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.
14/072,184	01/05/2016	9231968	FOR-106C4	7558

88268 7590 12/16/2015

Law Office of Dorian Cartwright
P.O. Box 7617
San Jose, CA 95150

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):

Fortinet, Inc., Sunnyvale, CA;
Yu Fang, Burnaby, CANADA;
Michael Xie, Menlo Park, 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.

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
14/072,184	11/05/2013	Yu Fang	2831.006US6

CONFIRMATION NO. 7558

88268
Law Office of Dorian Cartwright
P.O. Box 7617
San Jose, CA 95150

POA ACCEPTANCE LETTER

OC00000079251782

Date Mailed: 12/10/2015

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 12/08/2015.

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**.

/qtran/

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
14/072,184	11/05/2013	Yu Fang	2831.006US6

CONFIRMATION NO. 7558

POWER OF ATTORNEY NOTICE

21186
SCHWEGMAN LUNDBERG & WOESSNER, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

OC00000079251771

Date Mailed: 12/10/2015

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 12/08/2015.

- The Power of Attorney to you in this application has been revoked by the applicant.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

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/qtran/

PTO/AIA/82B (07-13)
Approved for use through 11/30/2014. OMB 0651-0051
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 BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date
14/072,184	11/5/2013

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 88268

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☑ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Fortinet, Inc.

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature	Todd Nelson	Date (Optional)	
Name	Todd Nelson		
Title	Vice President & Chief IP Counsel		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☑ Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

Electronic Acknowledgement Receipt

EFS ID:	24288723
Application Number:	14072184
International Application Number:	
Confirmation Number:	7558
Title of Invention:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
First Named Inventor/Applicant Name:	Yu Fang
Customer Number:	21186
Filer:	Dorian Cartwright
Filer Authorized By:	
Attorney Docket Number:	2831.006US6
Receipt Date:	08-DEC-2015
Filing Date:	05-NOV-2013
Time Stamp:	01:59:09
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	Power of Attorney	FOR-106C4_power_of_attorney.pdf	159976 2ac5ec7fa35668b5218cb6d61288025017b7146c	no	1
Warnings:					
Information:					

Total Files Size (in bytes):	159976

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.

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)

21186 7590 11/16/2015
SCHWEGMAN LUNDBERG & WOESSNER, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

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.

Diana Johnson	(Depositor's name)
/Diana Johnson/	(Signature)
12/02/2015	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/072,184	11/05/2013	Yu Fang	2831.006US6	7558

TITLE OF INVENTION: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	02/16/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
ALMEIDA, DEVIN E	2492	726-012000

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 Schwegman Lundberg
2 & Woessner, P.A.
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)
Fortinet, Inc.	Sunnyvale, 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 19-0743 (enclose an extra copy of this form).

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

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

Authorized Signature /James D. Hallenbeck/ Date 12/2/2015
Typed or printed name James D. Hallenbeck Registration No. 63,561

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Yu Fang et al.	Examiner: Devin Almeida	
Serial No.:	14/072,184	Group Art Unit: 2432	
Filed:	November 5, 2013	Docket No.: 2831.006US6	
Customer No.:	21186	Confirmation No.: 7558	
Title:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS		

COMMUNICATION RE: FEE ADDRESS

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

In response to the Notice of Allowance and Issue Fee Due, please record the Fee Address under the provisions of 37 CFR 1.363 as the following:

Customer Number 21186

Please direct any inquiries to the undersigned attorney at (612) 373-6938.

Respectfully submitted,

SCHWEGMAN LUNDBERG & WOESSNER, P.A.
P.O. Box 2938
Minneapolis, MN 55402
(612) 373-6938

Date 12/2/2015 By /James D. Hallenbeck/
James D. Hallenbeck
Reg. No. 63,561

JDH:CMG:dmj

Electronic Patent Application Fee Transmittal

Application Number:	14072184
Filing Date:	05-Nov-2013
Title of Invention:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
First Named Inventor/Applicant Name:	Yu Fang
Filer:	Susan Yee/Diana Johnson
Attorney Docket Number:	2831.006US6

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	960	960

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**960**

Electronic Acknowledgement Receipt

EFS ID:	24237532
Application Number:	14072184
International Application Number:	
Confirmation Number:	7558
Title of Invention:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
First Named Inventor/Applicant Name:	Yu Fang
Customer Number:	21186
Filer:	Susan Yee/Diana Johnson
Filer Authorized By:	Susan Yee
Attorney Docket Number:	2831.006US6
Receipt Date:	02-DEC-2015
Filing Date:	05-NOV-2013
Time Stamp:	11:53:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$960
RAM confirmation Number	10588
Deposit Account	190743
Authorized User	HALLENBECK, JAMES

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 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		2831006US6IssuefeeSigned.pdf	287788 6be613acfca45e87814407882ee07e5d49ad0e1a	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	1
	Issue Fee Payment (PTO-85B)	2	2
	Miscellaneous Incoming Letter	3	3

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	30600 2d592f2440329b0d8715515cbaf5c97322a3314e	no	2

Warnings:

Information:

Total Files Size (in bytes):	318388

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Yu Fang et al.
Title: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

Docket No.:	2831.006US6	Serial No.:	14/072,184
Filed:	November 5, 2013	Due Date:	February 16, 2016
Examiner:	Devin Almeida	Group Art Unit:	2432
Customer No.:	21186	Confirmation No.:	7558

Notice of Allowance Date: November 16, 2015

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

We are transmitting herewith the following:

X Authorization to charge Deposit 19-0743 in the amount of $960.00 to cover the Large Entity Issue Fee Payment.
X Issue Fee Transmittal (Form PTOL-85).
X Communication Re: Fee Address (1 page).

Please charge any additional required fees or credit overpayment to Deposit Account No. 19-0743.

SCHWEGMAN LUNDBERG & WOESSNER, P.A. By /James D. Hallenbeck/
Customer No.: 21186 James D. Hallenbeck
JDH:CMG:dmj Reg. No. 63,561

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Mail Stop Issue Fee, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 2nd day of December, 2015.

Diana Johnson /Diana Johnson/
Name Signature

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

21186 7590 11/16/2015
SCHWEGMAN LUNDBERG & WOESSNER, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER
ALMEIDA, DEVIN E

ART UNIT	PAPER NUMBER
2492	

DATE MAILED: 11/16/2015

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/072,184	11/05/2013	Yu Fang	2831.006US6	7558

TITLE OF INVENTION: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	02/16/2016

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

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

HOW TO REPLY TO THIS NOTICE:

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

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

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

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

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

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

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

PART B - FEE(S) TRANSMITTAL

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

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

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

21186 7590 11/16/2015
SCHWEGMAN LUNDBERG & WOESSNER, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

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.
14/072,184	11/05/2013	Yu Fang	2831.006US6	7558

TITLE OF INVENTION: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	02/16/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
ALMEIDA, DEVIN E	2492	726-012000

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

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

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

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

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

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

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

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

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

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

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/072,184	11/05/2013	Yu Fang	2831.006US6	7558

21186 7590 11/16/2015

SCHWEGMAN LUNDBERG & WOESSNER, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER	
ALMEIDA, DEVIN E	
ART UNIT	PAPER NUMBER
2492	

DATE MAILED: 11/16/2015

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.

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. 14/072,184	Applicant(s) FANG ET AL.	
	Examiner DEVIN ALMEIDA	Art Unit 2492	AIA (First Inventor to File) Status No

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

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

1. ☒ This communication is responsive to *RCE filed 6/3/2015*.
   ☐ 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, 5-7, 11-13, 17 and 18*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

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

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 6/3/2015
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 _____.

/DEVIN ALMEIDA/ Examiner, Art Unit 2492	/Zachary A Davis/ Primary Examiner, Art Unit 2492

Reasons for Allowance

The following is an examiner's statement of reasons for allowance. The references in IDS filed 6/3/2015 does not teach "wherein when network traffic is determined to violate the at least one policy defining suspicious network traffic, forwarding the network traffic to an analysis process that will perform analysis on network traffic to determine whether the network traffic contains a threat desired to be detected and, when the network traffic is determined to contain a threat desired to be detected, the analysis process generates additional content detection data to detect the threat in subsequently received network traffic; receive, via the network interface device, the additional content detection data indirectly from the analysis process via an update station; store the additional content detection data on the at least one memory device; process subsequently received network traffic in view of the additional content detection data" with the other limitations of the claim.

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

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devin Almeida whose telephone number is 571-270-1018. The examiner can normally be reached on Monday-Thursday from 7:30 A.M. to. 5:00 P.M. The examiner can also be reached on alternate Fridays from 7:30 A.M. to 4:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Saleh Najjar, can be reached on 571-272-4006. 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.

/Devin Almeida/
Examiner, Art Unit 2432

/Zachary A Davis/
Primary Examiner, Art Unit 2492

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	14/072,184
Filing Date	November 5, 2013
First Named Inventor	Yu Fang
Group Art Unit	2432
Examiner Name	Devin Almeida

Sheet 1 of 14

Attorney Docket No: 2831.006US6

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /DA/

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document
	US-20020009070A1	1/24/2002	Lindsay, Charles L., et al.
	US-20020009079A1	1/24/2002	Jungck, Peder J, et al.
	US-20020083175A1	6/27/2002	Afek, Yehuda, et al.
	US-20020083195A1	6/27/2002	Beshai, Maged E., et al.
	US-2003/0110280A1	6/12/2003	Hinchliffe, Alexander J., et al.
	US-2004/0146006A1	7/29/2004	Jackson, Daniel H.
	US-2004/0153666A1	8/5/2004	Sobel, William E.
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	US-6,651,099	11/18/2003	Dietz, Russell S., et al.
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	US-7,577,721	8/18/2009	Chen, I. M
	US-7,600,257	10/6/2009	Dubrovsky, Aleksandr, et al.
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	US-8,046,832	10/25/2011	Goodman, Joshua T., et al.
	US-8,108,429	1/31/2012	Sim-Tang, Siew, et al.

FOREIGN PATENT DOCUMENTS

Examiner Initial *	Foreign Document Number	Publication Date	Name of Patentee or Applicant of cited Document	T 1
	WO-01/55905A1	8/2/2001	Kessinger, Joshua A.	
	WO-1997037454A1	10/9/1997	Perreault, John A., et al.	

EXAMINER /Devin Almeida/ **DATE CONSIDERED** 11/06/2015

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	Application Number	14/072,184
	Filing Date	November 5, 2013
	First Named Inventor	Yu Fang
	Group Art Unit	2432
	Examiner Name	Devin Almeida
Sheet 2 of 14	Attorney Docket No: 2831.006US6	

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OTHER DOCUMENTS – NON PATENT LITERATURE DOCUMENTS		
Examiner Initial *	**Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.**	**T 1**
	"Accurate Attack Protection", Juniper Networks, (2005), 6 pgs	
	"Anti-Virus Software Distribution: Managing the Distribution of Anti-Virus Upgrades and Updates Across the Enterprise", Network Associates, (1997), 7 pgs	
	"Application Serial No. 13/546,915, Response filed 05-27-15 to Non Final Office Action mailed 02-27-15", 11 pgs	
	"avast! Distributed Network Manager", [Online]. Retrieved from the Internet: <URL: http:/ /web .archive.org/web/20040612065805/http:/ /www.avast.com/i_ idt_l68.html, (6/12/04), 5 pgs	
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	"Comprehensive Intrusion Protection Solutions from Symantec: Secure enterprise assets and applications with advanced intrusion protection", Symantec Corporation, (2003), 8 pgs	
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	"Enhanced Dynamic Threat Protection via Automated Correlation and Analysis (An ISS White Paper)", Internet Security Systems, (2002), 1-14	
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	"ePolicy Ochestrator version 3.0 - Installation Guide Revision 1.0", McAfee, (2003), 108 pgs	
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	"Exhibit A-1, U.S. Patent No. 8,056,135, Invality Claim Chart based on U.S. Patent No. 6,484,315 to Ziese", (3/2/15), 1-27	

EXAMINER /Devin Almeida/ **DATE CONSIDERED** 11/06/2015

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Examiner Name	Devin Almeida

Sheet 3 of 14

Attorney Docket No: 2831.006US6

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OTHER DOCUMENTS – NON PATENT LITERATURE DOCUMENTS

Examiner Initial *	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T 1
	"Exhibit A-10, U.S. Patent No. 8,056,135, Invalidity Claim Chart based on U.S. Patent No. 7,992,142 to Hartshorne et al.", (3/2/15), 1-9	
	"Exhibit A-2, U.S. Patent No. 8,056,135, Invality Claim Chart based on U.S. Patent No. 6,782,527 to Kouznetsov", (3/2/15), 1-26	
	"Exhibit A-3, U.S. Patent No. 8,056,135, Invality Claim Chart based on U.S. Patent No. 7,577,721 to Chen", (3/2/15), 1-21	
	"Exhibit A-4, U.S. Patent No. 8,056,135, Invality Claim Chart based on Jun Li et al., Resilient Self-Organizing Overlay Networks for Secutiry Update Delivery, 22 IEEE Journal on Selected Areas Communications 189 (January 2004)", (3/2/15), 1-32	
	"Exhibit A-5, U.S. Patent No. 8,056,135, Invality Claim Chart based on Fortinet Prior Art System", (3/2/15), 1-65	
	"Exhibit A-6, U.S. Patent No. 8,056,135, Invality Claim Chart based on Symantec Prior Art System", (3/2/15), 1-53	
	"Exhibit A-7, U.S. Patent 8, 056,135, Invalidity Claim Chart based on the McAfee Prio Art System", (3/2/12), 1-67	
	"Exhibit A-8, U.S. Patent No. 8,056,135, Invality Claim Chart based on Trend Micro Prior Art System", (3/2/15), 1-38	
	"Exhibit A-9, U.S. Patent No. 8,056,135, Invality Claim Chart based on U.S. Patent No. 8,108,429 to Sim-tang et al.", (3/2/2015), 1-37	
	"Exhibit B-1, U.S. Patent No. 8,276,205, Invalidity Claim Chart based on U.S. Patent No. 6,484,315 to Ziese", (3/2/15), 1-43	
	"Exhibit B-2, U.S. Patent No. 8,276,205, Invalidity Claim Chart based on U.S. Patent No. 6,782,527 to Kouznetsov", (3/2/15), 1-40	
	"Exhibit B-3, U.S. Patent No. 8,276,205, Invalidity Claim Chart based on U.S. Patent No. 7,577,721 to Chen", (3/2/15), 1-35	
	"Exhibit B-4, U.S. Patent No. 8,276,205, Invalidity Claim Chart based on Jun Li et al., Resilient Self-Organizing Overlay Networks for Security Update Delivery, 22 IEEE Journal on Selected Areas Communications 189 (January 2004)", (3/2/2015), 1-43	
	"Exhibit B-5, Part 1, US. Patent No. 8,276,205, Invalidity Claim Chart based on the Fortinet Prior Art System", (3/2/15), 1-44	
	"Exhibit B-6, U.S. Patent No. 8,276,205, Invalidity Claim Chart based on Symantec Prior Art System", (3/2/15), 1-61	
	"Exhibit B-7, U.S. Patent No. 8,276,205, Invalidity Claim Chart based on the McAfee Prior Art System", (3/2/15), 1-62	
	"Exhibit B-8, U.S. Patent No. 8,276,205, Invalidity Claim Chart based on Trend Micro Prior Art System", (3/2/15), 1-45	
	"Exhibit B-9, U.S. Patent No. 8,276,205, Invalidity Claim Chart based on U.S. Patent No. 8,108,429 to Sim-tang et al.", (3/2/15), 1-50	
	"Exhibit C-1, U.S. Patent No. 8,051,483, Invalidity Claim Chart based on U.S. Patent No. 6,484,315 to Ziese", (3/2/15), 1-43	

EXAMINER /Devin Almeida/ **DATE CONSIDERED** 11/06/2015

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Examiner Name	Devin Almeida

Sheet 4 of 14

Attorney Docket No: 2831.006US6

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	"Exhibit C-3, U.S. Patent No. 8,051,483. Invalidity Claim Chart based on U.S. Patent No. 7,577,721 to Chen", (3/2/15), 1-37	
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	"Exhibit C-5, U.S. Patent No. 8,051,483, Invalidity Claim Chart based on the Fortinet Prior Art System", (3/2/15), 1-64	
	"Exhibit C-6, U.S. Patent No. 8,051,483, Invalidity Claim Chart based on the Symantec Prior Art System", (3/2/15), 1-33	
	"Exhibit C-7, U.S. Patent No. 8,051,483, Invalidity Claim Chart based on the McAfee Prior Art System", (3/2/15), 1-37	
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	"Exhibit D-1, U.S. Patent No. 7,580,974, Invalidity Claim Chart based on U.S. Patent No. 6,651,099 to Dietz et al.", (3/2/15), 1-21	
	"Exhibit D-2, U.S. Patent No. 7,580,974, Invalidity Claim Chart based on U.S. Patent No. 7,600,257 to Dubrovsky et al.", (3/2/15), 1-18	
	"Exhibit D-3, U.S. Patent No. 7,580,974, Invalidity Claim Chart based on U.S. Patent No. 7,292,531 to Hill", (3/2/15), 1-20	
	"Exhibit D-4, U.S. Patent No. 7,580,974, Invalidity Claim Chart based on U.S. Patent No. 7,664,048 to Yung", (3/2/15), 1-25	
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	"Exhibit D-6, U.S. Patent No. 7,580,974, Invalidity Claim Chart based on U.S. Patent No. 7,681,032 to Peled et al.", (3/2/15), 1-28	
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Sheet 5 of 14

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US Patent & Trademark Office: U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	14/072,184
Filing Date	November 5, 2013
First Named Inventor	Yu Fang
Group Art Unit	2432
Examiner Name	Devin Almeida

Sheet 11 of 14

Attorney Docket No: 2831.006US6

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /DA/

OTHER DOCUMENTS – NON PATENT LITERATURE DOCUMENTS

Examiner Initial *	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T 1
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	Filing Date	November 5, 2013
	First Named Inventor	Yu Fang
	Group Art Unit	2432
	Examiner Name	Devin Almeida
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14072184	FANG ET AL.
	Examiner	Art Unit
	DEVIN ALMEIDA	2432

CPC- SEARCHED		
Symbol	Date	Examiner
H04I63/0227; H04L63/1441; H04L63/1408; H04L63/1416; H04L63/1425	3/6/2015	DA

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
see east search	6/25/2014	DA
inventor search	3/16/2015	DA
see east search	3/16/2015	DA
see east search	11/6/2015	DA

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	(traffic and update adj station and content adj detection adj data and block$3 and allow$3).clm.	3/6/2015	DA

/DEVIN ALMEIDA/ Examiner.Art Unit 2492	

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14072184	FANG ET AL.
	Examiner	**Art Unit**
	DEVIN ALMEIDA	2432

CPC						
Symbol					**Type**	**Version**
H04L		63	/	1425	F	2013-01-01
H04L		63	/	0227	I	2013-01-01
H04L		63	/	1441	I	2013-01-01
G06F		21	/	567	I	2013-01-01
H04L		63	/	02	I	2013-01-01
H04L		63	/	1408	I	2013-01-01
H04L		63	/	1416	I	2013-01-01
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CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
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/DEVIN ALMEIDA/ Examiner.Art Unit 2492	11/06/2015	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	9	
/ZACHARY A DAVIS/ Primary Examiner.Art Unit 2492	11/10/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14072184	FANG ET AL.
	Examiner	Art Unit
	DEVIN ALMEIDA	2432

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS
726	12

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

INTERNATIONAL CLASSIFICATION					
CLAIMED					NON-CLAIMED
H	0	4	L	29 / 06 (2006.01)	
G	0	6	F	21 / 56 (2013.01)	

/DEVIN ALMEIDA/ Examiner.Art Unit 2492	11/06/2015	Total Claims Allowed:	
(Assistant Examiner)	(Date)	9	
/ZACHARY A DAVIS/ Primary Examiner.Art Unit 2492	11/10/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14072184	FANG ET AL.
	Examiner	**Art Unit**
	DEVIN ALMEIDA	2432

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

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1														
2	5														
3	6														
4	7														
5	11														
6	12														
7	13														
8	17														
9	18														

/DEVIN ALMEIDA/ Examiner.Art Unit 2492	11/06/2015	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	9	
/ZACHARY A DAVIS/ Primary Examiner.Art Unit 2492	11/10/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14072184	FANG ET AL.
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	DEVIN ALMEIDA	2432

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

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CLAIM		DATE								
Final	Original	06/25/2014	03/06/2015	11/06/2015						
1	1	✓	=	=						
	2	✓	-	-						
	3	✓	-	-						
	4	O	-	-						
2	5	✓	=	=						
3	6	✓	=	=						
4	7	✓	=	=						
	8	✓	-	-						
	9	✓	-	-						
	10	O	-	-						
5	11	✓	=	=						
6	12	✓	=	=						
7	13	✓	=	=						
	14	✓	-	-						
	15	O	-	-						
	16	✓	-	-						
8	17	✓	=	=						
9	18	✓	=	=						

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	3	14/072184	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L2	0	"7149219" and filter with router with block	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L3	4	"7149219" and filter with router	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L4	15	"7149219" and block	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L5	1	"7149219" and virus	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L6	2905	h04l63/0227.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L7	3151	h04l63/1441.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L8	1863	h04l63/02.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L9	3733	h04l63/1408.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
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L11	1812	h04l63/1425.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L12	5364	(L6 L7 L8 L9 L10 L11) and virus	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L13	770	(L6 L7 L8 L9 L10 L11) and filter with (virus worm spam)	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L14	270	(L6 L7 L8 L9 L10 L11) and filter with (virus worm spam) and user with policy	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
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L16	5	(L6 L7 L8 L9 L10 L11) and router with detect with (virus worm spam) and user with policy	US-PGPUB;	OR	ON	2015/11/06 12:09

			USPAT			
L17	4	(L6 L7 L8 L9 L10 L11) and router with detect with suspicious adj2 traffic	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L18	45	(L6 L7 L8 L9 L10 L11) and router with detect with (virus worm spam)	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
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L26	3874	h04l63/1416.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L27	1812	h04l63/1425.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
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L31	19	(L22 L23 L24 L25 L26 L27) and router with filter with (virus worm spam) and user with policy	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L32	5	(L22 L23 L24 L25 L26 L27) and router with detect with (virus worm spam) and user with policy	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
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L35	714	((Yu) near2 (Fang)).INV.	US-PGPUB;	OR	ON	2015/11/06 12:09

			USPAT			
L36	118	((Michael) near2 (Xie)).INV.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
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L38	0	"7149219" and filter with router with block	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L39	4	"7149219" and filter with router	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L40	15	"7149219" and block	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L41	1	"7149219" and virus	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L42	2905	h04l63/0227.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L43	3151	h04l63/1441.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L44	1863	h04l63/02.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L45	3733	h04l63/1408.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L46	3874	h04l63/1416.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L47	1812	h04l63/1425.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L48	5364	(L42 L43 L44 L45 L46 L47) and virus	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L49	770	(L42 L43 L44 L45 L46 L47) and filter with (virus worm spam)	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L50	270	(L42 L43 L44 L45 L46 L47) and filter with (virus worm spam) and user with policy	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L51	19	(L42 L43 L44 L45 L46 L47) and router with filter with (virus worm spam) and user with policy	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L52	5	(L42 L43 L44 L45 L46 L47) and router with detect with (virus worm spam) and user with policy	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L53	4	(L42 L43 L44 L45 L46 L47) and router with detect with suspicious adj2 traffic	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L54	45	(L42 L43 L44 L45 L46 L47) and router with detect with (virus worm spam)	US-PGPUB;	OR	ON	2015/11/06 12:09

			USPAT			
L55	714	((Yu) near2 (Fang)).INV.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L56	118	((Michael) near2 (Xie)).INV.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L57	2905	h04l63/0227.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L58	3151	h04l63/1441.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L59	1863	h04l63/02.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L60	3733	h04l63/1408.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L61	3874	h04l63/1416.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L62	1812	h04l63/1425.cpc.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L63	3184	(L57 L58 L59 L60 L61 L62) and filter and (virus worm spam)	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L64	1120	(L57 L58 L59 L60 L61 L62) and filter same traffic and (virus worm spam)	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L65	837	(L57 L58 L59 L60 L61 L62) and filter with traffic and (virus worm spam)	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L66	150	(L57 L58 L59 L60 L61 L62) and filter with traffic same router and (virus worm spam)	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L67	1	(traffic and update adj station and content adj detection adj data and block$3 and allow$3).clm.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09
L70	30	("20020009070" "20020009079" "20020083175" "20020083195" "200310110280" "20040146006" "20040153666" "5910179" "6044367" "6088804" "6484315" "6651099" "6782527" "7162538" "7292531" "7320020" "7379993" "7480297" "7577721" "7600257" "7639613" "7664048" "7672275" "7681032" "7725544" "7760722" "7774839" "7814089" "7992142" "8046832" "8108429").pn.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:13

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L68	1	(traffic and update adj station and content adj detection adj data and block$3 and allow$3).clm.	US-PGPUB; USPAT	OR	ON	2015/11/06 12:09

11/6/2015 12:13:56 PM
C:\Users\dalmeida\Documents\EAST\Workspaces\14072184.wsp

REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL		
	Application Number	14/072,184
	Filing Date	November 5, 2013
	First Named Inventor	Yu Fang
	Confirmation Number	7558
	Group Art Unit	2432
	Examiner Name	Devin Almeida
	Attorney Docket Number	2831.006US6
	Customer No.	21186

This is a Request for Continued Examination (RCE) under 37 C.F.R § 1.114 of the above-identified application entitled
SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

1. Submission required under 37 C.F.R. § 1.114:
   - X Amendment and Response Under 37 C.F.R § 1.116 (7 pages) is enclosed.
   - X Information Disclosure Statement (2 pages), Form 1449 (14 pages), and copies of cited documents (237).

2. Fees
   - X Authorization to charge deposit account 19-0743 in the amount of $1200.00 to pay the RCE filing fee required under 37 C.F.R. § 1.17(e).

The Commissioner is hereby authorized to charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

SCHWEGMAN LUNDBERG & WOESSNER, P.A.
Customer No.: 21186

/ James D. Hallenbeck /

James D. Hallenbeck
Reg. No. 63,561

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Yu Fang et al.	Examiner: Devin Almeida	
Serial No.:	14/072,184	Group Art Unit: 2432	
Filed:	November 5, 2013	Docket No.: 2831.006US6	
Customer No.:	21186	Confirmation No.: 7558	
Title:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS		

SUPPLEMENTAL AMENDMENT

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

Prior to taking up this application for examination, please enter the following amendments:

IN THE CLAIMS

Please amend the claims as follows:

1. (Previously Presented) A network gateway device comprising:

at least one processor;

at least one memory device;

at least one network interface device;

content detection and configuration data stored on the at least one memory device; and

an instruction set, stored in the at least one memory device and executable by the at least one processor to:

receive network traffic via the at least one network interface device;

process the received network traffic in view of the content detection and configuration data stored in the at least one memory device to enforce policies defined at least in part by the content detection and configuration data and including at least one policy that defines a suspicious category of network traffic, the policy enforcement performed to determine whether to allow the received network traffic to pass, the policy enforcement including user identification, content identification, and at least one of source verification and destination verification, wherein when network traffic is determined to violate the at least one policy defining suspicious network traffic, forwarding the network traffic to an analysis process that will perform analysis on network traffic to determine whether the network traffic contains a threat desired to be detected and, when the network traffic is determined to contain a threat desired to be detected, the analysis process generates additional content detection data to detect the threat in subsequently received network traffic;

receive, via the network interface device, the additional content detection data indirectly from the analysis process via an update station;

store the additional content detection data on the at least one memory device;

process subsequently received network traffic in view of the additional content detection data;

block network traffic determined to violate at least one policy; and

allow network traffic to pass that does not violate a policy.

2-4. (Canceled)

5. (Previously Presented) The network gateway device of claim 1, wherein the analysis process, to which the network traffic content is forwarded, executes on a computing device distinct from the network gateway device.

6. (Currently Amended) The ~~content detection system~~ network gateway device of claim 5, wherein the analysis process facilitates an analysis that includes receiving administrator input.

7. (Previously Presented) A method comprising:

receiving network traffic via at least one network interface device;

processing the received network traffic, by executing instructions on at least one processor of a data network device, in view of content detection and configuration data stored on at least one memory device to enforce policies defined at least in part by the content detection and configuration data and including at least one policy that defines a suspicious category of network traffic, the policy enforcement performed to determine whether to allow the received network traffic to pass on a data network, the policy enforcement including user identification, content identification, and at least one of source verification and destination verification;

when network traffic is determined to violate the at least one policy defining suspicious network traffic, forwarding the network traffic to an analysis process that will perform analysis on network traffic to determine whether the network traffic contains a threat desired to be detected and, when the network traffic is determined to contain a threat desired to be detected, the analysis process generates additional content detection data to detect the threat in subsequently received network traffic;

receiving, via the at least one network interface device, the additional content detection data indirectly from the analysis process via an update station;

storing the additional content detection data on the at least one memory device;

processing subsequently received network traffic in view of the additional content detection data;

blocking network traffic determined to violate at least one policy; and

allowing network traffic to pass on the data network that does not violate a policy.

8-10. (Canceled)

11. (Previously Presented) The method of claim 7, wherein the analysis process, to which the network traffic content is forwarded, executes on a computing device distinct from the data network device.

12. (Original) The method of claim 11, wherein the analysis process facilitates an analysis that includes receiving administrator input.

13. (Previously Presented) A non-transitory computer-readable medium with instructions stored thereon which when executed by at least one processor of a data network device, causes the data network device to:

receive network traffic via at least one network interface device;

process the received network traffic in view of content detection and configuration data stored on at least one memory device to enforce policies defined at least in part by the content detection and configuration data and including at least one policy that defines a suspicious category of network traffic, the policy enforcement performed to determine whether to allow the received network traffic to pass on a data network, the policy enforcement including user identification, content identification, and at least one of source verification and destination verification;

when network traffic is determined to violate the at least one policy defining suspicious network traffic, forward the network traffic to an analysis process that will perform analysis on network traffic to determine whether the network traffic contains a threat desired to be detected and, when the network traffic is determined to contain a threat desired to be detected, the analysis process generates additional content detection data to detect the threat in subsequently received network traffic;

receive, via the at least one network interface device, the additional content detection data indirectly from the analysis process via an update station;

store the additional content detection data on the at least one memory device;

process subsequently received network traffic in view of the additional content detection data;

block network traffic determined to violate at least one policy; and

allowing network traffic to pass on the data network that does not violate a policy.

14-16. (Canceled)

17. (Previously Presented) The non-transitory computer-readable medium of claim 13, wherein the analysis process, to which the network traffic content is forwarded, executes on a computing device distinct from the data network device.

18. (Original) The non-transitory computer-readable medium of claim 17, wherein the analysis process facilitates an analysis that includes receiving administrator input.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's representative at (612) 373-6938 to facilitate prosecution of this application.

If necessary, please charge any additional fees or deficiencies, or credit any overpayments to Deposit Account No. 19-0743.

Respectfully Submitted,

SCHWEGMAN LUNDBERG & WOESSNER, P.A.
P.O. Box 2938
Minneapolis, MN 55402--0938
(612) 373-6938

Date Jun 3, 2015

By / James D. Hallenbeck /

James D. Hallenbeck
Reg. No. 63,561

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Yu Fang et al.	Examiner:	Devin Almeida
Serial No.:	14/072,184	Group Art Unit:	2432
Filed:	November 5, 2013	Docket:	2831.006US6
Customer No.:	21186	Confirmation No.:	7558

Title: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

INFORMATION DISCLOSURE STATEMENT

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

In compliance with the duty imposed by 37 C.F.R. § 1.56, and in accordance with 37 C.F.R. §§ 1.97 *et. seq.*, the enclosed materials are brought to the attention of the Examiner for consideration in connection with the above-identified patent application. Applicant respectfully requests that this Information Disclosure Statement be entered and the documents listed on the attached PTO 1449 Form be considered by the Examiner and made of record. Pursuant to the provisions of MPEP 609, Applicant requests that a copy of the PTO 1449 Form, initialed as being considered by the Examiner, be returned to the Applicant with the next official communication.

Pursuant to 37 C.F.R. § 1.97(b), it is believed that no fee or statement is required with the Information Disclosure Statement. However, if an Office Action on the merits has been mailed after filing of the application or after the filing of the most recent RCE, the Commissioner is hereby authorized to charge the required fees to Deposit Account No. 19-0743 in order to have this Information Disclosure Statement considered.

Pursuant to 37 C.F.R. § 1.98(a)(2), copies of cited U.S. Patents and Published Applications, and Non-Published Applications identifiable by USPTO Serial Number, are no longer required to be provided to the Office. Applicant acknowledges the requirement to submit copies of foreign patent documents and non-patent literature in accordance with 37 C.F.R § 1.98(a)(2).

The Examiner is invited to contact the undersigned at the telephone number indicated if there are any questions regarding this communication.

Respectfully submitted,

SCHWEGMAN LUNDBERG & WOESSNER, P.A.
P.O. Box 2938
Minneapolis, MN 55402
(612) 373-6938

Date Jun 3, 2015

By /James D. Hallenbeck/
James D. Hallenbeck
Reg. No. 63,561

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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	14/072,184
Filing Date	November 5, 2013
First Named Inventor	Yu Fang
Group Art Unit	2432
Examiner Name	Devin Almeida

Sheet 1 of 14

Attorney Docket No: 2831.006US6

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Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document
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FOREIGN PATENT DOCUMENTS

Examiner Initial *	Foreign Document Number	Publication Date	Name of Patentee or Applicant of cited Document	T 1
	WO-01/55905A1	8/2/2001	Kessinger, Joshua A.	
	WO-1997037454A1	10/9/1997	Perreault, John A., et al.	

EXAMINER **DATE CONSIDERED**

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant is to place a check mark here if English language Translation is attached

Substitute for form 1449A/PTO **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (Use as many sheets as necessary)	*Complete if Known*	
	Application Number	14/072,184
	Filing Date	November 5, 2013
	First Named Inventor	Yu Fang
	Group Art Unit	2432
	Examiner Name	Devin Almeida
Sheet 2 of 14	Attorney Docket No: 2831.006US6	

OTHER DOCUMENTS – NON PATENT LITERATURE DOCUMENTS

Examiner Initial *	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T 1
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	"Exhibit A-1, U.S. Patent No. 8,056,135, Invality Claim Chart based on U.S. Patent No. 6,484,315 to Ziese", (3/2/15), 1-27	

EXAMINER **DATE CONSIDERED**

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Substitute for form 1449A/PTO **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (Use as many sheets as necessary)	*Complete if Known*	
	Application Number	14/072,184
	Filing Date	November 5, 2013
	First Named Inventor	Yu Fang
	Group Art Unit	2432
	Examiner Name	Devin Almeida
Sheet 3 of 14	Attorney Docket No: 2831.006US6	

OTHER DOCUMENTS – NON PATENT LITERATURE DOCUMENTS

Examiner Initial *	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T 1
	"Exhibit A-10, U.S. Patent No. 8,056,135, Invalidity Claim Chart based on U.S. Patent No. 7,992,142 to Hartshorne et al.", (3/2/15), 1-9	
	"Exhibit A-2, U.S. Patent No. 8,056,135, Invality Claim Chart based on U.S. Patent No. 6,782,527 to Kouznetsov", (3/2/15), 1-26	
	"Exhibit A-3, U.S. Patent No. 8,056,135, Invality Claim Chart based on U.S. Patent No. 7,577,721 to Chen", (3/2/15), 1-21	
	"Exhibit A-4, U.S. Patent No. 8,056,135, Invality Claim Chart based on Jun Li et al., Resilient Self-Organizing Overlay Networks for Secutiry Update Delivery, 22 IEEE Journal on Selected Areas Communications 189 (January 2004)", (3/2/15), 1-32	
	"Exhibit A-5, U.S. Patent No. 8,056,135, Invality Claim Chart based on Fortinet Prior Art System", (3/2/15), 1-65	
	"Exhibit A-6, U.S. Patent No. 8,056,135, Invality Claim Chart based on Symantec Prior Art System", (3/2/15), 1-53	
	"Exhibit A-7, U.S. Patent 8, 056,135, Invalidity Claim Chart based on the McAfee Prio Art System", (3/2/12), 1-67	
	"Exhibit A-8, U.S. Patent No. 8,056,135, Invality Claim Chart based on Trend Micro Prior Art System", (3/2/15), 1-38	
	"Exhibit A-9, U.S. Patent No. 8,056,135, Invality Claim Chart based on U.S. Patent No. 8,108,429 to Sim-tang et al.", (3/2/2015), 1-37	
	"Exhibit B-1, U.S. Patent No. 8,276,205, Invalidity Claim Chart based on U.S. Patent No. 6,484,315 to Ziese", (3/2/15), 1-43	
	"Exhibit B-2, U.S. Patent No. 8,276,205, Invalidity Claim Chart based on U.S. Patent No. 6,782,527 to Kouznetsov", (3/2/15), 1-40	
	"Exhibit B-3, U.S. Patent No. 8,276,205, Invalidity Claim Chart based on U.S. Patent No. 7,577,721 to Chen", (3/2/15), 1-35	
	"Exhibit B-4, U.S. Patent No. 8,276,205, Invalidity Claim Chart based on Jun Li et al., Resilient Self-Organizing Overlay Networks for Security Update Delivery, 22 IEEE Journal on Selected Areas Communications 189 (January 2004)", (3/2/2015), 1-43	
	"Exhibit B-5, Part 1, US. Patent No. 8,276,205, Invalidity Claim Chart based on the Fortinet Prior Art System", (3/2/15), 1-44	
	"Exhibit B-6, U.S. Patent No. 8,276,205, Invalidity Claim Chart based on Symantec Prior Art System", (3/2/15), 1-61	
	"Exhibit B-7, U.S. Patent No. 8,276,205, Invalidity Claim Chart based on the McAfee Prior Art System", (3/2/15), 1-62	
	"Exhibit B-8, U.S. Patent No. 8,276,205, Invalidity Claim Chart based on Trend Micro Prior Art System", (3/2/15), 1-45	
	"Exhibit B-9, U.S. Patent No. 8,276,205, Invalidity Claim Chart based on U.S. Patent No. 8,108,429 to Sim-tang et al.", (3/2/15), 1-50	
	"Exhibit C-1, U.S. Patent No. 8,051,483, Invalidity Claim Chart based on U.S. Patent No. 6,484,315 to Ziese", (3/2/15), 1-43	

EXAMINER **DATE CONSIDERED**

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	Application Number	14/072,184
	Filing Date	November 5, 2013
	First Named Inventor	Yu Fang
	Group Art Unit	2432
	Examiner Name	Devin Almeida
Sheet 4 of 14	Attorney Docket No: 2831.006US6	

OTHER DOCUMENTS – NON PATENT LITERATURE DOCUMENTS

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	"Exhibit C-6, U.S. Patent No. 8,051,483, Invalidity Claim Chart based on the Symantec Prior Art System", (3/2/15), 1-33	
	"Exhibit C-7, U.S. Patent No. 8,051,483, Invalidity Claim Chart based on the McAfee Prior Art System", (3/2/15), 1-37	
	"Exhibit C-8, U.S. Patent No. 8,051,483, Invalidity Claim Chart based on the Trend Micro Prior Art System", (3/2/15), 1-39	
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	"Exhibit D-2, U.S. Patent No. 7,580,974, Invalidity Claim Chart based on U.S. Patent No. 7,600,257 to Dubrovsky et al.", (3/2/15), 1-18	
	"Exhibit D-3, U.S. Patent No. 7,580,974, Invalidity Claim Chart based on U.S. Patent No. 7,292,531 to Hill", (3/2/15), 1-20	
	"Exhibit D-4, U.S. Patent No. 7,580,974, Invalidity Claim Chart based on U.S. Patent No. 7,664,048 to Yung", (3/2/15), 1-25	
	"Exhibit D-5, U.S. Patent No. 7,580,974, Invalidity Claim Chart based on U.S. Patent Publication 2002/0009079 to Jungck et al.", (3/2/15), 1-21	
	"Exhibit D-6, U.S. Patent No. 7,580,974, Invalidity Claim Chart based on U.S. Patent No. 7,681,032 to Peled et al.", (3/2/15), 1-28	
	"Exhibit D-7, U.S. Patent No. 7,580,974, Invalidity Claim Chart based on U.S. Patent No. 7,760,722 to Tripathi et al.", (3/2/15), 1-18	
	"Exhibit D-8, U.S. Patent No. 7,580,974, Invalidity Claim Chart based on U.S. Patent No. 7,639,613 to Ghannadian et al.", (3/2/15), 1-23	
	"Exhibit E-1, U.S. Patent No. 8,204,933, Invalidity Claim Chart based on U.S. Patent No. 6,651,099 to Dietz et al.", (3/2/15), 1-37	
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	"Exhibit E-3, U.S. Patent No. 8,204,933, Invalidity Claim Chart based on U.S. Patent No. 7,292,531 to Hill", (3/2/15), 1-26	

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	First Named Inventor	Yu Fang
	Group Art Unit	2432
	Examiner Name	Devin Almeida
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Substitute for form 1449A/PTO **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (Use as many sheets as necessary)	*Complete if Known*	
	Application Number	14/072,184
	Filing Date	November 5, 2013
	First Named Inventor	Yu Fang
	Group Art Unit	2432
	Examiner Name	Devin Almeida
Sheet 11 of 14	Attorney Docket No: 2831.006US6	

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Electronic Patent Application Fee Transmittal

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First Named Inventor/Applicant Name:	Yu Fang
Filer:	Gregory M. Stark/John Gustav-Wrathall
Attorney Docket Number:	2831.006US6

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Basic Filing:				
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Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
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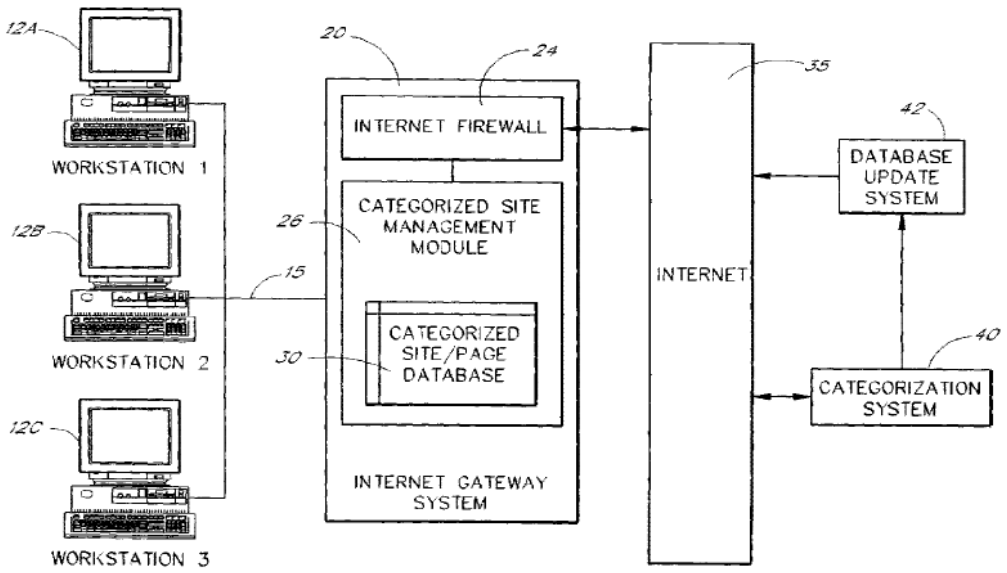
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(54) Title: AUTOMATED CATEGORIZATION OF INTERNET DATA



(57) Abstract: A method and system for automatically categorizing Internet sites is described. The system (20) first assigns relevances of word pairs and word adjacencies to particular categories (30). New Internet pages to be categorized are then parsed so that each word pair and adjacencies on the New Internet page (100A, 100B, 100C), a determination can be made whether the new site (100A, 100B, 100C) should be associated with one or more category (42). The system can then allow users (12A, 12B, 12C) selective access to only sites that are within (or outside of) specific categories (30).

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AUTOMATED CATEGORIZATION OF INTERNET DATA

Background of the Invention

Field of the Invention

This invention relates to systems and methods for selectively blocking access to particular Internet websites and pages. More specifically, embodiments of this invention relate to systems and methods for automatically categorizing Internet sites and pages so that users can be blocked from accessing specific categories of information.

Description of the Related Art

The Internet is a global system of computers that are linked together so that the various computers can communicate seamlessly with one another. Internet users access server computers in order to download and display informational pages. Once a server has been connected to the Internet, its informational pages can be displayed by virtually anyone having access to the Internet.

The easy access and inexpensive cost of retrieving Internet pages has led to several problems for restricting access to inappropriate information, such as pornography. Several solutions to this problem have been proposed, including rating systems similar to that used for rating movies so that a parent or employer could restrict access to Internet servers, or pages, that have a particular rating. Unfortunately, this mechanism requires each person running an Internet server to voluntarily rate their site. Because of the free-wheeling nature of the Internet, this type of voluntary rating scheme is unlikely to be very efficient for preventing access to sites, such as those containing pornography, that most parents or businesses desire to block.

In addition to a rating scheme, others have developed databases that contain the uniform resource locater (URL) address of sites to be blocked. These databases are integrated into network computer systems and Internet firewalls so that a person wishing access to the Internet first has their URL request matched against the database of blocked sites. Any URL found in the database cannot be accessed by the user. One such system is described in U.S. Patent No. 5,678,041 to Baker et al. Unfortunately, such systems rely on the database of accessed sites to be complete. Because new servers are being added to the Internet on a daily basis, as well as current servers being updated with new information, these databases do not provide a complete list of sites that should be blocked.

Thus, what is needed in the art is a system for restricting access to Internet sites in view of the constantly changing content appearing on Internet servers. The present invention provides such a system.

Summary of the Invention

One embodiment of the invention is a computerized system for controlling access to Internet sites. This embodiment includes: a first module that categorizes an Internet site into predefined subject-matter categories; a second module that stores the address of the Internet site and its associated category to a database; and a third

module that controls access to the Internet site, the third module comprising instructions that block access to the Internet site if the Internet site is within a particular category.

Another embodiment of the invention includes a method for creating a database of categorized Internet addresses. This embodiment provides a method of: retrieving a first Internet page; parsing the Internet page to determine the lexical elements on the page; comparing the lexical elements to a table of category relevancies to determine the relevance of each lexical element to a subject matter category; determining the subject matter category of the Internet page based on the relevance of each lexical element to a category; and storing the address and subject matter category of the Internet page to a database.

Yet another embodiment is a method of controlling access to an Internet site, that includes comprising: categorizing a first Internet site into a predefined subject-matter category; storing the address of the Internet site and its associated category to a database; capturing a user request to view the site; and determining whether the user has permission to view the category of sites and, responsive to the determination, controlling access to the site.

Still another embodiment is a method of controlling access to Internet sites. This embodiment includes a method of: providing a training database, the training database comprising lexical elements and their relevance to subject matter categories; determining the relevance of a plurality of Internet pages to subject matter categories; storing the address of the plurality of Internet pages and their relevance to subject matter categories to a categorized database; comparing the Internet address of pages requested by users with the categorized database to determine if said users have permission to view the pages.

Brief Description of the Drawings

Figure 1 is a block diagram providing an overview of one embodiment of a system for blocking access to Internet sites.

Figure 2 is a block diagram illustrating the categorization system found in Figure 1.

Figure 3 is a block diagram of the tables within the training database described in Figure 2.

Figure 4 is a flow diagram illustrating the process of a user requesting access to an Internet page.

Figure 5 is a flow diagram illustrating the "Analyze Word Content of Page" process found in Figure 4.

Figure 6 is a flow diagram illustrating the process of training data that is performed within the training module of Figure 2.

Figure 7 is a flow diagram illustrating one embodiment of a process for retrieving pages performed by the site/page retrieval module of Figure 2.

Detailed Description

Embodiments of the invention include systems and methods for automatically categorizing Internet pages to create and update a database of categorized sites. This categorized database is then used within an Internet access control system to control user's access to Internet sites within certain categories. For example, if the system

described herein assigns a particular Internet page to a "Sports" category, users that are restricted from viewing sports pages on the Internet will not be granted access to the requested site. In one embodiment, the system is installed within an Internet Gateway computer that controls traffic from the user to the Internet. Because the system described herein becomes more accurate with each page that is scored, minimal user intervention is required to assign pages to categories.

As will be described in detail below, embodiments of this system include a training database that is created by analysis of lexical elements appearing on Internet sites that are strongly associated with a particular category. In this context, a lexical element is a word or plurality of words that appear on the site under analysis. Examples of lexical elements include individual words, word pairs, adjacent words, and triplets of words. Thus, in order to train a "Sports" category, for example, a site for a football team would be fed into the system.

As a first step, each category, such as Sports, is trained to recognize words, words pairs and word adjacencies that are particularly relevant to their category. As discussed herein, a word pair means any two words that appear anywhere on a page. In contrast, a word adjacency is any two words that appear next to one another. Thus, the word adjacency "football team" would be given a strong relevance score to the Sports category. However, this same word adjacency would be given a low relevance score to the Internet Commerce category.

Once a training database has been created of word pairs and word adjacencies, along with their relevance score for each predefined category, any new pages appearing on the Internet can then be analyzed based on the relevance of word pairs/adjacencies appearing in the new pages. For example, a new Internet page having the word adjacency "football team" would be scored highly for the Sports category, but have a low relevance to the Internet Commerce category.

Moreover, by continuing to train each category with pages that have been confirmed to be within a particular category, the system can become increasingly accurate. With each training session, the relevance scores of lexical elements within each page are either increased to indicate a higher relevance to the category, or decreased to indicate a lower relevance to the category.

