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January 10, 2024

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UNITED STATES PATENT AND TRADEMARK OFFICE
DEPARTMENT OF COMMERCE

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PTO/AIA/80 (07-12)
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I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

[■] Practitioners associated with Customer Number: 23,446

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 assignments documents attached to this form in accordance with 37 CFR 3.73(c).

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Firm or Individual Name			
Address			
City		State	Zip
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Assignee Name and Address: Maxlinear, Inc.
5966 La Place Court
Suite 100
Carlsbad, CA 92008

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

Signature		Date	8-18-15
Name	Adam Spice	Telephone	
Title	Chief Financial Officer		

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	Title: Method and System for Service Group Management in a Cable Network Atty Docket No.: 25052US02

As the below named inventor, I hereby declare that:

This declaration is directed to:

☑ The attached application, or

☐ United States application or PCT international application number _____

filed on _____.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

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LEGAL NAME OF INVENTOR

Inventor: Curtis Ling Date (Optional): 21 Jul 2013

Signature: _____

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The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

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LEGAL NAME OF INVENTOR

Inventor: Timothy Gallagher Date (Optional) : 7/23/2013

Signature: /Timothy Gallagher/

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As the below named inventor, I hereby declare that:

This declaration is directed to:

- [x] The attached application, or
- [ ] United States application or PCT international application number _____

filed on _____.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

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LEGAL NAME OF INVENTOR

Inventor: Sridhar Ramesh Date (Optional) : 07/23/2013

Signature: /Sridhar Ramesh/

Note: An application data sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/SB/AIA01 form for each additional inventor.

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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.
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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.
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ABSTRACT

A cable modem termination system (CMTS) may determine, for a plurality of cable modems served by the CMTS, a corresponding plurality of SNR-related metrics. The CMTS may assigning the modems among a plurality of service groups based on the SNR-related metrics. For any one of the modems, the CMTS may configure physical layer communication parameters to be used by the one of the modems based on a SNR-related metric of a service group to which the one of the modems is assigned. The physical layer communication parameters may include one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate. The CMTS and the modems may communicate using orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers, and the physical layer communication parameters may be determined on a per-subcarrier basis.

CLAIMS

What is claimed is:

1 A method comprising:

determining, by a cable modem termination system (CMTS), for a plurality of cable modems served by said CMTS, a corresponding plurality of signal-to-noise ratio (SNR) related metrics;

assigning, by said CMTS, said plurality of cable modems among a plurality of service groups based on said plurality of SNR-related metrics;

generating, by said CMTS for each one of said plurality of service groups, a composite SNR-related metric based on a portion of said plurality of SNR-related metrics corresponding to said one of said plurality of service groups;

selecting, by said CMTS, physical layer communication parameters to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric; and

communicating, by said CMTS, with a portion of said plurality of cable modems corresponding to said one of said plurality of service groups using said selected physical layer communication parameters.

2. The method of claim 1, wherein said physical layer communication parameters include one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate.

3. The method of claim 1, wherein said CMTS uses orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers for said communicating.

4. The method of claim 3, comprising selecting, by said CMTS, said physical layer communication parameters on a per-OFDM-subcarrier basis.

5. The method of claim 4, wherein said physical layer communication parameters include one or both of: which of said OFDM subcarriers to use for transmission to said CMTS, and which of said OFDM subcarriers to use for reception of information from said CMTS.

6. The method of claim 1, wherein:

said plurality of service groups comprises a first service group and a second service group;

said first service group has a first composite SNR versus frequency profile, said second service group has a second composite SNR versus frequency profile, and a third cable modem has a particular SNR versus frequency profile; and

said assigning said plurality of cable modems among said plurality of service groups comprises:

assigning said third cable modem to said first service group if said particular SNR versus frequency profile is more similar to said first composite SNR versus frequency profile than to said second composite SNR versus frequency profile; and

assigning said third cable modem to said second service group if said particular SNR versus frequency profile is more similar to said second composite SNR versus frequency profile than to said first composite SNR versus frequency profile.

7. The method of claim 1, comprising assigning said plurality of cable modems among said plurality of service groups based on distances between said CMTS and said plurality of cable modems.

8. The method of claim 1, comprising assigning any particular one of said plurality of cable modems to one of said plurality of service groups based on which one or more of a plurality of branch amplifiers are upstream of said one of said plurality of cable modems.

9. The method of claim 1, wherein said determining said plurality of SNR-related metrics comprises:

transmitting a probe message to each said plurality of cable modems, said probe message comprising instructions for measuring a metric and reporting said measured metric back to said CMTS; and

receiving a metric reporting message from each of said plurality of cable modems.

10. A system comprising:

circuitry for use in a cable modem termination system (CMTS), said circuitry comprising a network interface and a processor wherein:

said processor is configured to determine, for a plurality of cable modems served by said CMTS, a corresponding plurality of signal-to-noise ratio (SNR) related metrics;

said processor is configured to assign said plurality of cable modems among a plurality of service groups based on said plurality of SNR-related metrics;

said processor is configured to generate, for each one of said plurality of service groups, a composite SNR-related metric based on a portion of said

plurality of SNR-related metrics corresponding to said one of said plurality of service groups;

said processor is configured to select physical layer communication parameters to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric; and

said network interface is configured to communicate with a portion of said plurality of cable modems corresponding to said one of said plurality of service groups using the selected physical layer communication parameters.

11. The system of claim 10, wherein said physical layer communication parameters include one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate.

12. The system of claim 10, wherein said network interface and said plurality of cable modems are configured to communicate using orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers.

13. The system of claim 12, wherein said network interface is configured such that said physical layer communication parameters are configurable on a per-OFDM-subcarrier basis.

14. The system of claim 12, wherein said physical layer communication parameters include one or both of: which of said OFDM subcarriers to use for transmission to said CMTS, and which of said OFDM subcarriers to use for reception of information from said CMTS.

15. The system of claim 10, wherein:

said plurality of service groups comprises a first service group and a second service group;

said first service group has a first composite SNR versus frequency profile, said second service group has a second composite SNR versus frequency profile, and a third cable modem has a particular SNR versus frequency profile;

said assignment of said plurality of cable modems among said plurality of service groups comprises:

assignment of said third cable modem to said first service group if said particular SNR versus frequency profile is more similar to said first composite SNR versus frequency profile than to said second composite SNR versus frequency profile; and

assignment of said third cable modem to said second service group if said particular SNR versus frequency profile is more similar to said second composite SNR versus frequency profile than to said first composite SNR versus frequency profile.

16. The system of claim 10, wherein said processor is configured to assign said plurality of cable modems among said plurality of service groups based on distances between said CMTS and said plurality of cable modems.

17. The system of claim 10, wherein said processor is configured to assign said plurality of cable modems among said plurality of service groups based on a branch further branch amplifier that serves each of said plurality of cable modems.

18. The system of claim 10, wherein said determination of said plurality of SNR-related metrics comprises:

transmission, via said network interface, of a probe message to each said plurality of cable modems, said probe message comprising instructions for measuring a metric and reporting said measured metric back to said CMTS; and

reception, via said network interface of said CMTS, of a metric reporting message from each of said plurality of cable modems.

METHOD AND SYSTEM FOR SERVICE GROUP MANAGEMENT IN A CABLE NETWORK

PRIORITY CLAIM

[0001] This patent application is a continuation of United States Patent Application 15/228,703 filed on August 4, 2016, which is a continuation of United States Patent Application No. 13/948,444 filed on July 23, 2013, now Patent No. 9,419,858, which makes reference to, claims priority to and claims benefit from United States Provisional Patent Application Serial No. 61/674,742 titled "Method and System for Service Group Management in a Cable Television Network" and filed on July 23, 2012.

[0002] The entirety of each of the above-mentioned applications is hereby incorporated herein by reference.

INCORPORATION BY REFERENCE

[0003] This application also makes reference to:

United States Patent Application Serial No. 13/553,328 titled "Method and System for Client-Side Message Handling in a Low-Power Wide Area Network," and filed on July 19, 2012;

United States Patent Application Serial No. 13/485,034 titled "Method and System for Server-Side Message Handling in a Low-Power Wide Area Network," and filed on May 31, 2012;

United States Patent Application Serial No. 13/553,175 titled "Method and System for a Low-Power Client in a Wide Area Network," and filed on July 19, 2012;

United States Patent Application Serial No. 13/553,195 titled "Method and System for Server-Side Handling of a Low-Power Client in a Wide Area Network," and filed on July 19, 2012;

United States Patent Application Serial No. 13/948,401 titled "Method and System for a High Capacity Cable Network," and filed on the same date as this application; and

United States Patent Application Serial No. 13/948,417 titled "Method and System for Noise Suppression in a Cable Network," and filed on the same date as this application.

[0004] The entirety of each of the above-mentioned applications is hereby incorporated herein by reference.

FIELD OF THE INVENTION

[0005] Certain embodiments of the invention relate to cable television networks. More specifically, certain embodiments of the invention relate to a method and system for service group management in a cable television network.

BACKGROUND OF THE INVENTION

[0006] Convention cable television networks can be inefficient and have insufficient capacity. Further limitations and disadvantages of conventional and traditional approaches will become apparent to one of skill in the art, through comparison of such systems with some aspects of the present invention as set forth in the remainder of the present application with reference to the drawings.

BRIEF SUMMARY OF THE INVENTION

[0007] A system and/or method is provided for service group management in a cable television network, substantially as shown in and/or described in connection with at least one of the figures, as set forth more completely in the claims.

[0008] These and other advantages, aspects and novel features of the present invention, as well as details of an illustrated embodiment thereof, will be more fully understood from the following description and drawings.

BRIEF DESCRIPTION OF SEVERAL VIEWS OF THE DRAWINGS

[0009] FIG. 1 is a diagram of an example cable/DOCSIS network.

[0010] FIG. 2A depicts an example method of determining locations of CMs within the HFC network.

[0011] FIGS. 2B and 2C depict signal-to-noise ratio (SNR) versus frequency profiles for an example cable/DOCSIS network.

[0012] FIG. 3A is a flowchart illustrating an example process for configuring a cable/DOCSIS HFC network based on measured performance metrics.

[0013] FIG. 3B is a flowchart illustrating an example process for configuring a cable/DOCSIS HFC network based on location of CMs within the network.

[0014] FIGS. 4A and 4B illustrate the network of FIG. 1, with different groupings of CMs based on one or both of: measured performance metric(s) and location within the HFC network.

DETAILED DESCRIPTION OF THE INVENTION

[0015] As utilized herein the terms "circuits" and "circuitry" refer to physical electronic components (i.e. hardware) and any software and/or firmware ("code") which may configure the hardware, be executed by the hardware, and or otherwise be associated with the hardware. As used herein, for example, a particular processor and memory may comprise a first "circuit" when executing a first one or more lines of code and may comprise a second "circuit" when executing a second one or more lines of code. As utilized herein, "and/or" means any one or more of the items in the list joined by "and/or". As an example, "x and/or y" means any element of the three-element set {(x), (y), (x, y)}. As another example, "x, y, and/or z" means any element of the seven-element set {(x), (y), (z), (x, y), (x, z), (y, z), (x, y, z)}. As utilized herein, the term "exemplary" means serving as a non-limiting example, instance, or illustration. As utilized herein, the terms "e.g.," and "for example" set off lists of one or more non-limiting examples, instances, or illustrations. As utilized herein, circuitry is "operable" to perform a function whenever the circuitry comprises the necessary hardware and code (if any is necessary) to perform the function, regardless of whether performance of the function is disabled, or not enabled, by some user-configurable setting.

[0016] FIG. 1 is a diagram of an example cable/DOCSIS network. The example network comprises a cable modem termination system (CMTS) 102, a fiber node 104, amplifiers 106_1–106_3, a directional coupler 108, splitters 110_1–110_3, and cable modems (CMs) 112_1–112_5.

[0017] The CMTS 102 may comprise circuitry operable to manage connections to the CMs 112_1–112_5. This may include, for example: participating in ranging operations to determine physical layer parameters used for communications between the CMTS 102 and CMs 112_1–112_5; forwarding of dynamic host configuration protocol (DHCP)

messages between a DHCP server and the CMs 112_1–112_5; forwarding of time of day messages between a time of day server and the CMs 112_1–112_5; directing traffic between the CMs 112_1–112_5 other network devices (e.g., Ethernet interfaces of the CMTS 102 may face the Internet, Optical RF interfaces of the CMTS 102 may face the CMs, and the CMTS may direct traffic between and among the Ethernet and Optical RF interfaces); and managing registration of the CMs 112_1–112_5 to grant the cable modems network (e.g., Internet) access. The registration process for a CM 112_X (X between 1 and 5 for the example network of FIG. 1) may comprise the CM 112 sending a registration request along with its configuration settings, and the CMTS 102 accepting or rejecting the cable modem based on the configuration settings. The registration process may additionally comprise an exchange of security keys, certificates, or other authentication information.

[0018] The fiber node 104 may comprise circuitry operable to convert between optical signals conveyed via the fiber optic cable 103 and electrical signals conveyed via coaxial cable 105.

[0019] Each of the amplifiers 106_1–106_3 may comprise a bidirectional amplifier which may amplify downstream signals and upstream signals, where downstream signals are input via upstream interface 107a and output via downstream interface 107b, and upstream signals are input via downstream interface 107b and output via upstream interface 107a. The amplifiers 106_1, which amplifies signals along the main coaxial "trunk" may be referred to as a "trunk amplifier." The amplifiers 1062 and 1063 which amplify signals along "branches" split off from the trunk may be referred to as "branch" or "distribution" amplifiers.

[0020] The directional coupler 108 may comprise circuitry operable to direct downstream traffic incident on interface 109a onto interfaces 109b and 109c, and to

direct upstream traffic incident on interfaces 109b and 109c onto interface 109a. The directional coupler 108 may be a passive device.

[0021] Each of the splitters 110_1–110_3 may comprise circuitry operable to output signals incident on each of its interfaces onto each of its other interfaces. Each of the splitters 110_1–110_3 may be a passive device.

[0022] Each of the cable modems (CMs) 112_1–112_5 may comprise circuitry operable to communicate with, and be managed by, the CMTS 1102 in accordance with one or more standards (e.g., DOCSIS). Each of the CMs 112_1–112_5 may reside at the premises of a cable subscriber.

[0023] The components (including, fiber optic cables, coaxial cables, amplifiers, directional couplers, splitters, and/or other devices) between the CMTS and the CMs may be referred to as a hybrid fiber coaxial (HFC) network. Any of the amplifiers, directional coupler, and splitters may be referred to generically as a coupling device.

[0024] FIG. 2A depicts an example method of determining locations of CMs within the HFC network. As shown in FIG. 2A, to determine one or more measured performance metric(s) (e.g., an SNR-related metric such as SNR at a particular frequency or SNR over a range of frequencies (an SNR profile), noise levels, strength of desired signals, and/or the like) for any particular CM 112_X, the CMTS 102 may transmit, at time 1, a message 202 that is destined (unicast, multicast, or broadcast) for the CM 112_X and that functions as a probe to enable determination of the metric(s) for the CM 112_X. The message 202 may be sent on multiple channels spanning multiple frequencies. Similarly, where OFDM is used for communications between the CMTS 102 and the CM 112_X, the message 202 may be transmitted on each subcarrier, or may be sent on a subset of subcarriers and then interpolation may be used for determining the SNR of subcarriers on which the message 202 was not sent.

[0025] The message 202 may be transmitted with such encoding, modulation, and transmit power such that even a CM 112_X with a worst-case performance metric(s) can receive the message and accurately measure the metric(s). In this regard, FIG. 2B shows a SNR versus frequency graph for an example HFC network that uses eight channels/subcarriers. The line 222 in FIG. 2B represents a composite worst-case SNR profile for one or more CM(s) in the HFC network to which the message 202 is destined. For example, line 222 may be a SNR profile for a single CM 112_X to which the message 202 is to be unicast. As another example, the line 222 may be a composite worst-case SNR profile for a plurality of CMs 112 of a particular service group to which the message 202 is to be multicast. As another example, the line 222 may be a composite worst-case SNR profile for all CMs of an HFC network handled by the CMTS 102 to which the message 202 is to be broadcast. The message 202 may be transmitted such that the minimum SNR needed to receive and accurately measure the SNR profile is below the line 222 (e.g., SNR needed for receiving the message 202 may be the line 224).

[0026] Upon receipt of the message 202, a CM 112_X may measure, over the channels/subbands on which the message was sent, one or more metrics (e.g., SNR versus frequency profile) for the transmission 202. The CM 112_X may then report the metrics(s) back to the CMTS 102 via a message 204. In an example implementation, the message 202 may contain information about when and/or how the CM(s) are supposed to report their metric(s) (e.g., SNR profiles) back to the CMTS 102. In this regard, the message 202 may contain information that is the same as and/or or analogous to what may be found in a MAP, UCD, and/or other MAC management message defined in a DOCSIS standard. Accordingly, the message 202 may have specified a format of the message 204 and that the message 204 is to be transmitted at time $T+\Delta$.

[0027] Once the metric(s) of one or more CMs are known to the CMTS 102, physical layer communication parameters to be used for communications between the CMTS 102 and the CMs 112 may be determined based on the metric(s). In this regard, physical layer communication parameters may be determined per-CM based on each CM's respective metric(s) (e.g., each CM's SNR profile), per-service-group based on a composite metric(s) of the CM(s) assigned to that service group (e.g., composite SNR profile for the CM(s) of that service group), per physical region of the HFC network based on a composite metric of the CMs located in that physical region (e.g., composite SNR profile for the CM(s) in that physical region), and/or the like. Furthermore, once the metric(s) of a CM 112_X is determined, the CMTS 102 may assign that CM 112_X to one or more service groups based on its metric(s), as, for example, described below with reference to FIG. 4A. Example physical layer parameters include: encoding parameters, modulation parameters, transmit power, receive sensitivity, timeslot duration, channel(s) or subcarrier(s) on which to listen, channel(s) or subcarrier(s) on which to transmit, and/or the like. Example encoding parameters include: type of forward error correction (FEC) to be used (e.g., Reed-Solomon, LDPC, etc.), FEC block size, FEC code rate, etc. Example modulation parameters include: type of modulation (e.g., frequency shift keying (FSK), phase shift keying (PSK), quadrature amplitude modulation (QAM), etc.), modulation depth, modulation order, etc.

[0028] In an example implementation, the transmission of messages 202, the calculation of metrics, such as SNR profile, by the CM(s), the transmission 204, and subsequent configuration of physical layer parameters based on the metric(s) may take place in parallel with other operations performed during the registration/ranging process.

[0029] Referring now to FIG. 2C, there is again shown the line 222 which represents the applicable SNR profile (e.g., an individual SNR profile if configuring physical layer parameters per CM, a composite SNR profile for a service group if

configuring physical layer parameters per service group, or a composite SNR profile for a particular physical region). Also shown is a line 226 corresponding to SNR utilization for communications with the CM(s) associated with the profile 222. Assuming the distance 228 is the minimum desired headroom, then the physical layer communication parameters resulting in line 226 are nearly optimal in the sense that there is minimal headroom on each of channels/subbands 1, 3, 4, 6, 7, 8, and only slightly more than minimal headroom on channels/subbands 2 and 5.

[0030] Physical layer parameters may be configured/coordinated using upstream and/or downstream MAP messages, upstream channel descriptors (UCDs), other MAC management messages defined in DOCSIS protocols, and/or purpose-specific messages tailored to configuring the parameters based on measured performance metrics such as SNR profiles as described in this disclosure.

[0031] FIG. 3A is a flowchart illustrating an example process for configuring a cable/DOCSIS HFC network based on SNR profiles. For clarity of illustration the process is described with reference to the network of FIG. 1 and the messages of FIG. 2A. The process begins with block 302 in which the CMTS 102 sends one or more probe messages 202 to the CMs 112_1–112_5. In block 304, each of the CMs 112_1–112_5 determines its respective SNR profile based on a received one of the messages 202, and reports the SNR profile back to the CMTS 102 in the form of a message 204. In block 306, the CMTS 102 assigns the CMs to service groups based on the SNR profiles.

[0032] In block 308, physical layer communication parameters are determined per service group and per channel/subcarrier. For example, for any particular service group, the modulation order and FEC code rate to be used on a particular subcarrier may be determined based on the worst case SNR for that subcarrier among the CMs in that particular service group. Thus, it can be seen that grouping CMs based on SNR profiles

may enable configuring physical layer communications parameters to such that one or more communication parameters (throughput, reliability, etc.) is optimal, or near-optimal, for all of the CMs in the service group. For example, without such grouping by SNR profile, one CM in a particular service group may have substantially lower SNR on one or more channels/subcarriers. As a result, all CMs in that particular service group may be forced to use physical layer parameters supported by this "lowest common denominator" CM. This may result in a lot of wasted capacity for the remaining CMs.

[0033] To illustrate with a specific example: assume that CMs 112_1, 112_4, and 112_5 of FIG. 1 have sufficient SNR on channel z to support 64-QAM on channel z, but that CMs 112_2 and 112_3 only have sufficient SNR on channel z to support 16-QAM. If 112_1 is assigned to the same service group as 112_2 or 112_3, then 112_1 may be forced to use 16-QAM on channel z. Conversely, if 112_1, 112_4, and 112_5 are assigned to a first service group and 112_2 and 112_3 are assigned to a second service group, then the first service group consisting of 112_1, 112_4, and 112_5 can use 64-QAM on channel z while the second service group consisting of 112_2 and 112_3 uses 16-QAM on channel z.

