8293037

# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

*September 09, 2022*

**THIS IS TO CERTIFY THAT ANNEXED IS A TRUE COPY FROM THE RECORDS OF THIS OFFICE OF THE FILE WRAPPER AND CONTENTS OF:**

**APPLICATION NUMBER:** ***15/866,106***
**FILING DATE:** ***January 09, 2018***
**PATENT NUMBER:** ***10135682***
**ISSUE DATE:** ***November 20, 2018***

Certified by

Kathi

Performing the Functions and Duties of the
Under Secretary of Commerce
for Intellectual Property
and Director of the United States
Patent and Trademark Office



ENTROPIC EXHIBIT 2002
Comcast v. Entropic
IPR2025-00184

PTO/AIA/80 (07-12)
Approved for use through 11/30/2014. OMB 0651-0035
U.S. Patent and Trademark Office; U.S DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

# POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

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

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

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

**OR**

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

Assignee Name and Address: Maxlinear, Inc.
5966 La Place Court
Suite 100
Carlsbad, CA 92008

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

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

PTO/AIA/01 (06-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

# 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<br>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.

## WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Curtis Ling Date (Optional): 2/3/2013

Signature: _____

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.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1 minute 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.*

PTO/AIA/01 (06-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

# 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<br>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.

## WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

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

Signature: /Timothy Gallagher/

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.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1 minute 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.

PTO/AIA/01 (06-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

# 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<br>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.

## WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

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.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1 minute 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.

# 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 15/434,673 filed on February 16, 2017, which is a continuation of United States Patent Application 15/228,703 filed on August 4, 2016, now Patent No. 9,577,886, 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+□.

[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.

## CLAIMS

What is claimed is:

1. A method comprising:

determining, by a cable modem termination system (CMTS), for each cable modem served by said CMTS, a corresponding signal-to-noise ratio (SNR) related metric;

assigning, by said CMTS, each cable modem among a plurality of service groups based on a respective corresponding SNR-related metric;

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

selecting, by said CMTS, one or more physical layer communication parameter 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 one or more cable modems corresponding to said one of said plurality of service groups using said selected one or more physical layer communication parameter.

2. The method of claim 1, wherein said one or more physical layer communication parameter includes 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 one or more physical layer communication parameter on a per-OFDM-subcarrier basis.

5. The method of claim 4, wherein said one or more physical layer communication parameter includes 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 particular cable modem has a particular SNR versus frequency profile; and

said assigning said each cable modem among said plurality of service groups comprises, for the particular cable modem:

assigning said particular 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 particular 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 cable modems among said plurality of service groups based on respective distances between said CMTS and said cable modems.

8. The method of claim 1, comprising assigning any particular one of said 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 cable modem, 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 cable modem.

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 each cable modem served by said CMTS, a corresponding signal-to-noise ratio (SNR) related metric;

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

said processor is configured to generate, 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 SNR-related metrics corresponding to said one of said plurality of service groups;

said processor is configured to select one or more physical layer communication parameter 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 one or more cable modems corresponding to said one of said plurality of service groups using the one or more selected physical layer communication parameter.

11. The system of claim 10, wherein said one or more physical layer communication parameter includes 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 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 at least one of said one or more physical layer communication parameters are configurable on a per-OFDM-subcarrier basis.

14. The system of claim 12, wherein said one or more physical layer communication parameter includes 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 particular cable modem has a particular SNR versus frequency profile;

said assignment of said each cable modem among said plurality of service groups comprises, for the particular cable modem:

assignment of said particular 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 particular 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 cable modems among said plurality of service groups based on respective distances between said CMTS and said cable modems.

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

## 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.

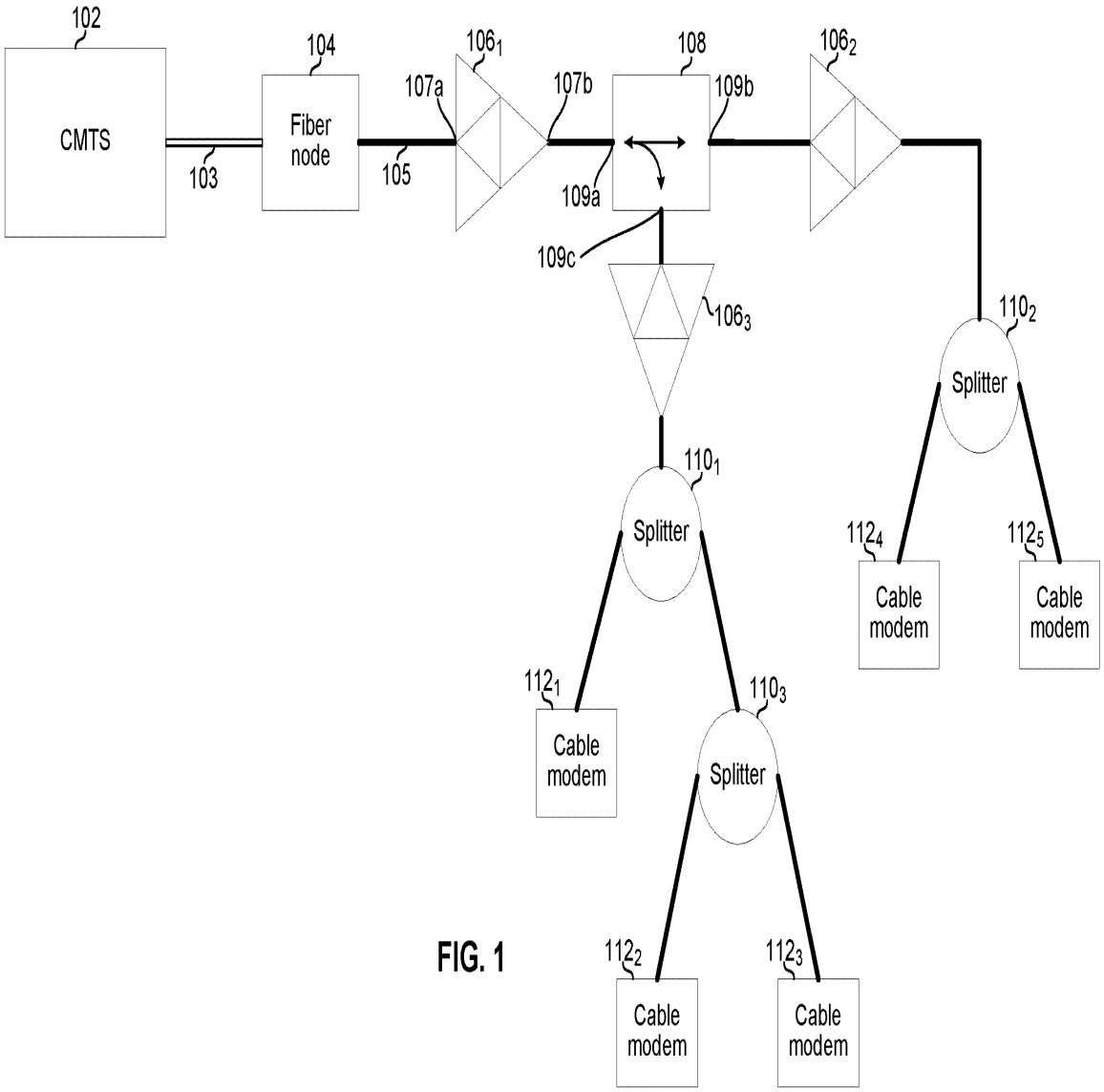
102
CMTS
103
104
Fiber node
105
107a
$106_1$
107b
108
109a
109b
109c
$106_2$
$106_3$
$110_1$
Splitter
$110_2$
Splitter
$110_3$
Splitter
$112_1$
Cable modem
$112_2$
Cable modem
$112_3$
Cable modem
$112_4$
Cable modem
$112_5$
Cable modem

FIG. 1

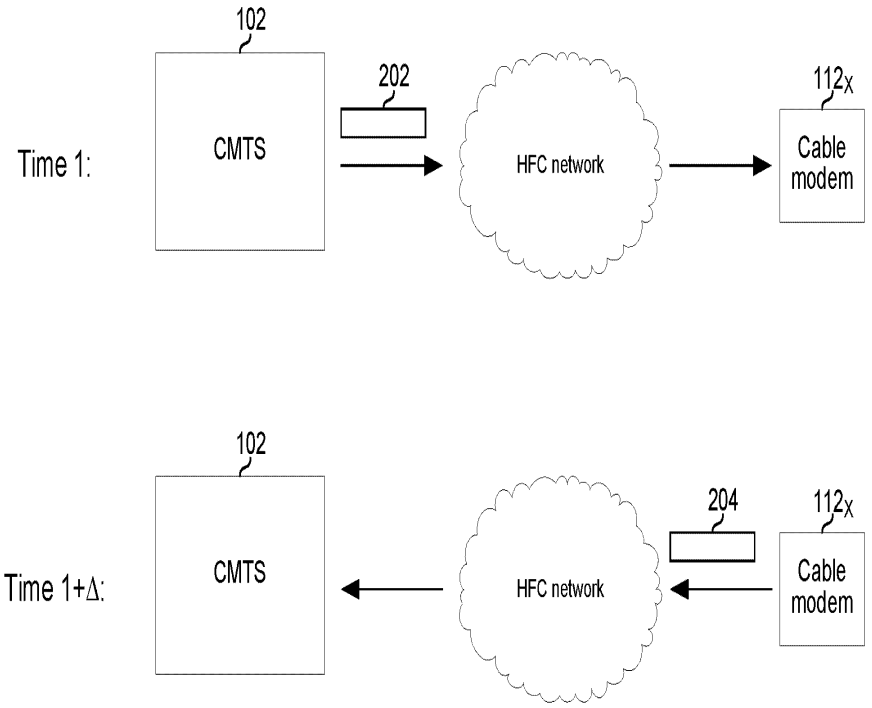
Time 1:
102
CMTS
202
HFC network
112x
Cable modem
Time 1+Δ:
102
CMTS
HFC network
204
112x
Cable modem