By using an automated Internet site retrieval program, embodiments of the system provide a database of categorized Internet sites and pages that is constantly updated with new Internet pages as they appear on the World Wide Web. Thus, embodiments of the system provide an efficient system for scoring and categorizing Internet pages.

Overview of the Process

An embodiment of the automated categorization system, as described below, includes computer instructions that, when run, evaluate the source page of an Internet site and categorize the given URL into one of several categories. The system includes three equations that score for:

1. Single Word Relevance — Example: In Category 2, "sex" = 4040.
2. Word Pair Relevance — Example: In Category 2, "sex" and "porn" = 6005
3. Word Adjacency Relevance — Example: In Category 2, "hardcore sex" = 8050

In addition, in other embodiments, equations which score for multiple word associations, such as word pairs, word adjacencies and combinations of higher degrees (triplet, quadruplets, etc.) can be implemented.

The categorization system is first trained by collecting a representative number of Internet sites that best represent the various facets of a given category. These sites are run through a training algorithm that assigns a relevance score to the words, word pairs and word adjacencies found in the Internet sites to the selected category. The result of the training process is a composite of the Internet sites called a "category prototype." The category prototype is a collection of the single word, word pair, and word adjacency relevance scores.

Once a category prototype has been generated for each category, the words, word pairs and word adjacencies from new Internet sites are tested against the category prototypes to determine if the new page should be categorized within any particular category. For example, if the word "sex" occurs on a source page, the computer checks the category prototype and retrieves a relevance score of 4040 for this word within Category 2 (Sex). If the word pair, "sex, porn" occurs on a source page, the computer checks the category prototype and retrieves the score of 6005 within Category 2 (Sex) for the word pair "sex, porn". This process is repeated for every word pair and word adjacency on the retrieved page. These scores are then used to calculate a category rating for the retrieved page.

The category rating is used to evaluate the probability that a page should be placed in a given category. For instance, if a URL has a category rating of 5000 within category two, then its associated probability of being within that category might be .99. This means that if there were 100 sites, each with a category two rating of 5000, then 99 of those sites belong in category two. In general, as the category rating increases, the probability that the corresponding site belongs to that category also increases. Consequently, it is possible to use this feature to establish a cut-off point that maintains 99% accuracy (or any other accuracy).

One goal of the process is to obtain two cut-off points within each category: the alpha point and the beta point. These two points create benchmarks against which decisions concerning a site's categorization can be made. The alpha point is chosen to maintain a sorting accuracy of, for example, 99%. As is known, the sorting accuracy is simply the computer's ability to correctly sort sites into a specific category. The Alpha point can be calculated for any category by using the following equation:

$$Ap = M7 + 4(SD7),$$

where, **Ap** = alpha point, **M7** = the average category rating of the incorrectly sorted sited within the specific category, and **SD7** = the standard deviation of the category rating for the incorrectly sorted sites within the specific category. This ensures 99 percent sorting accuracy because we are calculating four standard deviations away from the mean score, and should generalize to the Internet at large for the given category.

The beta point's sorting accuracy will undoubtedly vary between categories. However, it may generally maintain a sorting accuracy between the ranges of 75 to 85 percent. The beta point can be found using the equation:

$$Bp = M7 + 1(SD7),$$

where, **Bp** = beta point, **M7** = the average category rating of incorrectly sorted sites within the specific category and **SD7** = the standard deviation of the category rating for the incorrectly sorted sites within the specific category. Sites that fall between the beta point and the alpha point will be placed into a Suggest Database to be viewed by Web Analysts or technicians. It should be noted that each category will be assigned its own unique alpha and beta points.

As discussed below, embodiments of the system include the one or more modules. These modules include software instructions that are run on processors within the computer system. The modules can also include storages, such as Random Access Memory (RAM), Read Only Memory (ROM), Electrically Erasable Programmable Read Only Memory (EEPROM), hard disks or other computer storage devices.

Figure 1 provides an overview of a system 10 for controlling access to particular sites on the Internet. As shown, a plurality of workstations 12A-C are connected through a local area network 15 to an Internet gateway system 20. The workstations 12A-C are preferably Intel Pentium class personal computers operating under the Microsoft Windows Operating System. Of course, it should be realized that any conventional personal computer, such as those manufactured by Apple, IBM, Compaq, Dell, Digital Equipment Corp. (DEC) or other system can be used in a similar manner.

The local area network 15 is preferably an Ethernet 10baseT topology, but can be based on any well-known networking protocol, including wireless networks, token ring networks and the like. The local area network 15 communicates with the Internet Gateway system 20 in order to provide the workstations 12 A-C with TCP/IP communication to sites on the Internet 35. Such gateways are well known in the art and normally communicate through routers or other data packet switching technology for translating Internet TCP/IP protocols into the proper protocols for communicating across the local area network 15.

Within the Internet gateway system 20 is an Internet firewall module 24 that monitors data packets flowing to and from the Internet 35. The firewall module 24 controls access between the workstations 12A-C and the Internet so that unauthorized users cannot gain access to computer resources on the local area network 15. Thus, all communication between the Internet and the network server 15 first passes through the firewall 24. Many firewall software programs are available, such as Firewall-1 (Check Point software, Redwood City, California). However, it should be realized that while the embodiment described in Figure 1 relies on a firewall to control access of data packets between the Internet and the workstations 12A-C, other similar access control systems are available. For example, the Microsoft proxy server (Microsoft Corp., Redwood City, WA), Netscape proxy server (Netscape Corp) and the Open Server implementation of Cisco's Pix Firewall (Cisco Corp.) are currently available and can be implemented in place of the firewall 24.

Within the Internet gateway system 20, and communicating with the firewall 24 is a categorized site management module 26 that includes instructions for analyzing Internet site requests from the workstations 12A-C and then comparing those Internet site requests with a categorized site/page database 30. If the requested page is found within the database 30, it will either be blocked or allowed depending on the access rights granted to the user

within the management module 26. As illustrated, the categorized site management module 26 communicates with the firewall 24 to control access to the Internet 35.

Also connected to the Internet 35 is a categorization system 40 that, as described below, categorizes websites and pages in order to create the categorized site database 30. Once sites on the Internet have been categorized by the categorization system 40, a database update system 42 thereafter routinely copies the updated database from the categorization system 40 to the Internet gateway system 20. As can be imagined, the system can include hundreds of gateway systems, each of which is updated regularly by the database update system 42 to provide an updated database of blocked Internet sites. Moreover, the database update system 42 can preferably only transfer portions of the database to the gateway system 20 so that the entire database does not need to be transmitted.

Overall, Figure 1 illustrates one embodiment of a system for providing controlled access of workstation computers to the Internet. Each request from a workstation for an Internet address (e.g.: page or site) is first compared to a categorized database of Internet addresses. If the requested address is found within the categorized database, a management module accesses a user permissions table to determine if the requesting user has rights to view sites within the category that is associated with the requested page. If the user has access rights to view pages within the category, the page request is sent to the Internet. However, if the user does not have any access rights, the user is blocked from receiving the requested page from the Internet.

Referring to Figure 2, the categorization system 40 (Figure 1) is explained in more detail. As illustrated, Internet pages 100A, B and Internet site 100C are retrieved by a site/page retrieval module 110. Within the site/page retrieval module 110 are instructions for searching and retrieving Internet pages and sites from the Internet. One exemplary method for retrieving such sites is illustrated below in Figure 7.

Once an Internet site or page has been retrieved by the retrieval module 110, it is forwarded to an analysis module 120 in order to determine which category (or categories) is most strongly related to the retrieved site. The process for analyzing an Internet page for its relevance to one or more categories is explained in more detail below in Figure 5.

As illustrated, the analysis module 120 is linked to a copy of the categorized database 30' and a training database 125. The analysis module 120 calculates the relevance of the retrieved Internet page to each of the predefined categories by analyzing the word pairs and word adjacencies within the page. In order to provide this analysis, the training database 125, as explained below, includes category relevance scores for each word pair and word adjacency that might be found on the page. Thus, by comparing the word pairs and word adjacencies within the retrieved page to the scores for those word pairs and adjacencies within the training database, a total relevance score for the page within each category can be determined. Once a page relevance score has been calculated for the page in each category, a determination is made whether the relevance score for each category is high enough to warrant assigning the retrieved score to any category.

As discussed below, the determination of whether to assign a retrieved page to a particular category is made by comparing the page's relevance score for a particular category with a predetermined alpha value. If the page relevance score is higher than the alpha value for the category, the page is assigned to that category. If the score is lower than the alpha value, but greater than a beta value, the page is forwarded to a manual scoring system wherein technicians view the retrieved page and determine whether or not to include the page within the category. If the relevance of the page for a category is below the beta value, the page address is stored to a database of analyzed sites, and the system continues to score additional addresses.

The data within the training database 125 is created by providing training data 130 to a training module 135, as illustrated. The training data 130 includes Internet pages strongly associated with each category to be trained. For example, in order to train a Sports category, the training data might include the Internet address of a sports franchise or other sports website. The training module 135 then parses the word pairs and word adjacencies for each page within the given sports site. Any unique word pairs and word adjacencies, as described below, are then assigned high relevance scores in the Sports category within the training database. Thus, similar words and word pairs appearing on new pages will be given high relevance scores to the Sports category.

Referring to Figure 3, one embodiment of a training database 125 is illustrated. Within the training database 125 is a word identification table 200 that includes lists of words and a corresponding ID number for each word. This table allows every word pair or word adjacency referenced in the database to be represented by two numbers instead of two words. Since, in general, the number of characters in the ID number is less than the number of characters in the word itself, much less data storage space is required within the training database to store numerical representations of each word instead of the word itself. In addition, well-known words, such as "the" and "and" can be represented by single-digit numbers so that only one byte of data is taken to represent these common words. However, as discussed below, such common words are normally discarded prior to scoring an Internet page so that the lexical elements on each page will be more readily differentiated from every other Internet page. This provides a more advantageous page scoring system.

In addition to the word identification table 200 is a category identification table 205 that provides a category ID number for each category within the system. The category identification table 205 also includes an alpha and beta score that provide the cut-off values for assigning a particular page to the selected category. For example, as illustrated in Figure 3, the Sports category includes an alpha score of 920 and beta score of 810. If an Internet page is found to have a page relevance score of greater than 920 for the Sports category, it will be assigned to the Sports category. However, if the Internet page is found to have a page relevance score of between 810 and 920, it will be flagged for manual follow-up by a technician to determine whether or not it belongs within the Sports category. If the Internet page is found to have a page relevance score of below 810 for the Sports category, then it will not be flagged as being related to the Sports category. By using these values, the system determines whether or not to assign a particular page to one of the predefined categories.

Also within the training database 125 is a word relevance table 210 that provides the relevance scores of word pairs and word adjacencies with particular categories in the system. For example, the word "Cleveland" (ID No. 234) and the word "Browns" (ID No. 198) are illustrated with a word adjacency relevance score of 900 to category 1 (Sports). Because, in this illustration, the maximum relevance score is 1,000, the word adjacency "Cleveland Browns" is very strongly associated with the Sports category. Thus, any Internet page having the words "Cleveland Browns" adjacent one another will have their total page score raised in the Sports category due to the strong relevance of these words to sports.

Note that the words "diamond" (ID No. 755) and "jewelry" (ID No. 1345) only have a relevance score of 290 within the Sports category. However, the word pair "diamond" and "jewelry" is illustrated with a relevance score of 940 in category 3 (Shopping). Thus, as illustrated, any page having both of these words will be more strongly associated with the shopping category, and more weakly associated with the Sports category.

Referring to Figure 4, an overall process 300 of requesting access to an Internet page or site is illustrated. The process 300 begins at a start state 302 and then moves to a state 306 wherein an Internet browser on a workstation computer 12A-C requests an address on the Internet. Well-known browsers include Microsoft Explorer and Netscape Navigator. The browser request is normally made after a user has entered a desired URL into their browser software.

The user's request is then sent across the local area network 15 to the Internet Gateway system 20. The process 300 then moves to a state 308 wherein the requested Internet address is matched against the categorized database 30. It should be noted that the address can be a single page within an Internet site, or the default address of the site (e.g.: www.company.com).

A determination is then made at a decision state 310 whether an address match has been made with any address stored in the categorized database. If no match was found within the categorized database 30, the requested page is retrieved from the Internet at a state 312 and the process terminates at an end state 314.

However, if an address match between the requested address and the categorized database is found, the process 300 moves to a decision state 315 wherein a determination is made whether the current user has restricted access rights to specific categories of Internet pages. This determination can be made by reference to a list of network users, and an associated permissions table for each category found within the categorized database. Thus, a particular user may be restricted from access to all Sports and Pornography categories but not restricted from Internet Commerce or Travel categories. An exemplary list of Internet categories is provided below in Table 1.

Table 1

Listing of Categories

Category	Description
Abortion Advocacy	Abortion advocacy, pro or con.
Activist Groups	Organizations with a cause. This is a broad category that can include environmental groups and any other activist group not covered under other categories. **Note:** No special exceptions are made for Freedom of Speech activist sites.
Adult Entertainment	Full or partial nudity of individuals. This might include strip clubs, lingerie, adult-oriented chat rooms, erotica, sex toys, light adult humor and literature, escort services, password-verification sites, prostitution, and so forth. Sexually explicit language describing acts that would fit into this category are also categorized here.
Alcohol/Tobacco	Any site promoting, containing, or selling liquor or tobacco products, or their accessories.
Alternative Journals	Online equivalents to supermarket tabloids, or non-mainstream periodicals. **Note:** This category may contain materials that are sexual in nature.
Cult/New Age	Promoting or containing information on witchcraft, black arts, voodoo, spirituality, horoscopes, alternative religions, cult, UFOs. All religions not covered under the Religion category.
Drugs	Promotion of illegal drugs and/or drug culture information, or drug-related contraband. **Note:** As legality of drugs varies by country, the drug laws of the United States are used.
Entertainment	Sites promoting/containing information on movies, radio, television, books, theater, sedentary hobbies, magazines (non-business related), music, pets, humor/jokes, and sites containing downloadable software of an entertaining nature. **Note:** Computer magazines containing technical information are not included in this category.
Gambling	Any site that promotes gambling or allows online gambling.
Games	Information about or advocacy of board games, electronic games, video games, computer games, or on-line games. Includes both hardware and software.
Gay/Lesbian Lifestyles	Information about gay and lesbian lifestyles that does not contain sexually explicit images or text. Dating services and shopping sites that cater to gay or lesbian customers.
Hacking	Any site promoting questionable or illegal use of equipment and/or software to hack passwords, create viruses, gain access to other computers, and so on. Does not include security information sites.
Illegal	Promotion or information describing how to commit non-violent, illegal activity such as drunk driving, mail fraud, picking locks, white or blue collar crime of a non-technical nature. **Note:** U.S. laws are used as a guide.
Job Search	Personal job/career search sites.
Militancy	Any site promoting or containing information on militia operations, terrorist activity, war, riots, rebellion groups. Advocates of violence to overthrow governments.
Personals/Dating	People meeting other people, personal ads, mail order brides. Sites combining heterosexual and gay personals on the same site are included here. Dating and personals sites that accommodate only gay and lesbian lifestyles are categorized

Category	Description
•	under Gay/Lesbian Lifestyles.
Politics	Political advocacy of any type. Any site promoting or containing information on any political party, pro or con. This includes all registered and otherwise officially recognized political parties. Excludes all official government sites.
Racism/Hate	Ethnic impropriety, hate speech, anti-Semitism, racial clubs/conflict.
Religion	Religious advocacy, pro and con. Limited to: Atheism, Buddhism, Christianity, Hinduism, Island, Judaism and Shintoism.
Sex 1	Heterosexual activity involving one or two persons, hard-core adult humor and literature. Sexually explicit language describing acts that would fit into this category are also categorized here.
Sex 2	Heterosexual acts involving more than two people, homosexual and bisexual acts, orgies, swinging, bestiality, sadism/masochism, child pornography, fetishes and related hardcore adult humor and literature. Sexually explicit language describing acts that would fit into this category are also categorized here.
Shopping	Consumer-oriented online shopping. Includes real estate shopping. Excludes sites that sell sex toys, weapons, alcohol, tobacco, vehicles and vehicle parts or travel services. **Note:** The entire site is screened if the intent of the site is selling.
Sports	Sports and sports-related recreation. Team or individual activities, indoor or outdoor, with a physical component. For example, body building, hiking, camping, and football.
Tasteless	Offensive or useless sites, grotesque depictions caused by "acts of God."
Travel	Sites promoting or containing information on travel, leisure, vacation spots, transportation to vacation destinations.
Vehicles	Any site promoting vehicles, including: cars, vans, trucks, boats/water craft, ATV's, trains, planes and any other personal vehicles and vehicle parts. Vehicles within this category do not carry weapons.
Violence	Any site promoting or containing information on violent acts, murder, rape, violent criminal activity, gangs, gross depictions caused by acts of man, excess profanity.
Weapons	Any site promoting/containing information on guns, knives, missiles, bombs, or other weapons.
Web Chat	Chat sites via http protocol, chat rooms (non-IRC), forums and discussion groups. Home pages devoted to IRC.

Once a determination has been made at the decision state 315 that the user has restricted categories, the process 300 moves to a state 316 to determine which categories have been blocked for this particular user. This determination is made by reference to permissions list associated with the user.

The process 300 then moves to a decision state 320 to determine whether the requested page is within any of the restricted categories for this particular user. This determination is made by first determining the category of the requested address from the categorized database, and then comparing that result with the restricted categories for the user. If a determination is made that the requested page is not within one of the user's restricted categories, the revised page is retrieved at a state 324 and the process terminates at the end state 314.

If a determination is made at the decision state 320 that the requested page is within one of the user's restricted categories, the process 300 moves to a state 340 wherein access to the page is blocked. This blocking can occur by discarding the packet request from the user to the Internet, or simply closing the connection that was requested by the Internet browser to the requested page. The process 300 then returns an appropriate page notifying the user that their request has been denied. The process 300 then terminates at the end state 314.

Thus, Figure 4 provides an overview of one process for requesting and blocking access to particular Internet addresses based on whether the requested page appears within the categorized database 30. Figure 5 provides a method for creating the categorized database 30 by analyzing the content of word pairs and word adjacencies within Internet pages.

Referring to Figure 5, a process 328 of analyzing the word content of pages to determine their relevance to particular categories is illustrated. The process 328 begins at a start state 400 and then moves to a state 402 wherein the first word in an Internet page is retrieved. As used herein, the term "word adjacency" includes words that are directly adjacent one another. The term "word pair" includes any two words that are located on the same Internet page.

Once a first word from the page has been retrieved at the decision state 402, the process 328 moves to a state 404 wherein the relevance of every word pair that contains the first word in the page is determined for each of the defined categories. Thus, the first word and the third word in the page are determined, and that word pair is compared against the word relevancy table 210 in the training database to determine its relevance score in each of the listed categories. This relevance score is determined by reference to the word relevance table 210 (Figure 3) which lists each word pair and its associated relevance to every category. In one embodiment, the relevance score of a word pair within a particular category varies from 0 to 1,000, with 1,000 being a word pair that is perfectly associated with a category. Of course, various scoring systems can be developed that reflect the relevance of a particular word pair to a category. It should also be understood that a maximum distance between any two words within a word pair can be set. For example, the system may only analyze word pairs that are 10, 20, 30, 40 or more words apart, and then move to begin analyzing the next word in on the page.

The determined word pair relevance scores are then stored to a memory for later manipulation. The first word is then paired with the fifth word in the page to determine the new word pair's relevance to each category. This process is repeated for every possible two-word pair in the page that includes the first word.

The process 328 then moves to a state 405 wherein the relevance of the word adjacency of the first word and the second word is calculated by matching these words to the word relevance table 210 in the training database to determine their relevance to each category.

Once the relevance score for the retrieved word adjacency has been determined for every category, the process 328 moves to a state 408 wherein the relevance scores determined at the state 404 for each of the word pairs is added to the total page score for each category.

Thus, if the word pair "Cleveland" and "Browns" returned a relevancy score of 900 from the word relevancy table in the Sports category, the numerical value 900 would be added to the total page score for category 1 (Sports). Thus, word pairs having higher relevance scores in a category will result in a higher overall page relevance score in the current category for that page. Similarly, word pairs having lower relevance scores in a particular category will reduce the overall page relevance score to that category.

Once the word pair relevancy scores for the page have been added to the total page relevance score, the process 328 moves to a state 409 wherein the word adjacency relevancies that were determined at state 405 for each category are added to the page relevance category scores for the current Internet page.

Now that the page scores for each category have been calculated, a determination is made at a decision state 416 whether more words exist on the page to be analyzed. If a determination is made that no more words are available for analysis on the retrieved Internet page, the process 328 moves to a state 420 wherein the total page relevance score for each category is normalized to take into account the fact that pages with more words will have higher scores. For example, since page scores are determined by adding the relevancies of word pairs and word adjacencies, a page with 500 words will have a substantially higher score in each category than a page with 100 words. Thus, for example, dividing the page relevance score within each category by the total number of words on the page will normalize the page score so that pages of differing lengths will have approximately the same page score in each category. It should be noted that categories having higher average relevance scores for each word pair and word adjacency will have a higher page score than those categories having word pairs with lower relevance scores.

Once a normalized page score has been determined in each category for the retrieved page, the process 328 moves to a decision state 422 to determine whether the page relevance score for the category is greater than the alpha relevance score for that category. This determination is made by reference to the category ID table 205 in the training database 125. If the page relevance score is not greater than the alpha score, the process 328 moves to a decision state 424 to determine if the page relevance score is greater than the beta score for the category. If a determination is made that the page relevance score is not greater than the beta score, the process 328 moves to a state 426 wherein the retrieved site is stored to a table and flagged as having been analyzed, but not within any category. The process 328 then terminates at an end state 430.

If a determination is made at the decision state 422 that the page relevance score is above the alpha score for the category, the process 328 moves to a state 432 wherein the retrieved address is added to the categorized database 30. It should be noted that the categorized database 30 includes not only the address of the Internet addresses to block, but also the category that the Internet site is associated with so that a determination can be made whether a user having particular permissions should be provided access to the site, even though it is categorized within the database.

In an alternative embodiment, if a determination is made that the page score is greater than the alpha score for the category, the system may run instructions that access the current page on the Internet. The instructions then begin to score the hierarchical pages of the site while moving towards the main domain address

(e.g.:www.company.com). If a determination is made that any of higher nodes on the site are also above the alpha score for the same category, those sites are also added to the database. This provides the system with a mechanism for not only rating an individual page, but also the plurality of pages that appear below a specific node on an Internet site.

In one embodiment, the number of words that are considered on any page is limited to a predetermined number. For example, the system might be limited to only considering the first 100, 250, 500 or 1000 words on any page. Any words that follow the predetermined number would not be considered.

If a determination is made at the decision state 424 that the page relevance score is greater than the beta score, but lower than the alpha score, the process 328 moves to a state 434 wherein this address is flagged for further analysis by a technician. The process then terminates at the end state 430.

If a determination is made at the decision state 416 that more words are left to be analyzed in the retrieved page, the process 328 moves to a state 436 wherein the next word in the page is selected as the first word for each word pair and word adjacency. In this manner, the system "walks" across the page by analyzing each word in the page in conjunction with every other word. This provides a complete analysis of every possible word pair and word adjacency in the page.

Through the process 328 illustrated in Figure 5, a newly retrieved Internet page is scored and associated with one or more categories within the system. Each page that is found to have relevancy score within any category that is greater than the alpha score for that category is added to the categorized database 30 for the categories that it is associated with. In addition, any page that is found to have a relevancy score that is greater than the less stringent beta score is flagged for analysis by a technician so that it can be manually added to the categorized database, if necessary. Through this mechanism, new Internet pages are added to the system on a regular basis.

Referring to Figure 6, a process 500 for creating the word relevance table 210 within the training database 125 is described. The process 500 begins at a start state 502 and then moves to a state 504 wherein a first category to train is selected. The category might be, for example, the Sports category. The process 500 then moves to a state 508 wherein web pages that have been predetermined to be within the chosen category (e.g., sports) are retrieved. Thus, because these pages are known to be within the category selected at state 504, the relevance of each word pair and word adjacency within the chosen page can be assigned a high relevance to the current category.

Once web pages within the chosen category are retrieved, the process 500 moves to a state 510 wherein a target page score is determined for the currently selected page. Normally, a page that is highly relevant to a particular category is given a score of, for example, 1,000. However, it should be realized that any similar type of scoring scale that is used to relate words to a category can similarly be implemented. Once the target page score is determined at the state 510, the process 500 moves to a state 516 wherein the first page of the retrieved pages is selected for analysis.

The number of words on the selected page is then counted at the state 520 and the process thereafter moves to a state 526 wherein the number of unique word pairs are divided by the target page score (1000) so that if

the word pairs were re-scored, the total page relevance score would be 1000. Similarly, the target page score (1000) is divided by the number of unique word adjacencies to result in a word adjacency score that, if added together, would result in a page relevancy score of 1000 (extremely high relevance to the trained category). It should be noted that common words such as "a", "the" and "and" are ignored to minimize processing time and increase the accuracy of the scoring process. Moreover, computer language instructions and hypertext headers are also ignored in order to increase the accuracy of scoring the pages.

The process then moves to a state 530 wherein the current score for each word pair and word adjacency (1000) is averaged with the same word pair and word adjacency scores already stored in the word relevance table. Thus, if we are training the Sports category, and the word adjacency "Cleveland Browns" is found within the current page, it might be assigned a word adjacency value of 105 in the Sports category. However, if the term "Cleveland Browns" is already scored within the Sports category at a value of 89, the 105 value and the 85 value would be averaged to normalize the word adjacency score to the Sports category. This system therefore allows words that are used over and over within certain categories to be "up-trained" so that their relevance score with the chosen category will go up as they appear on more pages that are scored. In addition, it should be understood that the system is capable of parallel processing of a plurality of sites simultaneously.

The process 500 then moves to a state 534 wherein the alpha and beta scores for the category being trained are determined. The alpha score is the numerical score that, when exceeded, indicates that the selected page is clearly within a category. The beta score is the numerical score that, when exceeded, indicates that the selected page may be within a category. As discussed above, the alpha score is normally chosen so that 99% of the pages having that score are within the chosen category. The beta score is normally chosen so that 75-85% of the pages having that score are within the chosen category. These scores are determined by analyzing the average score of the trained pages in the category to determine cut-off values for new pages.

The word relevance scores are then saved to the word relevance table 210 in the training database 125 at a state 536. A determination is then made at a decision state 540 whether more pages that need to be trained are available. If no more pages are available, the process 500 terminates at an end state 544. If a determination is made that more pages do exist, the process 500 moves to a state 550 wherein the next page to be analyzed is selected. The number of words are then counted on the page at the state 520 and the process continues as described above.

Through the process 500 described above, a word relevance table is developed which includes normalized word relevances for every word pair and word adjacency that might be found in an Internet page. By analyzing new pages and by adding together the relevances of each word within the page, an automated system is provided for assigning a page relevance score for a particular page to each of the predetermined categories within the system. Thus, once a particular category has been trained by analysis of a large number of pages, the system can rapidly analyze new pages for their relevance to each of the predetermined categories.

As described above in Figure 2, a page retrieval module 110 is utilized for retrieving new Internet pages and sending them to the analysis module 120 for scoring. Figure 7 provides an illustration of a process 600 for retrieving pages from the Internet.

The process 600 begins at a start state 602 and then moves to a state 606 wherein the address of the first site to categorize is determined by random access of an address from the categorized web database 30. Once an address of a first site to categorize is determined at the state 606, the process 600 moves to a state 610 wherein the first page of the Internet site is read. The process then moves to a state 612 wherein the page that has been read is forwarded to the analysis module 120 so that the word pairs and word adjacencies on the page are analyzed for their relevance to a predetermined category.

The process 600 then moves to a decision state 616 in order to determine whether more pages exist on the current site to be analyzed. If no more pages exist on the current site, the process 600 moves to a decision state 620 to determine whether any sites on the Internet reference the currently analyzed site. If no more sites reference the current site, the process 600 terminates at an end state 624.

If more pages do exist to be analyzed at the decision state 616, the process 600 moves to a state 630 wherein the next page on the current site is read. The process then continues to state 612 wherein the new page is sent to the analysis module 120.

If a determination is made at the decision state 620 that there are sites that reference the current site, the process 600 moves to a state 632 wherein the system points to the address of the first referenced site. The process 600 then returns to the state 610 in order to read the first page on the newly retrieved Internet site.

EXAMPLE 1

Normalizing Training Data

As discussed above, the source pages of different web sites have different numbers of words on them. This can affect the word pair and word adjacency training process since Internet sites with fewer words on them can force higher relevancies on word pairs and word adjacencies than sites with fewer words. For instance, consider two pages, A and B, with 10 and 500 words pairs on their source pages respectively. Assuming each site has a current page score (***Sc***) of 0 and a target page score (***St***) of 1000. The current training algorithm takes the form of the following equation:

(E1) $$Wrn = Wrc + I ,$$

where ***Wrn*** is the new word pair relevance and ***Wrc*** is the current word pair relevance and ***I*** is the amount that the each word pair relevance should be incremented such that if the page were immediately re-scored its score would equal the target score. ***I*** can be found by taking the current score, subtracting it from the target score and dividing it by the total number of word pairs (***Wt***) on the page. The equation is as follows:

(E2) $I = [(St - Sc) / Wt$

Finding the new word pair relevance requires adding the current relevance to the increment value. The new word pair relevance equation then becomes:

(E3) $Wrn = Wrc + [(St - Sc) / Wt]$

Using the equation above to calculate the word pair relevances for sites A and B we find:

(E4) $Wrn(A) = 0 + [(1000 - 0) / 10] = 100$ *(note: I = 100)*

(E5) $Wrn(B) = 0 + [(1000 - 0) / 500] = 2$ *(note: I = 2)*

Interpreting these results, the 10 word pairs on site A would each have a relevance of 100 while the 500 word pairs on site B would each have a relevance of 2 to the chosen category after one round of training.

If these two sites were determined to be equally "qualified" to train a particular category, then logically they should influence word pairs from other pages to a similar degree. However, at this point, this is not the case. Instead, a site with 10 word pairs can influence the weight of words found up to as much as 5000% more than a site with 500 word pairs. Instead, a system that increments word pairs "evenly", regardless of the number of words that occur on the page is desired.

A method for normalizing the amount that each word pair is incremented is advantageous. Using the results from E4 and E5, the minimum and maximum amount that each word pair can be incremented is 100 and 2 respectively. Since, we want the minimum relevance score and the maximum relevance score to approach each other, we can take their average using the midpoint theorem:

Mp = (p1 + p2) / 2 , where Mp is midpoint, p1 is point 1, and p2 is point 2

We find that the midpoint between the min and max increment is:

(E6) $Mp = [I(A) + I(B)] / 2$

Using the values from E4 and E5,

(E7) $Mp = [100 + 2] / 2 = 102 / 2 = 51$

Thus, determining the *"adjustment constants"* that should be used to adjust the relevance scores towards the midpoint score for each site relies on the following two equations:

(E8) $I(A) * AdjCon(A) = Mp$ or $AdjCon(A) = Mp / I(A)$

(E9) $I(B) * AdjCon(B) = Mp$ or $AdjCon(B) = Mp / I(B)$

Substituting in,

(E10) $AdjCon(A) = 51 / 100 = .51$

(E11) $AdjCon(B) = 51 / 2 = 25.5$

Therefore, with ten words, the increment should be multiplied by .51 to reach the midpoint value of 51. Similarly, with 500 words, the increment value needs to be multiplied by 25.5 to reach the midpoint value of 51. This logic can be used to formulate the training normalization constant, ***Nt***. The equation for calculating ***Nt*** is:

(E12) $Wt(X) * Nt = AdjCon(X)$ or $Nt = AdjCon(X) / Wt(X)$

With a min of 10 words ($Wt(A) = 10$) and max of 500 words ($Wt(B) = 500$), the training normalization constant is:

(E13) $Nt = AdjCon(A) / Wt(A) = .51 / 10 = .051$

(E14) $Nt = AdjCon(B) / Wt(B) = 25.5 / 500 = .051$

The training normalization constant with a range of words between 10 and 500 words is .051. The importance of this constant can now be illustrated. The total score, ***Sn***, for the pages in our example after one round of training can be found using the equation:

(E15) $Sn = Wt * Nt * (St - Sc) / Tp$,

where ***Tp*** is the total number of possibilities of word combinations.

It should be noted that the total number of possibilities is dependent upon such things as groupings and the manner in which the words are cycled through. For example, if the page has 100 words, we can take groups of 10 words and cycle through them in increments of 5. Taking such things into account the equation for ***Tp*** becomes:

$$Tp = (Wt / Wi - 1) * (Wg)! / [(Wg - k)! (k)!]$$

Where k is the k-set: k =1 for single words, k = 2 for word pairs, k = 3 for word triplets, etc. ***Wg*** is word groupings, ***Wt*** is word total, and ***Wi*** is word increment (or cycling). In the examples in discussed below, ***Wt*** is equal to ***Tp***. While this simplifies the examples provided herein, it is not necessarily the case when k > 1.

In the special case where ***Wt = Tp***, the amount that the relevance score for each word will be raised is:

(E16) ***Nt * (St - Sc) or .051 * (St – Sc)***

This is a simplified example, but illustrates the basic principles of normalizing word scores in the training process. Note that for k > 1 (or anything other than single word counts), ***Wt is not equal to Tp.***

It should also be appreciated that this normalization process can be used to not only train lexical elements to be associated with a particular sites (up-train), it can also be used to train lexical elements to not be associated with a particular site (down-train). During an up-training session, the word relevance scores of lexical elements on a page are increased within the designated category to indicate that they are more strongly associated with the category.

During a down-training session, the word relevance scores of lexical elements on a page are reduced to indicate that they are less strongly associated with a chosen category. Accordingly, it should be realized that to down train a page, the normalization constant would be calculated to move the score of each page downward to, for example, a score of 500. Thus, each lexical element on the page would be multiplied by a normalization constant that resulted in a lowered value for the page relevance score.

However, in either case, it is advantageous to normalize the amount that each word relevance score changes so that a page with fewer lexical elements does not more greatly affect the word relevancies found on that page.

Example 2

Normalizing Internet Page Scoring

If words, word pairs and word adjacencies are "trained up" by approximately the same value so that each has a gradually greater relevance score, then how does that affect the page scoring process. Assume two sites A and B, have 10 and 500 words on them respectively. Each has a score of 0 before one round of training and the target score is 1000. Since we are dealing with single words, k = 1, then ***Wt = Tp***. Using equation 16, we find that the amount each word will be incremented is:

(E17) ***.051 * (St – Sc) = .051 * (1000 – 0) = 51***

If each word was raised 51 points, then the score of each page after one round of training would be 51 times the number of words on that page. The score for each page is:

(E18) ***Score(A) = 10 * 51 = 510***

(E19) ***Score(B) = 500 * 51 = 25500***

Obviously, these scores are not close to each other. Judging solely upon the numbers, it would seem that site B was much more relevant to a category than site A. However, we used them both to train the same category. Consequently, they should have similar values after one round of training. We need a system that takes into account the skew that pages with varying numbers of words can create.

What we want to accomplish is to create some means of normalizing scores of pages based on the number of words that occur on them. Using equations 18 and 19, we can approximate the maximum and minimum scores for sites. Since we want the min and max to approach each, we can find their midpoint using the midpoint formula:

(E20) ***(510 + 25500) / 2 = 13005***

Finding the *"adjustment variables"* for this set of data requires dividing the midpoint score by the real score:

(E21) ***Ns(A) = 13005 / 510 = 25.5*** ***(note: Wt = 10)***

(E22) ***Ns(B) = 13005 / 25500 = .51*** ***(note: Wt = 500)***

We now know the points (10 words, 25.5) and (500 words, .51). If we find a few more points (255, 1), (132, 1.931818), and (378, 0.674603) and plot them, we get
an ordered data set with a trendline that has the equation:

(E23) ***y = 255 * x ^ -1***

Substituting in the ***Ns(Wt)*** for ***y*** (which is the score normalizer, given a set number of words) and ***Wt*** (total words) for ***x***. We get the equation:

(E24) ***Ns(Wt) = 255 * (Wt) ^ -1***

For our sites A and B with 10 and 500 words:

(E25) ***Ns(10) = 255 * (10) ^ -1 = 25.5***

(E26) ***Ns(500) = 255 * (500) ^ -1 = .51***

In general, the scoring equation becomes:

(E27) ***Normalized Score(Site X) = Ns(Wt(Site X))*Original Score(Site X) .***

Using the results from equations 18 and 19, the scores of site A and site B were 510 and 25,500, respectively. Using the normalized score technique, after one round of training the scores of these sites would be:

(E28) ***Normalized Score(A) = Ns(Wt(A)) * Score(A) = 25.5 * 510 = 13005***

(E29) ***Normalized Score(B) = Ns(Wt(B)) * Score(B) = .51 * 25500 = 13005***

The sites have the same score after training. This supports the logic that sites that are used to train a category should have similar scores. These equations, in combination with the normalization of training data, as shown in Example 1, minimizes the error caused by having sites with different numbers of words on them in a training set.

Example 3

Scoring a Page

Approximately 8000 samples were collected from sites from the Category Two (or Sex 2) of the Suggest Database. These potential category two sites had previously been checked by Web Analysts to determine whether they were, in fact, Internet sites that were primarily sexual or pornographic in nature. A score of 8 was assigned to a site that was verified as a sex site and a score of 7 to those sites that were determined not to be sex sites. The categorization system had assigned a category rating for category two to all 8000 Sites.

The purpose of the study was to determine whether the categorization system could distinguish between sites rated as 8's and 7's, or accepted sites and deleted sites, respectively. It should be noted that a deleted site is one that should not have been categorized within the Sex category and an accepted site is one that was confirmed to be within the category. The hypothesis was that the mean score for the sites rate as 8's would be statistically different from the mean score for sites rated as 7's. As suspected, the mean for the accepted sites (8's) were significantly higher than the mean for the deletions (7's). However, there was an overlap between the two groups. This result suggests that the use of a cutoff point could be used to minimize the error involved.

	Mean Score	**Standard Deviation**	**Median**
7's (deletions)	929	482	842

Alpha Point = **Ap = M7 + 4 (SD7)** = 929 + 4 (482) = **2857**

Beta Point = **Bp = M7 + 1 (SD7)** = 929 + 1 (482) = **1411**

Using an alpha point of 2857 we found a sorting accuracy of 99% or above. There were only 9 sites that were above the alpha score, but did not belong within the Sex category. Seven of them were simple errors, perhaps attributable to poor training of the Category 2 sites.

Two of them were purposeful tricks, meaning that the Internet sites used sex-related terms to attract attention in their metatags. The exact percentage for the sorting accuracy, using the alpha point of 2857, was therefore 99.30%. Thus, according to this test, if a thousand sites were entered with a score above this alpha point there will be, on average, only 7 mistakes and 993 correctly sorted sites.

However, because the alpha point is set very high, many sites that are, in fact, sexually oriented, will not be categorized at all. Using an alpha point of 2857, the inclusion level of accepted sites is only 49.80%. This means that out of a thousand sites that should be placed in category two, 498 would be found and 502 missed.

For this reason, the system also monitors sites that have a lower relevance to each category through creation of a beta point. Using a beta point of 1411, the inclusion level rises from 49.80% to 81.76%. The number of sites missed falls from 502 to 183 sites, and the number caught rises from 498 to 817. Thus, the use of both the alpha and beta points results in more accurate scoring of any new site.

Example 4

Normalizing Training Data by Increments

Another embodiment of a method for normalizing training data is explained below. First, we define Is = initial score and Ts = target score for the page being trained.

1) Begin with a test increment value of, for example, 1. Increment the values of the relevance of all lexical values by the test value. (e.g.: all lexical values existing on the page).

2) Calculate the resulting page relevance score after this test addition.

3) If the new score = Ms., the increment value, I, (for all lexical elements) =

$$I = (Ts - Is) / (Ms - Is)$$

Thus, the difference between the target score and the current score, divided by the effect on the score when each elements relevance is incremented by 1 is the correct number to Increment each element to achieve the target score.

Accordingly, if the Is = 500, and Ts = 1000 incrementing all relevancies by 1 will result in a page score of 550 and:

$$I = (1000 - 500) / (550 - 500).$$

Therefore, to increment the page to result in a page score of 1000, we need to use an increment value is 10 for each lexical element.

In general the relevance for a value will be incremented by the Increment constant (I) * the # of occurrences of that element on the page. This follows from the notion that the more often an element appears on a page the more relevant it is. However, this process resulted in large fluctuations in the relevance of elements that would occur frequently, but were not common words. For this reason, in one embodiment, each value was only allowed to increment by a maximum 5 * increment constant (I).

WHAT IS CLAIMED IS:

1. A computerized system for controlling access to Internet sites, comprising:

a first module that categorizes an Internet site into predefined subject-matter categories;

a second module that stores the address of said Internet site and its associated category to a database; and

a third module that controls access to said Internet site, said third module comprising instructions that block access to said Internet site if said Internet site is within a particular category.

2. The computerized system of Claim 1, wherein said first module categorizes said Internet site by determining the relevance of lexical elements within said site to a subject-matter category.

3. The computerized system of Claim 2, wherein said lexical elements are selected from the group consisting of: words, word pairs and word adjacencies.

4. The computerized system of Claim 2, wherein the relevance of said lexical elements to said subject matter category is determined by comparing said lexical elements to a training database comprising a plurality of lexical elements and their associated relevancies to subject matter categories.

5. The computerized system of Claim 1, wherein said subject matter categories are selected from the group consisting of: sex, drugs, sports, shopping, alcohol, gambling, politics, religion, travel and violence.

6. The computerized system of Claim 1, wherein said third module comprises a permissions table for determining whether a user has access rights to Internet sites within a particular category.

7. A database of categorized Internet addresses, produced by the method of:

retrieving a first Internet page;

parsing said Internet page to determine the lexical elements on said page;

comparing said lexical elements to a table of category relevancies to determine the relevance of each lexical element to a subject matter category;

determining the subject matter category of said Internet page based on the relevance of each lexical element to a category; and

storing the address and subject matter category of said Internet page to a database.

8. The database of Claim 7, wherein said lexical elements are selected from the group consisting of: words, word pairs and word adjacencies.

9. The database of Claim 7, wherein the relevance of said lexical elements to said subject matter category is determined by comparing said lexical elements to a training database comprising a plurality of lexical elements and their associated relevancies to subject matter categories.

10. The database of Claim 7, wherein the table of category relevancies is produced by obtaining an Internet page from within a known subject matter category and storing lexical elements from said page to said table along with relevance scores indicating that said lexical elements are associated with said category.

11. A method of controlling access to an Internet site, comprising:

categorizing a first Internet site into a predefined subject-matter category;

storing the address of said Internet site and its associated category to a database;

capturing a user request to view said site; and

determining whether said user has permission to view said category of sites and, responsive to said determination, controlling access to said site.

12. The method of Claim 11, wherein said Internet site is categorized by determining the relevance of lexical elements within said site to a subject-matter category.

13. The method of Claim 12, wherein said lexical elements are selected from the group consisting of: words, word pairs and word adjacencies.

14. The method of Claim 12, wherein the relevance of said lexical elements to said subject matter category is determined by comparing said lexical elements to a training database comprising a plurality of lexical elements and their associated relevancies to subject matter categories.

15. The method of Claim 11, wherein said subject matter category is selected from the group consisting of: sex, drugs, sports, shopping, alcohol, gambling, politics, religion, travel and violence.

16. The method of Claim 11, wherein determining whether said user has permission to view said category of sites comprises referring to a permissions table that stores user identifications and access rights to subject matter categories.

17. A method of controlling access to Internet sites, comprising:

providing a training database, said training database comprising lexical elements and their relevance to subject matter categories;

determining the relevance of a plurality of Internet pages to subject matter categories;

storing the address of said plurality of Internet pages and their relevance to subject matter categories to a categorized database; and

comparing the Internet address of pages requested by users with said categorized database to determine if said users have permission to view said pages.

18. The method of Claim 17, wherein said Internet pages are categorized by determining the relevance of lexical elements within said site to a subject-matter category.

19. The method of Claim 18, wherein said lexical elements are selected from the group consisting of: words, word pairs and word adjacencies.

20. The method of Claim 18, wherein the relevance of said lexical elements to said subject matter category is determined by comparing said lexical elements to a training database comprising a plurality of lexical elements and their associated relevancies to subject matter categories.

21. The method of Claim 17, wherein said subject matter categories are selected from the group consisting of: sex, drugs, sports, shopping, alcohol, gambling, politics, religion, travel and violence.

22. The method of Claim 17, wherein determining whether said user has permission to view said category of sites comprises referring to a permissions table that stores user identifications and access rights to subject matter categories.

