carrier determines that members are cross-carrier, and therefore, sets up call legs for each member in the group and forwards the messaging associated with members of other carriers to the QuickConnect network.

[0019] The QuickConnect network performs the necessary translation and

transcoding (as needed) and forwards the messaging to the appropriate terminating carriers. The QuickConnect network is unaware of association between the various private call legs of the group call. However, based on the group ID that might be included in incoming private leg signaling, the QuickConnect network may be able to group the private legs and provide value added services.

[0020] The terminating dispatch servers shall function in slave mode and forward the messages arriving from the QuickConnect network to the respective end-users. The master controller in the originating carrier is responsible for arbitrating the floor across active members of the group.

[0021] Figure 4 illustrates a high-level call flow that visualizes the operations for the first embodiment. The circles indicate where the session control is located, wherein the darker shaded circles represent the management of the signaling plane and the lighter shaded circles represent the management of the bearer plane.

[0022] Figure 5 illustrates an exemplary system in accordance with the second embodiment of the present invention in which the QuickConnect network acts as a controller. In accordance with this embodiment, the dispatch controller in the QuickConnect network is the master controller, managing technology translation, talker arbitration, floor allocation, media duplication and delay smoothing. The originating and the terminating network are responsible for routing the session signaling and media to the appropriate end-user.

[0023] Figure 6 illustrates a high-level operational depiction for the second

embodiment of the present invention. Upon determining that the requested group call spans multiple carriers, the originating dispatch server forwards (or offloads) the call request to the QuickConnect network.

[0024] The QuickConnect network accesses the group database to obtain the member IDs for the group members (if they are not included in the call request) and set up private call legs to each member of the group. The QuickConnect network, after necessary translation, forwards the messaging for each member to its respective dispatch server.

[0025] The QuickConnect network acts as the master controller of both the signaling and media planes and arbitrates floor allocation across various active members of the group. The originating and the terminating dispatch servers operate in the slave mode by forwarding the messages emanating from the QuickConnect network to the members of the group call.

[0026] The two embodiments described above can each be modified such that the QuickConnect network acts as an intelligent replicator. The media replication is performed intelligently at the edge of the terminating networks rather than at the originating network.

[0027] As illustrated in Figure 7 (the modification of the first embodiment) instead of originating carrier duplicating media and signaling for each member of the group, the originating carrier is limited to duplicating for the members belonging to its own network. The QuickConnect network is responsible for

translating and duplicating incoming signaling and media on a per carrier basis. The involved carrier shall replicate the messages for each member belonging to its network.

[0028] With the exception of the signaling and media duplication, the operation of this embodiment is similar to the operation for the first embodiment. The signaling and media duplication for various legs is distributed across originating, QuickConnect and terminating networks as depicted by the circles in Figure 8.

[0029] As illustrated in Figure 9 (the modification to the second embodiment) the QuickConnect network, instead of duplicating for each member, creates a single message for each carrier involved in the call and relies on the carriers to perform duplications across their own network.

[0030] Operation of this embodiment is similar to that for the second embodiment, the only difference being that of duplication of signaling and media for each member of the call. Figure 10 illustrates the signaling for the modification of the second embodiment.

[0031] While the invention has been described in connection with various embodiments, it will be understood that the invention is capable of further modifications. This application is intended to cover any variations, uses or adaptation of the invention following, in general, the principles of the invention, and including such departures from the present disclosure as, within the known

and customary practice within the art to which the invention pertains.

What is claimed is:

1. A system for facilitating group calls across different dispatch operators, the system comprising:
 - a first dispatch network;
 - a second dispatch network; and
 - an inter-working network, wherein the inter-working network performs translation and routing of session signaling and media between the first and second dispatch networks and a dispatch controller in a network where a dispatch session originates manages talker arbitration, floor allocation and media duplication.
2. A system for facilitating group calls across different dispatch operators, the system comprising:
 - a first dispatch network;
 - a second dispatch network; and
 - an inter-working network, wherein the inter-working network performs translation and routing of session signaling and media between the first and second dispatch networks and manages talker arbitration, floor allocation and media duplication and delay smoothing.
3. A system for facilitating group calls across different dispatch operators, the system comprising:
 - a first dispatch network;

a second dispatch network; and

an inter-working network, wherein the inter-working network performs translation and routing of session signaling and media between the first and second dispatch networks and a dispatch controller in a network where a dispatch session originates manages talker arbitration, floor allocation and performs media duplication for members of the group call in the originating network, and wherein the inter-network network performs media duplication for all other networks.