[0034] In block 310, communications between the CMTS 102 and any particular service group use the per-service-group and per-subcarrier/channel physical layer parameters determined in block 308.

[0035] FIG. 3B is a flowchart illustrating an example process for configuring a cable/DOCSIS HFC network based on location of CMs within the network. For clarity of illustration, and as a non-limiting example, the process is described with reference to the network of FIG. 1 and the messages of FIG. 2B. The process begins with block 322 in which the CMTS 102 determines a location of each of the CMs 112_1–112_5 in the network. Location of a CM 112_X may be characterized in a variety of ways including, for example: total distance of fiber and/or coaxial cable between the CMTS 102 and the CM

112_X, total attenuation between the CMTS 102 and the CM 112_X, which trunk amplifier(s) are upstream of the CM 112_X, how many coupling elements (amplifiers, splitters, directional couplers, etc.) are between the CMTS 102 and the CM $112_{X,}$ GPS coordinates, and street address. In block 324, the CMTS 102 assigns the CMs 112_1–112_5 to service groups based on their determined locations. Blocks 326 and 328 are substantially similar to blocks 308 and 310, respectively, of FIG. 3A.

[0036] The locations of the CMs 112_1–112_5 may be determined by, for example, transmitting sounding signals into the network. In order to characterize the channel with more precision, the channel sounding signal may be sent repeatedly over an interval of time and the CMs may average multiple measurements over the time interval until they can resolve identifying characteristics in the signal which indicate, for example, how many branch amplifiers and/or other coupling elements that the signal traveled through to reach the CM. In another example implementation, the CMTS may communicate with a server that stores subscriber information that associates the CMs with their geographic location (e.g., street address).

[0037] While FIGS. 3A and 3B depict SNR profiles and location as two separate bases on which to assign CMs to service groups, the two may be used in combination.

[0038] FIGS. 4A and 4B illustrate the network of FIG. 1, with different groupings of CMs based on one or both of: measured performance metric(s) and location within the HFC network.

[0039] In the example of FIG. 4A, CMs 112_1, 112_4, and 112_5 are assigned to service group 402 and CMs 112_2 and 112_3 are assigned to service group 404. The assignment of FIG. 4A may result from, for example, assigning CMs based on the number of coupling elements between the CMTS 102 and the CMs–four each for CMs 112_1, 112_4, and 112_5; five each for CMs 112_2 and 112_3. The number of coupling

elements may be determined based on, for example, measured performance metrics (e.g., SNR profile) of the CMs and/or address or GPS information associated with the CMs. Alternatively, the assignment of FIG. 3A may result from, for example, assigning the CMs to service groups based directly on their respective measured performance metric(s) (e.g., the extra device in the path between CMTS 102 and CMs 111_2 and 112_3 may cause CMs 112_2 and 112_3 to have significantly poorer SNR).

[0040] In the example of FIG. 4B, CMs 112_1, 112_2, and 112_3 are assigned to service group 406 and CMs 112_4 and 112_5 are assigned to service group 408. The assignment of FIG. 4B may result from, for example, assigning CMs based on which trunk amplifiers are downstream of the CMs. Alternatively, the assignment of FIG. 3A may result from, for example, assigning the CMs to service groups based directly on their respective measured performance metric(s) (e.g., the distance between CMTS 102 and CMs 112_4 and 112_5 may be substantially greater than the distance between the CMTS 102 and the CMs 112_1, 112_2, and 112_3, thus resulting in poorer SNR in CMs 112_4 and 112_5).

[0041] Grouping CMs according to which trunk or distribution amplifiers are upstream of them may enable duty cycling power branch and/or distribution amplifiers. For example, when a CM in service group 406 is the talker, the upstream path through amplifier 1062 may be disabled such that noise from group 408 does not interfere with transmissions from the talker of service group 406. Grouping CMs according to which trunk or distribution amplifier(s) serve(s) them may enable using more efficient physical layer parameters. For example, where there is a relatively long distance of cable between amplifier 106_1 and 106_2 but relatively short distance of cable between amplifiers 106_1 and 106_3, grouping the CMs by geography/distance to the CMTS may enable a lower transmit power to be used by the CMTS 102 when talking to service group 406 as compared to when talking to service group 408..

[0042] Other embodiments of the invention may provide a non-transitory computer readable medium and/or storage medium, and/or a non-transitory machine readable medium and/or storage medium, having stored thereon, a machine code and/or a computer program having at least one code section executable by a machine and/or a computer, thereby causing the machine and/or computer to perform processes described.

[0043] Accordingly, the present invention may be realized in hardware, software, or a combination of hardware and software. The present invention may be realized in a centralized fashion in at least one computing system, or in a distributed fashion where different elements are spread across several interconnected computing systems. Any kind of computing system or other apparatus adapted for carrying out the methods described herein is suited. A typical combination of hardware and software may be a general-purpose computing system with a program or other code that, when being loaded and executed, controls the computing system such that it carries out the methods described herein. Another typical implementation may comprise an application specific integrated circuit or chip.

[0044] The present invention may also be embedded in a computer program product, which comprises all the features enabling the implementation of the methods described herein, and which when loaded in a computer system is able to carry out these methods. Computer program in the present context means any expression, in any language, code or notation, of a set of instructions intended to cause a system having an information processing capability to perform a particular function either directly or after either or both of the following: a) conversion to another language, code or notation; b) reproduction in a different material form.

[0045] While the present invention has been described with reference to certain embodiments, it will be understood by those skilled in the art that various changes may

be made and equivalents may be substituted without departing from the scope of the present invention. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the present invention without departing from its scope. Therefore, it is intended that the present invention not be limited to the particular embodiment disclosed, but that the present invention will include all embodiments falling within the scope of the appended claims.

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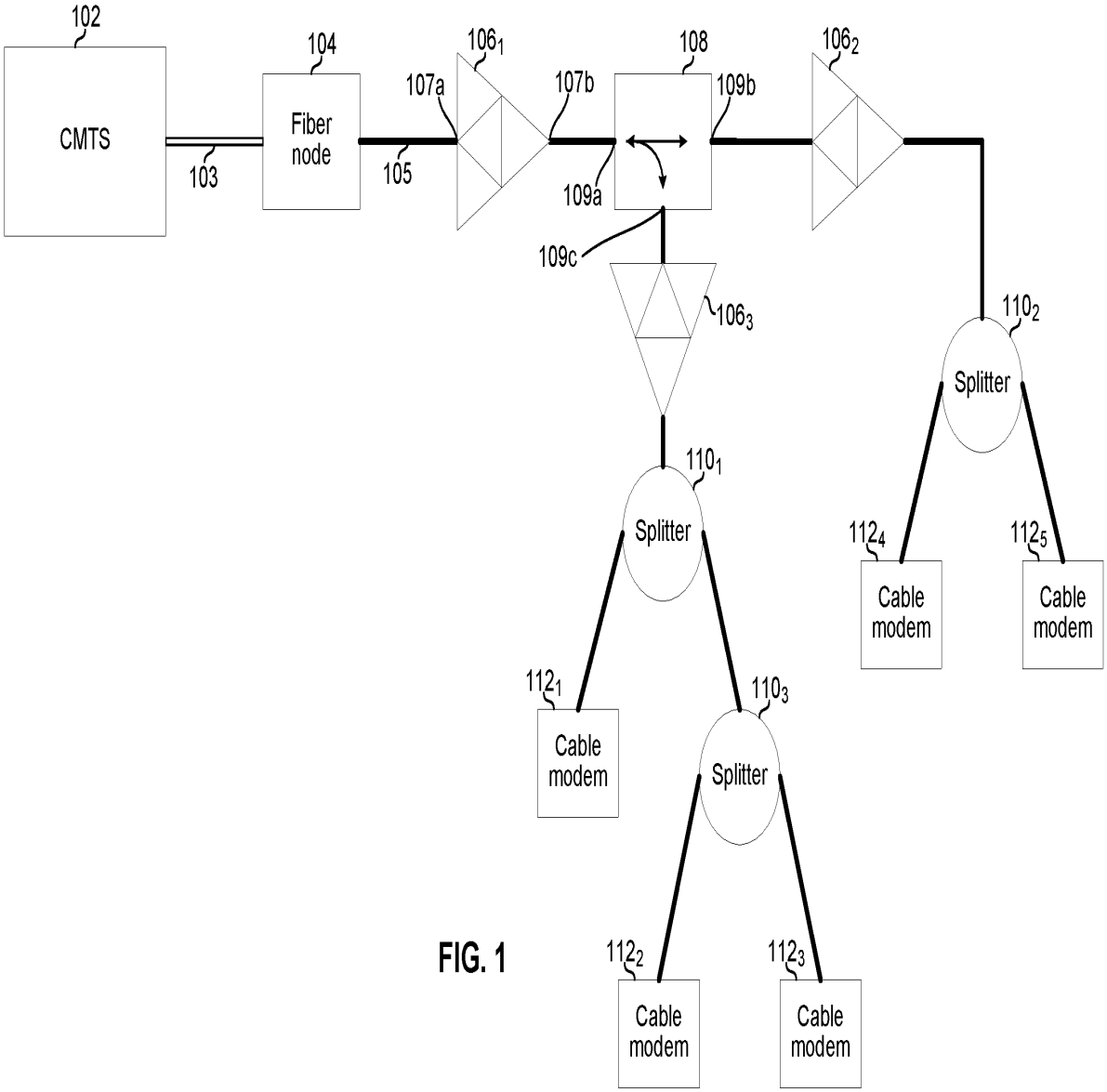

FIG. 1

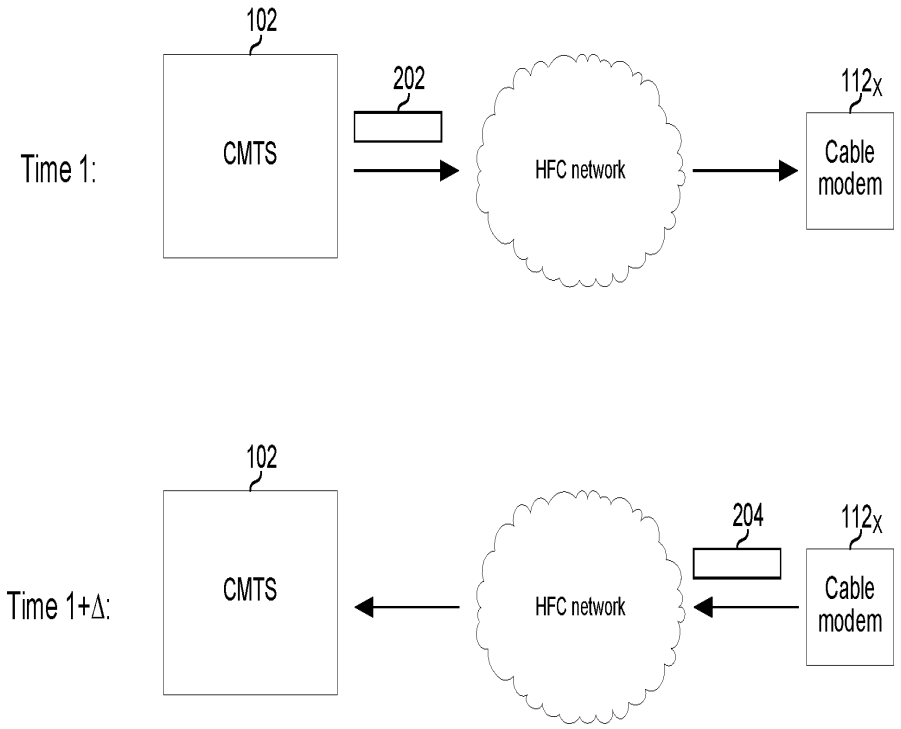
102
202
112X
Time 1:
CMTS
HFC network
Cable modem
102
204
112X
Time 1+Δ:
CMTS
HFC network
Cable modem

FIG. 2A

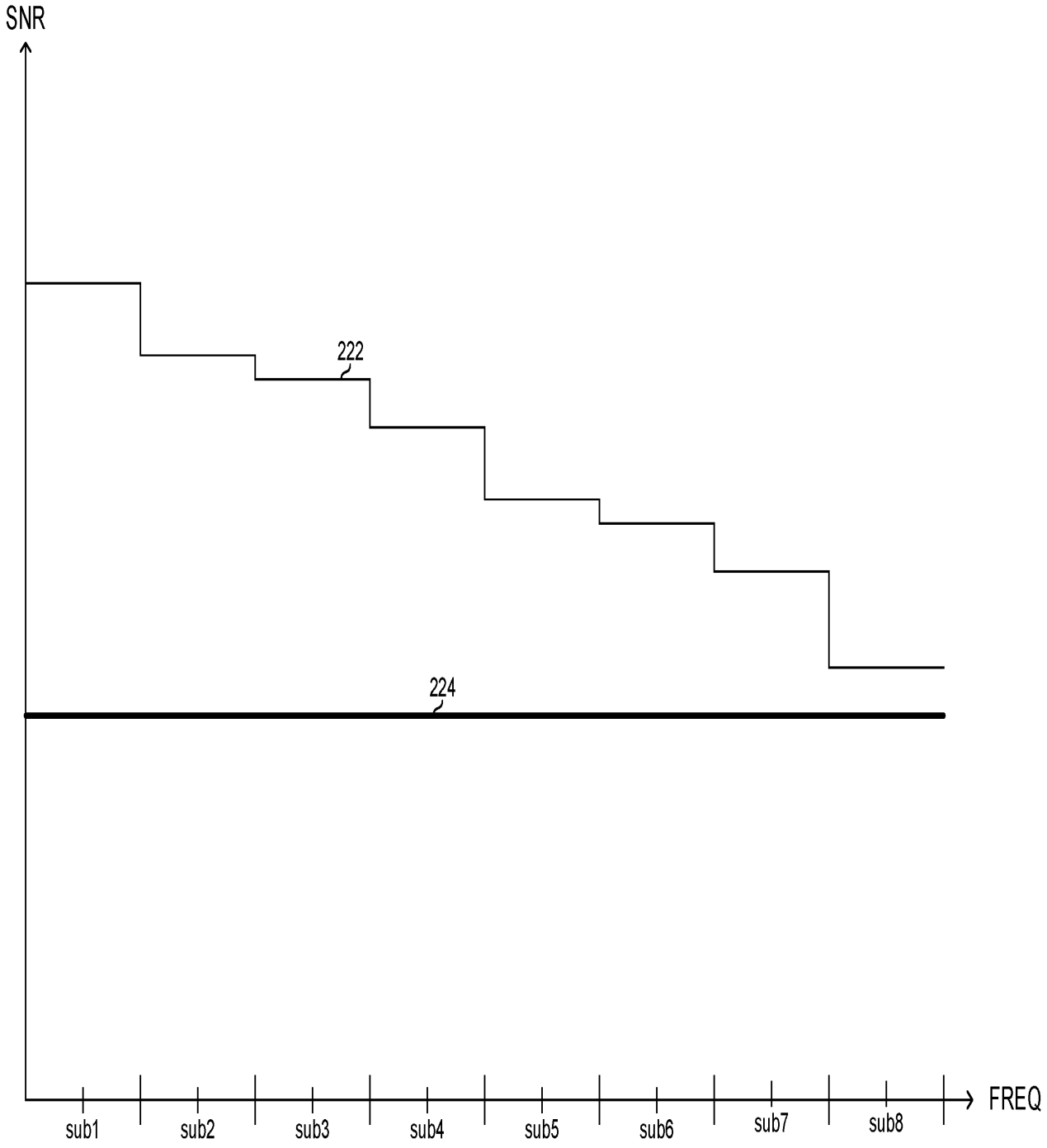

FIG. 2B

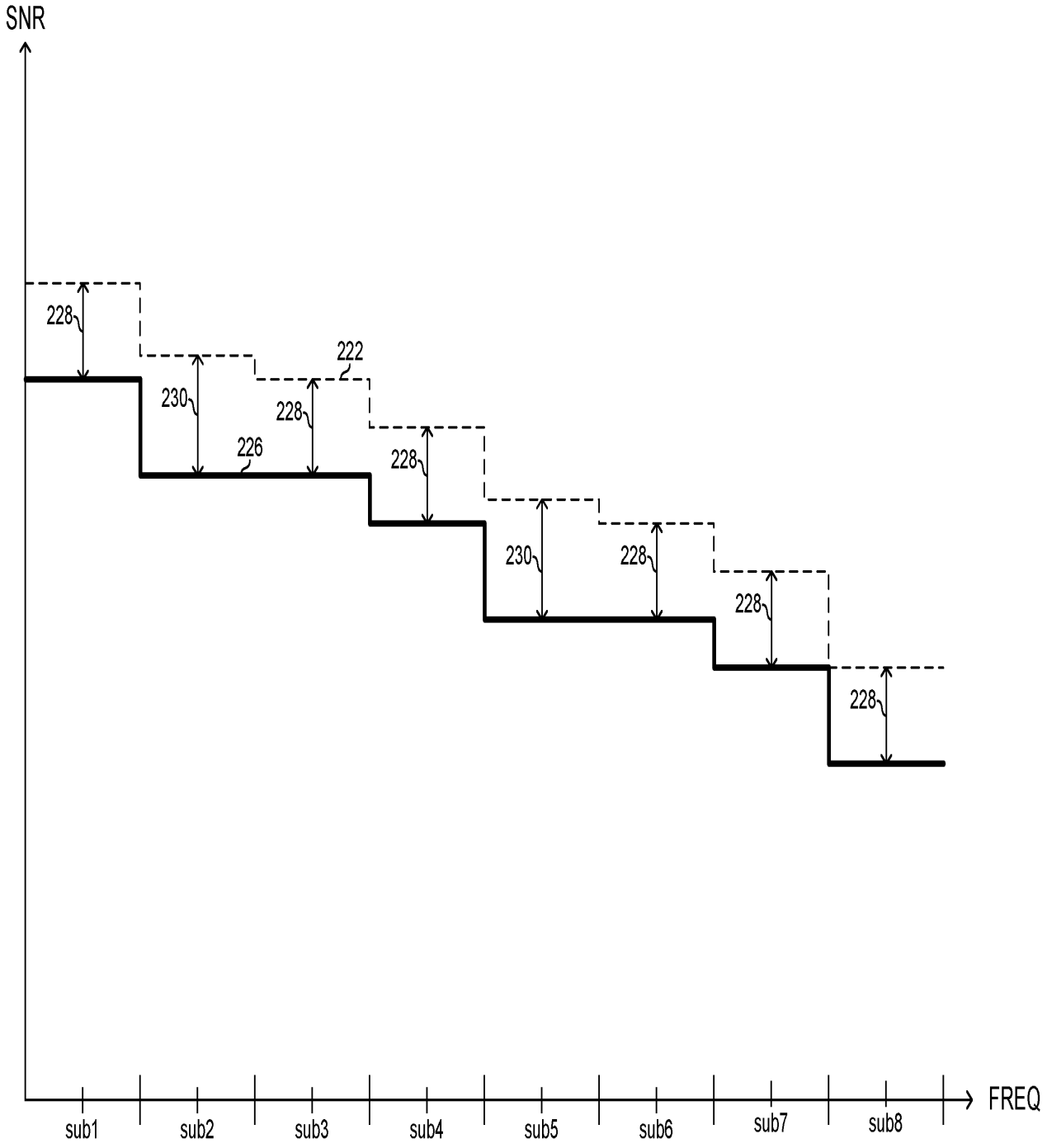
SNR
228
222
230
228
226
228
230
228
228
228
FREQ
sub1
sub2
sub3
sub4
sub5
sub6
sub7
sub8

FIG. 2C

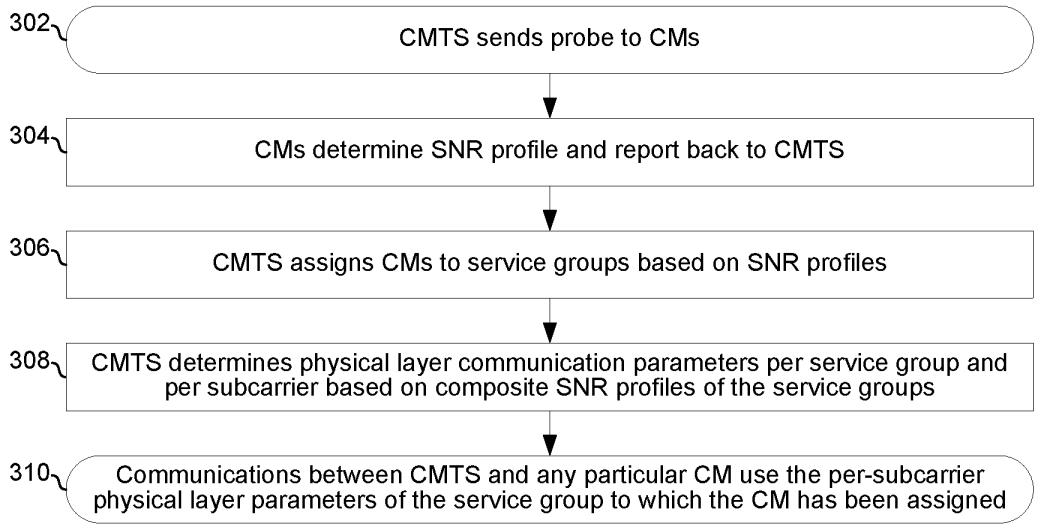
302
CMTS sends probe to CMs
304
CMs determine SNR profile and report back to CMTS
306
CMTS assigns CMs to service groups based on SNR profiles
308
CMTS determines physical layer communication parameters per service group and per subcarrier based on composite SNR profiles of the service groups
310
Communications between CMTS and any particular CM use the per-subcarrier physical layer parameters of the service group to which the CM has been assigned