5

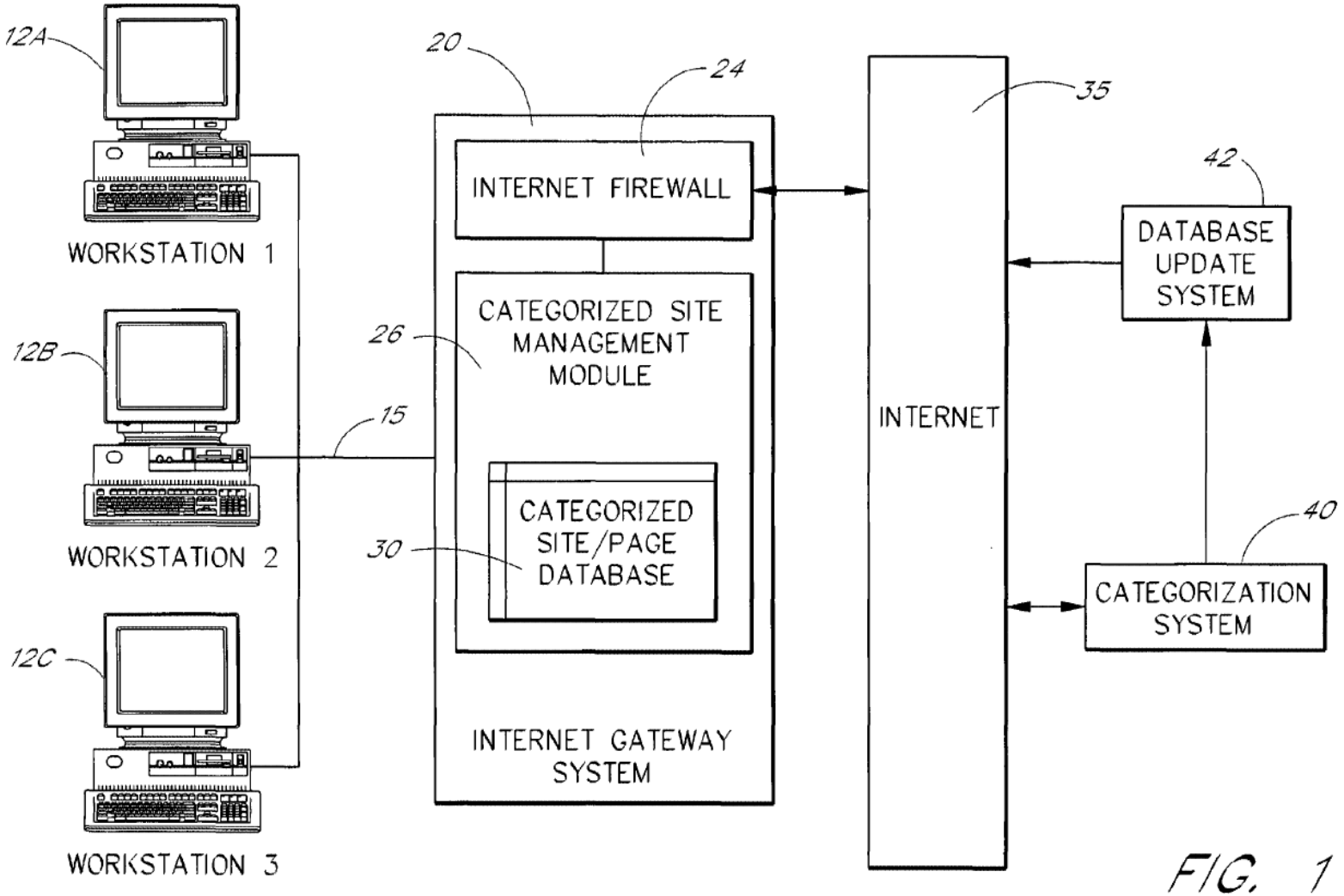


FIG. 1

SUBSTITUTE SHEET (RULE 26)

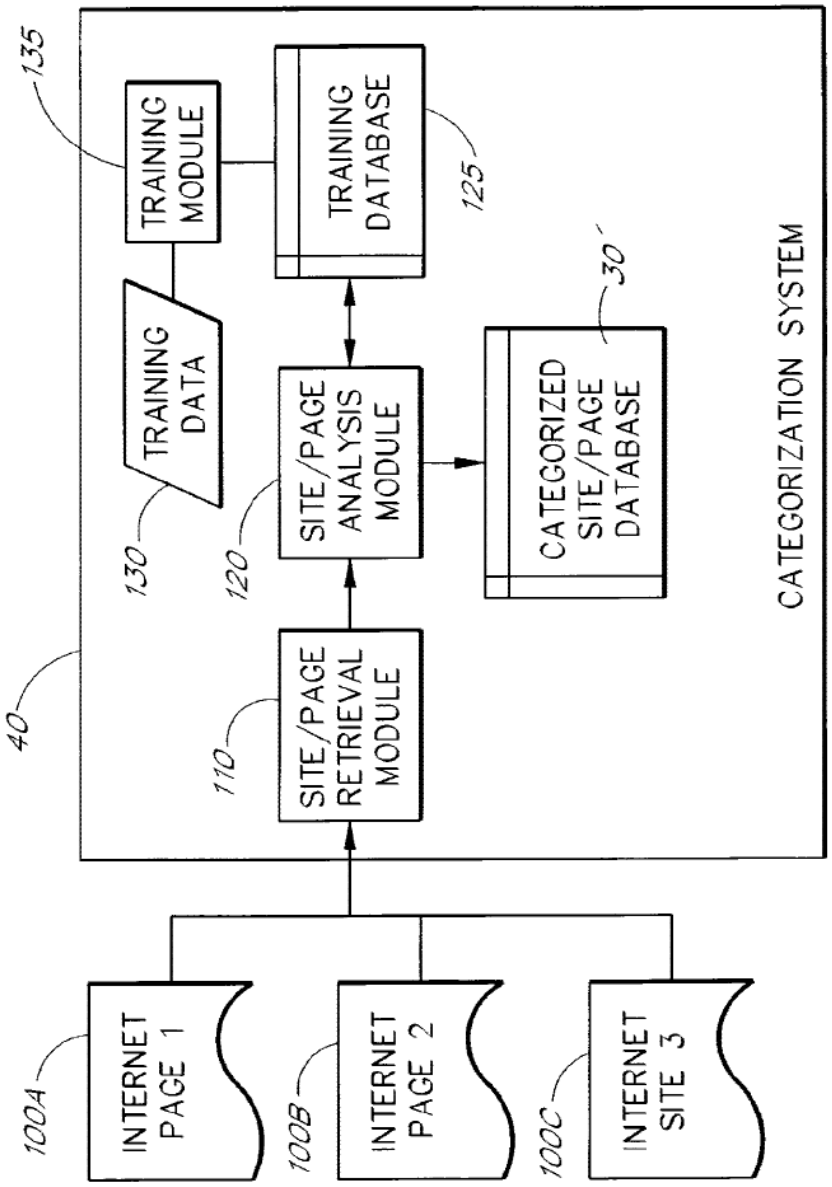


FIG. 2

Netskope Exhibit 1003

125

WORD ID TABLE 200

WORD	ID NUMBER
THE	1
AND	2
CLEVELAND	234
BROWNS	198
DIAMOND	755
JEWELRY	1345

CATEGORY ID TABLE 205

CATEGORY	ALPHA SCORE	BETA SCORE	DESCRIPTION
1	920	810	SPORTS
2	860	705	SEX
3	880	740	SHOPPING
4	710	630	PORNOGRAPHY
5	940	865	LEISURE
6	860	690	RELIGION

WORD RELEVENCE TABLE 210

FIRST WORD ID	SECOND WORD ID	CATEGORY	RELEVENCE SCORE	PAIR	ADJACENT
234	198	1	900	N	Y
755	1345	1	290	N	Y
755	1345	3	940	Y	N
234	1345	1	250	N	Y

TRAINING DATABASE

FIG. 3

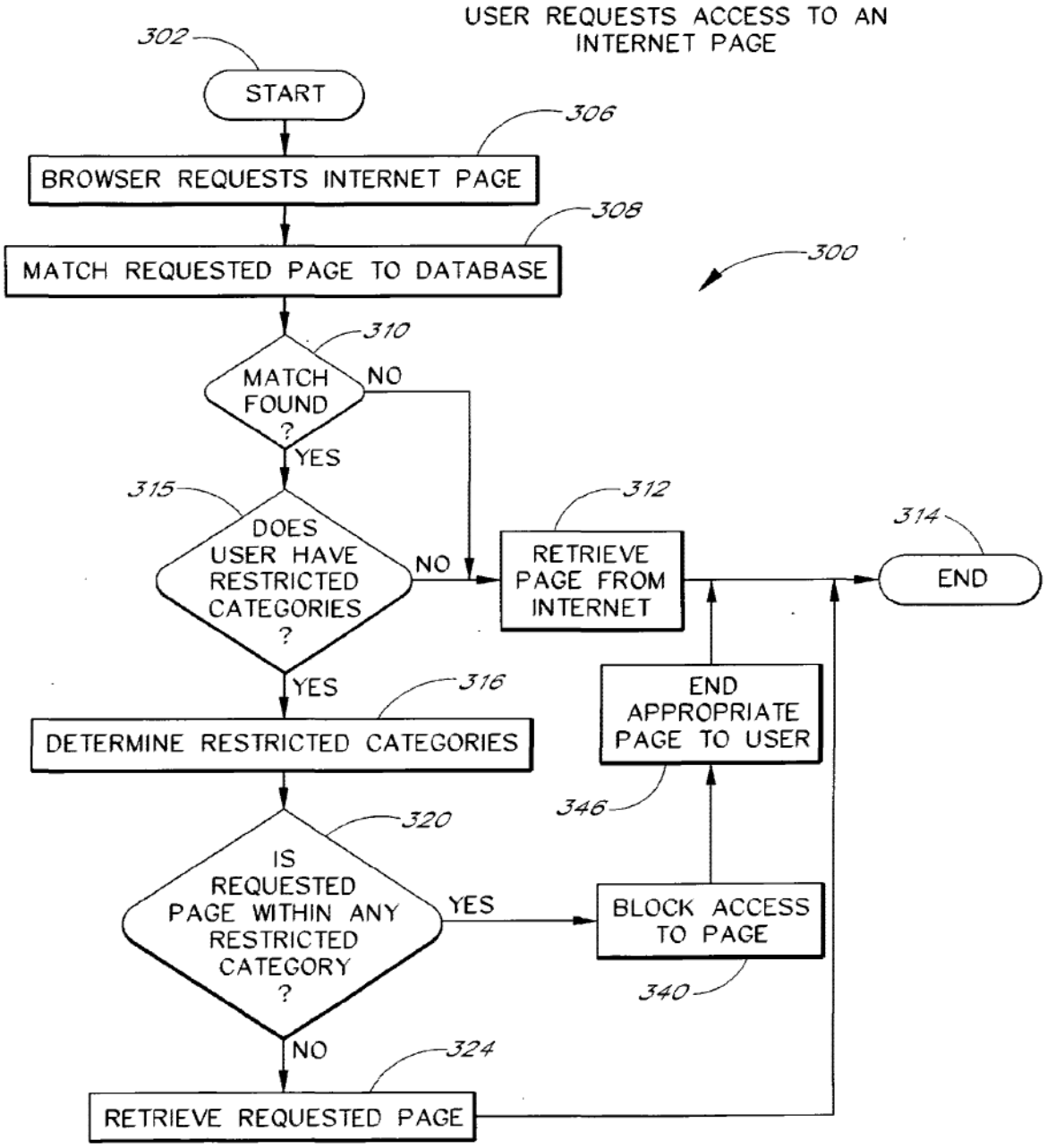

USER REQUESTS ACCESS TO AN INTERNET PAGE
302
START
306
BROWSER REQUESTS INTERNET PAGE
308
MATCH REQUESTED PAGE TO DATABASE
300
310
MATCH FOUND ?
NO
YES
315
DOES USER HAVE RESTRICTED CATEGORIES ?
NO
312
RETRIEVE PAGE FROM INTERNET
314
END
YES
316
DETERMINE RESTRICTED CATEGORIES
END APPROPRIATE PAGE TO USER
346
320
IS REQUESTED PAGE WITHIN ANY RESTRICTED CATEGORY ?
YES
BLOCK ACCESS TO PAGE
340
NO
324
RETRIEVE REQUESTED PAGE

FIG. 4

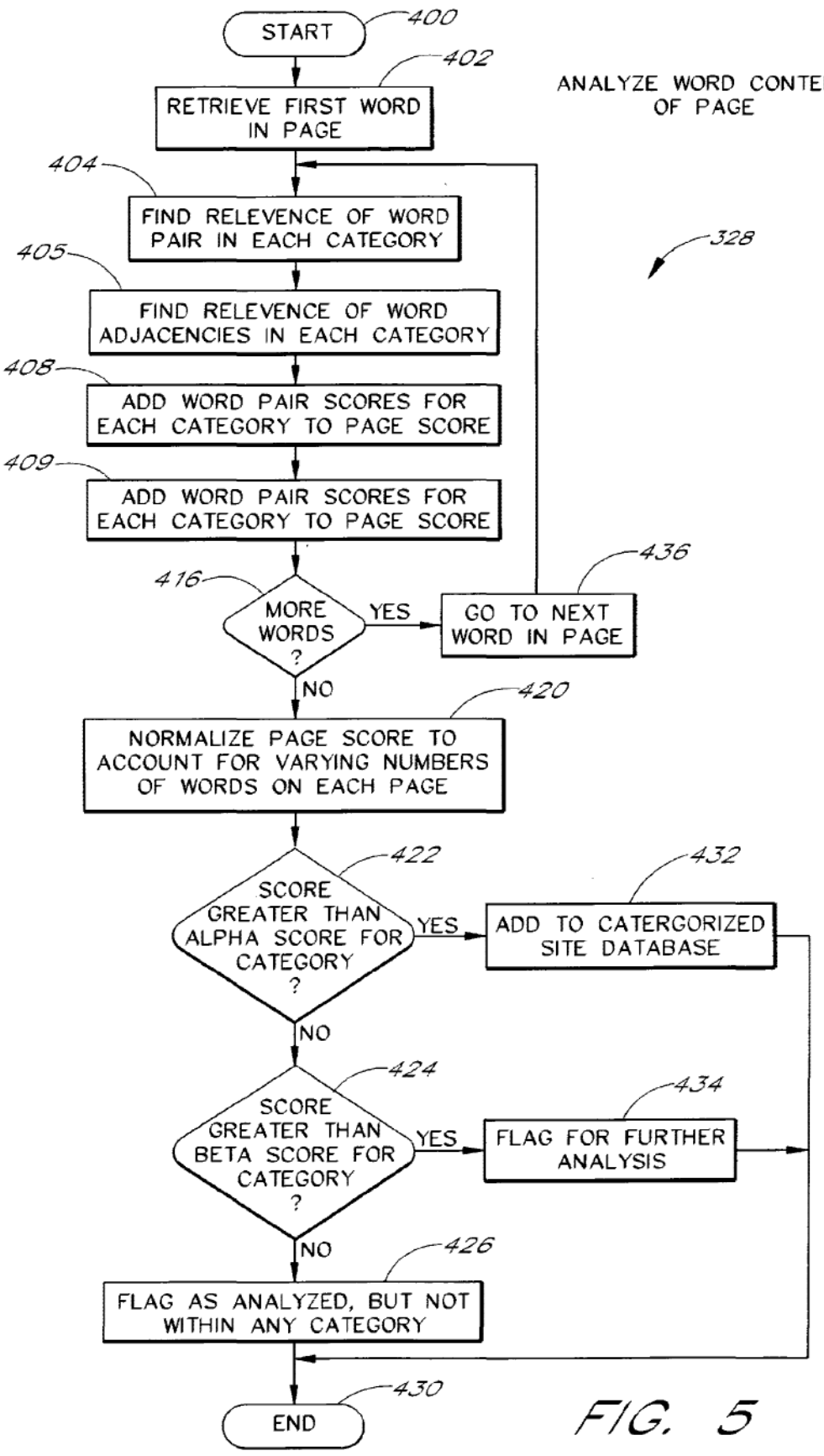

START
400
RETRIEVE FIRST WORD IN PAGE
402
ANALYZE WORD CONTENT OF PAGE
404
FIND RELEVENCE OF WORD PAIR IN EACH CATEGORY
328
405
FIND RELEVENCE OF WORD ADJACENCIES IN EACH CATEGORY
408
ADD WORD PAIR SCORES FOR EACH CATEGORY TO PAGE SCORE
409
ADD WORD PAIR SCORES FOR EACH CATEGORY TO PAGE SCORE
416
MORE WORDS ?
YES
436
GO TO NEXT WORD IN PAGE
NO
420
NORMALIZE PAGE SCORE TO ACCOUNT FOR VARYING NUMBERS OF WORDS ON EACH PAGE
422
SCORE GREATER THAN ALPHA SCORE FOR CATEGORY ?
YES
432
ADD TO CATERGORIZED SITE DATABASE
NO
424
SCORE GREATER THAN BETA SCORE FOR CATEGORY ?
YES
434
FLAG FOR FURTHER ANALYSIS
NO
426
FLAG AS ANALYZED, BUT NOT WITHIN ANY CATEGORY
430
END

FIG. 5

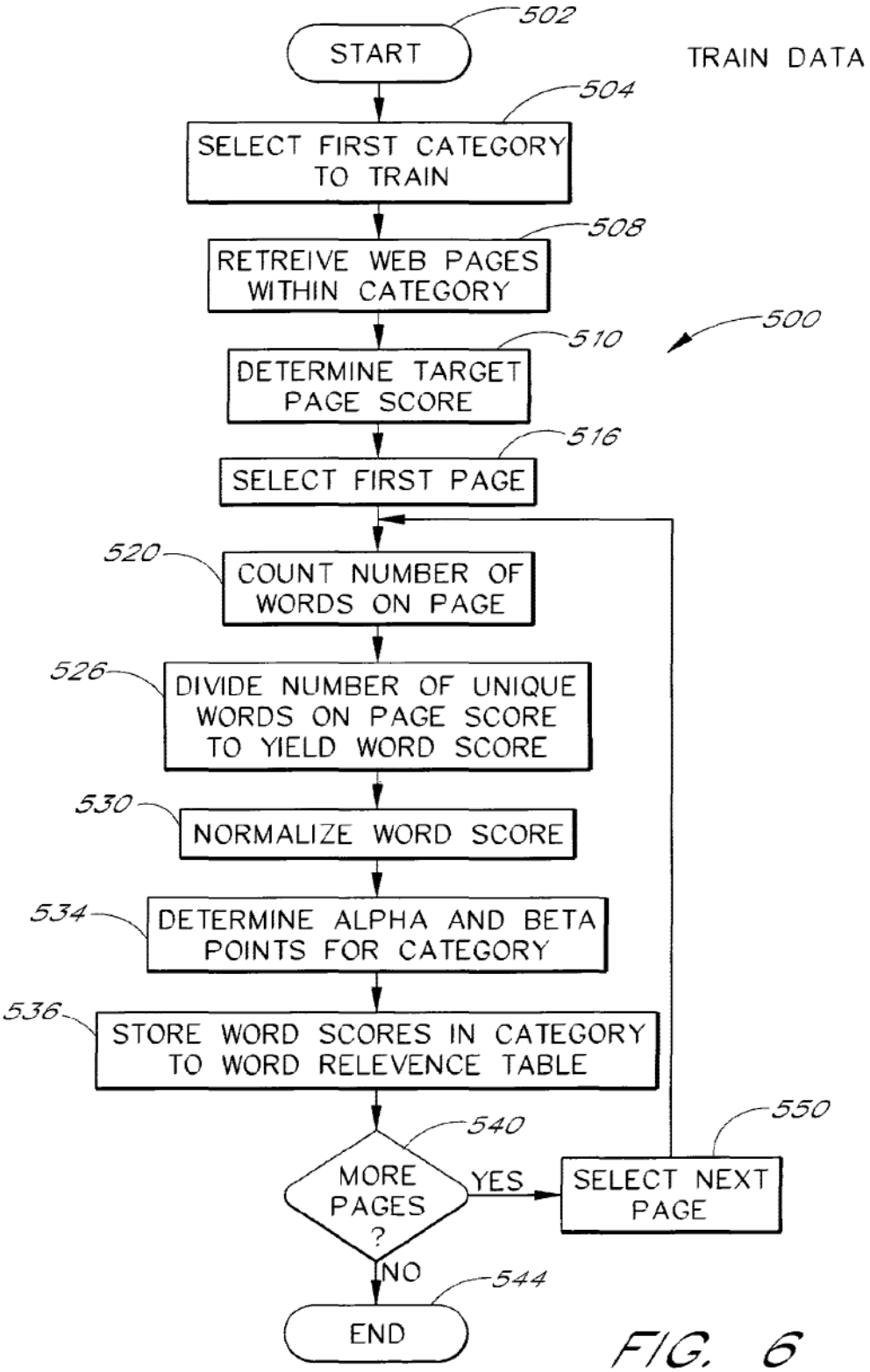

TRAIN DATA
502
START
504
SELECT FIRST CATEGORY TO TRAIN
508
RETREIVE WEB PAGES WITHIN CATEGORY
500
510
DETERMINE TARGET PAGE SCORE
516
SELECT FIRST PAGE
520
COUNT NUMBER OF WORDS ON PAGE
526
DIVIDE NUMBER OF UNIQUE WORDS ON PAGE SCORE TO YIELD WORD SCORE
530
NORMALIZE WORD SCORE
534
DETERMINE ALPHA AND BETA POINTS FOR CATEGORY
536
STORE WORD SCORES IN CATEGORY TO WORD RELEVENCE TABLE
540
MORE PAGES ?
YES
550
SELECT NEXT PAGE
NO
544
END

FIG. 6

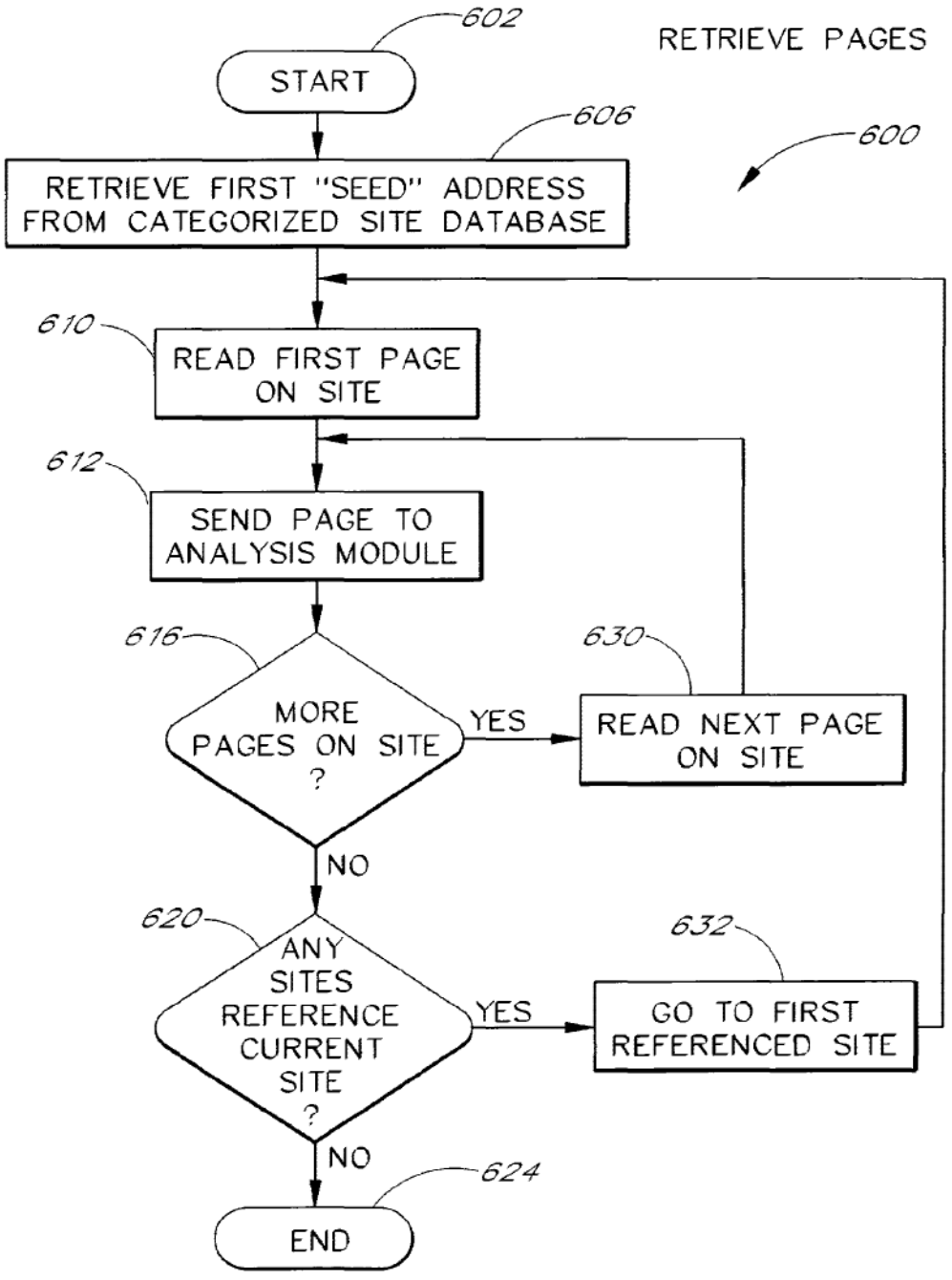

RETRIEVE PAGES
600
602
START
606
RETRIEVE FIRST "SEED" ADDRESS FROM CATEGORIZED SITE DATABASE
610
READ FIRST PAGE ON SITE
612
SEND PAGE TO ANALYSIS MODULE
616
MORE PAGES ON SITE ?
YES
630
READ NEXT PAGE ON SITE
NO
620
ANY SITES REFERENCE CURRENT SITE ?
YES
632
GO TO FIRST REFERENCED SITE
NO
624
END

FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/02280

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) : G06F 17/30, G06F 11/00
US CL : 707/9, 10; 709/203, 217, 221, 255
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 707/9, 10; 709/203, 217, 221, 255

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,832,212 A (CRAGUN et al) 03 November 1998, abstract, fig.1, col.3 line 30 to col.4 line 30, col.5 line 35 to col.6 line 10.	1-22
Y	US 5,835,722 A (BRADSHAW et al) 10 November 1998, abstract, figs.1, 2, col.7 lines 8-65, col.9 lines 1-31, col.10 lines 4-46.	1-22
A	US 5,848,412 A (ROWLAND et al) 08 December 1998, fig.1, col.3 line 36 to col.4 line 29.	1-22

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 19 APRIL 2000	Date of mailing of the international search report 25 MAY 2000
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer AHMAD MATAR Telephone No. (703) 305-4731

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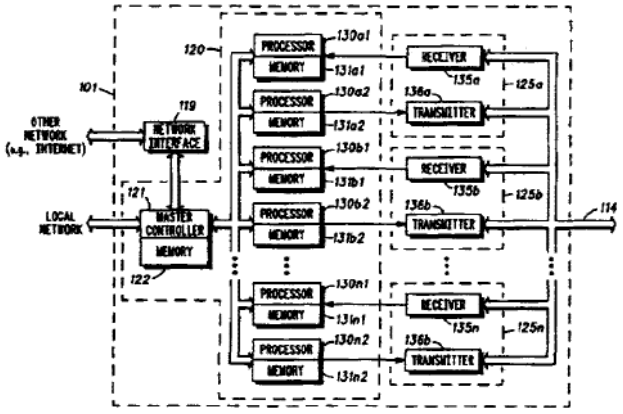
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(57) Abstract

The apparatus (101) and method for spectrum management in a multipoint communication system controls upstream channel usage for secondary stations (110) transmitting information to a primary station (101) and downstream channel usage for secondary stations (110) receiving information from a primary station (101). The preferred apparatus (101) embodiment includes a processor arrangement (120) having a master controller (121) and a plurality of processors (130), with the processor arrangement connected to a channel interface (125). The apparatus (101) and method controls channel load balancing, channel congestion, and channel assignment in a multipoint communication system, and controls upstream channels independently from downstream channels. Factors and parameters utilized in such channel control and allocation include error parameters, channel noise parameters, transmit and receive loading factors, and congestion parameters.

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APPARATUS AND METHOD FOR SPECTRUM MANAGEMENT IN A MULTIPOINT COMMUNICATION SYSTEM

Field of the Invention

This invention relates, in general, to data communications and data communications systems and devices and, more specifically, to an apparatus and method for spectrum management in a multipoint communication system.

Background of the Invention

With the advent of multimedia communications, data transmission has become increasingly complex. For example, multimedia communications applications such as real time transmission of digitally encoded video, voice, and other forms of data, may require new forms and systems for data communication and data transmission. One such new communication system is the CableComm™ System currently being developed by Motorola, Inc. In the CableComm™ System, a hybrid optical fiber and coaxial cable is utilized to provide substantial bandwidth over existing cable lines to secondary stations such as individual, subscriber access units, for example, households having new or preexisting cable television capability. These coaxial cables are further connected to fiber optical cables to a central location having centralized, primary (or "head end") controllers or stations having receiving and transmitting capability. Such primary equipment may be connected to any variety of networks or other information sources, from the Internet, various on line services, telephone networks, to video/movie subscriber service. With the CableComm™ System, digital data may be transmitted both in the downstream direction, from the primary station or controller (connected to a network) to the secondary station of an individual user (subscriber access unit), and in the upstream

direction, from the secondary station to the primary station (and to a network).

In the CableComm™ System, downstream data is currently intended to be transmitted using 64 quadrature amplitude modulation ("QAM") at a rate of 30 M bps (megabits per second), at 5 M symbols/second utilizing 6 bits/symbol, over channels having 6 MHz bandwidth in the frequency spectrum of 50 - 750 MHz. Anticipating asymmetrical requirements with large amounts of data tending to be transmitted in the downstream direction rather than the upstream direction, less capacity is provided for upstream data transmission, using $\pi/4$ differential quadrature phase shift keying ($\pi/4$-DQPSK) modulation in the frequency band from 5 - 42 MHz with a symbol rate of 384 k symbols/sec with 2 bits/symbol. In addition, the communication system is designed to have a multipoint configuration, i.e., many end users (secondary stations, also referred to as subscriber access units) transmitting upstream to a primary station, with one or more primary stations transmitting downstream to the secondary stations. The communication system is also designed for asynchronous transmission, with users transmitting and receiving packets of encoded data, such as video or text files. In addition, it is also highly likely that transmission may be bursty, with various users receiving or transmitting data at indeterminate intervals over selected channels in response to polling, contention, or other protocols from the primary station, rather than transmitting a more continuous and synchronous stream of information over a dedicated or circuit switched connection.

For such a communication system having a multipoint configuration, with multiple upstream and downstream channels, it is highly desirable to provide for appropriate or optimal spectrum management, providing for load balancing across various transmit and receive channels, channel (or spectrum) allocation under various types of noise or other

error conditions, and for channel (or spectrum) allocation under various types of congestion conditions. Prior art in other fields, such as telephone networks and wireless voice networks, have not been concerned with such spectrum management because these issues typically do not arise for such networks. For example, noise conditions may typically be tolerated in a voice (rather than data) environment. Other fields, such as typical wireline data, are not concerned with channel assignment issues. Wireless voice and data fields, moreover, tend to be concerned about overall system capacity and are not concerned about congestion management and load balancing within channels, as those channels are circuit switched, dedicated channels. Accordingly, a need has remained to provide for spectrum management in emerging multipoint communications systems, such as the CableComm™ system, providing for load balancing, channel assignment, and congestion management within the multipoint communication system.

Brief Description of the Drawings

FIG. 1 is a block diagram illustrating a communication system in accordance with the present invention.

FIG. 2 is a block diagram illustrating a primary station apparatus in accordance with the present invention.

FIG. 3 is a block diagram illustrating a secondary station apparatus in accordance with the present invention.

FIG. 4 is a flow chart illustrating upstream spectrum management under noise conditions in accordance with the present invention.

FIG. 5 is a flow chart illustrating downstream spectrum management under noise conditions in accordance with the present invention.

FIG. 6 is a flow chart illustrating upstream channel loading for secondary devices entering the communication system in accordance with the present invention.

FIG. 7 is a flow chart illustrating downstream channel loading for secondary devices entering the communication system in accordance with the present invention.

FIG. 8 is a flow chart illustrating upstream channel loading for active secondary devices of the communication system in accordance with the present invention.

FIG. 9 is a flow chart illustrating downstream channel loading for active secondary devices of the communication system in accordance with the present invention.

FIG. 10 is a flow chart illustrating upstream congestion management for active secondary devices of the communication system in accordance with the present invention.

FIG. 11 is a flow chart illustrating downstream congestion management for active secondary devices of the communication system in accordance with the present invention.

FIG. 12 is a flow chart illustrating upstream and downstream spectrum management in accordance with the present invention.

Detailed Description of the Invention

As mentioned above, a need has remained to provide for spectrum management in emerging multipoint communications systems, such as the CableComm™ system. Such spectrum management, in accordance with the present invention, includes channel allocation (and assignment) on the basis of error parameters, loading conditions, and congestion management. FIG. 1 is a block diagram illustrating a communication system 100 in accordance with the present invention, such as a multipoint communication system. As

illustrated in FIG. 1, a primary station 101, also referred to as a primary transceiver unit 101, is coupled to a plurality of secondary stations 110_a through 110_n, via communication media 115 and 116. In the preferred embodiment, communication media 115 and 116 are hybrid optical fiber and coaxial cable. In other embodiments, the communication media may be coaxial cable, fiber optic cable, twisted pair wires, and so on, and may also include air, atmosphere or space for wireless and satellite communication. The primary station 101 is also coupled to a network 105, which may include networks such as the Internet, on line services, telephone and cable networks, and other communication systems. The secondary stations 110_a through 110_n are illustrated in FIG. 1 as connected to the primary station 101 on two segments or branches of a communication medium, such as communication media 115 and 116. Equivalently, the secondary stations 110_a through 110_n may be connected to more than one primary station, and may be connected to a primary station (such as primary station 101) utilizing more or fewer branches, segments or sections of any communication medium.

Continuing to refer to FIG. 1, in the preferred embodiment, the communication medium, such as communication media 115 and 116, has or supports a plurality of communication channels. For ease of reference, the communication channels in which a primary station, such as the primary station 101, transmits information, signals, or other data to a secondary station, such as secondary station 110_n, are referred to as downstream channels or downstream communication channels. Also for ease of reference, the communication channels in which a secondary station, such as secondary station 110_n, transmits information, signals, or other data to a primary station, such as primary station 101, are referred to as upstream channels or upstream communication channels. These various upstream and downstream channels may, of course, be the same physical

channel or may be separate physical channels, for example, through time division multiplexing or frequency division multiplexing. These various channels may also be logically divided in other ways, in addition to upstream and downstream directions. As mentioned above, in the preferred embodiment of the CableComm™ System, the communication medium is hybrid fiber coaxial cable, with downstream channels in the frequency spectrum of 50 - 750 MHz, and with upstream channels in the frequency band from 5 - 42 MHz.

FIG. 2 is a block diagram illustrating a primary station 101 in accordance with the present invention. The primary station 101 (also referred to as a primary transceiver) is coupled to a communication medium 114 for upstream and downstream communication to one or more secondary stations (not illustrated), and is coupleable to a network, such as the Internet, through a network interface 119. The primary station includes a processor arrangement 120 which is connected to a plurality of channel interfaces, channel interface 125_a through channel interface 125_n, for communication over the communication medium 114. The processor arrangement 120 includes a master controller 121 having or connected to memory 122, and one or more additional processors 130_{a1} through 130_{n2} and corresponding associated memories 131_{a1} through 131_{n2}. In the preferred embodiment, the master controller 121 is a Motorola M68040 processor, and the memory 122 is 16 MB RAM. The master controller 121 performs a variety of higher level functions in the preferred embodiment, such as the spectrum management of the present invention, plus other functions such as routing, management of secondary stations, and communication protocol management (such as SNMP management). The master controller 121 is connected to a plurality of other processors, collectively referred to as processors 130 and separately illustrated as processor 130_{a1}, processor 130_{a2}, through processor 130_{n1} and processor 130_{n2}. Each of these processors, processor

130_{a1}, processor 130_{a2}, through processor 130_{n1} and processor 130_{n2}, is also coupled to or contains corresponding memory circuits, memory 131_{a1}, memory 131_{a2}, through memory 131_{n1} and memory 131_{n2}. In the preferred embodiment, each of these processors 130 are also Motorola M68040 processors, while the corresponding memory circuits, memory 131_{a1} through memory 131_{n2}, are 4 MB RAM. In the preferred embodiment, the processors 130 perform such functions related to upstream and downstream data protocols, such as sending a poll message or an acknowledgment message downstream. Each of these processors 130_{a1} through 130_{n2} of the processor arrangement 120 are connected to corresponding receivers and transmitters of the channel interfaces, channel interface 125_a through channel interface 125_n (collectively referred to as channel interfaces 125), namely, receiver 135_a through receiver 135_n (collectively referred to as receivers 135) and transmitter 136_a through transmitter 136_n (collectively referred to as transmitters 136). In the preferred embodiment, depending upon the functions implemented, each of the receivers 135_a through 135_n may include a Motorola M68302 processor, a Motorola 56000 series digital signal processor, a ZIF SYN integrated circuit, and an LSI Logic L64714 (Reed-Solomon decoder), for demodulation and for decoding forward error correction and cyclic redundancy checks. In the preferred embodiment, also depending upon the functions implemented, each of the transmitters 136_a through 136_n may include a Motorola M68302 processor, a Motorola 56000 series digital signal processor, a ZIF SYN integrated circuit, and an LSI Logic L64711 (Reed-Solomon encoder), for modulation and for coding for forward error correction and cyclic redundancy checks. As a consequence, as used herein, the channel interfaces 125 may be considered to perform the functions of data and other signal reception and transmission, regardless of the specific hardware implementations and additional functions which may

or may not be implemented. The various memories illustrated, such as memory 122 or 131_{a1}, may also be embodied or contained within their corresponding processors, such as master controller 121 or processor 130_{a1}. The functions of these various components with respect to the present invention are explained in greater detail below with reference to FIGs. 4 -12.

In the preferred apparatus embodiment illustrated in FIG. 2, the spectrum management method discussed below with reference to FIGs. 4 through 12 may be programmed and stored, as a set of program instructions for subsequent execution, in the processor arrangement 120, and more particularly, in the master controller 121 and its associated memory 122 of a primary station, such as primary station 101 illustrated in FIG. 2. Information from secondary stations, which are discussed below with reference to FIG. 3, such as downstream channel bit error and packet error rates, may be obtained from forward error correction encoders and/or decoders, such as the LSI Logic L64711 and L64714 integrated circuits, included in the channel interface circuit 160. Similar information for upstream channel bit error and packet error rates may be obtained from forward error correction encoders and/or decoders, such as the LSI Logic L64711 and L64714 integrated circuits, included in the channel interface circuits 125.

FIG. 3 is a block diagram illustrating a secondary station 110_n in accordance with the present invention. The secondary station 110_n includes a processor 150, with the processor 150 having or coupled to a memory 155. In the preferred embodiment, the processor 150 is a Motorola M68302 processor (also known as an integrated multiprotocol processor), and the memory 155 is 256 K RAM. The processor 150 is coupled to an interface 170, such as an ethernet port or an RS232 interface, for connection to a computer, a workstation, or other data terminal equipment. The processor 150 is also coupled to a channel interface 160 for

communication over the communication medium 114. The channel interface 160, in the preferred embodiment, depending upon the functions implemented, includes a Motorola M68HC11 integrated circuit, a ZIF SYN integrated circuit, a Broadcom BCM3100 QAMLink integrated circuit, a Motorola TxMod integrated circuit, and LSI Logic L64711 and L64714 integrated circuits, and performs such functions as forward error correction encoding and decoding, QAM demodulation (for downstream reception), $\pi/4$-DQPSK modulation (for upstream transmission), transmit level and frequency adjustment, for data and other signal reception and transmission. As a consequence, as used herein, the channel interface 160 may be considered to perform the functions of data and other signal reception and transmission, regardless of the specific hardware implementations and additional functions which may or may not be implemented. The memory illustrated as memory 155 may also be embodied or contained within the corresponding processor 150. The additional functions of these components of the secondary station 110_n with respect to the invention are also described in greater detail below with reference to FIGs. 4 - 12.

As discussed in greater detail below, the apparatus and method of the present invention provides for spectrum management, namely, channel allocation (or assignment), to optimize overall performance of a communication system 100 and to optimize performance to end users, typically consumers, who are utilizing secondary stations 110_a-110_n, under a variety of conditions. The first set of conditions, discussed with reference to FIGs. 4 and 5, concern various types of noise conditions, such as ingress noise and impulse noise. The second set of conditions, discussed with reference to FIGs. 6 and 7, concern channel loading conditions as devices such as secondary stations enter or come on line in the communication system 100, because as such devices come on line, there may be sudden bursts of activity (data transmission and reception),

which should be considered in performance optimization. The third set of conditions, discussed with reference to FIGs. 8 and 9, concern channel loading conditions for active devices, such as secondary stations, any of which may utilize large or small portions of any given channel at any given time, with concomitant potential to overuse or monopolize available bandwidth, impacting data throughput and system responsiveness. The fourth set of conditions, discussed with reference to FIGs. 10 and 11, concern congestion conditions, which also impacts data throughput and system responsiveness. Lastly, in FIG. 12, overall spectrum management utilizing all four types of conditions is illustrated. It should be understood that these various processes, routines or subroutines illustrated may be and most likely will be repeated, on an ongoing basis, for overall spectrum management. As a consequence, when a particular portion of the spectrum management method is terminated, as described below, it should be understood to mean that the particular iteration is terminated, as the process may be continually repeated. In addition, various steps, such as steps 710 and 810 of congestion management, are event driven, rather than poll driven, i.e., the congestion parameters are continually monitored, so that when a congestion condition occurs, it is an event which automatically causes the remaining congestion alleviation activities. As a consequence, no limitation should be inferred or implied, for any given step, concerning whether it is event or poll driven.

Throughout the specification, channel assignment, reassignment or allocation, and transferring of receivers and transmitters to other channels, are frequently discussed. As illustrated in FIGs. 2 and 3, such channel assignment, reassignment or allocation, and transferring of receivers and transmitters to other channels, should be understood to include or refer to the underlying physical or apparatus activities, such as the transfers of the corresponding transmitters and

receivers. For example, when a transmitter of a secondary station is transferred from an unusable upstream channel to another, second upstream channel, a corresponding primary station receiver will also be transferred to the second channel, and similarly, when a receiver of a secondary station is transferred, a corresponding primary station transmitter may also be transferred, depending upon the circumstances.

Also throughout the specification, various thresholds are frequently employed to describe how an outcome of a comparison, such as a branching of a method, may occur. While referred to as thresholds, it should be understood that such thresholds may have a variety of forms, and may also include allowable or desirable tolerances and variances. In addition, the thresholds may not only be fixed or predetermined, the thresholds may be adaptive and vary over time, depending upon external conditions and depending upon desired levels of performance.

FIG. 4 is a flow chart illustrating upstream spectrum management under noise conditions in accordance with the present invention. Based upon various noise conditions on a given (or first) upstream channel, in accordance with the present invention, secondary devices operating on that given upstream channel may be switched to another (or second) channel having better conditions, to increase data throughput and optimize communication system performance. Beginning with start step 200, an error parameter for a given (or first) channel is monitored (or measured), step 205. In the preferred embodiment, the packet error rate is monitored by each processor 130_{n1} in the primary station 101, based upon the forward error correction performed by the corresponding receiver 125_n (i.e., errors in the packet which could not be corrected through the use of a selected forward error correction methodology). In other embodiments, other error parameters may be monitored or measured, such as bit error rates, block error rates, burst error rates, frame error rates,

noise levels (such as levels of impulse noise or ingress noise), other interference, or other parameters or factors which could be correlated with channel quality. For example, monitoring an error rate may comprise monitoring a set of error rate parameters of a plurality of sets of error rate parameters in which the plurality of sets of error rate parameters consist of any of a plurality of combinations of a bit error rate, a packet error rate, a burst error rate, a block error rate, and a frame error rate. Next, in step 210, the error parameter is compared with a first predetermined or adaptive threshold, and if the error parameter is not greater than the first threshold, indicating that the error parameter is sufficiently or acceptably low, then nothing further needs to be performed with regard to upstream channel allocation under noise conditions and this portion of the method may terminate, return step 250. In the preferred embodiment, the first threshold is empirically determined, and may be predetermined (such as fixed) or adaptive, varying based upon historical information of the system and also vary according to the performance requirements of any given installation of the communication system 100. In step 210, however, if the error parameter is greater than the first predetermined threshold, indicating that the error parameter is unacceptably high, then based upon the presumption that the error is due to noise, distortion or other interference on the given channel, the method determines or measures a channel noise parameter for the given upstream channel, while it is idle (all coupled secondary stations not transmitting upstream), and for all idle upstream channels, step 215. In the preferred embodiment, the channel noise parameter is the received signal strength which, when measured while the channel is idle, provides an indication of noise levels, and is referred to as the received signal strength indicator ("RSSI"). The channel noise parameter may also be measured or determined utilizing other indicators, such as mean square error, phase or gain hits,

nonlinear distortion, phase error, signal to noise ratios, and narrow band interference. Next, in step 220, the channel noise parameter for the given (or first) channel is compared to a second threshold. The second threshold may also be empirically determined, and may also vary over time and vary based upon any data accumulated over time for a given communication system 100 (historical data).

In step 220, if the channel noise parameter, such as the RSSI, is greater than the second threshold, the channel noise is considered to be ingress noise, and if the channel noise parameter, such as the RSSI, is less than the second threshold, the channel noise is considered to be impulse noise. Utilizing RSSI as the channel noise parameter, impulse noise is assumed to form a low average (or average out) over time, resulting in a lower noise parameter compared to ingress noise, which may be more constant or have a more constant level over time. The selection of other channel noise parameters may result in a different comparison result in step 220. For example, a different channel parameter, when compared to a corresponding threshold, may indicate ingress noise if less than the threshold and impulse noise if greater than the threshold. Accordingly, the method only requires that the channel noise parameter be utilized in such a way, such as through comparison to a particular threshold level, so as to distinguish or differentiate impulse noise from other types or characterizations of noise, such as ingress noise. As a consequence, in step 220, when the channel noise is considered to be ingress noise (e.g., the channel noise parameter, such as the RSSI, is greater than the second threshold), as explained in greater detail below, the method will attempt to find another (second) channel having less overall noise, and reallocate secondary stations to this other (second) channel. If in step 220, however, the channel noise is considered to be impulse noise (e.g., the channel noise parameter, such as the RSSI, is less than the second threshold), as explained in greater detail

below, the method will attempt to find another (second) channel having a higher frequency than the current, given channel, based upon the consideration that impulse noise tends to diminish or roll off at higher frequencies.

Continuing to refer to FIG. 4, when the channel noise parameter indicates ingress noise in step 220, the method selects an idle channel having the lowest channel noise parameter, step 230, such as the idle channel having the lowest RSSI (as determined in step 215). Because of overhead (such as service disruption) associated with switching secondary stations or devices from one upstream channel to another upstream channel, in accordance with the present invention, secondary stations will only be switched to another channel if that channel is considerably better, i.e., secondary stations will not be switched from a bad channel to a bad (but somewhat better) channel. As a consequence, prior to switching any secondary stations from the given (first) channel to this selected (second) channel having the lowest channel noise parameter of the available idle channels, the channel noise parameter of the selected (second) channel is compared to a minimum acceptable level or threshold, step 235. If the channel noise parameter (such as the RSSI) of the selected (second) channel is less than the minimum acceptable level in step 235, then secondary stations or devices currently assigned to the given (first) channel will be reassigned to the selected (second) channel, step 240, along with the corresponding receiver and transmitter of the primary station. Once the devices have been transferred, upstream data transmission (or traffic) may resume, step 245, and this portion of the method may end, return step 250). In the preferred embodiment, this is accomplished by the transmission of a message from the primary station 101 to each of the secondary stations 110_a-110_n which have been operating on the given upstream channel.

Following step 235, if the channel noise parameter (such as the RSSI) of the selected (second) channel (which is the lowest channel noise parameter of the available idle channels), however, is not less than the minimum acceptable level in step 235, then the method determines whether receivers other than the given receiver for the given channel (such as any of the receivers 135_a-135_n) are available for the secondary devices which are utilizing the given channel, step 255. If other receivers are available in step 255, then the secondary devices currently assigned to the given channel and given receiver are reassigned to the other receivers (and channels), and the current (given) receiver is idled, step 260. The idled current receiver may then be utilized to measure channel noise parameters (such as RSSI) on all the idle channels of the system, so that other receivers do not need to perform this task, step 265, and will monitor the idle channels for future use or reuse if and when the idle channels once again meet minimal requirements. This portion of the spectrum management methodology may then terminate, return step 250. If other receivers are not available in step 255, however, the method will continue to utilize the current, given channel, step 270, as no reasonable alternatives are available. In these circumstances, the method will provide a communication system warning, step 275, followed by terminating this portion of the method, return step 250.

Continuing to refer to FIG. 4, when the channel noise parameter indicates impulse noise in step 220, the method selects an idle channel having the highest available frequency because, while impulse noise may have an effect over a wide frequency band, impulse noise tends to diminish at higher frequencies, step 280. The channel noise parameter of the selected, higher frequency channel is compared to the channel noise parameter of the current, given channel, step 285. If in step 285 the channel noise parameter of the selected, higher frequency channel is not worse than the channel noise

parameter of the current, given channel by a predetermined amount (i.e., the channel noise parameter of the selected, higher frequency channel is better than the combination consisting of the channel noise parameter of the current channel plus the predetermined amount), then secondary devices assigned to the current, given channel are switched to the selected, higher frequency channel, step 240 (followed by steps 245 and 250). The predetermined amount, such as 2 dB, may be empirically determined. This comparison step involves a balance or trade, namely, avoiding impulse noise, even if the avoidance results in slightly worse ingress noise. If in step 285 the channel noise parameter of the selected, higher frequency channel is worse than the channel noise parameter of the current, given channel plus the predetermined amount (i.e., the channel noise parameter of the selected, higher frequency channel is worse than the combination consisting of the channel noise parameter of the current channel plus the predetermined amount), then an idle channel is selected having the next highest frequency (higher than the frequency of the current channel), step 290. The comparison process of step 285 is repeated until either an acceptable higher frequency channel is found, or all available channels having a higher frequency have been examined (and none are better), step 295, and this iteration of the upstream channel allocation portion of the spectrum management method terminates, return step 250.

As indicated above, the channel noise parameter may be any number or type of indicator, and is an RSSI in the preferred embodiment, measured when the selected channel has been idled. In the preferred embodiment, the RSSI measurement is made utilizing an average of eight sets of samples, where each sample spans 16 symbols (with a symbol rate of 384,000 and 2 bits/symbol). In addition to utilization of a statistical average (mean) other statistical information may be applied to evaluate the channel noise parameter indications such as, for

example, the mean and standard deviation (or other measure of variance). For example, a high standard deviation within the samples may indicate a narrow peak of noise, indicative of impulse noise rather than ingress noise. In addition, depending upon the type of statistical information to be gathered, the number of samples and the duration of the samples may also be varied.

FIG. 5 is a flow chart illustrating downstream spectrum management under noise conditions in accordance with the present invention. Based upon various noise conditions on a given (or first) downstream channel, in accordance with the present invention, secondary devices operating on that given downstream channel may be switched to another (or second) channel having better noise conditions, to increase data throughput and optimize communication system performance. Beginning with start step 300, downstream error rate data is collected (via upstream channels) from all secondary stations connected and active (powered on and periodically or frequently receiving information or other data) on the current, given downstream channel, step 305, such as the packet error rate seen by each active secondary station. Next, in step 310, the method determines the number of secondary stations having error rates greater than a predetermined threshold. The predetermined threshold may be empirically determined, or may be based upon system data gathered over time (historical information or data). If the number of secondary stations having high error rates is not greater than a predetermined percentage (or adaptive threshold) of all connected secondary stations in step 315, indicating that most secondary devices are not experiencing excessively high error rates, then nothing further needs to be performed currently with regard to downstream channel allocation under noise conditions and this portion of the method may terminate, return step 330. If the number of secondary stations having high error rates is greater than the predetermined percentage (or adaptive threshold) of

all connected secondary stations in step 315, indicating that a sufficient number or percentage of secondary devices are experiencing excessively high error rates, then the current, given downstream channel is unacceptable, and secondary stations are reassigned to other downstream channels, if any are available, step 320. Alternatively, it may be the case that when one downstream channel is unacceptable that all other downstream channels may be experiencing similar noise or other interference problems and, in which case, step 320 may be omitted. Next, a system notification or warning is issued, step 325, followed by terminating this iteration of the downstream channel allocation portion of the spectrum management methodology, return step 330.

As indicated above, the predetermined threshold utilized in step 315 may also be adaptive. In the communication system 100, it is anticipated that downstream channels may be subject to minimum standards or other governmental regulation. As a consequence, it may be more likely that a particular secondary station connected to the downstream channel, or a section or a branch of a downstream channel, are experiencing high error rates, rather than an entire downstream channel. A high error rate experienced by one or only a few secondary stations on a downstream channel, first, may provide topological information concerning the communication system 100 and, second, distinguishes a possibly malfunctioning secondary station from a possibly malfunctioning downstream channel. As a consequence, prior to designating a downstream channel as malfunctioning or unacceptable, a predetermined or adaptive percentage of secondary stations should be having high error rates, rather than a few isolated secondary stations. This threshold level may be adaptive as well, varying in light of communication system activity, topological information, and historical information.

Other historical information may also be influential in development of the various thresholds referred to above, and for determinations of various communication system performance and quality metrics and other evaluations. In addition, as discussed in greater detail below, such historical information may also have predictive value, for example, to enhance the decision methodology employed in channel reallocation, such as in congestion management. As an example, it may be undesirable to add additional secondary stations to a particularly channel, if there is historical (or database) information indicating that the channel is likely to become congested. Relevant historical or database information may include, for example, system performance based upon the time of day, and especially during times in which there may be greater or additional sources of noise or other interference. Such time of day information may include early morning use of hair dryers, neighboring amateur radio antenna leakage at a particular time of the day, evening interference from televisions, or other sources of interference such as electric motors. As this historical information may be developed, it may be useful in distinguishing communication system performance, such as a malfunction, from other potential causes of error and system degradation.

