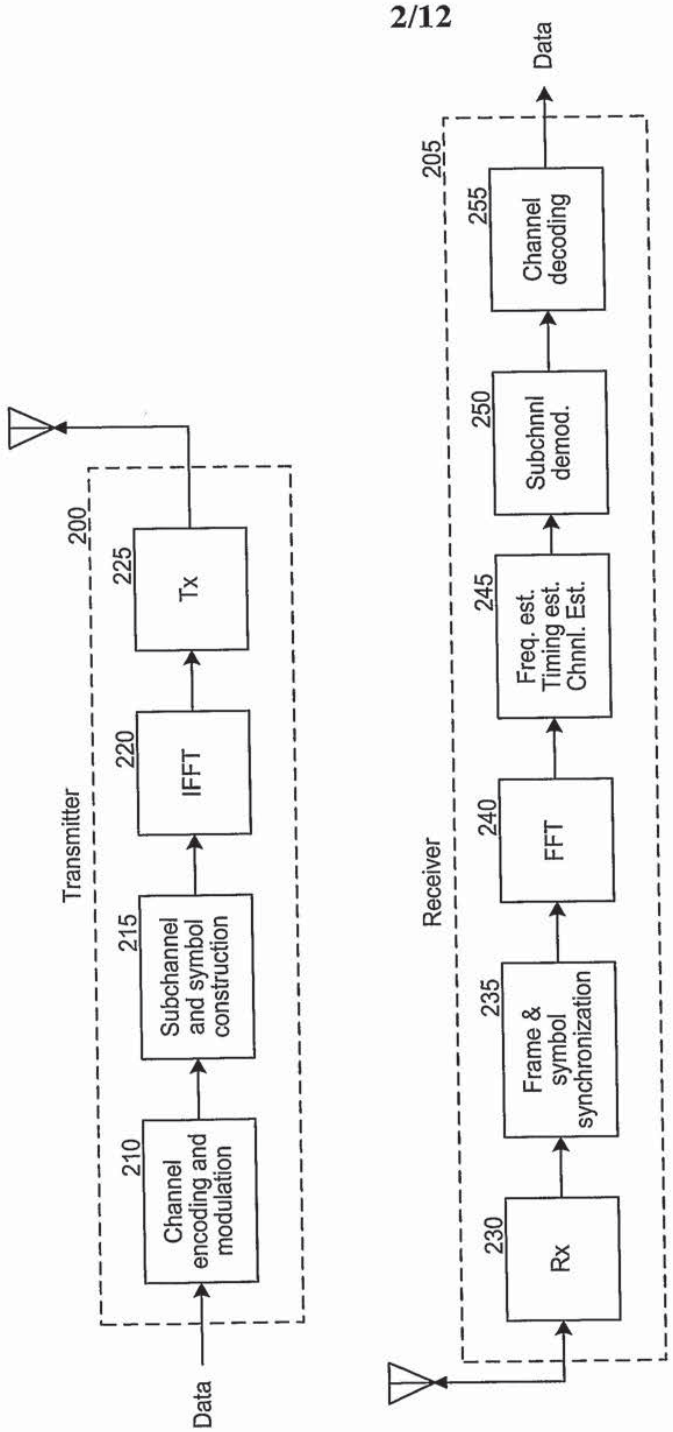

Transmitter
200
Data
210
Channel encoding and modulation
215
Subchannel and symbol construction
220
IFFT
225
Tx
Receiver
205
Data
230
Rx
235
Frame & symbol synchronization
240
FFT
245
Freq. est. Timing est. Chnnl. Est.
250
Subchnnl demod.
255
Channel decoding

FIG. 2

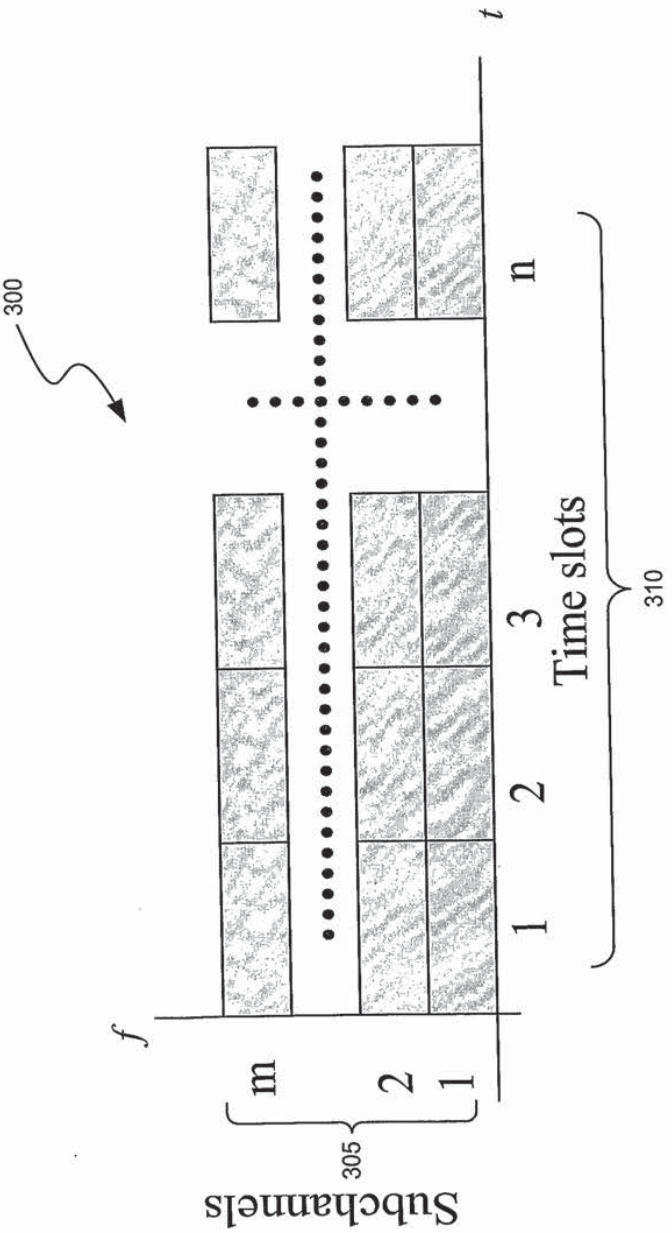


FIG. 3

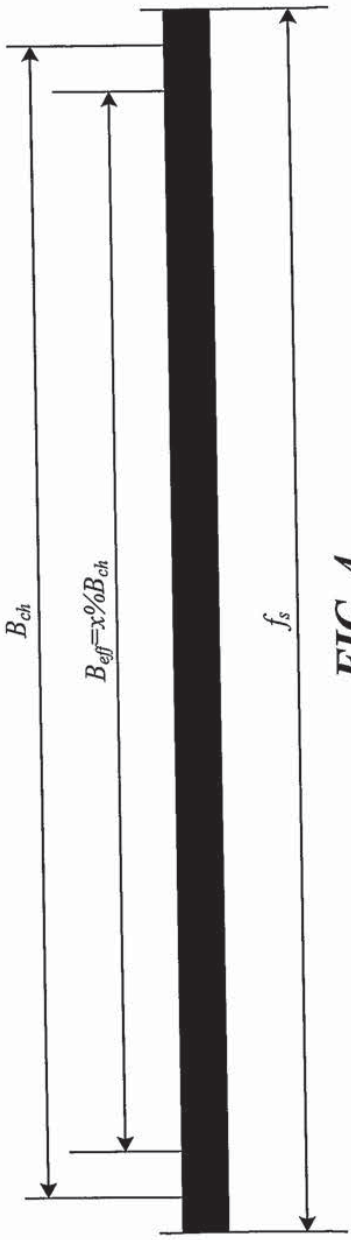


FIG. 4

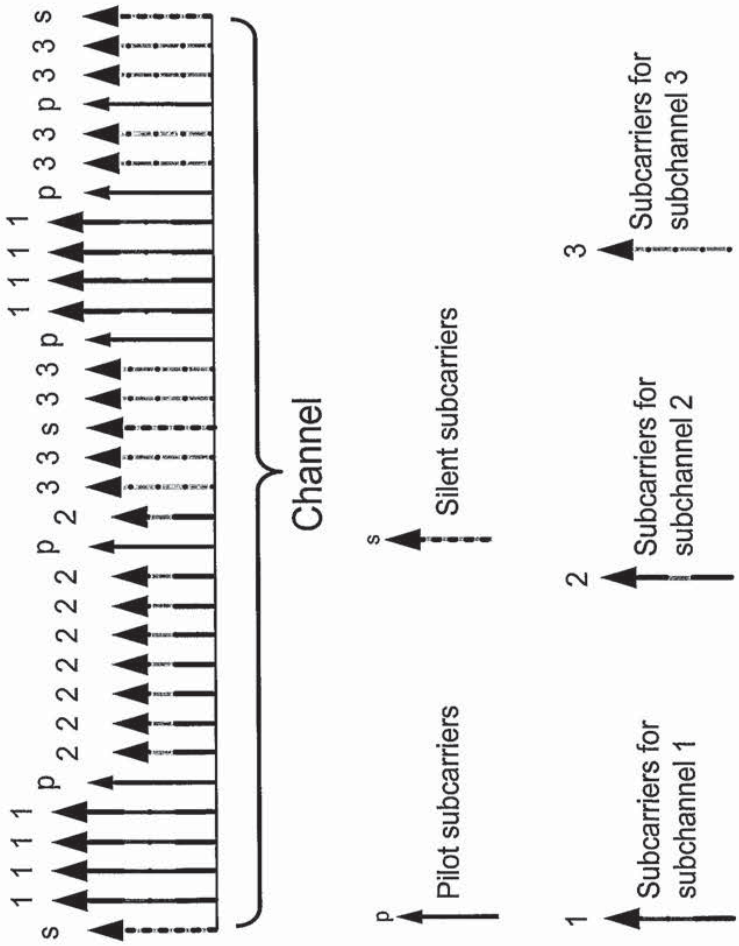

s 1 1 1 1 p 2 2 2 2 2 2 2 p 3 3 s 3 3 p 1 1 1 1 p 3 3 p 3 3 s
Channel
p
Pilot subcarriers
s
Silent subcarriers
1
Subcarriers for subchannel 1
2
Subcarriers for subchannel 2
3
Subcarriers for subchannel 3

FIG. 5

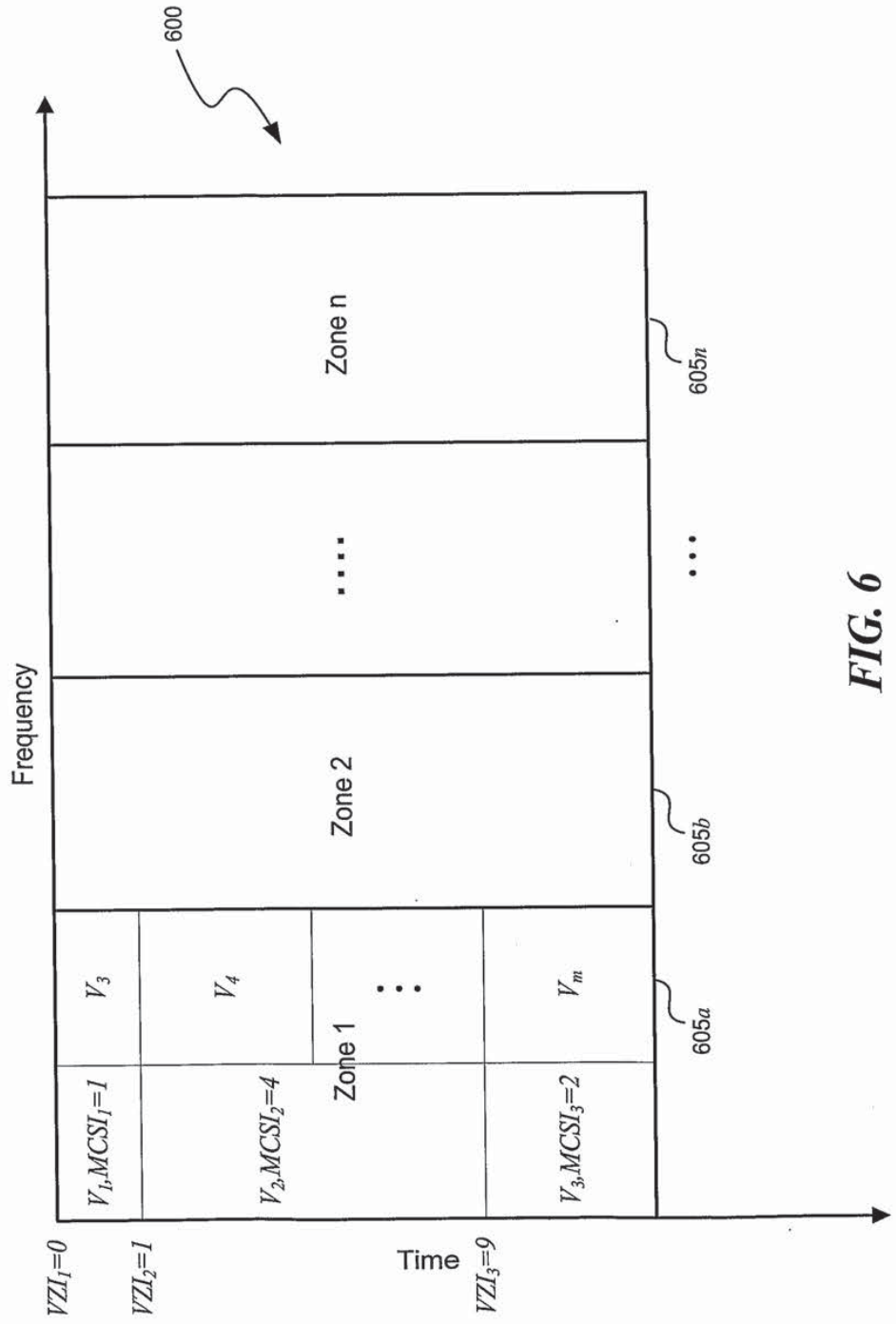

600
Frequency
Time
Zone 1
Zone 2
Zone n
605a
605b
605n
V_1,$MCSI_1$=1
V_2,$MCSI_2$=4
V_3,$MCSI_3$=2
V_3
V_4
V_m
VZI_1=0
VZI_2=1
VZI_3=9

FIG. 6

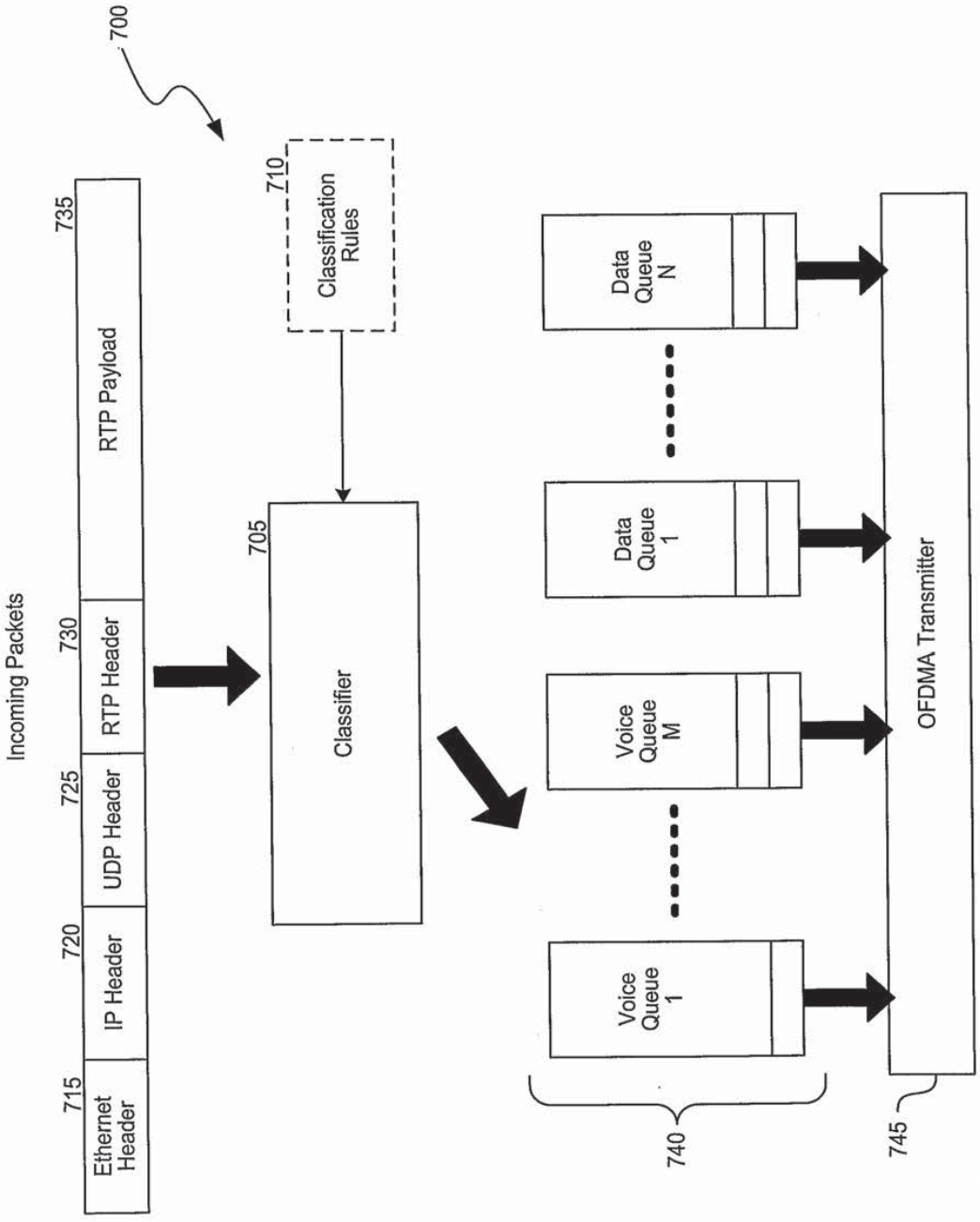

700
Incoming Packets
735
RTP Payload
730
RTP Header
725
UDP Header
720
IP Header
715
Ethernet Header
710
Classification Rules
705
Classifier
Data Queue N
Data Queue 1
Voice Queue M
Voice Queue 1
740
OFDMA Transmitter
745

FIG. 7

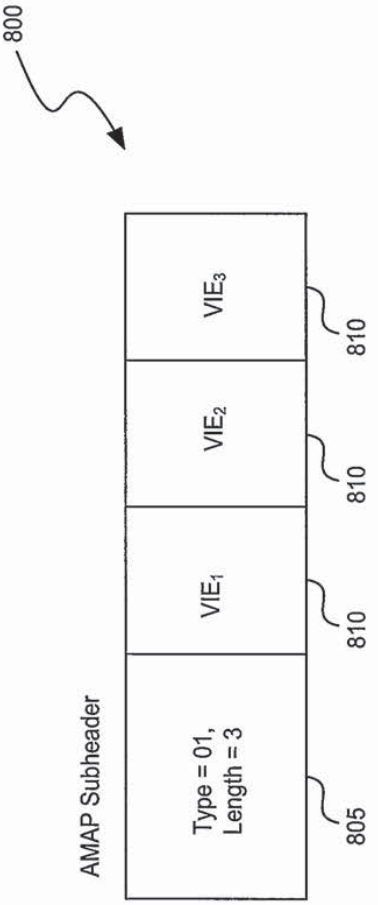

800
AMAP Subheader
Type = 01,
Length = 3
VIE1
VIE2
VIE3
805
810
810
810

FIG. 8A

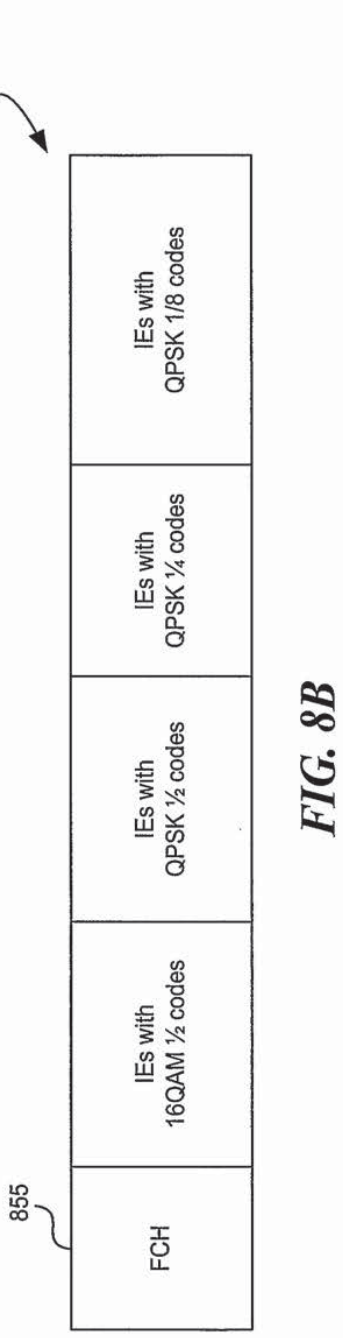

850
855
FCH
IEs with
16QAM ½ codes
IEs with
QPSK ½ codes
IEs with
QPSK ¼ codes
IEs with
QPSK 1/8 codes