FIG. 3A

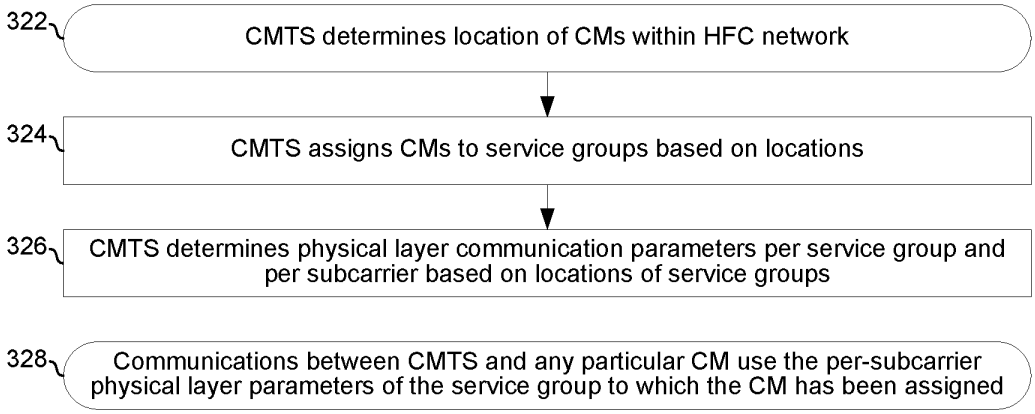
322
CMTS determines location of CMs within HFC network
324
CMTS assigns CMs to service groups based on locations
326
CMTS determines physical layer communication parameters per service group and per subcarrier based on locations of service groups
328
Communications between CMTS and any particular CM use the per-subcarrier physical layer parameters of the service group to which the CM has been assigned

FIG. 3B

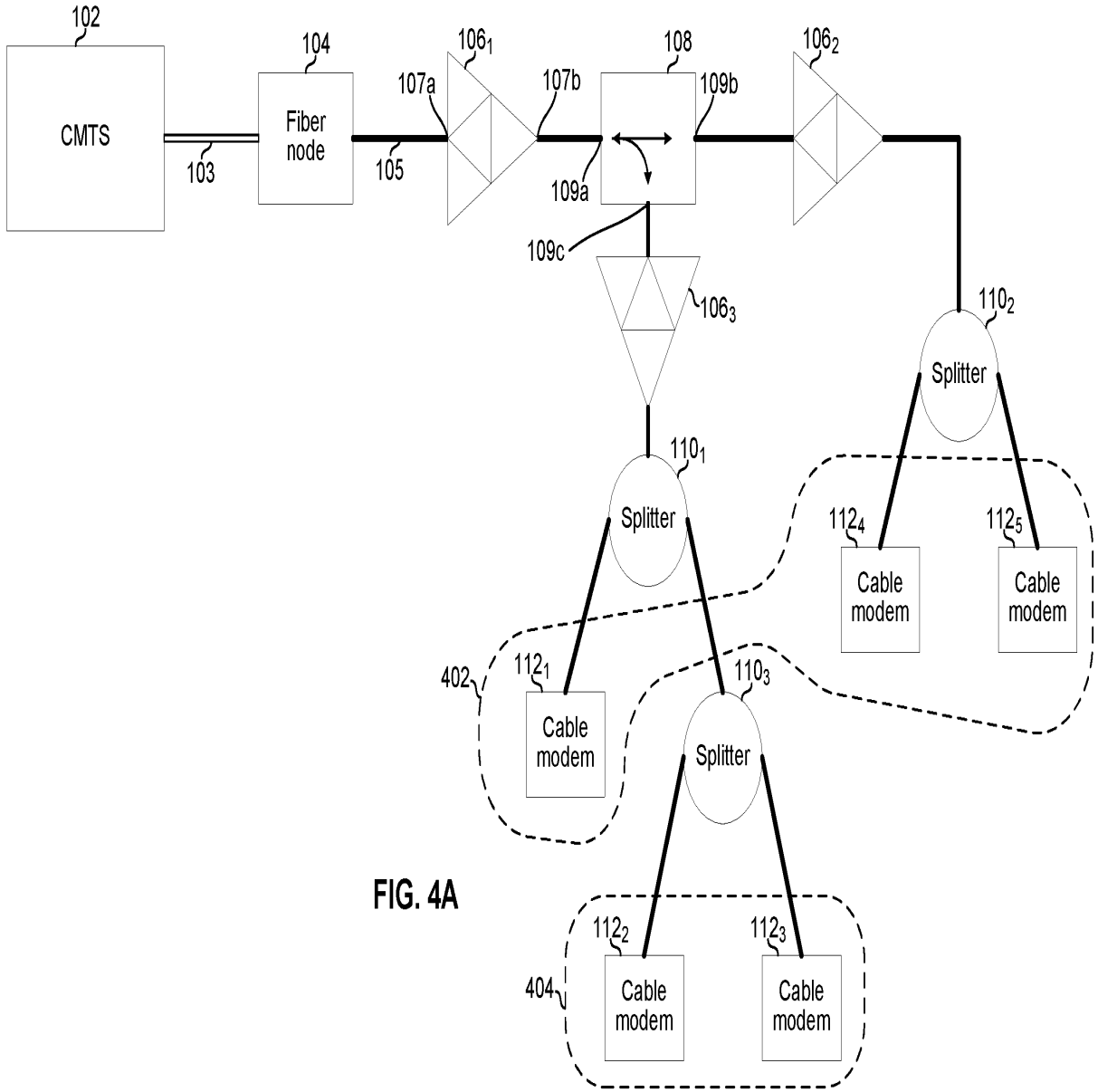
102
CMTS
103
104
Fiber node
105
107a
106_1
107b
108
109a
109b
106_2
109c
106_3
110_1
Splitter
110_2
Splitter
110_3
Splitter
112_1
Cable modem
112_2
Cable modem
112_3
Cable modem
112_4
Cable modem
112_5
Cable modem
402
404

FIG. 4A

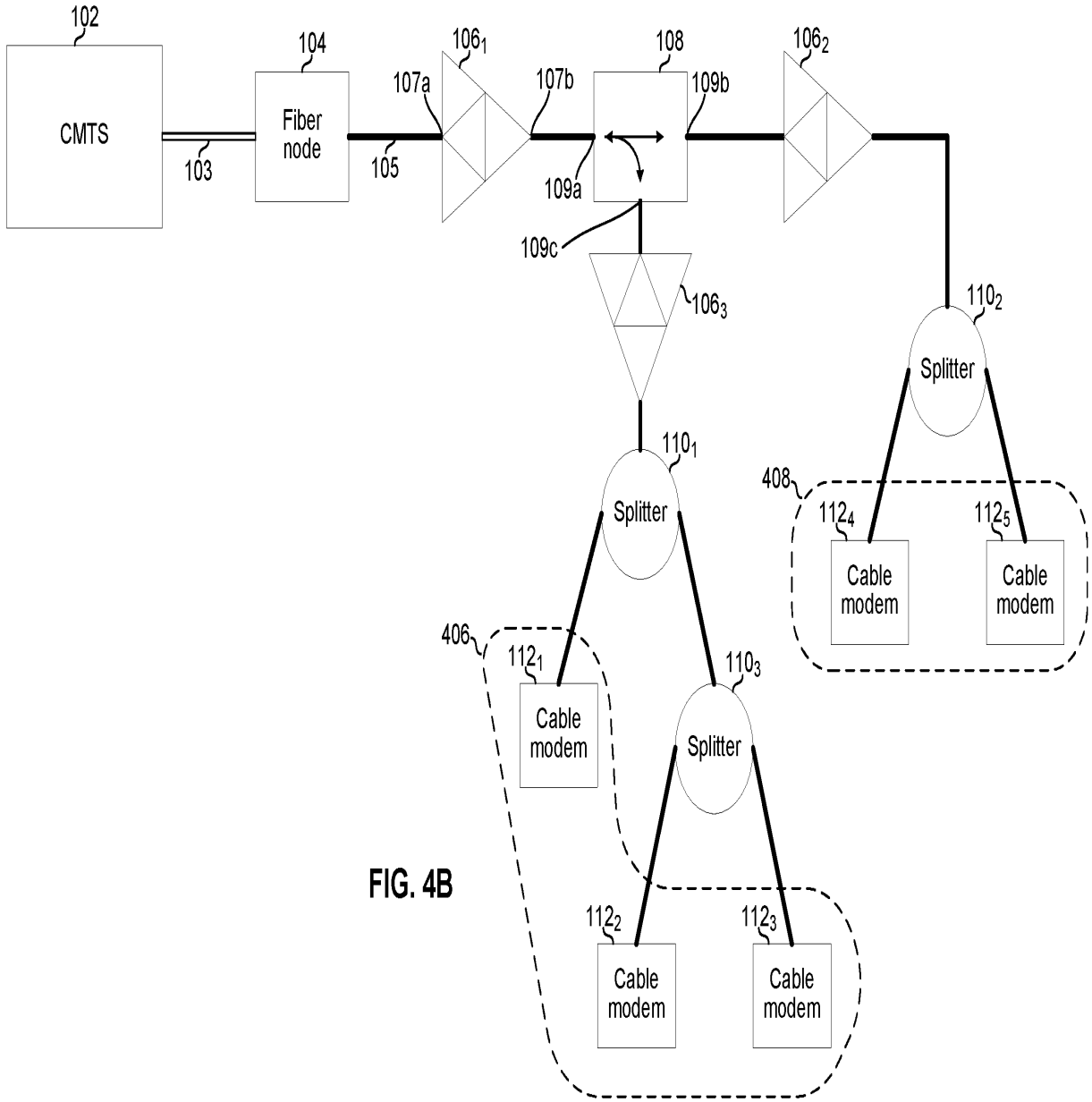
102
CMTS
103
104
Fiber node
105
107a
106_1
107b
108
109a
109b
106_2
109c
106_3
110_1
Splitter
110_2
Splitter
110_3
Splitter
406
112_1
Cable modem
112_2
Cable modem
112_3
Cable modem
408
112_4
Cable modem
112_5
Cable modem

FIG. 4B

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	Method And System For Service Group Management In A Cable Network
First Named Inventor/Applicant Name:	Curtis Ling
Filer:	Erick J. Michel/Brenda Campillo
Attorney Docket Number:	25052US04

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY APPLICATION FILING	1011	1	280	280
UTILITY SEARCH FEE	1111	1	600	600
UTILITY EXAMINATION FEE	1311	1	720	720
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1600**

Electronic Acknowledgement Receipt

EFS ID:	28377742
Application Number:	15434673
International Application Number:	
Confirmation Number:	9621
Title of Invention:	Method And System For Service Group Management In A Cable Network
First Named Inventor/Applicant Name:	Curtis Ling
Customer Number:	23446
Filer:	Erick J. Michel/Brenda Campillo
Filer Authorized By:	Erick J. Michel
Attorney Docket Number:	25052US04
Receipt Date:	16-FEB-2017
Filing Date:	
Time Stamp:	15:35:44
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1600
RAM confirmation Number	021717INTEFSW15380800
Deposit Account	130017
Authorized User	Erick Michel

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37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	25052US04_ADS.pdf	1793881 bbcb46791faf48f12127c833674bb941d31bf1d5	no	9
Warnings:					
Information:					
2	Power of Attorney	Maxlinear_PostAIA_POA.pdf	57159 c411665911520d2fc043d90fdc2ec2c276011499	no	1
Warnings:					
Information:					
3	Oath or Declaration filed	25052US02_Declaration_Ling.pdf	56354 929c327a45ffb292621f7625ce501a564778d051	no	1
Warnings:					
Information:					
4	Oath or Declaration filed	25052US02_Declaration_TimG.pdf	62995 72668deb69270eaef177727299651ec7bb21607e	no	2
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Warnings:					
Information:					
6		25052US04_Spec_as_filed.pdf	96380 ad853073a083bc83d0fe60ea2712a9c0001c575e	yes	22

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**

	Abstract		22	22	
	Claims		16	21	
	Specification		1	15	
Warnings:					
Information:					
7	Drawings-only black and white line drawings	25052US04_Figs_as_filed.pdf	70184 8543aaedd4f4549c8bfdc041390880762daf39a2	no	7
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Warnings:					
Information:					
		Total Files Size (in bytes):	2235566		

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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.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
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.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
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.

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.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	25052US04
	Application Number	
Title of Invention	Method And System For Service Group Management In A Cable Network	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Curtis		Ling	

Residence Information (Select One) ● US Residency Non US Residency Active US Military Service

City	Carlsbad	State/Province	CA	Country of Residence i	US

Mailing Address of Inventor:

Address 1	5966 La Place Court		
Address 2	Suite 100		
City	Carlsbad	State/Province	CA
Postal Code	92008	Country i	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Sridhar		Ramesh	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

City	Carlsbad	State/Province	CA	Country of Residence i	US

Mailing Address of Inventor:

Address 1	5966 La Place Court		
Address 2	Suite 100		
City	Carlsbad	State/Province	CA
Postal Code	92008	Country i	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Timothy		Gallagher	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

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.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	25052US04
	Application Number	
Title of Invention	Method And System For Service Group Management In A Cable Network	

City	Carlsbad	State/Province	CA	Country of Residence i	US

Mailing Address of Inventor:

Address 1	5966 La Place Court		
Address 2	Suite 100		
City	Carlsbad	**State/Province**	CA
Postal Code	92008	**Country** i	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	23446		
Email Address	mhmpto@mcandrews-ip.com	Add Email	Remove Email

Application Information:

Title of the Invention	Method And System For Service Group Management In A Cable Network		
Attorney Docket Number	25052US04	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	7	**Suggested Figure for Publication (if any)**	1

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country i

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	25052US04
	Application Number	
Title of Invention	Method And System For Service Group Management In A Cable Network	

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	● Customer Number	US Patent Practitioner	◯ Limited Recognition (37 CFR 11.9)
Customer Number	23446		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	15228703	2016-08-04

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
15228703	Continuation of	13948444	2013-07-23	9419858	2016-08-16

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
13948444	Claims benefit of provisional	61674742	2012-07-23

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

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.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	25052US04
	Application Number	
Title of Invention	Method And System For Service Group Management In A Cable Network	

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	25052US04
	Application Number	
Title of Invention	Method And System For Service Group Management In A Cable Network	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	25052US04
	Application Number	
Title of Invention	Method And System For Service Group Management In A Cable Network	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section. Clear

● Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	Maxlinear, Inc.		
Mailing Address Information For Applicant:			
Address 1	5966 La Place Court		
Address 2	Suite 100		
City	Carlsbad	**State/Province**	CA
Country	US	Postal Code	92008
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	25052US04
	Application Number	
Title of Invention	Method And System For Service Group Management In A Cable Network	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Erick J. Michel/			Date (YYYY-MM-DD)	2017-02-16
First Name	Erick	Last Name	Michel	Registration Number	60928

Additional Signature may be generated within this form by selecting the Add button. Add

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	25052US04
	Application Number	
Title of Invention	Method And System For Service Group Management In A Cable Network	

This collection of information is required by 37 CFR 1.76. 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 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet 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.**

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 the Freedom of Information Act requires disclosure of these records.

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 CooperationTreaty.

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 inspections 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	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
15/434,673	02/16/2017	2414	1600	25052US04	18	2

CONFIRMATION NO. 9621

FILING RECEIPT

23446
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

Date Mailed: 02/27/2017

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**

Inventor(s)

Curtis Ling, Carlsbad, CA;
Sridhar Ramesh, Carlsbad, CA;
Timothy Gallagher, Carlsbad, CA;

Applicant(s)

Maxlinear, Inc., Carlsbad, CA;

Power of Attorney: The patent practitioners associated with Customer Number 23446

Domestic Priority data as claimed by applicant

This application is a CON of 15/228,703 08/04/2016 PAT 9577886
which is a CON of 13/948,444 07/23/2013 PAT 9419858
which claims benefit of 61/674,742 07/23/2012

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 02/23/2017

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/434,673**

Projected Publication Date: 06/08/2017

Non-Publication Request: No

Early Publication Request: No
Title

Method And System For Service Group Management In A Cable Network

Preliminary Class

370

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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 (1-866-999-4258).

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).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number
15/434,673

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	18 minus 20 =	*			OR	x 80 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 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).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1600

APPLICATION AS AMENDED - PART II

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

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)	OR	RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
AMENDMENT B	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
AMENDMENT B	Application Size Fee (37 CFR 1.16(s))									
AMENDMENT B	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".
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Feb 27, 2017 01:30:42 AM

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Application	Document	Mailroom Date	Attorney Docket No.
15434673	APP.FILE.REC	02/27/2017	25052US04

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/434,673	02/16/2017	Curtis Ling	25052US04	9621

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EXAMINER
HUYNH, DUNG B.

ART UNIT	PAPER NUMBER
2469	

NOTIFICATION DATE	DELIVERY MODE
04/10/2017	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):

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PTOL-90A (Rev. 04/07)

Office Action Summary	Application No. 15/434,673	Applicant(s) LING ET AL.	
	Examiner DUNG B. HUYNH	Art Unit 2469	AIA (First Inventor to File) Status No

-- 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 MONTHS 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 02/16/2017.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

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

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ 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*

5)☒ Claim(s) 1-18 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) 1-18 is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

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

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

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

11)☒ The drawing(s) filed on 02/16/2017 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).

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).

Certified copies:

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)).

** 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) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

Drawings

2. The drawings were received on 02/16/2017 are accepted for examination purpose.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory

double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

Note that the applicant filling of the continuing application is voluntary and not direct, unmodified result of restriction requirement under 35 U.S.C. 121 (i.e. without a restriction requirement by the examiner) and the claims of the second application (continuing application) are drawn to the “same” invention” as the first application or patent.

4. **Claims 1-18 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-18 of U.S. Patent No. 9,577,886 B2 to Ling et al.** *(hereafter refers as Ling Patent)*. Although the claims at issue are not identical, they are not patentably distinct from each other for the reasons set forth below.

Regarding **claim 1**, although the claims at issue are not identical, they are not patentably distinct from each other because claim 1 of the instant application merely broadens the scope of the claim 1 of the Ling Patent by eliminating the elements and their respective functions of the claims as set forth below.

Claim 1 of Instant application	Claim 1 of Ling Patent
Limitation 1 : A method comprising: determining, by a cable modem termination system (CMTS), for a plurality of cable modems served by said CMTS, a corresponding plurality of signal-to-noise ratio (SNR) related metrics;	**Limitation 1 :** A method comprising: determining, by a cable modem termination system (CMTS), for a plurality of cable modems served by said CMTS, a corresponding plurality of signal-to-noise ratio (SNR) related metrics *comprising SNR versus frequency profiles*;
Limitation 2 : assigning, by said CMTS, said plurality of cable modems among a plurality of service groups based on said plurality of SNR-related metrics;	**Limitation 2 :** assigning, by said CMTS, said plurality of cable modems among a plurality of service groups based on said plurality of SNR-related metrics;
Limitation 3 : generating, by said CMTS for each one of said plurality of service groups, a composite SNR-related metric based on a portion of said plurality of SNR-related metrics corresponding to said one of said plurality of service groups;	**Limitation 3 :** generating, by said CMTS for each one of said plurality of service groups, a composite SNR-related metric based on a portion of said plurality of SNR-related metrics corresponding to said one of said plurality of service groups;
Limitation 4 : selecting, by said CMTS, physical layer communication parameters to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric; and	**Limitation 4 :** selecting, by said CMTS, physical layer communication parameters to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric; and

Claim 1 of Instant application	Claim 1 of Ling Patent
Limitation 5 : communicating, by said CMTS, with a portion of said plurality of cable modems corresponding to said one of said plurality of service groups using said selected physical layer communication parameters.	**Limitation 5 :** communicating, by said CMTS, with a portion of said plurality of cable modems corresponding to said one of said plurality of service groups using said selected physical layer communication parameters,
Limitation 6 : NONE	**Limitation 6 :** *wherein said composite SNR related metric is a worst-case SNR versus frequency profile for said one of said plurality of service groups.*

In view of the above, it is clear that the conflicting claims are not patentably distinct from each other because claim 1 of the instant application merely broadens the scope of the claim 1 of the Ling Patent by eliminating the italicized and underlined portion of limitation 1 of Ling Patent's claim 1 and entire limitation 6 of Ling Patent's claim 1.

