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PATENT ASSIGNMENT COVER SHEET

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|-----------------------|----------------|----------------|
| NATURE OF CONVEYANCE: | ASSIGNMENT | |
| CONVEYING PARTY DATA | | |
| | Name | Execution Date |
| Albrecht Ehrmann | | 11/07/2006 |
| Ulrich Wegmann | | 11/06/2006 |
| Rainer Hoch | | 11/13/2006 |
| Joerg Mallmann | | 11/18/2006 |
| Karl-Heinz Schuster | | 11/10/2006 |
| Ulrich Loering | | 11/14/2006 |
| Toralf Gruner | | 11/08/2006 |
| Bernhard Kneer | | 11/10/2006 |
| Bernhard Geuppert | | 11/06/2006 |
| Franz Sorg | | 11/10/2006 |
| Jens Kugler | | 11/13/2006 |
| Norbert Wabra | | 11/15/2006 |

| CARL ZEISS SMT AG |
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| RUDOLF-EBER-STRASSE 2 |
| OBERKOCHEN |
| GERMANY |
| 73447 |
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PROPERTY NUMBERS Total: 1

| Property Type | Number |
|---------------------|----------|
| Application Number: | 15250241 |

CORRESPONDENCE DATA

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PATENT REEL: 039577 FRAME: 0685

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| SIGNATURE: | /Alissa/ |
| DATE SIGNED: | 08/30/2016 |
| Total Attachments: 4 source=Assign#page1.tif source=Assign#page2.tif source=Assign#page3.tif source=Assign#page4.tif | |

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ASSIGNMENT

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PATENT REEL: 039577 FRAME: 0687

For valuable consideration, we,

Albrecht Ehrmann, An der Eichhalde 2, D-89551 Koenigsbronn, Germany Ulrich Wegmann, Erlenweg 5, D-89551 Koenigsbronn, Germany Rainer Hoch, Schumannstr. 18, D-73430 Aalen, Germany Joerg Mallmann, Huettenweg 12, D-56154 Boppard, Germany Karl-Heinz Schuster, Rechbergstr. 24, D-89551 Koenigsbronn, Germany Ulrich Loering, Freiherr-von-Liebig-Str. 4, D-73447 Oberkochen, Germany Toralf Gruner, Opalstr. 22, D-73433 Aalen-Hofen, Germany Bernhard Kneer, Muehlenweg 9, D-89605 Altheim, Germany Bernhard Geuppert, Kiefernweg 14, D-73430 Aalen, Germany Franz Sorg, Hegelstr. 86, D-73431 Aalen, Germany Jens Kugler, Walkstr. 64, D-73431 Aalen, Germany Norbert Wabra, Am Ring 20, D97440 Werneck, Germany hereby assign to:

Carl Zeiss SMT AG, a corporation of **Germany** having a place of business at: Rudolf-Eber-Str. 2, D-73447 Oberkochen, DE; and its successors and assign (collectively hereinafter called "the Assignee") the entire right, title and interest throughout the world in the inventions and improvements which are subject of an application for United States Patent signed by us entitled

MIKROLITHOGRAPHIC PROJECTION EXPOSURE APPARATUS AND MEASURING DEVICE FOR A PROJECTION LENS

filed July 18, 2006, and assigned U.S. Serial Number 11/458,216, and we authorize and request the attorneys appointed in said application to hereafter complete this assignment by inserting above the filing date and serial number of said application when known; this assignment including said application, any and all United States and foreign patents, utility models, and design registrations granted for any of said inventions or improvements, and the right to claim priority based on the filing date of said application under the International Convention for the Protection of Industrial Property, the Patent Cooperation Treaty, the European Patent Convention, and all other treaties of like purposes; and we authorize the Assignee to apply in all countries in our name or in its own name for patents, utility models, design registrations and like rights of exclusion and for inventors' certificates for said inventions and improvements; and we agree for ourselves our respective heirs, legal representatives and assigns, without further compensation to perform such lawful acts and to sign such further applications, assignments, Preliminary Statements and other lawful documents as the Assignee may reasonably request to effectuate fully this assignment.

