

<b>PATENT ASSIGNMENT COVER SHEET</b>
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Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT6184213

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	GRANT OF SECURITY INTEREST - PATENTS

**CONVEYING PARTY DATA**

Name	Execution Date
GRASS VALLEY USA, LLC	07/02/2020
GRASS VALLEY CANADA	07/02/2020
GRASS VALLEY LIMITED	07/02/2020

**RECEIVING PARTY DATA**

<b>Name:</b>	MGG INVESTMENT GROUP LP, AS COLLATERAL AGENT
<b>Street Address:</b>	ONE PENN PLAZA
<b>Internal Address:</b>	53RD FLOOR
<b>City:</b>	NEW YORK
<b>State/Country:</b>	NEW YORK
<b>Postal Code:</b>	10119

**PROPERTY NUMBERS Total: 153**

Property Type	Number
Application Number:	15991116
Application Number:	15955237
Application Number:	16825541
Application Number:	16569323
Application Number:	16837648
Application Number:	16837411
Application Number:	16878356
Application Number:	09603364
Application Number:	12450538
Application Number:	14539603
Application Number:	16146044
Application Number:	12450797
Application Number:	15835286
Application Number:	16425430
Application Number:	16859719
Application Number:	10551806
Application Number:	14742565

PATENT

<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	16018619
<b>Application Number:</b>	29227812
<b>Application Number:</b>	29298954
<b>Application Number:</b>	29298955
<b>Application Number:</b>	29227809
<b>Application Number:</b>	29227810
<b>Application Number:</b>	29227837
<b>Application Number:</b>	16159100
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<b>Application Number:</b>	16159063
<b>Application Number:</b>	14110227
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<b>Application Number:</b>	15970358
<b>Application Number:</b>	16834075
<b>Application Number:</b>	15459860
<b>Application Number:</b>	16283491
<b>Application Number:</b>	15321570
<b>Application Number:</b>	15685369
<b>Application Number:</b>	16549994
<b>Application Number:</b>	15489095
<b>Application Number:</b>	15981322
<b>Application Number:</b>	16310762
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<b>Application Number:</b>	16840848
<b>Application Number:</b>	15899236
<b>Application Number:</b>	15753895
<b>Application Number:</b>	14539840
<b>Application Number:</b>	14521598
<b>Application Number:</b>	13055509
<b>Application Number:</b>	14375708
<b>Application Number:</b>	14710314
<b>Application Number:</b>	12992192
<b>Application Number:</b>	14036054
<b>Application Number:</b>	14736440
<b>Application Number:</b>	14078640

<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	15636840
<b>Application Number:</b>	13742191
<b>Application Number:</b>	14928298
<b>Application Number:</b>	13832764
<b>Application Number:</b>	13948887
<b>Application Number:</b>	14236842
<b>Application Number:</b>	14103068
<b>Application Number:</b>	15091704
<b>Application Number:</b>	14245326
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<b>Application Number:</b>	13292559
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<b>Property Type</b>	<b>Number</b>
Application Number:	12858251
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Application Number:	13469189
Application Number:	13030592
Application Number:	13051700
Application Number:	13083446
Application Number:	09826392
Application Number:	10221482
Application Number:	10257149
Application Number:	13473116
Application Number:	13324260
Application Number:	13411096
Application Number:	13415962
Application Number:	13652225
Application Number:	10527911
Application Number:	10516068
Application Number:	10817436
Application Number:	11091951
Application Number:	11091345
Application Number:	12372197
Application Number:	12162911
Application Number:	09537986
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Application Number:	62878253
Application Number:	62864990
Application Number:	62890358
Application Number:	12986113
Application Number:	13746078
Application Number:	13801309
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Application Number:	09766014
Application Number:	09839571
Application Number:	12104596

Property Type	Number
Application Number:	14850895
Application Number:	15887211
Application Number:	16403394
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Application Number:	10025860
Application Number:	12062129
Application Number:	12627728
Application Number:	14245519
Application Number:	14245538
Application Number:	14509865
Application Number:	14830569
Application Number:	15687672
Application Number:	16442035
Application Number:	62929600
Application Number:	62943058
Application Number:	63013375
Application Number:	63027126
Application Number:	63030154
Application Number:	63010164
Application Number:	63013967
Application Number:	10023452

**CORRESPONDENCE DATA**

**Fax Number:** (212)593-5955

*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.*

**Phone:** 212-756-2132

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**Correspondent Name:** S. KAREFF C/O SCHULTE ROTH & ZABEL LLP

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**Address Line 2:** 25TH FLOOR

**Address Line 4:** NEW YORK, NEW YORK 10022

<b>ATTORNEY DOCKET NUMBER:</b>	050319-0107
<b>NAME OF SUBMITTER:</b>	SCOTT KAREFF (050319-0107)
<b>SIGNATURE:</b>	/kc for sk/
<b>DATE SIGNED:</b>	07/02/2020

**Total Attachments: 13**  
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GRANT OF SECURITY INTEREST - PATENTS

WHEREAS, GRASS VALLEY USA, LLC, a Delaware limited liability company, Grass Valley Canada, a general partnership organized under the laws of the Province of Ontario, and Grass Valley Limited, a private limited company organized under the laws of England and Wales (each a "Grantor" and collectively, the "Grantors") hold all right, title and interest in the letter patents, design patents and utility patents listed on the attached Schedule A, which patents are issued or applied for in the United States Patent and Trademark Office or the Canadian Intellectual Property Office (the "Patents");

WHEREAS, the Grantors have entered into a Pledge and Security Agreement, dated as of July 2<sup>nd</sup>, 2020 (as amended, restated, supplemented, modified or otherwise changed from time to time, the "Security Agreement"), in favor of MGG Investment Group LP, as the Collateral Agent for itself and certain lenders (in such capacity, together with its successors and assigns, if any, the "Grantee"); and


WHEREAS, pursuant to the Security Agreement, the Grantors have granted to the Grantee for the benefit of the Secured Parties (as defined in the Security Agreement) a continuing security interest in all right, title and interest of the Grantors in, to and under the Patents and the applications and registrations thereof, and all proceeds thereof, including, without limitation, any and all causes of action which may exist by reason of infringement thereof and any and all damages arising from past, present and future violations thereof (the "Collateral"), to secure the payment, performance and observance of the Secured Obligations (as defined in the Security Agreement);

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Grantors do hereby pledge, convey, sell, assign, transfer and set over unto the Grantee and grant to the Grantee for the benefit of the Grantee and the Secured Parties a continuing security interest in the Collateral to secure the prompt payment, performance and observance of the Secured Obligations.


The Grantors do hereby further acknowledge and affirm that the rights and remedies of the Grantee with respect to the Collateral are more fully set forth in the Security Agreement, the terms and provisions of which are hereby incorporated herein by reference as if fully set forth herein.

IN WITNESS WHEREOF, each Grantor has caused this Grant of Security Interest to be duly executed by its officer thereunto duly authorized as of July 2, 2020.

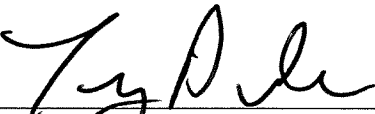
GRASS VALLEY USA, LLC

By:   
Name: Timothy Greenfield  
Title: President

GRASS VALLEY CANADA, by its general partner GRASS VALLEY CANADA PARTNER ULC

By:   
Name: Timothy Greenfield  
Title: President & Director

GRASS VALLEY LIMITED

By:   
Name: Timothy Greenfield  
Title: Director



SCHEDULE A TO GRANT OF SECURITY INTEREST

Patent and Patent Applications

<b>Title</b>	<b>Record Ownership</b>	<b>Jurisdiction / Type</b>	<b>App. No.</b>	<b>Filing Date</b>	<b>Patent No.</b>	<b>Issue Date</b>
SHARED PHOTODIODE RESET IN A 5 TRANSISTOR - FOUR SHARED PIXEL	Grass Valley Canada	PCT	PCT/CA2018/050636	05/30/2018		
SHARED PHOTODIODE RESET IN A 5 TRANSISTOR - FOUR SHARED PIXEL	Grass Valley Canada	United States	15/991116	05/29/2018	10,531,034	01/07/2020
SHARED PHOTODIODE RESET IN A 5 TRANSISTOR - FOUR SHARED PIXEL	Grass Valley Canada	CA PCT	3065343	05/30/2018		
SYSTEM AND METHOD FOR MAPPED SPLICING OF A THREE-DIMENSIONAL LOOK-UP TABLE FOR IMAGE FORMAT CONVERSION	Grass Valley Canada	United States	15/955237	04/17/2018	10,600,148	03/24/2020
SYSTEM AND METHOD FOR MAPPED SPLICING OF A THREE-DIMENSIONAL LOOK-UP TABLE FOR IMAGE FORMAT CONVERSION	Grass Valley Canada	United States	16/825/541	03/20/2020		
SYSTEM AND METHOD FOR MAPPED SPLICING OF A THREE-DIMENSIONAL LOOK-UP TABLE FOR IMAGE FORMAT CONVERSION	Grass Valley Canada	Canada	3,002,279	04/19/2018		
SYSTEM AND METHOD FOR DYNAMICALLY ACCESSING MEDIA ASSETS	Grass Valley Limited	United States	16/569,323	09/12/2019		
SYSTEM AND METHOD FOR DYNAMICALLY ACCESSING MEDIA ASSETS	Grass Valley Limited	PCT	PCT/GB2019/052572	09/13/2019		
SYSTEM AND METHOD FOR AI DRIVEN ORCHESTRATION AUTOMATION OF LIVE PRODUCTION & CHANNEL PLAYOUT	Grass Valley Canada	United States	16/837,648	04/01/2020		
SYSTEM AND METHOD FOR AI DRIVEN ORCHESTRATION AUTOMATION OF LIVE PRODUCTION & CHANNEL PLAYOUT	Grass Valley Canada	PCT	PCT/CA2020/050448	04/03/2020		
SYSTEM AND METHOD OF IDENTIFYING EQUIVALENTS FOR TASK COMPLETION	Grass Valley Canada	United States	16/837,411	04/01/2020		
SYSTEM AND METHOD FOR AI DRIVEN ORCHESTRATION AUTOMATION OF LIVE	Grass Valley Canada	PCT	PCT/CA2020/050453	04/03/2020		

Title	Record Ownership	Jurisdiction / Type	App. No.	Filing Date	Patent No.	Issue Date
PRODUCTION & CHANNEL PLAYOUT						
SYSTEM AND METHOD OF SYNCHRONIZING VIDEO AND AUDIO CLIPS WITH AUDIO DATA	Grass Valley Canada	United States	16/878356	04/19/2020		
SYSTEM AND METHOD OF SYNCHRONIZING VIDEO AND AUDIO CLIPS WITH AUDIO DATA	Grass Valley Canada	PCT	Not yet available	04/22/2020		
APPARATUS AND METHOD FOR ADAPTIVELY REDUCING NOISE IN A NOISY INPUT IMAGE SIGNAL	Grass Valley Canada	United States	09/603,364	06/26/2000	6,633,683	10/14/2003
METHOD AND APPARATUS FOR ENHANCING DIGITAL VIDEO EFFECTS (DVE)	Grass Valley Canada	US PCT	12/450538	09/29/2009	8,914,725	12/16/2014
METHOD AND APPARATUS FOR ENHANCING DIGITAL VIDEO EFFECTS (DVE)	Grass Valley Canada	United States	14/539603	11/12/2014	10088988	10/02/2018
METHOD AND APPARATUS FOR ENHANCING DIGITAL VIDEO EFFECTS (DVE)	Grass Valley Canada	United States	16/146044	09/28/2018		
EDITING APPARATUS AND EDITING METHOD	Grass Valley Canada	US PCT	12/450797	10/13/2009	9,875,772	01/23/2018
EDITING APPARATUS AND EDITING METHOD	Grass Valley Canada	United States	15/835286	12/07/2017	10311914	06/04/2019
EDITING APPARATUS AND EDITING METHOD	Grass Valley Canada	United States	16/425430	05/29/2019	10,636,450	04/28/2020
EDITING APPARATUS AND EDITING METHOD	Grass Valley Canada	United States	16/859719	04/27/2020		
BROADCAST CONTROL	Grass Valley Canada	United States	10/551806	02/08/2007	9,098,193	08/04/2015
BROADCAST CONTROL	Grass Valley Canada	United States	14/742565	06/17/2015	10013154	07/03/2018
BROADCAST CONTROL	Grass Valley Canada	United States	16/018619	06/26/2018		
KEYBOARD FOR CONTROL DESK	Grass Valley Limited	United States	29/227812	04/15/2005	D562,322	02/19/2008
KEYBOARD FOR CONTROL DESK	Grass Valley Limited	United States	29/298954	12/17/2007	D573,989	07/29/2008
KEYBOARD FOR CONTROL DESK	Grass Valley Limited	United States	29/298955	12/17/2007	D573,990	07/29/2008
CONTROL PANEL	Grass Valley Limited	United States	29/227809	04/15/2005	D565,046	03/25/2008
DISPLAY WITH INPUT MECHANISMS	Grass Valley Limited	United States	29/227810	04/15/2005	D562,318	02/19/2008
ELECTRONICS HOUSING	Grass Valley Limited	United States	29/227837	04/15/2005	D564,984	03/25/2008

<b>Title</b>	<b>Record Ownership</b>	<b>Jurisdiction / Type</b>	<b>App. No.</b>	<b>Filing Date</b>	<b>Patent No.</b>	<b>Issue Date</b>
METHODS OF STREAMING MEDIA FILE DATA AND MEDIA FILE SERVERS	Grass Valley Limited	United States	16/159100	10/12/2018		
METHODS OF STREAMING MEDIA FILE DATA AND MEDIA FILE SERVERS	Grass Valley Limited	CA PCT	3,021,132	04/13/2017		
METHODS OF STORING MEDIA FILES AND RETURNING FILE DATA FOR MEDIA FILES AND MEDIA FILE SYSTEMS	Grass Valley Limited	United States	16/159150	10/12/2018		
METHODS OF STORING MEDIA FILES AND RETURNING FILE DATA FOR MEDIA FILES AND MEDIA FILE SYSTEMS	Grass Valley Limited	CA PCT	3,021,133	04/13/2017		
MEDIA FILE SYSTEMS AND METHODS OF STORING MEDIA FILES IN A MEDIA FILE SYSTEM	Grass Valley Limited	United States	16/159063	10/12/2018		
MEDIA FILE SYSTEMS AND METHODS OF STORING MEDIA FILES IN A MEDIA FILE SYSTEM	Grass Valley Limited	CA PCT	3,021,130	04/13/2017		
METHODS AND SYSTEMS FOR PROVIDING FILE DATA FROM A FILE SYSTEM	Grass Valley Limited	US PCT	14/110227	12/17/2013		
METHODS AND SYSTEMS FOR PROVIDING FILE DATA FOR A MEDIA FILE	Grass Valley Limited	US PCT	14/375713	07/30/2014		
VIDEO PROCESSING METHOD AND APPARATUS FOR USE WITH A SEQUENCE OF STEREOSCOPIC IMAGES	Grass Valley Limited	United States	14/989568	01/06/2016	10154240	12/11/2018
VIDEO PROCESSING METHOD AND APPARATUS FOR USE WITH A SEQUENCE OF STEREOSCOPIC IMAGES	Grass Valley Limited	United States	16/215421	12/10/2018		
REFINING MOTION VECTORS IN VIDEO MOTION ESTIMATION	Grass Valley Limited	United States	15/903385	02/23/2018		
VIDEO PROCESSING USING A ONE-DIMENSIONAL CONTROL FUNCTION TO CONTROL PROCESSING TIME AND ERROR	Grass Valley Limited	United States	15/970358	05/03/2018	10,609,328	03/31/2020
VIDEO PROCESSING USING A ONE-DIMENSIONAL CONTROL FUNCTION TO CONTROL PROCESSING TIME AND ERROR	Grass Valley Limited	United States	16/834075	03/30/2020		
METHOD AND APPARATUS OF MANAGING VISUAL CONTENT	Grass Valley Limited	United States	15/459860	03/15/2017	10219033	02/26/2019
METHOD AND APPARATUS OF MANAGING VISUAL CONTENT	Grass Valley Limited	United States	16/283491	02/22/2019		

Title	Record Ownership	Jurisdiction / Type	App. No.	Filing Date	Patent No.	Issue Date
HASH-BASED MEDIA SEARCH	Grass Valley Limited	US PCT	15/321570	12/22/2016		
COMPARING VIDEO SEQUENCES USING FINGERPRINTS	Grass Valley Limited	United States	15/685369	08/24/2017	10395121	08/27/2019
COMPARING VIDEO SEQUENCES USING FINGERPRINTS	Grass Valley Limited	United States	16/549994	08/23/2019		
MONITORING AUDIO-VISUAL CONTENT WITH CAPTIONS	Grass Valley Limited	United States	15/489095	04/17/2017	10,091,543	10/02/2018
GENERATION OF VIDEO HASH	Grass Valley Limited	United States	15/981322	05/16/2018		
IMAGE PROCESSING	Grass Valley Limited	CA PCT	3027677	06/16/2017		
IMAGE PROCESSING	Grass Valley Limited	US PCT	16/310762	12/17/2018		
DECODING A BAYER-MASK OR LIKE CODED IMAGE	Grass Valley Limited	United States	15/899036	02/19/2018	10,614,550	04/07/2020
DECODING A BAYER-MASK OR LIKE CODED IMAGE	Grass Valley Limited	United States	16/840,848	04/06/2020		
DECODING A BAYER-MASK OR LIKE CODED IMAGE	Grass Valley Limited	United States	15/899236	02/19/2018		
DETERMINING A QUALITY MEASURE FOR A PROCESSED VIDEO SIGNAL	Grass Valley Limited	US PCT	15/753895	02/20/2018		
METHOD AND APPARATUS FOR PROCESSING A SWITCHED AUDIO SIGNAL FROM A CROSSPOINT ROUTER	Grass Valley Limited	United States	14/539840	11/12/2014	9,510,092	11/29/2016
ADJUSTING OCCUPANCIES OF A SET OF BUFFERS	Grass Valley Limited	United States	14/521598	10/23/2014	9,824,717	11/21/2017
PROCESSING OF IMAGES TO REPRESENT A TRANSITION IN VIEWPOINT	Grass Valley Limited	US PCT	13/055509	06/09/2011	8515205	08/20/2013
METHODS AND SYSTEMS FOR PROVIDING FILE DATA FOR A MEDIA FILE	Grass Valley Limited	US PCT	14/375708	07/30/2014	9,836,465	12/05/2017
LOGO DETECTION BY EDGE MATCHING	Grass Valley Limited	United States	14/710314	05/12/2015	9,536,171	01/03/2017
DIGITAL IMAGE PROCESSING FOR CONVERTING IMAGES FROM ONE SAMPLING STRUCTURE TO ANOTHER	Grass Valley Limited	US PCT	12/992192	02/07/2011	8477242	07/02/2013
IMAGE PROCESS WITH SPATIAL PERIODICITY MEASURE	Grass Valley Limited	United States	14/036054	09/25/2013	9082044	07/14/2015
IMAGE PROCESS WITH SPATIAL PERIODICITY MEASURE	Grass Valley Limited	United States	14/736440	06/11/2015	9311714	04/12/2016
MANAGEMENT OF BROADCAST AUDIO LOUDNESS	Grass Valley Limited	United States	14/078640	11/13/2013	9344052	05/17/2016

<b>Title</b>	<b>Record Ownership</b>	<b>Jurisdiction / Type</b>	<b>App. No.</b>	<b>Filing Date</b>	<b>Patent No.</b>	<b>Issue Date</b>
MANAGEMENT OF BROADCAST AUDIO LOUDNESS	Grass Valley Limited	United States	15/636840	06/29/2017	10027303	07/17/2018
DETERMINING ASPECT RATIO FOR DISPLAY OF VIDEO	Grass Valley Limited	United States	13/742191	01/15/2013	8908093	12/09/2014
IDENTIFYING POINTS OF INTEREST IN AN IMAGE	Grass Valley Limited	United States	14/928298	10/30/2015	9977992	05/22/2018
METHOD AND APPARATUS FOR ANALYSING AN ARRAY OF PIXEL-TO-PIXEL DISSIMILARITY VALUES BY COMBINING OUTPUTS OF PARTIAL.....	Grass Valley Limited	United States	13/832764	03/15/2013	9,532,053	12/27/2016
OFFSET INTERPOLATION OF A SEQUENCE OF IMAGES TO OBTAIN A NEW IMAGE	Grass Valley Limited	United States	13/948887	07/23/2013	8,860,880	10/14/2014
METHODS AND SYSTEMS FOR PROVIDING FILE DATA FOR MEDIA FILES	Grass Valley Limited	US PCT	14/236842	02/03/2014	10019448	07/10/2018
METHOD AND APPARATUS FOR MODIFYING A VIDEO STREAM TO ENCODE METADATA	Grass Valley Limited	United States	14/103068	12/11/2013	9330428	05/03/2016
METHOD AND APPARATUS FOR MODIFYING A VIDEO STREAM TO ENCODE METADATA	Grass Valley Limited	United States	15/091704	04/06/2016	9852489	12/26/2017
VIDEO SEQUENCE PROCESSING OF PIXEL-TO-PIXEL DISSIMILARITY VALUES	Grass Valley Limited	United States	14/245326	04/04/2014	9877022	01/23/2018
IMAGE PROCESSING WITH SEGMENTATION USING DIRECTIONALLY-ACCUMULATED DIFFERENCE-IMAGE PIXEL VALUES	Grass Valley Limited	United States	14/289179	05/28/2014	9648339	05/09/2017
DE-INTERLACING VIDEO	Grass Valley Limited	United States	12/100626	04/10/2008	8,421,918	04/16/2013
AUDIO VISUAL SIGNATURE, METHOD OF DERIVING A SIGNATURE, AND METHOD OF COMPARING AUDIO-VISUAL DATA	Grass Valley Limited	US PCT	12/918572	09/09/2010	8,682,651	03/25/2014
AUDIO VISUAL SIGNATURE, METHOD OF DERIVING A SIGNATURE, AND METHOD OF COMPARING AUDIO-VISUAL DATA BACKGROUND	Grass Valley Limited	United States	14/190325	02/26/2014	9,536,545	01/03/2017
RE-TIMING SAMPLED DATA	Grass Valley Limited	United States	14/290241	05/29/2014	9397774	07/19/2016
ENHANCING PERCEIVED SHARPNESS OF IMAGES	Grass Valley Limited	United States	14/328459	07/10/2014	9401010	07/26/2016
SYSTEM AND METHOD FOR VIDEO PROCESSING	Grass Valley Limited	United States	11/097149	04/04/2005	7,711,048	05/04/2010

Title	Record Ownership	Jurisdiction / Type	App. No.	Filing Date	Patent No.	Issue Date
DETECTING A BORDER REGION IN AN IMAGE	Grass Valley Limited	United States	12/417411	04/02/2009	8331689	12/11/2012
REGIONAL FILM CADENCE DETECTION	Grass Valley Limited	United States	12/717486	03/04/2010	8,964,837	02/24/2015
IMAGE PROCESSING	Grass Valley Limited	US PCT	11/795248	11/21/2008	8,421,916	04/16/2013
METHOD AND APPARATUS FOR MODIFYING A MOVING IMAGE SEQUENCE	Grass Valley Limited	US PCT	12/279283	10/29/2008	8,442,318	05/14/2013
SYSTEM AND METHOD FOR IMPROVED COMPOSITE DECODING	Grass Valley Limited	US PCT	10/539724	03/02/2006	7872689	01/18/2011
SYSTEM AND METHOD FOR IMPROVED COMPOSITE DECODING	Grass Valley Limited	United States	12/957062	11/30/2010	8279350	10/02/2012
SPORT ACTION CODING	Grass Valley Limited	United States	11/674240	02/13/2007	8,290,042	10/16/2012
METHOD AND APPARATUS FOR ANALYZING IMAGE DATA	Grass Valley Limited	United States	11/457211	07/13/2006	7,660,462	02/09/2010
PICTURE ATTRIBUTE ALLOCATION	Grass Valley Limited	US PCT	12/307528	08/26/2009	8462170	06/11/2013
METHOD AND APPARATUS FOR INTERPOLATING AN IMAGE	Grass Valley Limited	US PCT	12/375543	05/19/2009	8358878	01/22/2013
A/V EQUIPMENT CONTROL OVER A NETWORK	Grass Valley Limited	United States	11/404507	04/14/2006	8,407,328	03/26/2013
METHOD OF AND APPARATUS FOR IMAGE ANALYSIS	Grass Valley Limited	United States	11/470341	09/06/2006	8,238,691	08/07/2012
VIDEO SIGNAL PROCESSING	Grass Valley Limited	US PCT	10/220437	09/03/2002	7,009,656	03/07/2006
RE-SIZING IMAGE SEQUENCES (Seam Carving)	Grass Valley Limited	US PCT	12/743129	08/10/2010	8526764	09/03/2013
SYSTEM AND METHOD FOR VIDEO PROCESSING	Grass Valley Limited	United States	11/222235	09/09/2005	7,752,248	07/06/2010
VIDEO FRAMING CONTROL IN WHICH OPERATOR FRAMING OF NARROW VIEW IMAGE CONTROLS AUTOMATIC FRAMING OF WIDE VIEW IMAGE	Grass Valley Limited	United States	13/292559	11/09/2011	8,587,679	11/19/2013
DIGITAL AUDIO PROCESSING	Grass Valley Limited	United States	12/190853	08/13/2008	8,825,186	09/02/2014
MOTION IMAGE RENDERING SYSTEM	Grass Valley Limited	United States	13/867298	04/22/2013	8773586	07/08/2014
MOTION IMAGE RENDERING SYSTEMS AND METHODS	Grass Valley Limited	United States	12/633949	12/09/2009	8432487	04/30/2013
ROUTER AND METHOD OF ROUTING WITH REDUNDANCY	Grass Valley Limited	United States	12/756705	04/08/2010	8631172	01/14/2014
BIT RATE CONTROL FOR VIDEO DATA COMPRESSION	Grass Valley Limited	US PCT	09/890221	11/16/2001	6,865,224	03/08/2005

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DETECTION OF NON-UNIFORM SPATIAL SCALING OF AN IMAGE (Non-uniform stretch detection)	Grass Valley Limited	United States	12/786154	05/24/2010	8855443	10/07/2014
CORRECTING DEFECTS IN AN IMAGE	Grass Valley Limited	United States	12/858251	08/17/2010	8515204	08/20/2013
DEFINING IMAGE FEATURES AND USING FEATURES TO MONITOR IMAGE TRANSFORMATIONS	Grass Valley Limited	United States	12/899200	10/06/2010	8351705	01/08/2013
CHANGING THE TEMPORAL SAMPLE RATE OF A MOTION IMAGE SEQUENCE	Grass Valley Limited	US PCT	13/516550	07/06/2012	8810726	08/19/2014
MOTION ESTIMATION WITH VARIABLE SPATIAL RESOLUTION	Grass Valley Limited	United States	13/095978	04/28/2011	9270870	02/23/2016
METHODS AND APPARATUS FOR RESAMPLING A SPATIALLY SAMPLED ATTRIBUTE OF AN IMAGE	Grass Valley Limited	US PCT	13/809205	02/06/2013	9047683	06/02/2015
VIDEO PROCESSING METHOD AND APPARATUS FOR USE WITH A SEQUENCE OF STEREOSCOPIC IMAGES	Grass Valley Limited	United States	13/469189	05/11/2012	9264688	02/16/2016
OBJECTIVE PICTURE QUALITY MEASUREMENT	Grass Valley Limited	United States	13/030592	02/18/2011	8553988	10/08/2013
ANALYSIS OF STEREOSCOPIC IMAGES (L/Rswap detection by occlusion)	Grass Valley Limited	United States	13/051700	03/18/2011	9214052	12/15/2015
REPAIRING SCRATCH IMPAIRMENTS TO AN IMAGE	Grass Valley Limited	United States	13/083446	04/08/2011	9131126	09/08/2015
SPATIAL VIDEO PROCESSING	Grass Valley Limited	United States	09/826392	04/04/2001	6,950,560	09/27/2005
VIDEO SIGNAL PROCESSING WITH TWO STAGE MOTION COMPENSATION	Grass Valley Limited	US PCT	10/221482	01/08/2003	7,202,909	04/10/2007
VIDEO SIGNAL PROCESSING	Grass Valley Limited	US PCT	10/257149	02/24/2003	7,027,104	04/11/2006
DETECTING STEREOSCOPIC IMAGES	Grass Valley Limited	United States	13/473116	05/16/2012	8861837	10/14/2014
IMAGE ANALYSIS (SIMPLIFIED BLOCK SIZE MEASUREMENT)	Grass Valley Limited	United States	13/324260	12/13/2011	8743968	06/03/2014
ADAPTIVE SIGNAL PROCESSING	Grass Valley Limited	United States	13/411096	03/02/2012	9002918	04/07/2015
ANALYSIS OF STERESOCOPIC IMAGES (L/R swap detection by spatial disparity)	Grass Valley Limited	United States	13/415962	03/09/2012	8526716	09/03/2013
RE-SAMPLING METHOD AND APPARATUS	Grass Valley Limited	United States	13/652225	10/15/2012	8781259	07/15/2014

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SYSTEM AND METHOD FOR VIDEO PROCESSING BY IMAGE SEGMENTATION	Grass Valley Limited	US PCT	10/527911	11/07/2005	7,840,068	11/23/2010
VIDEO SIGNAL PROCESSING	Grass Valley Limited	US PCT	10/516068	11/29/2004	7,425,993	09/16/2008
APPARATUS AND PROCESS FOR RE-TIMING VIDEO CUTS	Grass Valley Limited	United States	10/817436	04/05/2004	8,401,069	03/19/2013
SYSTEM AND METHOD FOR VIDEO PROCESSING	Grass Valley Limited	United States	11/091951	03/29/2005	7,903,172	03/08/2011
VIDEO STORAGE DEVICE, AND METHOD OF CONTROLLING A VIDEO STORAGE DEVICE AND VIDEO MIXER	Grass Valley Limited	United States	11/091345	03/29/2005	7,511,767	03/31/2009
VIDEO STORAGE DEVICE, AND METHOD OF CONTROLLING A VIDEO STORAGE DEVICE AND VIDEO MIXER	Grass Valley Limited	United States	12/372197	02/17/2009	7,800,695	09/21/2010
METHOD OF IMAGE ANALYSIS OF AN IMAGE IN A SEQUENCE OF IMAGES TO DETERMINE A CROSS-FADE MEASURE	Grass Valley Limited	US PCT	12/162911	07/31/2008	8,150,167	04/03/2012
VIDEO EDITING SYSTEM	Grass Valley Limited	United States	09/537986	03/29/2000	7,103,260	09/05/2006
SYSTEM AND METHOD OF MEASURING DELAY BETWEEN TRANSMITTED AUDIO AND VIDEO SIGNALS	Grass Valley Limited	United States	62/883022	08/05/2019		
SYSTEM AND METHOD OF REDUCING DISTORTION DURING DOWNSAMPLING	Grass Valley Limited	United States	62/878253	07/24/2019		
SYSTEM AND METHOD OF WEB STREAMING MEDIA CONTENT	Grass Valley Limited	United States	62/864990	06/21/2019		
SYSTEM AND METHOD OF BUILDING A DISTRIBUTED NETWORK FOR ESSENCE MANAGEMENT AND ACCESS	Grass Valley Limited	United States	62/890358	08/22/2019		
AUDIO/VIDEO ROUTER	Grass Valley Canada	United States	12/986113	1/6/2011	8,359,417	1/22/2013
METHOD OF OPERATING A ROUTER	Grass Valley Canada	United States	13/746078	1/21/2013	8,996,766	3/31/2015
INTERCOM TRANSCEIVER WITH FIBER OPTIC LINK	Grass Valley Canada	United States	13/801309	3/13/2013	9,143,233	9/22/2015
EXPANDABLE ROUTER	Grass Valley Canada	United States	09/661844	9/14/2000	6,680,939	1/20/2004
CHANNEL STATUS MANAGEMENT FOR MULTICHANNEL AUDIO DISTRIBUTION	Grass Valley Canada	United States	09/661845	9/14/2000	6,757,302	6/29/2004



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SPATIALLY DISTRIBUTED ROUTING SWITCH	Grass Valley Canada	United States	10/364022	2/10/2003	7,277,427	10/2/2007
APPARATUS AND METHOD FOR EXTRACTING DATA VALUES FROM A SIGNAL ENCODED WITH AES3 DATA	Grass Valley Canada	United States	09/766014	1/18/2001	6,573,759	6/3/2003
ROUTER TOPOLOGY HAVING N ON 1 REDUNDANCY	Grass Valley Canada	United States	09/839571	4/20/2001	6,658,494	12/2/2003
SWITCHING FACILITY HAVING A CONTROL PANEL WITH RELEGENDABLE BUTTONS	Grass Valley USA, LLC	United States	12/104596	4/17/2008	9,621,426	4/11/2017
APPARATUS AND METHOD FOR ADAPTIVELY REDUCING NOISE IN A NOISY INPUT IMAGE SIGNAL	Grass Valley Canada	United States	09/603364	6/26/2000	6,633,683	10/14/2003
ROUTER FABRIC	Grass Valley Canada	United States	14/850895	09/10/2015	9,912,611	03/06/2018
ROUTER FABRIC	Grass Valley Canada	United States	15/887211	02/02/2018	10,397,135	08/27/2019
ROUTER FABRIC	Grass Valley Canada	United States	16/403394	05/03/2019		
ROUTER FABRIC	Grass Valley Canada	United States	16/403430	05/03/2019		
ROUTER FABRIC	Grass Valley Canada	United States	16/412230	05/14/2019		
REAR CONNECTOR PANELS FOR HOUSINGS	Grass Valley Canada	United States	10/025860	12/26/2001	7,031,171	4/18/2006
REAR CONNECTOR PANELS FOR HOUSINGS	Grass Valley Canada	Canada	2379239	3/26/2002	2379239	5/24/2011
COMBINED MULTI-IMAGE AND ROUTER APPARATUS	Grass Valley Canada	Canada	2662887	8/30/2007	2662887	
METHOD AND APPARATUS FOR PROVIDING AN INDICATION OF A LEVEL OF DISTORTION CREATED BY BLOCKING ARTIFACTS	Grass Valley Canada	United States	12/062129	4/3/2008	8,086,068	12/27/2011
METHOD AND APPARATUS FOR PROVIDING AN INDICATION OF A LEVEL OF DISTORTION CREATED BY BLOCKING ARTIFACTS	Grass Valley Canada	Canada	2719890	4/3/2009	2719890	8/28/2018
METHOD AND APPARATUS FOR PROVIDING SIGNATURES OF AUDIO/VIDEO SIGNALS AND FOR MAKING USE THEREOF	Grass Valley Canada	Canada	2686869	11/30/2009	2686869	9/25/2018
METHOD AND APPARATUS FOR PROVIDING SIGNATURES OF AUDIO/VIDEO SIGNALS AND FOR MAKING USE THEREOF	Grass Valley Canada	United States	12/627728	11/30/2009	8,860,883	10/14/2014

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SYSTEMS AND METHODS FOR CLOUD-BASED MEDIA PLAY OUT	Grass Valley Canada	United States	14/245519	4/4/2014	9,002,991	4/7/2015
SYSTEMS AND METHODS FOR A MEDIA PLAYOUT CARD	Grass Valley Canada	United States	14/245538	4/4/2014	9,749,370	8/29/2017
METHOD AND APPARATUS FOR PROVIDING SIGNATURES OF AUDIO/VIDEO SIGNALS AND FOR MAKING USE THEREOF	Grass Valley Canada	United States	14/509865	10/8/2014	10,116,838	10/30/2018
INTERCOM TRANSCEIVER WITH FIBER OPTIC LINK	Grass Valley Canada	Canada	2871432	4/22/2013		
SYSTEMS AND METHODS FOR MEDIA DISTRIBUTION AND MANAGEMENT	Grass Valley Canada	Canada	2908662	4/4/2014		
INTERCOM TRANSCEIVER WITH FIBER OPTIC LINK	Grass Valley Canada	United States	14/830569	8/19/2015	10,050,707	8/14/2018
SYSTEMS AND METHODS FOR AUTOMATION CONTROL	Grass Valley Canada	United States	15/687672	8/28/2017		
SYSTEMS AND METHODS FOR AUTOMATION FALLBACK	Grass Valley Canada	United States	16/442,035	6/14/2019		
SYSTEM AND METHOD FOR CONSTRUCTING FILTER GRAPH-BASED MEDIA PROCESSING PIPELINES IN A BROWSER	Grass Valley Limited	United States	62/929600	11/01/2019		
SYSTEM AND METHOD FOR CONSTRUCTING FILTER GRAPH-BASED MEDIA PROCESSING PIPELINES IN A BROWSER	Grass Valley Limited	United States	62/943058	12/03/2019		
SYSTEM AND METHOD FOR CONTROLLING DISTRIBUTION OF MEDIA CONTENT IN A DISTRIBUTED SYSTEM	Grass Valley Canada	United States	63/013375	04/21/2020		
SYSTEM AND METHOD FOR GENERATING A FACTORY LAYOUT FOR OPTIMIZING MEDIA CONTENT PRODUCTION	Grass Valley Canada	United States	63/027126	05/19/2020		
SYSTEM AND METHOD FOR SYNCHRONIZING TRANSMISSION OF MEDIA CONTENT USING TIMESTAMPS	Grass Valley Canada	United States	63/030154	05/26/2020		
SYSTEM AND METHOD OF DYNAMIC RANDOM ACCESS RENDERING	Grass Valley Canada	United States	63/010164	04/15/2020		
SYSTEM AND METHOD FOR IMAGE FORMAT CONVERSION USING 3D LOOKUP TABLE APPROXIMATION	Grass Valley Canada	United States	63/013967	04/22/2020		

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CAMERA-MOUNTABLE FIBER OPTIC TRANSCEIVER SYSTEM	Grass Valley Canada	United States	10/023,452		7,327,959	