### 504709124 12/29/2017

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2 EPAS ID: PAT4755846

| SUBMISSION TYPE:      | NEW ASSIGNMENT |
|-----------------------|----------------|
| NATURE OF CONVEYANCE: | ASSIGNMENT     |

#### **CONVEYING PARTY DATA**

| Name              | Execution Date |
|-------------------|----------------|
| SEIJI FURUSAKO    | 09/29/2017     |
| TOHRU OKADA       | 09/29/2017     |
| YASUNOBU MIYAZAKI | 09/29/2017     |
| FUMINORI WATANABE | 09/29/2017     |
| YOSHIAKI NAKAZAWA | 09/29/2017     |

#### **RECEIVING PARTY DATA**

| Name:           | NIPPON STEEL & SUMITOMO METAL CORPORATION |
|-----------------|---|
| Street Address: | 6-1, MARUNOUCHI 2-CHOME, CHIYODA-KU       |
| City:           | TOKYO                                     |
| State/Country:  | JAPAN                                     |
| Postal Code:    | 100-8071                                  |

### **PROPERTY NUMBERS Total: 1**

| Property Type       | Number   |
|---------------------|----------|
| Application Number: | 15740786 |

#### **CORRESPONDENCE DATA**

**Fax Number:** (703)205-8050

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:** (703) 205-8000

Email: mailroom@bskb.com, anh-vu.dao@bskb.com
Correspondent Name: BIRCH, STEWART, KOLASCH & BIRCH, LLP
Address Line 1: 8110 GATEHOUSE ROAD, SUITE 100E

Address Line 4: FALLS CHURCH, VIRGINIA 22042

| ATTORNEY DOCKET NUMBER: | 0210-0457PUS1 |
|-------------------------|---------------|
| NAME OF SUBMITTER:      | ANH-VU DAO    |
| SIGNATURE:              | /anh-vu dao/  |
| DATE SIGNED:            | 12/29/2017    |

**Total Attachments: 2** 

source=2017-12-28\_Assignment\_0210-0457PUS1#page1.tif

PATENT 504709124 REEL: 044509 FRAME: 0173

 $source = 2017\text{-}12\text{-}28\_Assignment\_0210\text{-}0457PUS1\#page2.tif}$ 

PATENT REEL: 044509 FRAME: 0174

# U.S. ASSIGNMENT

IN CONSIDERATION of the sum of One Dollar (\$1.00), and of other good and valuable consideration paid to the undersigned inventor(s) (hereinafter "ASSIGNOR") by