Instant application	Ling Patent
Claim 2: The method of claim 1, wherein said physical layer communication parameters include one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate.	**Claim 2:** The method of claim 1, wherein said physical layer communication parameters include one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate.
Claim 3: The method of claim 1, wherein said CMTS uses orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers for said communicating.	**Claim 3:** The method of claim 1, wherein said CMTS uses orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers for said communicating.
Claim 4: The method of claim 3, comprising selecting, by said CMTS, said physical layer communication parameters on a per-OFDM-subcarrier basis.	**Claim 4:** The method of claim 3, comprising selecting, by said CMTS, said physical layer communication parameters on a per-OFDM-subcarrier basis.
Claim 5: The method of claim 4, wherein said physical layer	**Claim 5:** The method of claim 4, wherein said physical layer

Instant application	Ling Patent
communication parameters include one or both of: which of said OFDM subcarriers to use for transmission to said CMTS, and which of said OFDM subcarriers to use for reception of information from said CMTS.	communication parameters include one or both of: which of said OFDM subcarriers to use for transmission to said CMTS, and which of said OFDM subcarriers to use for reception of information from said CMTS.
Claim 6: The method of claim 1, wherein: said plurality of service groups comprises a first service group and a second service group; said first service group has a first composite SNR versus frequency profile, said second service group has a second composite SNR versus frequency profile, and a third cable modem has a particular SNR versus frequency profile; and said assigning said plurality of cable modems among said plurality of service groups comprises: assigning said third cable modem to said first service group if said particular SNR versus frequency profile is more similar to said first composite SNR versus frequency profile than to said second composite SNR versus frequency profile; and assigning said third cable modem to said second service group if said particular SNR versus frequency profile is more similar to said second composite SNR versus frequency profile than to said first composite SNR versus frequency profile.	**Claim 6:** The method of claim 1, wherein: said plurality of service groups comprises a first service group and a second service group; said first service group has a first composite SNR versus frequency profile, said second service group has a second composite SNR versus frequency profile, and a third cable modem has a particular SNR versus frequency profile; and said assigning said plurality of cable modems among said plurality of service groups comprises: assigning said third cable modem to said first service group if said particular SNR versus frequency profile is more similar to said first composite SNR versus frequency profile than to said second composite SNR versus frequency profile; and assigning said third cable modem to said second service group if said particular SNR versus frequency profile is more similar to said second composite SNR versus frequency profile than to said first composite SNR versus frequency profile.
Claim 7: The method of claim 1, comprising assigning said plurality of cable modems among said plurality of service groups based on distances between said CMTS and said plurality of cable modems.	**Claim 7:** The method of claim 1, comprising assigning said plurality of cable modems among said plurality of service groups based on distances between said CMTS and said plurality of cable modems.
Claim 8: The method of claim 1, comprising assigning any particular one of said plurality of cable modems to one of said plurality of service	**Claim 8:** The method of claim 1, comprising assigning any particular one of said plurality of cable modems to one of said plurality of service

Instant application	Ling Patent
groups based on which one or more of a plurality of branch amplifiers are upstream of said one of said plurality of cable modems.	groups based on which one or more of a plurality of branch amplifiers are upstream of said one of said plurality of cable modems.
Claim 9: The method of claim 1, wherein said determining said plurality of SNR-related metrics comprises: transmitting a probe message to each said plurality of cable modems, said probe message comprising instructions for measuring a metric and reporting said measured metric back to said CMTS; and receiving a metric reporting message from each of said plurality of cable modems.	**Claim 9:** The method of claim 1, wherein said determining said plurality of SNR-related metrics comprises: transmitting a probe message to each said plurality of cable modems, said probe message comprising instructions for measuring a metric and reporting said measured metric back to said CMTS; and receiving a metric reporting message from each of said plurality of cable modems.

In view of the above, the conflicting claims are not patentably distinct from each other because claims 2-9 of the instant application are merely similar to the scope of the claims 2-9 of the Ling Patent.

Claim 10 of Instant application	Claim 10 of Ling Patent
Limitation 1 : A system comprising: circuitry for use in a cable modem termination system (CMTS), said circuitry comprising a network interface and a processor wherein:	**Limitation 1 :** A system comprising: circuitry for use in a cable modem termination system (CMTS), said circuitry comprising a network interface and a processor wherein:
Limitation 2 : said processor is configured to determine, for a plurality of cable modems served by said CMTS, a corresponding plurality of signal-to-noise ratio (SNR) related metrics;	**Limitation 2 :** said processor is configured to determine, for a plurality of cable modems served by said CMTS, a corresponding plurality of signal-to-noise ratio (SNR) related metrics *comprising SNR versus frequency profiles*;
Limitation 3 : said processor is configured to assign said plurality of cable modems among a plurality of service groups based on said plurality of SNR-related metrics;	**Limitation 3 :** said processor is configured to assign said plurality of cable modems among a plurality of service groups based on said plurality of SNR-related metrics;
Limitation 4 : said processor is configured to generate, for each one of	**Limitation 4 :** said processor is configured to generate, for each one of

Claim 10 of Instant application	Claim 10 of Ling Patent
said plurality of service groups, a composite SNR-related metric based on a portion of said plurality of SNR-related metrics corresponding to said one of said plurality of service groups;	said plurality of service groups, a composite SNR-related metric based on a portion of said plurality of SNR-related metrics corresponding to said one of said plurality of service groups;
Limitation 5 : said processor is configured to select physical layer communication parameters to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric; and	**Limitation 5 :** said processor is configured to select physical layer communication parameters to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric; and
Limitation 6 : said network interface is configured to communicate with a portion of said plurality of cable modems corresponding to said one of said plurality of service groups using the selected physical layer communication parameters.	**Limitation 6 :** said network interface is configured to communicate with a portion of said plurality of cable modems corresponding to said one of said plurality of service groups using the selected physical layer communication parameters,
Limitation 7 : NONE	**Limitation 7 :** *wherein said composite SNR related metric is a worst-case SNR versus frequency profile for said one of said plurality of service groups.*

In view of the above, it is clear that the conflicting claims are not patentably distinct from each other because claim 10 of the instant application merely broadens the scope of the claim 10 of the Ling Patent by eliminating the italicized and underlined portion of limitation 2 of Ling Patent's claim 10 and entire limitation 7 of Ling Patent's claim 10.

Instant application	Ling Patent
Claim 11: The system of claim 10, wherein said physical layer communication parameters include one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation	**Claim 11:** The system of claim 10, wherein said physical layer communication parameters include one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order,

Instant application	Ling Patent
order, forward error correction (FEC) type, and FEC code rate.	forward error correction (FEC) type, and FEC code rate.
Claim 12: The system of claim 10, wherein said network interface and said plurality of cable modems are configured to communicate using orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers.	**Claim 12:** The system of claim 10, wherein said network interface and said plurality of cable modems are configured to communicate using orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers.
Claim 13: The system of claim 12, wherein said network interface is configured such that said physical layer communication parameters are configurable on a per-OFDM-subcarrier basis.	**Claim 13:** The system of claim 12, wherein said network interface is configured such that said physical layer communication parameters are configurable on a per-OFDM-subcarrier basis.
Claim 14: The system of claim 12, wherein said physical layer communication parameters include one or both of: which of said OFDM subcarriers to use for transmission to said CMTS, and which of said OFDM subcarriers to use for reception of information from said CMTS.	**Claim 14:** The system of claim 12, wherein said physical layer communication parameters include one or both of: which of said OFDM subcarriers to use for transmission to said CMTS, and which of said OFDM subcarriers to use for reception of information from said CMTS.
Claim 15: The system of claim 10, wherein: said plurality of service groups comprises a first service group and a second service group; said first service group has a first composite SNR versus frequency profile, said second service group has a second composite SNR versus frequency profile, and a third cable modem has a particular SNR versus frequency profile; said assignment of said plurality of cable modems among said plurality of service groups comprises: assignment of said third cable modem to said first service group if said particular SNR versus frequency profile is more similar to said first composite SNR versus frequency profile than to said second composite SNR versus frequency profile; and assignment of	**Claim 15:** The system of claim 10, wherein: said plurality of service groups comprises a first service group and a second service group; said first service group has a first composite SNR versus frequency profile, said second service group has a second composite SNR versus frequency profile, and a third cable modem has a particular SNR versus frequency profile; said assignment of said plurality of cable modems among said plurality of service groups comprises: assignment of said third cable modem to said first service group if said particular SNR versus frequency profile is more similar to said first composite SNR versus frequency profile than to said second composite SNR versus frequency profile; and assignment of said third

Instant application	Ling Patent
said third cable modem to said second service group if said particular SNR versus frequency profile is more similar to said second composite SNR versus frequency profile than to said first composite SNR versus frequency profile.	cable modem to said second service group if said particular SNR versus frequency profile is more similar to said second composite SNR versus frequency profile than to said first composite SNR versus frequency profile.
Claim 16: The system of claim 10, wherein said processor is configured to assign said plurality of cable modems among said plurality of service groups based on distances between said CMTS and said plurality of cable modems.	**Claim 16:** The system of claim 10, wherein said processor is configured to assign said plurality of cable modems among said plurality of service groups based on distances between said CMTS and said plurality of cable modems.
Claim 17: The system of claim 10, wherein said processor is configured to assign said plurality of cable modems among said plurality of service groups based on a branch further branch amplifier that serves each of said plurality of cable modems.	**Claim 17:** The system of claim 10, wherein said processor is configured to assign said plurality of cable modems among said plurality of service groups based on a branch further branch amplifier that serves each of said plurality of cable modems.
Claim 18: The system of claim 10, wherein said determination of said plurality of SNR-related metrics comprises: transmission, via said network interface, of a probe message to each said plurality of cable modems, said probe message comprising instructions for measuring a metric and reporting said measured metric back to said CMTS; and reception, via said network interface of said CMTS, of a metric reporting message from each of said plurality of cable modems.	**Claim 18:** The system of claim 10, wherein said determination of said plurality of SNR-related metrics comprises: transmission, via said network interface, of a probe message to each said plurality of cable modems, said probe message comprising instructions for measuring a metric and reporting said measured metric back to said CMTS; and reception, via said network interface of said CMTS, of a metric reporting message from each of said plurality of cable modems.

In view of the above, the conflicting claims are not patentably distinct from each other because claims 11-18 of the instant application are merely similar to the scope of the claims 11-18 of the Ling Patent.

5. **Claims 1-18 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-18 of U.S. Patent No. 9,419,858 B2 to Ling et al.** *(hereafter refers as Ling Patent'858).* Although the claims at issue are not identical, they are not patentably distinct from each other for the reasons set forth below.

Regarding **claim 1**, although the claims at issue are not identical, they are not patentably distinct from each other because claim 1 of the instant application merely broadens the scope of the claim 1 of the Ling Patent'858 by eliminating the elements and their respective functions of the claims as set forth below.

Claim 1 of Instant application	Claim 1 of Ling Patent'858
Limitation 1 : A method comprising: determining, by a cable modem termination system (CMTS), for a plurality of cable modems served by said CMTS, a corresponding plurality of signal-to-noise ratio (SNR) related metrics;	**Limitation 1 :** A method comprising: determining, by a cable modem termination system (CMTS), for a plurality of cable modems served by said CMTS, a corresponding plurality of signal-to-noise ratio (SNR) related metrics;
Limitation 2 : assigning, by said CMTS, said plurality of cable modems among a plurality of service groups based on said plurality of SNR-related metrics;	**Limitation 2 :** assigning, by said CMTS, said plurality of cable modems among a plurality of service groups based on said plurality of SNR-related metrics;
Limitation 3 : generating, by said CMTS for each one of said plurality of service groups, a composite SNR-related metric based on a portion of said plurality of SNR-related metrics corresponding to said one of said plurality of service groups;	**Limitation 3 :** generating, by said CMTS for each one of said plurality of service groups, a composite SNR-related metric based on a portion of said plurality of SNR-related metrics corresponding to said one of said plurality of service groups;
Limitation 4 : selecting, by said CMTS, physical layer communication parameters to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric; and	**Limitation 4 :** selecting, by said CMTS, physical layer communication parameters to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric; and

Claim 1 of Instant application	Claim 1 of Ling Patent'858
Limitation 5 : communicating, by said CMTS, with a portion of said plurality of cable modems corresponding to said one of said plurality of service groups using said selected physical layer communication parameters.	**Limitation 5 :** communicating, by said CMTS, with a portion of said plurality of cable modems corresponding to said one of said plurality of service groups using said selected physical layer communication parameters
Limitation 6 : NONE	**Limitation 6 :** *wherein: each of said SNR-related metrics is signal-to-noise ration (SNR) versus frequency profile; and said composite SNR related metric is a worst-case SNR versus frequency profile for said one of said plurality of service groups.*

In view of the above, it is clear that the conflicting claims are not patentably distinct from each other because claim 1 of the instant application merely broadens the scope of the claim 1 of the Ling Patent'858 by eliminating the entire limitation 6 of Ling Patent'858's claim 1.

Instant application	Ling Patent'858
Claim 2: The method of claim 1, wherein said physical layer communication parameters include one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate.	**Claim 2:** The method of claim 1, wherein said physical layer communication parameters include one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate.
Claim 3: The method of claim 1, wherein said CMTS uses orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers for said communicating.	**Claim 3:** The method of claim 1, wherein said CMTS uses orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers for said communicating.
Claim 4: The method of claim 3, comprising selecting, by said CMTS, said physical layer communication parameters on a per-OFDM-subcarrier basis.	**Claim 4:** The method of claim 3, comprising selecting, by said CMTS, said physical layer communication parameters on a per-OFDM-subcarrier basis.
Claim 5: The method of claim 4,	**Claim 5:** The method of claim 4,

Instant application	Ling Patent'858
wherein said physical layer communication parameters include one or both of: which of said OFDM subcarriers to use for transmission to said CMTS, and which of said OFDM subcarriers to use for reception of information from said CMTS.	wherein said physical layer communication parameters include one or both of: which of said OFDM subcarriers to use for transmission to said CMTS, and which of said OFDM subcarriers to use for reception of information from said CMTS.
Claim 6: The method of claim 1, wherein: said plurality of service groups comprises a first service group and a second service group; said first service group has a first composite SNR versus frequency profile, said second service group has a second composite SNR versus frequency profile, and a third cable modem has a particular SNR versus frequency profile; and said assigning said plurality of cable modems among said plurality of service groups comprises: assigning said third cable modem to said first service group if said particular SNR versus frequency profile is more similar to said first composite SNR versus frequency profile than to said second composite SNR versus frequency profile; and assigning said third cable modem to said second service group if said particular SNR versus frequency profile is more similar to said second composite SNR versus frequency profile than to said first composite SNR versus frequency profile.	**Claim 6:** The method of claim 1, wherein: said plurality of service groups comprises a first service group and a second service group; said first service group has a first composite SNR versus frequency profile, said second service group has a second composite SNR versus frequency profile, and a third cable modem has a particular SNR versus frequency profile; and said assigning said plurality of cable modems among said plurality of service groups comprises: assigning said third cable modem to said first service group if said particular SNR versus frequency profile is more similar to said first composite SNR versus frequency profile than to said second composite SNR versus frequency profile; and assigning said third cable modem to said second service group if said particular SNR versus frequency profile is more similar to said second composite SNR versus frequency profile than to said first composite SNR versus frequency profile.
Claim 7: The method of claim 1, comprising assigning said plurality of cable modems among said plurality of service groups based on distances between said CMTS and said plurality of cable modems.	**Claim 7:** The method of claim 1, comprising assigning said plurality of cable modems among said plurality of service groups based on distances between said CMTS and said plurality of cable modems.
Claim 8: The method of claim 1, comprising assigning any particular one of said plurality of cable modems	**Claim 8:** The method of claim 1, comprising assigning any particular one of said plurality of cable modems

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to one of said plurality of service groups based on which one or more of a plurality of branch amplifiers are upstream of said one of said plurality of cable modems.	to one of said plurality of service groups based on which one or more of a plurality of branch amplifiers are upstream of said one of said plurality of cable modems.
Claim 9: The method of claim 1, wherein said determining said plurality of SNR-related metrics comprises: transmitting a probe message to each said plurality of cable modems, said probe message comprising instructions for measuring a metric and reporting said measured metric back to said CMTS; and receiving a metric reporting message from each of said plurality of cable modems.	**Claim 9:** The method of claim 1, wherein said determining said plurality of SNR-related metrics comprises: transmitting a probe message to each said plurality of cable modems, said probe message comprising instructions for measuring a metric and reporting said measured metric back to said CMTS; and receiving a metric reporting message from each of said plurality of cable modems.

In view of the above, the conflicting claims are not patentably distinct from each other because claims 2-9 of the instant application are merely similar to the scope of the claims 2-9 of the Ling Patent'858.

Claim 10 of Instant application	Claim 10 of Ling Patent'858
Limitation 1 : A system comprising: circuitry for use in a cable modem termination system (CMTS), said circuitry comprising a network interface and a processor wherein:	**Limitation 1 :** A system comprising: circuitry for use in a cable modem termination system (CMTS), said circuitry comprising a network interface and a processor wherein:
Limitation 2 : said processor is configured to determine, for a plurality of cable modems served by said CMTS, a corresponding plurality of signal-to-noise ratio (SNR) related metrics;	**Limitation 2 :** said processor is configured to determine, for a plurality of cable modems served by said CMTS, a corresponding plurality of signal-to-noise ratio (SNR) related metrics;
Limitation 3 : said processor is configured to assign said plurality of cable modems among a plurality of service groups based on said plurality of SNR-related metrics;	**Limitation 3 :** said processor is configured to assign said plurality of cable modems among a plurality of service groups based on said plurality of SNR-related metrics;
Limitation 4 : said processor is configured to generate, for each one of	**Limitation 4 :** said processor is configured to generate, for each one of

Claim 10 of Instant application	Claim 10 of Ling Patent'858
said plurality of service groups, a composite SNR-related metric based on a portion of said plurality of SNR-related metrics corresponding to said one of said plurality of service groups;	said plurality of service groups, a composite SNR-related metric based on a portion of said plurality of SNR-related metrics corresponding to said one of said plurality of service groups;
Limitation 5 : said processor is configured to select physical layer communication parameters to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric; and	**Limitation 5 :** said processor is configured to select physical layer communication parameters to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric; and
Limitation 6 : said network interface is configured to communicate with a portion of said plurality of cable modems corresponding to said one of said plurality of service groups using the selected physical layer communication parameters.	**Limitation 6 :** said network interface is configured to communicate with a portion of said plurality of cable modems corresponding to said one of said plurality of service groups using the selected physical layer communication parameters
Limitation 7 : NONE	**Limitation 7 :** *wherein: each of said SNR-related metrics is signal-to-noise ratio (SNR) versus frequency profile; and said composite SNR related metric is a worst-case SNR versus frequency profile for said one of said plurality of service groups.*

In view of the above, it is clear that the conflicting claims are not patentably distinct from each other because claim 10 of the instant application merely broadens the scope of the claim 10 of the Ling Patent'858 by eliminating the entire limitation 7 of Ling Patent'858's claim 10.

Instant application	Ling Patent'858
Claim 11: The system of claim 10, wherein said physical layer communication parameters include one or more of: transmit power, receive sensitivity, timeslot	**Claim 11:** The system of claim 10, wherein said physical layer communication parameters include one or more of: transmit power, receive sensitivity, timeslot duration,

Instant application	Ling Patent'858
duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate.	modulation type, modulation order, forward error correction (FEC) type, and FEC code rate.
Claim 12: The system of claim 10, wherein said network interface and said plurality of cable modems are configured to communicate using orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers.	**Claim 12:** The system of claim 10, wherein said network interface and said plurality of cable modems are configured to communicate using orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers.
Claim 13: The system of claim 12, wherein said network interface is configured such that said physical layer communication parameters are configurable on a per-OFDM-subcarrier basis.	**Claim 13:** The system of claim 12, wherein said network interface is configured such that said physical layer communication parameters are configurable on a per-OFDM-subcarrier basis.
Claim 14: The system of claim 12, wherein said physical layer communication parameters include one or both of: which of said OFDM subcarriers to use for transmission to said CMTS, and which of said OFDM subcarriers to use for reception of information from said CMTS.	**Claim 14:** The system of claim 12, wherein said physical layer communication parameters include one or both of: which of said OFDM subcarriers to use for transmission to said CMTS, and which of said OFDM subcarriers to use for reception of information from said CMTS.
Claim 15: The system of claim 10, wherein: said plurality of service groups comprises a first service group and a second service group; said first service group has a first composite SNR versus frequency profile, said second service group has a second composite SNR versus frequency profile, and a third cable modem has a particular SNR versus frequency profile; said assignment of said plurality of cable modems among said plurality of service groups comprises: assignment of said third cable modem to said first service group if said particular SNR versus frequency profile is more similar to said first composite SNR versus frequency profile than to said second composite SNR versus	**Claim 15:** The system of claim 10, wherein: said plurality of service groups comprises a first service group and a second service group; said first service group has a first composite SNR versus frequency profile, said second service group has a second composite SNR versus frequency profile, and a third cable modem has a particular SNR versus frequency profile; said assignment of said plurality of cable modems among said plurality of service groups comprises: assignment of said third cable modem to said first service group if said particular SNR versus frequency profile is more similar to said first composite SNR versus frequency profile than to said second composite SNR versus frequency

Instant application	Ling Patent'858
frequency profile; and assignment of said third cable modem to said second service group if said particular SNR versus frequency profile is more similar to said second composite SNR versus frequency profile than to said first composite SNR versus frequency profile.	profile; and assignment of said third cable modem to said second service group if said particular SNR versus frequency profile is more similar to said second composite SNR versus frequency profile than to said first composite SNR versus frequency profile.
Claim 16: The system of claim 10, wherein said processor is configured to assign said plurality of cable modems among said plurality of service groups based on distances between said CMTS and said plurality of cable modems.	**Claim 16:** The system of claim 10, wherein said processor is configured to assign said plurality of cable modems among said plurality of service groups based on distances between said CMTS and said plurality of cable modems.
Claim 17: The system of claim 10, wherein said processor is configured to assign said plurality of cable modems among said plurality of service groups based on a branch further branch amplifier that serves each of said plurality of cable modems.	**Claim 17:** The system of claim 10, wherein said processor is configured to assign said plurality of cable modems among said plurality of service groups based on a branch further branch amplifier that serves each of said plurality of cable modems.
Claim 18: The system of claim 10, wherein said determination of said plurality of SNR-related metrics comprises: transmission, via said network interface, of a probe message to each said plurality of cable modems, said probe message comprising instructions for measuring a metric and reporting said measured metric back to said CMTS; and reception, via said network interface of said CMTS, of a metric reporting message from each of said plurality of cable modems.	**Claim 18:** The system of claim 10, wherein said determination of said plurality of SNR-related metrics comprises: transmission, via said network interface, of a probe message to each said plurality of cable modems, said probe message comprising instructions for measuring a metric and reporting said measured metric back to said CMTS; and reception, via said network interface of said CMTS, of a metric reporting message from each of said plurality of cable modems.