FIG. 2A

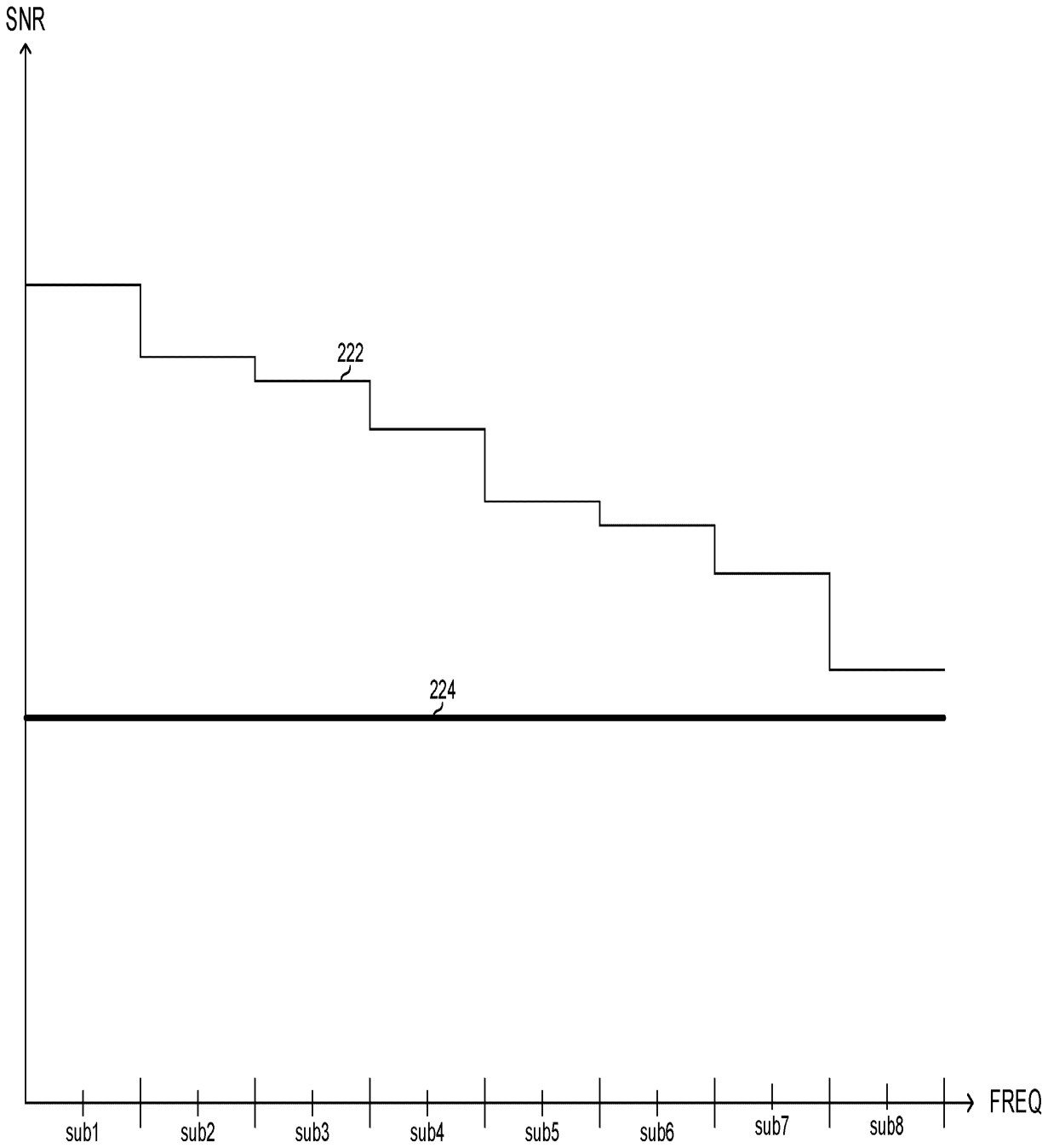


FIG. 2B

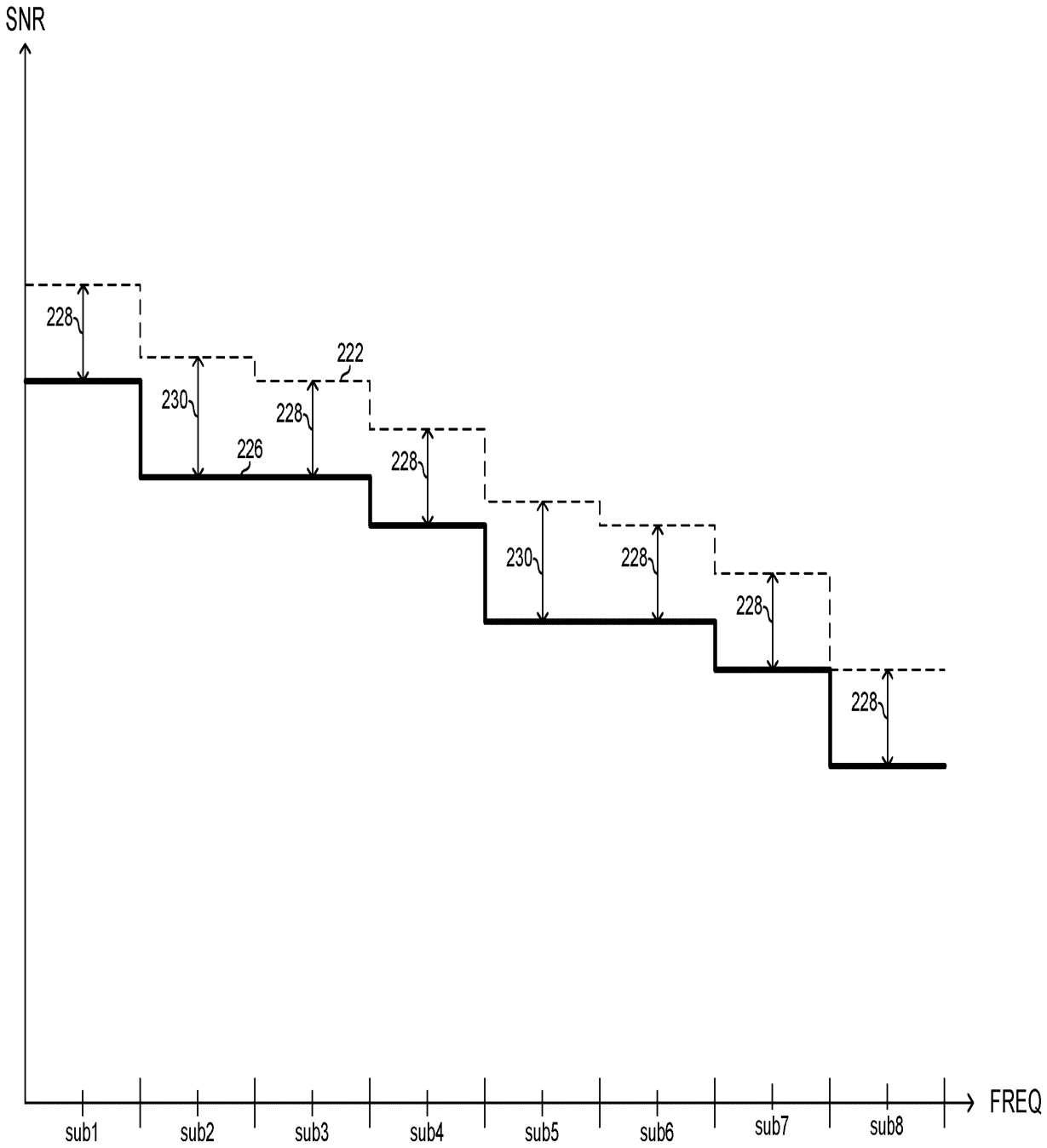
SNR
228
230
226
222
228
228
230
228
228
228
FREQ
sub1
sub2
sub3
sub4
sub5
sub6
sub7
sub8

FIG. 2C

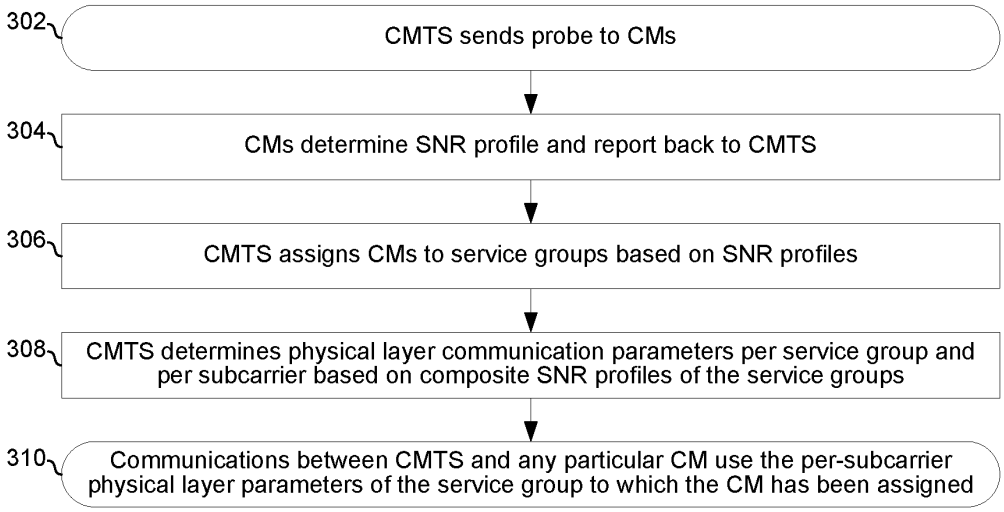
302
CMTS sends probe to CMs
304
CMs determine SNR profile and report back to CMTS
306
CMTS assigns CMs to service groups based on SNR profiles
308
CMTS determines physical layer communication parameters per service group and per subcarrier based on composite SNR profiles of the service groups
310
Communications 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

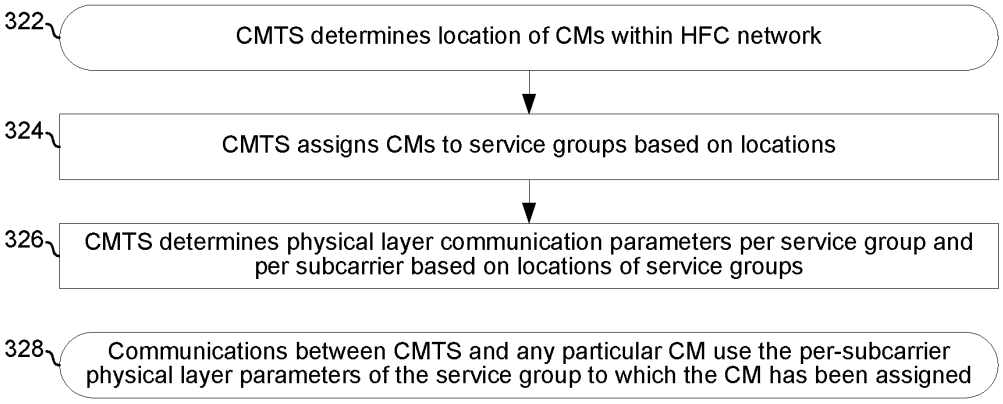
322
CMTS determines location of CMs within HFC network
324
CMTS assigns CMs to service groups based on locations
326
CMTS determines physical layer communication parameters per service group and per subcarrier based on locations of service groups
328
Communications between CMTS and any particular CM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

FIG. 3B

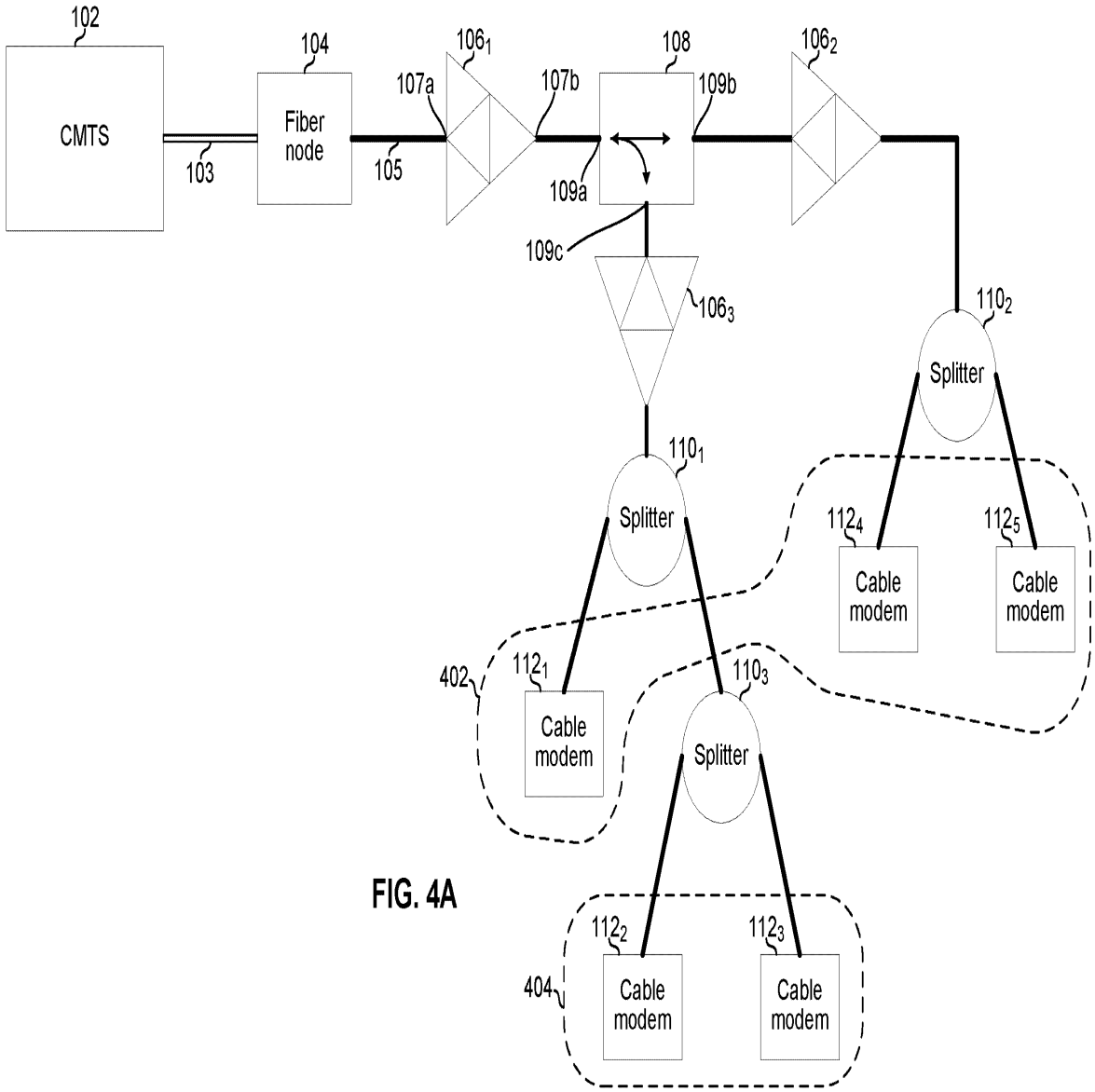
102
CMTS
103
104
Fiber node
105
107a
$106_1$
107b
108
109a
109b
$106_2$
109c
$106_3$
$110_2$
Splitter
$110_1$
Splitter
$112_4$
Cable modem
$112_5$
Cable modem
402
$112_1$
Cable modem
$110_3$
Splitter
$112_2$
Cable modem
$112_3$
Cable modem
404