| nsert                              | NIPPON STEEL & SUMITOM  | O METAL CORPORATION   | N   |
|------------------------------------|---|---|---|
| SSIGNEE's<br>ame(s)<br>ldress(es)) | 6-1, Marunouchi 2-chome, C  | Chiyoda-ku, Tokyo 100-8   | 071, Japan  |
|                                    |   |   |   |
|                                    |   |   |   |
|                                    |   |   |   |
|                                    |   |   |   |
|                                    | (hereinafter "ASSIGNEE"), the receipt of variansfers to ASSIGNEE the entire and ex-   | which is hereby acknowledged, the<br>clusive right, title and interest to th  | undersigned ASSIGNOR hereby sells, assigns e invention entitled   |
| le of<br>ention)                   | MECHANICAL JOINING APPA   | ARATUS AND MECHANICAI   | JOINING METHOD  |
|                                    |   |   |   |
|                                    | relating to International Patent Application  | on PCT/JP <u>2016</u> / <u>06971</u> on even date herewith or, if not so  | and/or for which application for Letters executed, was:   |
| ert date                           | (a) executed on September 29, 20  | 017   |   |
| xecution<br>pplication,<br>ot      | (a) executed on September 29, 20 (b) filed on December 28, 2017 (Serial No. 15 / 740,786)   | Assignee's attorney is he data, when known.   | reby authorized to insert in (b) the specified  |
| current)                           | Serial No15 / 740,786   | ;   |   |
|                                    | renewal, substitute, reissue or reexamina   | tion application based thereon, for   | on said application and any continuation, div<br>the full term or terms for which the said Lette<br>hereinafter, "said application(s) and Letters   |
|                                    | ASSIGNEE, to do all acts which the ASSI<br>enforcing protection for said invention, in<br>said Letters Patent(s), in any interference<br>proceeding which may arise or be declare | GNEE may deem necessary, desiral<br>cluding in the preparation and pro-<br>, reissue, reexamination, or public<br>d in relation to same, such acts to | without charge to but at the expense of said<br>ble or expedient, for securing, maintaining and<br>secution of said application(s) and the issuanc<br>use proceeding, and in any litigation or other l<br>include but not be limited to executing all pap<br>providing sworn testimony, and obtaining and |
|                                    | IN WITNESS WHEREOF, the u   | ndersigned inventor(s) has (have) at  | ffixed his/her/their signature(s).  |
| gnatures)                          | Sein Furnach  | Seiji Furusako  | September 29, 2017  |
| <b>3</b> ,                         | 1) Sliji Furusak<br>(SIGNATURE)   | (TYPE NAME)   | (DATE)  |
|                                    | 0)  | Tohru Okada   |   |
|                                    | (SIGNATURE)   | (TYPE NAME)   | (DATE)  |
|                                    | 2 Gas unobu Minanal a   | Yasunobu Miyazaki   | September 29, 2017  |
|                                    | 3) Gaeunobu Miranaki (SIGNATURE)  4) Fuminari Woxtanabe (SIGNATURE)  5) Voxtanabe (SIGNATURE)   | (TYPE NAME)   | (DATE)  |
|                                    | Funinari Watawalso  | Fuminori Watanabe   | September 29, 2017  |
|                                    | (SIGNATURE)   | (TYPE NAME)   | (DATE)  |
|                                    | Yoshiaki Ndrazana   | Yoshiaki Nakazawa   | September 29, 2017  |
|                                    | (SIGNATURE)   | (TYPE NAME)   | (DATE)  |
|                                    | 6)  |   |   |
|                                    | (SIGNATURE)   | (TYPE NAME)   | (DATE)  |
|                                    | 7)  |   |   |
|                                    | (SIGNATURE)   | (TYPE NAME)   | (DATE)  |
|                                    | 8)  |   |   |
|                                    | (SIGNATURE)   | (TYPE NAME)   | (DATE) DATENT   |

REEL: 044509 FRAME: 0175

## U.S. ASSIGNMENT

IN CONSIDERATION of the sum of One Dollar (1.00), and of other good and valuable consideration paid to the undersigned inventor(s) (hereinafter "ASSIGNOR") by

