

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
 Stylesheet Version v1.2

EPAS ID: PAT5499504

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	SECURITY INTEREST

CONVEYING PARTY DATA

Name	Execution Date
RIBBON COMMUNICATIONS SECURITIES CORP.	04/29/2019

RECEIVING PARTY DATA

Name:	SILICON VALLEY BANK, AS ADMINISTRATIVE AGENT
Street Address:	3003 TASMAN DRIVE
Internal Address:	HF 150
City:	SANTA CLARA
State/Country:	CALIFORNIA
Postal Code:	95054

PROPERTY NUMBERS Total: 28

Property Type	Number
Patent Number:	8111630
Patent Number:	8576744
Patent Number:	8208430
Patent Number:	8565076
Patent Number:	8451800
Patent Number:	8085810
Patent Number:	8717890
Patent Number:	9001840
Patent Number:	9043467
Patent Number:	8908507
Patent Number:	9001682
Patent Number:	9204329
Patent Number:	9204474
Patent Number:	8755405
Patent Number:	8799480
Patent Number:	8108517
Patent Number:	8935381
Patent Number:	8195661
Patent Number:	8732170

PATENT

Property Type	Number
Patent Number:	8755297
Patent Number:	8958313
Patent Number:	8775391
Patent Number:	8838784
Patent Number:	8462659
Patent Number:	8605597
Patent Number:	9003022
Patent Number:	9426049
Application Number:	62763969

CORRESPONDENCE DATA

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Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

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Address Line 4: WASHINGTON, D.C. 20005

ATTORNEY DOCKET NUMBER:	1075942 PAT IPSA RIBBON
NAME OF SUBMITTER:	JUDI EHRLICH
SIGNATURE:	/Judi Ehrlich/
DATE SIGNED:	04/30/2019

Total Attachments: 9

- source=1629298 - Patent Security Agreement (Ribbon Communications Securities Corp.)#page2.tif
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PATENT SECURITY AGREEMENT

This **PATENT SECURITY AGREEMENT** (this “*Agreement*”), dated as of April 29, 2019, is entered into by and among the signatory hereto (the “*Grantor*”) and **SILICON VALLEY BANK**, as Administrative Agent (as defined in the below described Credit Agreement) (the “*Assignee*”), pursuant to (i) that certain Guarantee and Collateral Agreement, dated as of December 21, 2017, as supplemented by that certain Assumption Agreement, dated as of September 21, 2018, and as further supplemented by that certain Reaffirmation and Assumption Agreement, dated as of the date hereof (as further amended, amended and restated, supplemented or otherwise modified from time to time, the “*Guarantee and Collateral Agreement*”), among the Assignee, the Grantor and the other signatories thereto from time to time, and (ii) that certain Amended and Restated Credit Agreement, dated as of the date hereof (as further amended, amended and restated, supplemented or otherwise modified from time to time, the “*Credit Agreement*”), by and among the Borrower (as defined therein), Holdings (as defined therein), the Assignee and the lenders party thereto.

Capitalized terms not otherwise defined herein have the respective meanings ascribed to them in the Guarantee and Collateral Agreement.

WHEREAS, pursuant to the Guarantee and Collateral Agreement, the Grantor has granted in favor of the Assignee a security interest in certain Collateral, including the federally registered Patents set forth on Schedule A hereto as of the date hereof.

NOW, THEREFORE, in consideration of the foregoing and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Grantor and the Assignee hereby agree as follows:

1. Grant of Security Interest

(a) Subject to the terms and conditions of the Guarantee and Collateral Agreement, to evidence further the security interest granted by the Grantor to the Assignee pursuant to the Guarantee and Collateral Agreement, the Grantor hereby grants to the Assignee a security interest in all of the Grantor’s right, title and interest in, to and under the Patents, whether now owned or existing or at any time hereafter acquired or arising and wherever located, as collateral security for the prompt and complete payment and performance when due (whether at the stated maturity, by acceleration or otherwise) of the Grantor’s Secured Obligations. For the purposes of this Agreement, “*Patents*” means (i) all letters patent of the United States, any other country or any political subdivision thereof, all reissues and extensions thereof and all goodwill associated therewith, including, without limitation, any of the foregoing referred to on Schedule A, (b) all applications for letters patent of the United States or any other country and all divisions, continuations and continuations-in-part thereof, including, without limitation, any of the foregoing referred to on Schedule A, and (c) all rights to obtain any reissues or extensions of the foregoing.

