**PATENT ASSIGNMENT COVER SHEET**

Electronic Version v1.1  
Stylesheet Version v1.2  
EPAS ID: PAT4232339

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<th>SUBMISSION TYPE:</th>
<th>NEW ASSIGNMENT</th>
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<td>ASSIGNMENT</td>
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### CONVEYING PARTY DATA

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<tr>
<th>Name</th>
<th>Execution Date</th>
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<tbody>
<tr>
<td>TOHOKU TECHNO ARCH CO., LTD.</td>
<td>01/13/2017</td>
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### RECEIVING PARTY DATA

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<tr>
<th>Name</th>
<th>ASMI IP HOLDING B.V.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Address</td>
<td>VERSTERKERSTRAAT 8</td>
</tr>
<tr>
<td>City</td>
<td>ALMERE</td>
</tr>
<tr>
<td>State/Country</td>
<td>NETHERLANDS</td>
</tr>
<tr>
<td>Postal Code</td>
<td>1322 AP</td>
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### PROPERTY NUMBERS Total: 1

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### CORRESPONDENCE DATA

Fax Number: (520)882-7643  
*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 2: N/A  
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### ATTORNEY DOCKET NUMBER:  
SHIG XP030

### NAME OF SUBMITTER:  
NORMAN P. SOLOWAY

### SIGNATURE:  
/norman p. soloway/

### DATE SIGNED:  
01/19/2017

Total Attachments: 3
source=Assignmentexecuted#page1.tif  
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source=Assignmentexecuted#page3.tif
ASSIGNMENT OF INVENTION

For:   [ ] U.S. and/or [ ] Foreign Rights
For:   [ ] U.S. Application or
       [ ] U.S. Provisional Application
For:   [x] U.S. Patent
For:   [ ] PCT Application
By:    [ ] Inventor(s) or [ ] Present Owner

In consideration of the payment by ASSIGNEE to ASSIGNOR of good consideration, receipt of which is hereby acknowledged, and for other good and valuable consideration,

ASSIGNOR:

(inventor(s) or person(s) or entity(ies) who own the invention)

Name:  TOHOKU TECHNO ARCH CO., LTD.
Address:  468, AZA AOBA, ARAMAKI
          AOBA-KU, SENDAI-SHI
          MIYAGI, JAPAN 980-0845
Nationality:  JAPAN

(if assignment is by person or entity to whom invention was previously assigned and this was recorded in the PTO, add the following)

Recorded on:  August 4, 2008  Reel:  021328  Frame:  0642

hereby sells, assigns and transfers to

ASSIGNEE:

Name:  ASM IP Holding B.V.
Address:  Versterkerstraat 8, 1322 AP, Almere, The Netherlands
Nationality:  Netherlands

and the successors, assigns and legal representatives of the ASSIGNEE

(complete one of the following)

[X]  the entire right, title and interest, including right to sue for past infringement

[ ]  an undivided _____________________ percent (__________ %) interest
for the United States and its territorial possessions

(check the following box, if foreign rights are also to be assigned)

[ ] and in all foreign countries, including all rights to claim priority,

in and to any and all improvements which are disclosed in the invention entitled:

**NEUTRAL PARTICLE BEAM PROCESSING APPARATUS**

Name of inventor(s): ICHIKI, KATSUNORI; YAMAUCHI, KAZUO; HIYAMA, HIROKUNI; SAMUKAWA, SEIJI

(check and complete (a), (b), (c), (d), (e), (f), or (g))

and which is found in

(a) [ ] U.S. patent application executed on even date herewith
(b) [ ] U.S. patent application executed on:
(c) [ ] U.S. provisional application naming the above inventor(s) for the above-entitled invention.
   [ ] Express mail label No.: 
   [ ] Mailed:

[f] To comply with 37 CFR 3.21 for recordal of this assignment, I, an ASSIGNOR signing below, hereby authorize and request my attorney to insert below the filing date and application number when they become known.

(d) [ ] U.S. application No: filed on:
(e) [ ] International application No:
(f) [x] U.S. patent No: 6,861,642 issued: March 1, 2005
   [ ] A change of address to which correspondence is to be sent regarding patent maintenance fees is being sent separately.

(also check (g), if foreign application(s) is also being assigned)

(g) [ ] and any legal equivalent thereof in a foreign country, including the right to claim priority

and, in and to, all Letters Patent to be obtained for said invention by the above application or any continuation, division, renewal, or substitute thereof, and as to letters patent any reissue or re-examination thereof;

ASSIGNOR hereby covenants that no assignment, sale, agreement or encumbrance has been or will be made or entered into which would conflict with this assignment;
ASSIGNOR further covenants that ASSIGNEE will, upon its request, be provided promptly with all pertinent facts and documents relating to said invention and said Letters Patent and legal equivalents as may be known and accessible to ASSIGNOR and will testify as to the same in any interference, litigation or proceeding related thereto and will promptly execute and deliver to ASSIGNEE or its legal representatives any and all papers, instruments or affidavits required to apply for, obtain, maintain, issue and enforce said application, said invention and said Letters Patent and said equivalents thereof which may be necessary or desirable to carry out the purposes thereof.

IN WITNESS WHEREOF, I/We have hereunto set hand and seal this 13th day of January 2017.

(date of signing)

Warning: The date of signing must be the same as the date of execution of the application if item (a) was checked above.

Signature(s) of ASSIGNOR(S):

Date: January 13, 2017

(if ASSIGNOR is a legal entity, complete the following in formation)

Takanobu Mizuta
(type or print the name of the above person authorized to sign on behalf of ASSIGNOR)

Title

President

Witness: Kanale
Date: January 17, 2017

Witness: Ayane Inoue
Date: January 17, 2017