FIG. 8B

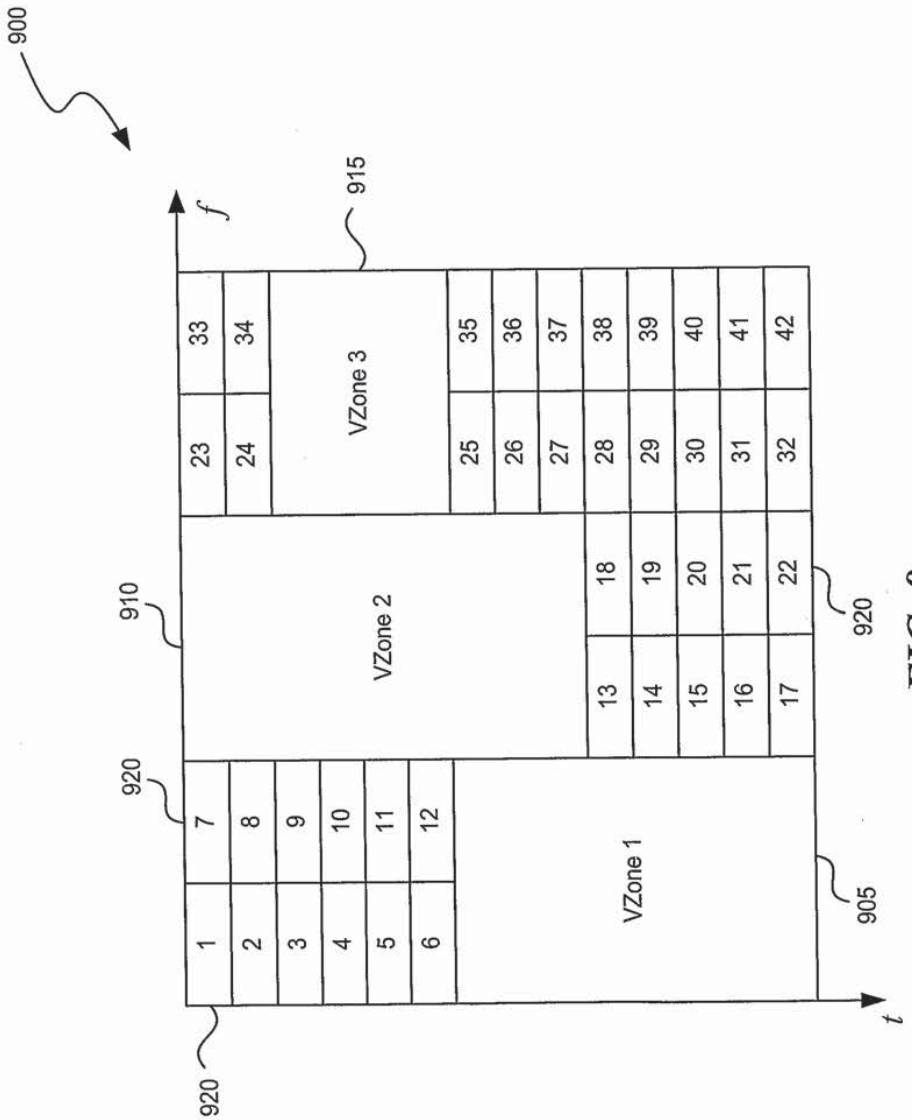

900
f
915
VZone 3
VZone 2
VZone 1
910
920
905
t
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
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41
42

FIG. 9

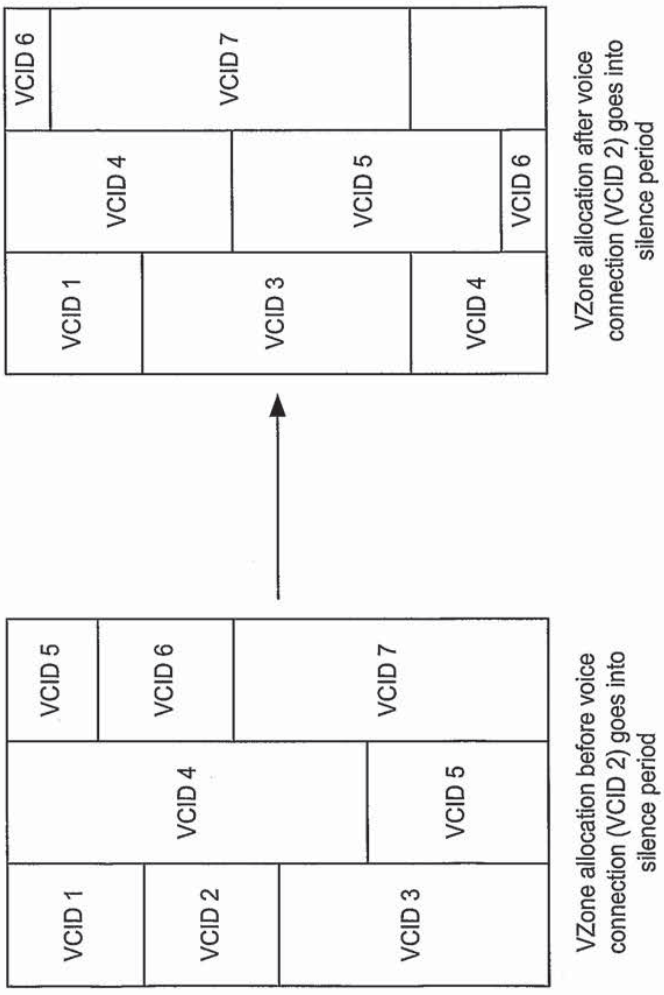

VCID 1
VCID 2
VCID 3
VCID 4
VCID 5
VCID 5
VCID 6
VCID 7
VZone allocation before voice connection (VCID 2) goes into silence period
VCID 1
VCID 3
VCID 4
VCID 4
VCID 5
VCID 6
VCID 6
VCID 7
VZone allocation after voice connection (VCID 2) goes into silence period

FIG. 10A

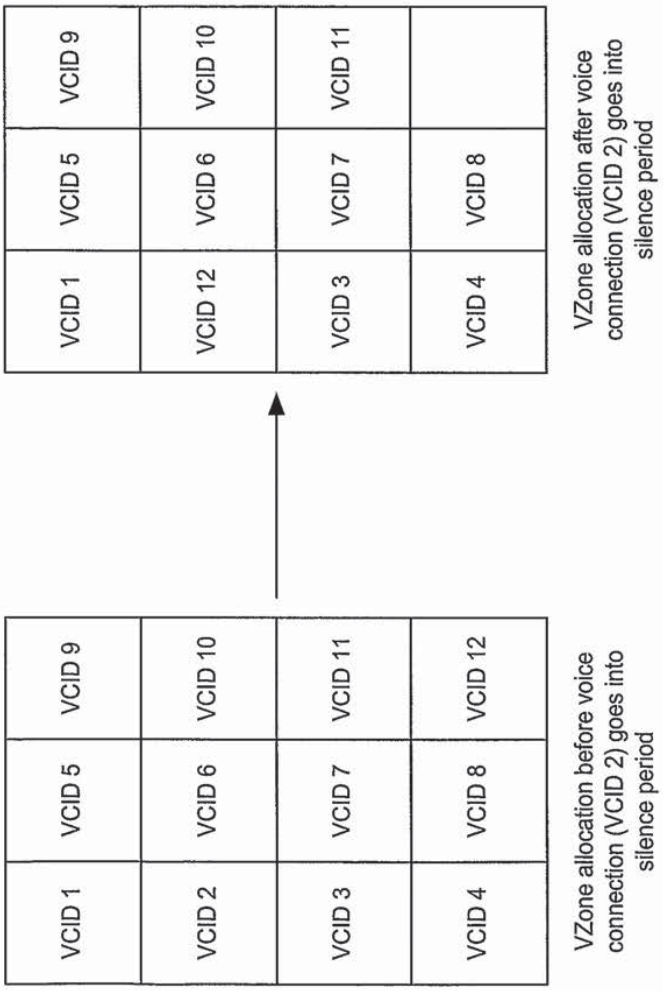

VCID 1
VCID 5
VCID 9
VCID 2
VCID 6
VCID 10
VCID 3
VCID 7
VCID 11
VCID 4
VCID 8
VCID 12
VZone allocation before voice connection (VCID 2) goes into silence period
VCID 1
VCID 5
VCID 9
VCID 12
VCID 6
VCID 10
VCID 3
VCID 7
VCID 11
VCID 4
VCID 8
VZone allocation after voice connection (VCID 2) goes into silence period

FIG. 10B

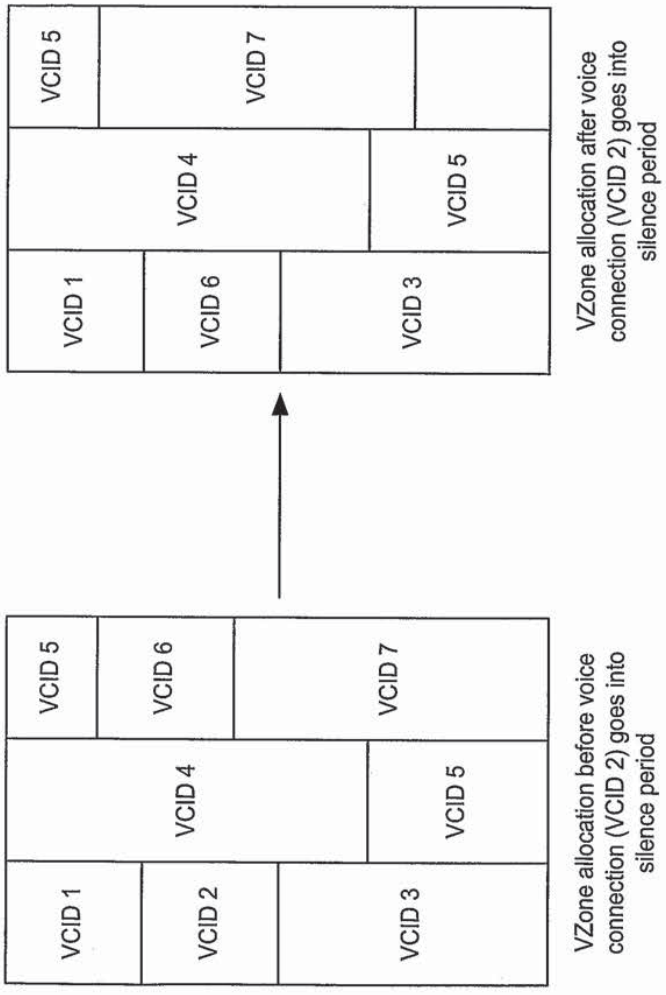

VCID 1
VCID 2
VCID 4
VCID 3
VCID 5
VCID 6
VCID 7
VCID 5
VZone allocation before voice connection (VCID 2) goes into silence period
VCID 1
VCID 6
VCID 4
VCID 3
VCID 5
VCID 7
VCID 5
VZone allocation after voice connection (VCID 2) goes into silence period

FIG. 10C

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Additional inventors are being named on the _____ *separately numbered sheets attached hereto*

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Method and Apparatus for Multi-Carrier Packet Communication with Reduced Overhead

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ENCLOSED APPLICATION PARTS *(check all that apply)*

☒ Specification *Number of Pages* 11 ☐ CD(s), Number _____

☒ Drawing(s) *Number of Sheets* 13 ☐ Other (specify) _____

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Respectfully submitted,

SIGNATURE _____

TYPED or PRINTED NAME Titus Lo

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Date 09/27/2005

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Docket Number: _____

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Titus	Lo	Bellevue, WA
Ruifeng	Wang	Sammamish, WA

Number 1 of 1

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Method and Apparatus for Multi-Carrier Packet Communication with Reduced Overhead

Xiaodong Li, Haiming Huang, Titus Lo, and Ruifeng Wang

1 Background of the Invention

Bandwidth efficiency is one of the most important system performance factors for wireless communication systems. In packet based data communication, where the mixed traffic has a bursty and irregular pattern, application payloads are of different sizes and with different quality of service (QoS) requirements. In order to accommodate different applications, a wireless communication system should be able to provide a high degree of flexibility. However, in order to support such flexibility, additional overhead are usually required. For example, in a wireless system based on the IEEE 802.16 standard, multiple service flows are established for each mobile station to support different applications. At the medium access control (MAC) layer, each service flow is mapped into a wireless connection. The MAC scheduler allocates wireless air link resources to these connections. Special scheduling messages, DL-MAP and UL-MAP are defined to broadcast the scheduling decisions to the mobile stations.

In the MAP message in IEEE802.16, there is a significant overhead. First of all, each connection is identified by a 16 bits connection ID (CID). The CID is included in the MAP to identify the mobile station. The maximum number of connections that a system can support is therefore 65,536. Each mobile station has minimal two management connections for control and management messages and various number of traffic connections for application data traffic. Secondly, the airlink resource allocation can be correspondent to any time/frequency region. It is identified by the time domain scale with start symbol offset (8 bits) and symbol length (7 bits) and the frequency domain scale with start logical subchannel offset (6 bits) and numbers of allocated subchannels (6 bits). Due to the fact that different application has different resource requirement, the allocated resource region is irregular from connection to connection. Thirdly, the modulation and coding scheme is identified by MCS code, called as either downlink interval usage code (DIUC) or uplink interval usage code (UIUC), which is 4 bits. Another 2 bits are used to indicate the coding repetition in addition to 3 bits for power control. Overall, the overhead of a MAP element is 52 bits. For applications such as voice over IP, the payload of an 8Kbps voice codec is 20 bytes in every 20ms. The overhead of the MAP element alone can be as much as 32.5%, thereby resulting in a relatively low spectral efficiency.

The present invention describes the method and apparatus to reduce overhead in a multi-carrier packet communication system, thereby improve the spectral efficiency of the system.

2 Summary of the Invention

In this invention are described method and apparatus for a multi-carrier packet communication

system with reduced overhead. A specific area in the time-frequency resource is designated for certain applications, such as VoIP. Adaptive modulation and coding method with modular resource utilization is designed to improve transmission spectral efficiency, while minimizing the control overhead. Method and apparatus are designed to take advantage of the special characteristics of the applications to minimize the number of bits to identify the destination of the packets. A control message is sent prior to the transmission of an application packet to indicate the packet destination, the radio resource utilized by the packet, and the modulation and coding method for the packet.

The system mentioned in this invention can be of any special formats such as Code Division Multiple Access (CDMA), Orthogonal Frequency Division Multiple Access (OFDMA), or Multi-Carrier Code Division Multiple Access (MC-CDMA). Without loss of generality, OFDMA is taken as an example to illustrate the present invention. In addition, without loss of generality, voice applications are used as example applications to illustrate the present invention.

The subtitles are introduced for illustrating the aspects of the invention, and should not be interpreted as limiting the aspects of the invention.

3 Brief Description of the Drawings

The present invention will be thoroughly understood from the detailed description given below and from the accompanying drawings of various embodiments of the invention, which, however, should not be taken to limit the invention to the specific embodiments, but are for explanation and understanding only.

Figure 1: A basic multi-carrier wireless communication system consists of a transmitter and a receiver, which consist of the necessary functions for transmission and reception, respectively.

Figure 2: A cellular wireless network is comprised of a plurality of cells, in each of which the coverage is provided by a base station (BS). Within each coverage area, there are distributed mobile stations. A base station is connected to the backbone of the network via a dedicated link and also provides radio links to the mobile stations within its coverage.

Figure 3: The radio resource is divided into small units in both the frequency and time domains: subchannels and time slots. Subchannels are formed by subcarriers. The basic structure of a multi-carrier signal in the time domain is made up of time slots.

Figure 4: The relationship is shown between the sampling frequency, the channel bandwidth, and the usable subcarriers. For a given bandwidth of a spectral band or channel (B_{ch}), the number of usable subcarriers is finite and limited, whose value depends on the size of the FFT and the sampling frequency (f_s).

Figure 5: The basic structure of a multi-carrier signal in the frequency domain is made up of subcarriers. Data subcarriers can be grouped into subchannels in a particular way. Each subchannel may be set at a different power level.

Figure 6: An illustration of an OFDMA system with Classifier. Incoming application packets are classified by the Classifier based on classification rules. The classification rules can be configured statically or dynamically by a control process. Each classification rule is defined using parameters, such as application type, QoS parameters and other properties. Different application packets will be put into different data queues and transmitted by the OFDMA transmitter.

Figure 7: AMC resource for voice applications, where each unit is the time-frequency resource required for carrying the same specific amount of voice data using a given MCS.

Figure 8: A time-frequency zone, which is specially allocated for voice applications.

Figure 9: AMC is applied to MAP transmission, where subchannels using the same MCS are specified or defined using a MAP, to which the same MCS is also applied.

Figure 10: An illustration of special resource region with unit sequence defined in time-first order.

Figure 11: An illustration of a resource allocation scheme in the same VZone before and after a voice connection goes into the silence period. All subsequent resource allocations shift up to fill the gap.

Figure 12: Another example that illustrates a resource allocation scheme in the same VZone before and after a voice connection goes into silence period. In this scheme, the last resource unit occupies the resource gap.

Figure 13: Yet another example in case not all the resource units are using the same modulation and coding scheme in the same VZone. In this scheme, the last one using the same MCS scheme as the one which goes in to the silence period occupies the resource gap.

4 Detailed Description

4.1 Cellular Wireless Networks

In a cellular wireless network, the geographical region to be serviced by the network is normally divided into smaller areas called cells. In each cell the coverage is provided by a base station. Thus, this type of structure is normally referred to as the cellular structure (Figure 1). Within each coverage area, there are located mobile stations to be used as an interface between the users and the network. A base station is connected to the backbone of the network, usually by a dedicated link. A base station also serves as a focal point to distribute information to and collect information from its mobile stations by radio signals.

In a wireless network, there are a number of base stations, each of which provides coverage to its designated area, normally called a cell. If a cell is divided in to sectors, from system engineering point of view each sector can be considered as a cell. In this context, the terms "cell" and "sector" are interchangeable.

4.2 Multi-Carrier Communication System

In a wireless communication system with base stations and mobile stations, the transmission from a base station to a mobile station is called a downlink (DL) and the transmission from a mobile station to a base station is called an uplink (UL). In multi-carrier communication system, a transmitter may consist of the following functional blocks (Figure 2):

1. Channel encoding and modulation, including
    a. data bit randomization
    b. FEC encoding
    c. interleaving
    d. Modulation
2. Subchannel and symbol construction
3. Inverse fast Fourier transform (IFFT)
4. Transmission

A receiver may consist of the following functional blacks:

1. Reception
2. Frame and symbol synchronization
3. Fast Fourier transform (FFT)
4. Frequency, timing, and channel estimation
5. Subchannel demodulation
6. Channel decoding, including
    a. De-interleaving
    b. Decoding
    c. De-randomization

4.3 Multi-Carrier Signal Format

The physical media resource (e.g., radio or cable) in a multi-carrier communication system can be divided in both the frequency and time domains, as depicted in Figure 3. This canonical division provides a high flexibility and fine granularity for resource sharing.

The basic structure of a multi-carrier signal in the frequency domain is made up of subcarriers. For a given bandwidth of a spectral band or channel (B_{ch}), the number of usable subcarriers is finite and limited, whose value depends on the size of the FFT and the sampling frequency (f_s) and the effective bandwidth (B_{eff}), as depicted in Figure 4. There are three types of subcarriers, as illustrated in Figure 5.

1. Data subcarriers, which carries information data;

2. Pilot subcarriers, whose phases and amplitudes are predetermined and made known to all receivers and which are used for assisting system functions such as estimation of system parameters; and

3. Silent subcarriers, which have no energy and are used for guard bands and DC carrier.

The data subcarriers can be arranged, in a particular manner, into groups called subchannels to support scalability and multiple-access. The subcarriers forming one subchannel may or may not be adjacent to each other. Each user may use some or all of the subchannels.

The basic structure of a multi-carrier signal in the time domain is generally made up of time frames, time slots, and OFDM symbols. A frame consists of a number of time slots, whereas each time slot is comprised of one or more OFDM symbols. The OFDM time domain waveform is generated by applying the inverse-fast-Fourier-transform (IFFT) to the OFDM signals in the frequency domain. A copy of the last portion of the time waveform, known as the cyclic prefix (CP), is inserted in the beginning of the waveform itself to form the OFDM symbol.

In one embodiment, a mapper, as implied by the "Subchannel and Symbol Construction" box in Figure 2, is designed to map the logical frequency/subcarrier and OFDM symbol indices seen by upper layer facilities, such as the MAC resource scheduler or the coding and modulation modules, to the actual physical subcarrier and OFDM symbol indices. A contiguous time-frequency area before the mapping may be actually discontinuous after the mapping, and vice versa. On the other hand, in a special case, the mapping may be a "null process", which maintains the same time and frequency indices before and after the mapping. The mapping process may change from time slot to time slot, from frame to frame, or from cell to cell. Without loss of generality, in the invention, the terms "resource", "airlink resource", "physical resource", "radio resource", and "time-frequency resource" may refer to either the time-frequency resource before such mapping or that after such mapping.

4.4 Basic Connection ID's and Application Connection ID's

In accordance with aspects of certain embodiments of this invention, both basic connection identification (BCID) and application connection-specific identification (ACID) are employed to facilitate the control process.

When a mobile station enters the wireless network, it is first assigned a BCID for each direction of the wireless connection: downlink and uplink. A BCID can be used for control messages or generic (unclassified) application connections. The BCID for downlink may or may not be the same as that of the uplink.

In one embodiment, certain application data are classified into different application packet streams based on the application type, quality of service (QoS) requirement, or other properties. For example, voice application stream is identified based on the special value in the type of service (ToS) field of its IP header. A new combination of RTP/UDP/IP headers with the special IP ToS field value indicates a new voice application stream. Such a new stream is identified by peeking into the voice session setup protocol messages, such as session initiation protocol (SIP).

Figure 6 illustrates the design of an OFDMA system with a system component called Classifier.

Incoming application packets are classified by the Classifier based on classification rules. The classification rules can be configured statically or dynamically by a control process. Each classification rule is defined using parameters, such as application type, QoS parameters and other properties. Different application packets will be put into different data queues and transmitted by the OFDMA transmitter.

In one embodiment, a special connection is set up to transmit a special application stream to/from a mobile station over the air. An ACID can be assigned for the corresponding application packet flow. For example, for voice application, the ACID is a voice connection ID (VCID) that is assigned for voice packets. Furthermore, an application type can be further classified into different sub-types, based on certain properties of that application. For example, voice applications can be further classified into different sub-types based on the voice source coding (vocoder) methods (e.g., G.711 and G.729A) and are given corresponding sub-types of VCID's.

For certain multi-casting application, an ACID may be shared by multiple base stations or mobile stations.

Once established, the connection ID's, including BCID's and ACID's, are disseminated, through broadcasting messages for example, to the corresponding base station(s) and mobile station(s) for proper packet transmission and reception.

The medium access control (MAC) scheduler allocates airlink resource to different connections. A certain application types may be associated with a certain airlink resource block, such as a time and frequency region. Such correspondence is made known to base stations and mobile stations through default configuration or additional broadcasting messages. More details regarding the usage of airlink resources for certain application is described in the subsequent sections.

A connection ID is released once the wireless system determines that there is no need to continue the connection. For example, a voice connection and its VCID are released once the system detects deactivation of the voice stream. In one embodiment, the voice connection is deactivated if the voice session disconnect is detected through snooping SIP signaling. In another embodiment, the voice connection is released if there is no voice packet activity on the connection for a certain period of time.