(b) Schedule A hereto contains a true and accurate list of all of the Grantor’s United States registrations and applications for registration for the Patents with the United States Patent and Trademark Office existing as of the date hereof.

(c) The security interest granted hereby is granted concurrently and in conjunction with the security interest granted to the Assignee under the Guarantee and Collateral Agreement. In the event that any of the provisions of this Agreement are in conflict with the Guarantee and Collateral Agreement, the provisions of the Guarantee and Collateral Agreement shall govern. The Grantor and the Assignee agree

that the security interest set forth herein and in the Guarantee and Collateral Agreement is not to be construed as an assignment of any Patent.

2. Modifications

This Agreement or any provision hereof may not be changed, waived or terminated except in writing signed by the parties hereto. The Grantor additionally agrees to execute any additional agreement or amendment hereto as may be reasonably required by the Assignee from time to time, to subject any such owned or subsequently acquired right, title or interest in any Patent to the security interests and perfection created or contemplated hereby or by the Guarantee and Collateral Agreement.

3. Applicable Law

THIS AGREEMENT AND THE RIGHTS AND OBLIGATIONS OF THE PARTIES HEREUNDER SHALL BE GOVERNED BY, AND SHALL BE CONSTRUED AND INTERPRETED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF NEW YORK.

4. Counterparts

This Agreement may be executed by one or more of the parties to this Agreement on any number of separate counterparts, and all of said counterparts taken together shall be deemed to constitute one and the same instrument. Delivery of an executed signature page of this Agreement by electronic transmission shall be equally effective as delivery of an original executed counterpart hereof.

[signature pages follow]

IN WITNESS WHEREOF, each of the undersigned has caused this Agreement to be duly executed and delivered as of the date first above written.

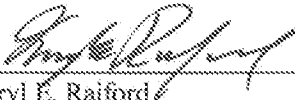
ASSIGNEE:

SILICON VALLEY BANK,
as Administrative Agent

By: Will Deevy
Name: Will Deevy
Title: Director

GRANTOR:

RIBBON COMMUNICATIONS SECURITIES CORP.

By: 
Name: Daryl E. Raiford
Title: President and Chief Executive Officer

Signature Page to Patent Security Agreement

PATENT
REEL: 049034 FRAME: 0232

Schedule A to PATENT SECURITY AGREEMENT

Patents and Patent Applications

	<u>Owner</u>	<u>Application Number / Patent Number</u>	<u>Title</u>	<u>Jurisdiction</u>	<u>Filing Date / Issue Date</u>
1.	Ribbon Communications Securities Corp.	8,111,630	CONTENT CACHING IN THE RADIO ACCESS NETWORK (RAN)	US, China, Japan	2/7/2012
2.	Ribbon Communications Securities Corp.	8,576,744	CONTENT CACHING IN THE RADIO ACCESS NETWORK (RAN)	US	11/5/2013
3.	Ribbon Communications Securities Corp.	8,208,430	TRANSPARENT INTERACTION WITH MULTI-LAYER PROTOCOLS VIA SELECTIVE BRIDGING AND PROXYING	US	6/26/2012
4.	Ribbon Communications Securities Corp.	8,565,076	DESTINATION LEARNING AND MOBILITY DETECTION IN TRANSIT NETWORK DEVICE IN LTE & UMTS RADIO ACCESS NETWORKS	US	10/22/2013
5.	Ribbon Communications Securities Corp.	8,451,800	SESSION HANDOVER IN MOBILE-NETWORK CONTENT-DELIVERY DEVICES	US	5/28/2013
6.	Ribbon Communications Securities Corp.	8,085,810	CROSS-LAYER PIPELINING OPTIMIZATIONS FOR REDUCED ROUNDTRIPS AND IMPROVING QUALITY OF EXPERIENCE	US, China, Japan, Europe	12/27/2011
7.	Ribbon Communications Securities Corp.	8,717,890	APPLICATION, USAGE & RADIO LINK AWARE TRANSPORT NETWORK	US	5/6/2014