4. A system for facilitating group calls across different dispatch operators, the system comprising:

a first dispatch network;

a second dispatch network; and

an inter-working network, wherein the inter-working network performs translation and routing of session signaling and media between the first and second dispatch networks and a dispatch controller in a network where a dispatch session originates manages talker arbitration, floor allocation, and wherein a dispatch controller in each network involved in a dispatch session performs media duplication for all members of the group call within its network.

ABSTRACT OF THE DISCLOSURE

Methods and systems for facilitating group dispatch session across network operators are provided. In accordance with exemplary embodiments of the present invention, a group management server brokers propagation of group definitions across carriers and provides a root repository for all group definitions spanning multiple carriers. In accordance with exemplary embodiments of the present invention, the QuickConnect network provides inter-working across multiple dispatch carriers. To support group calls the QuickConnect network can act as a pass-through, act as a controller or as an intelligent replicator.

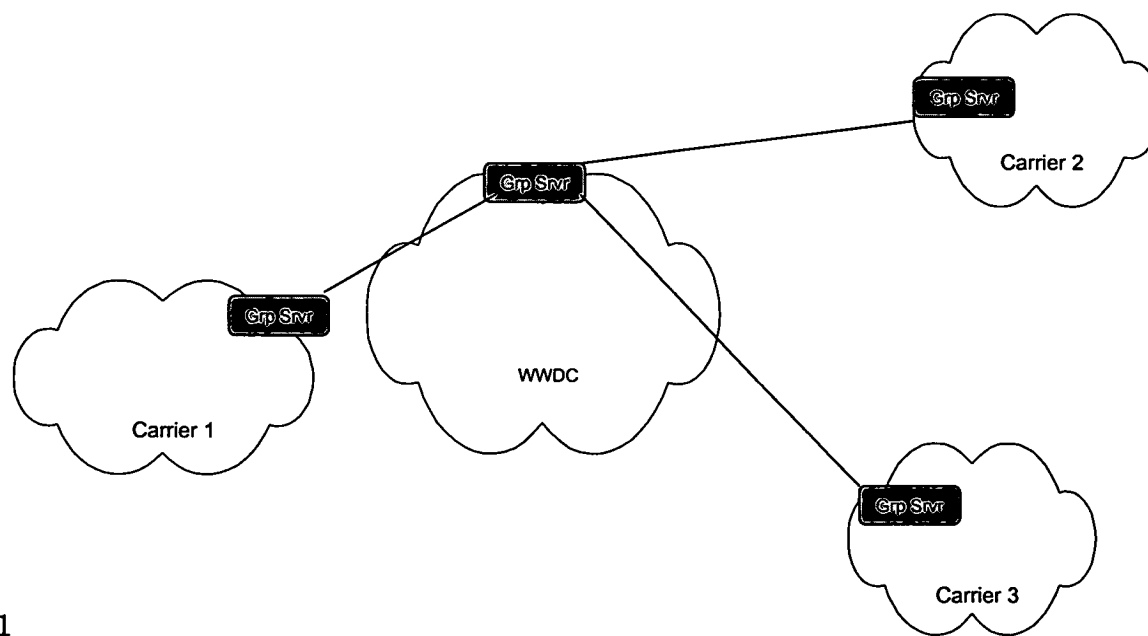


FIGURE 1

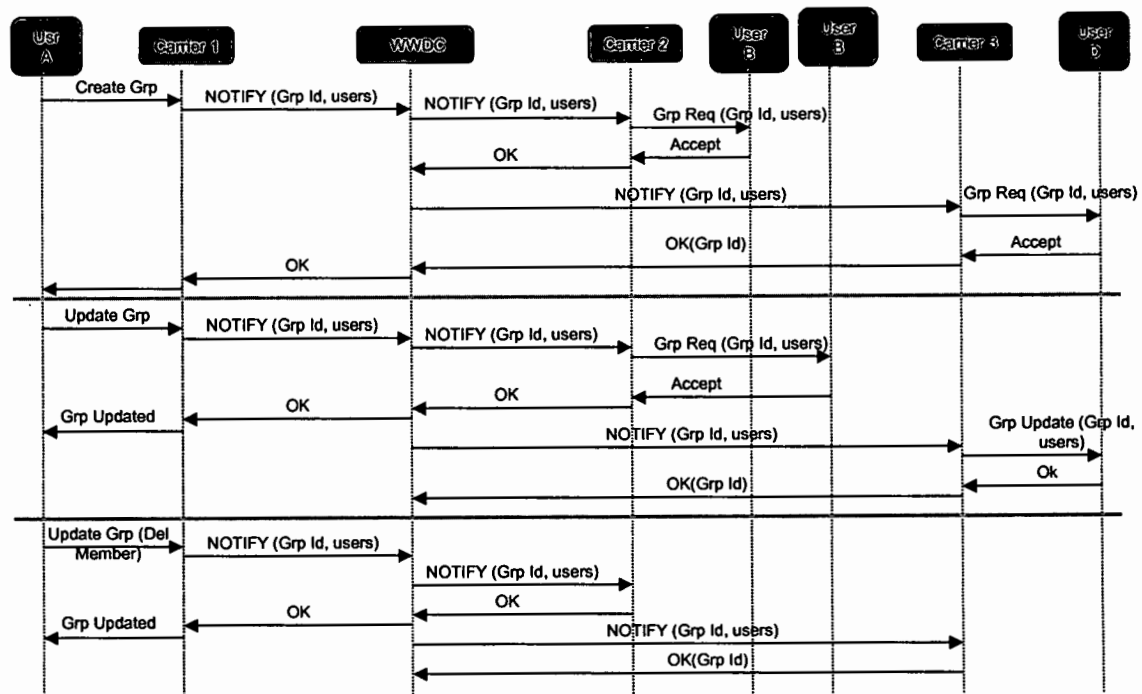


FIGURE 2

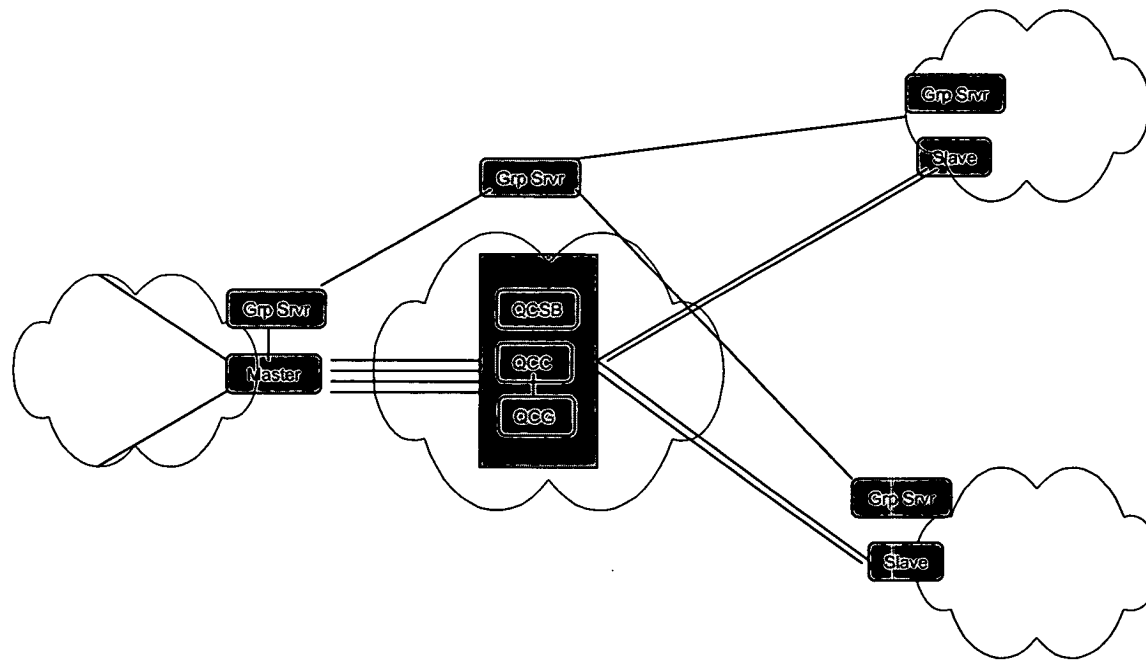


FIGURE 3

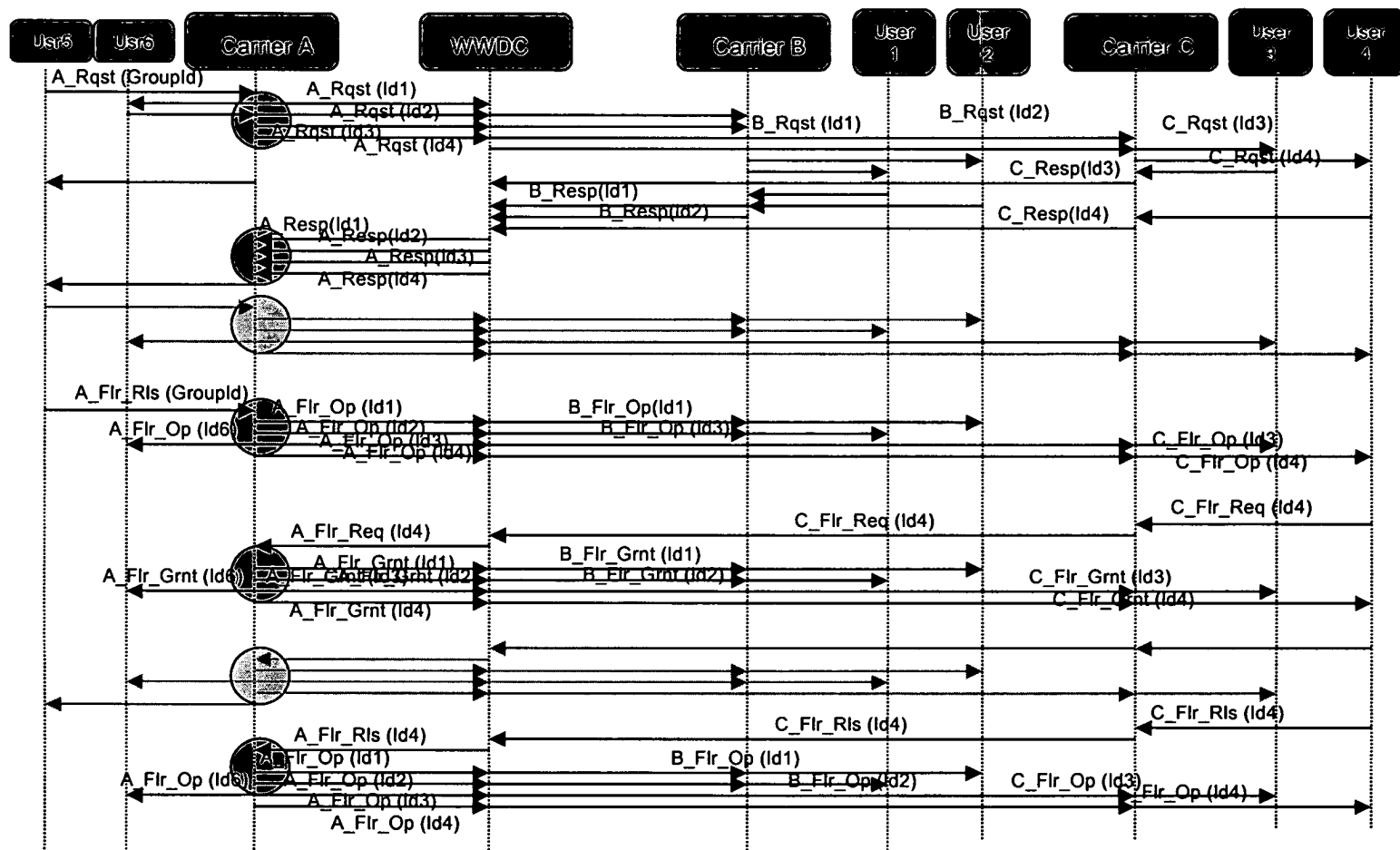
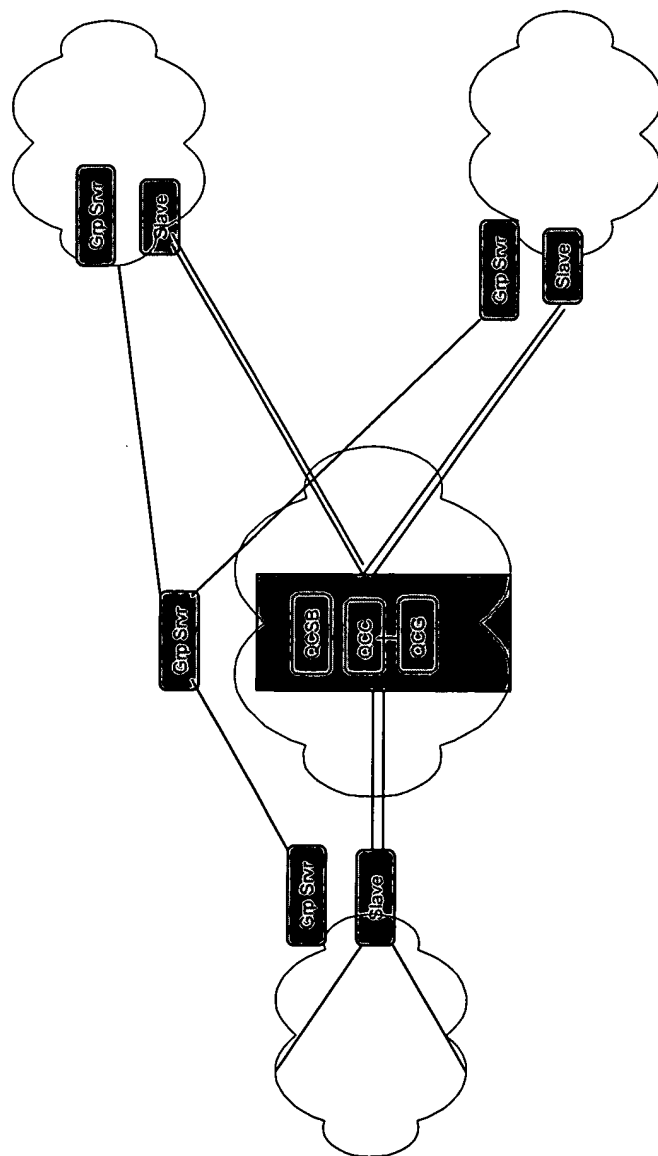