In one embodiment, the same bit length is used in different types of connections ID's, including BCID's, and ACID's. In another embodiment, different types of connection ID's may have different bit length. For example, in a typical implementation, a BCID is 16-bit, to accommodate a large number of mobile stations and unclassified applications, while a VCID is 6-bit, to accommodate up to 64 simultaneous voice connections in a cell. The shorter ACID length, such as that of VCID, is beneficial for reducing the control overhead, especially when an application utilizes many small data packets, such as VoIP packets.

In another embodiment, an ACID is further augmented by other properties of the utilized airlink resources, such as time or frequency indices, to identify an application connection. This can be used to further reduce ACID bit length or to increase the maximum number of accommodated application connection given a certain ACID bit length. For example, a voice codec generates voice application data periodically. The allocation period is usually multiple times of the air link

frame duration. In this case, the air link frame number can be combined with a VCID to identify a voice connection. For example, the voice codec of G.723.1 generates a voice frame once every 30 milliseconds. The MAC scheduler allocates airlink resource to such a voice connection once every 30ms. In a wireless cellular system using 5ms frame duration, a single VCID can be shared by 6 voice streams, each associated with a different frame number to uniquely identify a voice connection.

4.5 Adaptive Modulation and Coding

In accordance with aspects of certain embodiments of this invention, a particular set of modulation and forward-error correction (FEC) coding schemes (MCS) are used for transmission of a particular type of applications under various channel conditions. For example, a prescribed set of MCS can be used for voice applications, as shown in Table 1.

In one embodiment, the MCS are designed to utilize modular resources. For example, as illustrated in Table 1, 80 raw modulation symbols are needed to transmit 160 information bits using 16QAM modulation and rate-½ coding, the highest available MCS in the table. The resource utilized by this highest MCS is called a basic resource unit (Unit), i.e., 80 raw symbols in this example. The resource utilized by other MCS is simply an integer multiple of the basic unit. For example, 4 units are required to transmit the same number of information bits using QPSK modulation with rate-¼ coding. The relationship of MCS and required number of basic units to carry the same specific amount of voice data is illustrated in Figure 7. Such modular utilization of resources of various MCS leads to significant reduction of control overhead, which becomes more evident in the subsequent sections.

Table 1. Modulation and coding schemes used for voice packets

MCSI	Modulation	Coding rate	Information bits	Raw symbols	Units
1	16QAM	1/2	160	80	1
2	QPSK	1/2	160	160	2
3	QPSK	1/4	160	320	4
4	QPSK	1/8	160	640	8

The MCS index (MCSI) conveys the information about modulation and coding schemes. For a known vocoder, MCSI also implies the number of AMC resource units required for a voice packet.

Coding and signal repetition can be combined to provide lower coding rates. For example, rate-1/8 coding can be realized by a concatenation of rate-½ coding and 4-time repetition.

The decision process for selecting proper MCS of a packet can vary by applications. In one

embodiment, the process for voice packets can be more conservative than that for general data packets due to the QoS requirements of the voice applications. For example, when the signal to interference noise ratio (SINR) is used as a threshold for selecting the MCS, the threshold value for voice packets is set higher than that for general data packets. For example, the SINR threshold of QPSK with rate-½ coding for voice packets is 12 dB, while that for general data packets is 10 dB.

4.6 Special Airlink Resource Region for Certain Applications

In accordance with aspects of certain embodiments of this invention, a particular region/zone of time-frequency resources are designated for a particular type of application so as to reduce the control overhead in MAC headers. Unused resources in one application zone may be allocated for other applications.

In one embodiment, a special time-frequency zone is allocated for voice applications, as shown in Figure 7, where VZone is the region designated for voice application, and V1 is the resource to be used for the first voice packet, and V2 is the resource to be used for the second voice packet, so on so forth.

In another embodiment, the time-frequency resource used for a voice packet, i.e., V1, or V2, ... , is indicated by the starting time-frequency coordinates and the ending coordinates, relative to the starting point of the VZone. The granularity in the time coordinates can be one or multiple OFDM symbols, and that in the frequency coordinates can be one or multiple subcarriers. The amount of control information may be significant to indicate certain arbitrary starting and ending coordinates of a voice packet.

In yet another embodiment, voice packets are arranged sequentially with certain rules in the VZone, as shown in Figure 7, where the VZone is divided into multiple columns and the voice packets are arranged from top down in each column and from left to right over columns. The width of each column can be a certain number of subcarriers.

In still another embodiment, the two-dimensional time-frequency coordinates are converted to a one dimensional offset to the origin of the VZone. Such offset is shown as VZone index (VZI) in Figure 7. For example, with MCS and modular resource, the granularity of the offset is defined as a basic resource Unit as described in the previous sections. For instance, the location offset for the first voice packet VZI_1=0 and its $MCSI_1$=1, which implies that one basic resource unit is used; the offset for the second voice packet VZI_2 = 1 and its $MCSI_2$=4, which implies that eight basic resource units are used; and the offset for the third voice packet VZI_3=9 and its $MCSI_3$=2, which implies that two basic resource units are used.

Using MCS resource Unit as the granularity of location offset of a packet (instead of OFDM symbol and subcarrier coordinates) reduces the number of bits required to represent its VZone indices. For example, to support a maximum of 64 calls in a cell, a maximum of 64x8=512 units might be used, assuming that every voice packet is transmitted using the lowest MCS. Therefore, a 9-bit number is sufficient to represent a VZI. In practice, different voice packets may be transmitted using different MCS's, some with MCSI=1, some with MCSI=4, so on so forth. According to statistics, a shorter bit-length than the maximum needed, for example 8 bits, may

be used for VZI for practical purpose.

In the case where an MCS is used with modular resource and voice packets are located sequentially in the VZone, the overhead required to indicate the location of a voice packet can be further reduced. In one embodiment, the VZone index of a packet can be inferred from the MCSI of the packets located before the subject packet. For example, if the first voice packet uses $MCSI_1$=1, 16QAM with ½ coding, and the second voice packet uses $MCSI_2$=4, QPSK with 1/8 coding, then the first two voice packets occupy 1+8=9 units, and the starting location of the third voice packet is the 9th unit. Therefore, the VZone index for each packet can be skipped in the control message and the overhead is further reduced.

In accordance with aspects of certain embodiments of this invention, resource allocation can be carried out in various manners. In one embodiment, an application zone may contain all subcarriers of one or multiple OFDM symbols or time slots. In another embodiment, the definition, such as the location and size, of an application zone, may be different from cell to cell. In yet another embodiment, the VZones of voice applications are allocated at different locations for neighboring cells to avoid inter-cell interference. In still another embodiment, the system allocates fixed amount of resource to each voice connection. The system uses AMC and matches it with adaptive multi-rate (AMR) voice coding to improve the voice quality.

4.7 Control Messages and Headers

In accordance with aspects of certain embodiments of this invention, a control message, often called Information Element (IE), is used to facilitate the control process.

In one embodiment, the IE is sent prior to transmitting an application packet to indicate the information on the packet, such as the packet destination, modulation and coding method, and the airlink resource used. For example, the IE for a voice packet includes (VCID, MCSI, VZI). In one embodiment, VCID is 6 bits, MCSI is 2 bits, and VZI is 8 bits, thereby resulting in a 2-byte IE overhead for each voice packet. In some cases, the IE regarding each voice packet includes only VCID and MCSI, thereby effectively reducing the IE overhead for each voice packet to 1 byte. The VZI can be inferred from the MCSI of the voice packets located before the subject voice packet.. Additional control information, such as power control information, can be added to the IE with additional bit fields.

In another embodiment, the base station sends the IE for a downlink packet to inform the mobile station for proper reception of the packet, and the base station sends the IE for an uplink packet to inform the mobile station for proper, subsequent transmission of the packet. The downlink and uplink packet IE's may be separately grouped together. The IE's may be broadcasted or multi-casted to corresponding destinations.

In yet another embodiment, the IE's of the same application type or subtype are grouped together. A special field, called Application MAP (AMAP) subheader, for a specific application type, may be added to the IE group. The subheader may indicate the application type and the length of the IE group. For example, as shown in Figure 8, an AMAP subheader for voice application (shown as VMAP) is followed by IE's for voice packets (Shown as VIE), where Length = 3 indicates that the subheader is followed by three voice IE's, and Type = 01 indicates

that the application type is voice.

In one embodiment, the IE's for all packets are transmitted with the same modulation and coding schemes (MCS). In another embodiment, adaptive modulation and coding (AMC) is used for the transmission of the IE's, as illustrated in Figure 9. A special rule, which is known to both base stations and mobile stations, can be used to determine the IE MCS, based on the MCS of its corresponding packet for proper reception of the IE. In one embodiment, the MCS for an IE is maintained the same as that of its corresponding application packet. In another embodiment, the MCS for an IE is one level more conservative than that of its corresponding packet. For example, if the MCSI for a packet is 2 (QPSK with rate-½ coding), then the MCSI for its IE is 3 (QPSK with rate-¼ coding).

In an embodiment, multiple IE's with the same MCS are grouped together into a block. An additional control message is transmitted prior to such block to indicate the length and the MCS used for the block.

In a system with one or multiple application zones, the remaining resource unused by the application zones can be treated as a special resource zone. The special resource zone may be irregular in shape. A particular mechanism in MAC scheduler tracks the time-frequency resources in this special zone and broadcasts the resource allocation in a special zone MAP message.

In one embodiment, the special zone MAP message explicitly identifies the resource region, for example using the time and frequency coordinates of a resource block. The mobile station can identify its own resource by decoding the MAP message.

In another embodiment, both the base station and the mobile station share the configuration information of the special resource region, and view the special region as a contiguous resource region. The MAP message only includes the resource allocation information in the special resource zone, using connection ID, resource identification parameters and MCS index.

In yet another embodiment, the MAP message can be further compressed if the sequence of the resource units in the special resource region is pre-defined. A so-called time first sequence assigns smaller sequence number to the units in the time axle. Figure 10 shows the time first sequence definition. The special resource region is illustrated in the shaded area. Similarly, the unit sequence number can be assigned along the frequency axle.

4.8 Voice Activity Detection

Typical voice conversations contain approximately 50 percent silence. The silence period in conversation is detected by a vocoder using technologies such as Voice Activity Detection (VAD). Voice packets are only generated when voice activity is detected. During the silence period, the voice packet data rate is greatly reduced.

The VAD indication can also be used by the MAC scheduler at the base station to adjust the bandwidth allocation for the voice connection.

In the uplink direction, the mobile station sends a special MAC message once the VAD indication is received from its vocoder. The MAC message indicates to the base station that the

voice data rate is reduced temporarily. By receiving such an indication, the MAC scheduler can reduce the airlink resource allocation to the voice connection. Similarly, if the VAD indicates new voice activity, the mobile station notifies the base station using a similar mechanism and the original resource allocation schedule is re-applied to the voice connection.

In the downlink direction, if there is no voice packet to be transmitted over a voice connection, the MAC scheduler allocates the resource to other voice connections.

Once a voice connection is in the silence period, the MAC scheduler reduces the resource allocation to the mobile station. As a consequence, a resource block previous allocated for the connection in the VZone may become vacant. Several methods can be used to deal with such fragmentation in the VZone.

In one embodiment, the MAC scheduler at the base station reallocates the resource with the objective of minimizing the impact to other voice connections, such as their adaptive modulation and coding processes.

In another embodiment, the MAC scheduler maintains the resource allocation of the other voice connections, and allocates the resource vacated by the silent voice connection to new voice connections or other application packets.

In another embodiment, the MAC scheduler moves all the subsequent allocations up to fill the resource gap. As shown in Figure 11, once voice connection, identified by VCID 2, is in the silence period, the other voice connections occupy the resource used to allocate for VCID 2.

In another embodiment, the MAC scheduler uses the last voice time-frequency resource, in the same VZone, to fill the resource gap of a silent voice connection. Figure 12 illustrates such a case, the last voice connection, identified by VCID 12, occupies the resource allocation gap of the voice connection (VCID 2).

In yet another embodiment, the MAC scheduler uses the last voice time-frequency resource, with the same coding and modulation scheme, in the same VZone, to fill the resource gap. The new resource gap introduced by such a replacement is filled by the subsequent voice time-frequency resource. As shown in Figure 13, voice connection (VCID 6) uses the same coding and modulation scheme as voice connection (VCID 2), and is the last one in the same VZone. Once voice connection (VCID 2) goes into silence period, the MAC scheduler allocates its resource to voice connection (VCID 6). And other voice connections after voice connection (VCID 6) are allocated with subsequent resources.

Best Available Copy

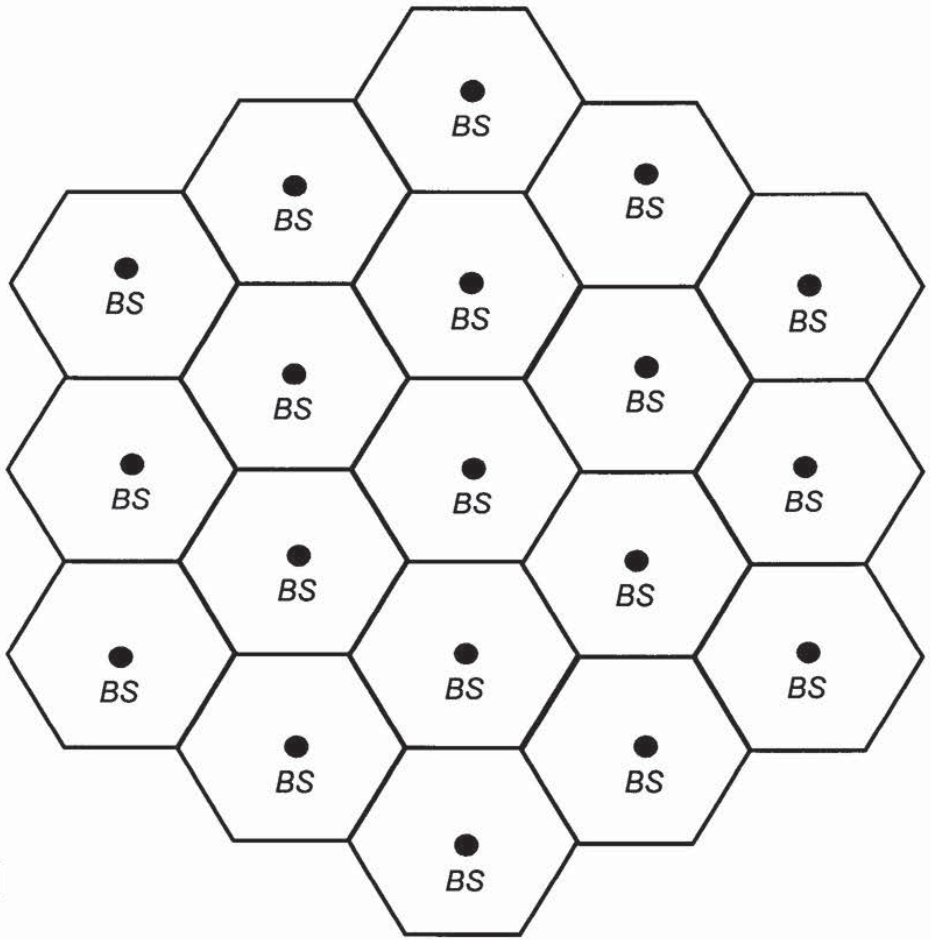


Figure 1

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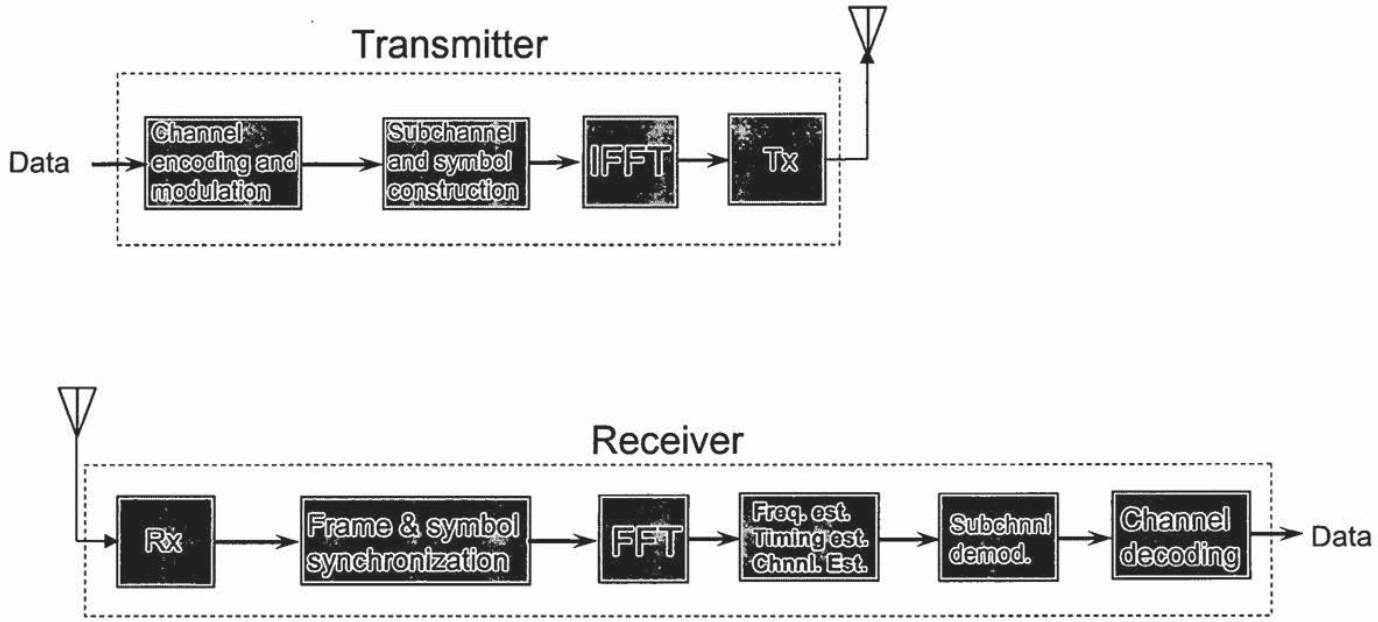


Figure 2

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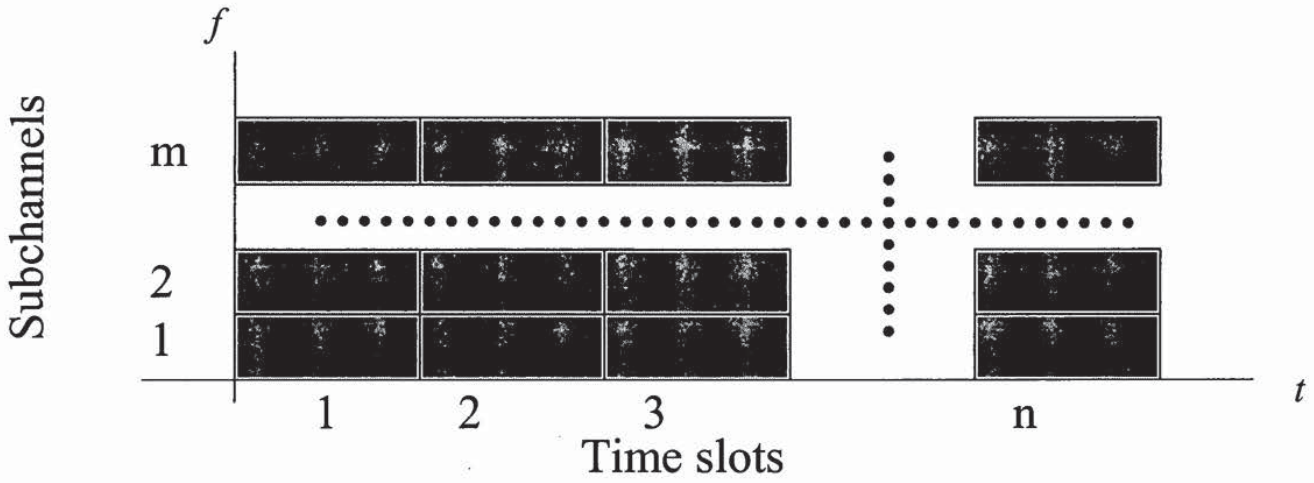
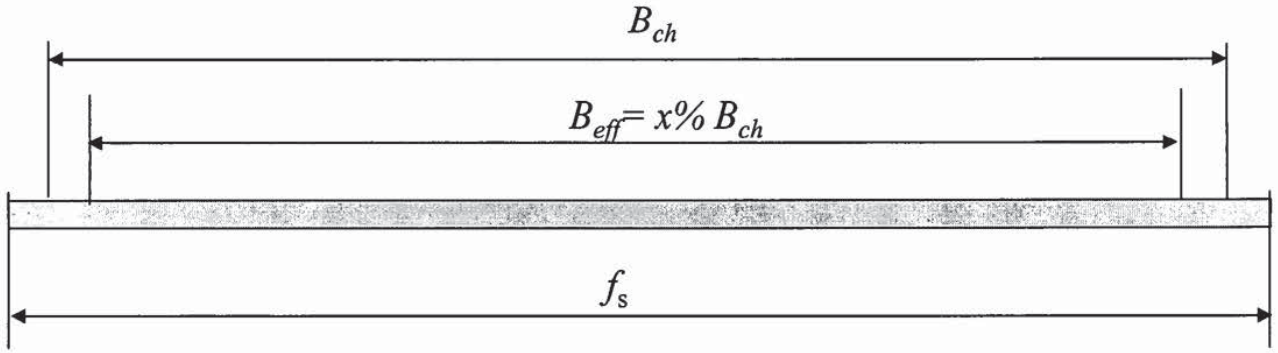