	<u>Owner</u>	<u>Application Number / Patent Number</u>	<u>Title</u>	<u>Jurisdiction</u>	<u>Filing Date / Issue Date</u>
			SCHEDULER		
8.	Ribbon Communications Securities Corp.	9,001,840	CONTENT CACHING IN THE RADIO ACCESS NETWORK (RAN)	US	4/7/2015
9.	Ribbon Communications Securities Corp.	9,043,467	Adaptive Chunked & Content Aware Pacing of Multi-Media Delivery over HTTP Transport & Network Controlled Bit Rate Selection (P09)	US	5/26/2015
10.	Ribbon Communications Securities Corp.	8,908,507	RAN Analytics, Control, And Tuning Via Multi-Protocol, Multi-Domain, And Multi-RAT Analysis (P17, P18) - SUL, KPIs, Export	US	12/9/2014
11.	Ribbon Communications Securities Corp.	9,001,682	Content & RAN Aware Network Selection in Multiple Wireless Access and Small-Cell Overlay Wireless Access Networks (P19)	US	4/7/2015
12.	Ribbon Communications Securities Corp.	9,204,329	Distributed RAN Information Collection, Consolidation & RAN Analytics (PP20)	US	12/1/2015
13.	Ribbon Communications Securities Corp.	9,204,474	DESTINATION LEARNING AND MOBILITY DETECTION IN TRANSIT NETWORK DEVICE IN LTE AND UMTS RADIO ACCESS NETWORKS	US	12/1/2015
14.	Ribbon Communications Securities Corp.	8,755,405	Burst Packet Scheduler for Improved RAN Efficiency in UMTS/HSPA Networks (P07)	US	6/17/2014
15.	Ribbon Communications Securities Corp.	8,799,480	Content Pre-Fetching and CDN Assist Methods in a	US	8/5/2014

	<u>Owner</u>	<u>Application Number / Patent Number</u>	<u>Title</u>	<u>Jurisdiction</u>	<u>Filing Date / Issue Date</u>
			Wireless Mobile Network (PP11)		
16.	Ribbon Communications Securities Corp.	8,108,517	System and Method for Collecting, Reporting and Analyzing data on application level activity and other user information in a mobile data network	US	1/31/2012
17.	Ribbon Communications Securities Corp.	8,935,381	Method and Apparatus for Real-Time collection of information about application level activity and other user information in a mobile data network	US	1/13/2015
18.	Ribbon Communications Securities Corp.	8,195,661	Method and Apparatus for Storing data on application-level activity and other user information to enable real-time multi-dimensional reporting about user of a mobile data network	US	6/5/2012
19.	Ribbon Communications Securities Corp.	8,732,170	Method and Apparatus for Real-Time multi-dimensional Reporting and analyzing data on application level activity and other user information in a mobile data network	US	5/20/2014
20.	Ribbon Communications Securities Corp.	8,755,297	System and Method for Collecting, Reporting and Analyzing data on application level activity and other user information in a mobile data network (Continuation Application)	US	6/17/2014
21.	Ribbon Communications Securities Corp.	8,958,313	Method and Apparatus for Storing data on	US	2/17/2015

	<u>Owner</u>	<u>Application Number / Patent Number</u>	<u>Title</u>	<u>Jurisdiction</u>	<u>Filing Date / Issue Date</u>
			application-level activity and other user information to enable real-time multi-dimensional reporting about user of a mobile data network (continuation)		
22.	Ribbon Communications Securities Corp.	8,775,391	SYSTEM AND METHOD FOR SHARING ANONYMOUS USER PROFILES WITH A THIRD PARTY	US	7/8/2014
23.	Ribbon Communications Securities Corp.	8,838,784	Method and Apparatus for Privacy Safe Actionable Analytics on Mobile data usage	US	9/16/2014
24.	Ribbon Communications Securities Corp.	8,462,659	Method and Apparatus pertaining to the assessment of mobile communications network infrastructure latency through high-speed channels	US	6/11/2013
25.	Ribbon Communications Securities Corp.	8,605,597	Method and Apparatus pertaining to the assessment of mobile communications network infrastructure latency through high-speed channels (continuation)	US	12/10/2013
26.	Ribbon Communications Securities Corp.	9,003,022	Determining an average effective data through-put as corresponds to a network served end user	US	4/7/2015
27.	Ribbon Communications Securities Corp.	9,426,049	Domain Name Resolution	US	8/23/2016
28.	Ribbon Communications Securities Corp.	62/763,969	Method of Automatically Classifying Network	US	7/24/2018

	<u>Owner</u>	<u>Application Number / Patent Number</u>	<u>Title</u>	<u>Jurisdiction</u>	<u>Filing Date / Issue Date</u>
			Performance Degradation & Corrective Action given network data events and Key Performance Indicators (Provisional Application)		