| renewal, substitute, reissue or reexamination application based thereon, for the full term or terms for wh  | DD  |  |  |  |  |  |
|---|---|--|--|--|--|--|
| Tride of invention  MECHANICAL JOINING APPARATUS AND MECHANICAL JOINING METHOR invention  relating to International Patent Application PCT/JP 2016 / 069718 and/or for which application of the United States was executed on even date herewith or, if not so executed, was:  (a) executed on September 29, 2017 / (b) filed on December 28, 2017 / (b) filed on 15 / 740,786 :  and to said application and all Letters Patent(s) of the United States granted on said application and any renewal, substitute, reissue or reexamination application based thereon, for the full term or terms for wheaten(s).  The ASSIGNOR agree(s), when requested by said ASSIGNEE and without charge to but at the ASSIGNEE, to do all acts which the ASSIGNEE may deem necessary, desirable or expecting, and in any the proceeding which may arise or be declared in relation to sane, such acts to include but not be limited to including separate assignments and declarations, taking all rightful oaths, providing sworn testimony, approducing evidence.  IN WITNESS WHEREOF, the undersigned inventor(s) has (have) affixed his/her/their signatures)  Seigi Furusako  1) (SIGNATURE) (DATE)  Tohru Okada September 29, (DATE)  Yasunobu Miyazaki   | DD  |  |  |  |  |  |
| Tride of invention  MECHANICAL JOINING APPARATUS AND MECHANICAL JOINING METHOR invention  relating to International Patent Application PCT/JP 2016 / 069718 and/or for which application of the United States was executed on even date herewith or, if not so executed, was:  (a) executed on September 29, 2017 / (b) filed on December 28, 2017 / (b) filed on 15 / 740,786 :  and to said application and all Letters Patent(s) of the United States granted on said application and any renewal, substitute, reissue or reexamination application based thereon, for the full term or terms for wheaten(s).  The ASSIGNOR agree(s), when requested by said ASSIGNEE and without charge to but at the ASSIGNEE, to do all acts which the ASSIGNEE may deem necessary, desirable or expecting, and in any the proceeding which may arise or be declared in relation to sane, such acts to include but not be limited to including separate assignments and declarations, taking all rightful oaths, providing sworn testimony, approducing evidence.  IN WITNESS WHEREOF, the undersigned inventor(s) has (have) affixed his/her/their signatures)  Seigi Furusako  1) (SIGNATURE) (DATE)  Tohru Okada September 29, (DATE)  Yasunobu Miyazaki   | DD  |  |  |  |  |  |
| Tride of invention  MECHANICAL JOINING APPARATUS AND MECHANICAL JOINING METHOR invention  relating to International Patent Application PCT/JP 2016 / 069718 and/or for which application of the United States was executed on even date herewith or, if not so executed, was:  (a) executed on September 29, 2017 / (b) filed on December 28, 2017 / (b) filed on 15 / 740,786 :  and to said application and all Letters Patent(s) of the United States granted on said application and any renewal, substitute, reissue or reexamination application based thereon, for the full term or terms for wheaten(s).  The ASSIGNOR agree(s), when requested by said ASSIGNEE and without charge to but at the ASSIGNEE, to do all acts which the ASSIGNEE may deem necessary, desirable or expecting, and in any the proceeding which may arise or be declared in relation to sane, such acts to include but not be limited to including separate assignments and declarations, taking all rightful oaths, providing sworn testimony, approducing evidence.  IN WITNESS WHEREOF, the undersigned inventor(s) has (have) affixed his/her/their signatures)  Seigi Furusako  1) (SIGNATURE) (DATE)  Tohru Okada September 29, (DATE)  Yasunobu Miyazaki   | DD  |  |  |  |  |  |