Figure 3



$$\#\text{ of usable subcarriers} = \frac{B_{eff}}{f_s} \times N_{fft}$$

Figure 4

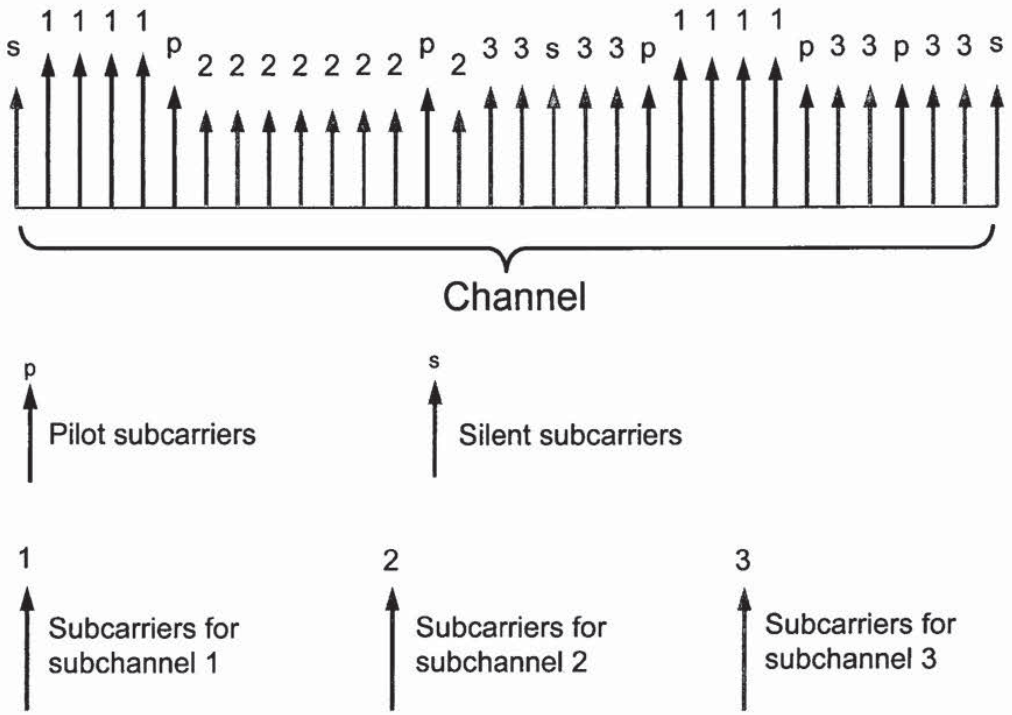

s 1 1 1 1 p 2 2 2 2 2 2 2 p 2 3 3 s 3 3 p 1 1 1 1 p 3 3 p 3 3 s
Channel
p
Pilot subcarriers
s
Silent subcarriers
1
Subcarriers for subchannel 1
2
Subcarriers for subchannel 2
3
Subcarriers for subchannel 3

Figure 5

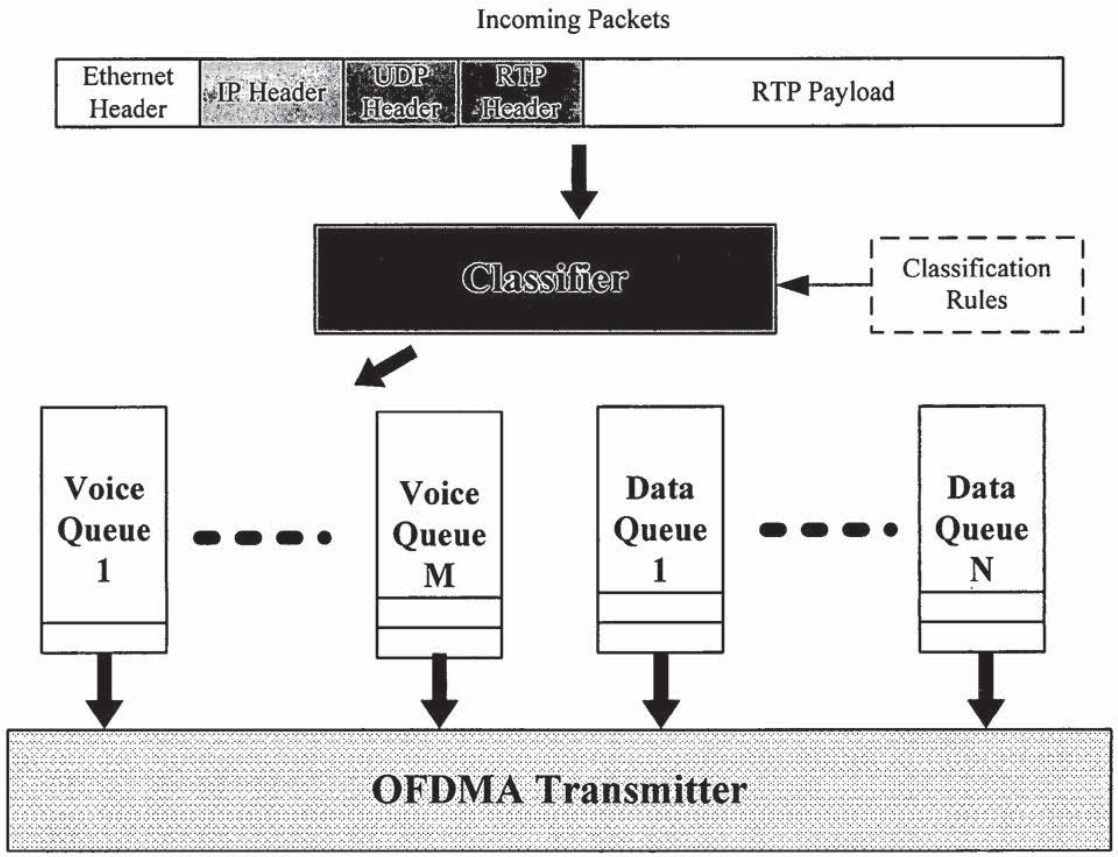

Incoming Packets
Ethernet Header
IP Header
UDP Header
RTP Header
RTP Payload
Classifier
Classification Rules
Voice Queue 1
Voice Queue M
Data Queue 1
Data Queue N
OFDMA Transmitter

Figure 6

AMC with Modular Resource Utilization

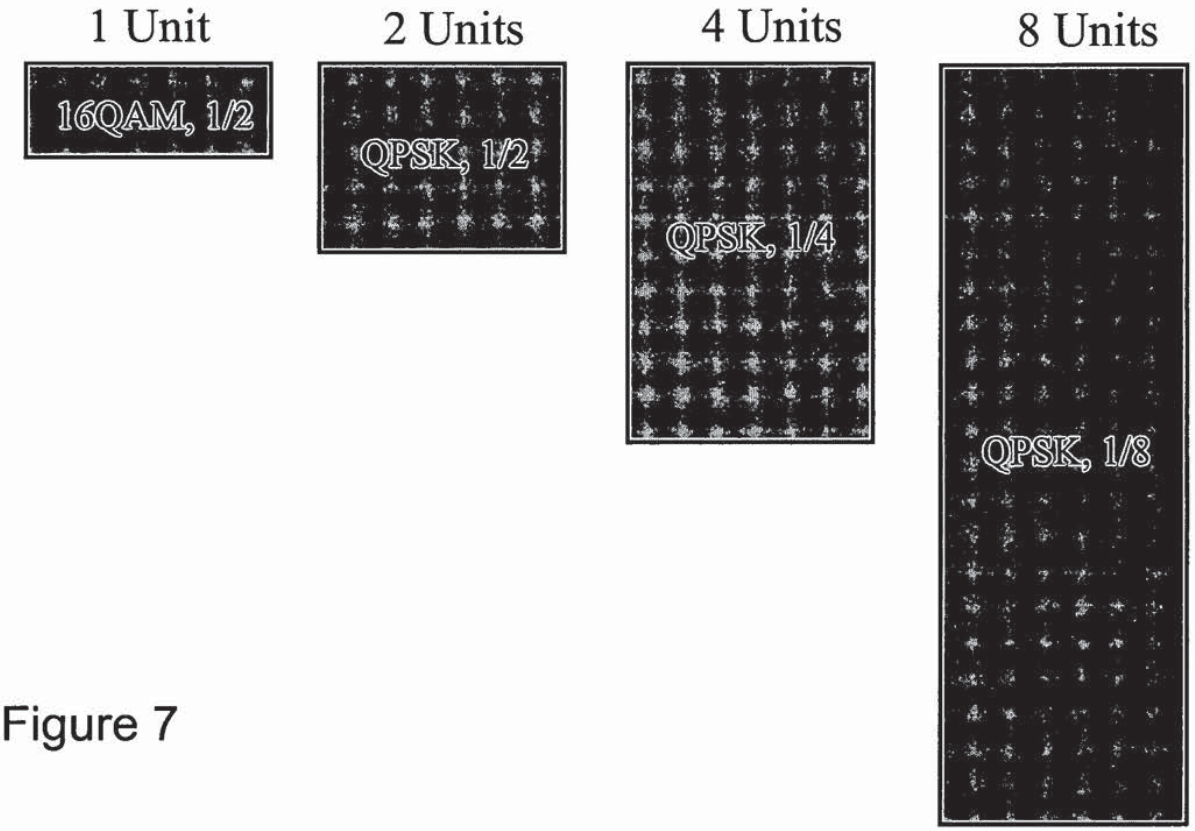


Figure 7

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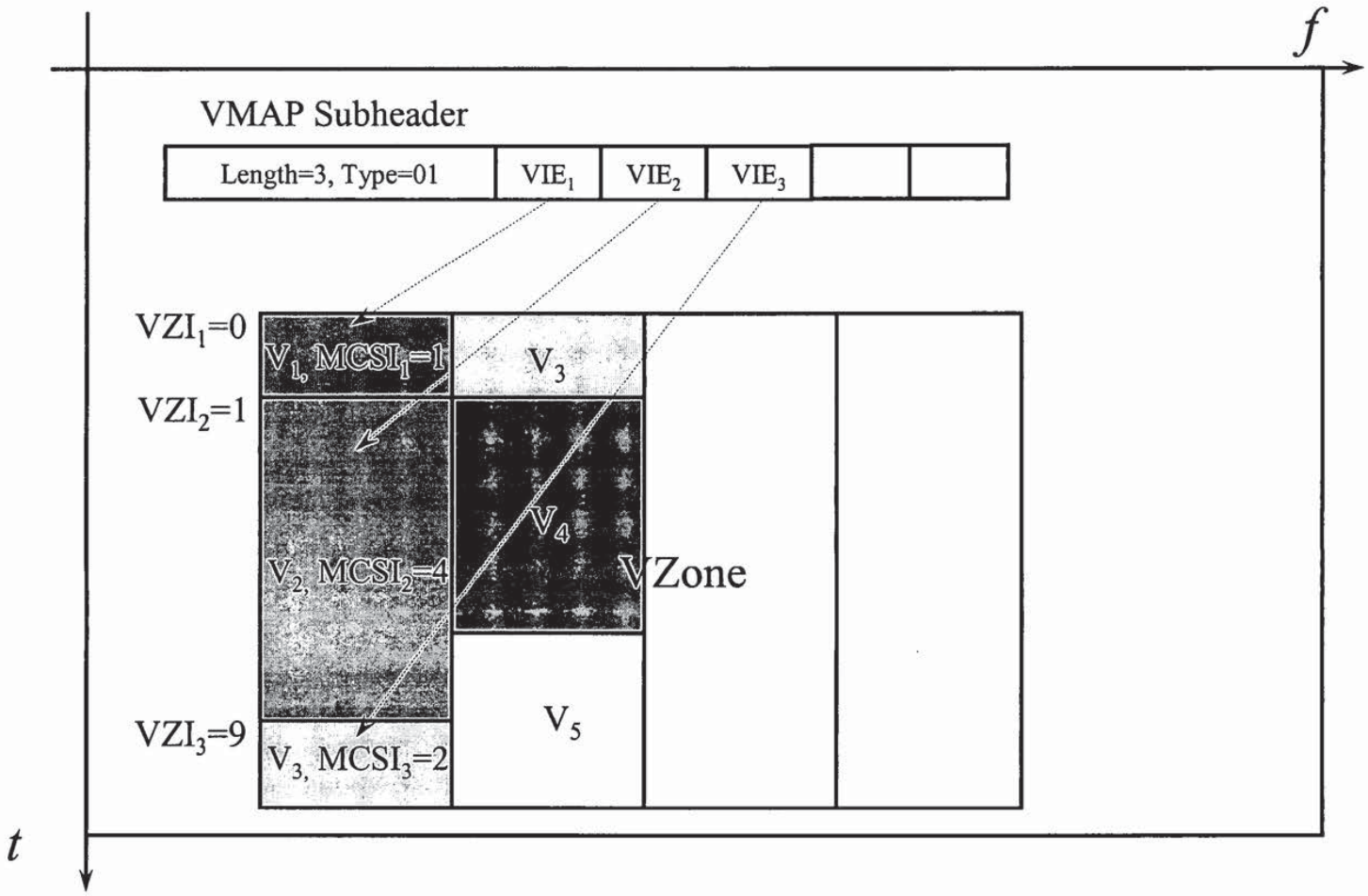


Figure 8

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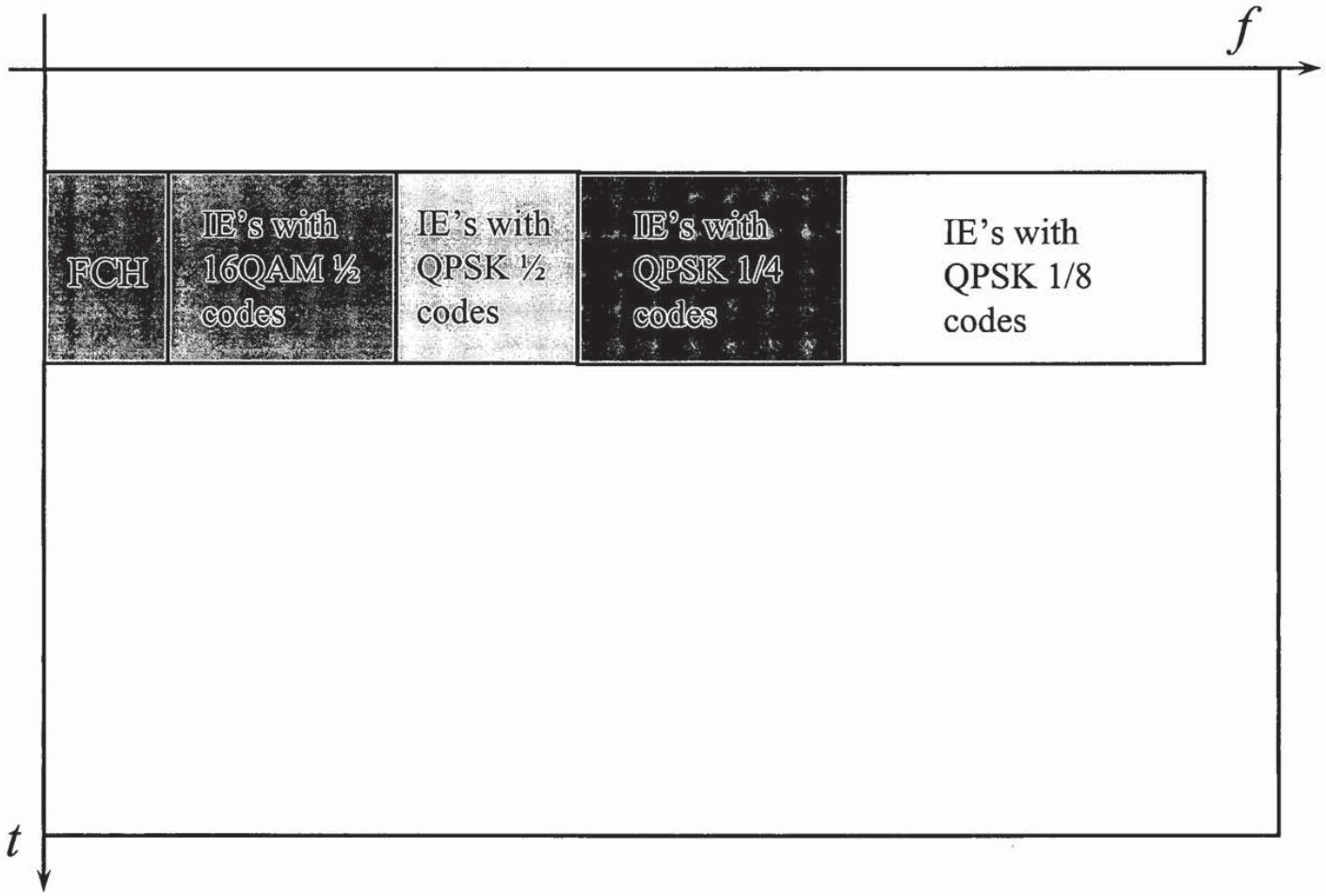

f
FCH
IE's with 16QAM ½ codes
IE's with QPSK ½ codes
IE's with QPSK 1/4 codes
IE's with QPSK 1/8 codes
t

Figure 9

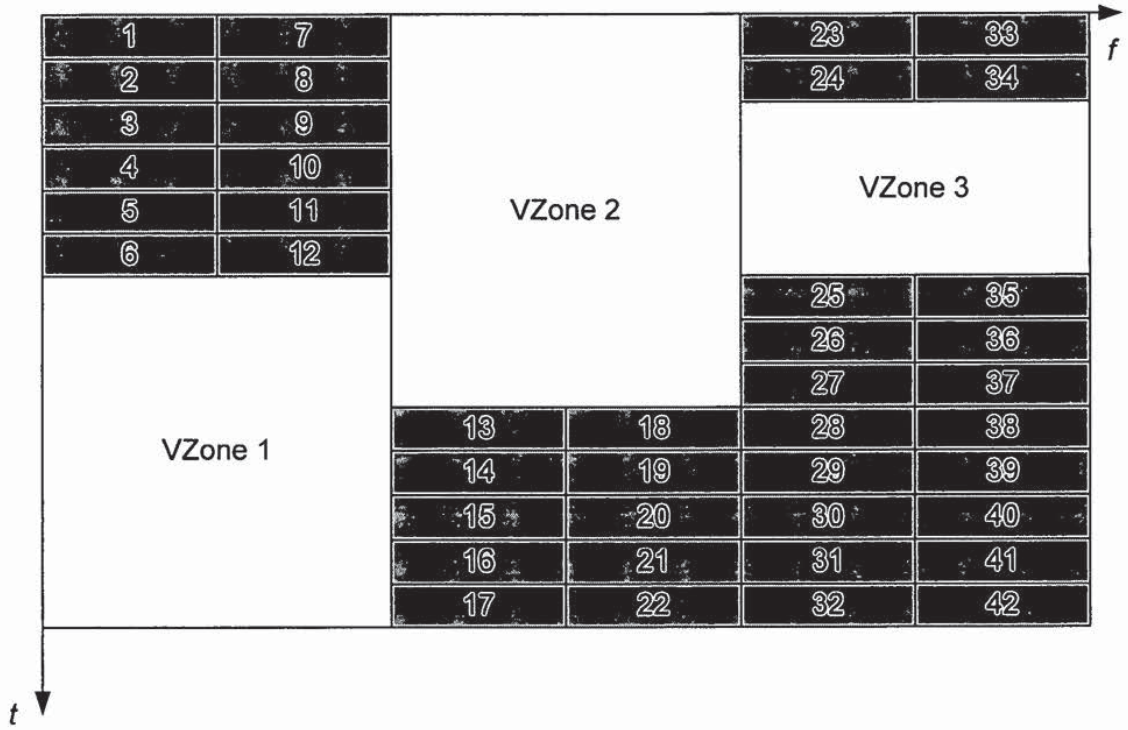
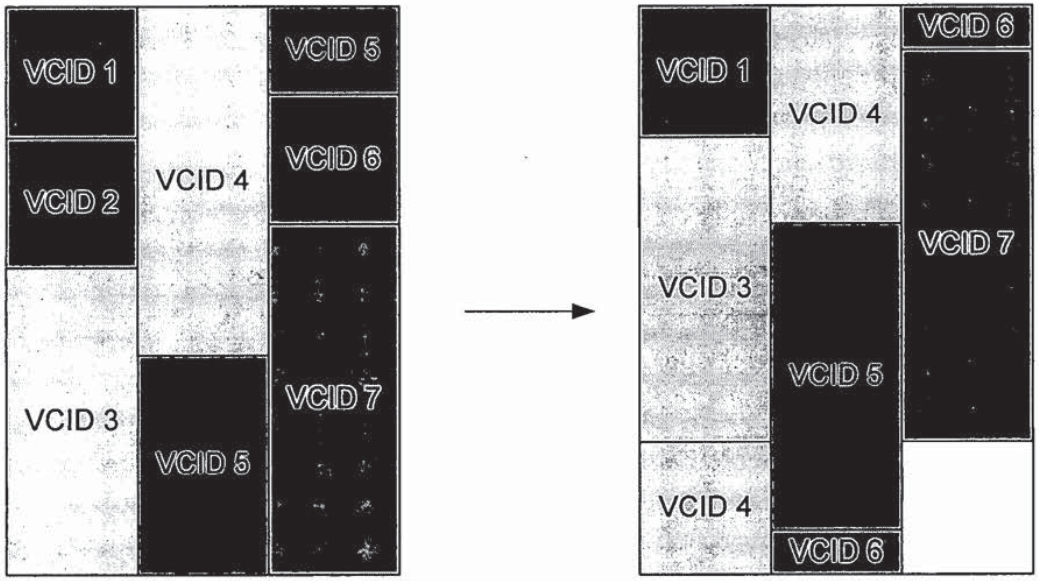


Figure 10

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VZone allocation before voice connection (VCID 2) goes into silence period