FIG. 4A

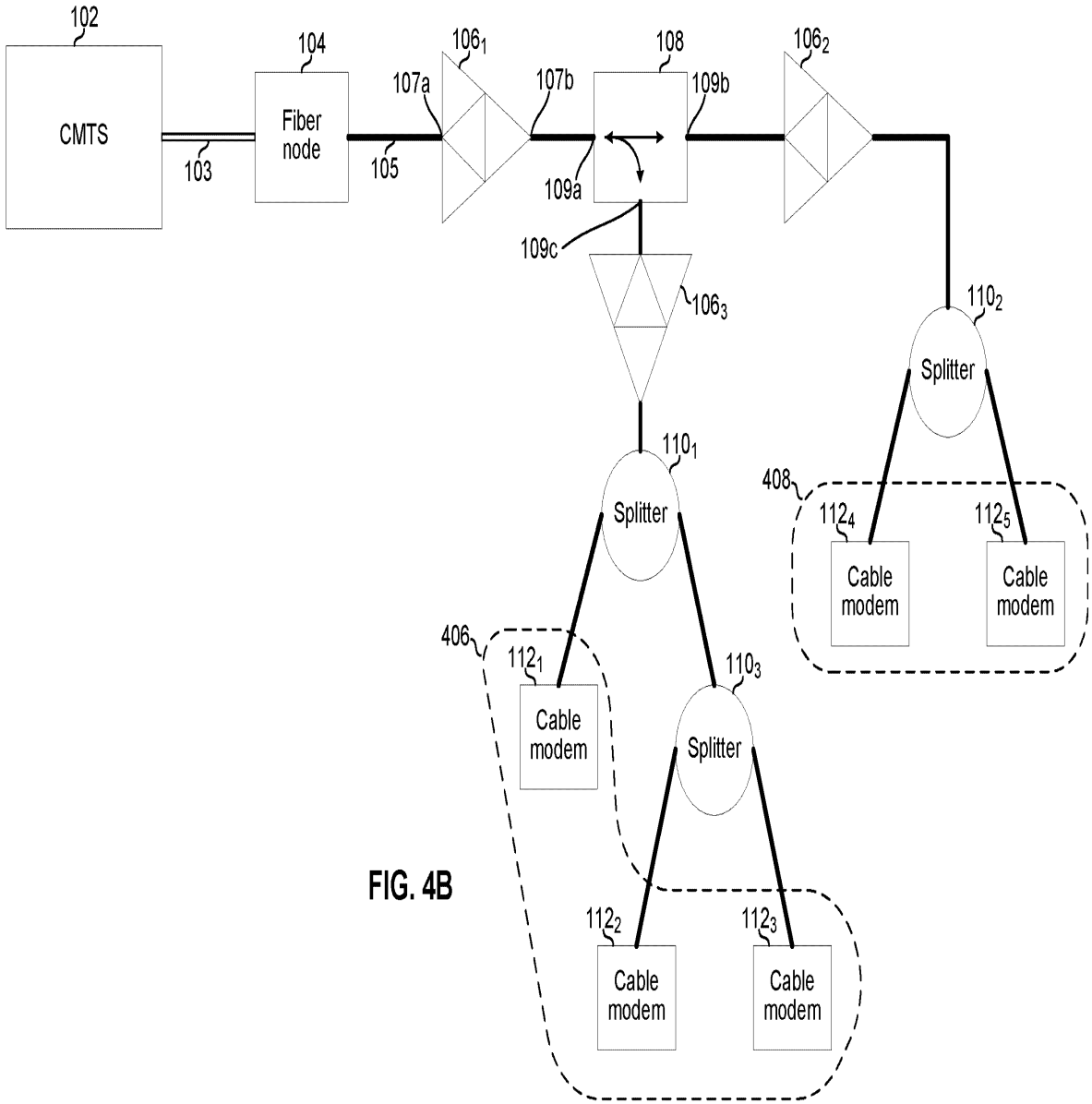
102
CMTS
103
104
Fiber node
105
107a
$106_1$
107b
108
109a
109b
$106_2$
109c
$106_3$
$110_1$
Splitter
$110_2$
Splitter
$110_3$
Splitter
406
$112_1$
Cable modem
$112_2$
Cable modem
$112_3$
Cable modem
408
$112_4$
Cable modem
$112_5$
Cable modem

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:** | 25052US05 |

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:** | 31448992 |
| **Application Number:** | 15866106 |
| **International Application Number:** | |
| **Confirmation Number:** | 8423 |
| **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:** | 25052US05 |
| **Receipt Date:** | 09-JAN-2018 |
| **Filing Date:** | |
| **Time Stamp:** | 17:10:29 |
| **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 | 011018INTEFSW17112300 |
| Deposit Account | 130017 |
| Authorized User | Erick Michel |
| The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:<br>37 CFR 1.16 (National application filing, search, and examination fees)<br>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 | 25052US05_ADS.pdf | 1793908<br>7ca451bed559a758838c902f6bfb8ea68ef9bf6e | no | 9 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Power of Attorney | Maxlinear_PostAIA_POA.pdf | 57159<br>c411665911520d2fc043d90fdc2ec2c276011499 | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 3 | Oath or Declaration filed | 25052US02_Declaration_Ling.pdf | 56354<br>929c327a45ffb292621f7625ce501a564778d051 | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 4 | Oath or Declaration filed | 25052US02_Declaration_TimG.pdf | 62995<br>72668deb69270eaef177727299651ec7bb21607e | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 5 | Oath or Declaration filed | 25052US02_DeclarationSR.pdf | 63245<br>6c0df4f1d111e089699699e7ecf4765d4f1c13a7 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 6 | | 25052US05_Spec_as_filed.pdf | 100325<br>7a0f10a2deca9fd987ef7c8efd72c26e2291cd1c | yes | 23 |
| | **Multipart Description/PDF files in .zip description** | | | | |
| | **Document Description** | | **Start** | **End** | |

| | | | | | |
|---|---|---|---|---|---|
| | Specification | | 1 | 16 | |
| | Claims | | 17 | 22 | |
| | Abstract | | 23 | 23 | |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 7 | Drawings-only black and white line drawings | 25052US04_Figs_as_filed.pdf | 70184<br>9501e732dcaaa8507419fcead9ae7b9fa2e3318b | no | 7 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 8 | Fee Worksheet (SB06) | fee-info.pdf | 35306<br>2a6ae6a9948ff5cdaf5483c35edb84815cb3ba00 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 2239476 | | |

**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.**

**<u>New Applications Under 35 U.S.C. 111</u>**
**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.**

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | 25052US05 |
|---|---|---|
| | 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

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | 25052US05 |
|---|---|---|
| | 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** | 25052US05 | **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.

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 | 25052US05 |
|---|---|---|
| | 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 | 15434673 | 2017-02-16 | | |
| Prior Application Status | Patented | | | | Remove |
| Application Number | Continuity Type | Prior Application Number | Filing Date (YYYY-MM-DD) | Patent Number | Issue Date (YYYY-MM-DD) |
| 15434673 | Continuation of | 15228703 | 2016-08-04 | 9577886 | 2017-02-21 |
| 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:

| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | 25052US05 |
|---|---|---|
| | 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 | 25052US05 |
|---|---|---|
| | 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 | 25052US05 |
|---|---|---|
| | 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.

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 | 25052US05 |
|---|---|---|
| | 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) | 2018-01-09 |
|---|---|---|---|---|---|
| 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 | 25052US05 |
|---|---|---|
| | 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 |
|---|---|---|---|---|---|---|
| 15/866,106 | 01/09/2018 | 2414 | 1600 | 25052US05 | 18 | 2 |

**CONFIRMATION NO. 8423**

**FILING RECEIPT**

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

OC000000097078428

Date Mailed: 02/01/2018

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 15/434,673 02/16/2017 PAT 9866438
which 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:** 01/31/2018

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/866,106**

**Projected Publication Date:** 05/10/2018

**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<br>Substitute for Form PTO-875 | Application or Docket Number<br>15/866,106 |
|---|---|

## 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 | 300 |
| SEARCH FEE (37 CFR 1.16(k), (i), or (m)) | N/A | N/A | N/A | | | N/A | 660 |
| EXAMINATION FEE (37 CFR 1.16(o), (p), or (q)) | N/A | N/A | N/A | | | N/A | 760 |
| TOTAL CLAIMS (37 CFR 1.16(i)) | 18 minus 20 = | * | | | OR | x 100 = | 0.00 |
| INDEPENDENT CLAIMS (37 CFR 1.16(h)) | 2 minus 3 = | * | | | | x 460 = | 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 | 1720 |

## 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($) | ADDITIONAL FEE($) | | 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".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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

Feb 01, 2018 03:52:54 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. |
|---|---|---|---|
| 15866106 | APP.FILE.REC | 02/01/2018 | 25052US05 |

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

**EAST Search History**

**EAST Search History (Prior Art)**

/D.B.H/ /D.B.H/ /D.B.H/

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| S19 | 2327 | (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 | 2018/03/28 16:53 |
| S20 | 80747 | ( (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 | 2018/03/28 16:53 |
| S21 | 62 | S19 and S20 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/28 16:53 |
| S22 | 54 | S19 and cable near modem | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/28 16:55 |
| S23 | 59 | (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 | 2018/03/28 16:56 |
| S24 | 544 | (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 (S21 S22 S23) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/28 16:56 |
| S25 | 109 | S24 and S20 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/28 16:56 |
| S26 | 435 | S24 not S25 | US-PGPUB; | OR | ON | 2018/03/28 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | | | 16:58 |
| S27 | 16 | S26 and (classif$5 group$5 classificat$3 categor$3 categorizat$3) near5 (CM cable near modem) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/28 16:58 |
| S28 | 109 | (US-15434673-$ \| 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 | 2018/03/28 16:59 |
| S29 | 3 | "9866438".pn. | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/28 17:43 |

**3/29/2018 8:15:01 AM**
**C:\Users\dhuynh3\Documents\EAST\Workspaces\15866106.wsp**

**EAST Search History**

**EAST Search History (Prior Art)** /D.B.H/ /D.B.H/ /D.B.H/

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L1 | 1 | "15866106" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/29 08:18 |
| L2 | 3 | "9866438".pn. | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/29 08:19 |
| L3 | 80785 | ( (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 | 2018/03/29 08:19 |
| L4 | 2740 | cable near modem and (physical phy) near2 (parameter criteria profile modulation power energy fec) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/29 08:27 |
| L5 | 464 | 3 and 4 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/29 08:27 |
| L6 | 708 | cable near modem and (select$3 elect$3 find$3 determin$3 identif$3) near10 (physical phy) near2 (parameter criteria profile modulation power energy fec) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/29 08:30 |
| L7 | 90 | 6 and 3 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/29 08:32 |
| L8 | 10090066 | (@rlad<"20120723" @ad<"20120723") | US-PGPUB; USPAT | OR | ON | 2018/03/29 08:41 |
| L9 | 64 | 7 and 8 | US-PGPUB; USPAT | OR | ON | 2018/03/29 08:41 |
| L10 | 491 | cable near modem and (select$3 elect$3 find$3 determin$3 identif$3) near10 (physical phy) near2 (parameter criteria profile | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; | OR | ON | 2018/03/29 08:55 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | modulation power energy fec) and 8 not 9 | DERWENT; IBM_TDB | | | |

**3/ 29/ 2018 9:12:25 AM**
**C:\ Users\ dhuynh3\ Documents\ EAST\ Workspaces\ 15866106.wsp**

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. |
|---|---|---|---|---|
| 15/866,106 | 01/09/2018 | Curtis Ling | 25052US05 | 8423 |

23446 7590 04/03/2018
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, ILLINOIS 60661
UNITED STATES OF AMERICA

| EXAMINER |
|---|
| HUYNH, DUNG B. |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2469 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 04/03/2018 | 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):

mhmpto@mcandrews-ip.com

PTOL-90A (Rev. 04/07)

| Office Action Summary | Application No. 15/866,106 | Applicant(s) Ling et al. | |
|---|---|---|---|
| | Examiner DUNG B HUYNH | Art Unit 2469 | AIA 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 01/09/2018.

☐ 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 01/09/2018 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

### *Notice of Pre-AIA or AIA Status*

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**.

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 US Patent No. 9,577,886 B2 |
|---|---|
| **Limitation 1 :** A method comprising: determining, by a cable modem termination system (CMTS), for each cable modem served by said CMTS, a corresponding signal-to-noise ratio (SNR) related metric; | **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, each cable modem among a plurality of service groups based on a respective corresponding SNR-related metric; | **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 at least in part on a worst-case SNR profile of said 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, one or more physical layer communication parameter 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 |
| **Limitation 5 :** communicating, by said CMTS, with one or more cable modems corresponding to said one of said plurality of service groups using said selected one or more physical layer communication parameter. | **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,* |

| Claim 1 of Instant application | Claim 1 of US Patent No. 9,577,886 B2 |
|---|---|
| **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 limitations 1, 2 and 5 of Ling Patent's claim 1 and entire limitation 6 of Ling Patent's claim 1.

| Instant application | US Patent No. 9,577,886 B2 |
|---|---|
| **Claim 2:** The method of claim 1, wherein said one or more physical layer communication parameter includes 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 one or more physical layer communication parameter 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 one or more physical layer communication parameter includes 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 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. |

| Instant application | US Patent No. 9,577,886 B2 |
|---|---|
| **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 particular cable modem has a particular SNR versus frequency profile; and said assigning said each cable modem among said plurality of service groups comprises, for the particular cable modem: assigning said particular 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 particular 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 cable modems among said plurality of service groups based on respective distances between said CMTS and said 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 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 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. |
| **Claim 9:** The method of claim 1, wherein said determining said plurality of SNR-related metrics comprises: transmitting a probe message to each | **Claim 9:** The method of claim 1, wherein said determining said plurality of SNR-related metrics comprises: transmitting a probe message to each |

| Instant application | US Patent No. 9,577,886 B2 |
|---|---|
| cable modem, 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 cable modem. | 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 US Patent No. 9,577,886 B2 |
|---|---|
| **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 each cable modem served by said CMTS, a corresponding signal-to-noise ratio (SNR) related metric; | **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 each of said cable modems among a plurality of service groups based on a respective corresponding SNR-related metric; | **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 said plurality of service groups, a composite SNR-related metric based at least in part on a worst-case SNR profile of said SNR-related metrics corresponding to said one of said plurality of service groups; | **Limitation 4 :** 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; |
| **Limitation 5 :** said processor is configured to select one or more physical layer communication parameter to be used for | **Limitation 5 :** said processor is configured to select physical layer communication parameters to be used for communicating with said one of said |

| Claim 10 of Instant application | Claim 10 of US Patent No. 9,577,886 B2 |
|---|---|
| communicating with said one of said plurality of service groups based on said composite SNR-related metric; and | plurality of service groups based on said composite SNR-related metric; and |
| **Limitation 6 :** said network interface is configured to communicate with one or more cable modems corresponding to said one of said plurality of service groups using the one or more selected physical layer communication parameter. | **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 limitations 2, 3 and 6 of Ling Patent's claim 10 and entire limitation 7 of Ling Patent's claim 10.