Such historical information may also be utilized to distinguish impulse noise from ingress noise, useful for step 220 of FIG. 4. For example, a continuous degradation of a channel may be indicative of ingress noise, whereas a satisfactory channel with a sudden increase in error may be indicative of impulse noise. Such historical information may also be useful for making channel noise parameter measurements, such as an RSSI. For example, historical information may be useful to adaptively control the time window or duration of samples and the number of samples performed.

FIG. 6 is a flow chart illustrating upstream channel loading for secondary devices entering or coming on line in the communication system in accordance with the present invention. As secondary stations or devices are powered up and come on line, they will be assigned an upstream channel connected to a particular receiver 135_n of the primary station 101, and the upstream channel loading for the various receivers will be varied or balanced in accordance with this portion of the spectrum management methodology. Beginning with start step 340, a receive loading factor will be determined for each receiver 135_n. In the preferred embodiment, for each receiver 135_n, a packet rate (packets/second) will be determined in step 345, a bit rate (bits/second) will be determined in step 350, and a cycle time will be determined in step 355. The cycle time is a measure of the time taken to reach every secondary station (connected to the particular receiver) according to the particular protocol. In the preferred embodiment, utilizing a polling protocol, the cycle time is the average time to perform one iteration of polling all secondary stations (with the corresponding acknowledgment messages transmitted upstream by each of the secondary stations), and measures how long the system will take to respond to a given secondary station (with corresponding potential impact on consumer satisfaction). Other factors may also be utilized in the determination of the receive loading factor. In addition, the receive loading factor may be a weighted combination of these factors such as cycle time, packet and bit rates. Next, in step 360, the receive loading factor is determined which, in the preferred embodiment, is a weighted sum of the cycle time, the bit rate and the packet rate. In some circumstances, the cycle time may also be the predominant or sole measurement forming the receive loading factor. Next, in step 365, the process returns to step 345, repeating steps 345 - 360 for each receiver, until receive loading factors have been determined for all receivers.

If the receive loading factors indicate initial system start up or initialization in step 370, such as all or most receivers having low or negligible loading factors, then entering secondary devices are assigned to the receivers in a "round robin" fashion, with each entering secondary station sequentially assigned to the receivers of the primary station, step 380. If the receive loading factors do not indicate initial system start up or initialization in step 370, such as all or most receivers having non-negligible loading factors, then each entering secondary device is assigned to the currently least loaded receiver, step 375. This iteration of the upstream loading portion of the spectrum management method may then terminate, return step 385, or may continue with step 515 discussed below with reference to FIG. 8.

FIG. 7 is a flow chart illustrating downstream channel loading for secondary devices entering the communication system in accordance with the present invention. As secondary stations or devices are powered up and come on line, they will be assigned a downstream channel connected to a particular transmitter 136_n of the primary station 101, and the downstream channel loading for the various primary station transmitters will be varied or balanced in accordance with this portion of the spectrum management methodology. Beginning with start step 400, a transmit loading factor will be determined for each transmitter 136_n. In the preferred embodiment, for each transmitter 136_n, a packet rate (packets/second) will be determined in step 405, a bit rate (bits/second) will be determined in step 410, and a queue depth will be determined in step 415. The queue depth is a measure of a backlog, if any, of the number of data or information packets or frames waiting to be transmitted downstream to all of the various secondary stations. In the preferred embodiment, downstream messages are broadcast to all secondary stations, with identification information for reception by the intended secondary station, such that queue

depth is a measure of how long each secondary station must wait to receive its requested information (with corresponding potential impact on consumer satisfaction). Other factors may also be utilized in the determination of the transmit loading factor. In addition, the transmit loading factor may be a weighted combination of these factors such as queue depth, packet and bit rates. Next, in step 420, the transmit loading factor is determined which, in the preferred embodiment, is a weighted sum of the queue depth, the bit rate and the packet rate. In some circumstances, the queue depth may also be the predominant or sole measurement forming the transmit loading factor. Next, in step 425, the process returns to step 405, repeating steps 405 - 420 for each transmitter, until transmit loading factors have been determined for all transmitters. If the transmit loading factors indicate initial system start up or initialization in step 430, such as all or most transmitters having low or negligible transmit loading factors, then entering secondary devices are assigned to the transmitters in a "round robin" fashion, with each entering secondary station sequentially assigned to the transmitters of the primary station, step 440. If the transmit loading factors do not indicate initial system start up or initialization in step 430, such as all or most transmitters having non-negligible transmit loading factors, then each entering secondary device is assigned to the currently least loaded transmitter, step 435. This iteration of the downstream loading portion of the spectrum management method may then terminate, return step 445, or may continue with step 615 discussed below with reference to FIG. 9.

FIG. 8 is a flow chart illustrating upstream channel loading for active secondary devices of the communication system in accordance with the present invention. In accordance with this portion of the spectrum management method, if a receiver of a primary station is comparatively overloaded, namely, having too many active secondary stations

transmitting on an upstream channel, some of the secondary station transmitters will be transferred to other, less loaded primary station receivers (operating on other upstream channels). Beginning with start step 500, receive loading factors are determined for each primary station receiver, step 505, until receive loading factors have been determined for all receivers of a primary station 101, step 510. When these determinations may have been made during steps 345 - 365 discussed above, this portion of the spectrum management method may also directly proceed beginning with step 515. In step 515, the variation in the receive loading factors (for all primary station receivers) is determined. If the variation in receive loading factors is not greater than a predetermined (or adaptive) threshold, step 520, indicating that all primary station receivers have similar loading within a particular range (or variance), then no further adjustments need to be made with regard to the upstream channel loading for active secondary devices, and this iteration of the upstream channel loading portion of the spectrum management method may terminate, return step 570. If the variation in receive loading factors is greater than a predetermined (or adaptive) threshold in step 520, indicating that all primary station receivers do not have similar loading within a particular range (or variance), then primary station receivers (of the plurality of primary station receivers 135) are selected which have receive loading factors which are greater than the mean receive loading factor, step 525. Secondary station transmitters will then be transferred from heavily loaded primary station receivers to more lightly loaded primary station receivers, depending upon various conditions. For example, only secondary station transmitters which would have an impact if transferred, namely, decreasing the receive loading factor for the given primary station receiver, will be transferred, provided that the transfer does not result in overloading yet another primary station receiver. Moreover, to

avoid excessive service disruptions, excessive transfers of secondary stations (either or both transmitter and receiver) should also be avoided.

As a consequence, in step 530, for the primary station receiver having the highest receive loading factor, an impact level of a transfer, for each corresponding transmitter (of the secondary stations), is determined. For example, a transfer of a secondary station transmitter which is transmitting very little information upstream may have a negligible impact on decreasing the receive loading factor of the selected primary station receiver and, therefore, little would be gained by transferring the secondary station transmitter. Next, in step 535, the secondary station transmitter having the highest impact level, if transferred, is selected. To avoid transferring the same secondary station transmitter an excessive number of times, with concomitant potential service disruption, in step 540, if the historical information for the selected secondary station transmitter is greater than a predetermined or adaptive threshold, e.g., the selected secondary station transmitter has already been transferred recently, then another (second) secondary station transmitter having the next highest impact level is selected, step 545. The second secondary station transmitter having the next highest impact level is also evaluated for possible transfer, returning to step 540. If in step 540 the historical information for the selected secondary station transmitter is not greater than the predetermined or adaptive threshold, e.g., the selected secondary station transmitter has not been transferred recently, then the selected secondary station transmitter is evaluated to determine whether protocol information indicates that a transfer of the selected secondary station transmitter would be allowable, step 550. For example, protocol information may indicate that the particular secondary station (having the transmitter) is heavily involved in a particular application, such as a downstream file transfer requiring the

upstream transmission of acknowledgment messages as packets are received, and as a consequence, because a transfer of upstream channels may excessively impact the downstream application, this secondary station transmitter may not be a good candidate for upstream channel transfer. In addition, other protocol information, such as previously transmitted upstream information requesting a file transfer or other application, may also indicate that this secondary station transmitter may not be a good candidate for upstream channel transfer. Accordingly, if such protocol information indicates that a transfer of the selected transmitter of the secondary station would be inadvisable in step 550, another secondary station transmitter (having the next highest impact level if transferred) is selected, returning to step 545.

Continuing to refer to FIG. 8, if the protocol information indicates that a transfer of the selected secondary station transmitter would be allowable in step 550, then a second primary station receiver, having a receive loading factor less than the mean receive loading factor, is selected in the primary station (or in another primary station servicing the same secondary station), step 555, for evaluation as a candidate primary station receiver (to which the secondary station transmitter from the selected, heavily loaded primary station receiver may be transferred) (step 560). In the preferred embodiment, the primary station receiver having the smallest receive loading factor is selected as the second (or candidate) primary station receiver. Other information may also be pertinent in the selection of the candidate primary station receiver; for example, other historical information, such as error rate and noise levels, may indicate that additional secondary station transmitters should not be transferred to the candidate primary station receiver, or an excessively high error rate may result. In step 560, if the candidate primary station receiver would, with the proposed transfer (i.e., with the additional impact of the selected

secondary station transmitter), have a new receive loading factor which is still less than (or equal to) the mean receive loading factor, then the selected secondary station transmitter may be transferred to this candidate primary station receiver, step 565. Following such a transfer in step 565, the process may be repeated, returning to step 515, to continue to balance the upstream channel loading across all the receivers of the primary stations. In step 560, however, if the candidate primary station receiver would, with the proposed transfer (i.e., with the additional impact of the selected secondary station transmitter), have a new receive loading factor which is greater than the mean receive loading factor, potentially overloading the candidate primary station receiver, then the selected secondary station transmitter should probably not be transferred to this candidate primary station receiver. Protocol information and other predictive information may also indicate, in step 560, that a transfer may be ill advised because, while the candidate primary station receiver may currently (with the additional impact of the selected secondary station transmitter) have a receive loading factor less than the mean, anticipated traffic (based upon protocol information) may indicate that the receive loading factor soon will be greater than the mean, and the selected secondary station transmitter should probably not be transferred. In these cases, when the selected secondary station transmitter should probably not be transferred to this candidate primary station receiver in step 560, the method may proceed to step 545, to select another (second or third) secondary station transmitter having the next highest impact level for evaluation for possible transfer. Alternatively, if the primary station receiver having the smallest receive loading factor was not already selected in step 555 and evaluated in step 560, then the method may select another (second) candidate primary station receiver for evaluation for possible transfer of the selected secondary station transmitter, returning to step 555.

As may be apparent from the above discussion, as this portion of the spectrum management process continues to iterate, transmitters of secondary stations will be transferred from heavily loaded primary station receivers to less loaded primary station receivers, resulting in receive loading factors moving toward the mean and balanced loading across upstream channels.

FIG. 9 is a flow chart illustrating downstream channel loading for active secondary stations of the communication system in accordance with the present invention. In parallel with the methodology discussed above with reference to FIG. 8, in accordance with this portion of the spectrum management method, if a transmitter of a primary station is comparatively overloaded, namely, having too many active secondary stations receiving on a downstream channel, some of the secondary stations will be transferred to other, less loaded primary station transmitters (operating on other downstream channels). Referring to FIG. 9, beginning with start step 600, transmit loading factors are determined for each primary station transmitter 136_n, step 605, until transmit loading factors have been determined for all transmitters 136 of a primary station 101, step 610. When these determinations may have been made during steps 405 - 425 discussed above, this portion of the spectrum management method may also directly proceed beginning with step 615. In step 615, the variation in the transmit loading factors (for all primary station transmitters) is determined. If the variation in transmit loading factors is not greater than a predetermined (or adaptive) threshold, step 620, indicating that all primary station transmitters have similar loading within a particular range (or variance), then no further adjustments need to be made with regard to the downstream channel loading for active secondary devices, and this iteration of the downstream channel loading portion of the spectrum management method may terminate, return step 670. If the variation in transmit

loading factors is greater than a predetermined (or adaptive) threshold in step 620, indicating that all primary station transmitters do not have similar loading within a particular range (or variance), then primary station transmitters (of the plurality of primary station transmitters 136) are selected which have transmit loading factors which are greater than the mean transmit loading factor, step 625. Secondary station receivers will then be transferred from heavily loaded primary station transmitters to more lightly loaded primary station transmitters, depending upon various conditions. For example, only secondary station receivers which would have an impact if transferred, namely, decreasing the transmit loading factor for the given primary station transmitter, will be transferred, provided that the transfer does not result in overloading yet another primary station transmitter. Moreover, to avoid excessive service disruptions, excessive transfers of secondary station receivers (and transmitters) should also be avoided.

As a consequence, in step 630, for the primary station transmitter having the highest transmit loading factor, an impact level of a transfer, for each corresponding receiver (of the secondary stations), is determined. For example, a transfer of a secondary station receiver which is receiving very little information on a downstream channel may have a negligible impact on decreasing the transmit loading factor of the selected primary station transmitter and, therefore, little would be gained by transferring the secondary station receiver. Next, in step 635, the secondary station receiver having the highest impact level, if transferred, is selected. To avoid transferring the same secondary station receiver an excessive number of times, with concomitant potential service disruption, in step 640, if the historical information for the selected secondary station receiver is greater than a predetermined or adaptive threshold, e.g., the selected secondary station receiver has already been transferred

recently, then another (second) secondary station receiver having the next highest impact level is selected, step 645. The second secondary station receiver having the next highest impact level is also evaluated for possible transfer, returning to step 640. If in step 640 the historical information for the selected secondary station receiver is not greater than the predetermined or adaptive threshold, e.g., the selected secondary station receiver has not been transferred recently, then the selected secondary station receiver is evaluated to determine whether protocol information indicates that a transfer of the selected secondary station receiver would be allowable, step 650. For example, protocol information may indicate that because the particular secondary station (having the receiver) is or is about to become heavily involved in a particular application, such as a downstream file transfer, this secondary station may not be a good candidate for downstream channel transfer. Accordingly, if such protocol information indicates that a transfer of the selected receiver of the secondary station would be inadvisable in step 650, another secondary station receiver (having the next highest impact level if transferred) is selected, returning to step 645.

Continuing to refer to FIG. 9, if the protocol information indicates that a transfer of the selected secondary station receiver would be allowable in step 650, then a second primary station transmitter, having a transmit loading factor less than the mean transmit loading factor, is selected in the primary station (or in another primary station servicing the same secondary station), step 655, for evaluation as a candidate primary station transmitter (to which a secondary station receiver from the selected, heavily loaded primary station transmitter may be transferred) (step 660). In the preferred embodiment, the primary station transmitter having the smallest transmit loading factor is selected. Other information may also be pertinent to the selection of a candidate primary station transmitter; for example, historical

information, such as error rate and noise levels, may indicate that additional secondary station receivers should not be transferred to the candidate primary station transmitter, or an excessively high error rate may result. In step 660, if the candidate primary station transmitter would, with the proposed transfer (i.e., with the additional impact of the selected secondary station receiver), have a new transmit loading factor which is still less than (or equal to) the mean transmit loading factor, then the selected secondary station receiver may be transferred to this candidate primary station transmitter, step 665. Following such a transfer in step 665, the process may be repeated, returning to step 615, to continue to balance the downstream channel loading across all the transmitters of the primary stations. In step 660, however, if the candidate primary station transmitter would, with the proposed transfer (i.e., with the additional impact of the selected secondary station receiver), have a new transmit loading factor which is greater than the mean transmit loading factor, potentially overloading the candidate primary station transmitter, then the selected secondary station receiver should probably not be transferred to this candidate primary station transmitter. Protocol information and other predictive information may also indicate, in step 660, that a transfer may be ill advised because, while the candidate primary station transmitter may currently (with the additional impact of the selected secondary station receiver) have a transmit loading factor less than the mean, anticipated traffic (based upon protocol information) may indicate that the transmit loading factor soon will be greater than the mean, and the selected secondary station receiver should probably not be transferred. In these cases, when the selected secondary station receiver should probably not be transferred to this candidate primary station transmitter in step 660, the method may proceed to step 645, to select another (second or third) secondary station receiver having the next highest impact level for evaluation

for possible transfer. Alternatively, if the primary station transmitter having the smallest transmit loading factor was not already selected in step 655 and evaluated in step 660, then the method may select another (second) candidate primary station transmitter for evaluation for possible transfer of the selected secondary station receiver, returning to step 655. As may be apparent from the above discussion, as this portion of the spectrum management process continues to iterate, receivers of secondary stations will be transferred from heavily loaded primary station transmitters to less loaded primary station transmitters, resulting in transmit loading factors moving toward the mean and load balancing across downstream channels.

FIG. 10 is a flow chart illustrating upstream congestion management for active secondary devices 110 of the communication system 100 in accordance with the present invention. While related to upstream channel allocation and loading illustrated in FIGs. 4, 6 and 8, upstream congestion management concerns additional factors and additional circumstances which affect system performance. While the upstream channel allocation portion of the spectrum management methodology of FIGs. 6 and 8 focused upon a receive (upstream) loading factor, formed by parameters such as the cycle time to reach all active secondary devices in a polling protocol, the upstream congestion management portion of the spectrum management methodology concerns a broader and more inclusive congestion parameter. In the preferred embodiment, the congestion parameter for upstream congestion management is an access latency factor, while in other embodiments, the congestion parameter may include, for example, factors or measurements of data throughput, the number of data collisions, or the various receive loading factors such as cycle time and packet and bit rates. In addition to the access latency experienced by polled secondary stations, referred to more specifically as cycle time, the

access latency factor as a congestion parameter includes delays which may be experienced by any and all secondary stations, including those which may be initiating communication with the system utilizing a contention access protocol or hybrid contention/polling protocol. For example, congestion may occur when many secondary stations are transmitting upstream, creating collisions of messages to which the primary station should respond. If an excessive number of such collisions have occurred, any given secondary station may be unable to gain access to the communication system 100 within a reasonable or acceptable period of time, resulting in excessive or unacceptable access latency.

Referring to FIG. 10, beginning with start step 700, a congestion parameter (preferably an access latency factor) is determined for each primary station receiver 135_n, step 705, until congestion parameters have been determined for all receivers 135 of the primary station 101, step 710. Next, in step 715, if none of the plurality of congestion parameters obtained in steps 705 and 710 are greater than a predetermined threshold or an adaptive threshold, indicating that all primary station receivers have acceptable congestion parameters and are not experiencing upstream congestion, then no further adjustments need to be made with regard to the upstream congestion management of secondary stations, and this iteration of the upstream congestion management portion of the spectrum management method may terminate, return step 765. In step 715, however, if any of the plurality of congestion parameters obtained in steps 705 and 710 are greater than a predetermined threshold or an adaptive threshold, indicating that one or more primary station receivers have unacceptable congestion parameters (such as access latency factors) and are experiencing congestion, then a primary station receiver (of the plurality of primary station receivers 135) is selected which has the highest congestion parameter, and impact levels of all its corresponding

secondary station transmitters are determined, step 720. As in the upstream load balancing portion of the spectrum management method illustrated in FIG. 8, secondary station transmitters will then be transferred from congested primary station receivers to more lightly loaded, non-congested primary station receivers, depending upon various conditions. For example, only secondary station transmitters which would have an impact if transferred, namely, decreasing the congestion parameter for the given primary station receiver, will be transferred, provided that the transfer does not result in creating congestion for yet another primary station receiver. Moreover, to avoid excessive service disruptions, excessive transfers of secondary device transmitters should also be avoided. As a consequence, referring to FIG. 10, in step 720, for the primary station receiver having the highest congestion parameter, the impact level of a transfer, for each corresponding transmitter (of the secondary stations), is determined. Next, in step 725, the secondary station transmitter having the highest impact level, if transferred, is selected. In step 730, another (or second) receiver of a primary station, which has a congestion parameter less than the predetermined (or adaptive) threshold, is selected as a candidate to which the selected secondary station transmitter may be transferred. In the preferred embodiment, the second primary station receiver having the lowest congestion parameter (i.e., having the least congestion) is selected. As discussed above, to avoid transferring the same secondary station transmitter an excessive number of times, with concomitant potential service disruption, in step 735, if the historical information for the selected secondary station transmitter is greater than a predetermined or adaptive threshold, e.g., the selected secondary station transmitter has already been transferred recently, then another (second) secondary station transmitter having the next highest impact level is selected, step 740. The second secondary station

transmitter having the next highest impact level is also evaluated for possible transfer, returning to step 735. If in step 735 the historical information for the selected secondary station transmitter is not greater than the predetermined or adaptive threshold, e.g., the selected secondary station transmitter has not been transferred recently, then the selected secondary station transmitter is evaluated to determine whether protocol information indicates that a transfer of the selected secondary station transmitter would be allowable, step 745, as discussed above for step 550. If such protocol information indicates that a transfer of the selected transmitter of the secondary station would be inadvisable in step 745, another secondary station transmitter (having the next highest impact level if transferred) is selected, returning to step 740.

Continuing to refer to FIG. 10, if the protocol information indicates that a transfer of the selected secondary station transmitter would be allowable in step 745, then potential congestion of the second primary station receiver is evaluated in step 750. If, in step 750, the transfer of the selected secondary station transmitter to the second primary station receiver would cause the second primary station receiver to become congested and potentially overloaded (having an congestion parameter greater than the predetermined (or adaptive) threshold), then another secondary station transmitter is selected for possible transfer, returning to step 740. Alternatively, if the primary station receiver selected in step 730 was not the primary station receiver having the lowest congestion parameter, then yet another (third) receiver of the primary station, having an congestion parameter less than the threshold, may be selected, returning to step 730. In step 750, if the candidate primary station receiver would, with the proposed transfer (i.e., with the additional impact of the selected secondary station transmitter), have a new congestion parameter which is still less than (or equal to) the

predetermined (or adaptive) threshold, then the selected secondary station transmitter may be transferred to this candidate primary station receiver, step 755. Next, in step 760, the first primary station receiver (previously having the highest congestion parameter), is evaluated to determine whether its current congestion parameter has been reduced below a second predetermined (or adaptive) threshold. In the preferred embodiment, this second threshold is a hysteresis level, namely, is less than the first threshold (of step 715), such that the first primary station receiver does not immediately become congested again. If the congestion parameter of this (first) primary station receiver has at least been reduced to the hysteresis (or second) threshold, in step 760, then no further congestion reduction is needed for this (first) primary station receiver, and this iteration of the congestion management portion of the spectrum management method may terminate, return step 765. If the congestion parameter of this (first) primary station receiver has not been reduced to the hysteresis (or second) threshold, in step 760, then the process will be repeated, returning to step 720, provided that the number of secondary station transmitters moved from the upstream channel of this primary station receiver is not excessive (with corresponding service disruptions), step 770. If the number of secondary station transmitters moved from the upstream channel of this primary station receiver is below a predetermined (or adaptive) threshold in step 770, then the process will be repeated (returning to step 720). If the number of secondary station transmitters moved from the upstream channel of this primary station receiver is greater than the predetermined (or adaptive) threshold in step 770, indicating that enough secondary station transmitters have been transferred during this iteration (and additional transfers may tend to cause service disruptions), then this iteration of the congestion management portion of the spectrum management method may

terminate, return step 765. The congestion management process may also be repeated for additional primary station receivers which may be congested, returning to step 705. As may be apparent from the above discussion, as this portion of the spectrum management process continues to iterate, transmitters of secondary stations will be transferred from heavily loaded, congested primary station receivers to less loaded primary station receivers, resulting in improved congestion parameters, less overall communication system congestion, and improved upstream transmission performance.

FIG. 11 is a flow chart illustrating downstream congestion management for active secondary devices 110 of the communication system 100 in accordance with the present invention. While related to downstream channel allocation and loading illustrated in FIGs. 5, 7 and 9, downstream congestion management concerns additional factors and additional circumstances which may affect system performance. While the downstream channel allocation portion of the spectrum management methodology of FIGs. 8 and 10 focused upon a transmit (downstream) loading factor, formed by parameters such as the queue depth, the downstream congestion management portion of the spectrum management methodology concerns a broader congestion parameter, both for the particular downstream channel and for each secondary station connected to the primary station. In the preferred embodiment, this congestion parameter, for downstream congestion management, is a throughput factor. In other embodiments, the congestion parameter may also include the various transmit loading factors such as queue depth and packet and bit rates. For a downstream channel, a very high congestion parameter such as throughput tends to indicate high levels of activity by secondary station receivers, which may be better serviced through utilization of other downstream channels (and corresponding primary station transmitters) for those very active secondary stations. However, in the

preferred embodiment, transfer of a secondary station receiver to another downstream channel may have greater disruption to a secondary station, such as delay, compared to transfer of a secondary station transmitter to another upstream channel (and corresponding primary station receiver). As a consequence, in the preferred embodiment, the smallest set of secondary station receivers needed to relieve downstream channel congestion (of primary station transmitters) is transferred to another downstream channel (and correspondingly to other primary station transmitters).

Referring to FIG. 11, beginning with start step 800, a congestion parameter is determined for each primary station transmitter 136_n, step 805, until congestion parameters have been determined for all transmitters 136 of the primary station 101, step 810. Next, in step 815, if none of the plurality of congestion parameters obtained in steps 805 and 810 are greater than a predetermined threshold or an adaptive threshold, indicating that all primary station transmitters have acceptable congestion parameters and are not experiencing congestion, then no further adjustments need to be made with regard to the downstream congestion management of secondary devices, and this iteration of the downstream congestion management portion of the spectrum management method may terminate, return step 865. In step 815, however, if any of the plurality of congestion parameters obtained in steps 805 and 810 are greater than a predetermined threshold or an adaptive threshold, indicating that one or more primary station transmitters have unacceptable congestion parameters and are experiencing congestion, then a primary station transmitter (of the plurality of primary station transmitters 136) is selected which has the highest congestion parameter, and impact levels of all its corresponding secondary station receivers are determined, step 820. As in the downstream load balancing portion of the spectrum management method illustrated in FIG.

9, secondary station receivers will then be transferred from congested primary station transmitters to more lightly loaded, non-congested primary station transmitters, depending upon various conditions. For example, only secondary station receivers which would have an impact if transferred, namely, decreasing the congestion parameter for the given primary station transmitter, will be transferred, provided that the transfer does not result in creating congestion for yet another primary station transmitter. Moreover, as indicated above, to avoid excessive service disruptions, excessive transfers of secondary device receivers (and transmitters) should also be avoided. As a consequence, referring to FIG. 11, in step 820, for the primary station transmitter having the highest congestion parameter, the impact level of a transfer, for each corresponding receiver (of the secondary stations), is determined. Next, in step 825, the secondary station receiver having the highest impact level, if transferred, is selected. In step 830, another (or second) transmitter of a primary station, which has a congestion parameter less than the predetermined (or adaptive) threshold, is selected as a candidate to which the selected secondary station receiver may be transferred. In the preferred embodiment, the second primary station transmitter having the lowest congestion parameter (i.e., is the least congested) is selected. As discussed above, to avoid transferring the same secondary station receiver an excessive number of times, with concomitant potential service disruption, in step 835, if the historical information for the selected secondary station receiver is greater than a predetermined or adaptive threshold, e.g., the selected secondary station receiver has already been transferred recently, then another (second) secondary station receiver having the next highest impact level is selected, step 840. The second secondary station receiver having the next highest impact level is also evaluated for possible transfer, returning to step 835. If in step 835 the historical information for the

selected secondary station receiver is not greater than the predetermined or adaptive threshold, e.g., the selected secondary station receiver has not been transferred recently, then the selected secondary station receiver is evaluated to determine whether protocol information indicates that a transfer of the selected secondary station receiver would be allowable, step 845, as discussed above for step 650. If such protocol information indicates that a transfer of the selected receiver of the secondary station would be inadvisable in step 845, another secondary station receiver (having the next highest impact level if transferred) is selected, returning to step 840.

If the protocol information indicates that a transfer of the selected secondary station receiver would be allowable in step 845, then potential congestion of the second, candidate transmitter (of the primary station) is evaluated in step 850. If, in step 850, the transfer of the selected secondary station receiver to the second primary station transmitter would cause the second primary station transmitter to become congested and potentially overloaded (having a congestion parameter greater than the predetermined (or adaptive) threshold), then another secondary station receiver is selected for possible transfer, returning to step 840. Alternatively, if the primary station transmitter selected in step 830 was not the transmitter having the lowest congestion parameter, then yet another (third) primary station transmitter of the primary station, having a congestion parameter less than the threshold, may be selected, returning to step 830. In step 850, if the candidate primary station transmitter would, with the proposed transfer (i.e., with the additional impact of the selected secondary station receiver), have a new congestion parameter which is still less than (or equal to) the predetermined (or adaptive) threshold, then the selected secondary station receiver may be transferred to this candidate primary station transmitter, step 855. Next, in step

860, the first primary station transmitter (previously having the highest congestion parameter), is evaluated to determine whether its current congestion parameter has been reduced below a second predetermined (or adaptive) threshold. In the preferred embodiment, this second threshold is also a hysteresis level, namely, is less than the first threshold (of step 815), such that the first primary station transmitter does not immediately become congested again. If the congestion parameter of this (first) primary station transmitter has at least been reduced to the hysteresis (or second) threshold, in step 860, then no further congestion reduction is needed for this (first) primary station transmitter, and this iteration of the downstream congestion management portion of the spectrum management method may terminate, return step 865. If the congestion parameter of this (first) primary station transmitter has not been reduced to the hysteresis (or second) threshold, in step 860, then the process will be repeated, returning to step 820, provided that the number of secondary station receivers moved from the downstream channels of this primary station transmitter is not excessive (with corresponding service disruptions), step 870. If the number of secondary station receivers moved from the downstream channels of this primary station transmitter is below a predetermined (or adaptive) threshold in step 870, then the process will be repeated (returning to step 820). If the number of secondary station receivers moved from the downstream channels of this primary station transmitter is greater than the predetermined (or adaptive) threshold in step 870, indicating that enough secondary station receivers have been transferred during this iteration (and additional transfers may tend to cause service disruptions), then this iteration of the downstream congestion management portion of the spectrum management method may terminate, return step 865. The downstream congestion management process may also be repeated for additional transmitters of a primary station

which may be congested, returning to step 805. Also as may be apparent from the above discussion, as this portion of the spectrum management process continues to iterate, receivers of secondary stations will be transferred from heavily loaded, congested primary station transmitters to less loaded primary station transmitters, resulting in improved congestion parameters, less overall communication system congestion, and improved downstream transmission performance.

FIG. 12 is a flow chart illustrating upstream and downstream spectrum management in accordance with the present invention. Beginning with start step 900, upstream and downstream channel loading is allocated for secondary stations which are entering the communication system 100, step 905, as discussed in detail above and as illustrated in FIGs. 6 and 7. Next or concurrently with step 905, upstream and downstream channel loading is allocated for secondary stations which are and have been active in the communication system 100, step 910, also as discussed in detail above and as illustrated in FIGs. 8 and 9. Next, in step 915, upstream and downstream channels are allocated based upon error parameters, as discussed in detail above and as illustrated in FIGs. 4 and 5. Lastly, in step 920, upstream and downstream channels are allocated based upon congestion parameters, as discussed in detail above and as illustrated in FIGs. 10 and 11. Steps 915 and 920 may be concurrent with each other, and may also be concurrent with either or both steps 905 and 910. Following steps 915 and 920, the iteration of the spectrum management process may end, return step 925, or may continue and repeat, as in the preferred embodiment, returning to steps 905 and 910.

In summary, FIG. 2 in light of FIG. 12 illustrates an apparatus 101 for spectrum management in a communication system, with the communication system having a communication medium, with the communication medium having a plurality of downstream communication channels, the

communication medium further having a plurality of upstream communication channels, with the communication system further having a plurality of secondary stations coupleable to the communication medium, and with each secondary station of the plurality of secondary stations having a receiver and a transmitter. The apparatus 101 then comprises: first, a channel interface 125_n coupleable to the communication medium for signal transmission on a downstream communication channel of the plurality of downstream communication channels and for signal reception on an upstream communication channel of the plurality of upstream communication channels; and second, a processor arrangement 120 coupled to the channel interface 125_n, the processor arrangement 120 responsive through a set of program instructions to allocate loading of the plurality of upstream communication channels and of the plurality of downstream communication channels for an entering secondary station of the plurality of secondary stations; to allocate loading of the plurality of upstream communication channels and of the plurality of downstream communication channels for an active secondary station of the plurality of secondary stations; to allocate the plurality of upstream communication channels and the plurality of downstream communication channels based upon an error parameter; and to allocate loading of the plurality of upstream communication channels and of the plurality of downstream communication channels based upon a congestion parameter.

In summary, FIG. 2 in light of FIG. 4 illustrates an apparatus 101 wherein the processor arrangement 120 is further responsive: first, to monitor an error rate for each upstream communication channel of the plurality of upstream communication channels; to determine whether the error rate for each upstream communication channel of the plurality of upstream communication channels exceeds a first threshold to form a set of upstream high error channels; second, to

determine a channel noise parameter for a first upstream high error channel of the set of upstream high error channels; third, when the channel noise parameter of the first upstream high error channel exceeds a second threshold, to transfer a secondary station transmitter from the first upstream high error channel to a first idle upstream communication channel of the plurality of upstream communication channels, the first idle upstream communication channel then having a channel noise parameter lower than the second threshold; and fourth, when the channel noise parameter of the first upstream high error channel is less than the second threshold, to transfer a secondary station transmitter from the first upstream high error channel to a second idle upstream communication channel of the plurality of upstream communication channels, the second idle upstream communication channel having a frequency higher than a frequency of the first upstream high error channel. As discussed above, any of the thresholds of the preferred embodiment, such as the first threshold and the second threshold of FIG. 4, may be either predetermined or adaptive. In the preferred embodiment, the channel noise parameter is the received signal strength measured when a high error channel of the plurality of high error channels is idle.

In summary, FIG. 2 in light of FIG. 5 illustrates an apparatus 101 wherein the processor arrangement is further responsive: first, to monitor a downstream error rate for each secondary station connected to a first downstream communication channel of the plurality of downstream communication channels; and second, when a predetermined number of the plurality of secondary stations have a downstream error rate which exceeds a threshold, to transfer a secondary station receiver from the first downstream communication channel to a second downstream communication channel of the plurality of downstream communication channels.

Also in summary, FIG. 2 in light of FIG. 6 illustrates an apparatus 101 wherein the processor arrangement 120 is further responsive: first, to determine a receive loading factor for each receiver of a plurality of primary station receivers to form a plurality of receive loading factors; second, when the plurality of receive loading factors indicate initialization of the communication system, to sequentially assign a transmitter of each secondary station transmitter of the plurality of secondary stations to each receiver of the plurality of primary station receivers; and third, when the plurality of receive loading factors do not indicate initialization of the communication system, to assign a transmitter of an entering secondary station of the plurality of secondary stations to a receiver of the plurality of primary station receivers then having a lowest receive loading factor.

Also in summary, FIG. 2 in light of FIG. 7 illustrates an apparatus 101 wherein the processor arrangement 120 is further responsive: first, to determine a transmit loading factor for each transmitter of a plurality of primary station transmitters to form a plurality of transmit loading factors; second, when the plurality of transmit loading factors indicate initialization of the communication system, to sequentially assign a receiver of each secondary station of the plurality of secondary stations to each transmitter of the plurality of primary station transmitters; and third, when the plurality of transmit loading factors do not indicate initialization of the communication system, to assign a receiver of an entering secondary station of the plurality of secondary stations to a transmitter of the plurality of primary station transmitters then having a lowest transmit loading factor.

Also in summary, FIG. 2 in light of FIG. 8 illustrates an apparatus 101 wherein the processor arrangement 120 is further responsive: first, to determine a receive loading factor for each receiver of a plurality of primary station receivers to form a plurality of receive loading factors;

second, when a variation of the plurality of receive loading factors exceeds a threshold, to select a first receiver of the plurality of primary station receivers then having a highest receive loading factor; third, for the first receiver, to determine an impact level of a transfer for each corresponding secondary station transmitter of the plurality of secondary stations and selecting a secondary station transmitter of the plurality of secondary stations then having a highest impact level to form a selected transmitter; fourth, to select a second receiver of the plurality of primary station receivers then having a receive loading factor less than a mean receive loading factor and to determine a second receive loading factor for the second receiver in conjunction with the selected transmitter; and fifth, when the second receive loading factor is less than the mean receive loading factor, to transfer the selected transmitter to the second receiver. In the preferred embodiment, the receive loading factor further comprises a weighted combination of a packet rate, a bit rate, and a cycle time.

Also in summary, FIG. 2 in light of FIG. 9 illustrates an apparatus 101 wherein the processor arrangement 120 is further responsive: first, to determine a transmit loading factor for each transmitter of a plurality of primary station transmitters to form a plurality of transmit loading factors; second, when a variation of the plurality of transmit loading factors exceeds a threshold, to select a first transmitter of the plurality of primary station transmitters then having a highest transmit loading factor; third, for the first transmitter, to determine an impact level of a transfer for each corresponding secondary station receiver of the plurality of secondary stations and to select the secondary station receiver of the plurality of secondary stations then having a highest impact level to form a selected receiver; fourth, to select a second transmitter of the plurality of primary station transmitters then having a transmit loading factor less than a

mean transmit loading factor and to determine a second transmit loading factor for the selected transmitter in conjunction with the second receiver; and fifth, when the second transmit loading factor is less than the mean transmit loading factor, to transfer the selected receiver to the second transmitter. In the preferred embodiment, the transmit loading factor further comprises a weighted combination of a packet rate, a bit rate, and a queue depth.

Also in summary, FIG. 2 in light of FIG. 10 illustrates an apparatus 101 wherein the processor arrangement 120 is further responsive: first, to determine a congestion parameter for each receiver of a plurality of primary station receivers to form a plurality of congestion parameters; second, when a congestion parameter of the plurality of congestion parameters exceeds a first threshold, to select a first receiver of the plurality of primary station receivers then having a highest congestion parameter; third, for the first receiver, to determine an impact level of a transfer for each corresponding secondary station transmitter of the plurality of secondary stations and to select a secondary station transmitter of the plurality of secondary stations then having a highest impact level to form a selected transmitter; fourth, to select a second receiver of the plurality of primary station receivers then having a congestion parameter less than the first threshold and to determine a second congestion parameter for the second receiver in conjunction with the selected transmitter; and fifth, when the second congestion parameter is less than the first threshold, to transfer the selected transmitter to the second receiver. In the preferred embodiment, the congestion parameter is an access latency factor.

Lastly in summary, FIG. 2 in light of FIG. 11 illustrates an apparatus 101 wherein the processor arrangement 120 is further responsive: first, to determine a congestion parameter for each transmitter of a plurality of primary station transmitters to form a plurality of congestion parameters;

second, when a congestion parameter of the plurality of congestion parameters exceeds a first threshold, to select a first transmitter of the plurality of primary station transmitters then having a highest congestion parameter; third, for the first transmitter, to determine an impact level of a transfer for each corresponding secondary station receiver of the plurality of secondary stations and to select a secondary station receiver of the plurality of secondary stations then having a highest impact level to form a selected receiver; fourth, to select a second transmitter of the plurality of primary station transmitters then having a congestion parameter less than the first threshold and to determine a second congestion parameter for the second transmitter in conjunction with the selected receiver; and fifth, when the second congestion parameter is less than first threshold, to transfer the selected receiver to the second transmitter. In the preferred embodiment, the congestion parameter further comprises a throughput factor.

Numerous advantages of the spectrum management apparatus and method of the present invention may be apparent. First, the spectrum management apparatus and method of the present invention addresses a completely new issue in data communications, namely, concurrent load balancing, congestion management, and channel assignment, in a multipoint communication system. Second, the spectrum management apparatus and method of the present invention provides a unique response to channel noise conditions, utilizing direct feedback from secondary stations, distinguishing impulse from ingress noise, and providing corresponding solutions. Next, the spectrum management apparatus and method of the present invention, uniquely provides for a minimal access latency, which is very significant in such an asymmetric communication system, as upstream access latency may negatively and severely impact downstream data throughput. Yet another advantage of the spectrum management apparatus

and method of the present invention is the independent management of upstream and downstream channels, both for quality and for congestion, rather than the prior art approach of coupled upstream and downstream channel assignment and management. Lastly, the spectrum management apparatus and method of the present invention provides a needed methodology to integrate channel quality management with data traffic management, in one overall system.

From the foregoing, it will be observed that numerous variations and modifications may be effected without departing from the spirit and scope of the novel concept of the invention. It is to be understood that no limitation with respect to the specific methods and apparatus illustrated herein is intended or should be inferred. It is, of course, intended to cover by the appended claims all such modifications as fall within the scope of the claims. The invention is further defined by the following claims.

1. A method for spectrum management in a communication system, the communication system having a communication medium, the communication medium having a plurality of downstream communication channels, the communication medium further having a plurality of upstream communication channels, the communication system further having a plurality of secondary stations coupleable to the communication medium, each secondary station of the plurality of secondary stations having a receiver and a transmitter, the method comprising:

(a) allocating loading of the plurality of upstream communication channels and of the plurality of downstream communication channels for an entering secondary station of the plurality of secondary stations;

(b) allocating loading of the plurality of upstream communication channels and of the plurality of downstream communication channels for an active secondary station of the plurality of secondary stations;

(c) allocating the plurality of upstream communication channels and the plurality of downstream communication channels based upon an error parameter; and

(d) allocating loading of the plurality of upstream communication channels and of the plurality of downstream communication channels based upon a congestion parameter.

2. The method of claim 1 wherein step (c) further comprises:

for upstream communication channels:

monitoring an error rate for each upstream communication channel of the plurality of upstream communication channels;

determining whether the error rate for each upstream communication channel of the plurality of upstream

communication channels exceeds a first threshold to form a set of upstream high error channels;

determining a channel noise parameter for a first upstream high error channel of the set of upstream high error channels;

when the channel noise parameter of the first upstream high error channel exceeds a second threshold, transferring a secondary station transmitter from the first upstream high error channel to a first idle upstream communication channel of the plurality of upstream communication channels, the first idle upstream communication channel then having a channel noise parameter lower than the second threshold; and

when the channel noise parameter of the first upstream high error channel is less than the second threshold, transferring a secondary station transmitter from the first upstream high error channel to a second idle upstream communication channel of the plurality of upstream communication channels, the second idle upstream communication channel having a frequency higher than a frequency of the first upstream high error channel; and

for downstream communication channels:

monitoring a downstream error rate for each secondary station of the plurality of secondary stations which is connected to a first downstream communication channel of the plurality of downstream communication channels; and

when a predetermined number of the plurality of secondary stations have a downstream error rate which exceeds a threshold, transferring a secondary station receiver from the first downstream communication channel to a second downstream communication channel of the plurality of downstream communication channels.

3. The method of claim 1 wherein step (a) further comprises:

for upstream communication channels:

determining a receive loading factor for each receiver of a plurality of primary station receivers to form a plurality of receive loading factors;

when the plurality of receive loading factors indicate initialization of the communication system, sequentially assigning a transmitter of each secondary station of the plurality of secondary stations to each receiver of the plurality of primary station receivers; and

when the plurality of receive loading factors do not indicate initialization of the communication system, assigning a transmitter of an entering secondary station of the plurality of secondary stations to a receiver of the plurality of primary station receivers then having a lowest receive loading factor; and

for downstream communication channels:

determining a transmit loading factor for each transmitter of a plurality of primary station transmitters to form a plurality of transmit loading factors;

when the plurality of transmit loading factors indicate initialization of the communication system, sequentially assigning a receiver of each secondary station of the plurality of secondary stations to each transmitter of the plurality of primary station transmitters; and

when the plurality of transmit loading factors do not indicate initialization of the communication system, assigning a receiver of an entering secondary station of the plurality of secondary stations to a transmitter of the plurality of primary station transmitters then having a lowest transmit loading factor.

4. The method of claim 1 wherein step (b) further comprises:

for upstream communication channels:

determining a receive loading factor for each receiver of a plurality of primary station receivers to form a plurality of receive loading factors;

when a variation of the plurality of receive loading factors exceeds a threshold, selecting a first receiver of the plurality of primary station receivers then having a highest receive loading factor;

for the first receiver, determining an impact level of a transfer for each corresponding secondary station transmitter of the plurality of secondary stations and selecting a secondary station transmitter of the plurality of secondary stations then having a highest impact level to form a selected transmitter;

selecting a second receiver of the plurality of primary station receivers then having a receive loading factor less than a mean receive loading factor and determining a second receive loading factor for the selected receiver in conjunction with the selected transmitter; and

when the second receive loading factor is less than the mean receive loading factor, transferring the selected transmitter to the second receiver; and

for downstream communication channels:

determining a transmit loading factor for each transmitter of a plurality of primary station transmitters to form a plurality of transmit loading factors;

when a variation of the plurality of transmit loading factors exceeds a threshold, selecting a first transmitter of the plurality of primary station transmitters then having a highest transmit loading factor;

for the first transmitter, determining an impact level of a transfer for each corresponding secondary station receiver of the plurality of secondary stations and selecting a secondary station receiver of the plurality of secondary stations then having a highest impact level to form a selected receiver;

selecting a second transmitter of the plurality of primary station transmitters then having a transmit loading factor less than a mean transmit loading factor and determining a second transmit loading factor for the second transmitter in conjunction with the selected receiver; and

when the second transmit loading factor is less than the mean transmit loading factor, transferring the selected receiver to the second transmitter.

5. The method of claim 1 wherein step (d) further comprises:

for upstream communication channels:

determining a congestion parameter for each receiver of a plurality of primary station receivers to form a plurality of congestion parameters;

when a congestion parameter of the plurality of congestion parameters exceeds a first threshold, selecting a first receiver of the plurality of primary station receivers then having a highest congestion parameter;

for the first receiver, determining an impact level of a transfer for each corresponding secondary station transmitter of the plurality of secondary stations and selecting a secondary station transmitter of the plurality of secondary stations then having a highest impact level to form a selected transmitter;

selecting a second receiver of the plurality of primary station receivers then having a congestion parameter less than the first threshold and determining a second congestion parameter for the second receiver in conjunction with the selected transmitter; and

when the second congestion parameter is less than the first threshold, transferring the selected transmitter to the second receiver; and

for downstream communication channels:

determining a congestion parameter for each transmitter of a plurality of primary station transmitters to form a plurality of congestion parameters;

when a congestion parameter of the plurality of congestion parameters exceeds a first threshold, selecting a first transmitter of the plurality of primary station transmitters then having a highest congestion parameter;

for the first transmitter, determining an impact level of a transfer for each corresponding secondary station receiver of the plurality of secondary stations and selecting a secondary station receiver of the plurality of secondary stations then having a highest impact level to form a selected receiver;

selecting a second transmitter of the plurality of primary station transmitters then having a congestion parameter less than the first threshold and determining a second congestion parameter for the second transmitter in conjunction with the selected receiver; and

when the second congestion parameter is less than first threshold, transferring the selected receiver to the second transmitter.

6. An apparatus for spectrum management in a communication system, the communication system having a communication medium, the communication medium having a plurality of downstream communication channels, the communication medium further having a plurality of upstream communication channels, the communication system further having a plurality of secondary stations coupleable to the communication medium, each secondary station of the plurality of secondary stations having a receiver and a transmitter, the apparatus comprising:

a channel interface coupleable to the communication medium for signal transmission on a downstream communication channel of the plurality of downstream

communication channels and for signal reception on an upstream communication channel of the plurality of upstream communication channels; and

a processor arrangement coupled to the channel interface, the processor arrangement responsive through a set of program instructions to allocate loading of the plurality of upstream communication channels and of the plurality of downstream communication channels for an entering secondary station of the plurality of secondary stations; to allocate loading of the plurality of upstream communication channels and of the plurality of downstream communication channels for an active secondary station of the plurality of secondary stations; to allocate the plurality of upstream communication channels and the plurality of downstream communication channels based upon an error parameter; and to allocate loading of the plurality of upstream communication channels and of the plurality of downstream communication channels based upon a congestion parameter.

7. The apparatus of claim 6 wherein the processor arrangement is further responsive:

for upstream communication channels:

to monitor an error rate for each upstream communication channel of the plurality of upstream communication channels;

to determine whether the error rate for each upstream communication channel of the plurality of upstream communication channels exceeds a first threshold to form a set of upstream high error channels;

to determine a channel noise parameter for a first upstream high error channel of the set of upstream high error channels;

when the channel noise parameter of the first upstream high error channel exceeds a second threshold, to transfer a secondary station transmitter from the first

upstream high error channel to a first idle upstream communication channel of the plurality of upstream communication channels, the first idle upstream communication channel then having a channel noise parameter lower than the second threshold; and

when the channel noise parameter of the first upstream high error channel is less than the second threshold, to transfer a secondary station transmitter from the first upstream high error channel to a second idle upstream communication channel of the plurality of upstream communication channels, the second idle upstream communication channel having a frequency higher than a frequency of the first upstream high error channel; and

for downstream communication channels:

to monitor a downstream error rate for each secondary station connected to a first downstream communication channel of the plurality of downstream communication channels; and

when a predetermined number of the plurality of secondary stations have a downstream error rate which exceeds a threshold, to transfer a secondary station receiver from the first downstream communication channel to a second downstream communication channel of the plurality of downstream communication channels.

8. The apparatus of claim 6 wherein the processor arrangement is further responsive:

for upstream communication channels:

to determine a receive loading factor for each receiver of a plurality of primary station receivers to form a plurality of receive loading factors;

when the plurality of receive loading factors indicate initialization of the communication system, to sequentially assign a transmitter of each secondary station

transmitter of the plurality of secondary stations to each receiver of the plurality of primary station receivers; and

when the plurality of receive loading factors do not indicate initialization of the communication system, to assign a transmitter of an entering secondary station of the plurality of secondary stations to a receiver of the plurality of primary station receivers then having a lowest receive loading factor; and

for downstream communication channels:

to determine a transmit loading factor for each transmitter of a plurality of primary station transmitters to form a plurality of transmit loading factors;

when the plurality of transmit loading factors indicate initialization of the communication system, to sequentially assign a receiver of each secondary station of the plurality of secondary stations to each transmitter of the plurality of primary station transmitters; and

when the plurality of transmit loading factors do not indicate initialization of the communication system, to assign a receiver of an entering secondary station of the plurality of secondary stations to a transmitter of the plurality of primary station transmitters then having a lowest transmit loading factor.