VZone allocation after voice connection (VCID 2) goes into silence period

Figure 11

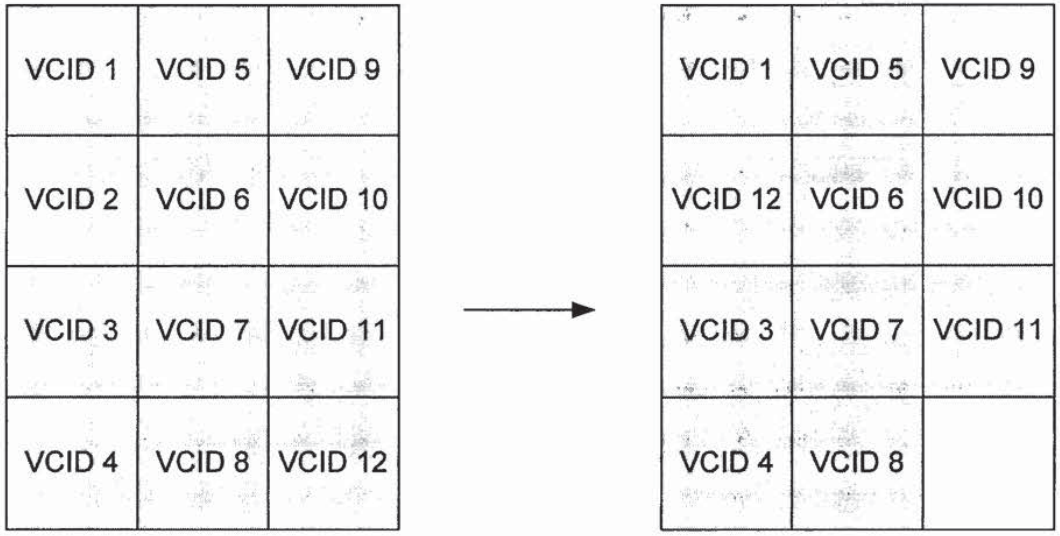
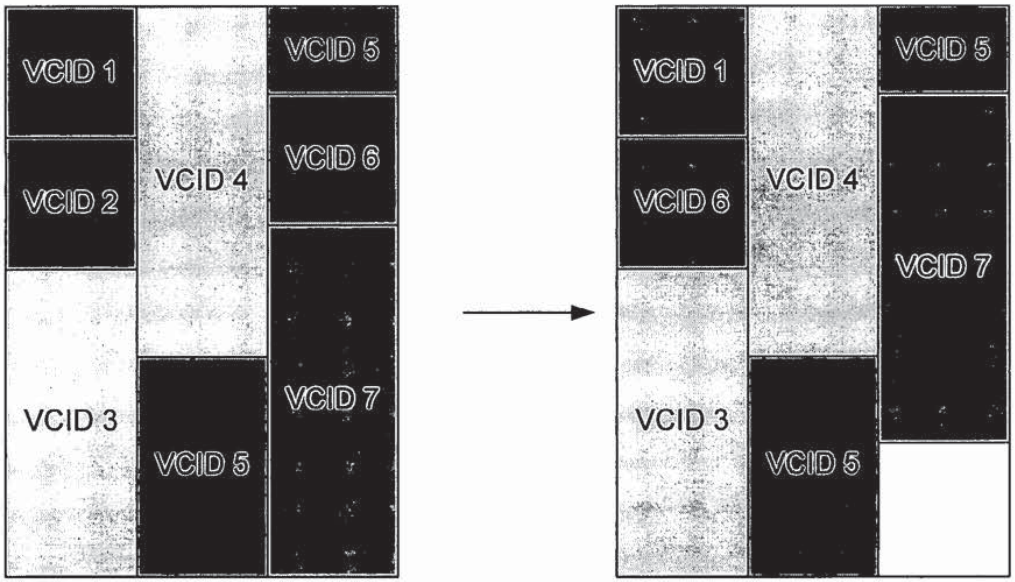


Figure 12

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VZone allocation before voice connection (VCID 2) goes into silence period

VZone allocation after voice connection (VCID 2) goes into silence period

Figure 13

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PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
STEPHEN C. BISHOP
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing (*day/month/year*)	21 FEB 2007
Applicant's or agent's file reference 612408017WO	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date (*day/month/year*)	Priority date (*day/month/year*)
PCT/US06/38149	28 September 2006 (28.09.2006)	28 September 2005 (28.09.2005)

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

IPC: **H04J 11/00**
USPC: 370/203

Applicant

NEOCIFIC, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I — Basis of the opinion
- ☐ Box No. II — Priority
- ☐ Box No. III — Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV — Lack of unity of invention
- ☒ Box No. V — Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI — Certain documents cited
- ☐ Box No. VII — Certain defects in the international application
- ☐ Box No. VIII — Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(*b*) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US	Date of completion of this opinion	Authorized officer
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	05 January 2007 (05.01.2007)	Christopher Grey Telephone No. (571)272-2600

Form PCT/ISA/237 (cover sheet) (April 2005)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US06/38149

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

☒ the international application in the language in which it was filed

☐ a translation of the international application into ____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ on paper

☐ in electronic form

c. time of filing/furnishing

☐ contained in the international application as filed.

☐ filed together with the international application in electronic form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US06/38149

Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1-33	YES
	Claims NONE	NO
Inventive step (IS)	Claims 1-33	YES
	Claims NONE	NO
Industrial applicability (IA)	Claims 1-33	YES
	Claims NONE	NO

2. Citations and explanations:

Claims 1-33 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest dedicating zones in the airlink resources (time-frequency resources), where the zones are designated for different types of applications.

Claims 1-33 meet the criteria set out in PCT Article 33(4), and thus meet industrial applicability because the subject matter claimed can be made or used in industry.

Form PCT/ISA/237 (Box No. V) (April 2005)

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U.S. APPLICATION NUMBER NO.	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
11/908,257	Xiaodong Li	612408017US1

25096
PERKINS COIE LLP
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

INTERNATIONAL APPLICATION NO.	
PCT/US2006/038149	
I.A. FILING DATE	PRIORITY DATE
09/28/2006	09/28/2005

CONFIRMATION NO. 1928
371 FORMALITIES LETTER

OC000000029884752

Date Mailed: 05/13/2008

NOTIFICATION OF MISSING REQUIREMENTS UNDER 35 U.S.C. 371 IN THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US)

The following items have been submitted by the applicant or the IB to the United States Patent and Trademark Office as an Elected Office (37 CFR 1.495):

- Indication of Small Entity Status
- Priority Document
- Copy of the International Application filed on 09/10/2007
- Copy of the International Search Report filed on 09/10/2007
- Copy of IPE Report filed on 09/10/2007
- U.S. Basic National Fees filed on 09/10/2007
- Priority Documents filed on 09/10/2007
- Specification filed on 09/10/2007
- Claims filed on 09/10/2007
- Abstracts filed on 09/10/2007
- Drawings filed on 09/10/2007

The applicant needs to satisfy supplemental fees problems indicated below.

The following items **MUST** be furnished within the period set forth below in order to complete the requirements for acceptance under 35 U.S.C. 371:

- Translation of the application into English. The current translation of the application into English is defective as described below. Note a processing fee will be required if submitted later than 30 months from the priority date.
  - The bottom of specification page 4 is cut off at the bottom left of the page. Please re-submit a complete legible copy of page 4.
- Processing fee of $130 for providing the translation of the application and/or the Annexes later than 30 months from the priority date (37 CFR 1.492(i)).
- Oath or declaration of the inventors, in compliance with 37 CFR 1.497(a) and (b), identifying the application by the International application number and international filing date.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.492(h) of $65 for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this letter.

SUMMARY OF FEES DUE:

Total additional fees required for this application is $**195** for a Small Entity:

FORM PCT/DO/EO/905 (371 Formalities Notice)

- $**65** Surcharge.
- $**130** for English translation surcharge required.

ALL OF THE ITEMS SET FORTH ABOVE MUST BE SUBMITTED WITHIN TWO (2) MONTHS FROM THE DATE OF THIS NOTICE OR BY 32 MONTHS FROM THE PRIORITY DATE FOR THE APPLICATION, WHICHEVER IS LATER. FAILURE TO PROPERLY RESPOND WILL RESULT IN ABANDONMENT.

The time period set above may be extended by filing a petition and fee for extension of time under the provisions of 37 CFR 1.136(a).

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
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KAREN R MCLEAN

Telephone: (703) 308-9140 EXT 214

FORM PCT/DO/EO/905 (371 Formalities Notice)

Docket No.: 612408017US1
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Li et al.

Application No.: 11/908,257

Filed: September 10, 2007

For: METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD

Confirmation No.: 1928

Art Unit: N/A

Examiner: Not Yet Assigned

RESPONSE TO NOTIFICATION OF MISSING REQUIREMENTS

MS Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Notification of Missing Requirements mailed May 13, 2008 for the above application, Applicant respectfully submits a copy of page 4 of the Specification, the Declaration, and the Non-English Specification fee and Late filing fee for the Application (as shown on accompanying Fee Transmittal). Applicant also respectfully submits a copy of page 16 of the Specification, due to the fact that this page was also cut off at the bottom left of the page.

Please charge our EFT Account SEA1PIRM in the amount of $195.00 covering the fees set forth in 37 CFR 1.16(f), 1.16(a)(1), 1.16(k), and 1.16(o). The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or

which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 50-0665, under Order No. 612408017US1.

Dated: July 14, 2008

Respectfully submitted,

By _____
Stephen Bishop
Registration No.: 38,829
PERKINS COIE LLP
P.O. Box 1247
Seattle, Washington 98111-1247
(206) 359-8000
(206) 359-7198 (Fax)
Attorney for Applicant

Declaration for Patent Application English Language Declaration	Attorney Docket No.	612408017US1
	First Named Inventor	Xiaodong Li
	COMPLETE IF KNOWN:	
☐ Submitted with initial filing ☒ Submitted after initial filing (surcharge required 37 CFR 1.16(e))	Application No.	11/908,257-Conf. #1928
	U.S. Filing Date	September 10, 2007
	Art Unit	N/A
	Examiner	Not Yet Assigned

As a below named inventor, I hereby declare that:

My residence, mailing address and citizenship are as stated below next to my name.

I believe I am the onginal, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD

the specification of which

☐ is attached hereto

OR

☒ was filed on 09/10/2007

as United States Application No. or PCT International Application No. 11/908,257

and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the National or PCT International filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign applications(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's right certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

(Number)	(Country)	(Filing Date)	Priority Not Claimed	Certified Copy Attached YES	Certified Copy Attached NO
PCT/US2006/038149	PCT	09/28/2006	☐	☐	☒
			☐	☐	☐
			☐	☐	☐

☐ Additional prior foreign applications are listed on a supplemental data sheet attached hereto.

IN UEU OF PTO SB/01 (03-01))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor Xiaodong Li	
Sole or first inventor's signature	Date 07/08/2008
Residence Kirkland, Washington	
Citizenship US	
Mailing Address 9919 129th PL NE Kirkland, Washington 98033	

Full name of second inventor Haiming Huang	
Second inventor's signature Huang, Haiming	Date 07/08/2008
Residence Bellevue, Washington	
Citizenship People's Republic of China	
Mailing Address 605 141st CT SE #D203 Bellevue, Washington 98007	

IN LIEU OF PTO SB-GB (03-01;

Full name of third inventor	
Titus Lo	
Third inventor's signature	Date 7/8/2008
Residence	
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Citizenship Canada	
Mailing Address	
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Full name of fourth inventor, if any	
Ruifeng Wang	
Fourth inventor's signature	Date 7/8/2008
Residence	
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Citizenship Canada	
Mailing Address	
656 237th Pl SE Sammamish, Washington 98074	

IN LIEU OF PTO SB-02B (03-01)

Electronic Patent Application Fee Transmittal

Application Number:	11908257
Filing Date:	
Title of Invention:	METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD
First Named Inventor/Applicant Name:	Xiaodong Li
Filer:	Maurice J. Pirio/Stephanie Olson
Attorney Docket Number:	612408017US1
Filed as Small Entity	

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Oath/decl > 30 mo. from priority date	2617	1	65	65
Eng. Transl. > 30 mo. from priority date	1618	1	130	130
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	195

Electronic Acknowledgement Receipt	
EFS ID:	3610876
Application Number:	11908257
International Application Number:	
Confirmation Number:	1928
Title of Invention:	METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD
First Named Inventor/Applicant Name:	Xiaodong Li
Customer Number:	25096
Filer:	Maurice J. Pirio/Stephanie Olson
Filer Authorized By:	Maurice J. Pirio
Attorney Docket Number:	612408017US1
Receipt Date:	14-JUL-2008
Filing Date:	
Time Stamp:	15:19:01
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$195
RAM confirmation Number	599
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)

1		RespToMP.pdf	279098 12d449e0adeb55a235c038ae1869b4f03f675059	yes	8

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Fee Worksheet (PTO-06)	1	1
Applicant Response to Pre-Exam Formalities Notice	2	3
Specification	4	4
Oath or Declaration filed	5	7
Specification	8	8

Warnings:

Information:

2	Fee Worksheet (PTO-06)	fee-info.pdf	8358 7e3469d6a91bcab276ae97efb7db23c3d4b78be3	no	2

Warnings:

Information:

Total Files Size (in bytes):	287456

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/17 (10-07)
Approved for use through 06/30/2010. OMB 0651-0032
U.S. Patent and Trademark Office. U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no person are required to respond to a collection of information unless it displays a valid OMB control number.

Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2008

[X] Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 195.00

Complete if Known	
Application Number	11/908,257-Conf. #1928
Filing Date	September 10, 2007
First Named Inventor	Xiaodong Li
Examiner Name	Not Yet Assigned
Art Unit	N/A
Attorney Docket No.	612408017US1

METHOD OF PAYMENT (check all that apply)

[ ] Check [ ] Credit Card [ ] Money Order [ ] None [X] Other (please identify): EFT Account SEAIPIRM

[X] Deposit Account Deposit Account Number: 50-0665 Deposit Account Name: Perkins Coie LLP

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

[ ] Charge fee(s) indicated below
[ ] Charge fee(s) indicated below, **except for the filing fee**
[X] Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17
[X] Credit any overpayments

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
Application Type	**Fee ($)**	**Small Entity Fee ($)**	**Fee ($)**	**Small Entity Fee ($)**	**Fee ($)**	**Small Entity Fee ($)**	**Fees Paid ($)**
Utility	310	155	510	255	210	105	
Design	210	105	100	50	130	65	
Plant	210	105	310	155	160	80	
Reissue	310	155	510	255	620	310	
Provisional	210	105	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	**Fee ($)**	**Small Entity Fee ($)**
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	210	105
Multiple dependent claims	370	185

Total Claims	**Extra Claims**	**Fee ($)**	**Fee Paid ($)**
33 - 33 =		x	=

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	**Extra Claims**	**Fee ($)**	**Fee Paid ($)**
2 - 3 =		x	=

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims	
Fee ($)	**Fee Paid ($)**

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $260 ($130 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	**Extra Sheets**	**Number of each additional 50 or fraction thereof**	**Fee ($)**	**Fee Paid ($)**
38 - 100 =		/50 = (round up to a whole number) x		=

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	130.00
Other (e.g., late filing surcharge): 2051 Surcharge-Late filing fee	65.00

SUBMITTED BY					
Signature		Registration No (Attorney/Agent)	38,829	Telephone	(206) 359-8000
Name (Print/Type)	Stephen Bishop			Date	July 14, 2008

61240-8017.US01/LEGAL14469853.1

PTO/SB/17 (10-07)
Approved for use through 06/30/2010. OMB 0651-0032
U.S. Patent and Trademark Office. U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no person are required to respond to a collection of information unless it displays a valid OMB control number.

Effective on 12/08/2004.
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FEE TRANSMITTAL
For FY 2008

[X] Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 195.00

Complete if Known	
Application Number	11/908,257-Conf. #1928
Filing Date	September 10, 2007
First Named Inventor	Xiaodong Li
Examiner Name	Not Yet Assigned
Art Unit	N/A
Attorney Docket No.	612408017US1

METHOD OF PAYMENT (check all that apply)

[ ] Check [ ] Credit Card [ ] Money Order [ ] None [X] Other (please identify): EFT Account SEAIPIRM

[X] Deposit Account Deposit Account Number: 50-0665 Deposit Account Name: Perkins Coie LLP

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

[ ] Charge fee(s) indicated below
[ ] Charge fee(s) indicated below, **except for the filing fee**
[X] Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17
[X] Credit any overpayments

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
Application Type	**Fee ($)**	**Small Entity Fee ($)**	**Fee ($)**	**Small Entity Fee ($)**	**Fee ($)**	**Small Entity Fee ($)**	**Fees Paid ($)**
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Design	210	105	100	50	130	65	
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2. EXCESS CLAIM FEES

Fee Description	**Fee ($)**	**Small Entity Fee ($)**
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	210	105
Multiple dependent claims	370	185

Total Claims	**Extra Claims**	**Fee ($)**	**Fee Paid ($)**
33 - 33 =		x	=

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	**Extra Claims**	**Fee ($)**	**Fee Paid ($)**
2 - 3 =		x	=

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims	
Fee ($)	**Fee Paid ($)**

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Total Sheets	**Extra Sheets**	**Number of each additional 50 or fraction thereof**	**Fee ($)**	**Fee Paid ($)**
38 - 100 =		/50 = (round up to a whole number) x		=

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	130.00
Other (e.g., late filing surcharge): 2051 Surcharge-Late filing fee	65.00

SUBMITTED BY					
Signature		Registration No (Attorney/Agent)	38,829	Telephone	(206) 359-8000
Name (Print/Type)	Stephen Bishop			Date	July 14, 2008

61240-8017.US01/LEGAL14469853.1

application type or subtype, modulation and coding scheme, or other parameter may be grouped together for efficiency.

[0018] While the following discussion contemplates the application of the disclosed technology to an Orthogonal Frequency Division Multiple Access (OFDMA) system, those skilled in the art will appreciate that the technology can be applied to other system formats such as Code Division Multiple Access (CDMA), Multi-Carrier Code Division Multiple Access (MC-CDMA), or others. Without loss of generality, OFDMA is therefore only used as an example to illustrate the present technology. In addition, the following discussion uses voice-over-IP as a representative application to which the disclosed technology can be applied. The disclosed technology is equally applicable to other applications including, but not limited to, audio and video.

[0019] The following description provides specific details for a thorough understanding of, and enabling description for, various embodiments of the technology. One skilled in the art will understand that the technology may be practiced without these details. In some instances, well-known structures and functions have not been shown or described in detail to avoid unnecessarily obscuring the description of the embodiments of the technology. It is intended that the terminology used in the description presented below be interpreted in its broadest reasonable manner, even though it is being used in conjunction with a detailed description of certain embodiments of the technology. Although certain terms may be emphasized below, any terminology intended to be interpreted in any restricted manner will be overtly and specifically defined as such in this Detailed Description section.

I. Wireless Communication Network

[0020] Figure 1 is a representative diagram of a wireless communication network 100 that services a geographic region. The geographic region is divided into a plurality of cells 105, and wireless coverage is provided in each cell by a base station (BS) 110. One or more mobile devices (not shown) may be fixed or may roam within the geographic region covered by the network. The mobile devices are used as an interface between users and the network. Each base station is connected to the backbone of the network, usually by a dedicated link. A base station serves as a focal point to transmit information to and receive information from

pertain to packet stream V_3. Those skilled in the art will appreciate that the although text is used to indicate the contents of the IE in Figure 8A, in an actual implementation the text would be replaced by appropriately coded information.

[0054] In some embodiments, the IEs for all packets that are transmitted with the same modulation and coding schemes (MCS) are grouped together for efficiency. Figure 8B is a block diagram of a block 850 of IEs that are grouped by MCS. A frame control header (FCH) 855 or other control message is transmitted prior to the block to indicate the length and the MCS used for each segment of the block. In some embodiments, adaptive modulation and coding (AMC) is used for the transmission of the IE's. A special rule, which is known to both base stations and mobile devices, can be used to determine the IE MCS, based on the MCS of its corresponding packet for proper reception of the IE. In some embodiments, the MCS for an IE is maintained the same as that of its corresponding application packet. In some embodiments, the MCS for an IE is one level more conservative than that of its corresponding packet. For example, if the MCSI for a packet is 2 (QPSK with rate-½ coding), then the MCSI for its IE is 3 (QPSK with rate-¾ coding).

V. Voice Activity Detection

[0055] Typical voice conversations contain approximately 50 percent silence. In order to take advantage of the fact that about half of the time data does not need to be transmitted at the same rate as when a user is speaking, the system may rely upon detecting the period of silence and reducing the effective data transfer rate during that period. The silence period in conversation is detected by a vocoder using technologies such as Voice Activity Detection (VAD). Voice packets are only generated when voice activity is detected. During the silence period, the voice packet data rate is greatly reduced.

[0056] In addition to reducing the voice packet data rate during periods of silence, the bandwidth allocation for the voice connection may also be reduced. The MAC scheduler at the base station may use the indication of voice activity to adjust the bandwidth allocation for the voice connection. In the uplink direction, the mobile device sends a special MAC message once a VAD indication is received from its vocoder. The MAC message indicates to the base station that the voice data rate is being temporarily reduced. When such an indication is received, the MAC scheduler

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

U.S. APPLICATION NUMBER NO.	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
11/908,257	Xiaodong Li	612408017US1

25096
PERKINS COIE LLP
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

INTERNATIONAL APPLICATION NO.	
PCT/US2006/038149	
I.A. FILING DATE	PRIORITY DATE
09/28/2006	09/28/2005

CONFIRMATION NO. 1928
371 ACCEPTANCE LETTER

OC000000036351899

Date Mailed: 06/10/2009

NOTICE OF ACCEPTANCE OF APPLICATION UNDER 35 U.S.C 371 AND 37 CFR 1.495

The applicant is hereby advised that the United States Patent and Trademark Office in its capacity as a Designated / Elected Office (37 CFR 1.495), has determined that the above identified international application has met the requirements of 35 U.S.C. 371, and is ACCEPTED for national patentability examination in the United States Patent and Trademark Office.

The United States Application Number assigned to the application is shown above and the relevant dates are:

07/14/2008	07/14/2008
DATE OF RECEIPT OF 35 U.S.C. 371(c)(1), (c)(2) and (c)(4) REQUIREMENTS	DATE OF COMPLETION OF ALL 35 U.S.C. 371 REQUIREMENTS

A Filing Receipt (PTO-103X) will be issued for the present application in due course. **THE DATE APPEARING ON THE FILING RECEIPT AS THE " FILING DATE" IS THE DATE ON WHICH THE LAST OF THE 35 U.S.C. 371 (c)(1), (c)(2) and (c)(4) REQUIREMENTS HAS BEEN RECEIVED IN THE OFFICE. THIS DATE IS SHOWN ABOVE.** *The filing date of the above identified application is the international filing date of the international application (Article 11(3) and 35 U.S.C. 363).* Once the Filing Receipt has been received, send all correspondence to the Group Art Unit designated thereon.

The following items have been received:

- Indication of Small Entity Status
- Copy of the International Application filed on 09/10/2007
- English Translation of the IA filed on 07/14/2008
- Copy of the International Search Report filed on 09/10/2007
- Copy of IPE Report filed on 09/10/2007
- Oath or Declaration filed on 07/14/2008
- U.S. Basic National Fees filed on 09/10/2007
- Priority Documents filed on 09/10/2007
- Specification filed on 09/10/2007
- Claims filed on 09/10/2007
- Abstracts filed on 09/10/2007
- Drawings filed on 09/10/2007

FORM PCT/DO/EO/903 (371 Acceptance Notice)

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

KAREN R MCLEAN

Telephone: (703) 756-1463

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
11/908,257	07/14/2008		670	612408017US1	33	2

CONFIRMATION NO. 1928

25096
PERKINS COIE LLP
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

FILING RECEIPT



Date Mailed: 06/10/2009

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Xiaodong Li, Kirkland, WA;
Haiming Huang, Bellevue, WA;
Titus Lo, Bellevue, WA;
Ruifeng Wang, Sammamish, WA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/US2006/038149 09/28/2006
which claims benefit of 60/721,451 09/28/2005

Foreign Applications

If Required, Foreign Filing License Granted: 06/05/2009

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 11/908,257**

Projected Publication Date: 09/17/2009

Non-Publication Request: No

Early Publication Request: No
** **SMALL ENTITY** **

Title

METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD

Preliminary Class

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as

set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/908,257	07/14/2008	Xiaodong Li	612408017US1

CONFIRMATION NO. 1928

25096
PERKINS COIE LLP
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

PUBLICATION NOTICE

OC000000037847294

Title:METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD

Publication No.US-2009-0232084-A1
Publication Date:09/17/2009

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PLUS Search Results for S/N 11908257, Searched Mon May 10 10:26:31 EDT 2010

The Patent Linguistics Utility System (PLUS) is a USPTO automated search system for U.S. Patents from 1971 to the present PLUS is a query-by-example search system which produces a list of patents that are most closely related linguistically to the application searched. This search was prepared by the staff of the Scientific and Technical Information Center, SIRA.