| Instant application | US Patent No. 9,577,886 B2 |
|---|---|
| **Claim 11:** The system of claim 10, wherein said one or more physical layer communication parameter includes one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate. | **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, forward error correction (FEC) type, and FEC code rate. |
| **Claim 12:** The system of claim 10, wherein said network interface and said 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 | **Claim 13:** The system of claim 12, wherein said network interface is |

| Instant application | US Patent No. 9,577,886 B2 |
|---|---|
| configured such that at least one of said one or more physical layer communication parameters are configurable on a per-OFDM-subcarrier basis. | 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 one or more physical layer communication parameter includes 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 particular cable modem has a particular SNR versus frequency profile; said assignment of said each cable modem among said plurality of service groups comprises, for the particular cable modem: assignment of said particular 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 particular 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 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. |
| **Claim 16:** The system of claim 10, wherein said processor is configured to assign said cable modems among said plurality of service groups based on | **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 |

| Instant application | US Patent No. 9,577,886 B2 |
|---|---|
| respective distances between said CMTS and said cable modems. | 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 each of said cable modems among said plurality of service groups based on one or more branch amplifier that serves said each of said 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 cable modem, 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 cable modem. | **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 each cable modem served by said CMTS, a corresponding signal-to-noise ratio (SNR) related metric; | **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, each cable modem among a plurality of service groups based on a respective corresponding SNR-related metric; | **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 at least in part on a worst-case SNR profile of said 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, one or more physical layer communication parameter 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 |
| **Limitation 5 :** communicating, by said CMTS, with one or more cable modems corresponding to said one of said plurality of service groups using said selected one or more physical layer communication parameter. | **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 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 1 of the instant application merely broadens the scope of the claim 1 of the Ling Patent'858 by eliminating the italicized and underlined portion of limitations 2 and 5 of the Ling Patent'858's claim 1 and 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 one or more physical layer communication parameter includes 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 one or more physical layer communication parameter 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 one or more physical layer communication parameter includes 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 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. |
| **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 | **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 |

| Instant application | Ling Patent'858 |
|---|---|
| particular cable modem has a particular SNR versus frequency profile; and said assigning said each cable modem among said plurality of service groups comprises, for the particular cable modem: assigning said particular 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 particular 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. | 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 cable modems among said plurality of service groups based on respective distances between said CMTS and said 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 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 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. |
| **Claim 9:** The method of claim 1, wherein said determining said plurality of SNR-related metrics comprises: transmitting a probe message to each cable modem, 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 cable modem. | **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 each cable modem served by said CMTS, a corresponding signal-to-noise ratio (SNR) related metric; | **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 each of said cable modems among a plurality of service groups based on a respective corresponding SNR-related metric; | **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 said plurality of service groups, a composite SNR-related metric based at least in part on a worst-case SNR profile of said SNR-related metrics corresponding to said one of said plurality of service groups; | **Limitation 4 :** 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; |
| **Limitation 5 :** said processor is configured to select one or more physical layer communication parameter 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 one or more cable modems corresponding to said one of said plurality of service groups using the one or more selected physical layer communication parameter. | **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* |

| Claim 10 of Instant application | Claim 10 of Ling Patent'858 |
|---|---|
| **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 eliminating the italicized and underlined portion of limitations 2, 3 and 6 of Ling Patent'858's claim 10 and 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 one or more physical layer communication parameter includes one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate. | **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, forward error correction (FEC) type, and FEC code rate. |
| **Claim 12:** The system of claim 10, wherein said network interface and said 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 at least one of said one or more 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 one or more physical layer communication parameter | **Claim 14:** The system of claim 12, wherein said physical layer communication parameters include one |

| Instant application | Ling Patent'858 |
|---|---|
| includes 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. | 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 particular cable modem has a particular SNR versus frequency profile; said assignment of said each cable modem among said plurality of service groups comprises, for the particular cable modem: assignment of said particular 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 particular 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 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. |
| **Claim 16:** The system of claim 10, wherein said processor is configured to assign said cable modems among said plurality of service groups based on respective distances between said CMTS and said 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 each of said cable modems among said plurality of service groups based on one or more branch amplifier | **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 |

| Instant application | Ling Patent'858 |
|---|---|
| that serves said each of said cable modems. | 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 cable modem, 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 cable modem. | **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.

6. **Claims 1-18 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-18 of U.S. Patent No. 9,866,438 B2 to Ling et al.** *(hereafter refers as Ling Patent'438)*. 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'438 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'438 |
|---|---|
| **Limitation 1 :** A method comprising: determining, by a cable modem termination system (CMTS), for each | **Limitation 1 :** A method comprising: determining, by a cable modem termination system (CMTS), for *a plurality* |

| Claim 1 of Instant application | Claim 1 of Ling Patent'438 |
|---|---|
| cable modem served by said CMTS, a corresponding signal-to-noise ratio (SNR) related metric; | *of cable modems* served by said CMTS, a corresponding plurality of signal-to-noise ratio (SNR) related metrics; |
| **Limitation 2 :** assigning, by said CMTS, each cable modem among a plurality of service groups based on a respective corresponding SNR-related metric; | **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 at least in part on a worst-case SNR profile of said 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 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; |
| **Limitation 4 :** selecting, by said CMTS, one or more physical layer communication parameter 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 |
| **Limitation 5 :** communicating, by said CMTS, with one or more cable modems corresponding to said one of said plurality of service groups using said selected one or more physical layer communication parameter. | **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.* |

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'438 by eliminating the italicized and underlined portion of limitations 1, 2, 4 and 5 of Ling Patent'438's claim 1.

| Instant application | Ling Patent'438 |
|---|---|
| **Claim 10:** The method of claim 1, wherein said one or more physical layer communication parameter includes one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation | **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, |

| Instant application | Ling Patent'438 |
|---|---|
| order, forward error correction (FEC) type, and FEC code rate. | forward error correction (FEC) type, and FEC code rate. |
| **Claim 11:** 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 12:** The method of claim 3, comprising selecting, by said CMTS, said one or more physical layer communication parameter 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 13:** The method of claim 4, wherein said one or more physical layer communication parameter includes 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 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. |
| **Claim 14:** 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 particular cable modem has a particular SNR versus frequency profile; and said assigning said each cable modem among said plurality of service groups comprises, for the particular cable modem: assigning said particular 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 particular cable modem to said second service group if said particular SNR versus frequency profile is more similar to said second | **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 |

| Instant application | Ling Patent'438 |
|---|---|
| composite SNR versus frequency profile than to said first composite SNR versus frequency profile. | frequency profile than to said first composite SNR versus frequency profile. |
| **Claim 15:** The method of claim 1, comprising assigning said cable modems among said plurality of service groups based on respective distances between said CMTS and said 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 16:** The method of claim 1, comprising assigning any particular one of said 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 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. |
| **Claim 17:** The method of claim 1, wherein said determining said plurality of SNR-related metrics comprises: transmitting a probe message to each cable modem, 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 cable modem. | **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'438.

| Claim 10 of Instant application | Claim 10 of Ling Patent'438 |
|---|---|
| **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 each cable modem served by said CMTS, a | **Limitation 2 :** said processor is configured to determine, *for a plurality of cable modems* served by said |

| Claim 10 of Instant application | Claim 10 of Ling Patent'438 |
|---|---|
| corresponding signal-to-noise ratio (SNR) related metric; | CMTS, a corresponding plurality of signal-to-noise ratio (SNR) related metrics; |
| **Limitation 3 :** said processor is configured to assign each of said cable modems among a plurality of service groups based on a respective corresponding SNR-related metric; | **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 said plurality of service groups, a composite SNR-related metric based at least in part on a worst-case SNR profile of said SNR-related metrics corresponding to said one of said plurality of service groups; | **Limitation 4 :** said processor is configured to generate, for each one of said plurality of service groups, a composite SNR-related metric based at least in part on a worst-case SNR 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 one or more physical layer communication parameter 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 one or more cable modems corresponding to said one of said plurality of service groups using the one or more selected physical layer communication parameter. | **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.* |

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 limitations 2, 3, 5 and 6 of Ling Patent'438's claim 10.

| Instant application | Ling Patent'438 |
|---|---|
| **Claim 11:** The system of claim 10, wherein said one or more physical layer communication parameter | **Claim 11:** The system of claim 10, wherein said physical layer communication parameters include one |

| Instant application | Ling Patent'438 |
|---|---|
| includes one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate. | or more of: transmit power, receive sensitivity, timeslot duration, 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 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 at least one of said one or more 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 one or more physical layer communication parameter includes 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 particular cable modem has a particular SNR versus frequency profile; said assignment of said each cable modem among said plurality of service groups comprises, for the particular cable modem: assignment of said particular cable modem to said first service group if said particular SNR versus frequency profile is more similar to said first | **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 |

| Instant application | Ling Patent'438 |
|---|---|
| composite SNR versus frequency profile than to said second composite SNR versus frequency profile; and assignment of said particular 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. | 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. |
| **Claim 16:** The system of claim 10, wherein said processor is configured to assign said cable modems among said plurality of service groups based on respective distances between said CMTS and said 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 each of said cable modems among said plurality of service groups based on one or more branch amplifier that serves said each of said 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 cable modem, 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 cable modem. | **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'438.

**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.**

***Allowable Subject Matter***

7. **Claims 1-18 would be allowable** if overcome the rejections **on the ground of nonstatutory double patenting** set forth in this Office action.

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

**Claims 1-18** are allowed over the prior arts, since the prior arts taken individually or in combination fail to particular disclose, fairly suggest, or render obvious the following under limitation:

**In claims 1 and 10,** "...*a composite SNR-related metric based* <u>*at least in part on a worst-case SNR profile of said SNR-related metrics*</u> *corresponding to said one of said plurality of service groups*…." in combination with other limitations recited in the claims.

Noted that the **first closes prior art US Patent 8,743,933 B2** to Prodan et al. *(hereafter refers as 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).*

Thus, Prodan teaches a conventional technique of selecting physical layer communication parameters to each of the plural of cable modems based on SNR profile(s). However, Prodan does not teach a composite SNR-related metric based "**at least in part on a worst-case SNR profile of said SNR-related metrics corresponding to said one of said plurality of service groups**". Therefore, Prodan does not teach the underlined limitation above when such limitation is incorporated with other limitations of the independent claims.

Noted that the **second closest prior art US 2009/0219856 A1 to Richardson et al.** *(hereafter refers as 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, thus the average SNR value of a group is based on a plurality of SNR values for each of the terminals in the group).*

However, Richardson does not teach that the composite SNR related metric based "**at least in part on a worst-case SNR profile of said SNR-related metrics corresponding to said one of said plurality of service groups**". Therefore, Richardson does not teach the underlined limitation above when such limitation is incorporated with other limitations of the independent claims.

In view of the foregoing, **Prodan and Richardson**, when taken individually or in combination fail to particular disclose, fairly suggest, or render obvious the underlined limitations when such limitation is incorporated with other limitations of the base claims. Hence, **Claims 1-18 are allowable over the prior arts.**

***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 9:00 AM - 6:00 PM.

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
March 29, 2018

| Search Notes | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 15/866,106 | Ling et al. |
| | **Examiner** | **Art Unit** |
| | DUNG B HUYNH | 2469 |

| CPC - Searched* | | |
|---|---|---|
| **Symbol** | **Date** | **Examiner** |
| h04l12/2801 | 03/28/2018 | DBH |
| h04l1/0009,0026 | 03/28/2018 | |
| h04l27/2601 | 03/28/2018 | DBH |
| h04l41/0823 | 03/28/2018 | DBH |
| h04l43/08,12 | 03/28/2018 | 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** |
| Assignee and Inventor search in PALM | 03/29/2018 | DBH |

| Interference Search | | | |
|---|---|---|---|
| **US Class/CPC Symbol** | **US Subclass/CPC Group** | **Date** | **Examiner** |
| | | | |

# Bibliographic Data

Application No: 15866106

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No | ☐ Met After Allowance

Verified and Acknowledged: /DUNG B HUYNH/ | Examiner's Signature | Initials

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

---

| FILING or 371(c) DATE | CLASS | GROUP ART UNIT | ATTORNEY DOCKET NO. |
|---|---|---|---|
| 01/09/2018 | 370 | 2469 | 25052US05 |
| **RULE** | | | |