| Tride of invention  MECHANICAL JOINING APPARATUS AND MECHANICAL JOINING METHOR invention  relating to International Patent Application PCT/JP 2016 / 069718 and/or for which application of the United States was executed on even date herewith or, if not so executed, was:  (a) executed on September 29, 2017 / (b) filed on December 28, 2017 / (b) filed on 15 / 740,786 :  and to said application and all Letters Patent(s) of the United States granted on said application and any renewal, substitute, reissue or reexamination application based thereon, for the full term or terms for wheaten(s).  The ASSIGNOR agree(s), when requested by said ASSIGNEE and without charge to but at the ASSIGNEE, to do all acts which the ASSIGNEE may deem necessary, desirable or expecting, and in any the proceeding which may arise or be declared in relation to sane, such acts to include but not be limited to including separate assignments and declarations, taking all rightful oaths, providing sworn testimony, approducing evidence.  IN WITNESS WHEREOF, the undersigned inventor(s) has (have) affixed his/her/their signatures)  Seigi Furusako  1) (SIGNATURE) (DATE)  Tohru Okada September 29, (DATE)  Yasunobu Miyazaki   | DD  |  |  |  |  |  |
| Tride of invention  MECHANICAL JOINING APPARATUS AND MECHANICAL JOINING METHOR invention  relating to International Patent Application PCT/JP 2016 / 069718 and/or for which application of the United States was executed on even date herewith or, if not so executed, was:  (a) executed on September 29, 2017 / (b) filed on December 28, 2017 / (b) filed on 15 / 740,786 :  and to said application and all Letters Patent(s) of the United States granted on said application and any renewal, substitute, reissue or reexamination application based thereon, for the full term or terms for wheaten(s).  The ASSIGNOR agree(s), when requested by said ASSIGNEE and without charge to but at the ASSIGNEE, to do all acts which the ASSIGNEE may deem necessary, desirable or expecting, and in any the proceeding which may arise or be declared in relation to sane, such acts to include but not be limited to including separate assignments and declarations, taking all rightful oaths, providing sworn testimony, approducing evidence.  IN WITNESS WHEREOF, the undersigned inventor(s) has (have) affixed his/her/their signatures)  Seigi Furusako  1) (SIGNATURE) (DATE)  Tohru Okada September 29, (DATE)  Yasunobu Miyazaki   | DD  |  |  |  |  |  |
| relating to International Patent Application PCT/JP 2016 / 069718 and/or for which application of the United States was executed on even date herewith or, if not so executed, was:  (a) executed on September 29, 2017 (b) filed on December 28, 2017 (c) Serial No. 15 / 740,786.  (a) executed on September 29, 2017 (b) filed on December 28, 2017 (c) Serial No. 15 / 740,786.  (a) executed on September 29, 2017 (b) filed on December 28, 2017 (c) Serial No. 15 / 740,786.  (b) filed on December 28, 2017 (c) Serial No. 15 / 740,786.  (c) To Assignce's attorney is hereby authorized to insert in (b) data, when known.  (c) The Assignce's attorney is hereby authorized to insert in (b) data, when known.  (c) The Assignce's attorney is hereby authorized to insert in (b) data, when known.  (c) The Assignce's attorney is hereby authorized to insert in (b) data, when known.  (c) The Assignce's attorney is hereby authorized to insert in (b) data, when known.  (c) The Assignce's attorney is hereby authorized to insert in (b) data, when known.  (c) The Assignce's attorney is hereby authorized to insert in (b) data, when known.  (c) The Assignce's attorney is hereby authorized to insert in (b) data, when known.  (c) The Assignce's attorney is hereby authorized to insert in (b) data, when known.  (c) The Assignce's attorney is hereby authorized to insert in (b) data, when known.  (d) The Assignce's attorney is hereby authorized to insert in (b) data, when known.  (d) The Assignce's attorney is hereby authorized to insert in (b) data, when known.  (d) The Assignce's attorney is hereby authorized to insert in (b) data, when known.  (d) The Assignce's attorney is hereby authorized to insert in (b) data, when known.  (d) The Assignce's attorney is hereby authorized to insert in (b) data, when known.  (d) The Assignce's attorney is hereby authorized to insert in (b) data, when known.  (d) The Assignce's attorney is hereby authorized to insert in (b) data, when known.  (e) The Assignce's attorney is hereby authorized to insert in (b) data, |   |  |  |  |  |  |