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UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/908,257	07/14/2008	Xiaodong Li	612408017US1	1928

25096 7590 08/02/2010

PERKINS COIE LLP
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

EXAMINER	
PATEL, CHANDRAHAS B	
ART UNIT	**PAPER NUMBER**
2464	

NOTIFICATION DATE	DELIVERY MODE
08/02/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentprocurement@perkinscoie.com

Office Action Summary	Application No.	Applicant(s)	
	11/908,257	LI ET AL.	
	Examiner	Art Unit	
	Chandrahas Patel	2464	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 July 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,9,11,14-24 and 28-30* is/are rejected.

7)☒ Claim(s) *8,10,12,13,25-27 and 31-33* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 September 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4, 6, 7, 9, 16-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Vijayan et al. (USPN 7,221,680).

Regarding claim 1, Vijayan teaches a method of communication between base stations and mobile devices in a multi-carrier packet communication system that utilizes an air link resource and covers a plurality of geographic cells **[Fig. 1]**, the method comprising: allocating a zone in the air link resource, wherein the zone is designated for a type of application and is capable of carrying two or more packet streams associated with the type of application, and wherein the portion of the air link resource falling outside of the zone is capable of carrying two or more packet streams not associated with the type of application **[Col. 4, lines 20-42, the superframe resources are allocated in the frequency where one superframe carries two or more packets of same type of application]**; for at least some of the two or more packet streams within the zone, creating a control message associated with each packet stream wherein the control message is used in part to ensure proper communication of the packet stream

[Fig. 2, 230, pilot & overhead is used to ensure proper delivery of the packet stream, Col. 5, line 35 - Col. 6, line 3]; aggregating the created control messages associated with each packet stream in accordance with a common characteristic of the packet streams **[Col. 5, lines 58 - Col. 6, line 3, the control message for packet streams are aggregated so that they are not sent in each superframe]**; and transmitting the control messages in a group **[Col. 5, line 66 - Col. 6, line 3, the control message is transmitted]**.

Regarding claim 2, Vijayan teaches the common characteristic is the coding and modulation scheme of the packet streams **[Col. 5, lines 43-49, coding and modulation scheme is sent in overhead]**.

Regarding claim 3, Vijayan teaches the common characteristic is a location of the packet stream within the air link resource **[Col. 5, lines 52-58, identifies the location]**.

Regarding claim 4, Vijayan teaches adding a header to the group of control messages, wherein the header comprises the number of control messages, the length of the control messages, and the common characteristics of the associated packet streams **[Col. 5, lines 36-47, identifies length and number of superframes, and common characteristics of the packet stream of superframes]**.

Regarding claim 6, Vijayan teaches assigning a basic connection identification (BCID) value to a packet stream communicated via the air link resource **[Fig. 2, 230, overhead information contains BCID value]**; assigning an application connection identification (ACID) value to a second packet stream communicated via the air link

resource, wherein the ACID value contains a lesser number of bits than the BCID value **[Col. 13, line 65 - Col. 14, line 2, ACID value is assigned which uses less bits than BCID]**; and incorporating the ACID value in the control message associated with the identified second packet stream **[Col. 13, line 65 - Col. 14, line 2, single inner code is sent as part of the control message]**.

Regarding claim 7, Vijayan teaches an ACID value may be reused by base stations or mobile devices **[Col. 13, line 65 - Col. 14, line 2, single inner code use indicates the ACID value is reused]**.

Regarding claim 9, Vijayan teaches each of the two or more packet streams associated with the type of application utilize one of a plurality of modulation and coding schemes, and a modulation and coding scheme index associated with each packet stream carries information about the utilized modulation and coding scheme for the packet stream **[Col. 5, lines 37-47, identifies coding and modulation scheme for the packet stream]**.

Regarding claim 16, Vijayan teaches the zone is divided into a plurality of rows and a plurality of columns to thereby form a coordinate system **[Fig. 4]**.

Regarding claim 17, Vijayan teaches a location of packet stream within the zone may be specified by an offset from the origin of the zone **[Fig. 4, Transmission Unit is offset from the origin of the coordinates]**.

Regarding claim 18, Vijayan teaches a location of a packet stream within the zone may be specified by a starting row and column coordinate and an ending row and column coordinate **[Fig. 4, Transmission Unit specified by a row and a column]**.

Regarding claim 19, Vijayan teaches a granularity of a time coordinate is an OFDM symbol and a granularity of a frequency coordinate is a sub carrier **[Col. 5, lines 35-52]**.

Regarding claim 20, Vijayan teaches the portion of the air link resource falling outside of the zone is treated as a second zone and wherein a resource allocation message pertaining to the second zone is communicated to a base station and a mobile station **[Col. 6, lines 50-63, each superframe is transmitted with its specific overhead]**.

Regarding claim 21, Vijayan teaches the resource allocation message identifies a connection identifier, a resource identification parameter, and a modulation and coding index for at least some of the packet streams in the second zone **[Col. 6 lines 50-63, specific outer code rate and overhead identifies the above parameters]**.

Regarding claim 22, Vijayan teaches dividing the second zone into a plurality of units, wherein the resource allocation message identifies at least some of the packet streams in the second zone based on the plurality of units **[Col. 6, lines 50-63 specific outer code rate and overhead identifies the above parameters]**.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vijayan et al. (USPN 7,221,680) in view of Kostic et al. (USPN 6,826,409).

Regarding claim 5, Vijayan teaches a method as discussed in rejection of claim 1.

However, Vijayan does not teach the zone in one geographic cell is assigned to a different time-frequency location in the air link resource than the zone in a neighboring geographic cell in order to mitigate inter-cell interference.

Kostic teaches the zone in one geographic cell is assigned to a different time-frequency location in the air link resource than the zone in a neighboring geographic cell in order to mitigate inter-cell interference **[Col. 4, lines 46-53, uses different time-frequency location to reduced inter-cell interference]**.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to used different time-frequency location then the neighboring geographic cell so that capacity of the system can be increased **[Col. 1, lines 16-26]**.

5. Claims 11, 14, 23, 24, 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vijayan et al. (USPN 7,221,680) in view of El-Hennawey et al. (USPN 7,619,995).

Regarding claim 11, Vijayan teaches a method as discussed in rejection of claim 1.

However, Vijayan does not teach using adaptive modulation and coding for the transmission of the group of control messages.

El-Hennawey teaches using adaptive modulation and coding for the transmission of the group of control messages **[Col. 7, lines 30-33, uses SB-ADPCM]**.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use adaptive modulation and coding so that frequency band can be split into multiple bands which can be combined later **[Col. 7, lines 30-41]**.

Regarding claim 14, Vijayan further teaches the common characteristic is the coding and modulation scheme of the packet streams and further comprising a header transmitted prior to the group of control messages to indicate the length of the group and the modulation and coding scheme used for the group **[Col. 5, lines 36-47, identifies length and number of superframes, coding and modulation of the packet stream]**.

Regarding claim 23, Vijayan teaches a method of communication between base stations and mobile devices in a multi-carrier packet communication system that utilizes an air link resource and covers a plurality of geographic cells **[Fig. 1]**, the method comprising: allocating a zone in the air link resource for packet streams, wherein the zone is capable of carrying two or more packet streams and the packet streams are arranged sequentially in the zone **[Col. 4, lines 20-42, the superframe resources are allocated in the frequency where one superframe carries two or more packets of same type of application]**; for at least some of the packet streams within the zone, creating a control message associated with each packet stream wherein the control message is used in part to ensure proper communication of the packet stream **[Fig. 2, 230, pilot & overhead is used to ensure proper delivery of the packet stream, Col.**

5, line 35 - Col. 6, line 3]; aggregating the created control messages associated with each packet stream in accordance with a common characteristic of the packet streams **[Col. 5, lines 58 - Col. 6, line 3, the control message for packet streams are aggregated so that they are not sent in each superframe]**; and transmitting the control messages in a group **[Col. 5, line 66 - Col. 6, line 3, the control message is transmitted]**.

However, Vijayan does not teach the packet streams are voice-over-IP (VoIP) packet streams.

El-Hennawey teaches the packet streams are voice-over-IP (VoIP) packet streams **[Col. 4, lines 63-66, VoIP streams]**.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have VoIP streams so that voice can be communicated using internet **[Col. 1, lines 25-31]**.

Regarding claim 24, Vijayan further teaches packet streams are arranged sequentially in the zone starting at an origin **[Fig. 4]**.

Regarding claim 28, the references teach a method as discussed in rejection of claim 23.

However, the references do not teach each of the two or more packet streams within the zone is allocated based on voice activity carried in the corresponding packet stream.

El-Hennawey teaches each of the two or more packet streams within the zone is allocated based on voice activity carried in the corresponding packet stream **[Col. 5, line 66 - Col. 6, line 13, packet streams are allocated based on voice activity]**.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to allocate packet streams based on voice activity so that it could be determined how much weight should be give to each frame **[Col. 6, lines 10-13]**.

Regarding claim 29, the references teach a method as discussed in rejection of claim 28.

However, the references do not teach the allocated air link resource is an initial amount of resource and adaptive modulation and coding with an adaptive multi-rate voice coding is used to improve voice quality carried in the packet stream.

El-Hennawey teaches the allocated air link resource is an initial amount of resource and adaptive modulation and coding with an adaptive multi-rate voice coding is used to improve voice quality carried in the packet stream **[Col. 6, lines 5-13, frames are adapted according to amount of voice present]**.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to allocate packet streams based on voice activity so that it could be determined how much weight should be give to each frame **[Col. 6, lines 10-13]**.

Regarding claim 30, the references teach a method as discussed in rejection of claim 28.

However, the references do not teach reallocating an air link resource associated with a first packet stream having a silent voice connection to a second packet stream having an active voice connection.

El-Hennawey teaches reallocating an air link resource associated with a first packet stream having a silent voice connection to a second packet stream having an active voice connection **[Col. 6, lines 5-13, frame weights are adapted according to amount of voice present]**.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to allocate packet streams based on voice activity so that it could be determined how much weight should be give to each frame **[Col. 6, lines 10-13]**.

6. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vijayan et al. (USPN 7,221,680) in view of Koike (USPN 6,445,308).

Regarding claim 15, Vijayan teaches a method as discussed in rejection of claim 1.

However, Vijayan does not teach a starting time-frequency coordinate and an ending time-frequency coordinate are used to specify a location of a packet stream within the zone.

Koike teaches a starting time-frequency coordinate and an ending time-frequency coordinate are used to specify a location of a packet stream within the zone **[Col. 9, lines 46-54, packet's location is determined based on time-frequency coordinate]**.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use time-frequency coordinate to determine a location of packet since the packet can be transmitted using PN series of the frequency hopping **[Col. 9, lines 46-54]**.

Allowable Subject Matter

7. Claims 8, 10, 12, 13, 25-27, 31-33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chandrahas Patel whose telephone number is (571)270-1211. The examiner can normally be reached on Monday through Thursday 7:30 to 17:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on 571-272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ricky Ngo/
Supervisory Patent Examiner, Art Unit 2464

/Chandrahas Patel/
Examiner, Art Unit 2464

Notice of References Cited	Application/Control No. 11/908,257	Applicant(s)/Patent Under Reexamination LI ET AL.	
	Examiner Chandrahas Patel	Art Unit 2464	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,445,308 B1	09-2002	Koike, Shin	340/902
*	B	US-6,826,409 B2	11-2004	Kostic et al.	455/501
*	C	US-7,221,680 B2	05-2007	Vijayan et al.	370/441
*	D	US-7,619,995 B1	11-2009	El-Hennawey et al.	370/260
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S2	1102	(370/260).CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2010/07/27 09:42
S3	665	S2 and group	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/27 09:43
S4	2034	(370/390).CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2010/07/27 10:07
S5	1549	S4 and group	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/27 10:07
S6	773	S4 and (group same message)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/27 10:07
S7	474	(348/14.09). CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2010/07/27 10:44
S8	789	(348/e7.082). CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2010/07/27 11:06

S9	617	(348/e7.084).CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2010/07/27 11:30
S10	560	(frequency near5 coordinate) same (Packet pdu frame cell segment)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/27 11:33
S11	107	(frequency near5 time near5 coordinate) same (Packet pdu frame cell segment)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/27 11:34
S12	4052	(709/204).CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2010/07/27 11:53
S13	2724	S12 and group	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/27 11:53
S14	1049	S12 and (group same message)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/27 11:53
S15	68	S12 and (group same message same packet)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/27 11:54

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	3	(Li and Huang and Lo and Wang).in.	US-PGPUB; USPAT; UPAD	OR	ON	2010/07/26 12:49

7/27/2010 2:03:20 PM
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BIB DATA SHEET

CONFIRMATION NO. 1928

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
11/908,257	07/14/2008 RULE	370	2464	612408017US1

APPLICANTS

Xiaodong Li, Kirkland, WA;
Haiming Huang, Bellevue, WA;
Titus Lo, Bellevue, WA;
Ruifeng Wang, Sammamish, WA;

**** CONTINUING DATA **************************

This application is a 371 of PCT/US2006/038149 09/28/2006
which claims benefit of 60/721,451 09/28/2005

**** FOREIGN APPLICATIONS **************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
06/05/2009

Foreign Priority claimed	35 USC 119(a-d) conditions met	Verified and Acknowledged	Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
☐ Yes ☑ No	☐ Yes ☐ No	/CHANDRAHAS B PATEL/ Examiner's Signature	☐ CBP Initials	WA	12	33	2

ADDRESS

PERKINS COIE LLP
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247
UNITED STATES

TITLE

METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD

FILING FEE RECEIVED	FEES: Authority has been given in Paper	
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BIB (Rev. 05/07).

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11908257	LI ET AL.
	Examiner	Art Unit
	Chandrahas Patel	2464

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	07/27/2010								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	O								
	9	✓								
	10	O								
	11	✓								
	12	O								
	13	O								
	14	✓								
	15	✓								
	16	✓								
	17	✓								
	18	✓								
	19	✓								
	20	✓								
	21	✓								
	22	✓								
	23	✓								
	24	✓								
	25	O								
	26	O								
	27	O								
	28	✓								
	29	✓								
	30	✓								
	31	O								
	32	O								
	33	O								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11908257	LI ET AL.
	Examiner	Art Unit
	Chandrahas Patel	2464

SEARCHED			
Class	Subclass	Date	Examiner
370	260, 390	7/27/2010	CBP
348	14.09, E7.082, E7.084	7/27/2010	CBP
709	204	7/27/2010	CBP

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search	7/27/2010	CBP
Inventor Search	7/27/2010	CBP

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

Docket No.: 612408017US1
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Li et al.

Application No.: 11/908,257 | Confirmation No.: 1928

Filed: July 14, 2008 | Art Unit: 2464

For: METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD | Examiner: C. B. Patel

AMENDMENT IN RESPONSE TO NON-FINAL OFFICE ACTION UNDER 37 C.F.R. 1.111

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

INTRODUCTORY COMMENTS

In response to the Office Action dated August 2, 2010, please amend the above-identified U.S. patent application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 9 of this paper.

AMENDMENTS TO THE CLAIMS

[c1] 1. (Currently Amended) A method of communication between base stations and mobile devices in a multi-carrier packet communication system that utilizes ~~an airlink~~ time-frequency resource and covers a plurality of geographic cells, the method comprising:

allocating a zone in the ~~airlink~~ time-frequency resource, wherein:

the zone is designated for a type of application and is capable of carrying two or more packet streams associated with the type of application, each of the two or more packet streams associated with the type of application utilizing one of a plurality of modulation and coding schemes, the plurality of modulation and coding schemes utilizing a basic time-frequency resource unit and integer multiples of the basic time-frequency resource unit; and ~~wherein~~

the portion of the ~~airlink~~ time-frequency resource falling outside of the zone is capable of carrying two or more packet streams not associated with the type of application;

for at least some of the two or more packet streams within the zone, creating a control message associated with each packet stream wherein the control message is used in part to ensure proper communication of the packet stream;

aggregating the created control messages associated with each packet stream in accordance with a common characteristic of the packet streams; and

transmitting the control messages in a group.

[c2] 2. (Original) The method of claim 1, wherein the common characteristic is the coding and modulation scheme of the packet streams.

[c3] 3. (Currently Amended) The method of claim 1, wherein the common characteristic is a location of the packet stream within the ~~airlink~~ time-frequency resource.

[c4] 4. (Original) The method of claim 1, further comprising adding a header to the group of control messages, wherein the header comprises the number of control messages, the length of the control messages, and the common characteristics of the associated packet streams.

[c5] 5. (Currently Amended) The method of claim 1, wherein the zone in one geographic cell is assigned to a different time-frequency location in the ~~airlink~~ time-frequency resource than the zone in a neighboring geographic cell in order to mitigate inter-cell interference.

[c6] 6. (Currently Amended) ~~The method of claim 1, further comprising:~~ A method of communication between base stations and mobile devices in a multi-carrier packet communication system that utilizes a time-frequency resource and covers a plurality of geographic cells, the method comprising:

allocating a zone in the time-frequency resource, wherein the zone is designated for a type of application and is capable of carrying two or more packet streams associated with the type of application, and wherein the portion of the time-frequency resource falling outside of the zone is capable of carrying two or more packet streams not associated with the type of application;

for at least some of the two or more packet streams within the zone, creating a control message associated with each packet stream wherein the control message is used in part to ensure proper communication of the packet stream;

aggregating the created control messages associated with each packet stream in accordance with a common characteristic of the packet streams;

transmitting the control messages in a group;

assigning a basic connection identification (BCID) value to a packet stream communicated via the ~~airlink~~ time-frequency resource;

assigning an application connection identification (ACID) value to a second packet stream communicated via the ~~airlink~~ time-frequency resource, wherein the ACID value contains a lesser number of bits than the BCID value and wherein the ACID value is augmented by time or frequency indices in the time-frequency resource to identify the second packet stream; and

incorporating the ACID value in the control message associated with the identified second packet stream.

[c7] 7. (Original) The method of claim 6, wherein an ACID value may be reused by base stations or mobile devices.

[c8] 8. (Cancelled)

[c9] 9. (Currently Amended) The method of claim 1, wherein ~~each of the two or more packet streams associated with the type of application utilize one of a plurality of modulation and coding schemes, and~~ a modulation and coding scheme index associated with each packet stream carries information about the utilized modulation and coding scheme for the packet stream.

[c10] 10. (Cancelled)

[c11] 11. (Original) The method of claim 1, further comprising using adaptive modulation and coding for the transmission of the group of control messages.

[c12] 12. (Original) The method of claim 11, wherein the modulation and coding for the group of control messages is the same as the modulation and coding used for the packet streams associated with the group of control messages.

[c13] 13. (Original) The method of claim 11, wherein the modulation and coding for the group of control messages is one level lower than the modulation and coding used for the packet streams associated with the group of control messages

[c14] 14. (Currently Amended) The method of claim ~~14~~, wherein the common characteristic is the coding and modulation scheme of the packet streams and further comprising a header transmitted prior to the group of control messages to indicate ~~the~~ a length of the group and ~~the~~ a modulation and coding scheme used for the group.

[c15] 15. (Original) The method of claim 1, wherein a starting time-frequency coordinate and an ending time-frequency coordinate are used to specify a location of a packet stream within the zone.

[c16] 16. (Original) The method of claim 1, wherein the zone is divided into a plurality of rows and a plurality of columns to thereby form a coordinate system.

[c17] 17. (Currently Amended) The method of claim 16, wherein a location of a packet stream within the zone may be specified by an offset from ~~the~~ an origin of the zone.

[c18] 18. (Original) The method of claim 16, wherein a location of a packet stream within the zone may be specified by a starting row and column coordinate and an ending row and column coordinate.

[c19] 19. (Original) The method of claim 16, wherein a granularity of a time coordinate is an OFDM symbol and a granularity of a frequency coordinate is a subcarrier.

[c20] 20. (Currently Amended) The method of claim 1, wherein the portion of the ~~airlink~~ time-frequency resource falling outside of the zone is treated as a second zone and wherein a resource allocation message pertaining to the second zone is communicated to a base station and a mobile station.

[c21] 21. (Original) The method of claim 20, wherein the resource allocation message identifies a connection identifier, a resource identification parameter, and a modulation and coding index for at least some of the packet streams in the second zone.

[c22] 22. (Original) The method of claim 20, further comprising dividing the second zone into a plurality of units, wherein the resource allocation message identifies at least some of the packet streams in the second zone based on the plurality of units.

[c23] 23. (Currently Amended) A method of communication between base stations and mobile devices in a multi-carrier packet communication system that utilizes an ~~airlink~~ time-frequency resource and covers a plurality of geographic cells, the method comprising:

allocating a zone in the ~~airlink~~ time-frequency resource for voice-over-IP packet streams, wherein the zone is capable of carrying two or more packet streams and the packet streams are arranged sequentially in the zone starting at an origin;

specifying a location of a packet stream in the zone by an offset to the origin, wherein the offset is one or more units of time-frequency resource that is

determined by a type of modulation and coding associated with the packet stream;

for at least some of the voice-over-IP packet streams within the zone, creating a control message associated with each packet stream wherein the control message is used in part to ensure proper communication of the packet stream;

aggregating the created control messages associated with each packet stream in accordance with a common characteristic of the packet streams; and

transmitting the control messages in a group.

[c24] 24-25. (Cancelled)

[c26] 26. (Currently Amended) The method of claim ~~25~~23, wherein the offset is included in the control message associated with the packet stream.