**APPLICANTS**

Maxlinear, Inc., Carlsbad, CA,

**INVENTORS**

Curtis Ling, Carlsbad, CA, UNITED STATES

Sridhar Ramesh, Carlsbad, CA, UNITED STATES

Timothy Gallagher, Carlsbad, CA, UNITED STATES

**CONTINUING DATA**

This application is a CON of 15434673 02/16/2017 PAT 9866438

15434673 is a CON of 15228703 08/04/2016 PAT 9577886

15228703 is a CON of 13948444 07/23/2013 PAT 9419858

13948444 has PRO of 61674742 07/23/2012

**FOREIGN APPLICATIONS**

**IF REQUIRED, FOREIGN LICENSE GRANTED****

01/31/2018

**STATE OR COUNTRY**

UNITED STATES

**ADDRESS**

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

**FILING FEE RECEIVED**

$1,600

| Notice of References Cited | Application/Control No. 15/866,106 | 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-20040085976-A1 | 05-2004 | Dale, Mark | H04B7/18582 | 370/411 |
| * | B | US-20060067278-A1 | 03-2006 | Li; Xiaodong | H04B1/707 | 370/335 |
| * | C | US-20010055319-A1 | 12-2001 | Quigley, Thomas J. | H04J3/1694 | 370/480 |
| * | D | US-6898755-B1 | 05-2005 | Hou; Victor T. | H04L1/0003 | 370/282 |
| * | E | US-20060126505-A1 | 06-2006 | Denney; Lisa Voigt | H04J3/1694 | 370/229 |
| * | F | US-20100154017-A1 | 06-2010 | An; James S. | H04L12/2801 | 725/111 |
| * | G | US-20130170528-A1 | 07-2013 | Pantelias; Niki | H04L12/2801 | 375/222 |
| * | H | US-9577886-B2 | 02-2017 | Ling; Curtis | H04L1/0026 | 1/1 |
| * | I | US-9419858-B2 | 08-2016 | Ling; Curtis | H04L1/0026 | 1/1 |
| * | J | US-9866438-B2 | 01-2018 | Ling; Curtis | H04L41/0823 | 1/1 |
| * | K | US-8743933-B2 | 06-2014 | Prodan; Richard | H04L5/1446 | 375/219 |
| * | L | US-20090219856-A1 | 09-2009 | Richardson; Thomas | H04W72/044 | 370/328 |
| | M | | | | | |

**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) |
|---|---|---|
| | U | |
| | V | |
| | W | |
| | X | |

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

| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 15/866,106 | Ling et al. |
| | **Examiner** | **Art Unit** |
| | DUNG B HUYNH | 2469 |

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

**CLAIMS**

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

| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 03/29/2018 | | | | | | | | |
| | 1 | ✓ | | | | | | | | |
| | 2 | ✓ | | | | | | | | |
| | 3 | ✓ | | | | | | | | |
| | 4 | ✓ | | | | | | | | |
| | 5 | ✓ | | | | | | | | |
| | 6 | ✓ | | | | | | | | |
| | 7 | ✓ | | | | | | | | |
| | 8 | ✓ | | | | | | | | |
| | 9 | ✓ | | | | | | | | |
| | 10 | ✓ | | | | | | | | |
| | 11 | ✓ | | | | | | | | |
| | 12 | ✓ | | | | | | | | |
| | 13 | ✓ | | | | | | | | |
| | 14 | ✓ | | | | | | | | |
| | 15 | ✓ | | | | | | | | |
| | 16 | ✓ | | | | | | | | |
| | 17 | ✓ | | | | | | | | |
| | 18 | ✓ | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

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

Apr 03, 2018 05:04:49 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. |
|---|---|---|---|
| 15866106 | CTNF | 04/03/2018 | 25052US05 |
| | 892 | 04/03/2018 | 25052US05 |

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

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 |
|---|---|---|---|
| 15/866,106 | 01/09/2018 | Curtis Ling | 25052US05 |

**CONFIRMATION NO. 8423**

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

**PUBLICATION NOTICE**

*OC000000099440605*

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

**Publication No.**US-2018-0131567-A1
**Publication Date:**05/10/2018

## NOTICE OF PUBLICATION OF APPLICATION

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

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

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

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

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

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

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

May 11, 2018 03:27:52 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. |
|---|---|---|---|
| 15866106 | NTC.PUB | 05/10/2018 | 25052US05 |

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

(Attorney Docket No. 25052US05)

| | | |
|---|---|---|
| In the Application of: | ) | |
| | ) | Electronically Filed |
| Curtis Ling | ) | |
| | ) | June 21, 2018 |
| Serial No. 15/866,106 | ) | |
| | ) | |
| For: SERVICE GROUP MANAGEMENT IN A CABLE NETWORK | ) | |
| | ) | |
| Examiner: Dung Huynh | ) | |
| | ) | |
| Group Art Unit: 2469 | ) | |
| | ) | |
| Confirmation No. 8423 | ) | |
| | ) | |
| | ) | |
| | ) | |

**RESPONSE**

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

This paper responds to the non-final Office Action mailed April 3, 2018 ("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.

## AMENDMENTS TO THE CLAIMS

**Listing of the Claims**

1. (Previously presented) A method comprising:

determining, by a cable modem termination system (CMTS), for each cable modem served by said CMTS, a corresponding signal-to-noise ratio (SNR) related metric;

assigning, by said CMTS, each cable modem among a plurality of service groups based on a respective corresponding SNR-related metric;

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

selecting, by said CMTS, one or more physical layer communication parameter 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 one or more cable modems corresponding to said one of said plurality of service groups using said selected one or more physical layer communication parameter.

2. (Previously presented) The method of claim 1, wherein said one or more physical layer communication parameter includes 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 one or more physical layer communication parameter on a per-OFDM-subcarrier basis.

5. (Previously presented) The method of claim 4, wherein said one or more physical layer communication parameter includes 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 particular cable modem has a particular SNR versus frequency profile; and

said assigning said each cable modem among said plurality of service groups comprises, for the particular cable modem:

assigning said particular 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 particular 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 cable modems among said plurality of service groups based on respective distances between said CMTS and said cable modems.

8. (Previously presented) The method of claim 1, comprising assigning any particular one of said 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 cable modem, 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 cable modem.

10. (Previously presented) 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 each cable modem served by said CMTS, a corresponding signal-to-noise ratio (SNR) related metric;

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

said processor is configured to generate, 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 SNR-related metrics corresponding to said one of said plurality of service groups;

said processor is configured to select one or more physical layer communication parameter 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 one or more cable modems corresponding to said one of said plurality of service groups using the one or more selected physical layer communication parameter.

11. (Previously presented) The system of claim 10, wherein said one or more physical layer communication parameter includes 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 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 at least one of said one or more physical layer communication parameters are configurable on a per-OFDM-subcarrier basis.

14. (Previously presented) The system of claim 12, wherein said one or more physical layer communication parameter includes 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 particular cable modem has a particular SNR versus frequency profile;

said assignment of said each cable modem among said plurality of service groups comprises, for the particular cable modem:

assignment of said particular 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 particular 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 cable modems among said plurality of service groups based on respective distances between said CMTS and said cable modems.

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

## 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.

## 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, U.S. Patent No. 9,419,858 B2, and Patent No. 9,866,438 B2. The Applicant respectfully traverses the rejections but nevertheless hereby submits Terminal Disclaimers to obviate the rejections. Accordingly, the Applicant requests that the rejections be withdrawn.

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: June 21, 2018

/Erick J. Michel/

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

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

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**( Not for submission under 37 CFR 1.99)**

| | |
|---|---|
| Application Number | 15866106 |
| Filing Date | 2018-01-09 |
| First Named Inventor | Curtis Ling |
| Art Unit | 2469 |
| Examiner Name | HUYNH, DUNG B. |
| Attorney Docket Number | 25052US05 |

**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 | 6898755 | | | Hou, Victor T. | |
| | 2 | 9577886 | | | Ling, Curtis | |
| | 3 | 9419858 | | | Ling, Curtis | |
| | 4 | 9866438 | | | Ling, Curtis | |
| | 5 | 8743933 | | | Prodan, Richard | |
| | 6 | 7761049 | | | Zeng, Dongsong | |
| | 7 | 8488514 | | | Cai, Zhijun | |
| | 8 | 9025954 | | | Fang, Liming | |

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | Application Number | 15866106 |
|---|---|---|
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 9 | 6757522 | | | Naegeli, Charles | |
| | 10 | 6560225 | | | Czajkowski, Igor K. | |
| | 11 | 6898755 | | | Hou, Victor T. | |
| | 12 | 6891858 | | | Mahesh, Harihara | |
| | 13 | 8743933 | | | Prodan, Richard | |
| | 14 | 5563918 | | | Waldschmidt, Richard J. | |
| | 15 | 6275483 | | | Papasakellariou, Aristides | |
| | 16 | 6421327 | | | Lundby, Stein A. | |
| | 17 | 6757522 | | | Naegeli, Charles | |
| | 18 | 6560225 | | | Czajkowski, Igor K. | |
| | 19 | 6898755 | | | Hou, Victor T. | |

EFS Web 2.1.18

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | Application Number | 15866106 |
|---|---|---|
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 20 | 6891858 | | | Mahesh, Harihara | |
| | 21 | 8743933 | | | Prodan, Richard | |
| | 22 | 5563918 | | | Waldschmidt, Richard J. | |
| | 23 | 6275483 | | | Papasakellariou, Aristides | |
| | 24 | 6421327 | | | Lundby, Stein A. | |
| | 25 | 7761049 | | | Zeng, Dongsong | |
| | 26 | 8488514 | | | Cai, Zhijun | |
| | 27 | 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 | 20040085976 | | | Dale, Mark | |

EFS Web 2.1.18

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 2 | 20060067278 | | | Li, Xiaodong | |
| | 3 | 20010055319 | | | Quigley, Thomas J. | |
| | 4 | 20060126505 | | | Denney, Lisa Voigt | |
| | 5 | 20100154017 | | | An, James S. | |
| | 6 | 20130170528 | | | Pantelias, Niki | |
| | 7 | 20090219856 | | | Richardson, Thomas | |
| | 8 | 20110188852 | | | Stodola, Kevin C. | |
| | 9 | 20110306380 | | | Zavadsky, Dean | |
| | 10 | 20130021931 | | | Kim, Tae-Yoon | |
| | 11 | 20130024753 | | | Masuda, Kyoichiro | |
| | 12 | 20140169431 | | | Arambepola, Bernard | |

EFS Web 2.1.18

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | Application Number | 15866106 |
|---|---|---|
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 13 | 20140286203 | | | Jindal, Nihar | |
| | 14 | 20150071161 | | | Salhab, Anas M. A. Ata | |
| | 15 | 20150288498 | | | Kliger, Avi | |
| | 16 | 20030236071 | | | Ito, Osamu | |
| | 17 | 20030223481 | | | Jones, William W. | |
| | 18 | 20040218568 | | | Goodall, David S. | |
| | 19 | 20050122996 | | | Azenkot, Yehuda | |
| | 20 | 20050135253 | | | Cal, Liyu | |
| | 21 | 20050213579 | | | Iyer, Pradeep J. | |
| | 22 | 20070202904 | | | Cheng, Jun | |
| | 23 | 20070253388 | | | Pietraski, Philip J. | |

EFS Web 2.1.18

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 24 | 20090040942 | | | Yang, Daoyan | |
| | 25 | 20090215403 | | | Currivan, Bruce J. | |
| | 26 | 20100002575 | | | Eichinger, Josef Martin | |
| | 27 | 20140301237 | | | Yi, Yunjung | |
| | 28 | 20090219856 | | | Richardson, Thomas | |
| | 29 | 20130114480 | | | Chapman,John T. | |
| | 30 | 20060008020 | | | Blankenship, Yufei W. | |
| | 31 | 20020062486 | | | Park, Min Young | |
| | 32 | 20130266310 | | | Fox, David B. | |
| | 33 | 20090016420 | | | Kwak, Ki Young | |
| | 34 | 20110051607 | | | Begen, Ali C. | |

EFS Web 2.1.18

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 35 | 20030053419 | | | Kanazawa, Toshiyuki | |
| | 36 | 20030177502 | | | Kolze, Thomas J. | |
| | 37 | 20030199283 | | | Busch, Patrick | |
| | 38 | 20050097617 | | | Currivan, Bruce J. | |
| | 39 | 20070098007 | | | Prodan, Richard S. | |
| | 40 | 20100100919 | | | Hsue, Jin-Jen | |
| | 41 | 20130107921 | | | Prodan, Richard | |
| | 42 | 20130227373 | | | Shen, Ba-Zhong | |
| | 43 | 20100172316 | | | Hwang, Sung-Hyun | |
| | 44 | 20120269242 | | | Prodan, Richard | |
| | 45 | 20130100843 | | | Croak, Marian | |

EFS Web 2.1.18

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | Application Number | 15866106 |
|---|---|---|
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 46 | 20130114480 | | | Chapman, John T. | |
| | 47 | 20140133330 | | | Chapman, John T. | |
| | 48 | 20140022926 | | | Ling, Curtis | |
| | 49 | 20020186459 | | | DeGrange, James E. Jr. | |
| | 50 | 20030002450 | | | Jalali, Ahmad | |
| | 51 | 20030043732 | | | Walton, Jay R. | |
| | 52 | 20050185824 | | | Chen, Hai-Wen | |
| | 53 | 20070253388 | | | Pietraski, Philip J. | |
| | 54 | 20040085976 | | | Dale, Mark | |
| | 55 | 20060067278 | | | Li, Xiaodong | |

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

**FOREIGN PATENT DOCUMENTS** Remove

EFS Web 2.1.18

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | Application Number | 15866106 |
|---|---|---|
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

| 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] |
|---|---|---|---|---|---|---|---|---|
| | 1 | | | | | | | |

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

**NON-PATENT LITERATURE DOCUMENTS** Remove

| 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 | | |

If you wish to add additional non-patent literature document citation information please click the Add button Add

**EXAMINER SIGNATURE**

| Examiner Signature | | Date Considered | |
|---|---|---|---|

*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.