FIGURE 4

FIGURE 5



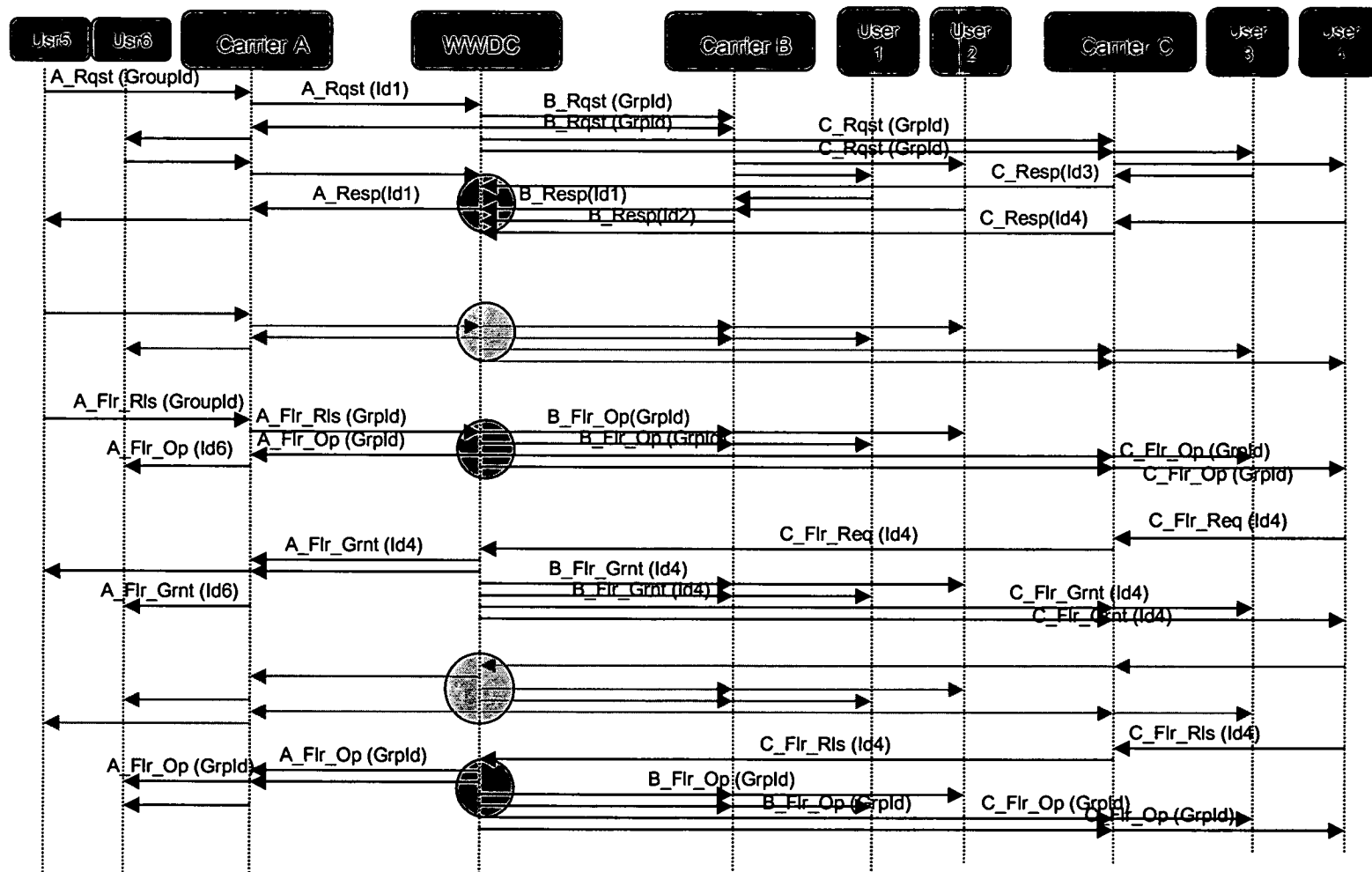


FIGURE 6

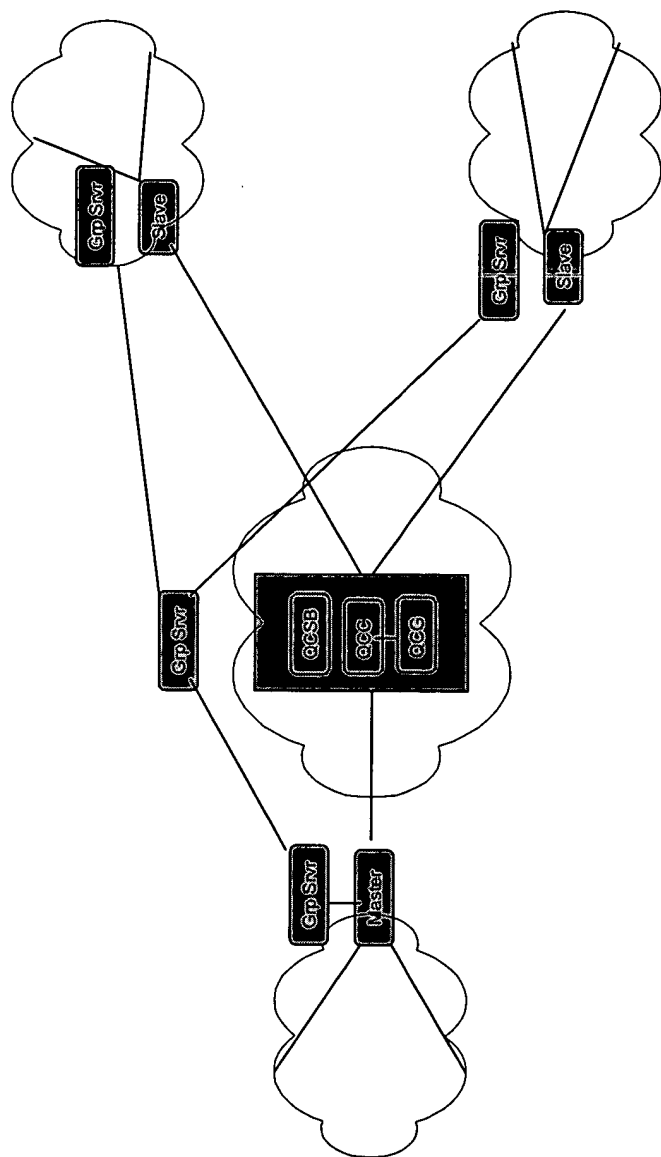


FIGURE 7

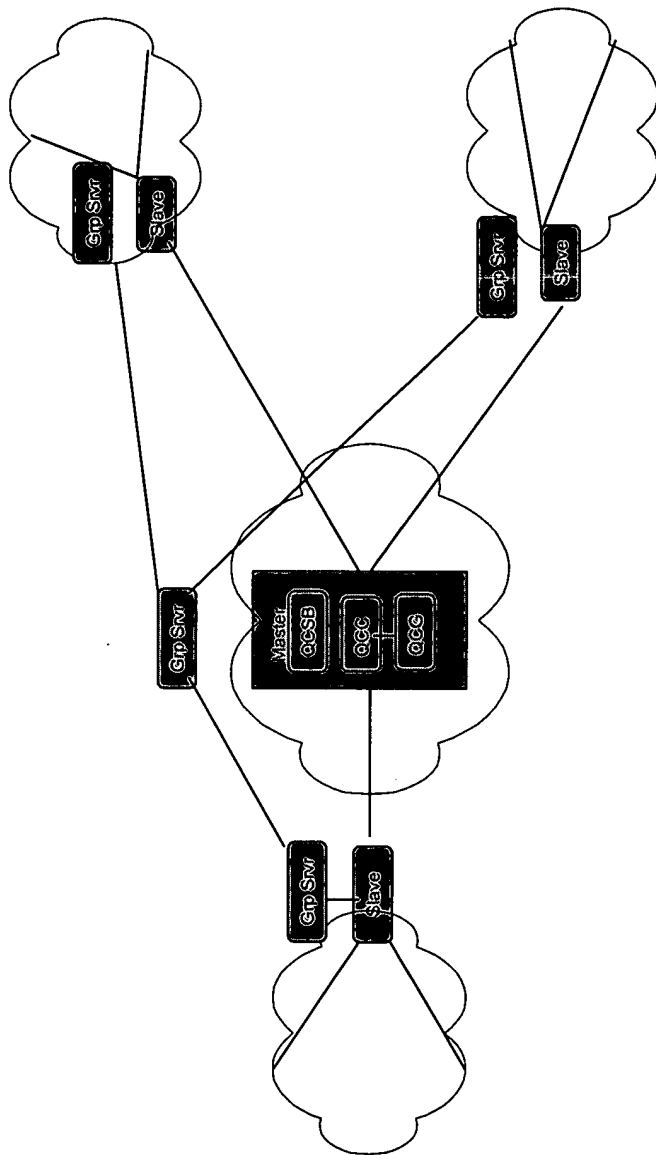


FIGURE 9

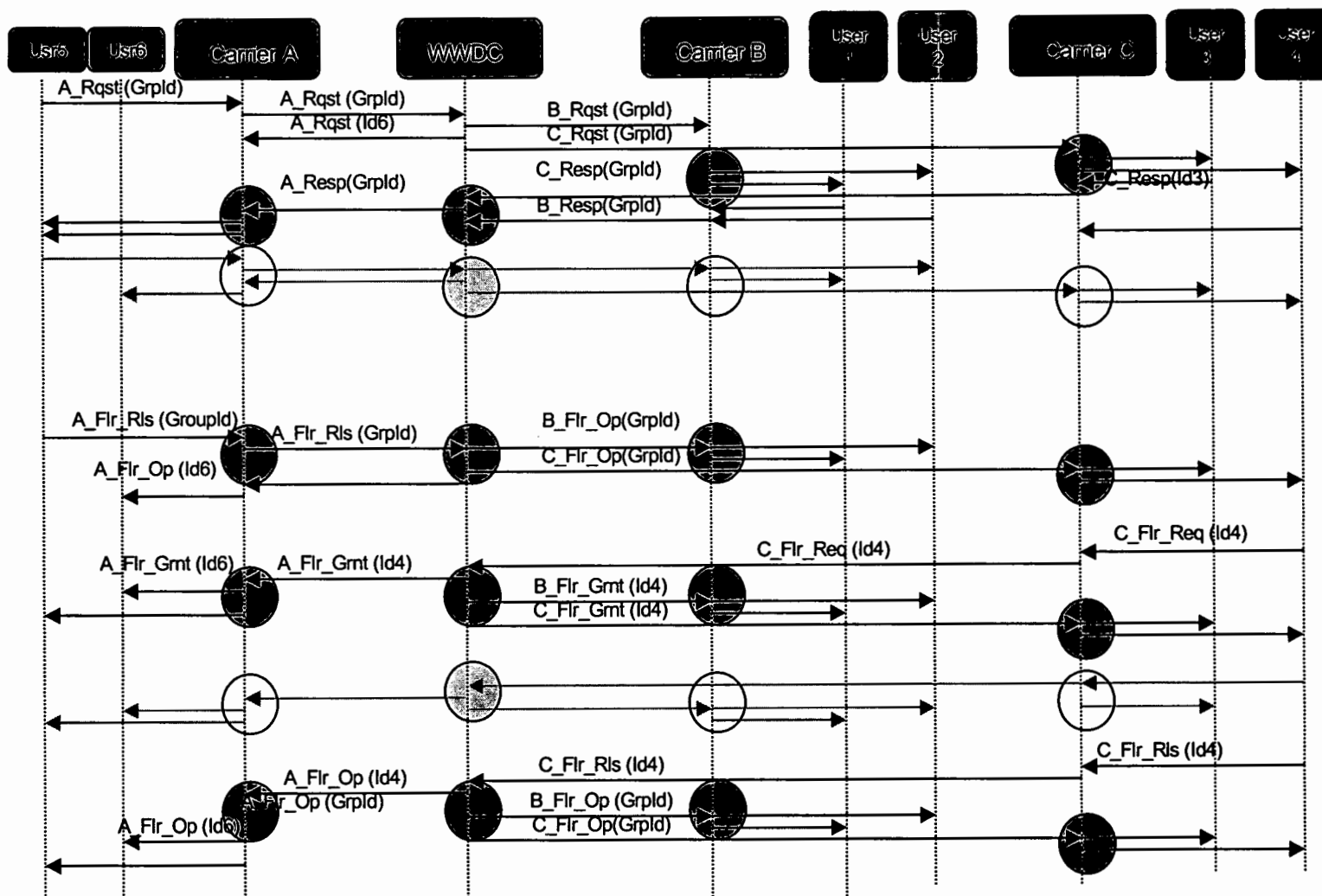


FIGURE 10

PATENT APPLICATION SERIAL NO. _____

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FEE RECORD SHEET

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APPLICATION DATA SHEET

APPLICATION INFORMATION

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Attorney Docket No.::	100773.55337PV
Total Drawing Sheets::	Ten (10)

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