[c27] 27. (Currently Amended) The method of claim ~~25~~23, wherein the offset is not included in the control message associated with the packet stream and is instead calculated from the type of modulation and coding associated with other packet streams that precede the packet stream in the sequence of packet streams.

[c28] 28. (Currently Amended) The method of claim 23, wherein an ~~airlink~~ time-frequency resource associated with each of the two or more packet streams within the zone is allocated based on voice activity carried in the corresponding packet stream.

[c29] 29. (Currently Amended) The method of claim 28, wherein the allocated ~~airlink~~ time-frequency resource is an initial amount of resource and adaptive modulation and coding with an adaptive multi-rate voice coding is used to improve voice quality carried in the packet stream.

[c30] 30. (Currently Amended) The method of claim 28, further comprising reallocating ~~an airlink~~ time-frequency resource associated with a first packet stream having a silent voice connection to a second packet stream having an active voice connection.

[c31] 31. (Original) The method of claim 30, wherein the second packet stream is the next packet stream in sequence after the first packet stream.

[c32] 32. (Original) The method of claim 30, wherein the second packet stream is the last packet stream in the sequence of packet streams.

[c33] 33. (Original) The method of claim 30, wherein the second packet stream is the last packet stream in the sequence of packet streams that has the same coding and modulation scheme as the first packet stream.

[c34] 34. (New) The method of claim 1, wherein the packet streams are transmitted in orthogonal frequency division multiplexing (OFDM) symbols, and wherein logical subcarriers and OFDM symbol indices seen by upper layer facilities are mapped to actual physical subcarrier and OFDM symbol indices.

[c35] 35. (New) The method of claim 1, wherein the zone allocated in the time-frequency resource is associated with video applications.

[c36] 36. (New) The method of claim 1, wherein the zone allocated in the time-frequency resource is further subdivided into time-frequency segments, wherein a mapping of packet streams to segments is achieved using a one-dimensional offset with respect to an origin of the zone.

REMARKS

In the Office Action mailed August 2, 2010 (the "Office Action"), the Examiner rejected claims 1-4, 6-7, 9, and 16-22 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 7,221,680 to Vijayan et al. ("Vijayan"); rejected claim 5 under 35 U.S.C. § 103(a) as being unpatentable over Vijayan in view of U.S. Patent No. 6,826,409 to Kostic et al. ("Kostic"); rejected claim 11, 14, 23-24, and 28-30 under 35 U.S.C. § 103(a) as being unpatentable over Vijayan in view of U.S. Patent No. 7,619,995 to El-Hennawey et al. ("El-Hennawey"); and rejected claim 15 under 35 U.S.C. § 103(a) as being unpatentable over Vijayan in view of U.S. Patent No. 6,445,308 to Koike ("Koike"). Applicants respectfully traverse these rejections. Claim 8, 10, 12-13, 25-27, and 31-33 were indicated as being allowable.

Applicants herein amend claims 1, 3, 5-6, 9, 14, 17, 20, 23, and 26-30 to more clearly identify the subject matter for which applicants seek protection. Claims 8, 10 and 24-25 have been canceled, and claims 34-36 have been added. Claims 1-7, 9, 11-23, and 26-36 are therefore currently pending.

A. Interview Summary

Applicants' representative thanks the Examiner for the courtesy of the telephone interview conducted on November 10, 2010. In the interview, applicants' representative discussed the amendments made herein to claim the subject matter indicated as allowable by the Examiner. In addition, applicants' representative reviewed a number of minor amendments that were made to, for example, clarify the scope of the claims. Such amendments are supported by at least paragraph [0027] of applicants' specification. If the Examiner believes that additional details are needed to summarize the interview, the Examiner is invited to contact the applicants' representative at the number below.

B. New Claims

Applicants have added new dependent claims 34-36, which depend from independent claim 1. The new claims are supported by at least paragraphs [0027], [0029], and [0032] of applicants' specification.

C. Conclusion

In view of the above amendments, applicants believe the pending application is in condition for allowance. If the Examiner has any questions or believes a telephone conference would expedite prosecution of this application, the Examiner is encouraged to call the undersigned at (206) 359-3129.

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, the applicants are not conceding that previously pending claims are not patentable over the cited references; instead, any alteration or characterizations are being made to facilitate expeditious prosecution of this application.

The applicants reserve the right to later pursue any previously pending or other broader or narrow claims that capture any subject matter supported by the present disclosure, including subject matter that might be found disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that the applicants have made any disclaimers or disavowals of any subject matter supported by the present application.

Please charge any deficiencies or credit any overpayment to our Deposit Account No. 50-0665, under Order No. 612408017US1 from which the undersigned is authorized to draw.

Dated: 10 Nov 2010

Respectfully submitted,

By _____
Stephen Bishop
Registration No.: 38,829
PERKINS COIE LLP
P.O. Box 1247
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(206) 359-8000
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Attorney for Applicant

Docket No.: 612408017US1
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Li et al.

Application No.: 11/908,257 | Confirmation No.: 1928

Filed: July 14, 2008 | Art Unit: 2464

For: METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD | Examiner: C. B. Patel

INFORMATION DISCLOSURE STATEMENT (IDS)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Pursuant to 37 CFR 1.56, 1.97 and 1.98, the attention of the Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement is filed more than three months after the U.S. filing date, OR more than three months after the date of entry of the national stage of a PCT application, AND after the mailing date of the first Office Action on the merits, whichever occurs first, but before the mailing date of any of a Final Office Action, a Notice of Allowance (37 CFR 1.97(c)) or an action that otherwise closes prosecution in the application.

In accordance with 37 CFR 1.98(a)(2)(ii), Applicant has not submitted copies of U.S. patents and U.S. patent applications. Applicant submits herewith copies of non-patent literature in accordance with 37 CFR 1.98(a)(2).

This Information Disclosure Statement is not to be construed as a representation that: (i) a search has been made; (ii) additional information that may be material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the cited information is, or is considered to be, material to patentability. In addition, applicant does not admit that any enclosed item of information constitutes prior art to the subject invention and specifically reserves the right to demonstrate that any such reference is not prior art.

It is submitted that the Information Disclosure Statement is in compliance with 37 CFR 1.98 and the Examiner is respectfully requested to consider the listed references.

Please charge our EFT Account SEA1PIRM in the amount of $180.00 covering the fee set forth in 37 CFR 1.17(p). The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 50-0665, under Order No. 612408017US1.

Dated: 10 Nov 2010

Respectfully submitted,

By _____

Stephen Bishop
Registration No.: 38,829
PERKINS COIE LLP
P.O. Box 1247
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Attorney for Applicant

PTO/SB/08b (07-09)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	11/908,257-Conf. #1928
Filing Date	July 14, 2008
First Named Inventor	Xiaodong Li
Art Unit	2464
Examiner Name	C. B. Patel
Attorney Docket Number	612408017US1

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US-7,181,246	02-20-2007	Lo	
		US-7,164,669	01-16-2007	Li et al.	
		US-7,020,072	03-28-2006	Li et al.	
		US-6,947,748	09-20-2005	Li et al.	
		US-6,940,914	09-06-2005	Lo et al.	
		US-6,940,827	09-06-2005	Li et al.	
		US-6,490,270	12-03-2002	Krishnamoorthy et al.	
		US-6,459,740	10-01-2002	Lo	
		US-6,442,222	08-27-2002	Ghazi-Moghadam et al.	
		US-6,377,783	04-23-2002	Lo et al.	
		US-6,314,081	11-06-2001	Chennakeshu et al.	
		US-6,219,341	04-17-2001	Varanasi	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. * CITE NO.: Those application(s) which are marked with an single asterisk (*) next to the Cite No. are not supplied (under 37 CFR 1.98(a)(2)(iii)) because that application was filed after June 30, 2003 or is available in the IFW. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		International Search Report and Written Opinion, International Patent Application No. PCT/US06/38149; Filed 28 September 2006; Applicant Neocific, Inc.; Mailed 21 February 2007; 8 pages.	

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1]Applicant's unique citation designation number (optional). [2]Applicant is to place a check mark here if English language Translation is attached.

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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

[X] Practitioners associated with the Customer Number: 25096

OR

[ ] Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

[X] The address associated with Customer Number: 25096

OR

[ ] Firm or Individual Name					
Address					
City		State		Zip	
Country		Telephone		Email	

Assignee Name and Address:

Neocific, Inc.
13312 SE 43rd Street
Bellevue, Washington 98006

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	[signature]	Date	1/3/2007
Name	XIAODONG LI	Telephone	425-445-2270
Title	PRESIDENT		

61240-8000/LEGAL12936537.1

PTO/SB/96 (07-09)
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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Xiaodong Li, Haiming Huang, Titus Lo, and Ruifeng Wang

Application No./Patent No.: 11/908,257 Filed/Issue Date: July 14, 2008

Titled: METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD

Neocific, Inc. (Name of Assignee), a corporation (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. [X] the assignee of the entire right, title, and interest in;

2. [ ] an assignee of less than the entire right, title, and interest in
(The extent (by percentage) of its ownership interest is _____ %); or

3. [ ] an assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made) the patent application/patent identified above by virtue of either:

A. [X] An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 023455, Frame 0173, or for which a copy thereof is attached.

OR

B. [ ] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

[ ] Additional documents in the chain of title are listed on a supplemental sheet(s).

[X] As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Signature	10 Nov 2010 Date
Stephen Bishop Printed or Typed Name	Attorney for Assignee Title

612408017WO
SCB/CH

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

DOCKETED

PCT

To:
STEPHEN C. BISHOP
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

RECEIVED
PATENT DOCKETING
FEB 26 2007
PERKINS COIE LLP

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing (*day/month/year*) 21 FEB 2007
Applicant's or agent's file reference 612408017WO	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US06/38149	International filing date (*day/month/year*) 28 September 2006 (28.09.2006)
Applicant NEOCIFIC, INC.	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 338.82.70.

   For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90*bis*.1 and 90*bis*.3, respectively, before the completion of the technical preparations for international publication.

   The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

   In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

   See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450	Authorized officer Christopher Grey
Facsimile No. (571) 273-3201	Telephone No. (571)272-2600

Form PCT/ISA/220 (January 2004) *(See notes on accompanying sheet)*

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 612408017WO	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US06/38149	International filing date (*day/month/year*) 28 September 2006 (28.09.2006)	(Earliest) Priority Date (*day/month/year*) 28 September 2005 (28.09.2005)
Applicant NEOCIFIC, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the Report**
   a. With regard to the **language**, the international search was carried out on the basis of:
      ☒ the international application in the language in which it was filed.
      ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
   b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.
2. ☐ **Certain claims were found unsearchable** (See Box No. II)
3. ☐ **Unity of invention is lacking** (See Box No. III)
4. With regard to the **title**,
   ☒ the text is approved as submitted by the applicant.
   ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,
   ☒ the text is approved as submitted by the applicant.
   ☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,
   a. the figure of the **drawings** to be published with the abstract is Figure No. 6
      ☐ as suggested by the applicant.
      ☒ as selected by this Authority, because the applicant failed to suggest a figure.
      ☐ as selected by this Authority, because this figure better characterizes the invention.
   b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US06/38149

A. CLASSIFICATION OF SUBJECT MATTER
IPC: **H04B 11/00**

USPC: 370/203
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)
U.S. : 370/203

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,219,341 B1 (VARANASI) 17 April 2006 (17.04.2006), abstract figs 1 and 2.	1, 23
A	US 6,314,081 B1 (CHENNAKESHU et al) 06 November 2001 (06.11.2001), abstract	1, 23

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"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
05 January 2007 (05.01.2007)

Date of mailing of the international search report
21 FEB 2007

Name and mailing address of the ISA/US
Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
Facsimile No. (571) 273-3201

Authorized officer
Christopher Grey

Telephone No. (571)272-2600

Form PCT/ISA/210 (second sheet) (April 2005)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
STEPHEN C. BISHOP
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Applicant' s or agent' s file reference 612408017WO	Date of mailing (*day/month/year*) 21 FEB 2007 **FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date (*day/month/year*)	Priority date (*day/month/year*)
PCT/US06/38149	28 September 2006 (28.09.2006)	28 September 2005 (28.09.2005)

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

IPC: **H04J 11/00**
USPC: 370/203

Applicant

NEOCIFIC, INC.

1. This opinion contains indications relating to the following items:

☒	Box No. I	Basis of the opinion
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(*b*) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Date of completion of this opinion 05 January 2007 (05.01.2007)	Authorized officer Christopher Grey Telephone No. (571)272-2600

Form PCT/ISA/237 (cover sheet) (April 2005)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US06/38149

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

☒ the international application in the language in which it was filed

☐ a translation of the international application into ____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ on paper

☐ in electronic form

c. time of filing/furnishing

☐ contained in the international application as filed.

☐ filed together with the international application in electronic form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US06/38149

Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1-33	YES
	Claims NONE	NO
Inventive step (IS)	Claims 1-33	YES
	Claims NONE	NO
Industrial applicability (IA)	Claims 1-33	YES
	Claims NONE	NO

2. Citations and explanations:

Claims 1-33 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest dedicating zones in the airlink resources (time-frequency resources), where the zones are designated for different types of applications.

Claims 1-33 meet the criteria set out in PCT Article 33(4), and thus meet industrial applicability because the subject matter claimed can be made or used in industry.

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under Article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*, a publication of WIPO.

In these Notes, "Article," "Rule" and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report and the written opinion of the International Searching Authority, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only (see *PCT Applicant's Guide*, Volume I/A, Annexes B1 and B2).

The attention of the applicant is drawn to the fact that amendments to the claims under Article 19 are not allowed where the International Searching Authority has declared, under Article 17(2), that no international search report would be established (see *PCT Applicant's Guide*, Volume I/A, paragraph 296).

What parts of the international application may be amended ?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Preliminary Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When ? Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments ?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How ? Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments ?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, *if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.*

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

(i) the claim is unchanged;
(ii) the claim is cancelled;
(iii) the claim is new;
(iv) the claim replaces one or more claims as filed;
(v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under Article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

If a demand for international preliminary examination is made, the written opinion of the International Searching Authority will, except in certain cases where the International Preliminary Examining Authority did not act as International Searching Authority and where it has notified the International Bureau under Rule 66.1*bis*(b), be considered to be a written opinion of the International Preliminary Examining Authority. If a demand is made, the applicant may submit to the International Preliminary Examining Authority a reply to the written opinion together, where appropriate, with amendments before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later (Rule 43*bis*.1(c)).

Consequence *with regard* to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see the *PCT Applicant's Guide*, Volume II.

Electronic Patent Application Fee Transmittal	
Application Number:	11908257
Filing Date:	14-Jul-2008
Title of Invention:	METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD
First Named Inventor/Applicant Name:	Xiaodong Li
Filer:	John M. Wechkin/Stephanie Olson
Attorney Docket Number:	612408017US1
Filed as Small Entity	

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with $0 paid	2251	1	65	65

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**245**

Electronic Acknowledgement Receipt	
EFS ID:	8814046
Application Number:	11908257
International Application Number:	
Confirmation Number:	1928
Title of Invention:	METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD
First Named Inventor/Applicant Name:	Xiaodong Li
Customer Number:	25096
Filer:	John M. Wechkin/Stephanie Olson
Filer Authorized By:	John M. Wechkin
Attorney Docket Number:	612408017US1
Receipt Date:	10-NOV-2010
Filing Date:	14-JUL-2008
Time Stamp:	20:21:10
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$245
RAM confirmation Number	7512
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1		2010_11_10_OAResp.pdf	1361786 843552b902752483ed9d373eb3c2783d23daae43	yes	18

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Transmittal Letter	1	1
Extension of Time	2	2
Amendment/Req. Reconsideration-After Non-Final Reject	3	3
Claims	4	10
Applicant Arguments/Remarks Made in an Amendment	11	13
Transmittal Letter	14	15
Information Disclosure Statement (IDS) Filed (SB/08)	16	16
Power of Attorney	17	17
Assignee showing of ownership per 37 CFR 3.73(b).	18	18

Warnings:					
Information:					
2	NPL Documents	612408017WO_ISR.PDF	553066 b43385545250ea5d0f317506e0f8c162c8706124	no	8
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	32574 7172f5639ab653a7997897c23efed4575831e3ea	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1947426		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

AMENDMENT TRANSMITTAL LETTER

Docket No.
612408017US1

Application No	Filing Date	Examiner	Art Unit
11/908,257-Conf. #1928	July 14, 2008	C. B. Patel	2464

Applicant(s): Li et al.

Invention: METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD

TO THE COMMISSIONER FOR PATENTS

Transmitted herewith is an amendment in the above-identified application.

The fee has been calculated and is transmitted as shown below.

CLAIMS AS AMENDED

	Claims Remaining After Amendment	Highest Number Previously Paid	Number Extra Claims Present	Rate	
Total Claims	32	- 33 =	0	x 26.00	0.00
Independent Claims	3	- 3 =	0	x 110.00	0.00
Multiple Dependent Claims (check if applicable)		☐			
Other fee (please specify):	Extension for response within first month Information Disclosure Statement				65.00 180.00
TOTAL ADDITIONAL FEE FOR THIS AMENDMENT:					245.00

☐ Large Entity ☒ Small Entity

☐ No additional fee is required for this amendment.

☐ Please charge Deposit Account No. _____ in the amount of $ _____.

☐ A check in the amount of $ _____ to cover the filing fee is enclosed.

☒ Payment by EFT Account SEA1PIRM.

☒ The Director is hereby authorized to charge and credit Deposit Account No. 50-0665 as described below.

☒ Credit any overpayment.

☒ Charge any additional filing or application processing fees required under 37 CFR 1.16 and 1.17.

Dated: 10 May 2010

Stephen Bishop
Attorney/Agent Reg. No.: 38,829

PERKINS COIE LLP
P.O. Box 1247
Seattle, Washington 98111-1247
(206) 359-8000

61240-8017.US01/LEGAL19572520.1

PTO/SB/22 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) FY 2009 *(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)*	Docket Number (Optional) 61240801 7US1
Application Number 11/908,257-Conf. #1928	Filed July 14, 2008
For METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD	
Art Unit 2464	Examiner C. B. Patel

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	
[X]	One month (37 CFR 1.17(a)(1))	$130	$65	$ 65.00
[ ]	Two months (37 CFR 1.17(a)(2))	$490	$245	$
[ ]	Three months (37 CFR 1.17(a)(3))	$1110	$555	$
[ ]	Four months (37 CFR 1.17(a)(4))	$1730	$865	$
[ ]	Five months (37 CFR 1.17(a)(5))	$2350	$1175	$

[X] Applicant claims small entity status. See 37 CFR 1.27.

[ ] A check in the amount of the fee is enclosed.

[X] Payment by EFT Account SEA1PIRM.

[ ] The Director has already been authorized to charge fees in this application to a Deposit Account.

[X] The Director is hereby authorized to charge any deficiencies, or credit any overpayment, to Deposit Account Number 50-0665

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

[ ] applicant/inventor.

[ ] assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

[ ] attorney or agent of record. Registration Number

[X] attorney or agent under 37 CFR 1.34

Registration number if acting under 37 CFR 1.34 38,829

Signature — 10 Nov 2010 — Date

Stephen Bishop — Typed or printed name

(206) 359-8000 — Telephone Number

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

[X] Total of 1 forms are submitted.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 11/908,257	Filing Date 07/14/2008	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☒		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	33 minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
	11/10/2010	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	* 32	Minus	** 33	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1)		(Column 2)	(Column 3)					
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/PEGGY YARBOROUGH/

This collection of information is required by 37 CFR 1.16. 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 12 minutes 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: 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.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/908,257	07/14/2008	Xiaodong Li	612408017US1	1928

25096 7590 11/18/2010

PERKINS COIE LLP
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

EXAMINER	
PATEL, CHANDRAHAS B	
ART UNIT	**PAPER NUMBER**
2464	

NOTIFICATION DATE	DELIVERY MODE
11/18/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentprocurement@perkinscoie.com

Interview Summary	Application No.	Applicant(s)	
	11/908,257	LI ET AL.	
	Examiner	Art Unit	
	CHANDRAHAS PATEL	2464	

All participants (applicant, applicant's representative, PTO personnel):

(1) *CHANDRAHAS PATEL*. (3)_____.

(2) *Steve Bishop*. (4)_____.

Date of Interview: *10 November 2010*.

Type: a)☒ Telephonic b)☐ Video Conference
c)☐ Personal [copy given to: 1)☐ applicant 2)☐ applicant's representative]

Exhibit shown or demonstration conducted: d)☐ Yes e)☒ No.
If Yes, brief description: _____.

Claim(s) discussed: *1*.

Identification of prior art discussed: *Vijayan et al. (USPN 7,221,680)*.

Agreement with respect to the claims f)☐ was reached. g)☐ was not reached. h)☒ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: *Discussed proposed amendments to claim 1 in light of dependent ojected claims indicated as allowable*.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

/Chandrahas Patel/ Examiner, Art Unit 2464	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

———

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/908,257	07/14/2008	Xiaodong Li	612408017US1

CONFIRMATION NO. 1928

25096
PERKINS COIE LLP
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

POA ACCEPTANCE LETTER

OC000000044546099

Date Mailed: 11/19/2010

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/10/2010.

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.

/hgray/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

25096 7590 01/19/2011

PERKINS COIE LLP
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

EXAMINER	
PATEL, CHANDRAHAS B	
ART UNIT	PAPER NUMBER
2464	

DATE MAILED: 01/19/2011

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/908,257	07/14/2008	Xiaodong Li	612408017US1	1928

TITLE OF INVENTION: METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	$1055	04/19/2011

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

25096 7590 01/19/2011

PERKINS COIE LLP
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)

(Signature)

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/908,257	07/14/2008	Xiaodong Li	612408017US1	1928

TITLE OF INVENTION: METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	$1055	04/19/2011

EXAMINER	ART UNIT	CLASS-SUBCLASS
PATEL, CHANDRAHAS B	2464	370-330000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

❑ A check is enclosed.

❑ Payment by credit card. Form PTO-2038 is attached.

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. 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 12 minutes 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, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/908,257	07/14/2008	Xiaodong Li	612408017US1	1928

25096 7590 01/19/2011

PERKINS COIE LLP
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

EXAMINER	
PATEL, CHANDRAHAS B	
ART UNIT	PAPER NUMBER
2464	

DATE MAILED: 01/19/2011

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 314 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 314 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

Notice of Allowability	Application No.	Applicant(s)	
	11/908,257	LI ET AL.	
	Examiner	Art Unit	
	CHANDRAHAS PATEL	2464	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *11/10/2010*.