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | Application Number | 15866106 |
|---|---|---|
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

**CERTIFICATION STATEMENT**

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

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**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) | 2018-06-21 |
|---|---|---|---|
| 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.**

## 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 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.

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 15866106 |
| **Filing Date:** | 09-Jan-2018 |
| **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:** | 25052US05 |

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($) |
|---|---|---|---|---|
| **Miscellaneous:** | | | | |
| SUBMISSION- INFORMATION DISCLOSURE STMT | 1806 | 1 | 240 | 240 |
| | | **Total in USD ($)** | | **240** |

| Electronic Acknowledgement Receipt | |
|---|---|
| **EFS ID:** | 32962704 |
| **Application Number:** | 15866106 |
| **International Application Number:** | |
| **Confirmation Number:** | 8423 |
| **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:** | 25052US05 |
| **Receipt Date:** | 21-JUN-2018 |
| **Filing Date:** | 09-JAN-2018 |
| **Time Stamp:** | 15:26:35 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | CARD |
| Payment was successfully received in RAM | $240 |
| RAM confirmation Number | 062218INTEFSW15331900 |
| Deposit Account | 130017 |
| Authorized User | Erick Michel |
| The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:<br>37 CFR 1.16 (National application filing, search, and examination fees)<br>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 | | 25052US05_ROA.pdf | 39155<br>7cc4130fc2571a004906844ec844ebe07989799a | yes | 9 |

**Multipart Description/PDF files in .zip description**

| Document Description | Start | End |
|---|---|---|
| Amendment/Req. Reconsideration-After Non-Final Reject | 1 | 1 |
| Amendment Copy Claims/Response to Suggested Claims | 2 | 7 |
| Applicant Arguments/Remarks Made in an Amendment | 8 | 9 |

**Warnings:**

**Information:**

| | | | | | |
|---|---|---|---|---|---|
| 2 | Information Disclosure Statement (IDS) Form (SB08) | 25052US05_IDS.pdf | 1008983<br>f2248f55c2094484d0deb752ea924505b498162b | no | 11 |

**Warnings:**

**Information:**

| | | | | | |
|---|---|---|---|---|---|
| 3 | Fee Worksheet (SB06) | fee-info.pdf | 30698<br>0eeefb64dfd295d6ccb749ba78d257b3e3a219e0 | no | 2 |

**Warnings:**

**Information:**

| | |
|---|---|
| **Total Files Size (in bytes):** | 1078836 |

**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.**

| **Doc Code: DIST.E.FILE**<br>**Document Description: Electronic Terminal Disclaimer - Filed** | PTO/SB/26<br>U.S. Patent and Trademark Office<br>Department of Commerce |
|---|---|

| | |
|---|---|
| Electronic Petition Request | **TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT** |
| Application Number | 15866106 |
| Filing Date | 09-Jan-2018 |
| First Named Inventor | Curtis Ling |
| Attorney Docket Number | 25052US05 |
| Title of Invention | Method And System For Service Group Management In A Cable Network |

☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action

☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

| Owner | Percent Interest |
|---|---|
| Maxlinear, Inc. | 100% |

The owner(s) with percent interest listed above 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 number(s)

9866438

9419858

9577886

as the term of said prior patent is presently shortened by any terminal disclaimer. The owner 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 owner 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.

| | |
|---|---|
| ◉ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.<br><br>○ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application. | |
| Applicant claims the following fee status:<br><br>○ Small Entity<br><br>○ Micro Entity<br><br>◉ Regular Undiscounted<br><br>I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon. | |
| THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES<br><br>I certify, in accordance with 37 CFR 1.4(d)(4) that I am:<br><br>◉ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application<br><br>Registration Number 60928<br><br>○ A sole inventor<br><br>○ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application<br><br>○ A joint inventor; all of whom are signing this request | |
| Signature | /Erick J. Michel/ |
| Name | Erick J Michel |

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 15866106 |
| **Filing Date:** | 09-Jan-2018 |
| **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:** | 25052US05 |

Filed as Large Entity

**Filing Fees for Utility under 35 USC 111(a)**

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| STATUTORY OR TERMINAL DISCLAIMER | 1814 | 1 | 160 | 160 |
| **Pages:** | | | | |
| **Claims:** | | | | |
| **Miscellaneous-Filing:** | | | | |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |
| **Post-Allowance-and-Post-Issuance:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Extension-of-Time:** | | | | |
| **Miscellaneous:** | | | | |
| | | | **Total in USD ($)** | **160** |

Doc Code: DISQ.E.FILE
Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 15866106

Filing Date: 09-Jan-2018

Applicant/Patent under Reexamination: Ling

Electronic Terminal Disclaimer filed on June 21, 2018

☒ APPROVED

**This patent is subject to a terminal disclaimer**

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

| Electronic Acknowledgement Receipt | |
|---|---|
| **EFS ID:** | 32964776 |
| **Application Number:** | 15866106 |
| **International Application Number:** | |
| **Confirmation Number:** | 8423 |
| **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:** | 25052US05 |
| **Receipt Date:** | 21-JUN-2018 |
| **Filing Date:** | 09-JAN-2018 |
| **Time Stamp:** | 15:35:28 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | CARD |
| Payment was successfully received in RAM | $160 |
| RAM confirmation Number | 062218INTEFSW15352600 |
| Deposit Account | 130017 |
| Authorized User | Erick Michel |
| The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:<br>37 CFR 1.16 (National application filing, search, and examination fees)<br>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 | Terminal Disclaimer-Filed (Electronic) | eTerminal-Disclaimer.pdf | 33768<br>92d216eae5f3d690a82979ec86b1fec08307831a | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Fee Worksheet (SB06) | fee-info.pdf | 30736<br>f01f5b7f285c02b27f2411f951306da158f423f3 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 64504 | | |

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

**New Applications Under 35 U.S.C. 111**
**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**
**National Stage of an International Application under 35 U.S.C. 371**
**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**
**New International Application Filed with the USPTO as a Receiving Office**
**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

| **PATENT APPLICATION FEE DETERMINATION RECORD** Substitute for Form PTO-875 | Application or Docket Number 15/866,106 | Filing Date 01/09/2018 | ☐ To be Mailed |
|---|---|---|---|

**ENTITY**: ☒ LARGE ☐ SMALL ☐ MICRO

## APPLICATION AS FILED – PART I

| FOR | (Column 1) NUMBER FILED | (Column 2) NUMBER EXTRA | 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

| 06/21/2018 | (Column 1) CLAIMS REMAINING AFTER AMENDMENT | | (Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR | (Column 3) PRESENT EXTRA | RATE ($) | ADDITIONAL FEE ($) |
|---|---|---|---|---|---|---|
| Total (37 CFR 1.16(i)) | * 18 | Minus | ** 20 | = 0 | X $100 = | 0 |
| Independent (37 CFR 1.16(h)) | * 2 | Minus | ***3 | = 0 | X $460 = | 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

| | (Column 1) CLAIMS REMAINING AFTER AMENDMENT | | (Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR | (Column 3) PRESENT EXTRA | 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".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
VANESSA HODGES

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

UNITED STATES PATENT AND TRADEMARK OFFICE

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

# NOTICE OF ALLOWANCE AND FEE(S) DUE

23446 7590 08/01/2018
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, ILLINOIS 60661
UNITED STATES OF AMERICA

| EXAMINER |
|---|
| HUYNH, DUNG B. |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2469 | |

DATE MAILED: 08/01/2018

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/866,106 | 01/09/2018 | Curtis Ling | 25052US05 | 8423 |

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 | $1000 | $0.00 | $0.00 | $1000 | 11/01/2018 |

**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.**



PTOL-85 (Rev. 02/11)

## 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 08/01/2018
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, ILLINOIS 60661
UNITED STATES OF AMERICA

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. |
|---|---|---|---|---|
| 15/866,106 | 01/09/2018 | Curtis Ling | 25052US05 | 8423 |

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 | $1000 | $0.00 | $0.00 | $1000 | 11/01/2018 |

| 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

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

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.
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.
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. _____

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. |
|---|---|---|---|---|
| 15/866,106 | 01/09/2018 | Curtis Ling | 25052US05 | 8423 |

23446 7590 08/01/2018
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, ILLINOIS 60661
UNITED STATES OF AMERICA

| EXAMINER |
|---|
| HUYNH, DUNG B. |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2469 | |

DATE MAILED: 08/01/2018

**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

**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.

| Notice of Allowability | Application No. 15/866,106 | Applicant(s) Ling et al. | |
|---|---|---|---|
| | Examiner DUNG B HUYNH | Art Unit 2469 | AIA 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 06/21/2018.
   ☐ 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 areply 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

### *Notice of Pre-AIA or AIA Status*

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

### *Terminal Disclaimer*

2. The terminal disclaimer filed on 06/21/2018 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of **US Patent 9,866,438, US Patent 9,419,858 and US Patent 9,577,886** has been reviewed and is accepted. The terminal disclaimer has been recorded.

### *Response to Arguments*

3. Applicant's arguments, see Remarks, filed on 06/21/2018, with respect to the nonstatutory double patenting rejections of claims 1-18 have been fully considered and are persuasive in view of the terminal disclaimer filed on 06/21/2018, which has been approved. The nonstatutory double patenting rejections of claims 1-18 have been withdrawn.

### *Allowable Subject Matter*

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

***Conclusion***

5. 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 9:00 AM - 6:00 PM.

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
July 21, 2018

| Issue Classification | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 15/866,106 | 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 |
| H04B | / | 17 | / | 318 | I | 2015-01-15 |
| H04L | / | 27 | / | 2602 | I | 2013-01-01 |
| H04L | / | 12 | / | 2801 | I | 2013-01-01 |
| H04L | / | 27 | / | 2601 | I | 2013-01-01 |
| H04L | / | 43 | / | 08 | I | 2013-01-01 |
| H04L | / | 43 | / | 12 | I | 2013-01-01 |

**CPC Combination Sets**

| Symbol | | | | | Type | Set | Ranking | Version |
|---|---|---|---|---|---|---|---|---|
| | / | | / | | | | | |

| | | | |
|---|---|---|---|
| NONE<br>(Assistant Examiner) | (Date) | **Total Claims Allowed:**<br>18 | |
| /DUNG B HUYNH/<br>Primary Examiner, Art Unit 2469<br>(Primary Examiner) | 21 July 2018<br>(Date) | O.G. Print Claim(s)<br>1 | O.G. Print Figure<br>3A |

U.S. Patent and Trademark Office

Part of Paper No.: 20180721

| Issue Classification | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 15/866,106 | Ling et al. |
| | **Examiner** | **Art Unit** |
| | DUNG B HUYNH | 2469 |

| INTERNATIONAL CLASSIFICATION | | | | |
|---|---|---|---|---|
| CLAIMED | | | | |
| H04L | / | 12 | / | 24 |

| NON-CLAIMED | | | | |
|---|---|---|---|---|
| | / | | / | |

| US ORIGINAL CLASSIFICATION | |
|---|---|
| CLASS | SUBCLASS |
| | |

| CROSS REFERENCES(S) | | | | | | |
|---|---|---|---|---|---|---|
| CLASS | SUBCLASS (ONE SUBCLASS PER BLOCK) | | | | | |
| | | | | | | |

| NONE<br>(Assistant Examiner) | (Date) | Total Claims Allowed:<br>18 | |
|---|---|---|---|
| /DUNG B HUYNH/<br>Primary Examiner, Art Unit 2469<br>(Primary Examiner) | 21 July 2018<br>(Date) | O.G. Print Claim(s)<br>1 | O.G. Print Figure<br>3A |

U.S. Patent and Trademark Office Part of Paper No.: 20180721

| Issue Classification | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 15/866,106 | 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

**CLAIMS**

| Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | | 10 | | | | | | | | | | | | |
| | 2 | | 11 | | | | | | | | | | | | |
| | 3 | | 12 | | | | | | | | | | | | |
| | 4 | | 13 | | | | | | | | | | | | |
| | 5 | | 14 | | | | | | | | | | | | |
| | 6 | | 15 | | | | | | | | | | | | |
| | 7 | | 16 | | | | | | | | | | | | |
| | 8 | | 17 | | | | | | | | | | | | |
| | 9 | | 18 | | | | | | | | | | | | |

| NONE<br>(Assistant Examiner) | (Date) | **Total Claims Allowed:**<br>18 | |
|---|---|---|---|
| /DUNG B HUYNH/<br>Primary Examiner, Art Unit 2469<br>(Primary Examiner) | 21 July 2018<br>(Date) | O.G. Print Claim(s)<br>1 | O.G. Print Figure<br>3A |

U.S. Patent and Trademark Office Part of Paper No.: 20180721

| Search Notes | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 15/866,106 | Ling et al. |
| | **Examiner** | **Art Unit** |
| | DUNG B HUYNH | 2469 |

| CPC - Searched* | | |
|---|---|---|
| **Symbol** | **Date** | **Examiner** |
| h04l12/2801 | 03/28/2018 (updated on 07/21/2018) | DBH |
| h04l1/0009,0026 | 03/28/2018 (updated on 07/21/2018) | |
| h04l27/2601 | 03/28/2018 (updated on 07/21/2018) | DBH |
| h04l41/0823 | 03/28/2018 (updated on 07/21/2018) | DBH |
| h04l43/08,12 | 03/28/2018 (updated on 07/21/2018) | 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** |
| Assignee and Inventor search in PALM | 03/29/2018 | DBH |

| Interference Search | | | |
|---|---|---|---|
| **US Class/CPC Symbol** | **US Subclass/CPC Group** | **Date** | **Examiner** |
| | see Interference search history printout | 07/21/2018 | DBH |

| Search Notes | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 15/866,106 | Ling et al. |
| | **Examiner** | **Art Unit** |
| | DUNG B HUYNH | 2469 |

| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 15/866,106 | Ling et al. |
| | **Examiner** | **Art Unit** |
| | DUNG B HUYNH | 2469 |