9. The apparatus of claim 6 wherein the processor arrangement is further responsive:

for upstream communications channels:

to determine a receive loading factor for each receiver of a plurality of primary station receivers to form a plurality of receive loading factors;

when a variation of the plurality of receive loading factors exceeds a threshold, to select a first receiver of the plurality of primary station receivers then having a highest receive loading factor;

for the first receiver, to determine an impact level of a transfer for each corresponding secondary station transmitter of the plurality of secondary stations and selecting a secondary station transmitter of the plurality of secondary stations then having a highest impact level to form a selected transmitter;

to select a second receiver of the plurality of primary station receivers then having a receive loading factor less than a mean receive loading factor and to determine a second receive loading factor for the second receiver in conjunction with the selected transmitter; and

when the second receive loading factor is less than the mean receive loading factor, to transfer the selected transmitter to the second receiver; and

for downstream communication channels:

to determine a transmit loading factor for each transmitter of a plurality of primary station transmitters to form a plurality of transmit loading factors;

when a variation of the plurality of transmit loading factors exceeds a threshold, to select a first transmitter of the plurality of primary station transmitters then having a highest transmit loading factor;

for the first transmitter, to determine an impact level of a transfer for each corresponding secondary station receiver of the plurality of secondary stations and to select the secondary station receiver of the plurality of secondary stations then having a highest impact level to form a selected receiver;

to select a second transmitter of the plurality of primary station transmitters then having a transmit loading factor less than a mean transmit loading factor and to determine a second transmit loading factor for the selected transmitter in conjunction with the second receiver; and

when the second transmit loading factor is less than the mean transmit loading factor, to transfer the selected receiver to the second transmitter.

10. The apparatus of claim 6 wherein the processor arrangement is further responsive:

for upstream communication channels:

to determine a congestion parameter for each receiver of a plurality of primary station receivers to form a plurality of congestion parameters;

when a congestion parameter of the plurality of congestion parameters exceeds a first threshold, to select a first receiver of the plurality of primary station receivers then having a highest congestion parameter;

for the first receiver, to determine an impact level of a transfer for each corresponding secondary station transmitter of the plurality of secondary stations and to select a secondary station transmitter of the plurality of secondary stations then having a highest impact level to form a selected transmitter;

to select a second receiver of the plurality of primary station receivers then having a congestion parameter less than the first threshold and to determine a second congestion parameter for the second receiver in conjunction with the selected transmitter; and

when the second congestion parameter is less than the first threshold, to transfer the selected transmitter to the second receiver; and

for downstream communication channels:

to determine a congestion parameter for each transmitter of a plurality of primary station transmitters to form a plurality of congestion parameters;

when a congestion parameter of the plurality of congestion parameters exceeds a first threshold, to select a

first transmitter of the plurality of primary station transmitters then having a highest congestion parameter;

for the first transmitter, to determine an impact level of a transfer for each corresponding secondary station receiver of the plurality of secondary stations and to select a secondary station receiver of the plurality of secondary stations then having a highest impact level to form a selected receiver;

to select a second transmitter of the plurality of primary station transmitters then having a congestion parameter less than the first threshold and to determine a second congestion parameter for the second transmitter in conjunction with the selected receiver; and

when the second congestion parameter is less than first threshold, to transfer the selected receiver to the second transmitter.

FIG.1

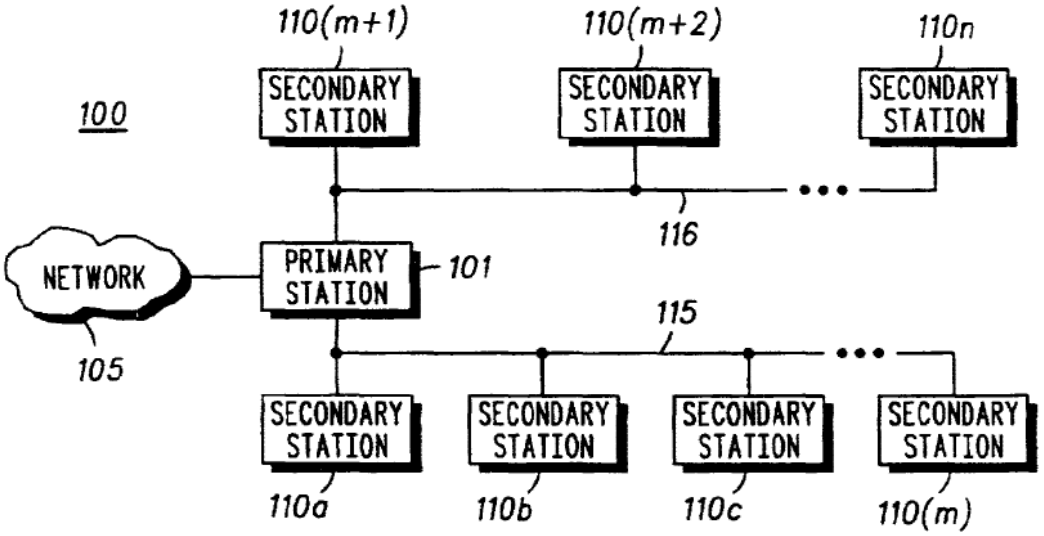
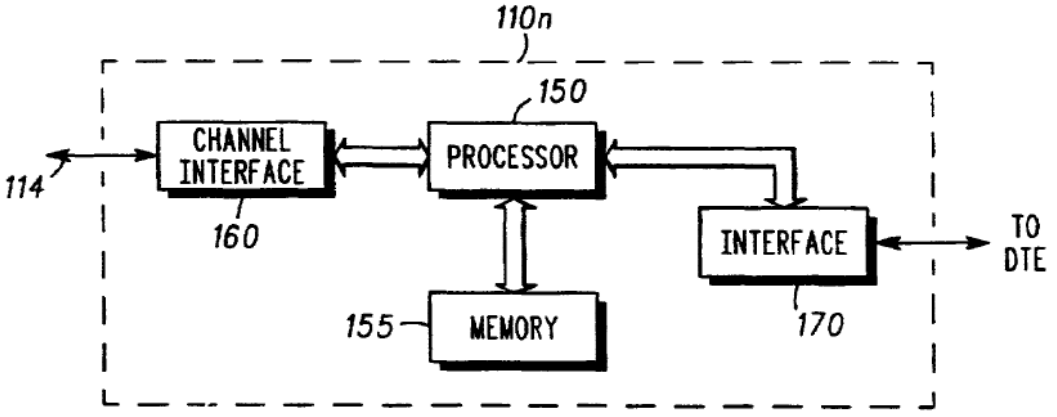

110(m+1)
110(m+2)
110n
100
SECONDARY STATION
SECONDARY STATION
SECONDARY STATION
116
NETWORK
PRIMARY STATION
101
115
105
SECONDARY STATION
SECONDARY STATION
SECONDARY STATION
SECONDARY STATION
110a
110b
110c
110(m)

FIG.3


110n
150
CHANNEL INTERFACE
PROCESSOR
114
160
INTERFACE
TO DTE
155
MEMORY
170

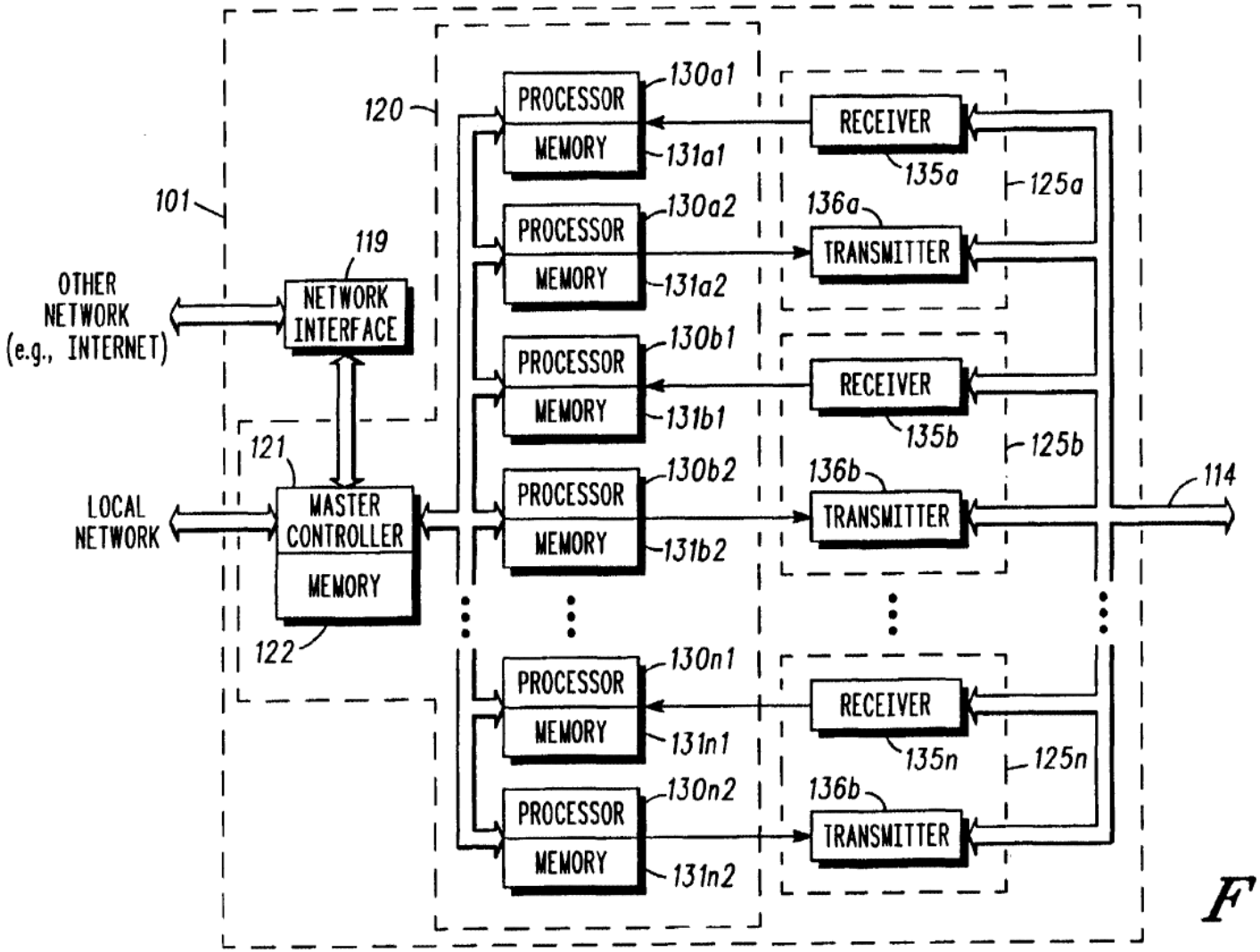

120
101
119
OTHER NETWORK (e.g., INTERNET)
NETWORK INTERFACE
121
LOCAL NETWORK
MASTER CONTROLLER
MEMORY
122
PROCESSOR
MEMORY
130a1
131a1
130a2
131a2
130b1
131b1
130b2
131b2
130n1
131n1
130n2
131n2
RECEIVER
135a
125a
136a
TRANSMITTER
RECEIVER
135b
125b
136b
TRANSMITTER
114
RECEIVER
135n
125n
136b
TRANSMITTER

FIG. 2

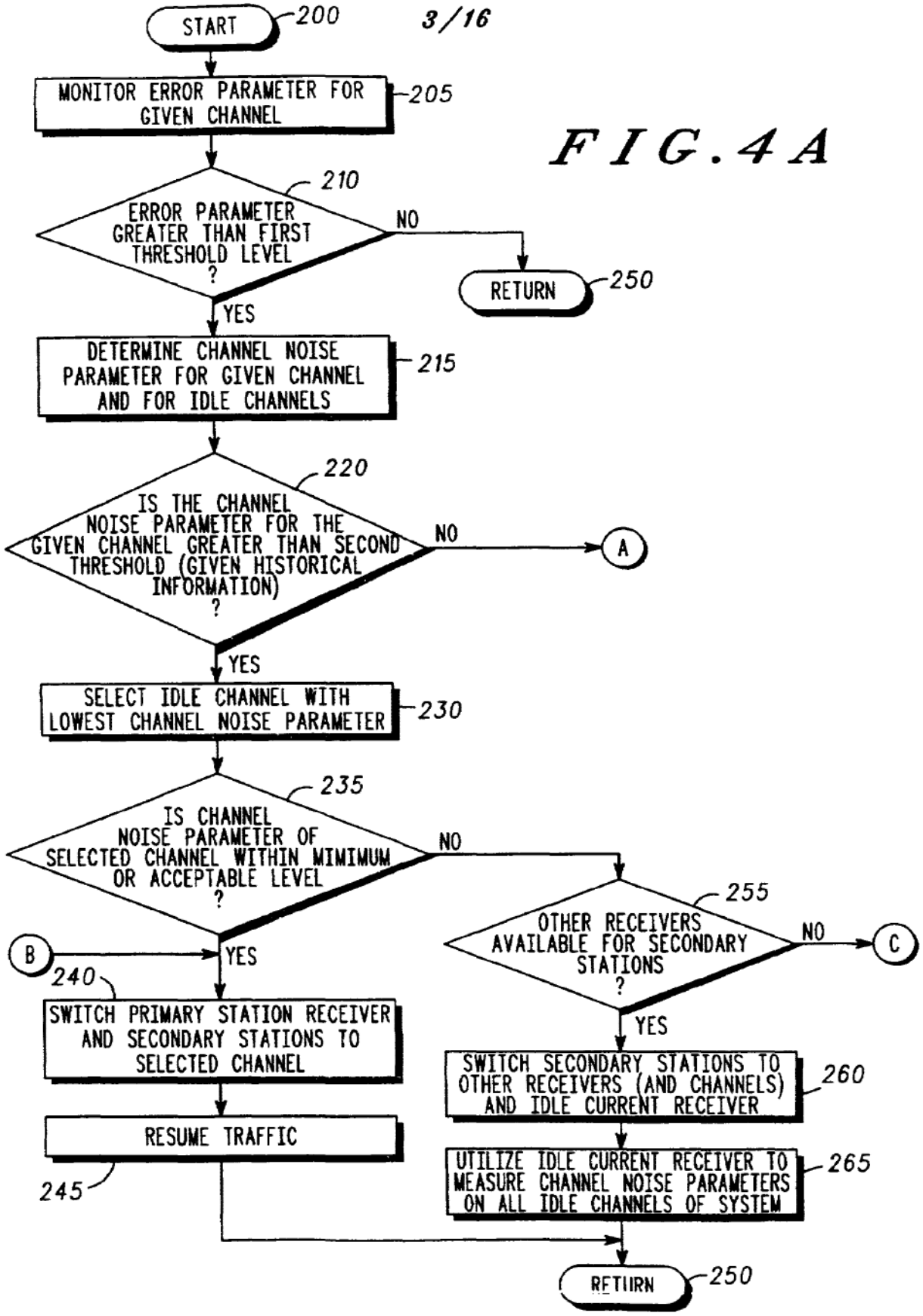

START
200
MONITOR ERROR PARAMETER FOR GIVEN CHANNEL
205
ERROR PARAMETER GREATER THAN FIRST THRESHOLD LEVEL ?
210
NO
RETURN
250
YES
DETERMINE CHANNEL NOISE PARAMETER FOR GIVEN CHANNEL AND FOR IDLE CHANNELS
215
IS THE CHANNEL NOISE PARAMETER FOR THE GIVEN CHANNEL GREATER THAN SECOND THRESHOLD (GIVEN HISTORICAL INFORMATION) ?
220
NO
A
YES
SELECT IDLE CHANNEL WITH LOWEST CHANNEL NOISE PARAMETER
230
IS CHANNEL NOISE PARAMETER OF SELECTED CHANNEL WITHIN MIMIMUM OR ACCEPTABLE LEVEL ?
235
NO
B
YES
240
SWITCH PRIMARY STATION RECEIVER AND SECONDARY STATIONS TO SELECTED CHANNEL
RESUME TRAFFIC
245
OTHER RECEIVERS AVAILABLE FOR SECONDARY STATIONS ?
255
NO
C
YES
SWITCH SECONDARY STATIONS TO OTHER RECEIVERS (AND CHANNELS) AND IDLE CURRENT RECEIVER
260
UTILIZE IDLE CURRENT RECEIVER TO MEASURE CHANNEL NOISE PARAMETERS ON ALL IDLE CHANNELS OF SYSTEM
265
RETURN
250

FIG. 4A

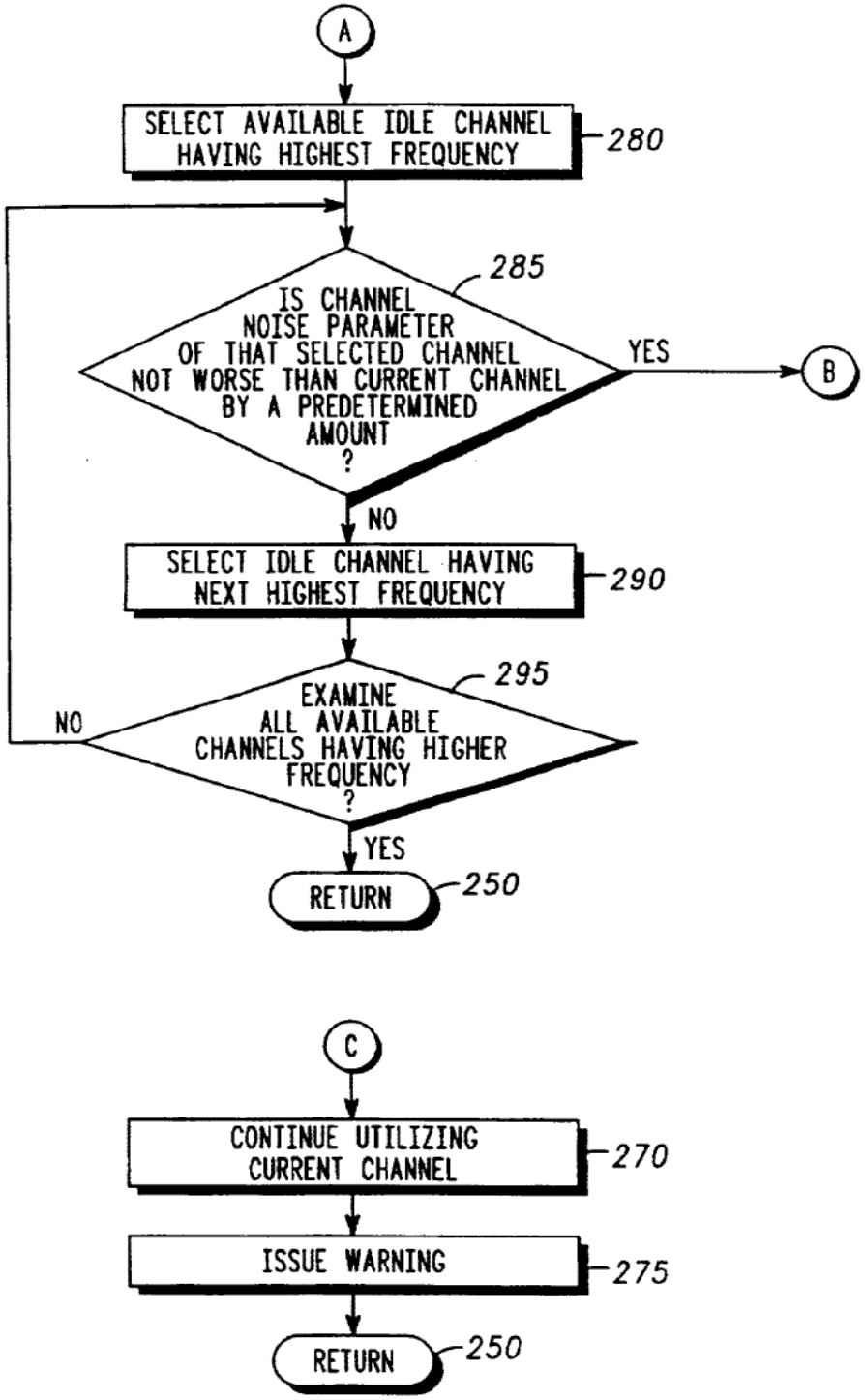

A
SELECT AVAILABLE IDLE CHANNEL HAVING HIGHEST FREQUENCY
280
285
IS CHANNEL NOISE PARAMETER OF THAT SELECTED CHANNEL NOT WORSE THAN CURRENT CHANNEL BY A PREDETERMINED AMOUNT ?
YES
B
NO
SELECT IDLE CHANNEL HAVING NEXT HIGHEST FREQUENCY
290
295
EXAMINE ALL AVAILABLE CHANNELS HAVING HIGHER FREQUENCY ?
NO
YES
RETURN
250
C
CONTINUE UTILIZING CURRENT CHANNEL
270
ISSUE WARNING
275
RETURN
250

FIG. 4B

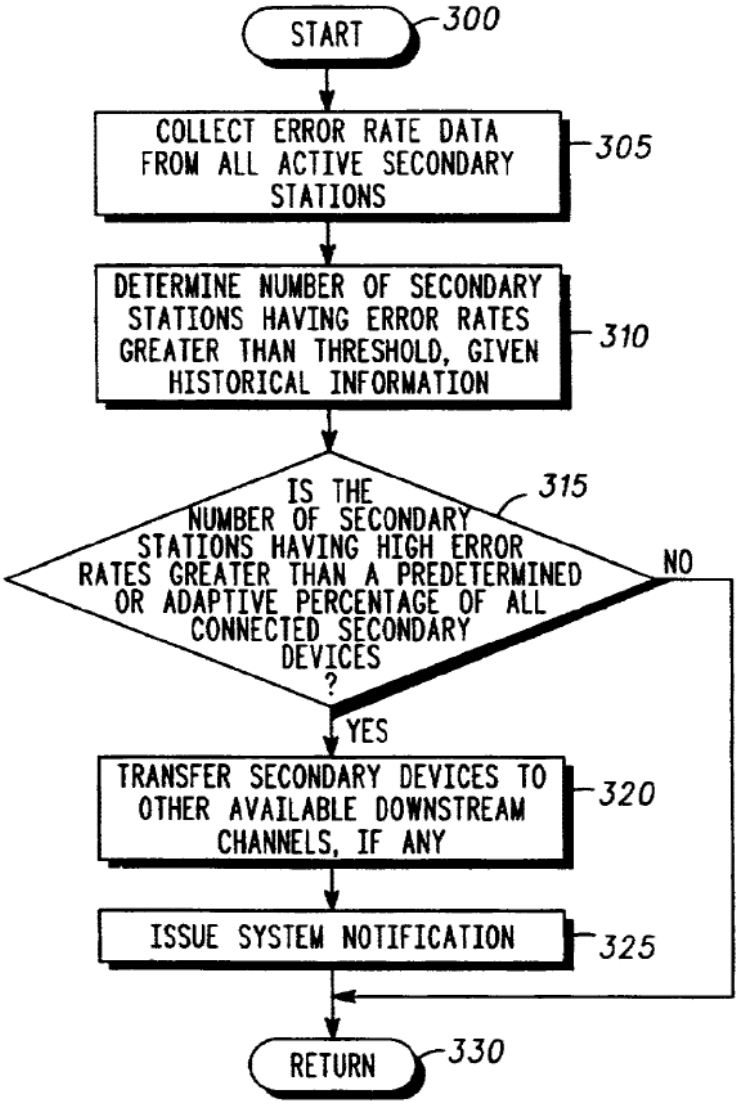

START
300
COLLECT ERROR RATE DATA FROM ALL ACTIVE SECONDARY STATIONS
305
DETERMINE NUMBER OF SECONDARY STATIONS HAVING ERROR RATES GREATER THAN THRESHOLD, GIVEN HISTORICAL INFORMATION
310
IS THE NUMBER OF SECONDARY STATIONS HAVING HIGH ERROR RATES GREATER THAN A PREDETERMINED OR ADAPTIVE PERCENTAGE OF ALL CONNECTED SECONDARY DEVICES ?
315
NO
YES
TRANSFER SECONDARY DEVICES TO OTHER AVAILABLE DOWNSTREAM CHANNELS, IF ANY
320
ISSUE SYSTEM NOTIFICATION
325
RETURN
330

FIG. 5

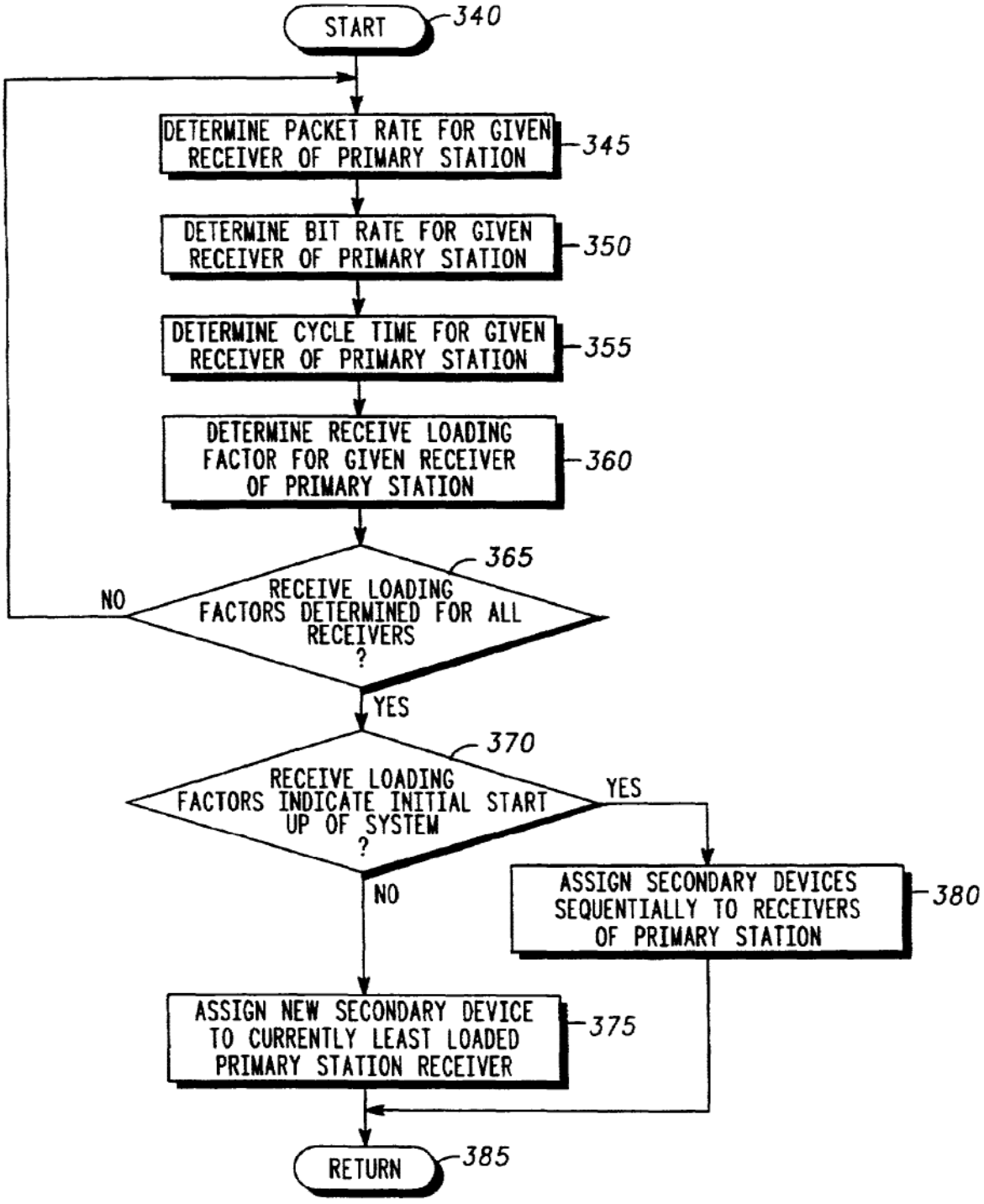

START
340
DETERMINE PACKET RATE FOR GIVEN RECEIVER OF PRIMARY STATION
345
DETERMINE BIT RATE FOR GIVEN RECEIVER OF PRIMARY STATION
350
DETERMINE CYCLE TIME FOR GIVEN RECEIVER OF PRIMARY STATION
355
DETERMINE RECEIVE LOADING FACTOR FOR GIVEN RECEIVER OF PRIMARY STATION
360
365
RECEIVE LOADING FACTORS DETERMINED FOR ALL RECEIVERS ?
NO
YES
370
RECEIVE LOADING FACTORS INDICATE INITIAL START UP OF SYSTEM ?
YES
NO
ASSIGN SECONDARY DEVICES SEQUENTIALLY TO RECEIVERS OF PRIMARY STATION
380
ASSIGN NEW SECONDARY DEVICE TO CURRENTLY LEAST LOADED PRIMARY STATION RECEIVER
375
RETURN
385

FIG. 6

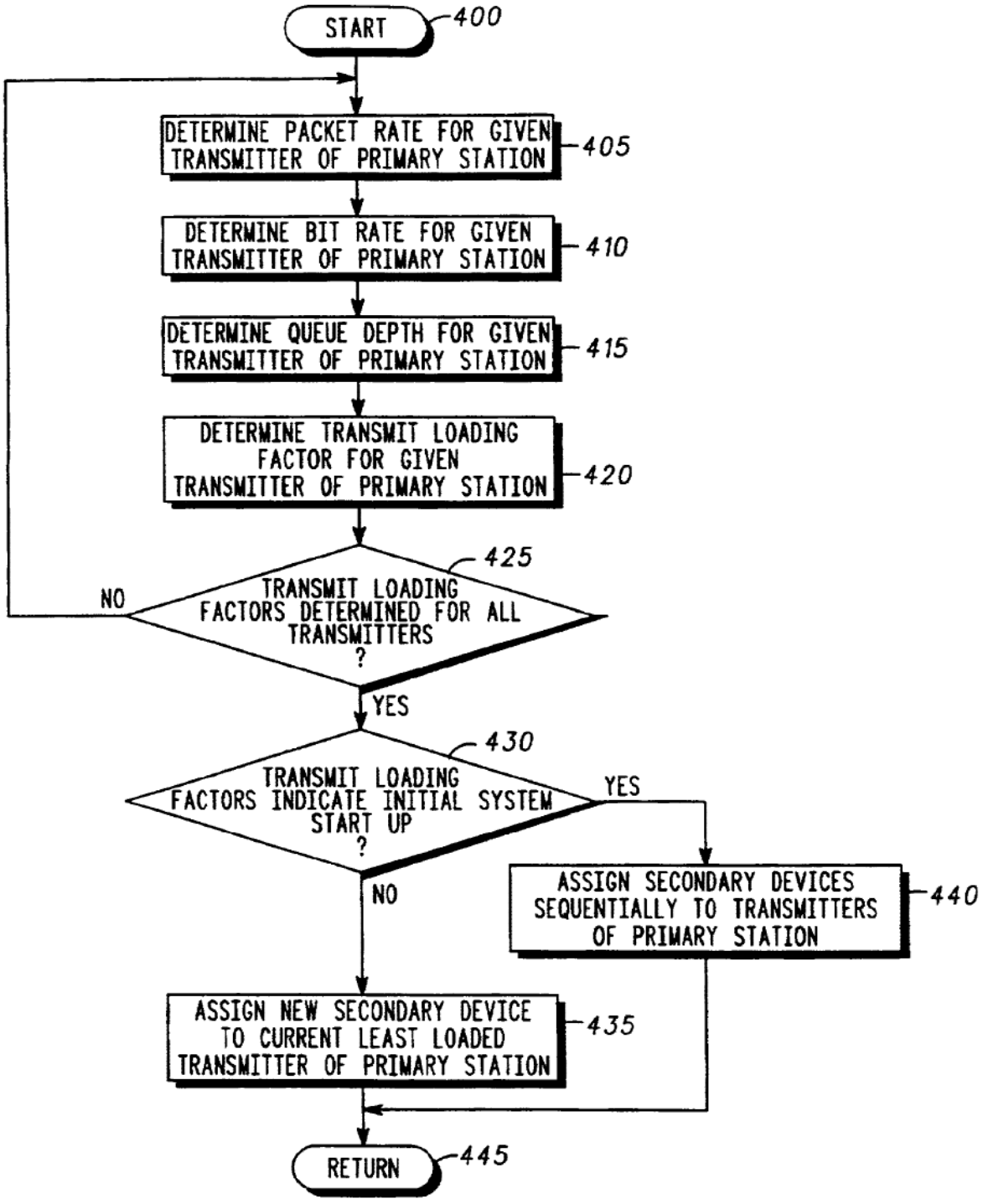

START
400
DETERMINE PACKET RATE FOR GIVEN TRANSMITTER OF PRIMARY STATION
405
DETERMINE BIT RATE FOR GIVEN TRANSMITTER OF PRIMARY STATION
410
DETERMINE QUEUE DEPTH FOR GIVEN TRANSMITTER OF PRIMARY STATION
415
DETERMINE TRANSMIT LOADING FACTOR FOR GIVEN TRANSMITTER OF PRIMARY STATION
420
425
TRANSMIT LOADING FACTORS DETERMINED FOR ALL TRANSMITTERS ?
NO
YES
430
TRANSMIT LOADING FACTORS INDICATE INITIAL SYSTEM START UP ?
YES
NO
ASSIGN SECONDARY DEVICES SEQUENTIALLY TO TRANSMITTERS OF PRIMARY STATION
440
ASSIGN NEW SECONDARY DEVICE TO CURRENT LEAST LOADED TRANSMITTER OF PRIMARY STATION
435
RETURN
445

FIG. 7

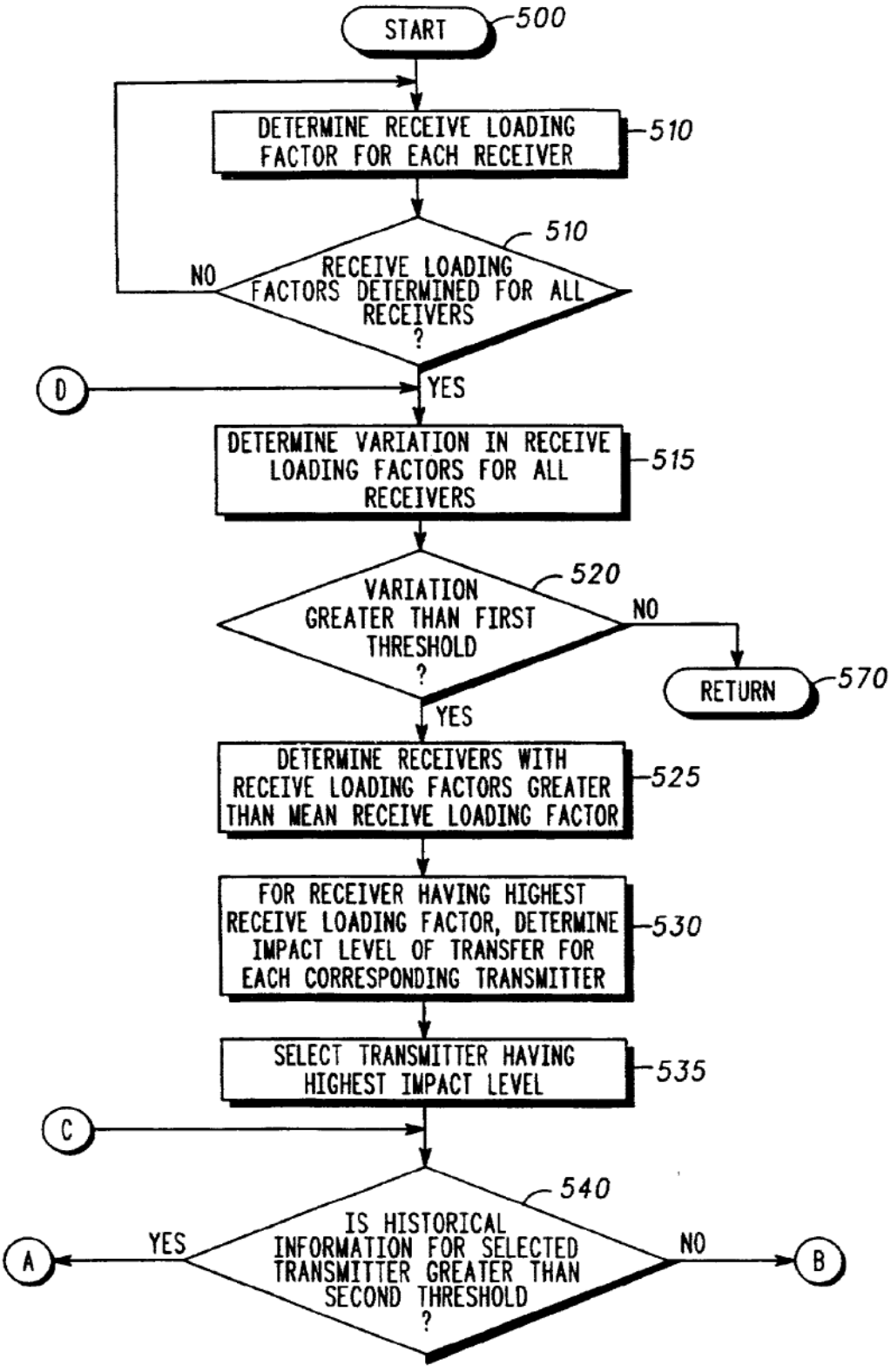

START
500
DETERMINE RECEIVE LOADING FACTOR FOR EACH RECEIVER
510
510
RECEIVE LOADING FACTORS DETERMINED FOR ALL RECEIVERS ?
NO
YES
D
DETERMINE VARIATION IN RECEIVE LOADING FACTORS FOR ALL RECEIVERS
515
520
VARIATION GREATER THAN FIRST THRESHOLD ?
NO
RETURN
570
YES
DETERMINE RECEIVERS WITH RECEIVE LOADING FACTORS GREATER THAN MEAN RECEIVE LOADING FACTOR
525
FOR RECEIVER HAVING HIGHEST RECEIVE LOADING FACTOR, DETERMINE IMPACT LEVEL OF TRANSFER FOR EACH CORRESPONDING TRANSMITTER
530
SELECT TRANSMITTER HAVING HIGHEST IMPACT LEVEL
535
C
540
IS HISTORICAL INFORMATION FOR SELECTED TRANSMITTER GREATER THAN SECOND THRESHOLD ?
YES
NO
A
B

FIG. 8A

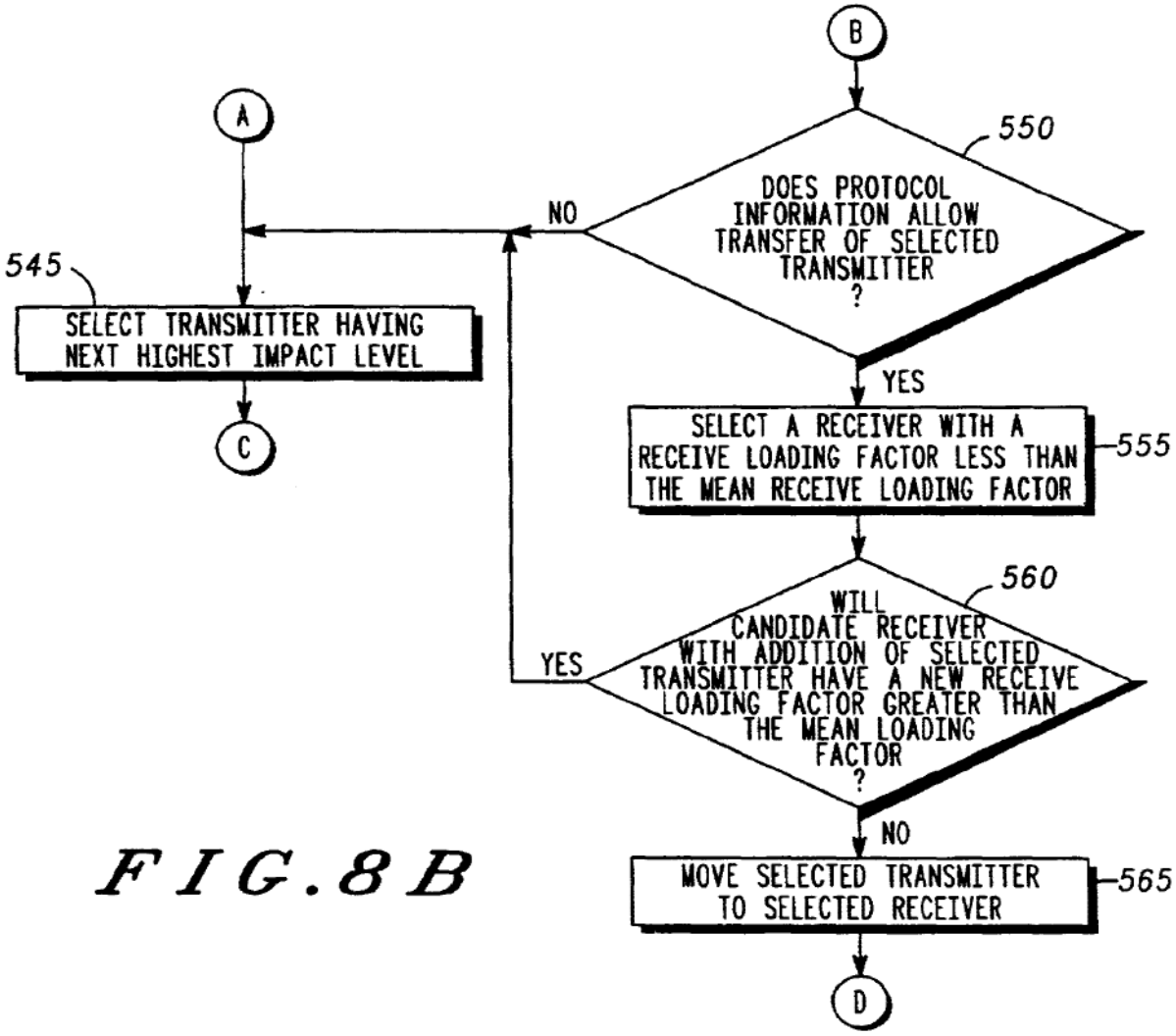

B
A
550
DOES PROTOCOL INFORMATION ALLOW TRANSFER OF SELECTED TRANSMITTER ?
NO
545
SELECT TRANSMITTER HAVING NEXT HIGHEST IMPACT LEVEL
C
YES
SELECT A RECEIVER WITH A RECEIVE LOADING FACTOR LESS THAN THE MEAN RECEIVE LOADING FACTOR
555
560
WILL CANDIDATE RECEIVER WITH ADDITION OF SELECTED TRANSMITTER HAVE A NEW RECEIVE LOADING FACTOR GREATER THAN THE MEAN LOADING FACTOR ?
YES
NO
MOVE SELECTED TRANSMITTER TO SELECTED RECEIVER
565
D

FIG. 8B

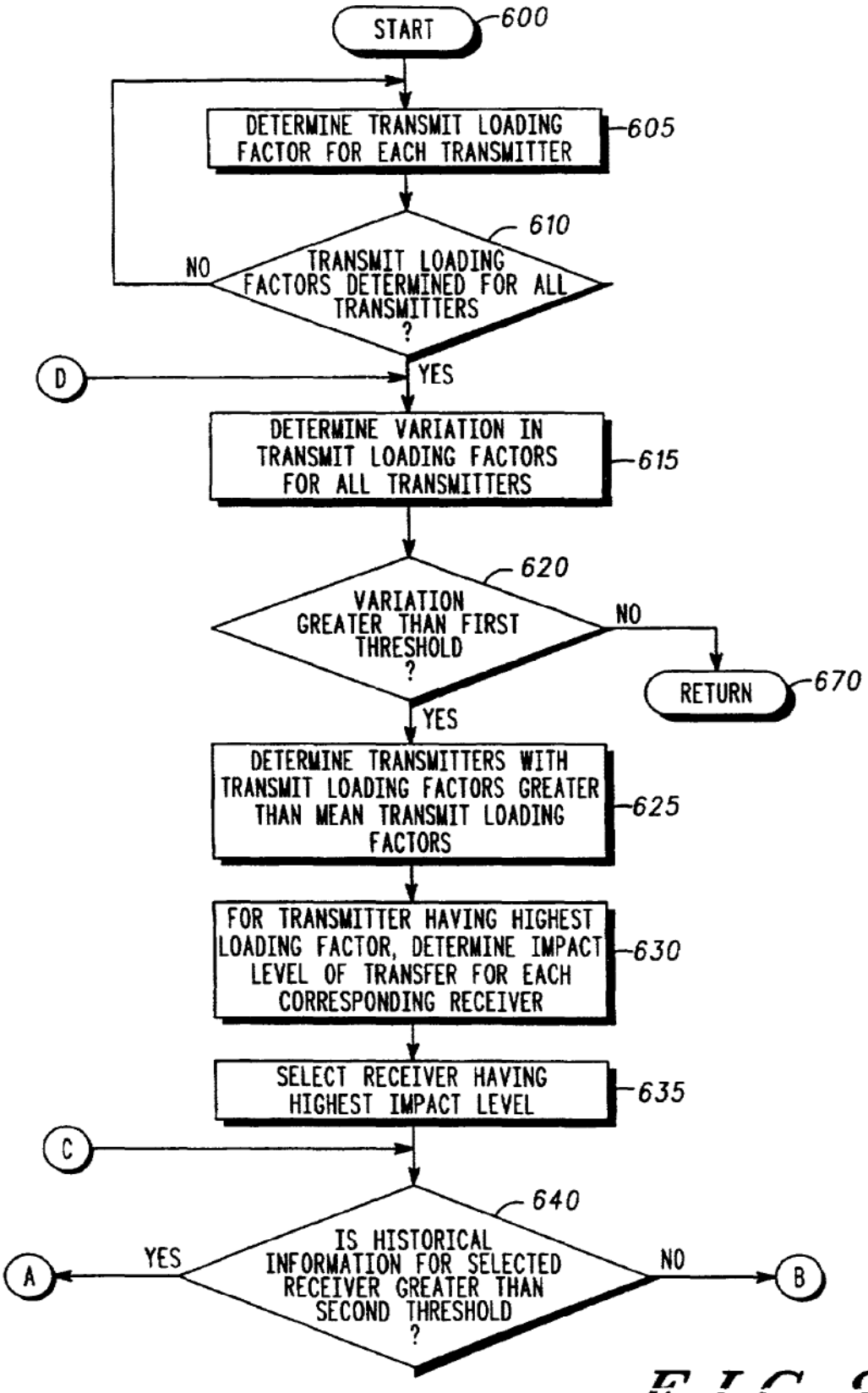

START
600
DETERMINE TRANSMIT LOADING FACTOR FOR EACH TRANSMITTER
605
610
TRANSMIT LOADING FACTORS DETERMINED FOR ALL TRANSMITTERS ?
NO
YES
D
DETERMINE VARIATION IN TRANSMIT LOADING FACTORS FOR ALL TRANSMITTERS
615
620
VARIATION GREATER THAN FIRST THRESHOLD ?
NO
RETURN
670
YES
DETERMINE TRANSMITTERS WITH TRANSMIT LOADING FACTORS GREATER THAN MEAN TRANSMIT LOADING FACTORS
625
FOR TRANSMITTER HAVING HIGHEST LOADING FACTOR, DETERMINE IMPACT LEVEL OF TRANSFER FOR EACH CORRESPONDING RECEIVER
630
SELECT RECEIVER HAVING HIGHEST IMPACT LEVEL
635
C
640
IS HISTORICAL INFORMATION FOR SELECTED RECEIVER GREATER THAN SECOND THRESHOLD ?
YES
NO
A
B