| Patent of the United States was executed on even date herewith or, if not so executed, was:  (a) executed on September 29, 2017  (b) filed on December 28, 2017  Serial No. 15 / 740,786  and to said application and all Letters Patent(s) of the United States granted on said application and any renewal, substitute, reissue or reexamination application based thereon, for the full term or terms for whe Patent(s) may be granted and including any extensions thereof (collectively, hereinafter, "said application Patent(s)").  The ASSIGNOR agree(s), when requested by said ASSIGNEE and without charge to but at the ASSIGNEE, to do all acts which the ASSIGNEE may deem necessary, desirable or expedient, for securing enforcing protection for said invention, including in the preparation and prosecution of said application(es said Letters Patent(s), in any interference, reissue, reexamination, or public use proceeding, and in any is proceeding which may arise or be declared in relation to same, such acts to include but not be limited to including separate assignments and declarations, taking all rightful oaths, providing sworn testimony, any producing evidence.  IN WITNESS WHEREOF, the undersigned inventor(s) has (have) affixed his/her/their signatures)  Signatures)  Tohru Okada  September 29, Yasunobu Miyazaki  Yasunobu Miyazaki  | ation for Letters   |  |  |  |  |  |
| of execution of application, foot concurrent)  (b) filed on December 28, 2017 Serial No. 15 / 740,786  and to said application and all Letters Patent(s) of the United States granted on said application and any renewal, substitute, reissue or reexamination application based thereon, for the full term or terms for whe Patent(s) may be granted and including any extensions thereof (collectively, hereinafter, "said application Patent(s)").  The ASSIGNOR agree(s), when requested by said ASSIGNEE and without charge to but at the ASSIGNEE, to do all acts which the ASSIGNEE may deem necessary, desirable or expedient, for securing enforcing protection for said invention, including in the preparation and prosecution of said application(s said Letters Patent(s), in any interference, reissue, reexamination, or public use proceeding, and in any I proceeding which may arise or be declared in relation to same, such acts to include but not be limited to including separate assignments and declarations, taking all rightful oaths, providing sworn testimony, approducing evidence.  IN WITNESS WHEREOF, the undersigned inventor(s) has (have) affixed his/her/their signature.  Seiji Furusako  1) (SIGNATURE) (TYPE NAME) (DATE)  Yasunobu Miyazaki  Yasunobu Miyazaki   |   |  |  |  |  |  |
| of application, frot Serial No. 15 / 740,786.  and to said application and all Letters Patent(s) of the United States granted on said application and any renewal, substitute, reissue or reexamination application based thereon, for the full term or terms for wheatent(s) may be granted and including any extensions thereof (collectively, hereinafter, "said application Patent(s)").  The ASSIGNOR agree(s), when requested by said ASSIGNEE and without charge to but at the ASSIGNEE, to do all acts which the ASSIGNEE may deem necessary, desirable or expedient, for securing enforcing protection for said invention, including in the preparation and prosecution of said applications, said Letters Patent(s), in any interference, reissue, reexamination, or public use proceeding, and in any I proceeding which may arise or be declared in relation to same, such acts to include but not be limited to including separate assignments and declarations, taking all rightful oaths, providing sworn testimony, as producing evidence.  IN WITNESS WHEREOF, the undersigned inventor(s) has (have) affixed his/her/their signatures.  Seiji Furusako  1) Seiji Furusako  1) (SIGNATURE) Tohru Okada September 29, (DATE)  Yasunobu Miyazaki  Yasunobu Miyazaki  | the appointed   |  |  |  |  |  |