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| Albrecht Ehrmann Date: UN 6, 2006 Min Algemenn Date: Mor. 13, 2006 Raure-1 Steel Rainer Hoch Date: Joerg Mallmann Date: Nov 10, 2006 If e.t. Steinet Setworks Karl-Heinz Schuster Date: Nov. 11, 2006 Und Y Ulrich Loering Date: Nov. 8, 2006 Tornf June Toralf Gruner Date: Nov. 8, 2006 Desaler & Ulsee Bernhard Kneer Date: Nov. 10, 2006 Desaler & Ulsee Bernhard Genryn H Date: Nov. 10, 2006 June Franz Sorg Date: Nov. 13, 2006 June Franz Sorg Date: Mor. 13, 2006 June Mugh Jens Kigler | Date: Nov 7, 2006 Allucht Clu |
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| Date: <u>MV. 13, 2006</u> <u>Returned Hick</u> Rainer Hoch Date: Joerg Mallmann Date: <u>Nor. 10, 2006</u> <u>Hext Heine</u> <u>Seluestig</u> Date: <u>Nov. 10, 2006</u> <u>Multiple</u> <u>Seluestig</u> Date: <u>Nov. 10, 2006</u> <u>Toreffgune</u> Toralf Gruper Date: <u>Mov. 8, 2006</u> <u>Toreffgune</u> Date: <u>Mov. 6, 2006</u> <u>B. Ufff</u> Date: <u>Nor. 6, 2006</u> <u>B. Ufff</u> Date: <u>Nor. 13, 2006</u> <u>Jung</u> Date: <u>Mov. 14, 2006</u> <u>Jung</u> Date: <u>Mov. 14, 200</u> | Date: UN, 6, 2006 Minh Schnaun |
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| Karl-Heinz Schuster Date: <u>Nov. 11. 7006</u> <u>ULL</u> <u>Ulrich Loering</u> Date: <u>Nov. 8, 2006</u> <u>Toraffguma</u> Toralf Gruner Date: <u>Nov. 8, 2006</u> <u>Resultand Ulexee</u> Bernhard Kneer Date: <u>Nov. 6, 2006</u> <u>B</u> . <u>ULL</u> Bernhard Geopperf Date: <u>Nov. 13, 2006</u> <u>June</u> Franz Sorg Date: <u>Mov. 13, 2006</u> <u>June</u> <u>Hurgh</u> Jens Kugler | Joerg Mallmann |
| Date: Nov. 11. 2006 Und June Ulrich Loering Date: Nov. 8, 2006 Toraffyund Toralf Gruner Date: May. 10, 2006 Desidend Cleece Bernhard Kneer Date: Nov 6, 2006 B. UH Bernhard Geopperf Date: Nov. 10, 2006 June Franz Sorg Date: Mon. 13, 2006 June Hugh Jens Kugler | Date: Nov 10, 2006 Thail- Fleine Seluster |
| Ulrich Loering Date: <u>Nov. 8, 2006</u> <u>Toraffyund</u> Toralf Gruner Date: <u>Nav. 10, 2006</u> <u>Resultand Ulvee</u> Bernhard Kneer Date: <u>Nov 6, 2006</u> <u>B</u> . <u>Ulvee</u> Bernhard Geupperf Date: <u>Nov 6, 2006</u> <u>B</u> . <u>Upp</u> Franz Sorg Date: <u>Mov. 13, 2006</u> Jens Kugler | Karl-Heinz Schuster |
| Date: Nov. 8, 2006 Toraffyund Toralf Gruner Date: Naj. 10, 2006 Resultand Uleee Bernhard Kneer Date: Nov 6, 800C B. UH Bernhard Geuppert Date: Nov 6, 2006 Por Franz Sorg Date: Nov. 13, 2006 Jen Kugh Jens Kugler | |
| Date: <u>Mar. 10, 2006</u> <u>Beorland Uleeec</u> Bernhard Kneer Date: <u>Nov 6, 2006</u> <u>B</u> - <u>U</u> <u>U</u> <u>U</u> <u>E</u> <u>E</u> <u>E</u> Date: <u>Nov 10, 2006</u> <u>B</u> <u>E</u> Franz Sorg Date: <u>Mor. 13, 2006</u> <u>Jewn Uurgh</u> Jens Kugler | Ulrich Loering |
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| Date: Nors 10, 2006 Franz Sorg Date: Nor 13, 2006 Jew Kugh Jens Kugler | |
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| Franz Sorg Date: <u>Nov 13, 2006</u> Jew Kugh Jens Kugler | |
| Date: Nov 13, 2006 Jens Kugh Jens Kugler | |
| | Franz Sorg |
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| Norbert Wabra | Date: Wow 15 2006 Walt Weber Norbert Wabra |

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page 2 of 2 PATENT REFL:039577 ERA

REEL: 039577 FRAME: 0688

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ASSIGNMENT

For valuable consideration, we,

Albrecht Ehrmann, An der Eichhalde 2, D-89551 Koenigsbronn, Germany

Ulrich Wegmann, Erlenweg 5, D-89551 Koenigsbronn, Germany

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Franz Sorg, Hegelstr. 86, D-73431 Aalen, Germany

Jens Kugler, Walkstr. 64, D-73431 Aalen, Germany

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MIKROLITHOGRAPHIC PROJECTION EXPOSURE APPARATUS AND MEASURING DEVICE FOR A PROJECTION LENS

filed July 18, 2006, and assigned U.S. Serial Number 11/458,216, and we authorize and request the attorneys appointed in said application to hereafter complete this assignment by inserting above the filing date and serial number of said application when known; this assignment including said application, any and all United States and foreign patents, utility models, and design registrations granted for any of said inventions or improvements, and the right to claim priority based on the filing date of said application under the International Convention for the Protection of Industrial Property, the Patent Cooperation Treaty, the European Patent Convention, and all other treaties of like purposes; and we authorize the Assignee to apply in all countries in our name or in its own name for patents, utility models, design registrations and like rights of exclusion and for inventors' certificates for said inventions and improvements; and we agree for ourselves our respective heirs, legal representatives and assigns, without further compensation to perform such lawful acts and to sign such further applications, assignments, Preliminary Statements and other lawful documents as the Assignee may reasonably request to effectuate fully this assignment.

page 1 of 2

PATENT REEL: 039577 FRAME: 0689

| Date: | • |
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| | Albrecht Ehrmann |
| Date: | |
| | Ulrich Wegmann |
| Date: | |
| | Rainer Hoch |
| Date: Nov. 1 | 18, 2006 Jeg Mallenn |
| Date | |
| Date | Karl-Heinz Schuster |
| Date: | |
| | Ulrich Loering |
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| | Toralf Gruner |
| Date: | |
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| | page 2 of 2 PATEN |

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