In view of the above, the conflicting claims are not patentably distinct from each other because claims 11-18 of the instant application are merely similar to the scope of the claims 11-18 of the Ling Patent'858.

It has been held that the omission an element and its function is an obvious expedient if the remaining elements perform the same function as before. *In re Karlson*, 136 USPQ 184 (CCPA). Also note *Ex parte Rainu*, 168 USPQ 375 (Bd.App.1969); omission of a reference element whose function is not needed would be obvious to one skilled in the art. Moreover, the doctrine of double patenting seeks to prevent the unjustified extension of patent exclusivity beyond the term of a patent.

Claim Rejections - 35 USC § 103

6. The following is a quotation of pre-AIA 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.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under pre-AIA 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of pre-AIA 35 U.S.C. 103(c) and potential pre-AIA 35 U.S.C. 102(e), (f) or (g) prior art under pre-AIA 35 U.S.C. 103(a).

9. **Claims 1-2, 6, 10-11, 15 and 17 are rejected under pre-AIA 35 U.S.C. 103(a)** as being unpatentable over US Patent 8,743,933 B2 to Prodan et al. *(hereafter refers as Prodan)* in view of US 2009/0219856 A1 to Richardson et al. *(hereafter refers as Richardson)*.

Regarding **claim 1**, Prodan teaches a method *(a method for allocating frequency spectrum and modulation scheme for each of the cable modems, see abstract)* comprising:

determining, by a cable modem termination system (CMTS) *(the method is performed by a cable modem termination system, CMTS, col. 7, lines 10-15 and col. 8, lines 4-9)*, for a plurality of cable modems served by said CMTS *(determining for each of the cable modems, CMs, connected to the CMTS, col. 4, lines 56-62)*, a corresponding plurality of signal-to-noise ratio (SNR) related metrics *(SNR vs. frequency profile for each of the CMs, col. 3, lines 50-55, col. 4, lines 56-62, col. 7, lines 10-22)*;

assigning, by said CMTs, said plurality of cable modems among a plurality of service groups based on said plurality of SNR-related metrics *(assigning each of plurality of CMs into one of the categories based on the plurality of SNR vs. frequency profiles and* ***a SNR profile*** *of each of the categories, col. 5, lines 5-20, col. 7, lines 10-20 and Fig. 2, 5)*;

generating, by said CMTS for each one of said plurality of service groups, a composite SNR related metric corresponding to said one of said plurality of service groups *(the CMTS retrieves SNR profile for each of the categories, col. 5, lines 10-20, and Fig. 5)*;

selecting, by said CMTS, physical layer communication parameters to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric *(assigning each of the plurality of cable modems, a respective modulation scheme and frequency spectrum to be used, based on SNR vs. frequency profile of the assigned group, Fig. 4, col. 5, lines 5-20 and col. 7, lines 23-54)*; and

communicating, by said CMTS, with a portion of said plurality of cable modems corresponding to said one of said plurality of service groups using said selected physical layer communication parameters *(the CMTS/headend assigns a respective frequency allocation based on category of each of the CMs to each of the CMs, col. 5, lines 50-67, col. 7, lines 23-45, thereby enable the CMTS/headend to communicate with each of the CMs based on the frequency allocation to each of the CMs, col. 7, lines 23-45).*

However, Prodan does not explicitly teach that the composite SNR related metric is generated "**based on a portion of the plurality of SNR related metrics corresponding to a group**".

Richardson teaches a method comprising:

determining, by a modem termination system *(AP, Fig. 2, access point 200)*, for a plurality of terminals served by the modem, a corresponding plurality of signal-to-noise ratio (SNR) related metrics *(the AP determines for each of the terminal served by the AP, Fig. 5A, a corresponding SNR value, paragraph [0043])*;

assigning, by said modem termination system, said plurality of terminals among a plurality of service groups based on said plurality of SNR-related metrics *(the AP assigns each of the terminals to a corresponding group based on the average SNR value of each group, paragraphs [0070, 0074] and claim 24)*; and

generating, by said modem termination system, a composite SNR related metric **based on a portion of said plurality of SNR related metrics corresponding to a particular group** *(the AP retrieves an average SNR value for each group, paragraphs [0070, 0074] and claim 24, wherein the average SNR value for each group is computed based on plurality of measured SNR value of terminals in each group, paragraphs [0070])*.

Therefore, it would have been obvious to one of the ordinary skills in the art at the time of invention to incorporate the teachings of generating, by said modem termination system, a composite SNR related metric **based on a portion of said plurality of SNR related metrics corresponding to a particular group** as taught by

Richardson, with the teachings of generating a composite SNR related metric as taught by Prodan, for a purpose of generating the composite SNR related metric **based on a portion of said plurality of SNR related metrics corresponding to a particular group** *(see Richardson, Fig. 7-8 and paragraphs [0070, 0074] and claim 24)*.

Regarding **claim 2**, Prodan further teaches wherein said physical layer communication parameters include one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate *(assigning each of the plurality of cable modems, respective modulation scheme and frequency spectrum to used, based on SNR vs. frequency profiles, Fig. 4 and col. 7, lines 23-54)*.

Regarding **claim 6**, Prodan further teaches wherein:

said plurality of service groups comprises a first service group and a second service group *(comprising categories I, II and III, Fig. 5)*;

a first portion of said plurality of cable modems has a first composite SNR versus frequency profile *(a cable modem of category/group I, col. 4, lines 4-7, which has a SNR vs. frequency profile of category/group I, Fig. 2, 5)*, a second portion of said plurality of cable modems has a second composite SNR versus frequency profile *((a cable modem of category/group II, col. 4, lines 4-7, which has a SNR vs. frequency profile of category/group II, Fig. 2, 5)*, and a third cable modem has a particular SNR versus frequency profile *(one of the CMs with its respective profile, col. 5, lines 5-20)*;

said first portion of said plurality of cable modems is assigned to said first service group *(the cable modem of category/group I, col. 4, lines 4-7 and Fig. 2, 5)*;

said second portion of said plurality of cable modems is assigned to said second service group *((the cable modem of category/group II, col. 4, lines 4-7 and Fig. 2, 5)*;

said assigning said plurality of cable modems among said plurality of service groups comprises:

assigning said third cable modem to said first service group if said particular SNR versus frequency profile is more similar to said first composite SNR versus frequency profile than to said second composite SNR versus frequency profile *(CM is assigned with one of the categories based on the tilt of its SNR vs. frequency profile curve, Fig. 5 and col. 5, lines 5-20)*; and

assigning said third cable modem to said second service group if said particular SNR versus frequency profile is more similar to said second composite SNR versus frequency profile than to said first composite SNR versus frequency profile *(CM is assigned with one of the categories based on the tilt of its SNR vs. frequency profile curve, Fig. 5 and col. 5, lines 5-20)*.

Regarding **claim 10**, Prodan teaches a system *(a system for allocating frequency spectrum and modulation scheme for each of the cable modems, see abstract and Fig.1)* comprising:

circuitry for use in a cable modem termination system (CMTS) *(a cable modem termination system, CMTS, is configured to perform the functions, col. 7, lines 10-15 and col. 8, lines 4-9, thus inherently including processor for performing such functions)* said circuitry comprising a network interface and a processor *(wherein the CMTS*

communicates with a plurality of cable modem, CMs, col. 4, lines 56-62, thus including the network interface) wherein:

said processor is configured to determine, for a plurality of cable modems served by said CMTS *(the CMTS/headend determines for each of the cable modems, CMs, connected to the CMTS, col. 4, lines 56-62)*, a corresponding plurality of signal-to-noise ratio (SNR) related metrics *(SNR vs. frequency profile for each of the CMs, col. 3, lines 50-55, col. 4, lines 56-62, col. 7, lines 10-22)*;

said processor is configured to assign said plurality of cable modems among a plurality of service groups based on said plurality of SNR-related metrics *(the CMTS/headend assigns each of plurality of CMs into one of the categories based on the plurality of SNR vs. frequency profiles and* ***a SNR profile*** *of each of the categories, col. 5, lines 5-20, col. 7, lines 10-20 and Fig. 2, 5)*;

said processor is configured to generate, for each one of said plurality of service groups, a composite SNR related metric corresponding to said one of said plurality of service groups *(the CMTS retrieves SNR profile for each of the categories, col. 5, lines 10-20, and Fig. 5)*;

said processor is configured to select physical layer communication parameters to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric *(assigning each of the plurality of cable modems, a respective modulation scheme and frequency spectrum to be used, based on SNR vs. frequency profile of the assigned group, Fig. 4, col. 5, lines 5-20 and col. 7, lines 23-54)*; and

said network interface is configured to communicate with a portion of said plurality of cable modems corresponding to said one of said plurality of service groups using the selected physical layer communication parameters *(the CMTS/headend assigns a respective frequency allocation based on category of each of the CMs to each of the CMs, col. 5, lines 50-67, col. 7, lines 23-45, thereby enable the CMTS/headend to communicate with each of the CMs based on the frequency allocation to each of the CMs, col. 42-67 and , col. 7, lines 23-45)*.

However, Prodan does not explicitly teach that the composite SNR related metric is generated "**based on a portion of the plurality of SNR related metrics corresponding to a group**".

Richardson teaches a system comprising:

circuitry for use in a modem termination system *(AP, Fig. 2, access point 200, including circuitry, Fig. 2)* said circuitry comprising a network interface and a processor *(wherein the AP includes processor and network interface, Fig. 2 and paragraphs [0081-0082])* wherein:

said processor is configured to determine, for a plurality of terminals served by said modem termination system, a corresponding plurality of signal-to-noise ratio (SNR) related metrics *(the AP includes processor determines for each of the terminal served by the AP, Fig. 5A, a corresponding SNR value, paragraph [0043])*;

said processor is configured to assign said plurality of terminals among a plurality of service groups based on said plurality of SNR-related metrics *(the AP assigns each*

of the terminals to a corresponding group based on the average SNR value of each group, paragraphs [0070, 0074] and claim 24); and

said processor is configured to **generate, for each one of said plurality of service groups, a composite SNR-related metric based on a portion of said plurality of SNR-related metrics corresponding to said one of said plurality of service groups** *(the AP retrieves an average SNR value for each group, paragraphs [0070, 0074] and claim 24, wherein the average SNR value for each group is computed based on plurality of measured SNR value of terminals in each group, paragraphs [0070])*; and

said network interface is configured to communicate with a portion of said plurality of terminals corresponding to said one of said plurality of service groups *(AP communicates with each terminal based on resource assignment for each terminal, paragraphs [0043])*.

Therefore, it would have been obvious to one of the ordinary skills in the art at the time of invention to incorporate the teachings of **generating, for each one of said plurality of service groups, a composite SNR-related metric based on a portion of said plurality of SNR-related metrics corresponding to said one of said plurality of service groups** as taught by Richardson, with the teachings of generating a composite SNR related metric as taught by Prodan, for a purpose of generating the composite SNR related metric **based on a portion of said plurality of SNR related metrics corresponding to a particular group** *(see Richardson, Fig. 7-8 and paragraphs [0070, 0074] and claim 24)*.

Regarding **claim 11**, Prodan further teaches wherein said physical layer communication parameters include one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate *(assigning each of the plurality of cable modems, respective modulation scheme and frequency spectrum to used, based on SNR vs. frequency profile of the group, Fig. 4, col. 5, lines 5-20 and col. 7, lines 23-54)*.

Regarding **claim 15**, Prodan further teaches wherein:

said plurality of service groups comprises a first service group and a second service group *(comprising categories I, II and III, Fig. 5)*;

a first portion of said plurality of cable modems has a first composite SNR versus frequency profile *(a cable modem of category/group I, col. 4, lines 4-7, which has a SNR vs. frequency profile of category/group I, Fig. 2, 5)*, a second portion of said plurality of cable modems has a second composite SNR versus frequency profile *((a cable modem of category/group II, col. 4, lines 4-7, which has a SNR vs. frequency profile of category/group II, Fig. 2, 5)*, and a third cable modem has a particular SNR versus frequency profile *(one of the CMs with its respective profile, col. 5, lines 5-20)*;

said first portion of said plurality of cable modems is assigned to said first service group *(the cable modem of category/group I, col. 4, lines 4-7 and Fig. 2, 5)*;

said second portion of said plurality of cable modems is assigned to said second service group *((the cable modem of category/group II, col. 4, lines 4-7 and Fig. 2, 5)*;

said assigning said plurality of cable modems among said plurality of service groups comprises:

assigning said third cable modem to said first service group if said particular SNR versus frequency profile is more similar to said first composite SNR versus frequency profile than to said second composite SNR versus frequency profile *(CM is assigned with one of the categories based on the tilt of its SNR vs. frequency profile curve, Fig. 5 and col. 5, lines 5-20)*; and

assigning said third cable modem to said second service group if said particular SNR versus frequency profile is more similar to said second composite SNR versus frequency profile than to said first composite SNR versus frequency profile *(CM is assigned with one of the categories based on the tilt of its SNR vs. frequency profile curve, Fig. 5 and col. 5, lines 5-20)*.

Regarding **claim 17**, Prodan further teaches said processor is configured to assign said plurality of cable modems among said plurality of service groups based on a branch amplifier that serves each of said plurality of cable modems *(the CMTS/headend assigns the plurality of CMs among the plurality of categories based on distances between the pluralities of CMs with an amplifier 106a, col. 3, lines 37-49, col. 4, lines 4-24 and Fig. 1)*.

10. **Claims 3, 12 and 14 are rejected under pre-AIA 35 U.S.C. 103(a)** as being unpatentable US Patent 8,743,933 B2 to Prodan et al. *(hereafter refers as Prodan)* in view of US 2009/0219856 A1 to Richardson et al. *(hereafter refers as Richardson)* as applied to claims above, and further in view of US 2013/0114480 A1 to Chapman et al. *(hereafter refers as Chapman)*.

Regarding **claim 3**, the combination of Prodan and Richardson teaches wherein said CMTS and said plurality of cable modems communicate over a plurality of subcarriers *(wherein the CMTS and the plurality of CMs communicate over a plurality of frequency bands, see Prodan, col. 4, line 64- col. 5, line 5, col. 7, lines 22-42)*, but however, does not explicitly teach that the communication is "**using orthogonal frequency division multiplexing (OFDM)**".

Chapman teaches a CMTS uses orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers for communicating *(CMs communicates with CMTS via OFDM, paragraph [0039], over a plurality of frequency bands, paragraphs [0039-0041])*.

Therefore, it would have been obvious to one of the ordinary skills in the art at the time of invention to incorporate the teachings of CMTS uses orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers for communicating as taught by Chapman, with the teachings of CMTS and said plurality of cable modems communicate over a plurality of subcarriers as taught by combination of Prodan and Richardson, for a purpose of allowing simultaneous transmissions from the CMs *(see Chapman, paragraph [0032])*.

Regarding **claim 12**, the combination of Prodan and Richardson teaches wherein said network interface and said plurality of cable modems are configured to communicate over a plurality of subcarriers *(wherein the CMTS and the plurality of CMs communicate over a plurality of frequency bands, see Prodan, col. 4, line 64- col. 5, line*

5, col. 7, lines 22-42), but however, does not explicitly teach that the communication is "**using orthogonal frequency division multiplexing (OFDM)**".

Chapman teaches a CMTS with network interface uses orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers for communicating *(CMs communicates with network interface of CMTS via OFDM, paragraph [0039], over a plurality of frequency bands, paragraphs [0039-0041]).*

Therefore, it would have been obvious to one of the ordinary skills in the art at the time of invention to incorporate the teachings of CMTS with network interface uses orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers for communicating as taught by Chapman, with the teachings of CMTS and said plurality of cable modems communicate over a plurality of subcarriers as taught by combination of Prodan and Richardson, for a purpose of allowing simultaneous transmissions from the CMs *(see Chapman, paragraph [0032]).*

Regarding **claim 14**, the combination of Prodan and Richardson further teaches wherein said physical layer communication parameters include one or both of: which of said subcarriers to use for transmission to said CMTS, and which of said subcarriers to use for reception of information from said CMTS *(assigning each of the plurality of cable modems a respective modulation scheme and frequency spectrum to be used by the CMs to communicate with the CMTS, see Prodan, col. 4, line 64- col. 5, line 5, col. 7, lines 22-42).*

However, the combination of Prodan and Richardson does not explicitly teach the subcarriers are "**OFDM**" subcarriers.

Chapman further teaches said OFDM subcarriers to use for transmission to said CMTS or said OFDM subcarriers to use for reception of information from said CMTS *(CMs communicates with CMTS via OFDM, paragraph [0039], over a plurality of frequency bands, paragraphs [0039-0041])*.

Therefore, it would have been obvious to one of the ordinary skills in the art at the time of invention to incorporate the teachings of **OFDM** subcarriers as taught by Chapman, with the teachings of CMTS and said plurality of cable modems communicate over a plurality of subcarriers as taught by combination of Prodan and Richardson, for a purpose of allowing simultaneous transmissions from the CMs *(see Chapman, paragraph [0032])*.

11. **Claims 4-5 and 13 are rejected under pre-AIA 35 U.S.C. 103(a)** as being unpatentable over US Patent 8,743,933 B2 to Prodan et al. *(hereafter refers as Prodan)* in view of US 2009/0219856 A1 to Richardson et al. *(hereafter refers as Richardson)* and US 2013/0114480 A1 to Chapman et al. *(hereafter refers as Chapman)* as applied to claims above, and further in view of US 2006/0008020 A1 to Blankenship et al. *(hereafter refers as Blankenship)*.

Regarding **claims 4 and 13**, the combination of Prodan, Richardson and Chapman teaches configuring, by said CMTS, said physical layer communication *(CMTS assigns each of the plurality of cable modems a respective modulation scheme and frequency spectrum to used, based on SNR vs. frequency profiles, see Prodan, Fig. 4 and col. 7, lines 23-54)*.

However, the combination of Prodan, Richardson and Chapman does not explicitly teach the configuring is "**per-OFDM-subcarrier basis**".

Blankenship teaches configuring physical layer communication parameter on a per-OFDM-subcarrier basis *(assigning modulation and coding scheme on a per-OFDM subcarrier basis, see paragraph [0019])*.

Therefore, it would have been obvious to one of the ordinary skills in the art at the time of invention to incorporate the teachings of configuring physical layer communication parameter on a per-OFDM-subcarrier basis as taught by Blankenship with the teachings of configuring said physical layer communication as taught by combination of Prodan, Richardson and Chapman, for a purpose of increasing efficiency for the teachings by considering the channel qualities of different subcarriers *(see Blankenship, paragraph [0019])*.

Regarding **claim 5**, the combination of Prodan, Richardson and Blankenship further teaches wherein said physical layer communication parameters include one or both of: which of said subcarriers to use for transmission to said CMTS, and which of said subcarriers to use for reception of information from said CMTS *(assigning each of the plurality of cable modems a respective modulation scheme and frequency spectrum to be used by the CMs to communicate with the CMTS, see Prodan, col. 4, line 64- col. 5, line 5, col. 7, lines 22-42).*

However, the combination of Prodan, Richardson and Blankenship does not explicitly teach the subcarriers are "**OFDM**" subcarriers.