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

**CLAIMS**

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

| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 03/29/2018 | 07/21/2018 | | | | | | | |
| | 1 | ✓ | = | | | | | | | |
| | 2 | ✓ | = | | | | | | | |
| | 3 | ✓ | = | | | | | | | |
| | 4 | ✓ | = | | | | | | | |
| | 5 | ✓ | = | | | | | | | |
| | 6 | ✓ | = | | | | | | | |
| | 7 | ✓ | = | | | | | | | |
| | 8 | ✓ | = | | | | | | | |
| | 9 | ✓ | = | | | | | | | |
| | 10 | ✓ | = | | | | | | | |
| | 11 | ✓ | = | | | | | | | |
| | 12 | ✓ | = | | | | | | | |
| | 13 | ✓ | = | | | | | | | |
| | 14 | ✓ | = | | | | | | | |
| | 15 | ✓ | = | | | | | | | |
| | 16 | ✓ | = | | | | | | | |
| | 17 | ✓ | = | | | | | | | |
| | 18 | ✓ | = | | | | | | | |

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

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**( Not for submission under 37 CFR 1.99)**

| | |
|---|---|
| Application Number | 15866106 |
| Filing Date | 2018-01-09 |
| First Named Inventor | Curtis Ling |
| Art Unit | 2469 |
| Examiner Name | HUYNH, DUNG B. |
| Attorney Docket Number | 25052US05 |

**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 | 6898755 | | | Hou, Victor T. | |
| | 2 | 9577886 | | | Ling, Curtis | |
| | 3 | 9419858 | | | Ling, Curtis | |
| | 4 | 9866438 | | | Ling, Curtis | |
| | 5 | 8743933 | | | Prodan, Richard | |
| | 6 | 7761049 | | | Zeng, Dongsong | |
| | 7 | 8488514 | | | Cai, Zhijun | |
| | 8 | 9025954 | | | Fang, Liming | |

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

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 9 | 6757522 | | | Naegeli, Charles | |
| | 10 | 6560225 | | | Czajkowski, Igor K. | |
| | 11 | 6898755 | | | Hou, Victor T. | |
| | 12 | 6891858 | | | Mahesh, Harihara | |
| | 13 | 8743933 | | | Prodan, Richard | |
| | 14 | 5563918 | | | Waldschmidt, Richard J. | |
| | 15 | 6275483 | | | Papasakellariou, Aristides | |
| | 16 | 6421327 | | | Lundby, Stein A. | |
| | 17 | 6757522 | | | Naegeli, Charles | |
| | 18 | 6560225 | | | Czajkowski, Igor K. | |
| | 19 | 6898755 | | | Hou, Victor T. | |



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

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 20 | 6891858 | | | Mahesh, Harihara | |
| | 21 | 8743933 | | | Prodan, Richard | |
| | 22 | 5563918 | | | Waldschmidt, Richard J. | |
| | 23 | 6275483 | | | Papasakellariou, Aristides | |
| | 24 | 6421327 | | | Lundby, Stein A. | |
| | 25 | 7761049 | | | Zeng, Dongsong | |
| | 26 | 8488514 | | | Cai, Zhijun | |
| | 27 | 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 | 20040085976 | | | Dale, Mark | |

EFS Web 2.1.18

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

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 2 | 20060067278 | | | Li, Xiaodong | |
| | 3 | 20010055319 | | | Quigley, Thomas J. | |
| | 4 | 20060126505 | | | Denney, Lisa Voigt | |
| | 5 | 20100154017 | | | An, James S. | |
| | 6 | 20130170528 | | | Pantelias, Niki | |
| | 7 | 20090219856 | | | Richardson, Thomas | |
| | 8 | 20110188852 | | | Stodola, Kevin C. | |
| | 9 | 20110306380 | | | Zavadsky, Dean | |
| | 10 | 20130021931 | | | Kim, Tae-Yoon | |
| | 11 | 20130024753 | | | Masuda, Kyoichiro | |
| | 12 | 20140169431 | | | Arambepola, Bernard | |



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

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 13 | 20140286203 | | | Jindal, Nihar | |
| | 14 | 20150071161 | | | Salhab, Anas M. A. Ata | |
| | 15 | 20150288498 | | | Kliger, Avi | |
| | 16 | 20030236071 | | | Ito, Osamu | |
| | 17 | 20030223481 | | | Jones, William W. | |
| | 18 | 20040218568 | | | Goodall, David S. | |
| | 19 | 20050122996 | | | Azenkot, Yehuda | |
| | 20 | 20050135253 | | | Cal, Liyu | |
| | 21 | 20050213579 | | | Iyer, Pradeep J. | |
| | 22 | 20070202904 | | | Cheng, Jun | |
| | 23 | 20070253388 | | | Pietraski, Philip J. | |

EFS Web 2.1.18

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

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 24 | 20090040942 | | | Yang, Daoyan | |
| | 25 | 20090215403 | | | Currivan, Bruce J. | |
| | 26 | 20100002575 | | | Eichinger, Josef Martin | |
| | 27 | 20140301237 | | | Yi, Yunjung | |
| | 28 | 20090219856 | | | Richardson, Thomas | |
| | 29 | 20130114480 | | | Chapman,John T. | |
| | 30 | 20060008020 | | | Blankenship, Yufei W. | |
| | 31 | 20020062486 | | | Park, Min Young | |
| | 32 | 20130266310 | | | Fox, David B. | |
| | 33 | 20090016420 | | | Kwak, Ki Young | |
| | 34 | 20110051607 | | | Begen, Ali C. | |

EFS Web 2.1.18

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

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 35 | 20030053419 | | | Kanazawa, Toshiyuki | |
| | 36 | 20030177502 | | | Kolze, Thomas J. | |
| | 37 | 20030199283 | | | Busch, Patrick | |
| | 38 | 20050097617 | | | Currivan, Bruce J. | |
| | 39 | 20070098007 | | | Prodan, Richard S. | |
| | 40 | 20100100919 | | | Hsue, Jin-Jen | |
| | 41 | 20130107921 | | | Prodan, Richard | |
| | 42 | 20130227373 | | | Shen, Ba-Zhong | |
| | 43 | 20100172316 | | | Hwang, Sung-Hyun | |
| | 44 | 20120269242 | | | Prodan, Richard | |
| | 45 | 20130100843 | | | Croak, Marian | |

EFS Web 2.1.18

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

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 46 | 20130114480 | | | Chapman, John T. | |
| | 47 | 20140133330 | | | Chapman, John T. | |
| | 48 | 20140022926 | | | Ling, Curtis | |
| | 49 | 20020186459 | | | DeGrange, James E. Jr. | |
| | 50 | 20030002450 | | | Jalali, Ahmad | |
| | 51 | 20030043732 | | | Walton, Jay R. | |
| | 52 | 20050185824 | | | Chen, Hai-Wen | |
| | 53 | 20070253388 | | | Pietraski, Philip J. | |
| | 54 | 20040085976 | | | Dale, Mark | |
| | 55 | 20060067278 | | | Li, Xiaodong | |

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

**FOREIGN PATENT DOCUMENTS** Remove



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

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

| Examiner Initial* | Cite No | Foreign Document Number[3] | Country Code[2] | 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] |
|---|---|---|---|---|---|---|---|---|
| | 1 | | | | | | | |

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

**NON-PATENT LITERATURE DOCUMENTS** Remove

| 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 | | |

If you wish to add additional non-patent literature document citation information please click the Add button Add

**EXAMINER SIGNATURE**

| Examiner Signature | /DUNG B HUYNH/ | Date Considered | 07/21/2018 |
|---|---|---|---|

*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/

**EAST Search History**

**EAST Search History (Interference)** /D.B.H/ /D.B.H/ /D.B.H/

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L23 | 15 | ((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 | 2018/07/21 11:29 |
| L24 | 120 | ((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 | 2018/07/21 11:36 |
| L25 | 35 | ((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 | 2018/07/21 11:36 |
| L26 | 115 | L24 not (L23 and L25) | US-PGPUB; USPAT | OR | ON | 2018/07/21 11:37 |
| L27 | 55 | ((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 | 2018/07/21 11:38 |

**7/21/2018 11:53:17 AM**
**C:\Users\dhuynh3\Documents\EAST\Workspaces\15866106.wsp**

**EAST Search History**

**EAST Search History (Prior Art)** /D.B.H/ /D.B.H/ /D.B.H/

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L1 | 2327 | (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 | 2018/03/28 16:53 |
| L2 | 80747 | ( (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 | 2018/03/28 16:53 |
| L3 | 62 | L1 and L2 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/28 16:53 |
| L4 | 54 | L1 and cable near modem | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/28 16:55 |
| L5 | 59 | (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 | 2018/03/28 16:56 |
| L6 | 544 | (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 (L3 L4 L5) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/28 16:56 |
| L7 | 109 | L6 and L2 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/28 16:56 |
| L8 | 435 | L6 not L7 | US-PGPUB; | OR | ON | 2018/03/28 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | | | 16:58 |
| L9 | 16 | L8 and (classif$5 group$5 classificat$3 categor$3 categorizat$3) near5 (CM cable near modem) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/28 16:58 |
| L10 | 109 | (US-15434673-$ \| 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 | 2018/03/28 16:59 |
| L11 | 3 | "9866438".pn. | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2018/03/28 17:43 |

**3/28/2018 6:19:07 PM**
**C:\Users\dhuynh3\Documents\EAST\Workspaces\15866106.wsp**

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

Aug 01, 2018 03:56:51 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. |
|---|---|---|---|
| 15866106 | NOA | 08/01/2018 | 25052US05 |
| | 1449 | 08/01/2018 | 25052US05 |

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

## 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 08/01/2018
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, ILLINOIS 60661
UNITED STATES OF AMERICA

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.

| | |
|---|---|
| Erick J. Michel | (Depositor's name) |
| /Erick J. Michel/ | (Signature) |
| October 15, 2018 | (Date) |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/866,106 | 01/09/2018 | Curtis Ling | 25052US05 | 8423 |

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 | $1000 | $0.00 | $0.00 | $1000 | 11/01/2018 |

| 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 McAndrews, Held & Malloy
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: Maxlinear, Inc.

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Carlsbad, CA

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 130017 (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

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

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.
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.
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 /Erick J. Michel/ Date October 15, 2018

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

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**Attorney Docket No.: 25052US05**

| | | |
|---|---|---|
| In the Application of: | ) | |
| | ) | |
| Curtis Ling | ) | |
| | ) | |
| Serial No.: 15/866,106 | ) | |
| | ) | |
| Filed: January 9, 2018 | ) | |
| | ) | **Filed electronically on** |
| For: Method And System For Service Group Management In A Cable Network | ) | **October 15, 2018** |
| | ) | |
| Examiner: HUYNH, Dung B. | ) | |
| | ) | |
| Group Art Unit: 2469 | ) | |
| | ) | |
| Confirmation No.: 8423 | ) | |

**COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE**

Mail Stop: Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This paper responds to the Notice of Allowance mailed August 1, 2018 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 August 1, 2018. 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: October 15, 2018

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:** | 15866106 |
| **Filing Date:** | 09-Jan-2018 |
| **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:** | 25052US05 |

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:** | | | | |
| UTILITY APPL ISSUE FEE | 1501 | 1 | 1000 | 1000 |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Extension-of-Time:** | | | | |
| **Miscellaneous:** | | | | |
| | | | **Total in USD ($)** | **1000** |

| Electronic Acknowledgement Receipt | |
|---|---|
| **EFS ID:** | 34006757 |
| **Application Number:** | 15866106 |
| **International Application Number:** | |
| **Confirmation Number:** | 8423 |
| **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:** | 25052US05 |
| **Receipt Date:** | 15-OCT-2018 |
| **Filing Date:** | 09-JAN-2018 |
| **Time Stamp:** | 16:35:00 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | CARD |
| Payment was successfully received in RAM | $1000 |
| RAM confirmation Number | 101618INTEFSW16361800 |
| Deposit Account | 130017 |
| Authorized User | Erick Michel |
| The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:<br>37 CFR 1.16 (National application filing, search, and examination fees)<br>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 | Issue Fee Payment (PTO-85B) | 25052US05_IF2.pdf | 212989<br>4aa5bec9668fca431625aaacdd554d8e1f22fc50 | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Post Allowance Communication - Incoming | 25052US05_CSRFA.pdf | 17816<br>9af341d234a4ca7e8cf19939e641cae1617862ff | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 3 | Fee Worksheet (SB06) | fee-info.pdf | 30629<br>48b0016ff80d127868469ee584cf52e3ce42ad3b | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 261434 | | |

**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.**

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

Change(s) applied to document, /V.D.W./ 8/16/2018

| | | | | | | |
|---|---|---|---|---|---|---|
| | 46 | 20130114480 | | 05/2013 | Chapman, John T. | |
| | 47 | 20140133330 | | 05/2014 | Chapman, John T. | |
| | 48 | 20140022926 | | 01/2014 | Ling, Curtis | |
| | 49 | 20020186459 | | 12/2002 | DeGrange, James E. Jr. | |
| | 50 | 20030002450 | | 01/2003 | Jalali, Ahmad | |
| | 51 | 20030043732 | | 03/2003 | Walton, Jay R. | |
| | 52 | 20050185824 | | 08/2005 | Chen, Hai-Wen | |
| | 53 | 20070253388 | | 11/2007 | Pietraski, Philip J. | |
| | 54 | 20040085976 | | 05/2004 | Dale, Mark | |
| | 55 | 20060067278 | | 03/2006 | Li, Xiaodong | |

