**PATENT ASSIGNMENT COVER SHEET**

**SUBMISSION TYPE:** NEW ASSIGNMENT  
**NATURE OF CONVEYANCE:** ASSIGNMENT

### CONVEYING PARTY DATA

<table>
<thead>
<tr>
<th>Name</th>
<th>Execution Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thomas Schicketanz</td>
<td>04/16/2012</td>
</tr>
<tr>
<td>Toralf Gruner</td>
<td>04/16/2012</td>
</tr>
</tbody>
</table>

### RECEIVING PARTY DATA

<table>
<thead>
<tr>
<th>Name</th>
<th>CARL ZEISS SMT GMBH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Address:</td>
<td>RUDOLF-EBER-STRASSE 2</td>
</tr>
<tr>
<td>City:</td>
<td>OBERKOCHEN</td>
</tr>
<tr>
<td>State/Country:</td>
<td>GERMANY</td>
</tr>
<tr>
<td>Postal Code:</td>
<td>73447</td>
</tr>
</tbody>
</table>

**PROPERTY NUMBERS Total: 1**

<table>
<thead>
<tr>
<th>Property Type</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Number</td>
<td>15783482</td>
</tr>
</tbody>
</table>

**CORRESPONDENCE DATA**

Fax Number: (877)769-7945  
**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: (650) 839-5001  
Email: apsi@fr.com  
Correspondent Name: CHRIS C. BOWLEY  
Address Line 1: FISH & RICHARDSON P.C.  
Address Line 2: P.O. BOX 1022  
Address Line 4: MINNEAPOLIS, MINNESOTA 55440-1022

**ATTORNEY DOCKET NUMBER:** 24548-0066003  
**NAME OF SUBMITTER:** CHERYL A. FORREST

**SIGNATURE:** /Cheryl A. Forrest/  
**DATE SIGNED:** 10/16/2017

Total Attachments: 2
source=Assignment#page1.tif  
source=Assignment#page2.tif
ASSIGNMENT

For valuable consideration, we, THOMAS SCHICKETANZ of Jahnstrasse 13, 73433 Aalen, Germany, TORALF GRUNER of Opalstrasse 22, 73433 Aalen-Hohen, Germany, hereby assign to: Carl Zeiss SMT GmbH, a corporation of Germany, having a place of business at:

Rudolf-Eber-Strasse 2
73447 Oberkochen
Germany; and

its successors and assigns (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 CATADIOPTRIC PROJECTION OBJECTIVE COMPRISING DEFLECTION MIRRORS AND PROJECTION EXPOSURE METHOD, filed 3/27/2012, and assigned U.S. Serial Number 13/431,681, 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 and 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.
Date: April 16th, 2012

THOMAS SCHICKETANZ

Witnessed by: [Signature]

Name: [Signature]

Date: April 16th, 2012

TORALF GRUNER

Witnessed by: [Signature]

Name: [Signature]

Date: April 16th, 2012