2. ☒ The allowed claim(s) is/are *1-7,9,11-23 and 26-36*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 11/10/2010
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Chandrahas Patel/
Examiner, Art Unit 2464

DETAILED ACTION

Allowable Subject Matter

1. Claims 1-7, 9, 11-23, 26-36 are allowed.

2. The following is an examiner's statement of reasons for allowance:

Regarding claim 1, the references do not teach the zone is designated for a type of application and is capable of carrying two or more packet streams associated with the type of application, each of the two or more packet streams associated with the type of application utilizing one of a plurality of modulation and coding schemes, the plurality of modulation and coding schemes utilizing a basic time-frequency resource unit and integer multiples of the basic time-frequency resource unit.

Regarding claim 6, the references do not teach assigning a basic connection identification (BCID) value to a packet stream communicated via the time-frequency resource; assigning an application connection identification (ACID) value to a second packet stream communicated via the time-frequency resource, wherein the ACID value contains a lesser number of bits than the BCID value and wherein the ACID value is augmented by time or frequency indices in the time-frequency resource to identify the second packet stream.

Regarding claim 23, the references not teach allocating a zone in the time-frequency resource for voice-over-IP packet streams, wherein the zone is capable of carrying two or more packet streams and the packet streams are arranged sequentially in the zone starting at an origin; specifying a location of a

packet stream in the zone by an offset to the origin, wherein the offset is one or more units of time-frequency resource that is determined by a type of modulation and coding associated with the packet stream.

Above taken with other limitations of the dependent claims is considered novel and non-obvious.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHANDRAHAS PATEL whose telephone number is (571)270-1211. The examiner can normally be reached on Monday through Thursday 7:30 to 17:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on 571-272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through

Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ricky Ngo/
Supervisory Patent Examiner,
Art Unit 2464

/Chandrahas Patel/
Examiner, Art Unit 2464

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11908257	LI ET AL.
	Examiner	Art Unit
	CHANDRAHAS PATEL	2464

ORIGINAL		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
370	330	H 0 4 W 4 / 00 (2009.0)	

CROSS REFERENCE(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	16	17	30	33										
2	2	17	18	6	34										
3	3	18	19	7	35										
4	4	19	20	8	36										
5	5	21	21												
22	6	20	22												
23	7	24	23												
	8		24												
9	9		25												
	10	26	26												
11	11	25	27												
12	12	27	28												
13	13	28	29												
14	14	29	30												
10	15	31	31												
15	16	32	32												

/CHANDRAHAS PATEL/ Examiner.Art Unit 2464	1/6/2011	Total Claims Allowed:	
(Assistant Examiner)	(Date)	32	
/RICKY NGO/ Supervisory Patent Examiner.Art Unit 2464	01/12/2011	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	6	(Li and Huang and Lo and Wang).in.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/06 11:14
L2	1175	(370/260).CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/01/06 11:14
L3	712	L2 and group	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/06 11:14
L4	2216	(370/390).CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/01/06 11:14
L5	1690	L4 and group	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/06 11:14
L6	847	L4 and (group same message)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/06 11:14
L7	494	(348/14.09).CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/01/06 11:14
L8	789	(348/e7.082).CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/01/06 11:14
L9	628	(348/e7.084).CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/01/06 11:14
L10	607	(frequency near5 coordinate) same (Packet pdu frame cell segment)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/06 11:14

L11	125	(frequency near5 time near5 coordinate) same (Packet pdu frame cell segment)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/06 11:14
L12	4498	(709/204).CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/01/06 11:14
L13	3052	L12 and group	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/06 11:14
L14	1174	L12 and (group same message)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/06 11:14
L15	77	L12 and (group same message same packet)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/06 11:14
L16	971	(370/330).CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/01/06 12:10
L23	24	("6219341" | "6314081" | "6377783" | "6442222" | "6459740" | "6490270" | "6940827" | "6940914" | "6947748" | "7020072" | "7164669" | "7181246").PN.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/06 13:49

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L17	969	(370/330).CCLS.	US-PGPUB; USPAT; USPAD	OR	OFF	2011/01/06 12:51
L18	75	17 and stream.dm.	US-PGPUB; USPAT; USPAD	OR	ON	2011/01/06 12:52
L20	4427	(stream and zone).dm.	US-PGPUB; USPAD	OR	ON	2011/01/06 13:12
L21	124	(stream and zone and ocd $3).dm.	US-PGPUB; USPAD	OR	ON	2011/01/06 13:12
L22	70	(stream and zone and ocd $3 and cntrd $4).dm.	US-PGPUB; USPAD	OR	ON	2011/01/06 13:13

1/6/2011 2:36:01 PM
C:\Documents and Settings\cpatel1\My Documents\EAST\Workspaces\11\11908257.wsp

PTO/SB/08b (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	11/908,257-Conf. #1928
Filing Date	July 14, 2008
First Named Inventor	Xiaodong Li
Art Unit	2464
Examiner Name	C. B. Patel
Attorney Docket Number	612408017US1

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/CBP/		US-7,181,246	02-20-2007	Lo	
		US-7,164,669	01-16-2007	Li et al.	
		US-7,020,072	03-28-2006	Li et al.	
		US-6,947,748	09-20-2005	Li et al.	
		US-6,940,914	09-06-2005	Lo et al.	
		US-6,940,827	09-06-2005	Li et al.	
		US-6,490,270	12-03-2002	Krishnamoorthy et al.	
		US-6,459,740	10-01-2002	Lo	
		US-6,442,222	08-27-2002	Ghazi-Moghadam et al.	
		US-6,377,783	04-23-2002	Lo et al.	
		US-6,314,081	11-06-2001	Chennakeshu et al.	
		US-6,219,341	04-17-2001	Varanasi	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

Examiner Signature	/Chandrahas Patel/	Date Considered	01/06/2011

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. * CITE NO.: Those application(s) which are marked with an single asterisk (*) next to the Cite No. are not supplied (under 37 CFR 1.98(a)(2)(iii)) because that application was filed after June 30, 2003 or is available in the IFW. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
/CBP/		International Search Report and Written Opinion, International Patent Application No. PCT/US06/38149; Filed 28 September 2006; Applicant Neocific, Inc.; Mailed 21 February 2007; 8 pages.	

Examiner Signature	/Chandrahas Patel/	Date Considered	01/06/2011

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1]Applicant's unique citation designation number (optional). [2]Applicant is to place a check mark here if English language Translation is attached.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11908257	LI ET AL.
	Examiner	Art Unit
	Chandrahas Patel	2464

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	07/27/2010	01/06/2011							
1	1	✓	=							
2	2	✓	=							
3	3	✓	=							
4	4	✓	=							
5	5	✓	=							
22	6	✓	=							
23	7	✓	=							
	8	O	-							
9	9	✓	=							
	10	O	-							
11	11	✓	=							
12	12	O	=							
13	13	O	=							
14	14	✓	=							
10	15	✓	=							
15	16	✓	=							
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24	23	✓	=							
	24	✓	-							
	25	O	-							
26	26	O	=							
25	27	O	=							
27	28	✓	=							
28	29	✓	=							
29	30	✓	=							
31	31	O	=							
32	32	O	=							
30	33	O	=							
6	34		=							
7	35		=							
8	36		=							

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11908257	LI ET AL.
	Examiner	Art Unit
	Chandrahas Patel	2464

SEARCHED			
Class	Subclass	Date	Examiner
370	260, 390	7/27/2010	CBP
348	14.09, E7.082, E7.084	7/27/2010	CBP
709	204	7/27/2010	CBP
370	330	1/6/2011	CBP
Above	Updated	1/6/2011	CBP

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search	7/27/2010	CBP
Inventor Search	7/27/2010	CBP
EAST Updated	1/6/2011	CBP

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
370	330	1/6/2011	CBP
US-PGPUB, UPAD	Database Interference Search	1/6/2011	CBP

PART B -FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571) 273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

PERKINS COIE LLP
P.O. Box 1247
Seattle, Washington 98111-1247

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being e-filed via PAIR.

Stephanie Olson	(Depositor's name)
	(Signature)
April 19, 2011	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/908,257	07/14/2008	Xiaodong Li	61240B017US1	1928

TITLE OF INVENTION: METHODS AND APPARATUS FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
Non-Provisional	yes	$755.00	$300.00	$1,055.00	04/19/2011

EXAMINER	ART UNIT	CLASS-SUBCLASS
C. B. Patel	2464	

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363)
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47, Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 Perkins Coie LLP
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Nextivity, Inc.
(B) RESIDENCE: (CITY and STATE OR COUNTRY): Bellevue, Washington

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are enclosed:
- ☒ Issue Fee
- ☒ Publication Fee (No small entity discount permitted)
- ☒ Advance Order - # of Copies 2

4b. Payment of Fee(s):
- ☐ A check in the amount of the fee(s) is enclosed.
- ☒ Payment by EFT Account SEA1PIRM.
- ☒ The Director is hereby authorized to charge any deficiencies, or credit any overpayment, to Deposit Account Number 50-0665

5. **Change in Entity Status** (from status indicated above)
- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
- ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.
NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature: /SB/ Date: April 19, 2011
Typed or printed name: Stephen Bishop Registration No: 38,829

PTOL-85 (Rev. 08/08) Approved for use through 08/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office. U.S. DEPARTMENT OF COMMERCE

61240-8017.US01/LEGAL20676763.1

Docket No.: 612408017US1
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Li et al.

Application No.: 11/908,257 | Confirmation No.: 1928

Filed: July 14, 2008 | Art Unit: 2464

For: METHODS AND APPARATUS FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD | Examiner: C. B. Patel

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

MS Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In the Notice of Allowability mailed January 19, 2011, the Examiner allowed claims 1-7, 9, 11-23 and 26-36. Although applicant agrees with the Examiner's conclusion that these claims are allowable, applicant notes that the claims may be allowable for reasons other than those identified by the Examiner and does not concede that the Examiner's characterizations of the terms of the claims and the prior art are correct.

Dated: April 19, 2011

Respectfully submitted,

By _____
Stephen Bishop
Registration No.: 38,829
PERKINS COIE LLP
P.O. Box 1247
Seattle, Washington 98111-1247
(206) 359-8000
(206) 359-7198 (Fax)
Attorney for Applicant

612408017US01/LEGAL2667839.1

Electronic Patent Application Fee Transmittal	
Application Number:	11908257
Filing Date:	14-Jul-2008
Title of Invention:	METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD
First Named Inventor/Applicant Name:	Xiaodong Li
Filer:	John M. Wechkin/Stephanie Olson
Attorney Docket Number:	612408017US1
Filed as Small Entity	

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	2501	1	755	755
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1055**

Electronic Acknowledgement Receipt	
EFS ID:	9909149
Application Number:	11908257
International Application Number:	
Confirmation Number:	1928
Title of Invention:	METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD
First Named Inventor/Applicant Name:	Xiaodong Li
Customer Number:	25096
Filer:	John M. Wechkin/Stephanie Olson
Filer Authorized By:	John M. Wechkin
Attorney Docket Number:	612408017US1
Receipt Date:	19-APR-2011
Filing Date:	14-JUL-2008
Time Stamp:	13:55:14
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$1055
RAM confirmation Number	168
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1		2011_04_19_IssueFeePayment.pdf	412242 1a7ef55accb54bd9f531d24599acfeca5d2de0b5	yes	2

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Issue Fee Payment (PTO-85B)	1	1
	Miscellaneous Incoming Letter	2	2

Warnings:

Information:

2	Fee Worksheet (PTO-875)	fee-info.pdf	32243 ae006256cd44fdc869ebfd467aa2c1ff317815ef	no	2

Warnings:

Information:

Total Files Size (in bytes):	444485

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/908,257	05/24/2011	7948944	612408017US1	1928

25096 7590 05/04/2011

PERKINS COIE LLP
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 371 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Xiaodong Li, Kirkland, WA;
Haiming Huang, Bellevue, WA;
Titus Lo, Bellevue, WA;
Ruifeng Wang, Sammamish, WA;

Docket No.: 612408017US1
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Letters Patent of:
Li et al.

Patent No.: 7,948,944

Issued: May 24, 2011

For: METHODS AND APPARATUS FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD

REQUEST FOR CERTIFICATE OF CORRECTION
PURSUANT TO 37 C.F.R. § 1.323

Attention: Certificate of Correction Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Upon reviewing the above-identified patent, Patentee noted typographical errors which should be corrected.

The applicant(s) requests a Certificate of Correction to correct the errors in the above-identified patent, which are listed on the attached Form PTO/SB/44.

Some of the errors were found in the application as filed by applicant. Please charge our Credit Card in the amount of $100.00 covering the fee set forth in 37 CFR 1.20(a).

The errors now sought to be corrected are inadvertent typographical errors the correction of which does not involve new matter or require reexamination.

Transmitted herewith is a proposed Certificate of Correction effecting such amendment. Patentee respectfully solicits the granting of the requested Certificate of Correction.

The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 50-0665, under Order No. 612408017US1.

Dated: 9 Dec 2011

Respectfully submitted,

By _____

Stephen Bishop
Registration No.: 38,829
PERKINS COIE LLP
P.O. Box 1247
Seattle, Washington 98111-1247
(206) 359-8000
(206) 359-7198 (Fax)
Attorney for Applicant

PTO/SB/44 (09-07)
Approved for use through 08/31/2013. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.
(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,948,944

APPLICATION NO.: 11/908,257

ISSUE DATE : May 24, 2011

INVENTOR(S) : Xiaodong Li et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 3, line 9, delete "described. In" and insert - - described in - -, therefor.

In column 6, line 23, delete "moauiar" and insert - - modular - -, therefor.

In column 7, line 4, delete "packet packet" and insert - - packet - -, therefor.

In column 7, line 19, delete "zone." and insert - - zone, - -, therefor.

In column 9, line 43, delete "(1Es)," and insert - - (IEs), - -, therefor.

In column 9, line 53, delete "fo" and insert - - of - -, therefor.

In column 10, line 24, delete "the although" and insert - - although the - -, therefor.

In column 14, line 33, in claim 24, delete "streams," and insert - - streams - -, therefor.

In column 15, line 2, in claim 29, delete "time-frequency" and insert - - a time-frequency - -, therefor.

In column 15, line 8, in claim 30, delete "stream." and insert - - stream, and further comprising reallocating the packet streams subsequent to the second packet stream in the sequence of packet streams in order to fill the airlink resource that was vacated by the second packet stream. - -, therefor.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Stephen Bishop
PERKINS COIE LLP
P.O. Box 1247
Seattle, Washington 98111-1247

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. 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 1.0 hour 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: Attention Certificate of Corrections Branch, 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

Electronic Patent Application Fee Transmittal	
Application Number:	11908257
Filing Date:	14-Jul-2008
Title of Invention:	METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD
First Named Inventor/Applicant Name:	Xiaodong Li
Filer:	Christopher J. Daley-Watson/Erica Tollefson
Attorney Docket Number:	61240-8017.US01
Filed as Large Entity	

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Certificate of correction	1811	1	100	100
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**100**

Electronic Acknowledgement Receipt	
EFS ID:	11587941
Application Number:	11908257
International Application Number:	
Confirmation Number:	1928
Title of Invention:	METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD
First Named Inventor/Applicant Name:	Xiaodong Li
Customer Number:	25096
Filer:	Christopher J. Daley-Watson/Erica Tollefson
Filer Authorized By:	Christopher J. Daley-Watson
Attorney Docket Number:	61240-8017.US01
Receipt Date:	09-DEC-2011
Filing Date:	14-JUL-2008
Time Stamp:	19:35:25
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$100
RAM confirmation Number	6145
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Request for Certificate of Correction	Req_for_COC_8017US1.PDF	115031 8b2fb92e99ebaf6193884eac4f1d899bf6c91cc9	no	3
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30344 b3d738850244b03301cb257d559b921c8854700e	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	145375		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

SPE RESPONSE FOR CERTIFICATE OF CORRECTION

Paper No.: _____

DATE : December 19, 2011

TO SPE OF : ART UNIT 2464 SPE Ricky Q. Ngo.

SUBJECT : Request for Certificate of Correction for Appl. No.: 11/908,257 Patent No.: 7,948,944 B2

Please respond to this request for a certificate of correction within 7 days.

FOR IFW FILES:

Please review the requested changes/corrections as shown in the **COCIN** document(s) in the IFW application image. No new matter should be introduced, nor should the scope or meaning of the claims be changed.

Please complete the response (see below) and forward the completed response to scanning using document code **COCX**.

FOR PAPER FILES:

Please review the requested changes/corrections as shown in the attached certificate of correction. Please complete this form (see below) and forward it with the file to:

Certificates of Correction Branch (CofC)
Randolph Square Building
2800 South Randolph Street
Arlington, VA 22206

Should the change to claim 30, which is inserting additional text, be approved as requested by applicant?
See COCIN dated 12-9-2011

Antonio Johnson

Certificates of Correction Branch

(571)272-0483 Fax – (571)270-9846

Thank You For Your Assistance

The request for issuing the above-identified correction(s) is hereby:
Note your decision on the appropriate box.

- ☒ **Approved** — **All** changes apply.
- ☐ **Approved in Part** — Specify below which changes **do not** apply.
- ☐ **Denied** — State the reasons for denial below.

Comments: Amendments to claim 30 are supported by specification. See page 17, Paragraphs 59-61 of submitted specification.

SPE_/RICKY NGO/ **Art Unit** 2464

PTOL-306 (REV. 7/03) U.S. DEPARTMENT OF COMMERCE Patent and Trademark Office

PTO/SB/80 (11-08)
Approved for use through 11/30/2020. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☑ Practitioners associated with the Customer Number: 03624

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☑ The address associated with Customer Number: 03624

OR

☐ Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:

Neo Wireless LLC
123 West Wayne Avenue, Floor 1
Wayne, PA 19087

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	David Loo	Date	02/20/2020
Name	David Loo	Telephone	603.674.2754
Title	C.E.O., Neo Wireless LLC		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. 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 1.11 and 1.14. This collection is estimated to take 3 minutes 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: 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.

Electronic Acknowledgement Receipt	
EFS ID:	38757236
Application Number:	11908257
International Application Number:	
Confirmation Number:	1928
Title of Invention:	METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD
First Named Inventor/Applicant Name:	Xiaodong Li
Customer Number:	25096
Filer:	Christina R. Walsh/Justin Slater
Filer Authorized By:	Christina R. Walsh
Attorney Docket Number:	61240-8017.US01
Receipt Date:	03-MAR-2020
Filing Date:	14-JUL-2008
Time Stamp:	16:45:33
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Assignee showing of ownership per 37 CFR 3.73	NEO-PT020_1US-PreAIA_373b_sb0096_EFS-20200303.PDF	220087 c00507dcd3c1ce2e5d0f4be4ed24c4d31447e4d7	no	2
Warnings:					

Information:					
2	Power of Attorney	NEO-PT020_1US-Executed_POA_sb0080_EFS-20200303.PDF	902039 a65a4b6133de7ca3e9a084eabfbd4d70ba23b784	no	1
Warnings:					
Information:					
			Total Files Size (in bytes):	1122126	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/96 (11-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Neo Wireless LLC

Application No./Patent No.: 7,948,944 Filed/Issue Date: May 24, 2011

Titled:

Neo Wireless LLC, a corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;

2. ☐ an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is _____ %); or

3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel_____, Frame_____, or a copy* is attached.

OR

B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: INVENTORS To: NEOCIFIC, INC.

The document was recorded in the United States Patent and Trademark Office at
Reel 023455, Frame 0173, or a copy* is attached.

2. From: NEOCIFIC, INC. To: CFIP NCF LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 051116, Frame 0396, or a copy* is attached.

3. From: CFIP NCF LLC To: NEO WIRELESS LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 051971, Frame 0226, or a copy* is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ *As required by 37 CFR 3.73(b)(1)(i), if a copy/copies is/are attached, the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Christina R. Walsh/ March 3, 2020
Signature Date

Christina R. Walsh 61553
Printed or Typed Name Title or Registration Number

This collection of information is required by 37 CFR 3.73(b). 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 1.11 and 1.14. This collection is estimated to take 12 minutes 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: 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.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/908,257	07/14/2008	Xiaodong Li	61240-8017.US01

CONFIRMATION NO. 1928

3624
VOLPE AND KOENIG, P.C.
30 SOUTH 17TH STREET, 18th Floor
PHILADELPHIA, PA 19103

POA ACCEPTANCE LETTER

OC000000115303015

Date Mailed: 03/10/2020

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/03/2020.

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.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/atesfai/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/908,257	07/14/2008	Xiaodong Li	61240-8017.US01

CONFIRMATION NO. 1928

POWER OF ATTORNEY NOTICE

25096
PERKINS COIE LLP - SEA General
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247



Date Mailed: 03/10/2020

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/03/2020.

- 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).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/atesfai/

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	11/908,257	
Filed:	September 28, 2006	FILE: NEO-PT020.1US
Patent No.:	7,948,944	DATE: March 11, 2020
Issued:	May 24, 2011	

DECLARATION OF LARGE ENTITY STATUS
PURSUANT TO 37 C.F.R. §1.27 (c)(1)

Commissioner for Patents
Mail Stop M Correspondence
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The above-identified patent is no longer entitled to small entity status and should be considered a large entity for all further payments.

Respectfully submitted,

NEO WIRELESS LLC

By /John C. Donch Jr./
John C. Donch Jr., Esquire
Registration No. 43,593
(215) 568-6400

Volpe and Koenig, P.C.
United Plaza
30 South 17th Street
Philadelphia, PA 19103-4009

JCD/dt

5670574-1

Electronic Acknowledgement Receipt	
EFS ID:	38834469
Application Number:	11908257
International Application Number:	
Confirmation Number:	1928
Title of Invention:	METHOD AND SYSTEM FOR MULTI-CARRIER PACKET COMMUNICATION WITH REDUCED OVERHEAD
First Named Inventor/Applicant Name:	Xiaodong Li
Customer Number:	3624
Filer:	John C. Donch/Diane Thatcher
Filer Authorized By:	John C. Donch
Attorney Docket Number:	61240-8017.US01
Receipt Date:	11-MAR-2020
Filing Date:	14-JUL-2008
Time Stamp:	14:27:40
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Notification of loss of entitlement to small entity status	NEO_PT020_1US.pdf	33240 f5e7c808be5b7a805889fcd92836e0f3e5106898	no	1

Warnings:

Information:	
Total Files Size (in bytes):	33240

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
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New International Application Filed with the USPTO as a Receiving Office
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