FIG. 9A

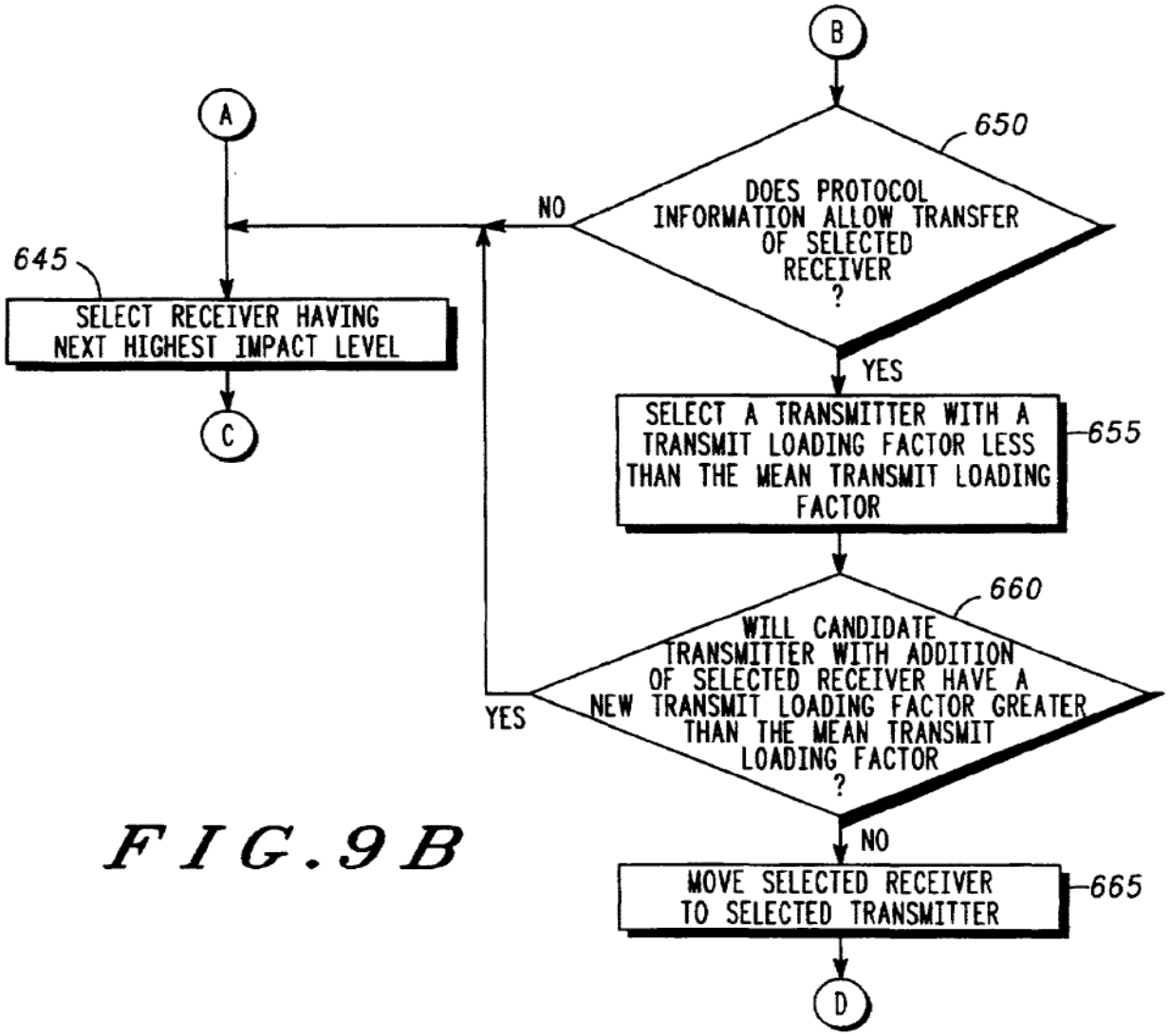

B
650
DOES PROTOCOL INFORMATION ALLOW TRANSFER OF SELECTED RECEIVER ?
NO
YES
A
645
SELECT RECEIVER HAVING NEXT HIGHEST IMPACT LEVEL
C
SELECT A TRANSMITTER WITH A TRANSMIT LOADING FACTOR LESS THAN THE MEAN TRANSMIT LOADING FACTOR
655
660
WILL CANDIDATE TRANSMITTER WITH ADDITION OF SELECTED RECEIVER HAVE A NEW TRANSMIT LOADING FACTOR GREATER THAN THE MEAN TRANSMIT LOADING FACTOR ?
YES
NO
MOVE SELECTED RECEIVER TO SELECTED TRANSMITTER
665
D

FIG. 9B

FIG.10A

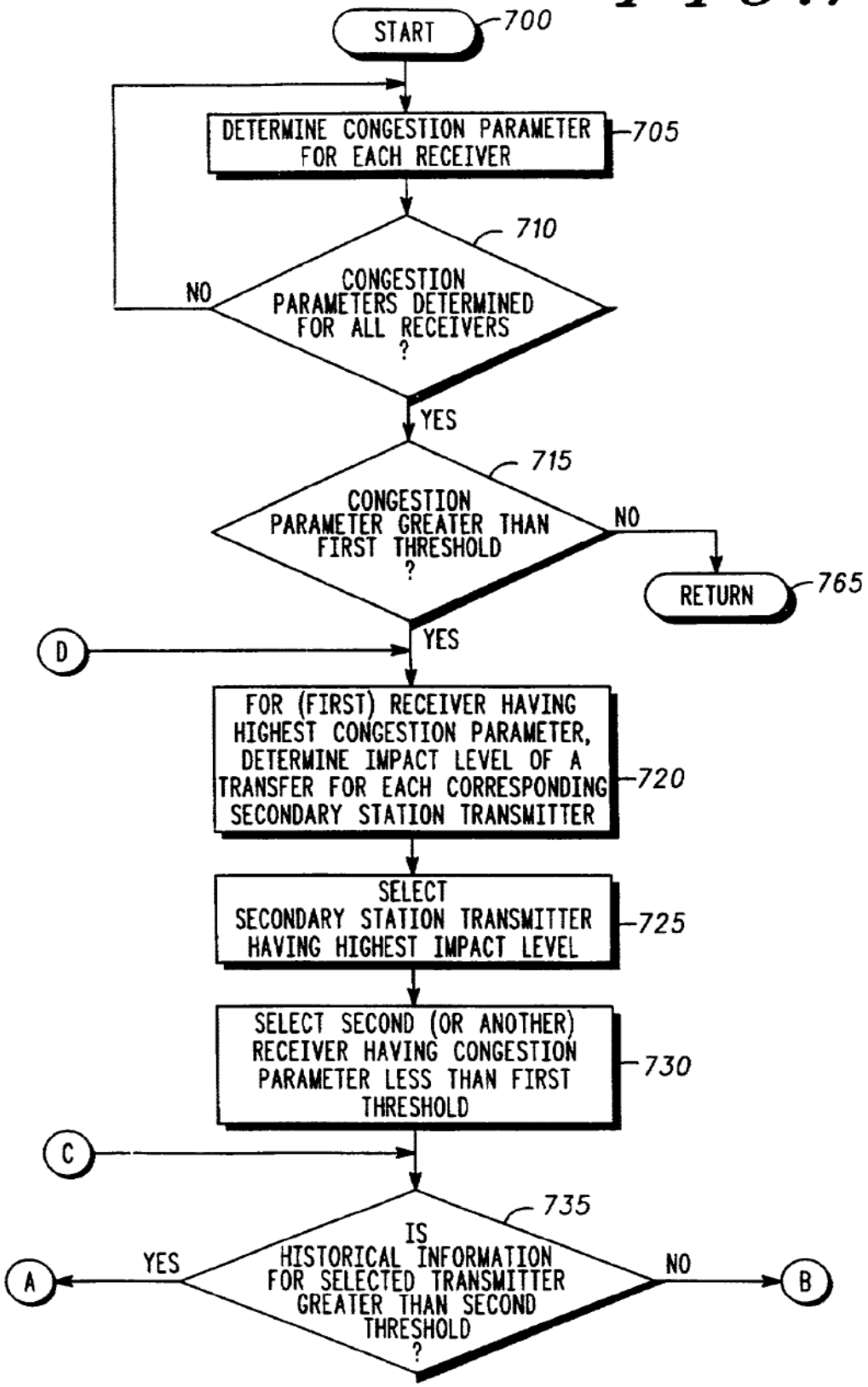
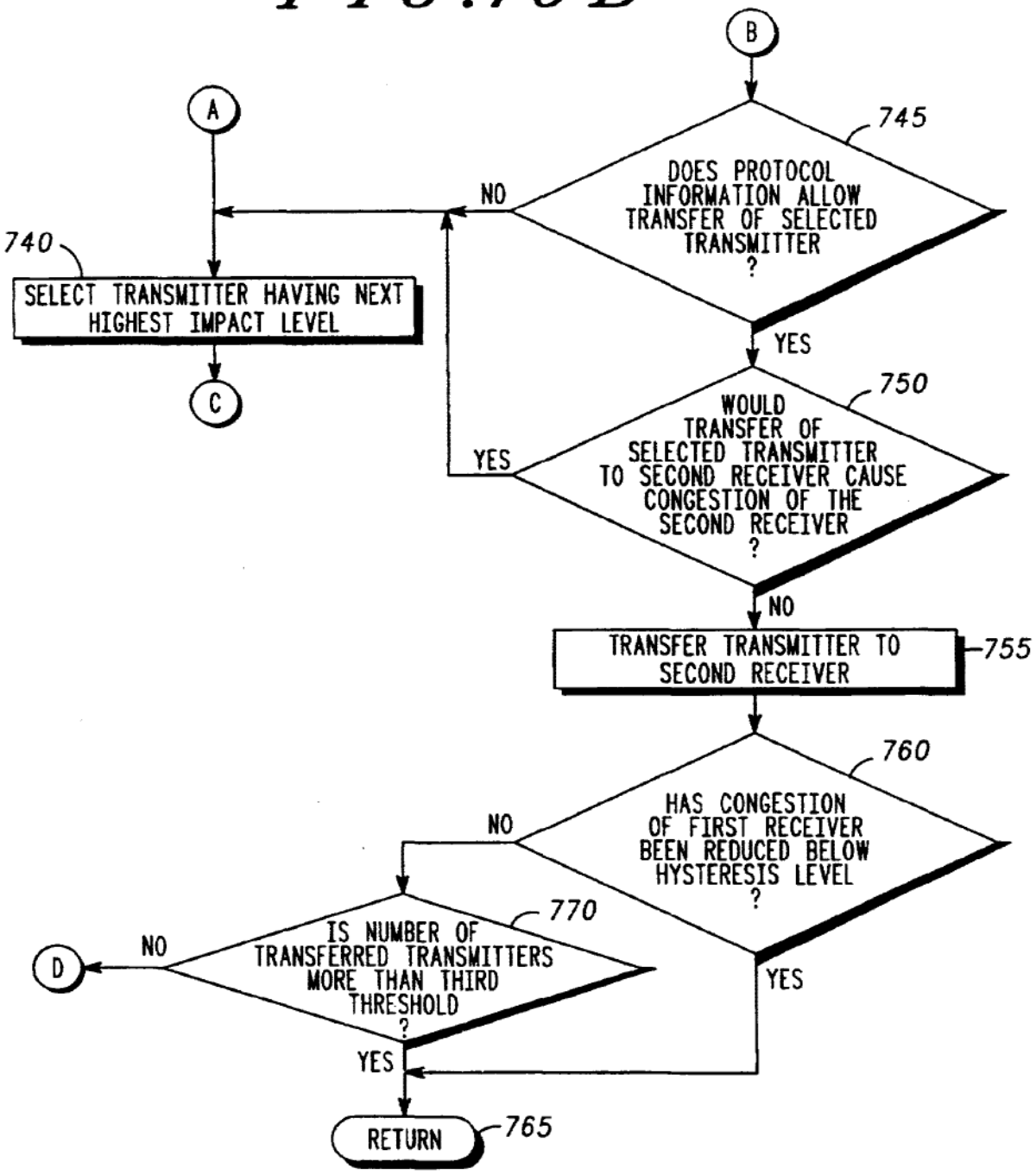

START
700
DETERMINE CONGESTION PARAMETER FOR EACH RECEIVER
705
710
CONGESTION PARAMETERS DETERMINED FOR ALL RECEIVERS ?
NO
YES
715
CONGESTION PARAMETER GREATER THAN FIRST THRESHOLD ?
NO
RETURN
765
YES
D
FOR (FIRST) RECEIVER HAVING HIGHEST CONGESTION PARAMETER, DETERMINE IMPACT LEVEL OF A TRANSFER FOR EACH CORRESPONDING SECONDARY STATION TRANSMITTER
720
SELECT SECONDARY STATION TRANSMITTER HAVING HIGHEST IMPACT LEVEL
725
SELECT SECOND (OR ANOTHER) RECEIVER HAVING CONGESTION PARAMETER LESS THAN FIRST THRESHOLD
730
C
735
IS HISTORICAL INFORMATION FOR SELECTED TRANSMITTER GREATER THAN SECOND THRESHOLD ?
YES
NO
A
B

FIG.10B


B
A
745
DOES PROTOCOL INFORMATION ALLOW TRANSFER OF SELECTED TRANSMITTER ?
NO
YES
740
SELECT TRANSMITTER HAVING NEXT HIGHEST IMPACT LEVEL
C
750
WOULD TRANSFER OF SELECTED TRANSMITTER TO SECOND RECEIVER CAUSE CONGESTION OF THE SECOND RECEIVER ?
YES
NO
TRANSFER TRANSMITTER TO SECOND RECEIVER
755
760
HAS CONGESTION OF FIRST RECEIVER BEEN REDUCED BELOW HYSTERESIS LEVEL ?
NO
YES
770
IS NUMBER OF TRANSFERRED TRANSMITTERS MORE THAN THIRD THRESHOLD ?
NO
D
YES
RETURN
765

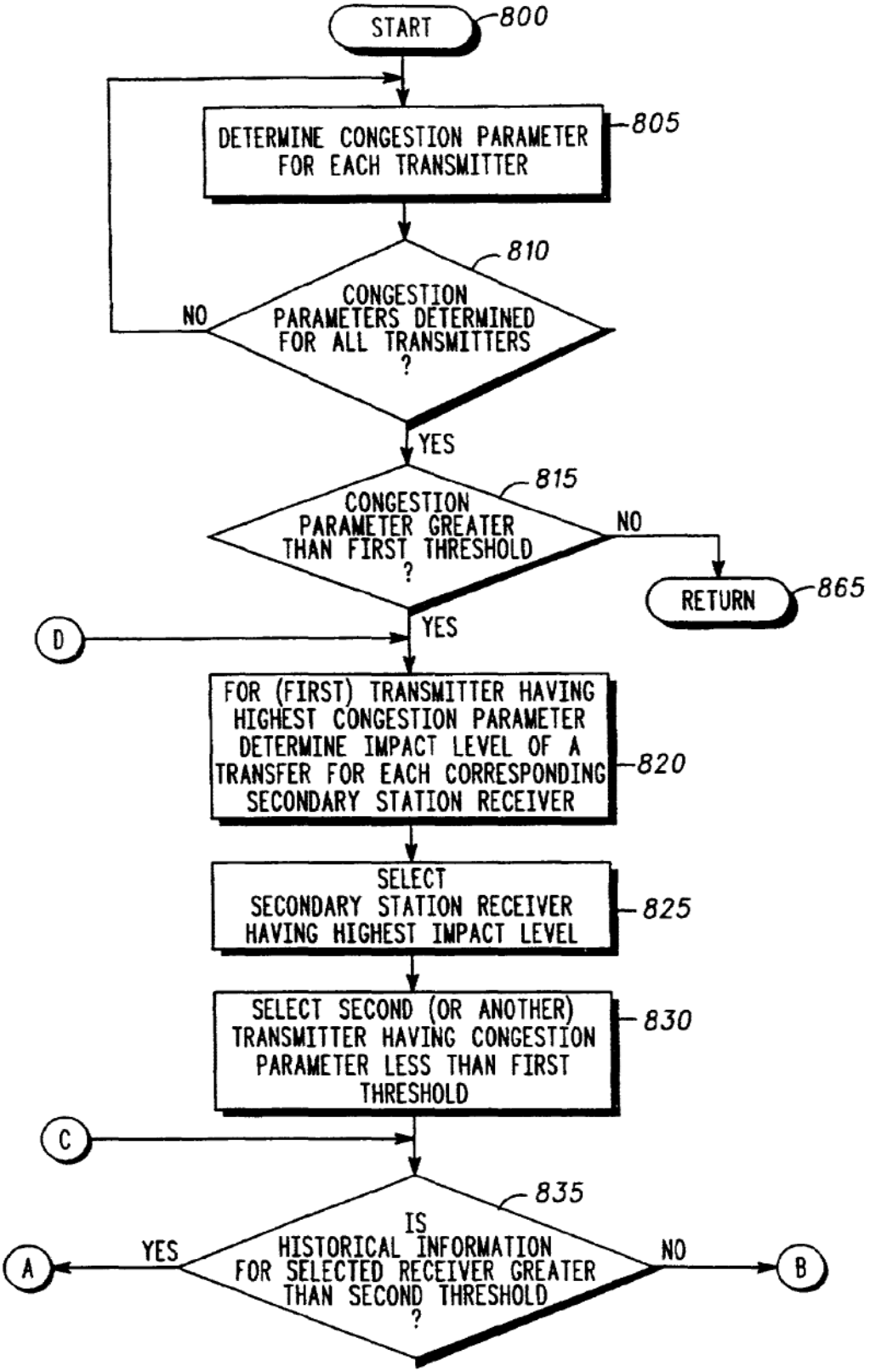
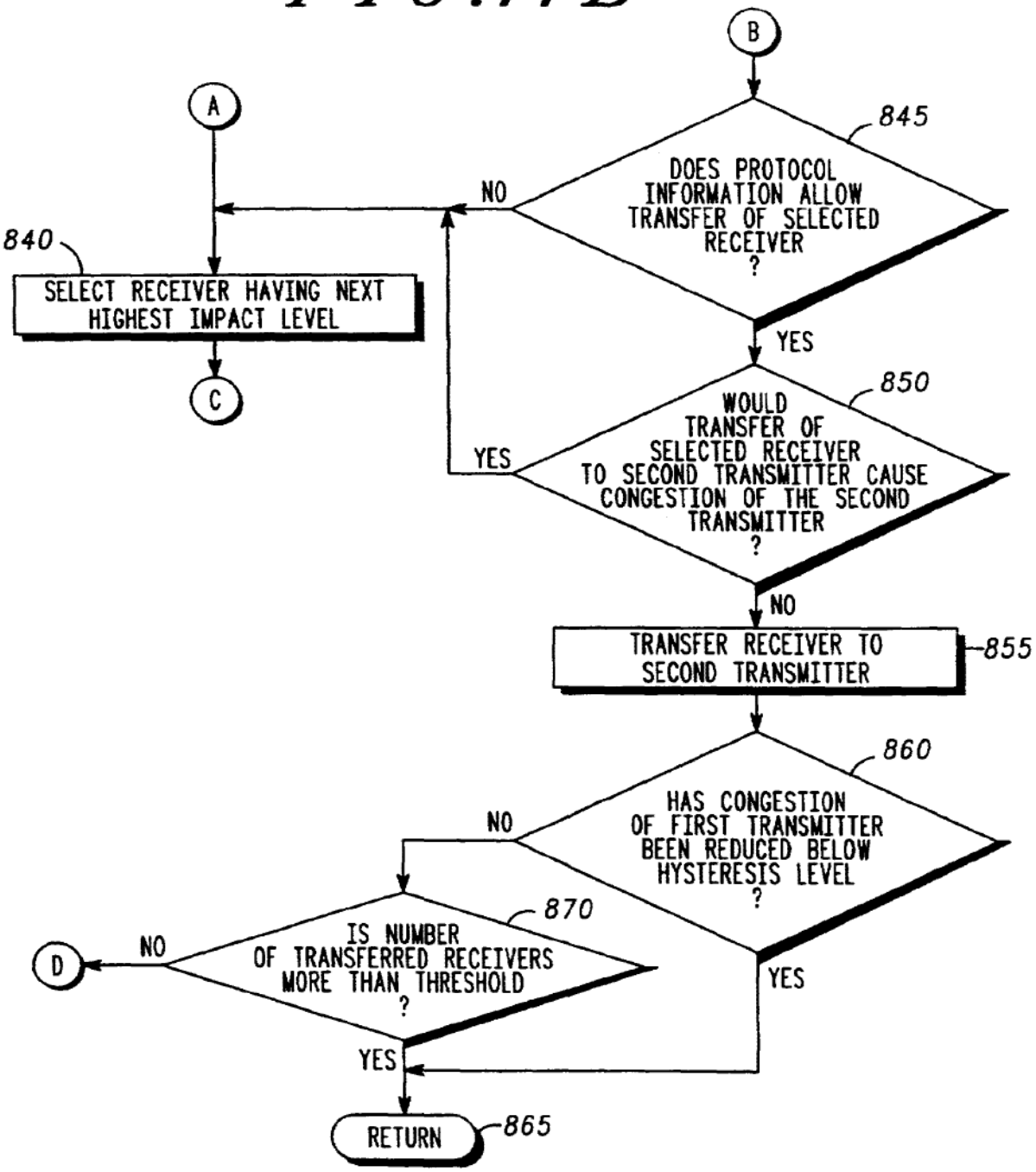

START
800
DETERMINE CONGESTION PARAMETER FOR EACH TRANSMITTER
805
CONGESTION PARAMETERS DETERMINED FOR ALL TRANSMITTERS ?
810
NO
YES
CONGESTION PARAMETER GREATER THAN FIRST THRESHOLD ?
815
NO
RETURN
865
YES
D
FOR (FIRST) TRANSMITTER HAVING HIGHEST CONGESTION PARAMETER DETERMINE IMPACT LEVEL OF A TRANSFER FOR EACH CORRESPONDING SECONDARY STATION RECEIVER
820
SELECT SECONDARY STATION RECEIVER HAVING HIGHEST IMPACT LEVEL
825
SELECT SECOND (OR ANOTHER) TRANSMITTER HAVING CONGESTION PARAMETER LESS THAN FIRST THRESHOLD
830
C
IS HISTORICAL INFORMATION FOR SELECTED RECEIVER GREATER THAN SECOND THRESHOLD ?
835
YES
NO
A
B

FIG. 11A

FIG.11B


B
A
845
DOES PROTOCOL INFORMATION ALLOW TRANSFER OF SELECTED RECEIVER ?
NO
YES
840
SELECT RECEIVER HAVING NEXT HIGHEST IMPACT LEVEL
C
850
WOULD TRANSFER OF SELECTED RECEIVER TO SECOND TRANSMITTER CAUSE CONGESTION OF THE SECOND TRANSMITTER ?
YES
NO
TRANSFER RECEIVER TO SECOND TRANSMITTER
855
860
HAS CONGESTION OF FIRST TRANSMITTER BEEN REDUCED BELOW HYSTERESIS LEVEL ?
NO
YES
870
IS NUMBER OF TRANSFERRED RECEIVERS MORE THAN THRESHOLD ?
NO
D
YES
RETURN
865

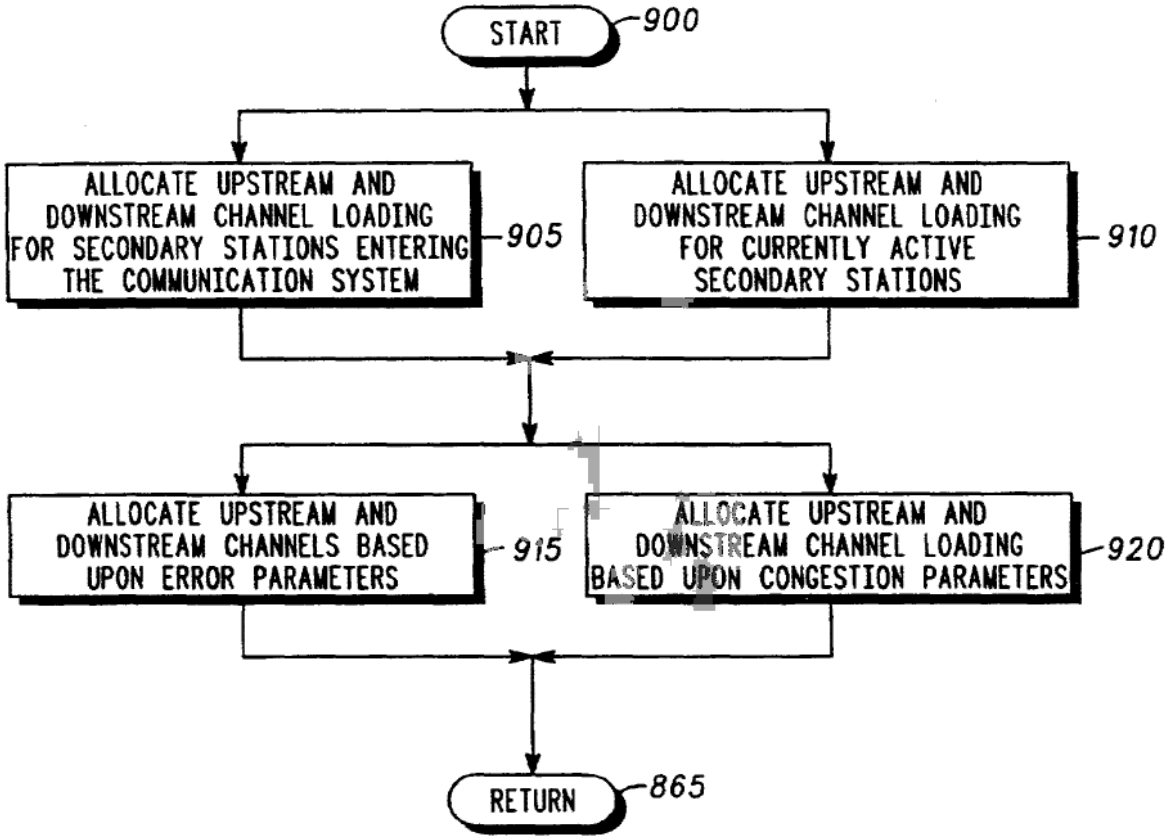

START
900
ALLOCATE UPSTREAM AND DOWNSTREAM CHANNEL LOADING FOR SECONDARY STATIONS ENTERING THE COMMUNICATION SYSTEM
905
ALLOCATE UPSTREAM AND DOWNSTREAM CHANNEL LOADING FOR CURRENTLY ACTIVE SECONDARY STATIONS
910
ALLOCATE UPSTREAM AND DOWNSTREAM CHANNELS BASED UPON ERROR PARAMETERS
915
ALLOCATE UPSTREAM AND DOWNSTREAM CHANNEL LOADING BASED UPON CONGESTION PARAMETERS
920
RETURN
865

FIG.12

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/04803

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :H04J 3/16
US CL :370/232, 458
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 370/229, 230, 231, 232, 235, 237, 458, 468

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,295,140 A (CRISLER ET AL) 15 March 1994, col. 3, line 65 - col. line 40.	1-10
A	US 5,483,533 A (KUBA) 09 January 1996, col. 2 lines 15 - 49.	1-10

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 01 AUGUST 1997	Date of mailing of the international search report 20 AUG 1997
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer BENEDICT V. SAFOUREK Telephone No. 703/305-3900

Form PCT/ISA/210 (second sheet)(July 1992)*

Electronic Acknowledgement Receipt

EFS ID:	22527881
Application Number:	14072184
International Application Number:	
Confirmation Number:	7558
Title of Invention:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
First Named Inventor/Applicant Name:	Yu Fang
Customer Number:	21186
Filer:	Eric B. Andersland/Valerie Murphy
Filer Authorized By:	Eric B. Andersland
Attorney Docket Number:	2831.006US6
Receipt Date:	03-JUN-2015
Filing Date:	05-NOV-2013
Time Stamp:	16:45:05
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	Foreign Reference	0001_wo0155905a1.pdf	1415971 8e4f3fa3f1c8adc67fc4c19dead8cecf1268bdac	no	34

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Information:	

2	Foreign Reference	0002_wo9737454a1.pdf	3494216 333ce6235c0018f80253f1f1d7933df690d3aea6	no	79
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3	Non Patent Literature	0003_fireeye_022244.pdf	758520 3e3cb75ce2692550c4e4a8ca96f68dfebc4ed979	no	6
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4	Non Patent Literature	0004_fireeye_015439.pdf	713199 e4b5bc590319b9d48e71a6f12c9ea3a597fc74db	no	7
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5	Non Patent Literature	0005_2831006us4_aarn_052715.pdf	2508261 6b0de7c4fb2c877973a8cca22e27ebb6d62df89d	no	11
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13	Non Patent Literature	0013_ceptsandexamplesch14_013264.pdf	12763798 6f705d1a957555b2ae74bcc0e1ce40a193b8b314	no	126
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14	Non Patent Literature	0014_ceptsandexamplesv21ch15_013544.pdf	12767232 f12751f79e0fb3915d857092b08c3570b375e72f	no	126
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15	Non Patent Literature	0015_ceptsandexamplesv3ch17_013994.pdf	18686483 19a90ed096a73a09d8766c51c5bc9cc02268e297	no	180
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16	Non Patent Literature	0016_fireeye_018912.pdf	2335332 e5e7515440351f69cb9d0a09992cad2d22abca2a	no	30
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17	Non Patent Literature	0017_fireeye_019619.pdf	104996 3261d978c002f5b3f48e387bf8706c00ab0e64bd	no	1
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18	Non Patent Literature	0018_fireeye_019073.pdf	1846483 241e3c451c0b92a1b661c295c36304d864ebd9ed	no	14
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19	Non Patent Literature	0019_fireeye_015928.pdf	8484329 c6450777f330b9e821e7b18caf77214479511ff3	no	79
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20	Non Patent Literature	0020_fireeye_012046.pdf	7913450 51d77dd9b9e9ae2141ae7c28e002f330c9f7e9ef	no	108
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21	Non Patent Literature	0021_fireeye_011903.pdf	4027677 7fbde9736caec6396e40debf1d53021029baf817	no	52
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22	Non Patent Literature	0022_exhibit_a01basedon6484315.pdf	903494 022c6c98dfd56bab1786d9b163b18f16adfc90a7	no	27
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23	Non Patent Literature	0023_exhibit_a10basedonpatent7992142_.pdf	364214 dea6ca7b9250ac1dcb5559c48a0e8cb727885335	no	9
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26	Non Patent Literature	0026_exhibit_a04basedonjunli.pdf	1385487 2c5ba3561d3c3325991b435862f2fbcb28a0506e	no	32
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27	Non Patent Literature	0027_exhibit_a05based_on_fortinetpasystem.pdf	20777138 dff6d516459bf35be582e46790daff0f8cb88ebd	no	65
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28	Non Patent Literature	0028_exhibit_a06basedon_symantecpasystem.pdf	16032501 2e7bb2d3d6d045603a635785942dd2ffb7977817	no	53
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29	Non Patent Literature	0029_exhibit_a07basedonmcafeepasystem.pdf	17653640 594fe20a5239b5152db0691573ed70c2c125e43d	no	67
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34	Non Patent Literature	0034_exhibit_b03.pdf	869953 a2aff87d3de2f4a1c52625d7cf8bd35dcb566e0d	no	35
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35	Non Patent Literature	0035_exhibit_b04.pdf	2251244 f509712bb553582c3ae03d08cf8c71933dadb32f	no	43
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38	Non Patent Literature	0038_exhibit_b07.pdf	13068211 62fdb44a0eda9ec4c0623484815761241201f36a7	no	62
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Information:					
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Information:					

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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.

Electronic Acknowledgement Receipt

EFS ID:	22528229
Application Number:	14072184
International Application Number:	
Confirmation Number:	7558
Title of Invention:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
First Named Inventor/Applicant Name:	Yu Fang
Customer Number:	21186
Filer:	Eric B. Andersland/Valerie Murphy
Filer Authorized By:	Eric B. Andersland
Attorney Docket Number:	2831.006US6
Receipt Date:	03-JUN-2015
Filing Date:	05-NOV-2013
Time Stamp:	16:58:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

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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.

Electronic Acknowledgement Receipt

EFS ID:	22528527
Application Number:	14072184
International Application Number:	
Confirmation Number:	7558
Title of Invention:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
First Named Inventor/Applicant Name:	Yu Fang
Customer Number:	21186
Filer:	Eric B. Andersland/Valerie Murphy
Filer Authorized By:	Eric B. Andersland
Attorney Docket Number:	2831.006US6
Receipt Date:	03-JUN-2015
Filing Date:	05-NOV-2013
Time Stamp:	17:11:21
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.)
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Information:					
		Total Files Size (in bytes):	180486608		

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<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.

Electronic Acknowledgement Receipt

EFS ID:	22528785
Application Number:	14072184
International Application Number:	
Confirmation Number:	7558
Title of Invention:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
First Named Inventor/Applicant Name:	Yu Fang
Customer Number:	21186
Filer:	Eric B. Andersland/Valerie Murphy
Filer Authorized By:	Eric B. Andersland
Attorney Docket Number:	2831.006US6
Receipt Date:	03-JUN-2015
Filing Date:	05-NOV-2013
Time Stamp:	17:22:51
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	Non Patent Literature	0180_fireeye_019027.pdf	2022021 ec0f10ef548363922 9f5252be0086548101b8906	no	19

Warnings:	
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2	Non Patent Literature	0181_fireeye_019880.pdf	2429078 f60cb77e979bebd645cb1eff0ede31f9f83a464b	no	13
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New Applications Under 35 U.S.C. 111
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New International Application Filed with the USPTO as a Receiving Office
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PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/072,184	Filing Date 11/05/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	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

		(Column 1)		(Column 2)	(Column 3)		
AMENDMENT	06/03/2015	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 9	Minus	** 20	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)		
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	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.

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/DIANIECE JACOBS/

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.**
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NOTICE OF ALLOWANCE AND FEE(S) DUE

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MINNEAPOLIS, MN 55402

EXAMINER	
ALMEIDA, DEVIN E	
ART UNIT	PAPER NUMBER
2432	

DATE MAILED: 03/27/2015

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/072,184	11/05/2013	Yu Fang	2831.006US6	7558

TITLE OF INVENTION: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	06/29/2015

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.

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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)

21186 7590 03/27/2015
SCHWEGMAN LUNDBERG & WOESSNER, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

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.
14/072,184	11/05/2013	Yu Fang	2831.006US6	7558

TITLE OF INVENTION: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	06/29/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
ALMEIDA, DEVIN E	2432	726-012000

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

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

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

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

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

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

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

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

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

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

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/072,184	11/05/2013	Yu Fang	2831.006US6	7558

21186 7590 03/27/2015

SCHWEGMAN LUNDBERG & WOESSNER, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER	
ALMEIDA, DEVIN E	
ART UNIT	PAPER NUMBER
2432	

DATE MAILED: 03/27/2015

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.

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. 14/072,184	Applicant(s) FANG ET AL.	
	Examiner DEVIN ALMEIDA	Art Unit 2432	AIA (First Inventor to File) Status No

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

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

1. ☒ This communication is responsive to *3/13/2015*.
   ☐ 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 *1,5-7,11-13,17 and 18*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

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

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

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

/DEVIN ALMEIDA/ Examiner, Art Unit 2432	/GILBERTO BARRON JR/ Supervisory Patent Examiner, Art Unit 2432

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14072184	FANG ET AL.
	Examiner	Art Unit
	DEVIN ALMEIDA	2432

CPC- SEARCHED		
Symbol	Date	Examiner
H04I63/0227; H04L63/1441; H04L63/1408; H04L63/1416; H04L63/1425	3/6/2015	DA

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
see east search	6/25/2014	DA
inventor search	3/16/2015	DA
see east search	3/16/2015	DA

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	(traffic and update adj station and content adj detection adj data and block$3 and allow$3).clm.	3/6/2015	DA

/DEVIN ALMEIDA/ Examiner.Art Unit 2432	

Modified form PTO/SB/08A(04-07) OMB 651-0031
US Patent & Trademark Office: U.S. DEPARTMENT OF COMMERCE
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Substitute for form 1449A/PTO **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (Use as many sheets as necessary)	*Complete if Known*	
	Application Number	14/072,184
	Filing Date	November 5, 2013
	First Named Inventor	Yu Fang
	Group Art Unit	2432
	Examiner Name	Devin Almeida
Sheet 1 of 1	Attorney Docket No: 2831.006US6	

US PATENT DOCUMENTS			
Examiner Initial *	**USP Document Number**	**Publication Date**	**Name of Patentee or Applicant of cited Document**
/DA/	US-20020178262A1	11/28/2002	Bonnell, David, et al.
/DA/	US-20050044165A1	2/24/2005	O'Farrell, Robert, et al.
/DA/	US-6,157,932	12/5/2000	Klein, Stieg R, et al.
/DA/	US-6,324,654	11/27/2001	Wahl, Steven B., et al.

OTHER DOCUMENTS – NON PATENT LITERATURE DOCUMENTS		
Examiner Initial *	**Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.**	**T 1**
/DA/	"Application Serial No. 13/546,915, Non Final Office Action mailed 02-27-15", 26 pgs	

EXAMINER /Devin Almeida/ **DATE CONSIDERED** 03/17/2015

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant is to place a check mark here if English language Translation is attached

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14072184	FANG ET AL.
	Examiner	Art Unit
	DEVIN ALMEIDA	2432

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

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

CLAIM		DATE								
Final	Original	06/25/2014	03/06/2015							
1	1	✓	=							
	2	✓	-							
	3	✓	-							
	4	O	-							
2	5	✓	=							
3	6	✓	=							
4	7	✓	=							
	8	✓	-							
	9	✓	-							
	10	O	-							
5	11	✓	=							
6	12	✓	=							
7	13	✓	=							
	14	✓	-							
	15	O	-							
	16	✓	-							
8	17	✓	=							
9	18	✓	=							

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	3	14/072184	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L2	0	"7149219" and filter with router with block	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L3	4	"7149219" and filter with router	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L4	15	"7149219" and block	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L5	1	"7149219" and virus	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L22	2585	h04l63/0227.cpc.	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L23	2701	h04l63/1441.cpc.	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L24	1651	h04l63/02.cpc.	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L25	3218	h04l63/1408.cpc.	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L26	3374	h04l63/1416.cpc.	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L27	1494	h04l63/1425.cpc.	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L28	4688	(L22 L23 L24 L25 L26 L27) and virus	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L29	680	(L22 L23 L24 L25 L26 L27) and filter with (virus worm spam)	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L30	229	(L22 L23 L24 L25 L26 L27) and filter with (virus worm spam) and user with policy	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L31	19	(L22 L23 L24 L25 L26 L27) and router with filter with (virus worm spam) and user with policy	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L32	5	(L22 L23 L24 L25 L26 L27) and router with detect with (virus worm spam) and user	US-PGPUB;	OR	ON	2015/03/06 16:18

		with policy	USPAT			
L33	4	(L22 L23 L24 L25 L26 L27) and router with detect with suspicious adj2 traffic	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L34	44	(L22 L23 L24 L25 L26 L27) and router with detect with (virus worm spam)	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L35	682	((Yu) near2 (Fang)).INV.	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18
L36	102	((Michael) near2 (Xie)).INV.	US-PGPUB; USPAT	OR	ON	2015/03/06 16:18

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L37	1	(traffic and update adj station and content adj detection adj data and block$3 and allow$3).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/06 16:18
L38	9	"8056135"	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/06 16:18
L39	7	"8276205"	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/06 16:18
L40	1	"8935790"	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/06 16:18

3/6/2015 4:20:28 PM
C:\Users\dalmeida\Documents\EAST\Workspaces\14072184.wsp

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14072184	FANG ET AL.
	Examiner	**Art Unit**
	DEVIN ALMEIDA	2432

CPC						
Symbol					**Type**	**Version**
H04L		63	/	1425	F	2013-01-01
H04L		63	/	0227	I	2013-01-01
H04L		63	/	1441	I	2013-01-01
G06F		21	/	567	I	2013-01-01
H04L		63	/	02	I	2013-01-01
H04L		63	/	1408	I	2013-01-01
H04L		63	/	1416	I	2013-01-01
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CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

/DEVIN ALMEIDA/ Examiner.Art Unit 2432	03/16/2015	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	9	
/GILBERTO BARRON JR/ Supervisory Patent Examiner.Art Unit 2432	03/17/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14072184	FANG ET AL.
	Examiner	Art Unit
	DEVIN ALMEIDA	2432

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS
726	12

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

INTERNATIONAL CLASSIFICATION					
CLAIMED					NON-CLAIMED
H	0	4	L	29 / 06 (2006.0)	
G	0	6	F	21 / 56 (2013.0)	

/DEVIN ALMEIDA/ Examiner.Art Unit 2432	03/16/2015	Total Claims Allowed:	
(Assistant Examiner)	(Date)	9	
/GILBERTO BARRON JR/ Supervisory Patent Examiner.Art Unit 2432	03/17/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14072184	FANG ET AL.
	Examiner	**Art Unit**
	DEVIN ALMEIDA	2432

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

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1														
2	5														
3	6														
4	7														
5	11														
6	12														
7	13														
8	17														
9	18														

/DEVIN ALMEIDA/ Examiner.Art Unit 2432	03/16/2015	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	9	
/GILBERTO BARRON JR/ Supervisory Patent Examiner.Art Unit 2432	03/17/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office

Part of Paper No. 20150306

Modified form PTO/SB/08A(04-07) OMB 651-0031
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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	14/072,184
Filing Date	November 5, 2013
First Named Inventor	Yu Fang
Group Art Unit	2432
Examiner Name	Devin Almeida

Sheet 1 of 1

Attorney Docket No: 2831.006US6

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document
/DA/	US-6,233,618	5/15/2001	Shannon, Steven

FOREIGN PATENT DOCUMENTS

Examiner Initial *	Foreign Document Number	Publication Date	Name of Patentee or Applicant of cited Document	T 1

OTHER DOCUMENTS – NON PATENT LITERATURE DOCUMENTS

Examiner Initial *	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T 1
/DA/	"Application Serial No. 13/795,407, Final Office Action mailed 06-06-14", 10 pgs	
/DA/	"Application Serial No. 13/795,407, Notice of Allowance mailed 09-24-14", 7 pgs	
/DA/	"Application Serial No. 13/795,407, Supplemental Notice of Allowability mailed 11-28-14", 4 pgs	
/DA/	"Application Serial No. 14/072,292, Final Office Action mailed 08-29-14", 14 pgs	
/DA/	"Application Serial No. 14/072,292, Non Final Office Action mailed 08-18-14", 11 pgs	
/DA/	"Application Serial No. 14/072,292, Notice of Allowance mailed 10-07-14", 7 pgs	
/DA/	"Application Serial No. 14/072,292, Response filed 08-19-14 to Non Final Office Action mailed 08-18-14", 9 pgs	
/DA/	"Application Serial No. 14/072,292, Response filed 09-03-14 to Final Office Action mailed 08-29-14", 7 pgs	

EXAMINER /Devin Almeida/ **DATE CONSIDERED** 03/06/2015

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant is to place a check mark here if English language Translation is attached

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	14/072,184	FANG ET AL.	

Document Code - DISQ	Internal Document – DO NOT MAIL

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 3/13/15	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:

Felicia D. Roberts

2 TDs approved with this filing date

U.S. Patent and Trademark Office

Modified form PTO/SB/08A(04-07) OMB 651-0031
US Patent & Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (Use as many sheets as necessary)	*Complete if Known*	
	Application Number	14/072,184
	Filing Date	November 5, 2013
	First Named Inventor	Yu Fang
	Group Art Unit	2432
	Examiner Name	Devin Almeida
Sheet 1 of 1	Attorney Docket No: 2831.006US6	

US PATENT DOCUMENTS			
Examiner Initial *	**USP Document Number**	**Publication Date**	**Name of Patentee or Applicant of cited Document**
	US-20020178262A1	11/28/2002	Bonnell, David, et al.
	US-20050044165A1	2/24/2005	O'Farrell, Robert, et al.
	US-6,157,932	12/5/2000	Klein, Stieg R, et al.
	US-6,324,654	11/27/2001	Wahl, Steven B., et al.

OTHER DOCUMENTS – NON PATENT LITERATURE DOCUMENTS		
Examiner Initial *	**Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.**	**T 1**
	"Application Serial No. 13/546,915, Non Final Office Action mailed 02-27-15", 26 pgs	

EXAMINER **DATE CONSIDERED**

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant is to place a check mark here if English language Translation is attached

Electronic Patent Application Fee Transmittal

Application Number:	14072184
Filing Date:	05-Nov-2013
Title of Invention:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
First Named Inventor/Applicant Name:	Yu Fang
Filer:	Eric B. Andersland/Valerie Murphy
Attorney Docket Number:	2831.006US6

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($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	21778576
Application Number:	14072184
International Application Number:	
Confirmation Number:	7558
Title of Invention:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
First Named Inventor/Applicant Name:	Yu Fang
Customer Number:	21186
Filer:	Eric B. Andersland/Valerie Murphy
Filer Authorized By:	Eric B. Andersland
Attorney Docket Number:	2831.006US6
Receipt Date:	16-MAR-2015
Filing Date:	05-NOV-2013
Time Stamp:	14:51:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$180
RAM confirmation Number	1095
Deposit Account	190743
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		14072184_SIDS_3-16-15.pdf	222865 f56a9415d5d68647020d663c9c4c4ac2c5167da6	yes	4
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Miscellaneous Incoming Letter		1	1	
	Transmittal Letter		2	3	
	Information Disclosure Statement (IDS) Form (SB08)		4	4	
Warnings:					
Information:					
2	Non Patent Literature	0001_2831006us4_oarn_022715.pdf	2863615 6f9c2bc1135cc3c839ff06abfee8c94c6a0cc3d6	no	26
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30803 baa52e142209d4af3d1bbe342989d5db1aa523b4	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	3117283		

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Yu Fang et al.
Title: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

Docket No.:	2831.006US6	Serial No.:	14/072,184
Filed:	November 5, 2013	Due Date:	N/A
Examiner:	Devin Almeida	Group Art Unit:	2432
Customer No.:	21186	Confirmation No.:	7558

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

We are transmitting herewith the following attached items (as indicated with an "X"):

X Supplemental Information Disclosure Statement (2 pgs.), Form 1449 (1 pg.) Copies of Cited References (1).
X Authorization to charge Deposit Account 19-0743 in the amount of $180.00 to cover the fee for consideration of Information Disclosure Statement under 37 C.F.R. § 1.97(c).

If not provided for in a separate paper filed herewith, please consider this a PETITION FOR EXTENSION OF TIME for sufficient number of months to enter these papers and please charge any additional fees or credit overpayment to Deposit Account No. 19-0743. If applicable, any papers or fees supplied herewith are considered to be timely filed pursuant to 37 C.F.R. § 1.7(a), the response period falling on a Federal Holiday, Saturday or Sunday being extended to the next succeeding business day.

SCHWEGMAN LUNDBERG & WOESSNER, P.A.
Customer No.: 21186

By: /James D. Hallenbeck/
James D. Hallenbeck
Reg. No. 63,561

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Yu Fang et al.	Examiner: Devin Almeida
Serial No.: 14/072,184	Group Art Unit: 2432
Filed: November 5, 2013	Docket: 2831.006US6
Customer No.: 21186	Confirmation No.: 7558
Title: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS	

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

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

In compliance with the duty imposed by 37 C.F.R. § 1.56, and in accordance with 37 C.F.R. §§ 1.97 *et. seq.*, the enclosed materials are brought to the attention of the Examiner for consideration in connection with the above-identified patent application. Applicant respectfully requests that this Information Disclosure Statement be entered and the documents listed on the attached PTO 1449 Form be considered by the Examiner and made of record. Pursuant to the provisions of MPEP 609, Applicant requests that a copy of the PTO 1449 Form, initialed as being considered by the Examiner, be returned to the Applicant with the next official communication.

Pursuant to 37 C.F.R. § 1.97(c)(2), Applicant hereby authorizes the Commissioner to charge the fee of $180.00 as set forth in 37 C.F.R. § 1.17(p), to Deposit Account No. 19-0743. Please charge any additional fees or deficiencies, or credit any overpayment to Deposit Account No. 19-0743.

Pursuant to 37 C.F.R. § 1.98(a)(2), copies of cited U.S. Patents and Published Applications, and Non-Published Applications identifiable by USPTO Serial Number, are no longer required to be provided to the Office. Applicant acknowledges the requirement to submit copies of foreign patent documents and non-patent literature in accordance with 37 C.F.R § 1.98(a)(2).

The Examiner is invited to contact the undersigned at the telephone number indicated if there are any questions regarding this communication.

Respectfully submitted,

SCHWEGMAN LUNDBERG & WOESSNER, P.A.
P.O. Box 2938
Minneapolis, MN 55402
(612) 373-6938

Date 3/16/2015 By /James D. Hallenbeck/

James D. Hallenbeck
Reg. No. 63,561

JDH:vam

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Yu Fang et al.	Examiner: Devin Almeida	
Serial No.:	14/072,184	Group Art Unit: 2432	
Filed:	November 5, 2013	Docket No.: 2831.006US6	
Customer No.: 21186		Confirmation No.: 7558	

Title: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

TERMINAL DISCLAIMER

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

I, James D. Hallenbeck, am an attorney of record for the above-identified patent application as evidenced by the Power of Attorney filed in the present application on July 10, 2014. This Terminal Disclaimer is submitted on behalf of Fortinet, Inc., the assignee of the present invention. As an attorney of record, I am empowered to act on behalf of the assignee and, in accordance with 37 C.F.R. § 1.321(b)(1)(iv), to sign this Terminal Disclaimer.

Certificate Under 37 C.F.R. § 3.73(b)

The assignee, Fortinet, Inc., hereby certifies that it is the owner of the entire right, title and interest in and to both the above-identified application (U.S. Application Serial No. 14/072,184) and to U.S. Patent No. 8,051,483, by virtue of the executed and filed assignment transferring title of both of these applications. The above-identified application is a continuation of U.S. Patent No. 8,935,790, which is a continuation of U.S. Patent Application Serial No. 13/240,661, which is a continuation of U.S. Patent No. 8,276,205, which is a continuation of U.S. Patent No. 8,051,483. The assignment for U.S. Patent No. 8,051,483 was recorded on November 30, 2004 at Reel 016042, Frames 0392 - 0394. That assignment assigned the application underlying U.S. Patent No. 8,051,483, as well as, *inter alia*, all continuations and divisionals based upon that application. The above-identified application is a continuation of U.S. Patent No. 8,051,483, and was thus assigned to the assignee by the identified assignment.

The undersigned representative of the assignee has reviewed the evidentiary documents of title and certifies that to the best of assignee's knowledge and belief, title is in the assignee seeking

to take the action set forth in this disclaimer.

Terminal Disclaimer

The assignee of the above-identified application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the above-identified patent application, which would extend beyond the expiration date of the full statutory term, as presently shortened by any terminal disclaimers, of U.S. Patent No. 8,051,483. The assignee hereby agrees that any patent to be granted on the above-identified application shall be enforceable only for and during such period as such patent is commonly owned with U.S. Patent No. 8,051,483. This agreement shall run with any patent granted on the above-identified application and shall be binding upon the assignee's successors and assigns.