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

**FOREIGN PATENT DOCUMENTS** Remove

EFS Web 2.1.18 ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.B.H/

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

Change(s) applied to document, /V.D.W./ 8/16/2018

| | | | | | | |
|---|---|---|---|---|---|---|
| | 35 | 20030053419 | | 03/2003 | Kanazawa, Toshiyuki | |
| | 36 | 20030177502 | | 09/2003 | Kolze, Thomas J. | |
| | 37 | 20030199283 | | 10/2003 | Busch, Patrick | |
| | 38 | 20050097617 | | 05/2005 | Currivan, Bruce J. | |
| | 39 | 20070098007 | | 05/2007 | Prodan, Richard S. | |
| | 40 | 20100100919 | | 04/2010 | Hsue, Jin-Jen | |
| | 41 | 20130107921 | | 05/2013 | Prodan, Richard | |
| | 42 | 20130227373 | | 08/2013 | Shen, Ba-Zhong | |
| | 43 | 20100172316 | | 07/2010 | Hwang, Sung-Hyun | |
| | 44 | 20120269242 | | 10/2012 | Prodan, Richard | |
| | 45 | 20130100843 | | 04/2013 | Croak, Marian | |

EFS Web 2.1.18

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

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

Change(s) applied to document, /V.D.W./ 8/16/2018

| | | | | | | |
|---|---|---|---|---|---|---|
| | 24 | 20090040942 | | 02/2009 | Yang, Daoyan | |
| | 25 | 20090215403 | | 08/2009 | Currivan, Bruce J. | |
| | 26 | 20100002575 | | 01/2010 | Eichinger, Josef Martin | |
| | 27 | 20140301237 | | 10/2014 | Yi, Yunjung | |
| | 28 | 20090219856 | | 09/2009 | Richardson, Thomas | |
| | 29 | 20130114480 | | 05/2013 | Chapman,John T. | |
| | 30 | 20060008020 | | 01/2006 | Blankenship, Yufei W. | |
| | 31 | 20020062486 | | 05/2002 | Park, Min Young | |
| | 32 | 20130266310 | | 10/2013 | Fox, David B. | |
| | 33 | 20090016420 | | 01/2009 | Kwak, Ki Young | |
| | 34 | 20110051607 | | 03/2011 | Begen, Ali C. | |

EFS Web 2.1.18

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

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

Change(s) applied to document, /N.D.W./ 8/16/2018

| | | | | | | |
|---|---|---|---|---|---|---|
| | 13 | 20140286203 | | 09/2014 | Jindal, Nihar | |
| | 14 | 20150071161 | | 03/2015 | Salhab, Anas M. A. Ata | |
| | 15 | 20150288498 | | 10/2015 | Kliger, Avi | |
| | 16 | 20030236071 | | 12/2003 | Ito, Osamu | |
| | 17 | 20030223481 | | 12/2003 | Jones, William W. | |
| | 18 | 20040218568 | | 11/2004 | Goodall, David S. | |
| | 19 | 20050122996 | | 06/2005 | Azenkot, Yehuda | |
| | 20 | 20050135253 | | 06/2005 | Cai et al. ~~Cai, Liyu~~ | |
| | 21 | 20050213579 | | 09/2005 | Iyer, Pradeep J. | |
| | 22 | 20070202904 | | 08/2007 | Cheng, Jun | |
| | 23 | 20070253388 | | 11/2007 | Pietraski, Philip J. | |

EFS Web 2.1.18

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

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

Change(s) applied to document, /N.D.W./ 8/16/2018

| | | | | | | |
|---|---|---|---|---|---|---|
| | 2 | 20060067278 | | 03/2006 | Li, Xiaodong | |
| | 3 | 20010055319 | | 12/2001 | Quigley, Thomas J. | |
| | 4 | 20060126505 | | 06/2006 | Denney, Lisa Voigt | |
| | 5 | 20100154017 | | 06/2010 | An, James S. | |
| | 6 | 20130170528 | | 07/2013 | Pantelias, Niki | |
| | 7 | 20090219856 | | 09/2009 | Richardson, Thomas | |
| | 8 | 20110188852 | | 08/2011 | Stodola, Kevin C. | |
| | 9 | 20110306380 | | 12/2011 | Zavadsky, Dean | |
| | 10 | 20130021931 | | 01/2013 | Kim, Tae-Yoon | |
| | 11 | 20130024753 | | 01/2013 | Masuda, Kyoichiro | |
| | 12 | 20140169431 | | 06/2014 | Arambepola, Bernard | |

EFS Web 2.1.18

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

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

Change(s) applied to document, /V.D.W./ 8/16/2018

| | | | | | | |
|---|---|---|---|---|---|---|
| | 20 | 6891858 | | 05/2005 | Mahesh, Harihara | |
| | 21 | 8743933 | | 06/2014 | Prodan, Richard | |
| | 22 | 5563918 | | 10/1996 | Waldschmidt, Richard J. | |
| | 23 | 6275483 | | 08/2001 | Papasakellariou, Aristides | |
| | 24 | 6421327 | | 07/2002 | Lundby, Stein A. | |
| | 25 | 7761049 | | 07/2010 | Zeng, Dongsong | |
| | 26 | 8488514 | | 07/2013 | Cai, Zhijun | |
| | 27 | 9025954 | | 05/2015 | 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 | 20040085976 | | 05/2004 | Dale, Mark | |

EFS Web 2.1.18

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

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15866106 |
| | Filing Date | 2018-01-09 |
| | First Named Inventor | Curtis Ling |
| | Art Unit | 2469 |
| | Examiner Name | HUYNH, DUNG B. |
| | Attorney Docket Number | 25052US05 |

Change(s) applied to document, /V.D.W./ 8/16/2018

| | | | | | | |
|---|---|---|---|---|---|---|
| | 9 | 6757522 | | 06/2004 | Naegeli, Charles | |
| | 10 | 6560225 | | 05/2003 | Czajkowski, Igor K. | |
| | 11 | 6898755 | | 05/2005 | Hou, Victor T. | |
| | 12 | 6891858 | | 05/2005 | Mahesh, Harihara | |
| | 13 | 8743933 | | 06/2014 | Prodan, Richard | |
| | 14 | 5563918 | | 10/1996 | Waldschmidt, Richard J. | |
| | 15 | 6275483 | | 08/2001 | Papasakellariou, Aristides | |
| | 16 | 6421327 | | 07/2002 | Lundby, Stein A. | |
| | 17 | 6757522 | | 06/2004 | Naegeli, Charles | |
| | 18 | 6560225 | | 05/2003 | Czajkowski, Igor K. | |
| | 19 | 6898755 | | 05/2005 | Hou, Victor T. | |

EFS Web 2.1.18

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

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

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**( Not for submission under 37 CFR 1.99)**

| | |
|---|---|
| Application Number | 15866106 |
| Filing Date | 2018-01-09 |
| First Named Inventor | Curtis Ling |
| Art Unit | 2469 |
| Examiner Name | HUYNH, DUNG B. |
| Attorney Docket Number | 25052US05 |

**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 |
|---|---|---|---|---|---|---|
| Change(s) applied to document, /V.D.W./ 8/16/2018 | 1 | 6898755 | | 05/2005 | Hou, Victor T. | |
| | 2 | 9577886 | | 02/2017 | Ling, Curtis | |
| | 3 | 9419858 | | 08/2016 | Ling, Curtis | |
| | 4 | 9866438 | | 01/2018 | Ling, Curtis | |
| | 5 | 8743933 | | 06/2014 | Prodan, Richard | |
| | 6 | 7761049 | | 07/2010 | Zeng, Dongsong | |
| | 7 | 8488514 | | 07/2013 | Cai, Zhijun | |
| | 8 | 9025954 | | 05/2015 | Fang, Liming | |

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

| APPLICATION NO. | ISSUE DATE | PATENT NO. | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/866,106 | 11/20/2018 | 10135682 | 25052US05 | 8423 |

23446 7590 10/31/2018
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.

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

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

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

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

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 USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

IR103 (Rev. 10/09)

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

Nov 01, 2018 04:57:39 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. |
|---|---|---|---|
| 15866106 | ISSUE.NTF | 10/31/2018 | 25052US05 |

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

PTO/AIA/80 (07-17)
Approved for use through 03/31/2021. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no person is required to respond to a collection of information unless it displays a valid OMB control number

# POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(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:** | 42975705 |
| **Application Number:** | 15866106 |
| **International Application Number:** | |
| **Confirmation Number:** | 8423 |
| **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:** | 25052US05 |
| **Receipt Date:** | 14-JUN-2021 |
| **Filing Date:** | 09-JAN-2018 |
| **Time Stamp:** | 12:37:36 |
| **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 | 25052US05_373c_Statement.pdf | 119992<br>0bae956258f48fb09ef6b79112d7755805c13e97 | no | 3 |

**Warnings:**

| Information: | | | | | |
|---|---|---|---|---|---|
| 2 | Power of Attorney | Entropic-POA_General_Assignee_EntropicCommunications_ALG.pdf | 487892<br>51444e06ae84b241bfc127dc47c5d6c646944dd7 | no | 2 |
| Warnings: | | | | | |
| Information: | | | | | |
| | | | Total Files Size (in bytes): | 607884 | |

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

# STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: ENTROPIC COMMUNICATIONS, LLC

Application No./Patent No.: 15/866,106 Filed/Issue Date: 2018-01-09

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.**

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

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

## STATEMENT UNDER 37 CFR 3.73(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 |

# Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

UNITED STATES PATENT AND TRADEMARK OFFICE

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

| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|---|---|---|---|
| 15/866,106 | 01/09/2018 | Curtis Ling | 25052US05 |

**CONFIRMATION NO. 8423**

**POA ACCEPTANCE LETTER**

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

*OC000000126396612*

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**.

/sstephanos/

**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. |
|---|---|---|---|
| 15866106 | N570 | 06/18/2021 | 25052US05 |

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

AO 120 (Rev. 08/10)

| TO: Mail Stop 8<br>Director of the U.S. Patent and Trademark Office<br>P.O. Box 1450<br>Alexandria, VA 22313-1450 | **REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK** |
|---|---|

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Texas on the following

☐ Trademarks or ☑ Patents. ( ☐ the patent action involves 35 U.S.C. § 292.):

| DOCKET NO. | DATE FILED | U.S. DISTRICT COURT |
|---|---|---|
| 2:22-cv-125 | 4/27/2022 | Eastern District of Texas |

| PLAINTIFF | DEFENDANT |
|---|---|
| ENTROPIC COMMUNICATIONS, LLC | CHARTER COMMUNICATIONS, INC., ET AL |

| | PATENT OR TRADEMARK NO. | DATE OF PATENT OR TRADEMARK | HOLDER OF PATENT OR TRADEMARK |
|---|---|---|---|
| 1 | 8,223,775 | 7/17/2012 | Entropic Communications, LLC |
| 2 | 8,284,690 | 10/9/2012 | Entropic Communications, LLC |
| 3 | 8,792,008 | 7/29/2014 | Entropic Communications, LLC |
| 4 | 9,210,362 | 12/8/2015 | Entropic Communications, LLC |
| 5 | 9,825,826 | 11/21/2017 | Entropic Communications, LLC |

In the above---entitled case, the following patent(s)/ trademark(s) have been included:

| DATE INCLUDED | INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading | |
|---|---|---|
| PATENT OR TRADEMARK NO. | DATE OF PATENT OR TRADEMARK | HOLDER OF PATENT OR TRADEMARK |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |

In the above---entitled case, the following decision has been rendered or judgement issued:

| DECISION/JUDGEMENT |
|---|
| |

| CLERK | (BY) DEPUTY CLERK | DATE |
|---|---|---|
| | | |

**Copy 1---Upon initiation of action, mail this copy to Director Copy 3---Upon termination of action, mail this copy to Director**
**Copy 2---Upon filing document adding patent(s), mail this copy to Director Copy 4---Case file copy**

AO 120 (Rev. 08/10)

| TO: Mail Stop 8<br>Director of the U.S. Patent and Trademark Office<br>P.O. Box 1450<br>Alexandria, VA 22313-1450 | **REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK** |
|---|---|

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Texas on the following

☐ Trademarks or ☑ Patents. ( ☐ the patent action involves 35 U.S.C. § 292.):

| DOCKET NO. | DATE FILED | U.S. DISTRICT COURT |
|---|---|---|
| 2:22-cv-125 | 4/27/2022 | Eastern District of Texas |

| PLAINTIFF | DEFENDANT |
|---|---|
| ENTROPIC COMMUNICATIONS, LLC | CHARTER COMMUNICATIONS, INC., ET AL |

| PATENT OR TRADEMARK NO. | DATE OF PATENT OR TRADEMARK | HOLDER OF PATENT OR TRADEMARK |
|---|---|---|
| 1 10,135,682 | 11/20/2018 | Entropic Communications, LLC |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

| DATE INCLUDED | INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading | |
|---|---|---|
| PATENT OR TRADEMARK NO. | DATE OF PATENT OR TRADEMARK | HOLDER OF PATENT OR TRADEMARK |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |

In the above—entitled case, the following decision has been rendered or judgement issued:

| DECISION/JUDGEMENT |
|---|
| |

| CLERK | (BY) DEPUTY CLERK | DATE |
|---|---|---|
| | | |

**Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director**
**Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy**