

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

EPAS ID: PAT3408741

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
PROF. SIKORA	04/25/2012
ANDREAS KRUTZ	04/25/2012
ALEXANDER GLANTZ	04/25/2012
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	VESTEL ELEKTRONIK SANAYI VE TICARET A.S.
<b>Street Address:</b>	ORGANIZE SANAYI BOLGESI
<b>City:</b>	MANISA
<b>State/Country:</b>	TURKEY
<b>Postal Code:</b>	45030
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	13504739
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(248)358-3351
<i>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.</i>	
<b>Email:</b>	jnoble@brookskushman.com
<b>Correspondent Name:</b>	BROOKS KUSHMAN P.C.
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<b>ATTORNEY DOCKET NUMBER:</b>	KEHL 0115 PUSA
<b>NAME OF SUBMITTER:</b>	JUDY NOBLE
<b>SIGNATURE:</b>	/Judy Noble/
<b>DATE SIGNED:</b>	06/23/2015
<b>Total Attachments: 8</b>	
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**Patent Assignment**  
(hereinafter referred to as *Agreement*)

between

**VESTEL ELEKTRONIK SANAYI VE TICARET A.S.**  
Organize Sanayi Bölgesi  
45030 Manisa, Turkey

hereinafter referred to as **VESTEL**

and

1. **Prof. Dr.-Ing. Thomas Sikora**  
Technische Universität Berlin  
Institut Telekommunikationssysteme  
Fachgebiet Nachrichtenübertragung  
Einsteinufer 17  
10587 Berlin

2. **Dr.-Ing. Andreas Krutz**  
Danziger Straße 195,  
10407 Berlin,  
Germany

3. **Alexander Glantz,**  
Bouchestraße 37,  
12435 Berlin,  
Germany

1. – 3. hereinafter referred to as *Inventors*

**Preamble**

VESTEL is a major manufacturer of consumer electronic devices. The Inventors have filed patent applications for methods and devices for processing a video sequence. VESTEL and the Inventors (hereinafter jointly referred to as *the Parties* and each individually referred to as *the Party*) wish to cooperate in the field of video sequence processing. The

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parties understand that the respective inventions have the potential to become a technology standard for TV sets. To pursue this purpose and to transfer certain patents, the Parties agree as follows:

#### § 1 Patents

The Inventors have filed patents for methods and devices for processing a video sequence as enlisted in Annex I to this Agreement (hereinafter referred to as the *Patents*). The Patents also cover any right to the respective inventions described therein.

#### § 2 Assignments

- (1) The Inventors herewith assign to VESTEL the Patents with all rights and obligations connected thereto including any right to the inventions described in the Patents.
- (2) VESTEL accepts such assignment.
- (3) The Inventors agree to the recording of the assignment of the Patents in all national registers and the Inventors will provide the required documents and all necessary signatures without delay. Likewise, VESTEL will apply for the change of the respective registers without delay.

#### § 3 Prosecution

- (1) Upon execution of this Agreement it will be in the sole discretion of VESTEL to decide which of the Patents shall be further prosecuted, in which countries there shall be national phases initiated for the Patents and to which extend the Patents shall be pursued.
- (2) The Inventors will provide any required contribution, like signatures, consents etc., or assistance as required and upon first request by VESTEL without delay.

#### § 4 Technical support

#### § 5 Documentation

*U. V. 7*

*CA*

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**§ 6 Infringement**

The Inventors shall inform VESTEL promptly of any infringement of any of the Patents or any national part thereof that they become aware of.

**§ 7 Patent Purchase Price**

§ 9 Confidentiality and non-competition clause

§ 10 No-challenge clause

§ 11 Costs

§ 12 Changes of the Agreement

Changes of this Agreement shall be made in writing and signed by both Parties to be valid.

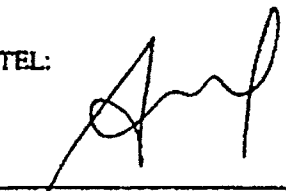
§ 13 Force Majeure

§ 14 Termination

§ 15 Controversies, law and jurisdiction

For VESTEL:

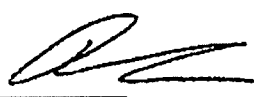
Manisa

  
Cihat Aytac,  
IPR. Division Manager

Prof. Sikora

Berlin

25<sup>th</sup> April

  
Prof. Sikora

Andreas Krutz

Berlin

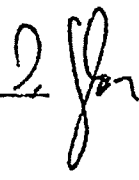
25<sup>th</sup> April 2012  
Andreas Krutz



Alexander Glantz

Berlin

25<sup>th</sup> April 2012  
Alexander Glantz



**Annex I**

**Patents and Patent Applications**

- |                    |                        |
|--------------------|------------------------|
| 1) US 61/279,983   | filed 29. October 2009 |
| 2) US 61/279,984   | filed 29. October 2009 |
| 3) WO 2011/050 997 | filed 28. October 2010 |
| 4) WO 2011/050 998 | filed 28. October 2010 |

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REEL: 035951 FRAME: 0931



**Annex II**  
**Documentation of the inventions**

**Alexander Glantz, Andreas Krutz, Martin Hafler, Thomas Sikora**

**Video Coding using Global Motion Temporal Filtering**

**Proceedings of the 16th IEEE International Conference on Image Processing (ICIP 2009), volume November 2009, Cairo, Egypt, 07.11.2009 - 11.11.2009, pp. 1053-1056**

**ISBN: 978-1-4244-5655-0 ISSN: 1522-4880**

**Andreas Krutz, Alexander Glantz, Thomas Sikora**

**Background Modeling for Video Coding: From Sprites to Global Motion Temporal Filtering**

**Proceedings of the IEEE International Symposium on Circuits and Systems (ISCAS 2010), volume June 2010, Paris, France, 30.05.2010 - 02.06.2010, pp. 2179-2182**

**ISBN: 978-1-4244-5309-2**

**Alexander Glantz, Andreas Krutz, Thomas Sikora**

**Global Motion Temporal Filtering for In-loop Deblocking**

**Proceedings of the 17th IEEE International Conference on Image Processing (ICIP 2010), Hong Kong, 26.09.2010 - 29.09.2010**

**ISBN: 978-1-4244-7993-1 ISSN: 1522-4880**

**Marko Esche, Andreas Krutz, Alexander Glantz, Thomas Sikora**

**A Novel In-loop Filter for Video-Compression based on Temporal Pixel Trajectories**

**Proceedings of the 28th IEEE Picture Coding Symposium (PCS 2010), Nagoya, Japan, 07.12.2010 - 10.12.2010**

**ISBN: 978-1-4244-7135-5**

**Alexander Glantz, Andreas Krutz, Thomas Sikora**

**Adaptive Global Motion Temporal Prediction for Video Coding**

**Proceedings of the 28th IEEE Picture Coding Symposium (PCS 2010), Nagoya, Japan, 07.12.2010 - 10.12.2010**

**ISBN: 978-1-4244-7135-5**

**Marko Esche, Andreas Krutz, Alexander Glantz, Thomas Sikora**

**Temporal trajectory filtering for bi-directional predicted frames**

**Proceedings of the 18th IEEE International Conference on Image Processing (IEEE ICIP2011), Brussels, Belgium, 11.09.2011 - 14.09.2011, pp. 1669-1672**

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IEEE catalog number: CFP11CIP-USB ISBN: 978-1-4577-1302-6

Andreas Krutz, Alexander Glantz, Thomas Sikora

Theoretical Consideration of Global Motion Temporal Filtering

Proceedings of the 18th IEEE International Conference on Image Processing (IEEE ICIP2011), Brussels, Belgium, 11.09.2011 - 14.09.2011, pp. 3534-3537

IEEE catalog number: CFP11CIP-USB ISBN: 978-1-4577-1302-6

Marko Esche, Alexander Glantz, Andreas Krutz and Thomas Sikora

Adaptive Temporal Trajectory Filtering for Video Compression

IEEE Transactions on Circuits and Systems for Video Technology (TCSVT). IEEE, to appear, 2012

Marko Esche, Alexander Glantz, Andreas Krutz, Michael Tok, Thomas Sikora

Weighted Temporal Long Trajectory Filtering for Video Compression

Proceedings of the 29th IEEE Picture Coding Symposium (PCS 2012), Kraków, Poland, 07.05.2012 - 09.05.2012

Andreas Krutz, Alexander Glantz, Michael Tok, Thomas Sikora

Adaptive Global Motion Temporal Filtering

Proceedings of the 29th IEEE Picture Coding Symposium (PCS 2012), Kraków, Poland, 07.05.2012 - 09.05.2012

Marko Esche, Alexander Glantz, Andreas Krutz, Michael Tok and Thomas Sikora

Quadtree-based Temporal Trajectory Filtering

Proceeding of the 19th IEEE International Conference on Image Processing (IEEE ICIP2012), Orlando, Florida, 30.09.2012 - 03.10.2012

Andreas Krutz, Alexander Glantz, Michael Tok, Marko Esche, and Thomas Sikora

Adaptive Global Motion Temporal Filtering for High Efficiency Video Coding

submitted to IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)