Limitations on the Disclaimer

The assignee does not disclaim any terminal part of any patent granted on the above-identified application prior to the expiration date of the full statutory term as presently shortened by any terminal disclaimer of U.S. Patent No. 8,051,483 in the event that it later expires before such term for failure to pay a maintenance fee, is held unenforceable, is found invalid, is statutorily disclaimed, is the subject of a reexamination certificate cancelling all claims, or is otherwise terminated prior to the expiration date of its statutory term as presently shortened by any terminal disclaimer.

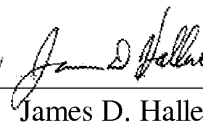
Fee Status

Please charge Deposit Account 19-0743 in the amount of $160.00 which is required under 37 C.F.R. § 1.20(d) to file a statutory disclaimer. The Commissioner of Patents and Trademarks is hereby authorized to charge any additional fees or deficiencies, or credit any overpayments to Deposit Account No. 19-0743.

Respectfully submitted,

SCHWEGMAN LUNDBERG & WOESSNER, P.A.
P.O. Box 2938
Minneapolis, MN 55402--0938
(612) 373-6938

Date 3/13/2015

By 
James D. Hallenbeck
Reg. No. 63,561

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Yu Fang et al.	Examiner: Devin Almeida	
Serial No.:	14/072,184	Group Art Unit: 2432	
Filed:	November 5, 2013	Docket No.: 2831.006US6	
Customer No.: 21186		Confirmation No.: 7558	

Title: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

TERMINAL DISCLAIMER

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

I, James D. Hallenbeck, am an attorney of record for the above-identified patent application as evidenced by the Power of Attorney filed in the present application on July 10, 2014. This Terminal Disclaimer is submitted on behalf of Fortinet, Inc., the assignee of the present invention. As an attorney of record, I am empowered to act on behalf of the assignee and, in accordance with 37 C.F.R. § 1.321(b)(1)(iv), to sign this Terminal Disclaimer.

Certificate Under 37 C.F.R. § 3.73(b)

The assignee, Fortinet, Inc., hereby certifies that it is the owner of the entire right, title and interest in and to both the above-identified application (U.S. Application Serial No. 14/072,184) and to U.S. Patent No. 8,935,790, by virtue of the executed and filed assignment transferring title of both of these applications. The assignment for U.S. Patent No. 8,935,790 was recorded on November 30, 2004 at Reel 016042, Frames 0392 - 0394. That assignment assigned the application underlying U.S. Patent No. 8,935,790, as well as, *inter alia*, all continuations and divisionals based upon that application. The above-identified application is a continuation of U.S. Patent No. 8,935,790, and was thus assigned to the assignee by the identified assignment.

The undersigned representative of the assignee has reviewed the evidentiary documents of title and certifies that to the best of assignee's knowledge and belief, title is in the assignee seeking to take the action set forth in this disclaimer.

Terminal Disclaimer

The assignee of the above-identified application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the above-identified patent application, which would extend beyond the expiration date of the full statutory term, as presently shortened by any terminal disclaimers, of U.S. Patent No. 8,935,790. The assignee hereby agrees that any patent to be granted on the above-identified application shall be enforceable only for and during such period as such patent is commonly owned with U.S. Patent No. 8,935,790. This agreement shall run with any patent granted on the above-identified application and shall be binding upon the assignee's successors and assigns.

Limitations on the Disclaimer

The assignee does not disclaim any terminal part of any patent granted on the above-identified application prior to the expiration date of the full statutory term as presently shortened by any terminal disclaimer of U.S. Patent No. 8,935,790 in the event that it later expires before such term for failure to pay a maintenance fee, is held unenforceable, is found invalid, is statutorily disclaimed, is the subject of a reexamination certificate cancelling all claims, or is otherwise terminated prior to the expiration date of its statutory term as presently shortened by any terminal disclaimer.

Fee Status

Please charge Deposit Account 19-0743 in the amount of $160.00 which is required under 37 C.F.R. § 1.20(d) to file a statutory disclaimer. The Commissioner of Patents and Trademarks is hereby authorized to charge any additional fees or deficiencies, or credit any overpayments to Deposit Account No. 19-0743.

Respectfully submitted,

SCHWEGMAN LUNDBERG & WOESSNER, P.A.
P.O. Box 2938
Minneapolis, MN 55402--0938
(612) 373-6938

Date 3/13/2015

By 

James D. Hallenbeck
Reg. No. 63,561

Electronic Patent Application Fee Transmittal

Application Number:	14072184
Filing Date:	05-Nov-2013
Title of Invention:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
First Named Inventor/Applicant Name:	Yu Fang
Filer:	Gregory M. Stark/John Gustav-Wrathall
Attorney Docket Number:	2831.006US6

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:				
Statutory or Terminal Disclaimer	1814	2	160	320

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**320**

Electronic Acknowledgement Receipt

EFS ID:	21766979
Application Number:	14072184
International Application Number:	
Confirmation Number:	7558
Title of Invention:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
First Named Inventor/Applicant Name:	Yu Fang
Customer Number:	21186
Filer:	Gregory M. Stark/John Gustav-Wrathall
Filer Authorized By:	Gregory M. Stark
Attorney Docket Number:	2831.006US6
Receipt Date:	13-MAR-2015
Filing Date:	05-NOV-2013
Time Stamp:	16:27:57
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$320
RAM confirmation Number	3138
Deposit Account	190743
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 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		2831006US6_tdf_031315.pdf	91534 3086938a8d08eabcc047c9cd5f686a46d9364f7f	yes	7

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Terminal Disclaimer Filed	2	4
	Terminal Disclaimer Filed	5	7

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	30571 85b8c223c14892931254af8f0f099154cea84266	no	2

Warnings:

Information:

Total Files Size (in bytes):	122105

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Yu Fang et al.
Title: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

Docket No.:	2831.006US6	Serial No.:	14/072,184
Filed:	November 5, 2013	Due Date:	N/A
Examiner:	Devin Almeida	Group Art Unit:	2432
Customer No.:	21186	Confirmation No.:	7558

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

We are transmitting herewith the following attached items (as indicated with an "X"):

X Terminal Disclaimer over U.S. Patent No. 8,051,483 (3 pgs.)
X Terminal Disclaimer over U.S. Patent No. 8,935,790 (3 pgs.)
X Authorization to charge Deposit Account 19-0743 in the amount of $320.00 to cover the fee for the Terminal Disclaimers

If not provided for in a separate paper filed herewith, please consider this a PETITION FOR EXTENSION OF TIME for sufficient number of months to enter these papers and please charge any additional fees or credit overpayment to Deposit Account No. 19-0743. If applicable, any papers or fees supplied herewith are considered to be timely filed pursuant to 37 C.F.R. § 1.7(a), the response period falling on a Federal Holiday, Saturday or Sunday being extended to the next succeeding business day.

SCHWEGMAN LUNDBERG & WOESSNER, P.A.
Customer No.: 21186

By: _____
James D. Hallenbeck
Reg. No. 63,561

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Yu Fang et al.	Examiner: Devin Almeida	
Serial No.:	14/072,184	Group Art Unit: 2432	
Filed:	November 5, 2013	Docket No.: 2831.006US6	
Customer No.:	21186	Confirmation No.: 7558	
Title:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS		

AMENDMENT & RESPONSE UNDER 37 C.F.R. § 1.111

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

In response to the Office Action dated July 22, 2014, please amend the application as follows:

This response is accompanied by a Petition, as well as the appropriate fee, to obtain a two-month extension of the period for responding to the Office action, thereby moving the deadline for response from October 22, 2014 to December 22, 2014.

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A network gateway device comprising:

at least one processor;

at least one memory device;

at least one network interface device;

content detection and configuration data stored on the at least one memory device; and

an instruction set, stored in the at least one memory device and executable by the at least one processor to:

receive network traffic via the at least one network interface device;

process the received network traffic in view of the content detection and configuration data stored in the at least one memory device to enforce policies defined at least in part by the content detection and configuration data and including at least one policy that defines a suspicious category of network traffic, the policy enforcement performed to determine whether to allow the received network traffic to pass, the policy enforcement including user identification, content identification, and at least one of source verification and destination verification, wherein when network traffic is determined to violate the at least one policy defining suspicious network traffic, forwarding the network traffic to an analysis process that will perform analysis on network traffic to determine whether the network traffic contains a threat desired to be detected and, when the network traffic is determined to contain a threat desired to be detected, the analysis process generates additional content detection data to detect the threat in subsequently received network traffic;

receive, via the network interface device, the additional content detection data indirectly from the analysis process via an update station;

store the additional content detection data on the at least one memory device;

process subsequently received network traffic in view of the additional content detection data;

block network traffic determined to violate at least one policy; and

allow network traffic to pass that does not violate a policy.

2-4. (Canceled)

5. (Currently Amended) The network gateway device of claim [[2]] 1, wherein the analysis process, to which the network traffic content is forwarded, executes on a computing device distinct from the network gateway device.

6. (Original) The content detection system of claim 5, wherein the analysis process facilitates an analysis that includes receiving administrator input.

7. (Currently Amended) A method comprising:

receiving network traffic via at least one network interface device;

processing the received network traffic, by executing instructions on at least one processor of a data network device, in view of content detection and configuration data stored on at least one memory device to enforce policies defined at least in part by the content detection and configuration data and including at least one policy that defines a suspicious category of network traffic, the policy enforcement performed to determine whether to allow the received network traffic to pass on a data network, the policy enforcement including user identification, content identification, and at least one of source verification and destination verification;

when network traffic is determined to violate the at least one policy defining suspicious network traffic, forwarding the network traffic to an analysis process that will perform analysis on network traffic to determine whether the network traffic contains a threat desired to be detected and, when the network traffic is determined to contain a threat desired to be detected, the analysis process generates additional content detection data to detect the threat in subsequently received network traffic;

receiving, via the at least one network interface device, the additional content detection data indirectly from the analysis process via an update station;

storing the additional content detection data on the at least one memory device;

processing subsequently received network traffic in view of the additional content detection data;

blocking network traffic determined to violate at least one policy; and

allowing network traffic to pass on the data network that does not violate a policy.

8-10. (Canceled)

11. (Currently Amended) The method of claim [[8]] 7, wherein the analysis process, to which the network traffic content is forwarded, executes on a computing device distinct from the data network device.

12. (Original) The method of claim 11, wherein the analysis process facilitates an analysis that includes receiving administrator input.

13. (Currently Amended) A non-transitory computer-readable medium with instructions stored thereon which when executed by at least one processor of a data network device, causes the data network device to:

receive network traffic via at least one network interface device;

process the received network traffic in view of content detection and configuration data stored on at least one memory device to enforce policies defined at least in part by the content detection and configuration data and including at least one policy that defines a suspicious category of network traffic, the policy enforcement performed to determine whether to allow the received network traffic to pass on a data network, the policy enforcement including user identification, content identification, and at least one of source verification and destination verification;

when network traffic is determined to violate the at least one policy defining suspicious network traffic, forward the network traffic to an analysis process that will perform analysis on network traffic to determine whether the network traffic contains a threat desired to be detected and, when the network traffic is determined to contain a threat desired to be detected, the analysis process generates additional content detection data to detect the threat in subsequently received network traffic;

receive, via the at least one network interface device, the additional content detection data indirectly from the analysis process via an update station;

store the additional content detection data on the at least one memory device;

process subsequently received network traffic in view of the additional content detection data;

block network traffic determined to violate at least one policy; and

allowing network traffic to pass on the data network that does not violate a policy.

14-16. (Canceled)

17. (Currently Amended) The non-transitory computer-readable medium of claim [[14]] 13, wherein the analysis process, to which the network traffic content is forwarded, executes on a computing device distinct from the data network device.

18. (Original) The non-transitory computer-readable medium of claim 17, wherein the analysis process facilitates an analysis that includes receiving administrator input.

REMARKS

This communication responds to the Office Action dated July 22, 2014.

Claims 1, 5, 7, 11, 13, and 17 are amended, claims 2-4, 8-10, and 14-16 are canceled, and no claims are added. As a result, claims 1, 5-7, 11-13, and 17-18 remain pending in this application.

Information Disclosure Statement

Applicant submitted an Information Disclosure Statement and a PTO 1449 Form on May 29, 2014. In the Form 1449 returned with the Office Action dated July 22, 2014, three references were not initialed. Applicant respectfully requests a clarification as to why the references were not initialed, or that a fully initialed copy of the PTO 1449 Form be returned to Applicant's Representatives to indicate that the cited references have been considered by the Examiner.

The Rejection of Claims Under §§ 102 and 103

Claims 1, 7 and 13 are rejected under 35 U.S.C. § 102(a) as allegedly being anticipated by Donahue et al (2003/0123465).

Claim 2, 3, 5-9, 11-15 and 17-18 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Donahue et al (2003/0123465) in view of Patel et al (7,181,765).

Allowable Subject Matter

Claim 4, 10 and 16 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicant has amended:

- independent claim 1 to incorporate allowable claim 4, as well as claims 2 and 3;
- independent claim 7 to incorporate allowable claim 10, as well as claims 8 and 9; and

- independent claim 13 to incorporate allowable claim 16, as well as claims 14 and 15.

These amendments further necessitated amendment of claims 5, 11, and 17 to maintain proper claim dependencies.

Applicant respectfully submits that each of amended independent claims 1, 7, and 13 include subject matter indicated to be allowable. As such, Applicant respectfully submits that each of claims 1, 5-7, 11-13, and 17-18 are now in allowable form. Entry of the amendments, withdrawal of the 35 U.S.C. §§ 102(a) and 103(a) rejections, and allowance of claims 1, 5-7, 11-13, and 17-18 are respectfully requested.

CONCLUSION

Applicant respectfully submits that claims 1, 5-7, 11-13, and 17-18 remain pending, are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's representative at (612) 373-6938 to facilitate prosecution of this application.

If necessary, please charge any additional fees or deficiencies, or credit any overpayments to Deposit Account No. 19-0743.

Respectfully submitted,

SCHWEGMAN LUNDBERG & WOESSNER, P.A.
P.O. Box 2938
Minneapolis, MN 55402--0938
(612) 373-6938

Date Dec 22, 2014

By / James Hallenbeck /
James D. Hallenbeck
Reg. No. 63,561

Electronic Patent Application Fee Transmittal

Application Number:	14072184
Filing Date:	05-Nov-2013
Title of Invention:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
First Named Inventor/Applicant Name:	Yu Fang
Filer:	Gregory M. Stark/John Gustav-Wrathall
Attorney Docket Number:	2831.006US6

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($)
Extension - 2 months with $0 paid	1252	1	600	600
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**780**

Electronic Acknowledgement Receipt

EFS ID:	21039821
Application Number:	14072184
International Application Number:	
Confirmation Number:	7558
Title of Invention:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
First Named Inventor/Applicant Name:	Yu Fang
Customer Number:	21186
Filer:	Gregory M. Stark/John Gustav-Wrathall
Filer Authorized By:	Gregory M. Stark
Attorney Docket Number:	2831.006US6
Receipt Date:	22-DEC-2014
Filing Date:	05-NOV-2013
Time Stamp:	17:15:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$780
RAM confirmation Number	4735
Deposit Account	190743
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 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		2831006us6_resp_122214.pdf	2918333 e46d4c6513d6fccf599530ab5cc0035d85c2fec5	yes	13

Multipart Description/PDF files in .zip description

Document Description	Start	End
Miscellaneous Incoming Letter	1	1
Extension of Time	2	2
Transmittal Letter	3	4
Information Disclosure Statement (IDS) Form (SB08)	5	5
Amendment/Req. Reconsideration-After Non-Final Reject	6	6
Claims	7	11
Applicant Arguments/Remarks Made in an Amendment	12	13

Warnings:

Information:

2	Non Patent Literature	2831006US5_FOAR_06-06-14.pdf	376623 b8bbc0a648ec9760e40283cf1df810b4b9b8180b	no	10

Warnings:

Information:

3	Non Patent Literature	2831006US7__AARN_08-19-14.pdf	271607 4ae9a88b1b2e140fd630cbb1391922a70efe78c4	no	9

Warnings:

Information:

4	Non Patent Literature	2831006US7_AARF_09-03-14.pdf	232145 d99e29bf423d70e8743913912218631630 58b8aa	no	7

Warnings:

Information:

5	Non Patent Literature	2831006US7_FOAR_08-29-14.pdf	485138 e0b6a8a73fddfdaf863ac7faeee29ca29043caa0	no	14
Warnings:					
Information:					
6	Non Patent Literature	2831006US7_NOAR_10-07-14.pdf	395761 d83a60c3ef773977340645fa6abf32143c233309	no	7
Warnings:					
Information:					
7	Non Patent Literature	2831006US7_OARN_08-18-14.pdf	379893 e1b356e4dbcb9db15ce7667c2c8bcd8578d784ad	no	11
Warnings:					
Information:					
8	Non Patent Literature	2831006US5_NOAR_09-24-14.pdf	1123061 d66a632c6f51c736ee964bd2522989bd49a8e595	no	7
Warnings:					
Information:					
9	Non Patent Literature	2831006US5_SNOA_11-28-14.pdf	554425 9d67724523fffc00dc8de7c8fb2d335fc0b4b7ef	no	4
Warnings:					
Information:					
10	Fee Worksheet (SB06)	fee-info.pdf	32878 8f2ea8ae331627e6640d2720f7c5dc38d6ace48a	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	6769864	

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Yu Fang et al.
Title: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
Docket No.: 2831.006US6
Filed: November 5, 2013
Examiner: Devin Almeida
Customer No.: 21186
Serial No.: 14/072,184
Due Date: October 22, 2014
Group Art Unit: 2432
Confirmation No.: 7558

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

We are transmitting herewith the following attached items (as indicated with an "X"):

X Amendment and Response under 37 C.F.R. § 1.111 (8 pgs.)
X Petition for Extension of Time (1 pg.)
X Authorization to charge Deposit Account 19-0743 in the amount of $600.00 to cover the Extension of Time Fee.
X Supplemental Information Disclosure Statement (2 pgs.), Form 1449 (1 pg.) Copies of Cited References (8).
X Authorization to charge Deposit Account 19-0743 in the amount of $180.00 to cover the fee for consideration of Information Disclosure Statement under 37 C.F.R. § 1.97(c).

If not provided for in a separate paper filed herewith, please consider this a PETITION FOR EXTENSION OF TIME for sufficient number of months to enter these papers and please charge any additional fees or credit overpayment to Deposit Account No. 19-0743. If applicable, any papers or fees supplied herewith are considered to be timely filed pursuant to 37 C.F.R. § 1.7(a), the response period falling on a Federal Holiday, Saturday or Sunday being extended to the next succeeding business day.

SCHWEGMAN LUNDBERG & WOESSNER, P.A.
Customer No.: 21186

/ James Hallenbeck /
James D. Hallenbeck
Reg. No. 63,561

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Yu Fang et al.	Examiner: Devin Almeida	
Serial No.:	14/072,184	Group Art Unit: 2432	
Filed:	November 5, 2013	Docket: 2831.006US6	
Customer No.:	21186	Confirmation No.: 7558	
Title:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS		

PETITION FOR A TWO-MONTH EXTENSION OF TIME

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

In accordance with the provision of 37 C.F.R § 1.136(a), it is respectfully requested that a two-month extension of time be granted in which to respond to the Office Action mailed July 22, 2014, said period of response being extended from October 22, 2014 to December 22, 2014.

Please charge Deposit Account No. 19-0743 in the amount of $600.00 to cover the required extension fee. Please charge any additional fees or credit overpayment to deposit Account No. 19-0743.

Respectfully submitted,

SCHWEGMAN LUNDBERG & WOESSNER, P.A.
P.O. Box 2938
Minneapolis, MN 55402
(612) 373-6938

Date Dec 22, 2014

By / James Hallenbeck /

James D. Hallenbeck
Reg. No. 63,561

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Yu Fang et al.	Examiner:	Devin Almeida
Serial No.:	14/072,184	Group Art Unit:	2432
Filed:	November 5, 2013	Docket:	2831.006US6
Customer No.:	21186	Confirmation No.:	7558

Title: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

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

In compliance with the duty imposed by 37 C.F.R. § 1.56, and in accordance with 37 C.F.R. §§ 1.97 *et. seq.*, the enclosed materials are brought to the attention of the Examiner for consideration in connection with the above-identified patent application. Applicant respectfully requests that this Information Disclosure Statement be entered and the documents listed on the attached PTO 1449 Form be considered by the Examiner and made of record. Pursuant to the provisions of MPEP 609, Applicant requests that a copy of the PTO 1449 Form, initialed as being considered by the Examiner, be returned to the Applicant with the next official communication.

Pursuant to 37 C.F.R. § 1.97(c)(2), Applicant hereby authorizes the Commissioner to charge the fee of $180.00 as set forth in 37 C.F.R. § 1.17(p), to Deposit Account No. 19-0743. Please charge any additional fees or deficiencies, or credit any overpayment to Deposit Account No. 19-0743.

Pursuant to 37 C.F.R. § 1.98(a)(2), copies of cited U.S. Patents and Published Applications, and Non-Published Applications identifiable by USPTO Serial Number, are no longer required to be provided to the Office. Applicant acknowledges the requirement to submit copies of foreign patent documents and non-patent literature in accordance with 37 C.F.R § 1.98(a)(2).

The Examiner is invited to contact the undersigned at the telephone number indicated if there are any questions regarding this communication.

Respectfully submitted,

SCHWEGMAN LUNDBERG & WOESSNER, P.A.
P.O. Box 2938
Minneapolis, MN 55402
(612) 373-6938

Date Dec 22, 2014

By / James Hallenbeck /

James D. Hallenbeck
Reg. No. 63,561

Modified form PTO/SB/08A(04-07) OMB 651-0031
US Patent & Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (Use as many sheets as necessary)	*Complete if Known*	
	Application Number	14/072,184
	Filing Date	November 5, 2013
	First Named Inventor	Yu Fang
	Group Art Unit	2432
	Examiner Name	Devin Almeida
Sheet 1 of 1	Attorney Docket No: 2831.006US6	

US PATENT DOCUMENTS			
Examiner Initial *	**USP Document Number**	**Publication Date**	**Name of Patentee or Applicant of cited Document**
	US-6,233,618	5/15/2001	Shannon, Steven

FOREIGN PATENT DOCUMENTS				
Examiner Initial *	**Foreign Document Number**	**Publication Date**	**Name of Patentee or Applicant of cited Document**	**T 1**

OTHER DOCUMENTS – NON PATENT LITERATURE DOCUMENTS		
Examiner Initial *	**Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.**	**T 1**
	"Application Serial No. 13/795,407, Final Office Action mailed 06-06-14", 10 pgs	
	"Application Serial No. 13/795,407, Notice of Allowance mailed 09-24-14", 7 pgs	
	"Application Serial No. 13/795,407, Supplemental Notice of Allowability mailed 11-28-14", 4 pgs	
	"Application Serial No. 14/072,292, Final Office Action mailed 08-29-14", 14 pgs	
	"Application Serial No. 14/072,292, Non Final Office Action mailed 08-18-14", 11 pgs	
	"Application Serial No. 14/072,292, Notice of Allowance mailed 10-07-14", 7 pgs	
	"Application Serial No. 14/072,292, Response filed 08-19-14 to Non Final Office Action mailed 08-18-14", 9 pgs	
	"Application Serial No. 14/072,292, Response filed 09-03-14 to Final Office Action mailed 08-29-14", 7 pgs	

EXAMINER **DATE CONSIDERED**

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant is to place a check mark here if English language Translation is attached

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 14/072,184	Filing Date 11/05/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	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	12/22/2014	(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))	* 9	Minus	** 20	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(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
/DENISE LILES/

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/072,184	11/05/2013	Yu Fang	2831.006US6

CONFIRMATION NO. 7558

21186
SCHWEGMAN, LUNDBERG & WOESSNER, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

POA ACCEPTANCE LETTER

OC000000069565808

Date Mailed: 07/23/2014

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/10/2014.

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.

/Itaba/

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/072,184	11/05/2013	Yu Fang	2831.006US6	7558

21186 7590 07/22/2014
SCHWEGMAN, LUNDBERG & WOESSNER, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER	
ALMEIDA, DEVIN E	

ART UNIT	PAPER NUMBER
2432	

NOTIFICATION DATE	DELIVERY MODE
07/22/2014	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):

uspto@slwip.com
SLW@blackhillsip.com

Office Action Summary	Application No. 14/072,184	Applicant(s) FANG ET AL.	
	Examiner DEVIN ALMEIDA	Art Unit 2432	AIA (First Inventor to File) Status No

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

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

Status

1)☒ Responsive to communication(s) filed on *11/5/2013*.

☐ 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 _____ 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

The present application is being examined under the pre-AIA first to invent provisions. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 5/29/2014 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 102

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

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1, 7 and 13 are rejected under pre-AIA 35 U.S.C. 102(a) as being anticipated by Donahue et al (2003/0123465).

With respect to claim 1, 7 and 13, a network gateway device comprising: at least one processor (see figure 3 element 302); at least one memory device (see figure 3 element 310); at least one network interface device (see figure 3 element 204 i.e. IP device); content detection and configuration data stored on the at least one memory device (see paragraph 0050-0054); an instruction set, stored in the at least one memory device and executable by the at least one processor to: receive network traffic via the at least one network interface device (see paragraph 0061-0063); process the received network traffic in view of the content detection and configuration data stored in the at least one memory device to enforce policies defined at least in part by the content detection and configuration data, the policy enforcement performed to determine whether to allow the received network traffic to pass, the policy enforcement including user identification, content identification, and at least one of source verification and destination verification; block network traffic determined to violate at least one policy; and allow network traffic to pass that does not violate a policy (Donahue paragraph 0061– 0071) .

Claim Rejections - 35 USC § 103

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

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

Claim 2, 3, 5-9, 11-15 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donahue et al (2003/0123465) in view of Patel et al (7,181,765).

With respect to claim 2, 8 and 14, Donahue teaches everything with respect to claims 1, 7 and 13 above but does not teach claims 2, 8 and 14. Patel teaches wherein: at least one policy defines a suspicious category of network traffic; and when network traffic is determined to violate the at least one policy defining suspicious network traffic, forwarding the network traffic to an analysis process that will perform analysis on network traffic to determine whether the network traffic contains a threat desired to be detected and, when the network traffic is determined to contain a threat desired to be detected, the analysis process generates additional content detection data to detect the threat in subsequently received network traffic (see Patel column 1 line 57- column 3 line 54).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to have filtered and blocked virus in smart routers by intercepting harmful data packets, such as viruses, worms, and Trojan horses at the earliest possible point after entry into the network and before much of the network can become collaborate with the other routers to update its virus database in an efforts to eradicate the harmful data packets(see Patel column 1 line 57- column 3 line 54). Therefore one would have been motivated to have a smart router that can send information to another router to eradicate harmful data packets.

With respect to claim 3, 9 and 15, wherein the instruction set is further executable by the at least one processor to: receive, via the network interface device,

the additional content detection data from the analysis process; store the additional content detection data on the at least one memory device; and process subsequently received network traffic in view of the additional content detection data (see Patel column 1 line 57- column 3 line 54 i.e. update virus database).

With respect to claims 5, 11 and 17 wherein the analysis process, to which the network traffic content is forwarded, executes on a computing device (Donahue filtering routers 210, 212 and 214) distinct from the network gateway device (see Donahue paragraph 0061-0063).

With respect to claim 6, 12 and 18 wherein the analysis process facilitates an analysis that includes receiving administrator input (see Donahue paragraph 0008).

Allowable Subject Matter

Claim 4, 10 and 16 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devin Almeida whose telephone number is 571-270-1018. The examiner can normally be reached on Monday-Thursday from 7:30 A.M. to

5:00 P.M. The examiner can also be reached on alternate Fridays from 7:30 A.M. to 4:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gilberto Barron, can be reached on 571-272-3799. 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).

/Devin Almeida/
Examiner, Art Unit 2432

/GILBERTO BARRON JR/
Supervisory Patent Examiner, Art Unit 2432

Notice of References Cited	Application/Control No. 14/072,184	Applicant(s)/Patent Under Reexamination FANG ET AL.	
	Examiner DEVIN ALMEIDA	Art Unit 2432	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2003/0123465	07-2003	Donahue, David B.	370/401
*	B	US-7,181,765	02-2007	Patel et al.	726/12
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	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.

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CONFIRMATION NO. 7558

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
14/072,184	11/05/2013	726	2432	2831.006US6

APPLICANTS

Fortinet, Inc., Sunnyvale, CA, Assignee (with 37 CFR 1.172 Interest);

INVENTORS

Yu Fang, Burnaby, CANADA;
Michael Xie, Menlo Park, CA;

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

This application is a CON of 13/795,407 03/12/2013
which is a CON of 13/546,915 07/11/2012
which is a CON of 13/240,661 09/22/2011 PAT 8276205
and is a CON of 11/000,703 11/30/2004 PAT 8051483
which claims benefit of 60/552,457 03/12/2004

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

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

11/19/2013

Foreign Priority claimed	☐ Yes ☑ No	☐ Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
35 USC 119(a-d) conditions met	☐ Yes ☑ No					
Verified and Acknowledged	/DEVIN E ALMEIDA/ Examiner's Signature	Initials	CANADA	2	18	3

ADDRESS

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402
UNITED STATES

TITLE

SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

FILING FEE RECEIVED		
1600	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

BIB (Rev. 05/07).

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14072184	FANG ET AL.
	Examiner	**Art Unit**
	DEVIN ALMEIDA	2432

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

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

CLAIM		DATE								
Final	Original	06/25/2014								
	1	✓								
	2	✓								
	3	✓								
	4	O								
	5	✓								
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	14	✓								
	15	O								
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	17	✓								
	18	✓								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14072184	FANG ET AL.
	Examiner	Art Unit
	DEVIN ALMEIDA	2432

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
see east search	6/25/2014	DA

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

/DEVIN ALMEIDA/ Examiner.Art Unit 2432	

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	14/072184	US-PGPUB; USPAT	OR	ON	2014/06/25 20:49
L2	0	"7149219" and filter with router with block	US-PGPUB; USPAT	OR	ON	2014/06/25 21:07
L3	4	"7149219" and filter with router	US-PGPUB; USPAT	OR	ON	2014/06/25 21:07
L4	13	"7149219" and block	US-PGPUB; USPAT	OR	ON	2014/06/25 21:13
L5	0	"7149219" and virus	US-PGPUB; USPAT	OR	ON	2014/06/25 21:42
L7	2297	h04l63/0227.cpc.	US-PGPUB; USPAT	OR	ON	2014/06/25 21:44
L8	2296	h04l63/1441.cpc.	US-PGPUB; USPAT	OR	ON	2014/06/25 21:44
L9	1451	h04l63/02.cpc.	US-PGPUB; USPAT	OR	ON	2014/06/25 21:44
L10	2702	h04l63/1408.cpc.	US-PGPUB; USPAT	OR	ON	2014/06/25 21:44
L11	2901	h04l63/1416.cpc.	US-PGPUB; USPAT	OR	ON	2014/06/25 21:44
L12	1208	h04l63/1425.cpc.	US-PGPUB; USPAT	OR	ON	2014/06/25 21:44
L13	4009	(l7 l8 l9 l10 l11 l12) and virus	US-PGPUB; USPAT	OR	ON	2014/06/25 21:45
L14	1	14/072184 and policy	US-PGPUB; USPAT	OR	ON	2014/06/25 21:46
L15	1	14/072184 and suspicious adj category	US-PGPUB; USPAT	OR	ON	2014/06/25 21:47
L16	1	14/072184 and threat	US-PGPUB; USPAT	OR	ON	2014/06/25 21:48
L18	587	(l7 l8 l9 l10 l11 l12) and filter with (virus worm spam)	US-PGPUB;	OR	ON	2014/06/25 21:49

			USPAT			
L19	199	(l7 l8 l9 l10 l11 l12) and filter with (virus worm spam) and user with policy	US-PGPUB; USPAT	OR	ON	2014/06/25 21:49
L20	19	(l7 l8 l9 l10 l11 l12) and router with filter with (virus worm spam) and user with policy	US-PGPUB; USPAT	OR	ON	2014/06/25 21:50
L21	5	(l7 l8 l9 l10 l11 l12) and router with detect with (virus worm spam) and user with policy	US-PGPUB; USPAT	OR	ON	2014/06/25 21:52
L22	4	(l7 l8 l9 l10 l11 l12) and router with detect with suspicious adj2 traffic	US-PGPUB; USPAT	OR	ON	2014/06/25 21:55
L23	44	(l7 l8 l9 l10 l11 l12) and router with detect with (virus worm spam)	US-PGPUB; USPAT	OR	ON	2014/06/25 21:55

EAST Search History (Interference)

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	14/072,184
Filing Date	November 5, 2013
First Named Inventor	Yu Fang
Group Art Unit	2431
Examiner Name	Unknown

Sheet 1 of 3

Attorney Docket No: 2831.006US6

US PATENT DOCUMENTS

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/DA/	US-7,937,697	5/3/2011	Alberti, Enrica, et al.

EXAMINER /Devin Almeida/ **DATE CONSIDERED** 06/25/2014

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	Application Number	14/072,184
	Filing Date	November 5, 2013
	First Named Inventor	Yu Fang
	Group Art Unit	2431
	Examiner Name	Unknown
Sheet 2 of 3	Attorney Docket No: 2831.006US6	

US PATENT DOCUMENTS			
Examiner Initial *	**USP Document Number**	**Publication Date**	**Name of Patentee or Applicant of cited Document**
	US-8,051,483	11/1/2011	Burnaby, Yu Fang, et al.
	US-8,056,135	11/8/2011	Fang, Yu, et al.
	US-8,276,205	9/25/2012	Xie, Micheal, et al.

OTHER DOCUMENTS – NON PATENT LITERATURE DOCUMENTS		
Examiner Initial *	**Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.**	**T 1**
/DA/	"Application Serial No. 11/000,703, Advisory Action mailed 07-14-08", 3 pgs	
/DA/	"Application Serial No. 11/000,703, Final Office Action mailed 04-03-09", 13 pgs	
/DA/	"Application Serial No. 11/000,703, Final Office Action mailed 04-07-08", 18 pgs	
/DA/	"Application Serial No. 11/000,703, Final Office Action mailed 06-29-10", 8 pgs	
/DA/	"Application Serial No. 11/000,703, Non Final Office Action mailed 11-14-07", 16 pgs	
/DA/	"Application Serial No. 11/000,703, Non-Final Office Action mailed 09-19-08", 3 pgs	
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/DA/	"Application Serial No. 11/000,703, Non-Final Office Action mailed 12-15-09", 16 pgs	
/DA/	"Application Serial No. 11/000,703, Notice of Allowance mailed 06-27-11", 12 pgs	
/DA/	"Application Serial No. 11/000,703, Notice of Allowance mailed 08-08-11", 5 pgs	
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EXAMINER /Devin Almeida/ **DATE CONSIDERED** 06/25/2014

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	Application Number	14/072,184
	Filing Date	November 5, 2013
	First Named Inventor	Yu Fang
	Group Art Unit	2431
	Examiner Name	Unknown
Sheet 3 of 3	Attorney Docket No: 2831.006US6	

OTHER DOCUMENTS – NON PATENT LITERATURE DOCUMENTS		
Examiner Initial *	**Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.**	**T 1**
/DA/	"Application Serial No. 13/240,661, 312 Amendment filed 08-17-12", 3 pgs	
/DA/	"Application Serial No. 13/240,661, Non Final Office Action mailed 05-03-12", 10 pgs	
/DA/	"Application Serial No. 13/240,661, Notice of Allowance mailed 06-13-12", 5 pgs	
/DA/	"Application Serial No. 13/546,915, Preliminary Amendment filed 08-17-12", 3 pgs	
/DA/	"Application Serial No. 13/795,407 , Response filed 02-27-14 to Non Final Office Action mailed 11-27-13", 6 pgs	
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I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

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I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Fortinet, Inc.

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	
Name	Todd Nelson		
Title	VP Legal		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☑ Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 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.

Amended 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: Fortinet, Inc.

Application No./Patent No.: 14/072,184 Filed/Issue Date: November 5, 2013

Titled: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

Fortinet, Inc. a Corporation
(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 016042, Frame 0392, 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: _____ To: _____

   The document was recorded in the United States Patent and Trademark Office at

   Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

   The document was recorded in the United States Patent and Trademark Office at

   Reel _____, Frame _____, or for which a copy thereof is attached.

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**.

Amended 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)

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.

/James D. Hallenbeck/ — Signature

7/9/2014 — Date

James D. Hallenbeck — Printed or Typed Name

USPTO Reg. No. 63,561 — Title or Registration Number

Electronic Acknowledgement Receipt

EFS ID:	19541003
Application Number:	14072184
International Application Number:	
Confirmation Number:	7558
Title of Invention:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
First Named Inventor/Applicant Name:	Yu Fang
Customer Number:	21186
Filer:	Mark Victor Muller/Diana Johnson
Filer Authorized By:	Mark Victor Muller
Attorney Docket Number:	2831.006US6
Receipt Date:	10-JUL-2014
Filing Date:	05-NOV-2013
Time Stamp:	12:16:21
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		2831006US6POAsigned.pdf	270989 b1fdc17ceedfcb6b4ffcf1f0c2b491bc55fb976d	yes	4

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	1
	Power of Attorney	2	2
	Assignee showing of ownership per 37 CFR 3.73.	3	4
Warnings:			
Information:			
	Total Files Size (in bytes):	270989	

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Yu Fang et al.
Title: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

Docket No.:	2831.006US6	Serial No.:	14/072,184
Filed:	November 5, 2013	Due Date:	N/A
Examiner:	Unknown	Group Art Unit:	2431
Customer No.:	21186	Confirmation No.:	7558

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

We are transmitting herewith the following attached items (as indicated with an "X"):

X Power of Attorney (1 pg.)
X Statement Under 37 C.F.R. 3.73 (c) (2 pgs)

If not provided for in a separate paper filed herewith, please consider this a PETITION FOR EXTENSION OF TIME for sufficient number of months to enter these papers and please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.
Customer No.: 21186

By: /James D. Hallenbeck/
James D. Hallenbeck
Reg. No. 63,561

Modified form PTO/SB/08A(04-07) OMB 651-0031
US Patent & Trademark Office: U.S. DEPARTMENT OF COMMERCE
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Substitute for form 1449A/PTO **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (Use as many sheets as necessary)	*Complete if Known*	
	Application Number	14/072,184
	Filing Date	November 5, 2013
	First Named Inventor	Yu Fang
	Group Art Unit	2431
	Examiner Name	Unknown
Sheet 1 of 3	Attorney Docket No: 2831.006US6	

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document
	US-20020013832A1	1/31/2002	Hubbard, Edward A.
	US-20020100036A1	7/25/2002	Moshir, Sean, et al.
	US-20020124181A1	9/5/2002	Nambu, Masaya
	US-20030079145A1	4/24/2003	Kouznetsov, Victor, et al.
	US-20030177485A1	9/18/2003	Waldin, Ray Woon, et al.
	US-20040003266A1	1/1/2004	Moshir, Sean, et al.
	US-20040030913A1	2/12/2004	Liang, Y. C, et al.
	US-20050091653A1	4/28/2005	Willehadson, Stefan, et al.
	US-20050120229A1	6/2/2005	Lahti, P.
	US-20050144616A1	6/30/2005	Hammond, Brad, et al.
	US-20050204151A1	9/15/2005	Fang, Yu, et al.
	US-20100154064A1	6/17/2010	Fang, Y., et al.
	US-20120017277A1	1/19/2012	Fang, Yu, et al.
	US-20120278896A1	11/1/2012	Fang, Yu, et al.
	US-20130263246A1	10/3/2013	Fang, Yu, et al.
	US-20140059689A1	2/27/2014	Fang, Yu, et al.
	US-6,035,423	3/7/2000	Hodges, Vernon, et al.
	US-6,052,531	4/18/2000	Waldin, Jr., Ray Soon, et al.
	US-6,269,456	7/31/2001	Hodges, Vernon, et al.
	US-6,314,565	11/6/2001	Kenner, Brian, et al.
	US-6,651,249	11/18/2003	Waldin, Ray Soon, et al.
	US-6,725,377	4/20/2004	Kouznetsov, Victor
	US-6,804,778	10/12/2004	Levi, S., et al.
	US-6,880,086	4/12/2005	Kidder, Joseph D, et al.
	US-7,080,000	7/18/2006	Cambridge, R. D
	US-7,159,036	1/2/2007	Hinchliffe, Alexander, et al.
	US-7,185,332	2/27/2007	Waldin, Ray, et al.
	US-7,210,168	4/17/2003	Hursey, Neil, et al.
	US-7,389,539	6/17/2008	Kouznetsov, Victor
	US-7,398,553	7/8/2008	Li, J.
	US-7,401,359	7/15/2008	Gartside, Paul, et al.
	US-7,424,706	9/9/2008	Ivanov, Oleg, et al.
	US-7,478,381	1/13/2009	Roberts, Jason, et al.
	US-7,761,503	7/20/2010	Dhawan, Guarav, et al.
	US-7,769,815	8/3/2010	Wang, Tak Yin, et al.
	US-7,844,708	11/30/2010	Willehadson, Stefan, et al.
	US-7,937,697	5/3/2011	Alberti, Enrica, et al.

EXAMINER **DATE CONSIDERED**

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant is to place a check mark here if English language Translation is attached

Modified form PTO/SB/08A(04-07) OMB 651-0031
US Patent & Trademark Office: U.S. DEPARTMENT OF COMMERCE
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Substitute for form 1449A/PTO **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (Use as many sheets as necessary)	*Complete if Known*	
	Application Number	14/072,184
	Filing Date	November 5, 2013
	First Named Inventor	Yu Fang
	Group Art Unit	2431
	Examiner Name	Unknown
Sheet 2 of 3	Attorney Docket No: 2831.006US6	

US PATENT DOCUMENTS			
Examiner Initial *	**USP Document Number**	**Publication Date**	**Name of Patentee or Applicant of cited Document**
	US-8,051,483	11/1/2011	Burnaby, Yu Fang, et al.
	US-8,056,135	11/8/2011	Fang, Yu, et al.
	US-8,276,205	9/25/2012	Xie, Micheal, et al.

OTHER DOCUMENTS – NON PATENT LITERATURE DOCUMENTS		
Examiner Initial *	**Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.**	**T 1**
	"Application Serial No. 11/000,703, Advisory Action mailed 07-14-08", 3 pgs	
	"Application Serial No. 11/000,703, Final Office Action mailed 04-03-09", 13 pgs	
	"Application Serial No. 11/000,703, Final Office Action mailed 04-07-08", 18 pgs	
	"Application Serial No. 11/000,703, Final Office Action mailed 06-29-10", 8 pgs	
	"Application Serial No. 11/000,703, Non Final Office Action mailed 11-14-07", 16 pgs	
	"Application Serial No. 11/000,703, Non-Final Office Action mailed 09-19-08", 3 pgs	
	"Application Serial No. 11/000,703, Non-Final Office Action mailed 10-14-10", 8 pgs	
	"Application Serial No. 11/000,703, Non-Final Office Action mailed 12-15-09", 16 pgs	
	"Application Serial No. 11/000,703, Notice of Allowance mailed 06-27-11", 12 pgs	
	"Application Serial No. 11/000,703, Notice of Allowance mailed 08-08-11", 5 pgs	
	"Application Serial No. 11/000,703, Response filed 01-15-08 to Non Final Office Action mailed 11-14-07", 13 pgs	
	"Application Serial No. 11/000,703, Response filed 04-08-11 to Non-Final Office Action mailed 10-14-10", 8 pgs	
	"Application Serial No. 11/000,703, Response filed 04-15-10 to Non Final Office Action mailed 12-15-09", 10 pgs	
	"Application Serial No. 11/000,703, Response filed 07-07-08 to Final Office Action mailed 04-07-08", 10 pgs	
	"Application Serial No. 11/000,703, Response filed 09-29-10 to Final Office Action mailed 06-29-10", 7 pgs	
	"Application Serial No. 11/000,703, Response filed 10-02-09 to Final Office Action mailed 04-03-09", 9 pgs	
	"Application Serial No. 11/000,703, Response filed 12-19-08 to Non-Final Office Action mailed 09-19-08", 9 pgs	
	"Application Serial No. 12/639,800, Non Final Office Action mailed 05-09-11", 11 pgs	
	"Application Serial No. 12/639,800, Notice of Allowance mailed 08-22-11", 5 pgs	
	"Application Serial No. 12/639,800, Response filed 06-28-11 to Non-Final Office Action Received 05-09-11", 7 pgs	
	"Application Serial No. 13/240,661 , Response filed 06-01-12 to Non Final Office Action mailed 05-03-12", 8 pgs	

EXAMINER **DATE CONSIDERED**

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant is to place a check mark here if English language Translation is attached

Modified form PTO/SB/08A(04-07) OMB 651-0031
US Patent & Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (Use as many sheets as necessary)	*Complete if Known*	
	Application Number	14/072,184
	Filing Date	November 5, 2013
	First Named Inventor	Yu Fang
	Group Art Unit	2431
	Examiner Name	Unknown
Sheet 3 of 3	Attorney Docket No: 2831.006US6	

OTHER DOCUMENTS – NON PATENT LITERATURE DOCUMENTS		
Examiner Initial *	**Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.**	**T 1**
	"Application Serial No. 13/240,661, 312 Amendment filed 08-17-12", 3 pgs	
	"Application Serial No. 13/240,661, Non Final Office Action mailed 05-03-12", 10 pgs	
	"Application Serial No. 13/240,661, Notice of Allowance mailed 06-13-12", 5 pgs	
	"Application Serial No. 13/546,915, Preliminary Amendment filed 08-17-12", 3 pgs	
	"Application Serial No. 13/795,407 , Response filed 02-27-14 to Non Final Office Action mailed 11-27-13", 6 pgs	
	"Application Serial No. 13/795,407, Non Final Office Action mailed 11-27-13", 10 pgs	

EXAMINER **DATE CONSIDERED**

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant is to place a check mark here if English language Translation is attached

Electronic Acknowledgement Receipt

EFS ID:	19157269
Application Number:	14072184
International Application Number:	
Confirmation Number:	7558
Title of Invention:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
First Named Inventor/Applicant Name:	Yu Fang
Customer Number:	21186
Filer:	Eric B. Andersland/Valerie Murphy
Filer Authorized By:	Eric B. Andersland
Attorney Docket Number:	2831.006US6
Receipt Date:	29-MAY-2014
Filing Date:	05-NOV-2013
Time Stamp:	13:11:28
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		14072184_IDS_5-28-14.pdf	303366 b6a68d9cb2273604ee70f5fd3841a43164074938	yes	8

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Miscellaneous Incoming Letter	2	3
	Transmittal Letter	4	5
	Information Disclosure Statement (IDS) Form (SB08)	6	8
Warnings:			
Information:			
	Total Files Size (in bytes):	303366	

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Yu Fang et al.
Title: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

Docket No.:	2831.006US6	Serial No.:	14/072,184
Filed:	November 5, 2013	Due Date:	N/A
Examiner:	Unknown	Group Art Unit:	2431
Customer No.:	21186	Confirmation No.:	7558

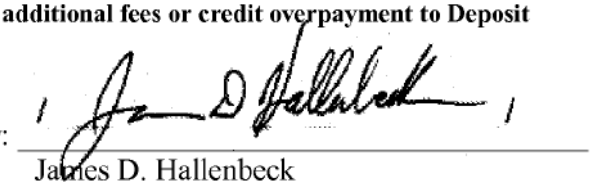
Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

We are transmitting herewith the following attached items (as indicated with an "X"):

X Communication Concerning Prior and Copending Applications (2 pgs.)
X Information Disclosure Statement (2 pgs.), Form 1449 (3 pgs.) Documents NOT enclosed, cited in parent application

If not provided for in a separate paper filed herewith, please consider this a PETITION FOR EXTENSION OF TIME for sufficient number of months to enter these papers and please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.
Customer No.: 21186

By: 
James D. Hallenbeck
Reg. No. 63,561

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Yu Fang et al.	Examiner: Unknown	
Serial No.:	14/072,184	Group Art Unit: 2431	
Filed:	November 5, 2013	Docket: 2831.006US6	
Customer No.: 21186		Confirmation No.: 7558	
Title:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS		

COMMUNICATION CONCERNING PRIOR OR COPENDING APPLICATION(S)

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

Pursuant to the guidance of MPEP §§ 2001.06(b) and 2004(9), Applicant would like to bring the following additional application(s) to the Examiner's attention. The identification of these applications is not intended to suggest that the subject matter claimed in any listed application is, or has been, substantially similar to any claim or claims in the present application.

Serial No./ Patent No.	Filing Date	Attorney Docket	Title
11/000,703 8,051,483	November 30, 2004	2831.006US1	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
12/639,800 8,056,135	December 16, 2009	2831.006US2	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
13/240,661 8,276,205	September 22, 2011	2831.006US3	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
13/546,915	July 11, 2012	2831.006US4	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
14/072,292	November 5, 2013	2831.006US7	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

13/795,407	March 12, 2013	2831.006US5	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

Respectfully submitted,

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.
P.O. Box 2938
Minneapolis, MN 55402
(612) 373-6938

Date 5/28/2014 By /James D. Hallenbeck/

James D. Hallenbeck
Reg. No. 63,561

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Yu Fang et al.	Examiner: Unknown
Serial No.: 14/072,184	Group Art Unit: 2431
Filed: November 5, 2013	Docket: 2831.006US6
Customer No.: 21186	Confirmation No.: 7558
Title: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS	

INFORMATION DISCLOSURE STATEMENT

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

In compliance with the duty imposed by 37 C.F.R. § 1.56, and in accordance with 37 C.F.R. §§ 1.97 *et. seq.*, the enclosed materials are brought to the attention of the Examiner for consideration in connection with the above-identified patent application. Applicant respectfully requests that this Information Disclosure Statement be entered and the documents listed on the attached PTO 1449 Form be considered by the Examiner and made of record. Pursuant to the provisions of MPEP 609, Applicant requests that a copy of the PTO 1449 Form, initialed as being considered by the Examiner, be returned to the Applicant with the next official communication.