Chapman further teaches said OFDM subcarriers to use for transmission to said CMTS or said OFDM subcarriers to use for reception of information from said CMTS *(CMs communicates with CMTS via OFDM, paragraph [0039], over a plurality of frequency bands, paragraphs [0039-0041])*.

Therefore, it would have been obvious to one of the ordinary skills in the art at the time of invention to incorporate the teachings of **OFDM** subcarriers as taught by Chapman, with the teachings of CMTS and said plurality of cable modems communicate over a plurality of subcarriers as taught by combination of Prodan, Richardson and Blankenship, for a purpose of allowing simultaneous transmissions from the CMs *(see Chapman, paragraph [0032])*.

12. **Claims 7 and 16 are rejected under pre-AIA 35 U.S.C. 103(a)** as being unpatentable over US Patent 8,743,933 B2 to Prodan et al. *(hereafter refers as Prodan)* in view of US 2009/0219856 A1 to Richardson et al. *(hereafter refers as Richardson)* as applied to claims above, and further in view of US 2002/0062486 A1 to Park.

Regarding **claims 7 and 16**, the combination of Prodan and Richardson further teaches assigning said plurality of cable modems among said plurality of service groups based on distances to said plurality of cable modems *(assigning the plurality of CMs among the plurality of categories based on distances between the plurality of CMs with amplifier 106a, see Prodan, col. 3, lines 37-49, col. 4, lines 4-24 and Fig. 1)*.

However, the combination of Prodan and Richardson does not explicitly teach that the distances between the "**CMTS and said plurality of cable modems**".

Park teaches assigning said plurality of cable modems among said plurality of service groups based on distances between CMTS and the plurality of cable modems *(assigning the plurality of CMs among the plurality of categories based on distances between the plurality of CMs with CMTS, paragraph [0027] and Fig. 2)*.

Therefore, it would have been obvious to one of the ordinary skills in the art at the time of invention to incorporate the teachings of assigning said plurality of cable modems among said plurality of service groups based on distances between CMTS and the plurality of cable modems as taught by Park with the teachings of assigning said plurality of cable modems among said plurality of service groups based on distances to said plurality of cable modems as taught by combination of Prodan and Richardson, for a purpose of allowing the assignment be based on the distances **between the CMTS and the plurality of CMs** *(see Park, paragraphs [0027]) and Fig. 2).*

13. **Claim 8 is rejected under pre-AIA 35 U.S.C. 103(a)** as being unpatentable over US Patent 8,743,933 B2 to Prodan et al. *(hereafter refers as Prodan)* in view of US 2009/0219856 A1 to Richardson et al. *(hereafter refers as Richardson)* as applied to claims above, and further in view of US 2013/0266310 A1 to Fox et al. *(hereafter refers as Fox)*.

Regarding **claim 8**, the combination of Prodan and Richardson does not explicitly teach assigning particular one of said plurality of cable modems to one of said plurality of service group **"based on which one or more of a plurality of branch amplifiers are upstream of said one of said plurality of cable modems**".

Fox teaches assigning particular one of said plurality of cable modems to one of said plurality of service groups based on which one or more of a plurality of branch amplifiers are upstream of said one of said plurality of cable modems *(assigning the plurality of CMs to different categories/subnode 720 based which one or more of a plurality of branch amplifiers are upstream of said one of said .plurality of cable modems, paragraph [0019-0022] and Fig. 3).*

Therefore, it would have been obvious to one of the ordinary skills in the art at the time of invention to incorporate the teachings of assigning particular one of said plurality of cable modems to one of said plurality of service groups based on which one or more of a plurality of branch amplifiers are upstream of said one of said plurality of cable modems as taught by Fox, with the teachings of combination of Prodan and Richardson, for a purpose of allowing the assignment be based on which one or more of a plurality of branch amplifiers are upstream of said one of said plurality of cable modems *(see Fox, paragraph [0019-0022] and Fig. 3).*

14. **Claims 9 and 18 are rejected under pre-AIA 35 U.S.C. 103(a)** as being unpatentable over US Patent 8,743,933 B2 to Prodan et al. *(hereafter refers as Prodan)* in view of US 2009/0219856 A1 to Richardson et al. *(hereafter refers as Richardson)* as applied to claims above, and further in view of US 2009/0016420 A1 to Kwak et al. *(hereafter refers as Kwak)* and US 2011/0051607 A1 to Begen.

Regarding **claims 9 and 18**, the combination of Prodan and Richardson teaches determining said plurality of SNR-related metrics *(see rejection of claim 1 above)*, but

however, does not explicitly teach "**transmitting a message to a device, said probe message comprising instructions for measuring a metric and reporting said measured metric back to a terminal system; and receiving a metric reporting message from the device**".

Kwak teaches transmitting a message to a device *(a base station transmits instruction message to a terminal, paragraph [0103])*, said message comprising instructions for measuring a metric and reporting said measured metric back to a terminal system *(the instruction message instructs the terminal to measure the CINR metric and to report the measurement back to the base station, paragraph [0103])*; and receiving a metric reporting message from the device *(the base station receives the CINR measurement from the terminal, paragraphs [0103, 0107])*.

Therefore, it would have been obvious to one of the ordinary skills in the art at the time of invention to incorporate the teachings of **transmitting a message to a device, said probe message comprising instructions for measuring a metric and reporting said measured metric back to a terminal system; and receiving a metric reporting message from the device** as taught by Kwak, with the teachings of determining the plurality of SNR-related metrics corresponding to plurality of cable modems as taught by combination of Prodan and Richardson, for a purpose of enabling each of the plurality of cable modems to measure its own SNR-related metrics (see Kwak, paragraphs [0103, 0107]).

However, the combination of Prodan, Richardson and Kwak does not explicitly teach that the message is a "**probe**" message.

Begen teaches transmitting a probe message comprising instructions for measuring a metric *(server transmits probing packet to computing device to request for measuring, see abstract, col. 5, lines 25-40, claim 7 and Fig. 3)*.

Therefore, it would have been obvious to one of the ordinary skills in the art at the time of invention to incorporate the teachings of transmitting a probe message comprising instructions for measuring a metric as taught by transmitting message comprising instructions as taught by combination of Prodan, Richardson and Kwak, for a purpose of be compatible with the probe protocol *(see Begen, col. 5, lines 25-40 and claim 7)*.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DUNG B. HUYNH whose telephone number is (571)270-7642. The examiner can normally be reached on M-F 9 AM - 5:30 PM EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ian N. Moore can be reached on (571)272-3085. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/DUNG B HUYNH/
Primary Examiner, Art Unit 2469
April 3, 2017

Notice of References Cited	Application/Control No. 15/434,673	Applicant(s)/Patent Under Reexamination LING ET AL.	
	Examiner DUNG B. HUYNH	Art Unit 2469	Page 1 of 2

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*	B	US-2005/0097617 A1	05-2005	Currivan, Bruce J.	H04B1/71	725/111
*	C	US-2005/0122996 A1	06-2005	Azenkot, Yehuda	H04L12/2801	370/477
*	D	US-2007/0098007 A1	05-2007	Prodan; Richard S.	H04L12/2801	370/443
*	E	US-2010/0100919 A1	04-2010	Hsue; Jin-Jen	H04L12/2801	725/111
*	F	US-2013/0107921 A1	05-2013	PRODAN; Richard	H04B1/04	375/222
*	G	US-2013/0227373 A1	08-2013	Shen; Ba-Zhong	H03M13/29	714/755
*	H	US-2014/0301237 A1	10-2014	Yi; Yunjung	H04W24/10	370/252
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*	K	US-2006/0008020 A1	01-2006	Blankenship; Yufei W.	H04L1/0003	375/261
*	L	US-2002/0062486 A1	05-2002	Park, Min Young	H04L12/2801	725/111
*	M	US-2013/0266310 A1	10-2013	FOX; David B.	H04L25/08	398/25

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	P					
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	Examiner DUNG B. HUYNH	Art Unit 2469	Page 2 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2009/0016420 A1	01-2009	Kwak; Ki Young	H04L5/0048	375/227
*	B	US-2011/0051607 A1	03-2011	Begen; Ali C.	H04L41/083	370/252
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
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	J	US-				
	K	US-				
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CONFIRMATION NO. 9621

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
15/434,673	02/16/2017 RULE	370	2469	25052US04

APPLICANTS
Maxlinear, Inc., Carlsbad, CA;

INVENTORS
Curtis Ling, Carlsbad, CA;
Sridhar Ramesh, Carlsbad, CA;
Timothy Gallagher, Carlsbad, CA;

**** CONTINUING DATA ****************************
This application is a CON of 15/228,703 08/04/2016 PAT 9577886
which is a CON of 13/948,444 07/23/2013 PAT 9419858
which claims benefit of 61/674,742 07/23/2012

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

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02/23/2017

Foreign Priority claimed	☐ Yes ☑ No		STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
35 USC 119(a-d) conditions met	☐ Yes ☑ No	☐ Met after Allowance				
Verified and Acknowledged	/DUNG B. HUYNH/ Examiner's Signature	Initials	CA	7	18	2

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TITLE
Method And System For Service Group Management In A Cable Network

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15434673	LING ET AL.
	Examiner	**Art Unit**
	DUNG B HUYNH	2469

CPC- SEARCHED

Symbol	Date	Examiner
H04B17/318	04/02/17	DBH
H04L41/0823	04/02/17	DBH
H04L1/0009,0026	04/02/17	DBH
H04L27/2602	04/02/17	DBH

CPC COMBINATION SETS - SEARCHED

Symbol	Date	Examiner

US CLASSIFICATION SEARCHED

Class	Subclass	Date	Examiner

SEARCH NOTES

Search Notes	Date	Examiner
Assginee and Inventor search in PALM	04/01/17	DBH
H04B17/318 H04L1/0009 H04L1/0026 H04L27/2602 H04L41/0823 (text search only - see search history printout)	04/02/17	DBH
H04N21/6118 ,6168 ,2221,2408	04/02/17	DBH
H04N7/102	04/02/17	DBH
EAST (US-PGPUB, USPAT, USOCR, FPRS, EPO, JPO, DERWENT, IBM_TDB) - see search history printout	04/02/17	DBH

INTERFERENCE SEARCH

US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

EAST Search History

EAST Search History (Prior Art) /dbh/ /dbh/ /dbh/

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	248	composit$3 near2 snr	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/01 17:01
S2	11	composit$3 near2 snr and cable near modem	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/01 17:02
S3	2	"15228703"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/02 14:15
S4	934	composit$3 and snr and cable near modem	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/02 14:15
S5	934	composit$3 and snr and cable near modem	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/02 14:16
S6	67074	((H04B17/318 OR H04L1/0009 OR H04L1/0026 OR H04L27/2602 OR H04L41/0823).CPC.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/02 14:16
S7	9970322	(@rlad<"20120723" @ad<"20120723")	US-PGPUB; USPAT	OR	ON	2017/04/02 14:17
S8	109	S5 and S6 and S7	US-PGPUB; USPAT	OR	ON	2017/04/02 14:17
S9	0	("2016/0344589").URPN.	USPAT	OR	ON	2017/04/02 14:20
S10	49	("20020062486" | "20020186459" | "20030002450" | "20030043732" |	US-PGPUB; USPAT;	OR	ON	2017/04/02 14:21

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S11	4681	((H04N21/6118 OR H04N21/6168 OR H04N21/2221 OR H04N21/2408 OR H04N7/102).CPC.)	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/02 14:21
S12	48	ofdm near10 (cmts cable near modem) and (categoriz$3 assign$3 allocat$3 allot$3 classify$3 group$5) near5 (CM cable near modem)	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/02 14:25
S13	366	ofdm and (categoriz$3 assign$3 allocat$3 allot$3 classify$3 group$5) near5 (CM cable near modem) and S7	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/02 14:26
S14	29	S13 and S6	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/02 14:27
S15	47	S13 and S11	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/02 14:27
S16	128	ofdm and (categoriz$3 assign$3 allocat$3 allot$3 classify$3 group$5) near5 (CM cable near modem) and S7 and (SNR sinr sir)	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/02 14:27
S17	22	(categoriz$3 assign$3 allocat$3 allot$3 classify$3 group$5) near5 (CM cable near modem) same (SNR sinr sir) and S7 not S16	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/02 14:48
S18	1	"9577886".pn.	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/02 15:16
S19	4	"13948444"	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/02 15:31
S20	1	"9419858".pn.	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/03 08:42

4/3/2017 11:22:57 AM
C:\Users\dhuynh3\Documents\EAST\Workspaces\15434673 (assigning cmts to a group).wsp

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15434673	LING ET AL.
	Examiner	**Art Unit**
	DUNG B HUYNH	2469

✓	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	04/03/2017								
	1	✓								
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/434,673	02/16/2017	Curtis Ling	25052US04

CONFIRMATION NO. 9621

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PUBLICATION NOTICE

OC000000091945261

Title: Method And System For Service Group Management In A Cable Network

Publication No.US-2017-0163486-A1
Publication Date:06/08/2017

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PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

AMENDMENTS TO THE CLAIMS

Listing of the Claims

1. (Currently amended) A method comprising:

determining, by a cable modem termination system (CMTS), for a plurality of cable modems served by said CMTS, a corresponding plurality of signal-to-noise ratio (SNR) related metrics;

assigning, by said CMTS, said plurality of cable modems among a plurality of service groups based on said plurality of SNR-related metrics;

generating, by said CMTS for each one of said plurality of service groups, a composite SNR-related metric based at least in part on a ~~portion~~ worst-case SNR profile of said plurality of SNR-related metrics corresponding to said one of said plurality of service groups;

selecting, by said CMTS, physical layer communication parameters to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric; and

communicating, by said CMTS, with a portion of said plurality of cable modems corresponding to said one of said plurality of service groups using said selected physical layer communication parameters.

2. (Previously presented) The method of claim 1, wherein said physical layer communication parameters include one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate.

3. (Previously presented) The method of claim 1, wherein said CMTS uses orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers for said communicating.

4. (Previously presented) The method of claim 3, comprising selecting, by said CMTS, said physical layer communication parameters on a per-OFDM-subcarrier basis.

5. (Previously presented) The method of claim 4, wherein said physical layer communication parameters include one or both of: which of said OFDM subcarriers to use for transmission to said CMTS, and which of said OFDM subcarriers to use for reception of information from said CMTS.

6. (Previously presented) The method of claim 1, wherein:

said plurality of service groups comprises a first service group and a second service group;

said first service group has a first composite SNR versus frequency profile, said second service group has a second composite SNR versus frequency profile, and a third cable modem has a particular SNR versus frequency profile; and

said assigning said plurality of cable modems among said plurality of service groups comprises:

assigning said third cable modem to said first service group if said particular SNR versus frequency profile is more similar to said first composite SNR versus frequency profile than to said second composite SNR versus frequency profile; and

assigning said third cable modem to said second service group if said particular SNR versus frequency profile is more similar to said second composite SNR versus frequency profile than to said first composite SNR versus frequency profile.

7. (Previously presented) The method of claim 1, comprising assigning said plurality of cable modems among said plurality of service groups based on distances between said CMTS and said plurality of cable modems.

8. (Previously presented) The method of claim 1, comprising assigning any particular one of said plurality of cable modems to one of said plurality of service groups based on which one or more of a plurality of branch amplifiers are upstream of said one of said plurality of cable modems.

9. (Previously presented) The method of claim 1, wherein said determining said plurality of SNR-related metrics comprises:

transmitting a probe message to each said plurality of cable modems, said probe message comprising instructions for measuring a metric and reporting said measured metric back to said CMTS; and

receiving a metric reporting message from each of said plurality of cable modems.

10. (Currently amended) A system comprising:

circuitry for use in a cable modem termination system (CMTS), said circuitry comprising a network interface and a processor wherein:

said processor is configured to determine, for a plurality of cable modems served by said CMTS, a corresponding plurality of signal-to-noise ratio (SNR) related metrics;

said processor is configured to assign said plurality of cable modems among a plurality of service groups based on said plurality of SNR-related metrics;

said processor is configured to generate, for each one of said plurality of service groups, a composite SNR-related metric based <u>at least in part</u> on a ~~portion~~ <u>worst-case SNR profile</u> of said plurality of SNR-

related metrics corresponding to said one of said plurality of service groups;

said processor is configured to select physical layer communication parameters to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric; and

said network interface is configured to communicate with a portion of said plurality of cable modems corresponding to said one of said plurality of service groups using the selected physical layer communication parameters.

11. (Previously presented) The system of claim 10, wherein said physical layer communication parameters include one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate.

12. (Previously presented) The system of claim 10, wherein said network interface and said plurality of cable modems are configured to communicate using orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers.

13. (Previously presented) The system of claim 12, wherein said network interface is configured such that said physical layer communication parameters are configurable on a per-OFDM-subcarrier basis.

14. (Previously presented) The system of claim 12, wherein said physical layer communication parameters include one or both of: which of said OFDM subcarriers to use for transmission to said CMTS, and which of said OFDM subcarriers to use for reception of information from said CMTS.

15. (Previously presented) The system of claim 10, wherein:

said plurality of service groups comprises a first service group and a second service group;

said first service group has a first composite SNR versus frequency profile, said second service group has a second composite SNR versus frequency profile, and a third cable modem has a particular SNR versus frequency profile;

said assignment of said plurality of cable modems among said plurality of service groups comprises:

assignment of said third cable modem to said first service group if said particular SNR versus frequency profile is more similar to said first composite SNR versus frequency profile than to said second composite SNR versus frequency profile; and

assignment of said third cable modem to said second service group if said particular SNR versus frequency profile is more similar to said second composite SNR versus frequency profile than to said first composite SNR versus frequency profile.

16. (Previously presented) The system of claim 10, wherein said processor is configured to assign said plurality of cable modems among said plurality of service groups based on distances between said CMTS and said plurality of cable modems.

17. (Previously presented) The system of claim 10, wherein said processor is configured to assign said plurality of cable modems among said plurality of service groups based on a branch further branch amplifier that serves each of said plurality of cable modems.

18. (Previously presented) The system of claim 10, wherein said determination of said plurality of SNR-related metrics comprises:

transmission, via said network interface, of a probe message to each said plurality of cable modems, said probe message comprising instructions for measuring a metric and reporting said measured metric back to said CMTS; and

reception, via said network interface of said CMTS, of a metric reporting message from each of said plurality of cable modems.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

(Attorney Docket No. 25052US04)

In the Application of:	)	
	)	Electronically Filed
Curtis Ling	)	
	)	August 10, 2017
Serial No. 15/434,673	)	
	)	
For: SERVICE GROUP MANAGEMENT IN A CABLE NETWORK	)	
	)	
Examiner: Dung Huynh	)	
	)	
Group Art Unit: 2469	)	
	)	
Confirmation No. 9621	)	
	)	
	)	
	)	

RESPONSE

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

This paper responds to the non-final Office Action mailed April 10, 2017 ("Office Action") in the above-identified application. The Applicant respectfully requests entry of the following amendments and consideration of the following remarks.

Amendments to the Claims begin on page 2 of this paper.

Remarks begin on page 8 of this paper.

PTO/AIA/26 (04-14)
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TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) 25052US04

In re Application of: Curtis Ling

Application No.: 15/434,673

Filed: February 16, 2017

For: SERVICE GROUP MANAGEMENT IN A CABLE NETWORK

The applicant, Maxlinear, Inc., owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. 9,419,858 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

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Erick J. Michel	August 10, 2017
Signature	Date

Erick J. Michel
Typed or printed name

Attorney/Agent of Record	312-775-8000
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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.
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Electronic Patent Application Fee Transmittal

Application Number:	15434673
Filing Date:	16-Feb-2017
Title of Invention:	Method And System For Service Group Management In A Cable Network
First Named Inventor/Applicant Name:	Curtis Ling
Filer:	Erick J. Michel/Brenda Campillo
Attorney Docket Number:	25052US04

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

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:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
STATUTORY OR TERMINAL DISCLAIMER	1814	2	160	320
		Total in USD ($)		**320**

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Application Number:	15434673
International Application Number:	
Confirmation Number:	9621
Title of Invention:	Method And System For Service Group Management In A Cable Network
First Named Inventor/Applicant Name:	Curtis Ling
Customer Number:	23446
Filer:	Erick J. Michel/Brenda Campillo
Filer Authorized By:	Erick J. Michel
Attorney Docket Number:	25052US04
Receipt Date:	10-AUG-2017
Filing Date:	16-FEB-2017
Time Stamp:	16:26:43
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$320
RAM confirmation Number	081117INTEFSW16280700
Deposit Account	130017
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2		25052US04_ROA.pdf	61871 b6f60f578c575c445ec73c48e52183e317eff984	yes	14

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Amendment Copy Claims/Response to Suggested Claims	2	7
Amendment/Req. Reconsideration-After Non-Final Reject	1	1

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(Not for submission under 37 CFR 1.99)

Application Number	15434673
Filing Date	2017-02-16
First Named Inventor	Curtis Ling
Art Unit	2469
Examiner Name	Huynh, Dung B.
Attorney Docket Number	25052US04

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	2	6560225			Czajkowski, Igor K.	
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	4	6891858			Mahesh, Harihara	
	5	8743933			Prodan, Richard	
	6	5563918			Waldschmidt, Richard J.	
	7	6275483			Papasakellariou, Aristides	
	8	6421327			Lundby, Stein A.	