| and to said application and all Letters Patent(s) of the United States granted on said application and any renewal, substitute, reissue or reexamination application based thereon, for the full term or terms for wheatent(s) may be granted and including any extensions thereof (collectively, hereinafter, "said application Patent(s)").  The ASSIGNOR agrec(s), when requested by said ASSIGNEE and without charge to but at the ASSIGNEE, to do all acts which the ASSIGNEE may deem necessary, desirable or expedient, for securing enforcing protection for said invention, including in the preparation and prosecution of said application(s said Letters Patent(s), in any interference, reissue, reexamination, or public use proceeding, and in any hyproceeding which may arise or be declared in relation to same, such acts to include but not be limited to including separate assignments and declarations, taking all rightful oaths, providing sworn testimony, as producing evidence.  IN WITNESS WHEREOF, the undersigned inventor(s) has (have) affixed his/her/their signatures)  Seiji Furusako  1)  (SIGNATURE)  Tohru Okada  September 29,  (TYPE NAME)  (DATE)  Yasunobu Miyazaki  3)  Yasunobu Miyazaki   | іне ѕресізієй   |  |  |  |  |  |
| renewal, substitute, reissue or reexamination application based thereon, for the full term or terms for wheatent(s) may be granted and including any extensions thereof (collectively, hereinafter, "said application Patent(s)").  The ASSIGNOR agree(s), when requested by said ASSIGNEE and without charge to but at the ASSIGNEE, to do all acts which the ASSIGNEE may deem necessary, desirable or expedient, for securing enforcing protection for said invention, including in the preparation and prosecution of said application(said Letters Patent(s), in any interference, reissue, reexamination, or public use proceeding, and in any I proceeding which may arise or be declared in relation to same, such acts to include but not be limited to including separate assignments and declarations, taking all rightful oaths, providing sworn testimony, as producing evidence.  IN WITNESS WHEREOF, the undersigned inventor(s) has (have) affixed his/her/their signatures)  Seigi Furusako  1)  (SIGNATURE)  Tohru Okada  September 29,  (TYPE NAME)  (DATE)  Yasunobu Miyazaki  3)  Yasunobu Miyazaki  |   |  |  |  |  |  |
| ASSIGNEE, to do all acts which the ASSIGNEE may deem necessary, desirable or expedient, for securing enforcing protection for said invention, including in the preparation and prosecution of said application(s said Letters Patent(s), in any interference, reissue, reexamination, or public use proceeding, and in any I proceeding which may arise or be declared in relation to same, such acts to include but not be limited to including separate assignments and declarations, taking all rightful oaths, providing sworn testimony, as producing evidence.  IN WITNESS WHEREOF, the undersigned inventor(s) has (have) affixed his/her/their signature.  Seiji Furusako  1)  (SIGNATURE)  Tohru Okada  September 29,  (TYPE NAME)  (DATE)  Yasunobu Miyazaki  3)  Yasunobu Miyazaki   | and to said application and all Letters Patent(s) of the United States granted on said application and any continuation, division, renewal, substitute, reissue or reexamination application based thereon, for the full term or terms for which the said Letters Patent(s) may be granted and including any extensions thereof (collectively, hereinafter, "said application(s) and Letters Patent(s)"). |  |  |  |  |  |
| Seiji Furusako  (SIGNATURE)  (SIGNATURE)  (TYPE NAME)  (DATE)  Tohru Okada  (SIGNATURE)  (TYPE NAME)  (DATE)  Yasunobu Miyazaki   | , maintaining and<br>) and the issuance of<br>tigation or other legal<br>executing all papers,  |  |  |  |  |  |
| (SIGNATURE)  (SIGNATURE)  (TYPE NAME)  (DATE)  Tohru Okada  (SIGNATURE)  (TYPE NAME)  (TYPE NAME)  (TYPE NAME)  (DATE)  Yasunobu Miyazaki   | :(s).   |  |  |  |  |  |
| Tohru Okada September 29, (TYPE NAME)  Yasunobu Miyazaki  |   |  |  |  |  |  |
| (SIGNATURE) (TYPE NAME) (DATE)  Yasunobu Miyazaki  3)   |   |  |  |  |  |  |
| Yasunobu Miyazaki   | 2017  |  |  |  |  |  |
| 3)  |   |  |  |  |  |  |
| (SIGNATURE) (TYPE NAME) (DATE)  |   |  |  |  |  |  |
| Fuminori Watanabe   | NoNo. Secretaria de canda   |  |  |  |  |  |
| 4)(SIGNATURE)   |   |  |  |  |  |  |
| Yoshiaki Nakazawa   |   |  |  |  |  |  |
| 5)(SIGNATURE) (TYPE NAME) (DATE)  |   |  |  |  |  |  |
|   |   |  |  |  |  |  |
| (SIGNATURE) (TYPE NAME) (DATE)  |   |  |  |  |  |  |
| 7)(SIGNATURE) (TYPE NAME) (DATE)  |   |  |  |  |  |  |
| (SIGNATURE) (TYPE NAME) (DATE)  |   |  |  |  |  |  |

(TYPE NAME)

PATENT REEL: 044509 FRAME: 0176

(DATE)

**RECORDED: 12/29/2017** 

(SIGNATURE)