Pursuant to 37 C.F.R. § 1.97(b), it is believed that no fee or statement is required with the Information Disclosure Statement. However, if an Office Action on the merits has been mailed after filing of the application or after the filing of the most recent RCE, the Commissioner is hereby authorized to charge the required fees to Deposit Account No. 19-0743 in order to have this Information Disclosure Statement considered.

Pursuant to 37 C.F.R. § 1.98(d), copies of the listed documents are not provided as these references were previously cited by or submitted to the U.S. Patent Office in connection with Applicant's prior U.S. application, Serial No. 13/795,407, filed on March 12, 2013, which is relied upon for an earlier filing date under 35 U.S.C. § 120.

Pursuant to 37 C.F.R. § 1.98(a)(2), copies of cited U.S. Patents and Published Applications, and Non-Published Applications identifiable by USPTO Serial Number, are no longer required to be provided to the Office. Applicant acknowledges the requirement to submit copies of foreign patent documents and non-patent literature in accordance with 37 C.F.R § 1.98(a)(2).

The Examiner is invited to contact the undersigned at the telephone number indicated if there are any questions regarding this communication.

Respectfully submitted,

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.
P.O. Box 2938
Minneapolis, MN 55402
(612) 373-6938

Date 5/28/2014 By /James D. Hallenbeck/

James D. Hallenbeck
Reg. No. 63,561

JDH:vam

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
14/072,184	11/05/2013	Yu Fang	2831.006US6

CONFIRMATION NO. 7558

21186
SCHWEGMAN, LUNDBERG & WOESSNER, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

PUBLICATION NOTICE

OC00000066987041

Title:SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

Publication No.US-2014-0068749-A1
Publication Date:03/06/2014

NOTICE OF PUBLICATION OF APPLICATION

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

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

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

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

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

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

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
14/072,184	11/05/2013	2431	1600	2831.006US6	18	3

CONFIRMATION NO. 7558

21186
SCHWEGMAN, LUNDBERG & WOESSNER, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

FILING RECEIPT

OC000000065067436

Date Mailed: 11/25/2013

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)

Yu Fang, Burnaby, CANADA;
Michael Xie, Menlo Park, CA;

Applicant(s)

Fortinet, Inc., Sunnyvale, CA

Assignment For Published Patent Application

Fortinet, Inc., Sunnyvale, CA

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 13/795,407 03/12/2013
which is a CON of 13/546,915 07/11/2012
which is a CON of 13/240,661 09/22/2011 PAT 8276205
and is a CON of 11/000,703 11/30/2004 PAT 8051483
which claims benefit of 60/552,457 03/12/2004

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 - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 11/19/2013

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/072,184**

Projected Publication Date: 03/06/2014

Non-Publication Request: No

Early Publication Request: No

Title

SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

Preliminary Class

726

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

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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

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

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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

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

NOT GRANTED

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

SelectUSA

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

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/072,184

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	18 minus 20 =	*			OR	x 80 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*				x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1600

APPLICATION AS AMENDED - PART II

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

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

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

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

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

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: Yu Fang et al.
Title: SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
Attorney Docket No.: 2831.006US6
Customer No.: 21186

PATENT APPLICATION TRANSMITTAL

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

We are transmitting herewith the following attached items and information (as indicated with an "X"):

X **CONTINUATION under 37 CFR 1.53(b) of prior Patent Application No. 13/795,407 comprising:**
- X Specification (25 pgs, including claims numbered 1 through 18 and a 1 page Abstract).
- X Formal Drawing(s) (2 sheets).
- X Application Data Sheet (5 pgs).
- X Copy of signed Declaration (2 pgs) from prior application.
- **X Authorization to charge Deposit Account 19-0743 in the amount of $1,600.00 to pay the filing fee.**

The filing fee has been calculated below as follows:

	No. Filed	No. Extra	Rate	Fee
TOTAL CLAIMS	18- 20	0	x $80.00 =	**$0.00**
INDEPENDENT CLAIMS	3 - 3	0	x $420.00 =	**$0.00**
[]MULTIPLE DEPENDENT CLAIMS PRESENTED				**$0.00**
BASIC FEE				**$280.00**
SEARCH FEE				**$600.00**
EXAMINATION FEE				**$720.00**
	No. of pages (75% for e-filing)	**Extra sets of 50 pages**	**Rate**	
APPLICATION SIZE FEE	(20 - 100) / 50	0	$400.00	**$0.00**
TOTAL				**$1,600.00**

Please charge any additional required fees or credit overpayment to Deposit Account No. 19-0743.

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.
Customer Number: 21186

By: /James D. Hallenbeck/
James D. Hallenbeck
Reg. No. 63,561

Date of Deposit: November 5, 2013
This paper or fee is being filed on the date indicated above using the USPTO's electronic filing system EFS-Web, and is addressed to The Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Amended PTO/AIA/14 (03-13)
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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	2831.006US6
	Application Number	Unknown

Title of Invention	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

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: Yu Fang

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Yu		Fang	

Residence Information (Select One) ☐ **US Residency** ☒ **Non US Residency** ☐ **Active US Military Service**

City	Burnaby	State/Province	BC	Country of Residence	Canada

Mailing Address of Inventor:

Address 1	1090 Kifer Road		
Address 2			
City	Sunnyvale	State/Province	CA
Postal Code	94086	Country	United States of America

Inventor 2: Michael Xie

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Michael		Xie	

Residence Information (Select One) ☒ **US Residency** ☐ **Non US Residency** ☐ **Active US Military Service**

City	Menlo Park	State/Province	CA	Country of Residence	United States of America

Mailing Address of Inventor:

Address 1	1090 Kifer Road		
Address 2			
City	Sunnyvale	State/Province	CA
Postal Code	94086	Country	United States of America

Correspondence Information:

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

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	2831.006US6
	Application Number	Unknown

Title of Invention	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

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.

☐ An Address is being provided for the correspondence Information of this application.	
Customer Number	21186
Email Address	request@slwip.com

Application Information:

Title of the Invention	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS		
Attorney Docket Number	2831.006US6	**Small Entity Status Claimed** ☐	
Application Type	Non-Provisional		
Subject Matter	Utility - CON		
Suggested Class (if any)		**Sub Class (if any)**	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	2	**Suggested Figure for Publication (if any)**	

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.**

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). Entereither Customer Number or complete the Representative Name section below. If bothsections 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	21186		

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	2831.006US6
	Application Number	Unknown

Title of Invention	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

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.

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this 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(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status	Pending		
Application Number	**Continuity Type**	**Prior Application Number**	**Filing Date (YYYY-MM-DD)**
This application	continuation of	13/795,407	2013-03-12
Prior Application Status	Pending		
Application Number	**Continuity Type**	**Prior Application Number**	**Filing Date (YYYY-MM-DD)**
13/795,407	continuation of	13/546,915	2012-07-11
Prior Application Status	Patented		
Application Number	**Continuity Type**	**Prior Application Number**	**Filing Date (YYYY-MM-DD)**
13/546,915	continuation of	13/240,661	2011-09-22
Prior Application Status	Patented		
Application Number	**Continuity Type**	**Prior Application Number**	**Filing Date (YYYY-MM-DD)**
13/240,661	continuation of	11/000,703	2004-11-30
Prior Application Status	Patented		
Application Number	**Continuity Type**	**Prior Application Number**	**Filing Date (YYYY-MM-DD)**
11/000,703	non-provisional of	60/552,457	2004-03-12

Foreign Priority Information:

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(d). 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(h)(1) and (2). Under the POX 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).

Application Number	Country	Parent Filing Date (YYYY-MM-DD)	Access Code (if applicable)

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	2831.006US6
	Application Number	Unknown
Title of Invention	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS	

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.

Authorization to Permit Access:

☒ **Authorization to Permit Access to the Instant Application by the Participating Offices**

If 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 World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

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: Fortinet, Inc.

<u>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed</u>. 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.

☒ 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:

☐ Deceased	☐ Legally incapacitated

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here: ☒

Prefix	Given Name	Middle Name	Family Name	Suffix

Amended PTO/AIA/14 (03-13)
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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	2831.006US6
	Application Number	Unknown
Title of Invention	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS	

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.

Mailing Address Information:			
Address 1	1090 Kifer Road		
Address 2			
City	Sunnyvale	State/Province	CA
Country	United States of America	Postal Code	94086
Phone Number			
Email Address			

Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications					
Signature	/James D Hallenbeck/			Date (YYYY-MM-DD)	11/4/2013
First Name	James	Last Name	Hallenbeck	Registration Number	63,561

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

Title of Invention	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

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 13/795,407, filed on March 12, 2013.

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

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

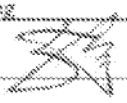
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LEGAL NAME OF INVENTOR

Inventor: Yu Fang Date (Optional): May 16, 2013

Signature: 

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

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This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 13/795,407, filed on March 12, 2013 .

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

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

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LEGAL NAME OF INVENTOR

Inventor: Michael Xie Date (Optional) :_____

Signature: _____

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SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS

RELATED APPLICATION DATA

[0001] This application is a Continuation of U.S. Application No. 13/795,407, filed on March 12, 2012, which is a Continuation of U.S. Application No.13/546,915, filed on July 11, 2012, which is a Continuation of U.S. Application No. 13/240,661, filed September 22, 2011 and issued on September 25, 2012 as U.S. Patent No. 8,276,205, which is a Continuation of U.S. Application No. 11/000,703, filed November 30, 2004 and issued on November 1, 2011 as U.S. Patent No. 8,051,483, which claims priority to U.S. Provisional Patent Application No. 60/552,457, filed on March 12, 2004, to each of which priority is claimed and the entire disclosures of which are expressly incorporated herein by reference.

BACKGROUND

Field of the Invention

[0002] The field of the invention relates to computer network and computer systems, and more particularly, to systems and methods for updating content detection modules.

Background

[0003] The generation and spreading of computer viruses are major problems in computer systems and computer networks. A computer virus is a program that is capable of attaching to other programs or sets of computer instructions, replicating itself, and/or performing unsolicited or malicious actions on a computer system. Viruses may be embedded in email attachments, files downloaded from Internet, and macros in MS Office files. The damage that can be done by a computer virus may range from mild interference with a program, such as a display of unsolicited messages or graphics, to complete destruction of data on a user's hard drive or server.

[0004] To provide protection from viruses, most organizations have installed virus scanning software on computers in their network. However, these organizations may still be vulnerable to a virus attack until every host in their network has received updated anti-virus software. With new attacks reported almost weekly, organizations are constantly exposed to virus attacks, and spend significant resources ensuring that all hosts are constantly updated with new antivirus information. For example, with existing content detection software, a user may have to request for a download of a new virus signature in order to enable the content detection software to detect new virus that has been created since the last update. If a user delays in downloading the new virus signature, the content detection software would be unable to detect the new virus. Also, with existing content detection systems, new virus signatures are generally not made available shortly after they are discovered. As such, a computer mat be subjected to attack by the new virus until the new virus signature is available and is downloaded by a user.

[0005] Besides virus attacks, many organizations also face the challenge of dealing with inappropriate content, such as email spam, misuse of networks in the form of browsing or downloading inappropriate content, and use of the network for non-productive tasks. Many organizations are struggling to control access to appropriate content without unduly restricting access to legitimate material and services. Currently, the most popular solution for blocking unwanted web activity is to block access to a list of banned or blacklisted web sites and pages based on their URLs. However, as with virus scanning, the list of blocked URL requires constant updating. If a user delays in downloading the list of URL, or if the list of URL is not made available soon enough, the content detection software would be unable to detect undesirable content, such as web pages.

[0006] Many email spam elimination systems also use blacklists (spammer lists) to eliminate unwanted email messages. These systems match incoming email messages against a list of mail servers that have been pre-identified to be spam hosts, and prevent user access of messages from these servers. However, as with virus scanning, the spammer list also requires constant updating. If a user delays in downloading the spammer list, or if the spammer list is not made available soon

enough, the content detection software would be unable to detect undesirable content.

SUMMARY

[0007] In accordance with some embodiments, a method of updating a content detection module includes obtaining content detection data, and transmitting the content detection data to a content detection module, wherein the transmitting is performed not in response to a request from the content detection module.

[0008] In accordance with other embodiments, a system for updating a content detection module includes means for obtaining content detection data, and means for transmitting the content detection data to a content detection module, wherein the means for transmitting is configured to perform the transmitting not in response to a request from the content detection module.

[0009] In accordance with other embodiments, a computer-program product having a medium, the medium having a set of instructions readable by a processor, an execution of the instructions by the processor causes a process to be performed, the process includes obtaining content detection data, and transmitting the content detection data to a content detection module, wherein the transmitting is performed not in response to a request from the content detection module.

[0010] In accordance with other embodiments, a content detection system includes a station having a computer-readable medium for storing content detection data, the content detection data usable by a content detection module to detect content, wherein the station is configured to transmit the content detection data not in response to a request by the content detection module.

[0011] In accordance with other embodiments, a method of sending content detection data includes determining whether a first update station received the content detection data, and sending the content detection data to the first update station if the first update station did not receive the content detection data.

[0012] In accordance with other embodiments, a system for sending content detection data includes means for determining whether a first update station received the content detection data, and means for sending the content detection

data to the first update station if the first update station did not receive the content detection data.

[0013] In accordance with other embodiments, a computer-program product having a medium, the medium having a set of instructions readable by a processor, an execution of the instructions by the processor causes a process to be performed, the process includes determining whether a first update station received the content detection data, and sending the content detection data to the first update station if the first update station did not receive the content detection data.

[0014] In accordance with other embodiments, a method of sending content detection data includes obtaining content detection data, selecting an update station from a plurality of update stations, and sending the content detection data to the selected update station.

[0015] In accordance with other embodiments, a system for sending content detection data includes means for obtaining content detection data, means for selecting an update station from a plurality of update stations, and means for sending the content detection data to the selected update station.

[0016] In accordance with other embodiments, a computer-program product having a medium, the medium having a set of instructions readable by a processor, an execution of the instructions by the processor causes a process to be performed, the process includes obtaining content detection data, selecting an update station from a plurality of update stations, and sending the content detection data to the selected update station.

[0017] In accordance with other embodiments, a method of building a content detection system includes establishing a first communication link between a central station and an update station, the central station configured to transmit content detection data to the update station, and establishing a second communication link between the update station and a content detection module.

[0018] In accordance with other embodiments, a system for building a content detection system includes means for establishing a first communication link between a central station and an update station, the central station configured to transmit content detection data to the update station, and means for establishing a

second communication link between the update station and a content detection module.

[0019] In accordance with other embodiments, a computer-program product having a medium, the medium having a set of instructions readable by a processor, an execution of the instructions by the processor causes a process to be performed, the process includes establishing a first communication link between a central station and an update station, the central station configured to transmit content detection data to the update station, and establishing a second communication link between the update station and a content detection module.

[0020] Other aspects and features of the invention will be evident from reading the following detailed description of the preferred embodiments, which are intended to illustrate, not limit, the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] The drawings illustrate the design and utility of preferred embodiments of the application, in which similar elements are referred to by common reference numerals. In order to better appreciate how advantages and objects of various embodiments are obtained, a more particular description of the embodiments are illustrated in the accompanying drawings. Understanding that these drawings depict only typical embodiments of the application and are not therefore to be considered limiting its scope, the embodiments will be described and explained with additional specificity and detail through the use of the accompanying drawings.

[0022] FIG. 1 illustrates a block diagram of a content detection system in accordance with some embodiments; and

[0023] FIG. 2 is a diagram of a computer hardware system.

DETAILED DESCRIPTION

[0024] Various embodiments are described hereinafter with reference to the figures. It should be noted that the figures are not drawn to scale and that elements of similar structures or functions are represented by like reference numerals

throughout the figures. It should also be noted that the figures are only intended to facilitate the description of specific embodiments. They are not intended as an exhaustive description of the invention or as a limitation on the scope of the invention. In addition, an illustrated embodiment may not show all aspects or advantages. An aspect or an advantage described in conjunction with a particular embodiment is not necessarily limited to that embodiment and can be practiced in any other embodiments, even if not so illustrated or described.

[0025] FIG. 1 illustrates a block diagram of a content detection system 100 in accordance with some embodiments. The content detection system 100 includes a central station 102, a processing station 104 for providing content detection data to the central station 102, a plurality of base stations 106 in communication with the central station 102, and a plurality of content detection modules 108 in communication with the base stations 106.

[0026] In the illustrated embodiments, processing station 104 is a computer. Alternatively, processing station 104 can be a server, a module, a device, a computer program, and the like, e.g., any one of a variety of devices that can receive and transmit information. Processing station 104 is configured to determine content detection data, such as a virus signature, a spammer identification, a URL, and the like, and transmit the content detection data to central station 102. For example, processing station 104 can be configured (e.g., programmed) to determine the content detection data using any of the techniques known in the art. Alternatively, the content detection data can be input into processing station 104 by a user of processing station 104. Although one processing station 104 is shown, in other embodiments, content detection system 100 can include more than one processing station 104 in communication with central station 102.

[0027] Central station 102 is configured to receive the content detection data from processing station 104, and send the content detection data to update stations 106 (e.g., through the Internet). In some embodiments, central station 102 also receives subscriber data, such as a user identification of a content detection module 108, level of protection desired by the user, etc., from processing station 104 or from update station(s) 106 for processing. In the illustrated embodiments, central

station 102 is a computer, but alternatively, can be a server, a module, a device, a computer program, and the like, e.g., any one of a variety of devices that can receive and transmit information. Although one processing station 102 is shown, in other embodiments, content detection system 100 can include more than one central station 102, each of which in communication with at least one update station 106. In other embodiments, central station 102 and processing station 104 are combined and implemented as a single unit (e.g., a processor, a computer, or the like).

[0028] Update stations 106 receive the content detection data from central station 102, and send the content detection data to content detection modules 108 (e.g., through the Internet). Each of the update stations 106 is located at a geographical location that is different from others. For example, update station 106a may be located at a different building, a different street, a different city, or a different country, from update station 106b. In some embodiments, the update stations 106 also receives subscriber data, such as a user identification of a content detection module 108, level of protection desired by the user, etc., from content detection module(s) 108, and forward the subscriber data to central station 102 for processing. In other embodiments, update station 106 may be configured to handle requests (such as a subscriber's contract information, the latest update data, etc.) from content detection module(s) 108, collect information (such as the version information, IP address, geographical location of the detection module, etc.) from content detection module(s) 108, and forward collected information to central station 102. In the illustrated embodiments, each update station 106 is a computer, but alternatively, can be a server, a module, a device, a computer program, and the like, e.g., any one of a variety of devices that can receive and transmit information. In FIG. 1, three update stations 106a-106c and five content detection modules 108a-108e are shown. However, in alternative embodiments, the system 100 can have different numbers of update station(s) 106 and different numbers of content detection module(s) 108.

[0029] In the illustrated embodiments, each content detection module 108 is configured to receive electronic content (content data), and determines whether the electronic content contains undesirable content based on the content detection data it

receives from update station 106. For example, content detection module 108 can be configured to detect virus based on a virus signature received from update station 106. In the illustrated embodiments, module 10 is implemented as a component of a gateway (or gateway product), which is configured to perform policy enforcement. As used in this specification, the term "policy enforcement" refers to a process or procedure, an execution of which creates a result that can be used to determine whether to pass data to user, and includes (but is not limited to) one or a combination of: source verification, destination verification, user authentication, virus scanning, content scanning (e.g., scanning for undesirable content), and intrusion detection (e.g., detecting undesirable content, such as worms, porno website, etc.). In other embodiments, instead of being a component of gateway, content detection module 108 can be a separate component that is coupled to gateway. In other embodiments, content detection module 108 can be a gateway product by itself.

[0030] In some embodiments, content detection module 108 can be implemented using software that is loaded onto a computer, a server, or other types of memory, such as a disk or a CD-ROM. Alternatively, content detection module 108 can be implemented as web applications. In alternative embodiments, content detection module 108 can be implemented using hardware. For example, in some embodiments, content detection module 108 includes an application-specific integrated circuit (ASIC), such as a semi-custom ASIC processor or a programmable ASIC processor. ASICs, such as those described in Application-Specific Integrated Circuits by Michael J.S. Smith, Addison-Wesley Pub Co. (1st Edition, June 1997), are well known in the art of circuit design, and therefore will not be described in further detail herein. In still other embodiments, content detection module 108 can be any of a variety of circuits or devices capable of performing the functions described herein. For example, in alternative embodiments, content detection module 108 can include a general purpose processor, such as a Pentium processor. In other embodiments, content detection module 108 can be implemented using a combination of software and hardware. In some embodiments, content detection module 108 may be implemented as a

firewall, a component of a firewall, or a component that is configured to be coupled to a firewall.

[0031] Having described the components of the content detection system 100, methods of using content detection system 100 in accordance with some embodiments will now be described. First, processing station 104 receives an electronic content. By means of non-limiting examples, such electronic content can be a web page, an email, an email attachment, a word file, a program, etc., and the like, e.g., a file that may contain undesirable content. In other examples, electronic content can be a virus, a spam, a worm, or any of other undesirable content. Processing station 104 can receive the electronic content from one or more sources. For example, a content detection module 108 may detect a content that is suspicious (or that requires further processing), in which case, content detection module 108 then sends the electronic content to processing station 104 for processing. Alternatively, processing station 104 can receive electronic content from a person, who sends the content to processing station 104 via email. In other embodiments, electronic content can be input into processing station 104 by a user of processing station 104.

[0032] After processing station 104 received the electronic content, processing station 104 then analyzes such information to determine whether the content contains/is a threat (e.g., a virus, a worm, a spam, etc.) that is desired to be detected. If processing station 104 determines that the electronic content contains a threat that is desired to be detected, processing station 104 then generates content detection data for the electronic content. For example, after processing station 104 received a set of content data, processing station 104 then performs an analysis using conventional or known technique(s) to determine whether it is a virus (an example of content that is desired to be detected). In some embodiments, processing station 104 is programmed to perform such analysis. Alternatively, the set of content data can be analyzed by an administrator, a separate device, or a separate software, and the result of the analysis is then input to processing station 104. If processing station 104 determines that the set of content data includes content that is undesirable (e.g., desired to be detected by content detection modules 108),

processing station then generates content detection data, which can be used by content detection modules 108 to detect the undesirable content. By means of non-limiting examples, content detection data can be a virus signature, a virus definition, a spammer identification, a URL, a NIDS signature, a time at which content detection data is created, a level of threat, etc., and the like, e.g., any information that can be used in a content detection or screening process. In other embodiments, processing station 104 does not generate the content detection data. In such cases, content detection data can be provided by a separate source, and is input into processing station 104.

[0033] As soon as, or shortly after, processing station 104 obtains the content detection data, processing station 104 then transmits the content detection data to central station 102. If processing station 104 and central station 102 are implemented as a single unit, then the step of transmitting content detection data to central station 102 is omitted. In response to obtaining the content detection data, central station 102 initiates a transmission process for transmitting the content detection data to update stations 106. In the illustrated embodiments, central station 102 maintains a list of prescribed geographical areas, a list of content detection modules 108 in each prescribed geographical area, and a list of update stations 106 for serving (e.g., sending content detection data to and/or from) each prescribed geographical area. Based on the lists, central station 102 assigns update stations 106 to provide the content detection data to content detection modules 108 within the prescribed geographical areas. In some embodiments, one update station 106 is used to serve content detection modules 108 within a prescribed geographical area. Alternatively, more than one update station 106 can be used to serve content detection modules 108 within a prescribed geographical area.

[0034] In some cases, an update station 106 can be configured to check another update station 106 to determine whether it has received content detection data. For example, if update station 106a determines that update station 106b did not receive content detection data, update station 106a then sends content detection data to update station 106b. Various techniques can be used to determine whether update station 106b received content detection data. For example, in some embodiments,

update station 106a is configured to send an inquiry to update station 106b. If update station 106b did not receive content detection data, update station 106b then transmits a signal or a reply to update station 106a, indicating that update station 106b did not receive content detection data. Alternatively, update station 106a is configured to initiate a timer after it has received content detection data. The timer continues to run until update station 106a receives a signal from update station 106b indicating that update station 106b received content detection data. If update station 106a does not receive such signal from update station 106b within a prescribed time period, update station 106a then determines that update station 106b did not receive the content detection data. Other techniques known in the art can also be used to check whether update station 106b received content detection data. If it is determined that update station 106b did not receive content detection data, update station 106a then sends content detection data to update station 106b. It should be noted that in other embodiments, instead of having one update station check another update station, one update station can check a plurality of other update stations. Also, in other embodiments, more than one update station 106 can check another update station 106.

[0035] In the illustrated embodiments, each of the update stations 106 are configured (e.g., pre-assigned) to serve one or more content detection module 108. For example, update station 106a can be configured to serve content detection modules 108a, 108b, update station 106b can be configured to serve content detection module 108c, and update station 106c can be configured to serve content detection modules 108d, 108e.

[0036] In other embodiments, instead of pre-assigning update stations 106 to serve certain content detection modules 108, central station 102 determines which update station 106 to use for sending content detection data based on a condition during use, e.g., based on load demands and/or capacities of update stations 106. As used in this specification, "capacity" refers to a variable that represents or associates with a level of ability for an update station 104 to handle content transmitted thereto. For example, capacity of an update station 104 can be an amount of memory space available, etc. Using the example of FIG. 1, central station 102

receives information regarding capacities of update stations 106a-106c, and selects one or more update stations 106 for transmitting content detection data based on their load and/or capacities. For example, if update station 106a has a high load demand (e.g., above a prescribed load demand) and/or if its remaining capacity to handle additional traffic is low (e.g., below a prescribed capacity threshold), central station 102 then uses update stations 106b and 106c to transmit content detection data to content detection modules 108a-108e. Load on the update stations 106b and 106c can be approximately shared in equal portion. For example, if central station 102 determines that update stations 106b and 106c are available, central station 102 can assign update station 106b to transmit content detection data to modules 108a and 108b, and update station 106c to transmit content detection data to modules 108a-108c. Alternatively, load among the available update stations 106 can be distributed based on the respective load demand and/or capacities of the available update stations 106. For example, if update stations 106b, 106c have capacities to serve twenty (20) and eighty (80) content detection modules 108, respectively, central station 102 then assign update stations 106b, 106c to transmit content detection data such that the ratio of the assigned loads approximately corresponds with the ratio of the capacities of the available update stations 106b, 106c. Following the above example, central station 102 will assign update station 106b to serve content detection module 108a, and update station 106c to serve content detection modules 108b-108e.

[0037] In other embodiments, central station 102 maintains an order list of update station 106, which prescribes an order (e.g., in a round-robin configuration) in which load is to be assigned to update stations 106. For example, the order list may have update stations 106a-106c as primary, secondary, and tertiary stations, respectively, for serving content detection modules 108a-108e. In such cases, central station 102 will initially attempt to use update station 106a (the primary station) for transmitting content detection data to content detection modules 108a-108e. However, if update station 106a is unavailable (e.g., due to heavy load demand), central station 102 will then attempt to use update station 106b (the secondary station) for transmitting content detection data to content detection

modules 108a-108e. If update station 106b is unavailable (e.g., due to heavy load demand), central station 102 will then attempt to use update station 106c (the third station on the order list) for transmitting content detection data to content detection modules 108a-108e.

[0038] It should be noted that the technique for transmitting content detection data from central station 102 and/or update station(s) 106 to content detection module(s) 108 should not be limited to the examples discussed previously, and that other techniques can also be used in other embodiments. For example, one or more of the techniques described previously can be combined with another technique. Also, in other embodiments, central station 102 does not maintain the list of content detection modules 108 and the list of geographical areas. In such cases, after central station 102 receives content detection data, it transmits the content detection data to all update stations 106. The update stations 106 are configured to coordinate among themselves to ensure that all content detection modules 108 are provided with the content detection data. For example, in the example of FIG. 1, update station 106a can be configured (e.g., programmed) to communicate with update station 106b for various purposes, such as, to check a load demand on update station 106b, to check a capacity of update station 106b, to check an availability of update station 106b, and/or to verify that update station 106b has received content detection data. In some embodiments, based on the load demand and/or the capacities on the update stations 106, update stations 106 share the load among themselves (e.g., by dividing the load in equal parts, or by distributing the load based on respective ratios of the demand and/or capacities on the update stations 106) to pass the content detection data to content detection modules 108. In some embodiments, one update station 106 can be configured to communicate with one or more other update station 106. In such cases, the update station 106 can check one or more other update station 106 to make sure that content detection data have been received, and/or to serve as backup for the one or more other update station 106. In other embodiments, more than one update stations 106 can check an update station 106, and serve as backup for the update station 106.

[0039] After content detection modules 108 received the content detection data (e.g., a virus signature), content detection modules 108 can then utilize the content detection data to detect content. In some embodiments, the content detection data is a virus signature, in which case, content detection modules 108 utilizes the virus signature to detect the virus that corresponds with the virus signature. Alternatively, the content detection data is a spammer identification, in which case, content detection modules 108 utilizes the spammer identification to detect and screen undesirable spam that corresponds with the spammer identification. In other embodiments; the content detection data can be other information, such as, a time at which content detection data is created, that content detection modules 108 can use in a content detection or screening process.

[0040] Using the above method, content detection data can be provided to content detection modules 108 within a short period, such as, several minutes, and in some cases, within seconds, after the content detection data has been obtained (determined) by processing station 104 and/or central station 102. This allows content detection modules 108 to be updated in substantially real time. This is advantageous because some content detection data such as virus definitions are very time-sensitive, and should be distributed to all content detection modules 108 as soon as the content detection data are available. Also, with system 100, the responsibility to keep up with the latest security update (e.g., content detection data) is shifted from users of content detection modules 108 to processing station 104 and/or central station 102. In addition, unlike typical update method, which requires a content detection module to regularly "poll" an update station to check if there is a new update, central station 102 and/or update stations 106 "push" the latest security update data within minutes (or even seconds) after they are available to all content detection modules 108. This method has the advantage of faster response time during an outbreak and less resource consumption on content detection modules 108.

[0041] Further, using a network of update stations 106 for transmitting content detection data is reliable because if update station(s) 106 is not available or fail to work properly, a nearby update station 106 in the same prescribed

geographical area or update station(s) 106 located in other prescribed geographical area can provide the content detection data to content detection modules 108. Also, with content detection system 100, an update station 106 can be added, removed from the content detection system 100 at run-time without causing service interruption. If the update stations 106 for a certain geographical areas cannot keep up with the ever-increasing load, more update station(s) can be added to the content detection system 100. As such, content detection system 100 provides high scalability.

[0042] In some embodiments, an update station can be customized to serve the need of certain organization(s). Some organizations have some special policies that restrict their network device's access to the Internet. For example, their network connection from Intranet to Internet is only limited to certain host(s). Therefore, it may not be possible for their content detection modules 108 inside the Intranet to access update station(s) 106. In such cases, a customized update station can be provided outside the Intranet of the organization (customer). For example, the customer can configure [] an update station to serve its own content detection module(s) 108. In some embodiments, a user interface can be provided for allowing a user to select which content detection module(s) 108 within the organization to use a customized update station and which content detection module(s) 108 to use a regular update station. As with update stations 106, more than one customized update station can be provided, and these customized update stations can back up each other and distribute their load.

[0043] Computer Architecture

[0044] As described previously, any of central station 102, processing station 104, update station 106, and content detection module 108 can be implemented using a computer. For example, one or more instructions can be imported into a computer to enable the computer to perform any of the functions described herein.

[0045] FIG. 2 is a block diagram that illustrates an embodiment of a computer system 200 upon which embodiments of the invention may be

implemented. Computer system 200 includes a bus 202 or other communication mechanism for communicating information, and a processor 204 coupled with bus 202 for processing information. Computer system 200 also includes a main memory 206, such as a random access memory (RAM) or other dynamic storage device, coupled to bus 202 for storing information and instructions to be executed by processor 204. Main memory 206 also may be used for storing temporary variables or other intermediate information during execution of instructions to be executed by processor 204. Computer system 200 may further include a read only memory (ROM) 208 or other static storage device(s) coupled to bus 202 for storing static information and instructions for processor 204. A data storage device 210, such as a magnetic disk or optical disk, is provided and coupled to bus 202 for storing information and instructions.

[0046] Computer system 200 may be coupled via bus 202 to a display 212, such as a cathode ray tube (CRT), for displaying information to a user. An input device 214, including alphanumeric and other keys, is coupled to bus 202 for communicating information and command selections to processor 204. Another type of user input device is cursor control 216, such as a mouse, a trackball, cursor direction keys, or the like, for communicating direction information and command selections to processor 204 and for controlling cursor movement on display 212. This input device typically has two degrees of freedom in two axes, a first axis (e.g., x) and a second axis (e.g., y), that allows the device to specify positions in a plane.

[0047] Embodiments of the invention are related to the use of computer system 200 for transmitting content data. According to some embodiments of the invention, such use may be provided by computer system 200 in response to processor 204 executing one or more sequences of one or more instructions contained in the main memory 206. Such instructions may be read into main memory 206 from another computer-readable medium, such as storage device 210. Execution of the sequences of instructions contained in main memory 206 causes processor 204 to perform the process steps described herein. One or more processors in a multi-processing arrangement may also be employed to execute the sequences of instructions contained in main memory 206. In alternative

embodiments, hard-wired circuitry may be used in place of or in combination with software instructions to implement the invention. Thus, embodiments of the invention are not limited to any specific combination of hardware circuitry and software.

[0048] The term "computer-readable medium" as used herein refers to any medium that participates in providing instructions to processor 204 for execution. Such a medium may take many forms, including but not limited to, non-volatile media, volatile media, and transmission media. Non-volatile media includes, for example, optical or magnetic disks, such as storage device 210. Volatile media includes dynamic memory, such as main memory 206. Transmission media includes coaxial cables, copper wire and fiber optics, including the wires that comprise bus 202. Transmission media can also take the form of acoustic or light waves, such as those generated during radio wave and infrared data communications.

[0049] Common forms of computer-readable media include, for example, a floppy disk, a flexible disk, hard disk, magnetic tape, or any other magnetic medium, a CD-ROM, any other optical medium, punch cards, paper tape, any other physical medium with patterns of holes, a RAM, a PROM, and EPROM, a FLASH-EPROM, any other memory chip or cartridge, a carrier wave as described hereinafter, or any other medium from which a computer can read.

[0050] Various forms of computer-readable media may be involved in carrying one or more sequences of one or more instructions to processor 204 for execution. For example, the instructions may initially be carried on a magnetic disk of a remote computer. The remote computer can load the instructions into its dynamic memory and send the instructions over a telephone line using a modem. A modem local to computer system 200 can receive the data on the telephone line and use an infrared transmitter to convert the data to·an infrared signal. An infrared detector coupled to bus 202 can receive the data carried in the infrared signal and place the data on bus 202. Bus 202 carries the data to main memory 206, from which processor 204 retrieves and executes the instructions. The instructions received by main memory 206 may optionally be stored on storage device 210 either before or after execution by processor 204.

[0051] Computer system 200 also includes a communication interface 218 coupled to bus 202. Communication interface 218 provides a two-way data communication coupling to a network link 220 that is connected to a local network 222. For example, communication interface 218 may be an integrated services digital network (ISDN) card or a modem to provide a data communication connection to a corresponding type of telephone line. As another example, communication interface 218 may be a local area network (LAN) card to provide a data communication connection to a compatible LAN. Wireless links may also be implemented. In any such implementation, communication interface 218 sends and receives electrical, electromagnetic or optical signals that carry data streams representing various types of information.

[0052] Network link 220 typically provides data communication through one or more networks to other devices. For example, network link 220 may provide a connection through local network 222 to a host computer 224. Network link 220 may also transmits data between an equipment 226 and communication interface 218. The data streams transported over the network link 220 can comprise electrical, electromagnetic or optical signals. The signals through the various networks and the signals on network link 220 and through communication interface 218, which carry data to and from computer system 200, are exemplary forms of carrier waves transporting the information. Computer system 200 can send messages and receive data, including program code, through the network(s), network link 220, and communication interface 218. Although one network link 220 is shown, in alternative embodiments, communication interface 218 can provide coupling to a plurality of network links, each of which connected to one or more local networks. In some embodiments, computer system 200 may receive data from one network, and transmit the data to another network. Computer system 200 may process and/or modify the data before transmitting it to another network.

[0053] Although particular embodiments have been shown and described, it will be understood that it is not intended to limit the present inventions to the preferred embodiments, and it will be obvious to those skilled in the art that various changes and modifications may be made without departing from the spirit and scope

of the present inventions. The specification and drawings are, accordingly, to be regarded in an illustrative rather than restrictive sense. The present inventions are intended to cover alternatives, modifications, and equivalents, which may be included within the spirit and scope of the present inventions as defined by the claims.

CLAIMS

What is claimed is:

1. A network gateway device comprising:

at least one processor;

at least one memory device;

at least one network interface device;

content detection and configuration data stored on the at least one memory device;

an instruction set, stored in the at least one memory device and executable by the at least one processor to:

receive network traffic via the at least one network interface device;

process the received network traffic in view of the content detection and configuration data stored in the at least one memory device to enforce policies defined at least in part by the content detection and configuration data, the policy enforcement performed to determine whether to allow the received network traffic to pass, the policy enforcement including user identification, content identification, and at least one of source verification and destination verification;

block network traffic determined to violate at least one policy; and

allow network traffic to pass that does not violate a policy.

2. The network gateway device of claim 1, wherein:

at least one policy defines a suspicious category of network traffic; and

when network traffic is determined to violate the at least one policy defining suspicious network traffic, forwarding the network traffic to an analysis process that will perform analysis on network traffic to determine whether the network traffic contains a threat desired to be detected and, when the network traffic is determined to contain a threat desired to be detected, the analysis process generates additional content detection data to detect the threat in subsequently received network traffic.

3. The network gateway device of claim 2, wherein the instruction set is further executable by the at least one processor to:

receive, via the network interface device, the additional content detection data from the analysis process;

store the additional content detection data on the at least one memory device; and

process subsequently received network traffic in view of the additional content detection data.

4. The network gateway device of claim 3, wherein the additional content detection data is received indirectly from the analysis process via an update station.

5. The network gateway device of claim 2, wherein the analysis process, to which the network traffic content is forwarded, executes on a computing device distinct from the network gateway device.

6. The content detection system of claim 5, wherein the analysis process facilitates an analysis that includes receiving administrator input.

7. A method comprising:

receiving network traffic via at least one network interface device;

processing the received network traffic, by executing instructions on at least one processor of a data network device, in view of content detection and configuration data stored on at least one memory device to enforce policies defined at least in part by the content detection and configuration data, the policy enforcement performed to determine whether to allow the received network traffic to pass on a data network, the policy enforcement including user identification, content identification, and at least one of source verification and destination verification;

blocking network traffic determined to violate at least one policy; and

allowing network traffic to pass on the data network that does not violate a policy.

8. The method of claim 7, wherein:

at least one policy defines a suspicious category of network traffic; and

when network traffic is determined to violate the at least one policy defining suspicious network traffic, the method further includes:

forwarding the network traffic to an analysis process that will perform analysis on network traffic to determine whether the network traffic contains a threat desired to be detected and, when the network traffic is determined to contain a threat desired to be detected, the analysis process generates additional content detection data to detect the threat in subsequently received network traffic.

9. The method of claim 8, further comprising:

receiving, via the at least one network interface device, the additional content detection data from the analysis process;

storing the additional content detection data on the at least one memory device; and

processing subsequently received network traffic in view of the additional content detection data.

10. The method of claim 9, wherein the additional content detection data is received indirectly from the analysis process via an update station.

11. The method of claim 8, wherein the analysis process, to which the network traffic content is forwarded, executes on a computing device distinct from the data network device.

12. The method of claim 11, wherein the analysis process facilitates an analysis that includes receiving administrator input.

13. A non-transitory computer-readable medium with instructions stored thereon which when executed by at least one processor of a data network device, causes the data network device to:

receive network traffic via at least one network interface device;

process the received network traffic in view of content detection and configuration data stored on at least one memory device to enforce policies defined at least in part by the content detection and configuration data, the policy enforcement performed to determine whether to allow the received network traffic to pass on a data network, the policy enforcement including user identification, content identification, and at least one of source verification and destination verification;

block network traffic determined to violate at least one policy; and

allowing network traffic to pass on the data network that does not violate a policy.

14. The non-transitory computer-readable medium of claim 13, wherein:

at least one policy defines a suspicious category of network traffic; and

when network traffic is determined to violate the at least one policy defining suspicious network traffic, the instructions are further executable by the at least one processor to:

forward the network traffic to an analysis process that will perform analysis on network traffic to determine whether the network traffic contains a threat desired to be detected and, when the network traffic is determined to contain a threat desired to be detected, the analysis process generates additional content detection data to detect the threat in subsequently received network traffic.

15. The non-transitory computer-readable medium of claim 14, wherein the instructions are further executable by the at least one processor to::

receive, via the at least one network interface device, the additional content detection data from the analysis process;

store the additional content detection data on the at least one memory device; and

process subsequently received network traffic in view of the additional content detection data.

16. The non-transitory computer-readable medium of claim 15, wherein the additional content detection data is received indirectly from the analysis process via an update station.

17. The non-transitory computer-readable medium of claim 14, wherein the analysis process, to which the network traffic content is forwarded, executes on a computing device distinct from the data network device.

18. The non-transitory computer-readable medium of claim 17, wherein the analysis process facilitates an analysis that includes receiving administrator input.

ABSTRACT

Systems, methods, and software for processing received network traffic content in view of content detection data and configuration data to either block, permit, or to further evaluate network traffic content when entering a network.

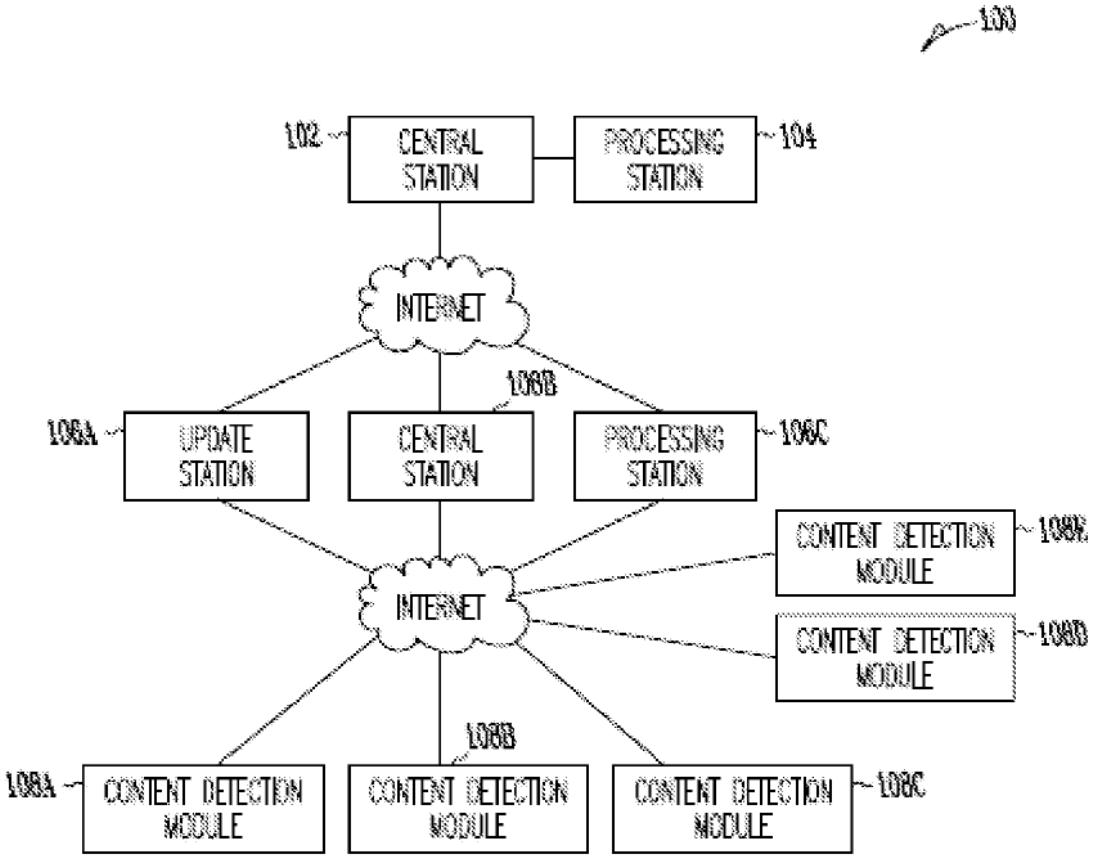

100
102
CENTRAL STATION
PROCESSING STATION
104
INTERNET
106B
106A
UPDATE STATION
CENTRAL STATION
PROCESSING STATION
106C
CONTENT DETECTION MODULE
108E
INTERNET
CONTENT DETECTION MODULE
108D
108B
108A
CONTENT DETECTION MODULE
CONTENT DETECTION MODULE
CONTENT DETECTION MODULE
108C

Fig. 1

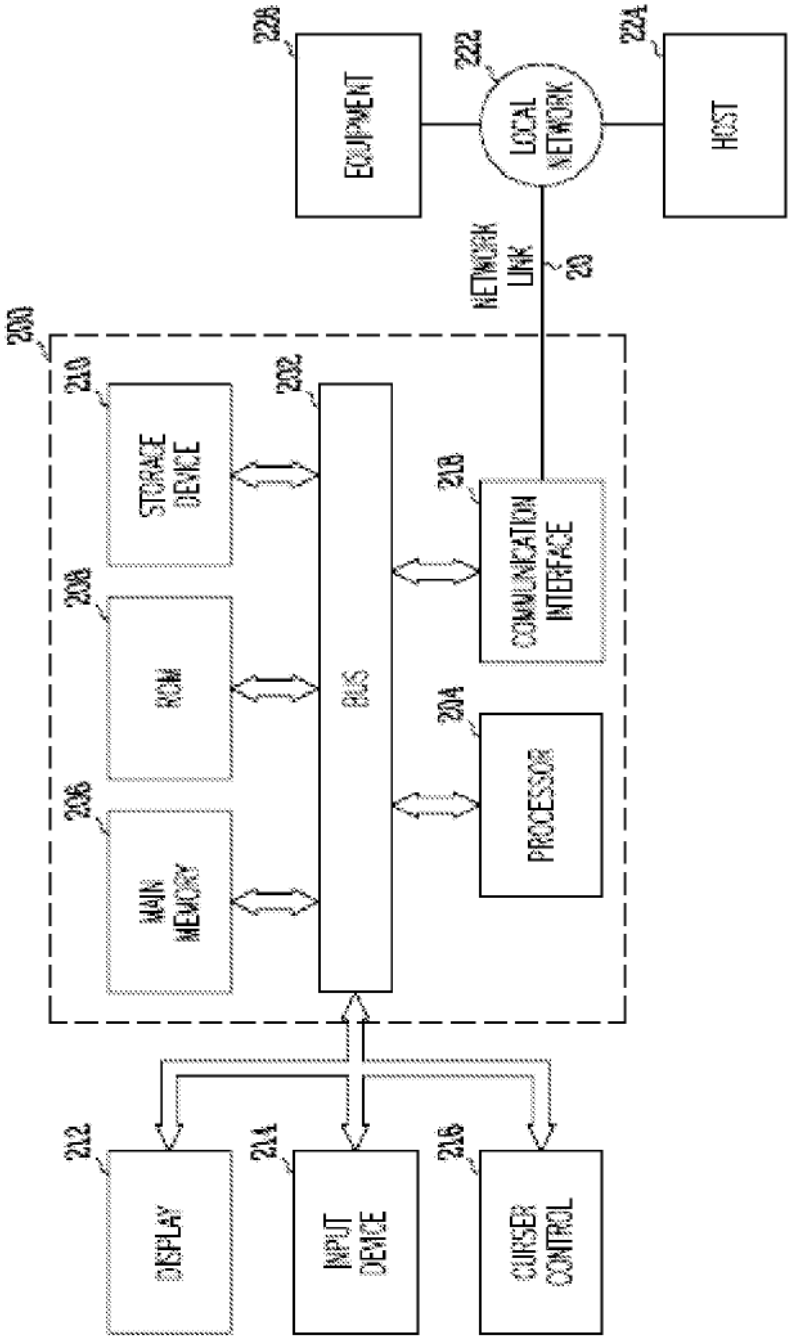

226
EQUIPMENT
222
LOCAL NETWORK
224
HOST
NETWORK LINK
228
200
210
STORAGE DEVICE
202
218
COMMUNICATION INTERFACE
208
ROM
BUS
206
MAIN MEMORY
204
PROCESSOR
212
DISPLAY
214
INPUT DEVICE
216
CURSER CONTROL

Fig. 2

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
First Named Inventor/Applicant Name:	Yu Fang
Filer:	Gregory M. Stark/John Gustav-Wrathall
Attorney Docket Number:	2831.006US6

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

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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**

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Application Number:	14072184
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Confirmation Number:	7558
Title of Invention:	SYSTEMS AND METHODS FOR UPDATING CONTENT DETECTION DEVICES AND SYSTEMS
First Named Inventor/Applicant Name:	Yu Fang
Customer Number:	21186
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Document Description	Start	End
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Application Data Sheet	2	6
Oath or Declaration filed	7	8
Specification	9	27
Claims	28	32
Abstract	33	33
Drawings-only black and white line drawings	34	35

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