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	Filing Date	2017-02-16
	First Named Inventor	Curtis Ling
	Art Unit	2469
	Examiner Name	Huynh, Dung B.
	Attorney Docket Number	25052US04

	9	7761049			Zeng, Dongsong	
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	First Named Inventor	Curtis Ling
	Art Unit	2469
	Examiner Name	Huynh, Dung B.
	Attorney Docket Number	25052US04

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	14	20110051607			Begen, Ali C.	
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	First Named Inventor	Curtis Ling
	Art Unit	2469
	Examiner Name	Huynh, Dung B.
	Attorney Docket Number	25052US04

	18	20030236071			Ito, Osamu	
	19	20030223481			Jones, William W.	
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	Application Number	15434673
	Filing Date	2017-02-16
	First Named Inventor	Curtis Ling
	Art Unit	2469
	Examiner Name	Huynh, Dung B.
	Attorney Docket Number	25052US04

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	30	20120269242			Prodan, Richard	
	31	20130100843			Croak, Marian	
	32	20130114480			Chapman, John T.	
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	Filing Date	2017-02-16
	First Named Inventor	Curtis Ling
	Art Unit	2469
	Examiner Name	Huynh, Dung B.
	Attorney Docket Number	25052US04

	40	20090219856			Richardson, Thomas	
	41	20110188852			Stodola; Kevin C.	
	42	20110306380			Zavadsky; Dean	
	43	20130021931			KIM; Tae-Yoon	
	44	20130024753			Masuda; Kyoichiro	
	45	20140169431			Arambepola; Bernard	
	46	20140286203			Jindal; Nihar	
	47	20150071161			SALHAB; ANAS M.A. ATA	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	15434673
	Filing Date	2017-02-16
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	15434673
	Filing Date	2017-02-16
	First Named Inventor	Curtis Ling
	Art Unit	2469
	Examiner Name	Huynh, Dung B.
	Attorney Docket Number	25052US04

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Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

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OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Erick J. Michel/	Date (YYYY-MM-DD)	2017-08-10
Name/Print	Erick J. Michel	Registration Number	60928

This collection of information is required by 37 CFR 1.97 and 1.98. 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 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: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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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 the Freedom of Information Act requires disclosure of these record s.

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 inspections 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.

REMARKS / ARGUMENTS

The present application originally includes pending claims 1-18 all of which stand rejected. Claims 1-18 stand rejected on the ground of non-statutory double patenting. Claims 1-18 stand rejected under 35 U.S.C. 103.

I. DOUBLE PATENTING

Claims 1-18 stand rejected on the ground of non-statutory double patenting over claims 1-18 of U.S. Patent No. 9,577,886 B2 and U.S. Patent No. 9,419,858 B2. The Applicant hereby submits a Terminal Disclaimer to obviate the rejection. Accordingly, the Applicant requests that the rejection be withdrawn.

II. REJECTION UNDER 35 U.S.C. 103

Claims 1-18 stand rejected under 35 U.S.C. 103 as being unpatentable over Prodan et al. (U.S. Patent No. 8,743,933 B2, hereinafter Prodan) in view of Richardson et al. (U.S. Patent Publication No. 2009/0219856 A1, hereinafter Richardson).

A. Rejection of Independent Claims 1 and 10

With regard to the rejection of independent claim 1 under 35 U.S.C. § 103(a), the Applicant submits that Prodan in view of Richardson does not disclose or suggest at least the limitation of "determining, by a cable modem termination system (CMTS), for a plurality of cable modems served by said CMTS, a corresponding plurality of signal-to-noise ratio (SNR) related metrics; assigning, by said CMTS, said plurality of cable modems among a plurality of service groups based on said plurality of SNR-related metrics; *generating, by said CMTS for each one of said plurality of service groups, a composite SNR-related metric based at least in part on a worst-case SNR profile of said plurality of SNR-related metrics corresponding to said one of said plurality of service groups; selecting, by said CMTS, physical layer communication parameters to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric*; and communicating, by said CMTS, with a portion of said plurality of cable modems corresponding to said one of said plurality of service groups using said selected physical layer communication parameters," as recited by the Applicant in independent claim 1.

The claims have been amended to clarify the terms and to further prosecution, particularly with respect to the composite SNR-related metric based at least in part on a worst-case SNR profile, which is not taught in any of the references.

Accordingly, independent claim 1 is not unpatentable over Prodan in view of Richardson and further, and is allowable. Independent claim 10 is similar in many respects to the method disclosed in independent claim 1. Therefore, the Applicant submits that independent claim 10 is also allowable over the references cited in the Office Action at least for the reasons stated above with regard to claim 1.

Applicant also reserves the right to argue additional reasons beyond those set forth above to support the allowability of claims 1 and 10.

B. Rejection of Dependent Claims 2, 6, 11, 15 and 17

Based on at least the foregoing, the Applicant believes the rejections of independent claims 1 and 10 under 35 U.S.C. § 103(a) as being unpatentable over Prodan in view of Richardson have been overcome and requests that the rejection be withdrawn. Claims 2, 6, 11, 15 and 17 respectively depend from independent claims 1 and 10, and are, consequently, also respectfully submitted to be allowable.

The Applicant also reserves the right to argue additional reasons beyond those set forth above to support the allowability of claims 2, 6, 11, 15 and 17.

C. Rejection of Dependent Claims 3, 12, and 14

Based on at least the foregoing, the Applicant believes the rejections of independent claims 1 and 10 under 35 U.S.C. § 103(a) as being unpatentable

over Prodan in view of Richardson have been overcome and requests that the rejections be withdrawn. The Office Action then cites to Chapman for communicating over subcarriers. However, Chapman does not overcome the deficiencies of Prodan and Richardson described above. Claims 3, 12, and 14 respectively depend from independent claims 1 and 10, and are, consequently, also respectfully submitted to be allowable.

The Applicant also reserves the right to argue additional reasons beyond those set forth above to support the allowability of claims 3, 12, and 14.

D. Rejection of Dependent Claims 4, 5, and 13

Based on at least the foregoing, the Applicant believes the rejections of independent claims 1 and 10 under 35 U.S.C. § 103(a) as being unpatentable over Prodan in view of Richardson and claims 3, 21, and 14 as being unpatentable over Prodan in view of Richardson and further in view of Chapman have been overcome and requests that the rejections be withdrawn. The Office Action then cites to Blankenship for configuring a physical layer on a per-OFDM-subcarrier basis. However, Blankenship does not overcome the deficiencies of Prodan, Richardson, and Chapman described above. Claims 4, 5, and 13 respectively depend from independent claims 1 and 10, and are, consequently, also respectfully submitted to be allowable.

The Applicant also reserves the right to argue additional reasons beyond those set forth above to support the allowability of claims 4, 5, and 13.

E. Rejection of Dependent Claims 7 and 16

Based on at least the foregoing, the Applicant believes the rejections of independent claims 1 and 10 under 35 U.S.C. § 103(a) as being unpatentable over Prodan in view of Richardson have been overcome and requests that the rejections be withdrawn. The Office Action then cites to Park for assigning cable modems based on a distance between the modems and a CMTS. However, Park does not overcome the deficiencies of Prodan and Richardson described above. Claims 7 and 16 respectively depend from independent claims 1 and 10, and are, consequently, also respectfully submitted to be allowable.

The Applicant also reserves the right to argue additional reasons beyond those set forth above to support the allowability of claims 7 and 16.

F. Rejection of Dependent Claim 8

Based on at least the foregoing, the Applicant believes the rejections of independent claims 1 and 10 under 35 U.S.C. § 103(a) as being unpatentable over Prodan in view of Richardson have been overcome and requests that the rejections be withdrawn. The Office Action then cites to Fox for assigning cable modems based on branch amplifiers. However, Fox does not overcome the deficiencies of Prodan and Richardson described above. Claim 8 depends from

independent claim 1, and is, consequently, also respectfully submitted to be allowable.

The Applicant also reserves the right to argue additional reasons beyond those set forth above to support the allowability of claim 8.

G. Rejection of Dependent Claims 9 and 18

Based on at least the foregoing, the Applicant believes the rejections of independent claims 1 and 10 under 35 U.S.C. § 103(a) as being unpatentable over Prodan in view of Richardson have been overcome and requests that the rejections be withdrawn. The Office Action then cites to Kwak for determining SNR-related metrics and Begen for a probe message. However, Kwak and Begen do not overcome the deficiencies of Prodan and Richardson described above. Claims 9 and 18 respectively depend from independent claims 1 and 10, and are, consequently, also respectfully submitted to be allowable.

The Applicant also reserves the right to argue additional reasons beyond those set forth above to support the allowability of claims 9 and 18.

In general, the Office Action makes various statements regarding claims 1-18 and the cited references, which statements are now moot in light of the above. Thus, the Applicant will not address such statements at the present time. However, the Applicants expressly reserve the right to challenge such statements in the future should the need arise (e.g., if such statement should become relevant by appearing in a rejection of any current or future claim or be relied upon in any proceeding involving this application or a corresponding patent).

The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to the deposit account of McAndrews, Held & Malloy, Ltd., Account No. 13-0017.

A Notice of Allowability is courteously solicited.

Respectfully submitted,

Date: August 10, 2017

/Erick J. Michel/

Erick J. Michel, Ph.D. EE
Registration No. 60,928
Attorney for Applicant

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(312) 775-8000

PTO/AIA/26 (04-14)
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TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) 25052US04

In re Application of: Curtis Ling

Application No.: 15/434,673

Filed: February 16, 2017

For: SERVICE GROUP MANAGEMENT IN A CABLE NETWORK

The applicant, Maxlinear, Inc., owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. 9,577,886 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☑ The undersigned is an attorney or agent of record. Reg. No. 60928

Erick J. Michel — Signature
August 10, 2017 — Date

Erick J. Michel
Typed or printed name

Attorney/Agent of Record — Title
312-775-8000 — Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	15/434,673	LING ET AL.	

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TERMINAL DISCLAIMER	☐ APPROVED	☒ DISAPPROVED
Date Filed : 8/10/17	**This patent is subject to a Terminal Disclaimer**	

Approved/Disapproved by:

Felicia D. Roberts - 2 TDs disapproved with this filing date:

Improper signature: Signature should be between forward slash marks. (See 37 CFR 1.4(d)(2).

Please correct and resubmit the TDs. (No new fee required)

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PATENT APPLICATION FEE DETERMINATION RECORD

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Application or Docket Number	Filing Date	☐ To be Mailed
15/434,673	02/16/2017	

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	NUMBER FILED (Column 1)	NUMBER EXTRA (Column 2)	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	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 $310 ($155 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	

APPLICATION AS AMENDED – PART II

AMENDMENT

08/10/2017	CLAIMS REMAINING AFTER AMENDMENT (Column 1)		HIGHEST NUMBER PREVIOUSLY PAID FOR (Column 2)	PRESENT EXTRA (Column 3)	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 18	Minus	** 20	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	**0**

AMENDMENT

	CLAIMS REMAINING AFTER AMENDMENT (Column 1)		HIGHEST NUMBER PREVIOUSLY PAID FOR (Column 2)	PRESENT EXTRA (Column 3)	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					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".
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The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

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TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) 25052US04

In re Application of: Curtis Ling

Application No.: 15/434,673

Filed: February 16, 2017

For: SERVICE GROUP MANAGEMENT IN A CABLE NETWORK

The applicant, Maxlinear, Inc., owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. 9,577,886 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

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expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
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Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☑ The undersigned is an attorney or agent of record. Reg. No. 60928

/Erick J. Michel/ — Signature
August 28, 2017 — Date

Erick J. Michel — Typed or printed name

Attorney/Agent of Record — Title
312-775-8000 — Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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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.

PTO/AIA/26 (04-14)
Approved for use through 07/31/2016. 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.

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) 25052US04

In re Application of: Curtis Ling

Application No.: 15/434,673

Filed: February 16, 2017

For: SERVICE GROUP MANAGEMENT IN A CABLE NETWORK

The applicant, Maxlinear, Inc., owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. 9,419,858 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☑ The undersigned is an attorney or agent of record. Reg. No. 60928

/Erick J. Michel/ — Signature
August 28, 2017 — Date

Erick J. Michel — Typed or printed name

Attorney/Agent of Record — Title
312-775-8000 — Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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.

This collection of information is required by 37 CFR 1.321. 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.
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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.

Electronic Acknowledgement Receipt

EFS ID:	30202109
Application Number:	15434673
International Application Number:	
Confirmation Number:	9621
Title of Invention:	Method And System For Service Group Management In A Cable Network
First Named Inventor/Applicant Name:	Curtis Ling
Customer Number:	23446
Filer:	Erick J. Michel/BRENDA CAMPILLO
Filer Authorized By:	Erick J. Michel
Attorney Docket Number:	25052US04
Receipt Date:	28-AUG-2017
Filing Date:	16-FEB-2017
Time Stamp:	16:43:52
Application Type:	Utility under 35 USC 111(a)

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	Terminal Disclaimer Filed	25052US04_TD1.pdf	160464 e406c1d33008f6f94ab0a134d381619e7e05f92e	no	2

Warnings:

Information:					
2	Terminal Disclaimer Filed	25052US04_TD2.pdf	160409 f704259fbffcb087291474b14ce76e4d0a6d08c9	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	320873		

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.

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	15/434,673	LING ET AL.	

Document Code - DISQ	Internal Document – DO NOT MAIL

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 8/28/17	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:
2/Tds both approved. Lawana Hixon

U.S. Patent and Trademark Office

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

23446 7590 09/07/2017
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

EXAMINER
HUYNH, DUNG B.

ART UNIT	PAPER NUMBER
2469	

DATE MAILED: 09/07/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/434,673	02/16/2017	Curtis Ling	25052US04	9621

TITLE OF INVENTION: Method And System For Service Group Management In A Cable Network

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	12/07/2017

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 ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

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.

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)

23446 7590 09/07/2017
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

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.
15/434,673	02/16/2017	Curtis Ling	25052US04	9621

TITLE OF INVENTION: Method And System For Service Group Management In A Cable Network

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	12/07/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
HUYNH, DUNG B.	2469	370-254000

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 credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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.
15/434,673	02/16/2017	Curtis Ling	25052US04	9621

23446 7590 09/07/2017
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

EXAMINER
HUYNH, DUNG B.

ART UNIT	PAPER NUMBER
2469	

DATE MAILED: 09/07/2017

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

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

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. 02/11)

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B 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.

Privacy Act Statement

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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.
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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.
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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.

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	15/434,673	LING ET AL.	
	Examiner	Art Unit	
	DUNG B. HUYNH	2469	

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

(1) *DUNG B. HUYNH*. (3)_____.

(2) *ERICK J. MICHEL (Reg. No. 60,928)*. (4)_____.

Date of Interview: *08/28/2017*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

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

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☒Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1-18*.

Identification of prior art discussed: _____.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

The Examiner and the Applicant's representative on 08/28/2017, discussed the terminal disclaimers filed on 08/10/2017, wherein the TDs are disapproved due to improper signature. The Applicant's representative in response has refiled the terminal disclaimers.

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/DUNG B HUYNH/
Primary Examiner, Art Unit 2469

Notice of Allowability	Application No. 15/434,673	Applicant(s) LING ET AL.	
	Examiner DUNG B. HUYNH	Art Unit 2469	AIA (First Inventor to File) Status No

-- 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 *08/10/2017*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-18*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   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.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ 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. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☒ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☒ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/DUNG B HUYNH/
Primary Examiner, Art Unit 2469

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

Terminal Disclaimer

2. The terminal disclaimers filed on 08/28/2017 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration dates of US Patent No. 9,577,886 and US Patent No. 9,419,858 have been reviewed and are accepted. The terminal disclaimers have been recorded.

Response to Arguments

3. Applicant's arguments, see Remarks, filed on 08/10/2017, with respect to the non-statutory double patenting rejections of claims 1-18 have been fully considered and are persuasive in view of the terminal disclaimers filed on 08/28/2017 *(which have been accepted on 08/29/2017)*. The non-statutory double patenting rejections of claims 1-18 have been withdrawn.

4. Applicant's arguments, see Remarks, filed on 08/10/2017, with respect to the pre-AIA 35 U.S.C. 103(a) rejections of claims 1-18 have been fully considered and are persuasive in view of amendments filed on 08/10/17. The pre-AIA 35 U.S.C. 103(a) rejections of claims 1-18 have been withdrawn.

Allowable Subject Matter

5. **Claims 1-18 are allowed**.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DUNG B. HUYNH whose telephone number is (571)270-7642. The examiner can normally be reached on M-F 9 AM - 5:30 PM EST.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ian N. Moore can be reached on (571)272-3085. 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.

/DUNG B HUYNH/
Primary Examiner, Art Unit 2469
August 30, 2017

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	15/434,673	LING ET AL.	
	Examiner	Art Unit	
	DUNG B. HUYNH	2469	

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

(1) *DUNG B. HUYNH*. (3)_____.

(2) *ERICK J. MICHEL (Reg. No. 60,928)*. (4)_____.

Date of Interview: *08/28/2017*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

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

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☒Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1-18*.

Identification of prior art discussed: _____.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

The Examiner and the Applicant's representative on 08/28/2017, discussed the terminal disclaimers filed on 08/10/2017, wherein the TDs are disapproved due to improper signature. The Applicant's representative in response has refiled the terminal disclaimers.

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/DUNG B HUYNH/
Primary Examiner, Art Unit 2469

Notice of References Cited	Application/Control No. 15/434,673	Applicant(s)/Patent Under Reexamination LING ET AL.	
	Examiner DUNG B. HUYNH	Art Unit 2469	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2004/0085976 A1	05-2004	Dale, Mark	H04B7/18582	370/411
*	B	US-2006/0067278 A1	03-2006	Li; Xiaodong	H04B1/707	370/335
	C	US-				
	D	US-				
	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	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	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.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15434673
Filing Date	2017-02-16
First Named Inventor	Curtis Ling
Art Unit	2469
Examiner Name	Huynh, Dung B.
Attorney Docket Number	25052US04

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6757522			Naegeli, Charles	
	2	6560225			Czajkowski, Igor K.	
	3	6898755			Hou, Victor T.	
	4	6891858			Mahesh, Harihara	
	5	8743933			Prodan, Richard	
	6	5563918			Waldschmidt, Richard J.	
	7	6275483			Papasakellariou, Aristides	
	8	6421327			Lundby, Stein A.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.B.H/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Filing Date	2017-02-16
	First Named Inventor	Curtis Ling
	Art Unit	2469
	Examiner Name	Huynh, Dung B.
	Attorney Docket Number	25052US04

	9	7761049			Zeng, Dongsong	
	10	8488514			Cai; Zhijun	
	11	9025954			Fang; Liming	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050097617			Currivan, Bruce J.	
	2	20050122996			Azenkot, Yehuda	
	3	20070098007			Prodan, Richard S.	
	4	20100100919			Hsue, Jin-Jen	
	5	20130107921			Prodan, Richard	
	6	20130227373			Shen, Ba-Zhong	

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	First Named Inventor	Curtis Ling
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	Examiner Name	Huynh, Dung B.
	Attorney Docket Number	25052US04

	7	20140301237			Yi, Yunjung	
	8	20090219856			Richardson, Thomas	
	9	20130114480			Chapman, John T.	
	10	20060008020			Blankenship, Yufei W.	
	11	20020062486			Park, Min Young	
	12	20130266310			Fox, David B.	
	13	20090016420			Kwak, Ki Young	
	14	20110051607			Begen, Ali C.	
	15	20030053419			Kanazawa, Toshiyuki	
	16	20030177502			Kolze, Thomas J.	
	17	20030199283			Busch, Patrick	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.B.H/

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	First Named Inventor	Curtis Ling
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	Attorney Docket Number	25052US04

	18	20030236071			Ito, Osamu	
	19	20030223481			Jones, William W.	
	20	20040218568			Goodall, David S.	
	21	20050122996			Azenkot, Yehuda	
	22	20050135253			Cai, Liyu	
	23	20050213579			Iyer, Pradeep J.	
	24	20070202904			Cheng, Jun	
	25	20070253388			Pietraski, Philip J.	
	26	20090040942			YANG, Daoyan	
	27	20090215403			Currivan; Bruce J.	
	28	20100002575			Eichinger, Josef Martin	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.B.H/

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	Application Number	15434673
	Filing Date	2017-02-16
	First Named Inventor	Curtis Ling
	Art Unit	2469
	Examiner Name	Huynh, Dung B.
	Attorney Docket Number	25052US04

	29	20100172316			Hwang; Sung-Hyun	
	30	20120269242			Prodan, Richard	
	31	20130100843			Croak, Marian	
	32	20130114480			Chapman, John T.	
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	34	20140022926			Ling; Curtis	
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	36	20030002450			Jalali, Ahmad	
	37	20030043732			Walton, Jay R.	
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	Attorney Docket Number	25052US04

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	42	20110306380			Zavadsky; Dean	
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	44	20130024753			Masuda; Kyoichiro	
	45	20140169431			Arambepola; Bernard	
	46	20140286203			Jindal; Nihar	
	47	20150071161			SALHAB; ANAS M.A. ATA	
	48	20150288498			Kliger; Avi	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]

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	First Named Inventor	Curtis Ling
	Art Unit	2469
	Examiner Name	Huynh, Dung B.
	Attorney Docket Number	25052US04

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Examiner Initials*	Cite No	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, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		

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EXAMINER SIGNATURE

Examiner Signature	/DUNG B HUYNH/	Date Considered	08/30/2017

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

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.B.H/

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15434673	LING ET AL.
	Examiner	**Art Unit**
	DUNG B HUYNH	2469

CPC- SEARCHED

Symbol	Date	Examiner
H04B17/318	04/02/17	DBH
H04L41/0823	04/02/17	DBH
H04L1/0009,0026	04/02/17 (updated on 08/24/17)	DBH
H04L27/2602	04/02/17	DBH
H04L12/2801	08/25/17	DBH
H04L27/2601	08/25/17	DBH
H04L41/0823	08/25/17	DBH
H04L43/08,12	08/25/17	DBH

CPC COMBINATION SETS - SEARCHED

Symbol	Date	Examiner

US CLASSIFICATION SEARCHED

Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES

Search Notes	Date	Examiner
Assginee and Inventor search in PALM	04/01/17	DBH
H04B17/318 H04L1/0009 H04L1/0026 H04L27/2602 H04L41/0823 (text search only - see search history printout)	04/02/17	DBH
H04N21/6118 ,6168 ,2221,2408	04/02/17	DBH
H04N7/102	04/02/17	DBH

SEARCH NOTES		
Search Notes	**Date**	**Examiner**
EAST (US-PGPUB, USPAT, USOCR, FPRS, EPO, JPO, DERWENT, IBM_TDB) - see search history printout	04/02/17 (updated on 08/25/17, 08/30/17)	DBH

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**
	see Interference search history printout	08/30/17	DBH

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15434673	LING ET AL.
	Examiner	**Art Unit**
	DUNG B HUYNH	2469

✓	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	04/03/2017	08/30/2017							
	1	✓	=							
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	17	✓	=							
	18	✓	=							

EAST Search History

EAST Search History (Interference) /DBH/ /DBH/ /DBH/

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	13	((worst lowest smallest) and (SNR signal near noise near ratio signal near2 noise signal near2 interfer$5 sir sinr snir) and cable near modem).clm.	US-PGPUB; USPAT	OR	ON	2017/08/30 15:43
L3	109	((group set sub$1group sub$1set) and (SNR signal near noise near ratio signal near2 noise signal near2 interfer$5 sir sinr snir) and cable near modem).clm.	US-PGPUB; USPAT	OR	ON	2017/08/30 15:44
L4	31	((group set sub$1group sub$1set) and (SNR signal near noise near ratio signal near2 noise signal near2 interfer$5 sir sinr snir) and cable near modem and (assign$5 classif$3 classification categor$5 categorizat$3)).clm.	US-PGPUB; USPAT	OR	ON	2017/08/30 15:46
L5	106	3 not (2 and 4)	US-PGPUB; USPAT	OR	ON	2017/08/30 15:47

8/30/2017 3:54:16 PM
C:\Users\dhuynh3\Documents\EAST\Workspaces\15434673 (assigning cmts to a group)after amendment.wsp

EAST Search History

EAST Search History (Prior Art) /dbh/ /dbh/ /dbh/

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	109	(US-15434673-$ | US-20020062486-$ | US-20020186459-$ | US-20030002450-$ | US-20030043732-$ | US-20030053419-$ | US-20030177502-$ | US-20030199283-$ | US-20030223481-$ | US-20030236071-$ | US-20040218568-$ | US-20050097617-$ | US-20050122996-$ | US-20050135253-$ | US-20050185824-$ | US-20050213579-$ | US-20060008020-$ | US-20070098007-$ | US-20070202904-$ | US-20070253388-$ | US-20090016420-$ | US-20090040942-$ | US-20090215403-$ | US-20090219856-$ | US-20100002575-$ | US-20100100919-$ | US-20100172316-$ | US-20110051607-$ | US-20110188852-$ | US-20110306380-$ | US-20120269242-$ | US-20130021931-$ | US-20130024753-$ | US-20130100843-$ | US-20130107921-$ | US-20130114480-$ | US-20130227373-$ | US-20130266310-$ | US-20140022926-$ | US-20140133330-$ | US-20140169431-$ | US-20140286203-$ | US-20140301237-$ | US-20150071161-$ | US-20150288498-$ | US-3025954-$ | US-3488514-$ | US-3743933-$ | US-5275483-$ | US-5421327-$ | US-5560225-$ | US-5563918-$ | US-5757522-$ | US-5891858-$ | US-5898755-$ | US-7761049-$).DID.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/30 15:20
S1	332	composite near10 (worst)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/25 17:25
S2	248	composite near10 (worst lowest least) near10 (SNR signal near noise near ratio signal near2 noise signal near2 interfer$5)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/25 17:27
S3	2224	(combin$3 mix$3 composite complex$3 total$3 compound$3) near10 (worst lowest least) near10 (SNR signal near noise near ratio signal near2 noise signal near2 interfer$5)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/25 17:28
S4	1	"15434673"	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2017/08/25 17:29

			EPO; JPO; DERWENT; IBM_TDB			
S5	76957	((H04L12/2801 OR H04L1/0009 OR H04L1/0026 OR H04L27/2601 OR H04L41/0823 OR H04L43/08 OR H04L43/12).CPC.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/25 17:29
S6	59	S3 and S5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/25 17:29
S7	50	S3 and cable near modem	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/25 17:30
S8	55	(combin$3 mix$3 composite complex$3 total$3 compound$3) near10 (worst lowest least) near10 (SNR signal near noise near ratio signal near2 noise signal near2 interfer$5 sir sinr snir) and cable near modem	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/25 17:38
S9	917	(worst lowest least) near10 (SNR signal near noise near ratio signal near2 noise signal near2 interfer$5 sir sinr snir) and cable near modem not (S6 S7 S8)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/25 17:48
S10	519	(worst lowest least) near3 (SNR signal near noise near ratio signal near2 noise signal near2 interfer$5 sir sinr snir) and cable near modem not (S6 S7 S8)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/25 17:49
S11	104	S10 and S5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/25 17:49
S12	415	S10 not S11	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/25 17:56
S13	15	S12 and (classif$5 group$5 classificat$3 categor$3 categorizat$3) near5 (CM cable	US-PGPUB; USPAT;	OR	ON	2017/08/25 17:56

		near modem)	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			

8/30/2017 3:42:41 PM
C:\Users\dhuynh3\Documents\EAST\Workspaces\15434673 (assigning cmts to a group)after amendment.wsp

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15434673	LING ET AL.
	Examiner	**Art Unit**
	DUNG B HUYNH	2469

CPC						
Symbol					**Type**	**Version**
H04L		41	/	0823	F	2013-01-01
H04L		1	/	0009	I	2013-01-01
H04L		1	/	0026	I	2013-01-01
H04L		27	/	2601	I	2013-01-01
H04L		12	/	2801	I	2013-01-01
H04L		43	/	12	I	2013-01-01
H04L		43	/	08	I	2013-01-01
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CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 18	
/DUNG B HUYNH/ Primary Examiner.Art Unit 2469 (Primary Examiner)	08/30/2017 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 4A

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15434673	LING ET AL.
	Examiner	**Art Unit**
	DUNG B HUYNH	2469

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
		H 0 4 L 12 / 24 (2006.01.01)	

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

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 18	
/DUNG B HUYNH/ Primary Examiner.Art Unit 2469 (Primary Examiner)	08/30/2017 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 4A

U.S. Patent and Trademark Office

Part of Paper No. 20170830

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15434673	LING ET AL.
	Examiner	**Art Unit**
	DUNG B HUYNH	2469

☒ **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		17												
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NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 18	
/DUNG B HUYNH/ Primary Examiner.Art Unit 2469 (Primary Examiner)	08/30/2017 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 4A

U.S. Patent and Trademark Office

Part of Paper No. 20170830

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From: PAIR_eOfficeAction@uspto.gov
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Sep 07, 2017 04:30:48 AM

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Application	Document	Mailroom Date	Attorney Docket No.
15434673	NOA	09/07/2017	25052US04
	INTV.SUM.EX	09/07/2017	25052US04
	892	09/07/2017	25052US04
	1449	09/07/2017	25052US04

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23446 7590 09/07/2017
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Erick J. Michel	(Depositor's name)
/Erick J. Michel/	(Signature)
December 4, 2017	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/434,673	02/16/2017	Curtis Ling	25052US04	9621

TITLE OF INVENTION: Method And System For Service Group Management In A Cable Network

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	12/07/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
HUYNH, DUNG B.	2469	370-254000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
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- ☐ "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,
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1 McAndrews, Held & Malloy
2
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(B) RESIDENCE: (CITY and STATE OR COUNTRY): Carlsbad, CA

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- ☒ Publication Fee (No small entity discount permitted)
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- ☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

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Authorized Signature /Erick J. Michel/ Date December 4, 2017

Typed or printed name Erick J. Michel Registration No. 60928

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No.: 25052US04

In the Application of:	)	
	)	
Curtis Ling	)	
	)	
Serial No.: 15/434,673	)	
	)	
Filed: February 16, 2017	)	
	)	**Filed electronically on**
For: Method And System For Service Group Management In A Cable Network	)	**December 4, 2017**
	)	
Examiner: Huynh, Dung B.	)	
	)	
Group Art Unit: 2469	)	
	)	
Confirmation No.: 9621	)	

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

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Commissioner for Patents
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Dear Sir:

This paper responds to the Notice of Allowance mailed September 7, 2017 in the above-identified application (the "Application"). Applicants respectfully request entry of the following remarks in the record.

REMARKS

Claims 1-18 were allowed in the Notice of Allowance mailed on September 7, 2017. The Applicant thanks the Examiner for positive consideration of the claims.

However, during the course of prosecution of the Application the Examiner may have provided various reasons for allowing claims 1-18. The Applicants do not agree or disagree at this time with those reasons, but respectfully reserve the right to support or traverse those reasons should the need arise, and argue different reasons for the allowability of the claims.

Respectfully submitted,

Dated: December 4, 2017 By: /Erick J. Michel/

Erick J. Michel
Attorney for Applicant
Reg. No. 60,928

McAndrews, Held & Malloy, Ltd.
500 West Madison Street, 34th Floor
Chicago, Illinois 60661
(tel) 312-775-8000
(fax) 312-775-8100

Electronic Patent Application Fee Transmittal

Application Number:	15434673
Filing Date:	16-Feb-2017
Title of Invention:	Method And System For Service Group Management In A Cable Network
First Named Inventor/Applicant Name:	Curtis Ling
Filer:	Erick J. Michel/Brenda Campillo
Attorney Docket Number:	25052US04

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

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:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
UTILITY APPL ISSUE FEE	1501	1	960	960
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**960**

Electronic Acknowledgement Receipt

EFS ID:	31121682
Application Number:	15434673
International Application Number:	
Confirmation Number:	9621
Title of Invention:	Method And System For Service Group Management In A Cable Network
First Named Inventor/Applicant Name:	Curtis Ling
Customer Number:	23446
Filer:	Erick J. Michel/Brenda Campillo
Filer Authorized By:	Erick J. Michel
Attorney Docket Number:	25052US04
Receipt Date:	04-DEC-2017
Filing Date:	16-FEB-2017
Time Stamp:	17:25:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$960
RAM confirmation Number	120517INTEFSW17262400
Deposit Account	130017
Authorized User	Erick Michel

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37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	25052US04_IF.pdf	70782 57c7c32dc8fdfb705b109cac46099b6cebf7545c	no	1
Warnings:					
Information:					
2	Post Allowance Communication - Incoming	25052US04_CSRFA.pdf	17843 328eae09066af331a732b13f51a64705fa7ef4da	no	2
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	32465 b30d246e632342df19ee4490990faed2cb8ef5c9	no	2
Warnings:					
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		Total Files Size (in bytes):	121090		

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15434673
	Filing Date	2017-02-16
	First Named Inventor	Curtis Ling
	Art Unit	2469
	Examiner Name	Huynh, Dung B.
	Attorney Docket Number	25052US04

Change(s) applied to document, /D.C./ 9/12/2017	40	20090219856		09/2009	Richardson, Thomas		
	41	20110188852		08/2011	Stodola; Kevin C.		
	42	20110306380		12/2011	Zavadsky; Dean		
	43	20130021931		01/2013	KIM; Tae-Yoon		
	44	20130024753		01/2013	Masuda; Kyoichiro		
	45	20140169431		06/2014	Arambepola; Bernard		
	46	20140286203		09/2014	Jindal; Nihar		
	47	20150071161		03/2015	SALHAB; ANAS M.A. ATA		
	48	20150288498		10/2015	Kliger; Avi		

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15434673
	Filing Date	2017-02-16
	First Named Inventor	Curtis Ling
	Art Unit	2469
	Examiner Name	Huynh, Dung B.
	Attorney Docket Number	25052US04

	18	20030236071		12/2003	Ito, Osamu	
	19	20030223481		12/2003	Jones, William W.	
	20	20040218568		11/2004	Goodall, David S.	
Change(s) applied to document, /D.C./ 9/12/2017	21	20050122996		06/2005	Azenkot, Yehuda	
	22	20050135253		06/2005	Cai, Liyu	
	23	20050213579		09/2005	Iyer, Pradeep J.	
	24	20070202904		08/2007	Cheng, Jun	
	25	20070253388		11/2007	Pietraski, Philip J.	
	26	20090040942		02/2009	YANG, Daoyan	
	27	20090215403		08/2009	Currivan; Bruce J.	
	28	20100002575		01/2010	Eichinger, Josef Martin	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15434673
	Filing Date	2017-02-16
	First Named Inventor	Curtis Ling
	Art Unit	2469
	Examiner Name	Huynh, Dung B.
	Attorney Docket Number	25052US04

	7	20140301237			Yi, Yunjung	
	8	20090219856			Richardson, Thomas	
Change(s) applied to document, /D.C./ 9/12/2017	9	20130114480			Chapman, John T.	
	10	20060008020			Blankenship, Yufei W.	
	11	20020062486			Park, Min Young	
	12	20130266310			Fox, David B.	
	13	20090016420			Kwak, Ki Young	
	14	20110051607			Begen, Ali C.	
	15	20030053419		03/2003	Kanazawa, Toshiyuki	
	16	20030177502		09/2003	Kolze, Thomas J.	
	17	20030199283		10/2003	Busch, Patrick	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15434673
	Filing Date	2017-02-16
	First Named Inventor	Curtis Ling
	Art Unit	2469
	Examiner Name	Huynh, Dung B.
	Attorney Docket Number	25052US04

Change(s) applied to document,

/D.C./ 9/12/2017	9	7761049		07/2010	Zeng, Dongsong	
	10	8488514		07/2013	Cai; Zhijun	
	11	9025954		05/2015	Fang; Liming	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050097617			Currivan, Bruce J.	
	2	20050122996			Azenkot, Yehuda	
	3	20070098007			Prodan, Richard S.	
	4	20100100919			Hsue, Jin-Jen	
	5	20130107921			Prodan, Richard	
	6	20130227373			Shen, Ba-Zhong	

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	Application Number	15434673
	Filing Date	2017-02-16
	First Named Inventor	Curtis Ling
	Art Unit	2469
	Examiner Name	Huynh, Dung B.
	Attorney Docket Number	25052US04

Change(s) applied to document, /D.C./ 9/12/2017	29	20100172316		07/2010 ~~08/2010~~	Hwang; Sung-Hyun	
Change(s) applied to document, /R.S./ 9/13/2017	30	20120269242		10/2012	Prodan, Richard	
	31	20130100843		04/2013	Croak, Marian	
	32	20130114480		05/2013	Chapman, John T.	
	33	20140133330		05/2014	Chapman, John T.	
	34	20140022926		01/2014	Ling; Curtis	
	35	20020186459		12/2002	DeGrange, James E. JR.	
	36	20030002450		01/2003	Jalali, Ahmad	
	37	20030043732		03/2003	Walton, Jay R.	
	38	20050185824		08/2005	Chen, Hai-Wen	
	39	20070253388		11/2007	Pietraski, Philip J.	

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15434673
Filing Date	2017-02-16
First Named Inventor	Curtis Ling
Art Unit	2469
Examiner Name	Huynh, Dung B.
Attorney Docket Number	25052US04

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
Change(s) applied to document, /D.C./ 9/12/2017	1	6757522			Naegeli, Charles	
	2	6560225		05/2003	Czajkowski, Igor K.	
	3	6898755		05/2005	Hou, Victor T.	
	4	6891858		05/2005	Mahesh, Harihara	
	5	8743933		06/2014	Prodan, Richard	
	6	5563918		10/1996	Waldschmidt, Richard J.	
Change(s) applied to document, /R.S./ 9/13/2017	7	6275483		08/2001	Papasakellariou, Aristides	
	8	6421327		~~08/2002~~ 07/2002	Lundby, Stein A.	

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/434,673	01/09/2018	9866438	25052US04	9621

23446 7590 12/20/2017
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

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 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

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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):

Curtis Ling, Carlsbad, CA;
Maxlinear, Inc., Carlsbad, CA;
Sridhar Ramesh, Carlsbad, CA;
Timothy Gallagher, Carlsbad, CA;

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IR103 (Rev. 10/09)

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Cc: PAIR_eOfficeAction@uspto.gov
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Dec 21, 2017 03:57:04 AM

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CHICAGO, IL 60661
UNITED STATES

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Application	Document	Mailroom Date	Attorney Docket No.
15434673	ISSUE.NTF	12/20/2017	25052US04

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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(c).

I hereby appoint:

[X] Practitioners associated with Customer Number: 23,446

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(c).

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

[X] The address associated with Customer Number: 23,446

OR

[ ]

Firm or individual name		
Address		
City	State	Zip
Country		
Telephone	Email	

Assignee name and address: ENTROPIC COMMUNICATIONS, LLC
1345 AVENUE OF THE AMERICAS, 46TH FLOOR
NEW YORK, NY 10105

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, 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 /Andrea L. Gothing/	Date 2021-05-04
Name Andrea L. Gothing	Telephone 415-830-0613
Title Licensing Officer and Authorized Signatory, Entropic Communications, 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 update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 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.

Electronic Acknowledgement Receipt

EFS ID:	42975678
Application Number:	15434673
International Application Number:	
Confirmation Number:	9621
Title of Invention:	Method And System For Service Group Management In A Cable Network
First Named Inventor/Applicant Name:	Curtis Ling
Customer Number:	23446
Filer:	Ronald H. Spuhler/Deborah Wilson
Filer Authorized By:	Ronald H. Spuhler
Attorney Docket Number:	25052US04
Receipt Date:	14-JUN-2021
Filing Date:	16-FEB-2017
Time Stamp:	12:35:55
Application Type:	Utility under 35 USC 111(a)

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	25052US04_373c_Statement.pdf	119968 52d3b6ce2e76fa4e1bb9da8fcd69fde283793c60	no	3

Warnings:

Information:					
2	Power of Attorney	Entropic-POA_General_Assignee_EntropicCommunications_ALG.pdf	487892 51444e06ae84b241bfc127dc47c5d6c646944dd7	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	607860	

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/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: ENTROPIC COMMUNICATIONS, LLC

Application No./Patent No.: 15/434,673 Filed/Issue Date: 2017-02-16

Titled: METHOD AND SYSTEM FOR SERVICE GROUP MANAGEMENT IN A CABLE NETWORK

ENTROPIC COMMUNICATIONS, LLC, a limited liability company

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

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

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 for which a copy thereof is attached.

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

1. From: Curtis Ling, Sridhar Ramesh, Timothy Gallagher To: MAXLINEAR, INC.

The document was recorded in the United States Patent and Trademark Office at Reel 030940, Frame 0405, or for which a copy thereof is attached.

2. From: MAXLINEAR, INC. To: ENTROPIC COMMUNICATIONS, LLC

The document was recorded in the United States Patent and Trademark Office at Reel 055898, Frame 0230, or for which a copy thereof is attached.

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**.

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STATEMENT UNDER 37 CFR 3.73(c)

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.

4. 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.

5. 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.

6. 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).

☑ As required by 37 CFR 3.73(c)(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.

/Ronald H. Spuhler/	2021-06-14
Signature	Date
Ronald H. Spuhler	52245
Printed or Typed Name	Title or Registration Number

[Page 2 of 2]

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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).
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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.
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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
15/434,673	02/16/2017	Curtis Ling	25052US04

CONFIRMATION NO. 9621

POA ACCEPTANCE LETTER

23446
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

OC000000126396442

Date Mailed: 06/18/2021

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 06/14/2021.

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**.

/ggasgedom/

To: mhmpto@mcandrews-ip.com,,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 23446

Jun 18, 2021 04:41:38 AM

Dear PAIR Customer:

MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 23446 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

Disclaimer:
The list of documents shown below is provided as a courtesy and is not part of the official file wrapper. The content of the images shown in PAIR is the official record.

Application	Document	Mailroom Date	Attorney Docket No.
15434673	N570	06/18/2021	25052US04

To view your correspondence online or update your email addresses, please visit us anytime at https://sportal.uspto.gov/secure/myportal/privatepair.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice,

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM