

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

Assignment ID: PATI515426

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT
CONVEYING PARTY DATA	
Name	Execution Date
Kohei SEYAMA	09/19/2024
Takahiro SHIMIZU	11/14/2020
RECEIVING PARTY DATA	
Company Name:	SHINKAWA LTD.
Street Address:	51-1, Inadaira 2-chome, Musashimurayama-shi,
City:	Tokyo
State/Country:	JAPAN
Postal Code:	208-8585
PROPERTY NUMBERS Total: 1	
Property Type	Number
Application Number:	18012944
CORRESPONDENCE DATA	
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ATTORNEY DOCKET NUMBER:	121204-US-1781-PCT
NAME OF SUBMITTER:	Donna Wu
SIGNATURE:	Donna Wu
DATE SIGNED:	09/24/2024
Total Attachments: 6	
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**DECLARATION AND ASSIGNMENT
FOR UTILITY OR DESIGN PATENT APPLICATION**

☐ Declaration Submitted With Initial Filing

OR

☒ Declaration Submitted After Initial Filing (surcharge 37 CFR 1.16(f) required)

(Title of the Invention)

MANUFACTURING APPARATUS OF SEMICONDUCTOR DEVICE

As a below named inventor (hereinafter designated as the undersigned), I hereby declare that:

This declaration is directed to:

☐ The attached application,

OR

☒ United States Application Number or PCT International application number

PCT/2021/045830 Filed on December 13, 2021

The above-identified application was made or authorized to be made by me.

I believe I am the original inventor or an original joint inventor of a claimed invention in the application.

The undersigned hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

**DECLARATION AND ASSIGNMENT
FOR UTILITY OR DESIGN PATENT APPLICATION**

WHEREAS, the undersigned has invented certain new and useful improvements described in the application identified.

WHEREAS, SHINKAWA LTD. (Name of Assignee)

of 51-1, Inadaira 2-chome, Musashimurayama-shi, Tokyo, 208-8585, Japan (Address of Assignee)

hereinafter referred to as ASSIGNEE, is desirous of acquiring the undersigned's interest in the said invention and application and in any U.S. Letters Patent which may be granted on the same:

NOW, THEREFORE, TO ALL WHOM IT MAY CONCERN: Be it known that, for good and valuable consideration, receipt of which is hereby acknowledged by the undersigned, the undersigned has/have sold, assigned and transferred, and by these presents does/do sell, assign and transfer unto the said Assignee, and Assignee's successors and assigns, all his/her/their rights, title and interest in and to the said invention and application and all future improvements thereon, and in and to any Letters Patent which may hereafter be granted on the same in the United States, the said rights, title and interest to be held and enjoyed by said Assignee as fully and exclusively as it would have been held and enjoyed by said the undersigned had this Assignment and transfer not been made, to the full end and term of any Letters Patent which may be granted thereon, or of any division, renewal, continuation in whole or in part, substitution, conversion, reissue, prolongation or extension thereof.

The undersigned further agrees/agree that he/she/they will, without charge to said Assignee, but at Assignee's expense, cooperate with Assignee in the prosecution of said application and/or applications, execute, verify, acknowledge and deliver all such further papers, including applications for Letters Patent and for the reissue thereof, and instruments of assignment and transfer thereof, and will perform such other acts as Assignee Lawfully may request, to obtain or maintain Letters Patent for said invention and improvement, and to vest title thereto in said Assignee, or Assignee's successors and assigns.

**DECLARATION AND ASSIGNMENT
FOR UTILITY OR DESIGN PATENT APPLICATION**

Signature:	<i>Kohei Seyama</i>	Date:	<i>19th / Sep / 24</i>
Legal Name of Sole or First Inventor: Kohei SEYAMA			
Signature:		Date:	
Legal Name of Additional Joint Inventor: Takahiro SHIMIZU			

To: Shinkawa Co., Ltd. Technical Division General Manager

Invention proposal and invention authorization notice

Revised April 1, 2016

Notification date	November 14, 2020		Intellectual Property Division entry field number	Receipt number	Docket number		1367P-XX-000
Type of intellectual property	Patents, Utility models, Design patents, know-how, and others () (*1)						
Temporary name of invention, etc.	A die pick-up method that combines a non-contact pick-up method and an adhesion reducing mechanism						
In-house proposer (Inventors, etc.)	Own department (Department name)		Full name	Furigana (half-width)	Rank (#2)		
	Flip Chip Group		SEYAMA Kohei	セヤマコウヘイ	1		
	Flip Chip Group		SHIMIZU Takahiro	シミズタカヒロ	2		
Outside proposer (Inventors, etc.)	Own department (Institution name/department name)		Full name	Furigana (half-width)	Telephone number	Presence or absence of joint application	
Summary of intellectual property (Essence of invention)	<p>In the conventional flip-chip technologies, next-generation bonding technologies represented by hybrid bonding require that the die be picked up from the wafer and held in contact with the die's bonding surface while being transported, which can result in a modified bonding surface that prevents bonding. Several floating non-contact handling methods have been proposed as solutions, but when conventional technologies (such as needle pick-up and slide-type pick-up methods) are used to peel the die from the wafer tape during pick-up, the floating non-contact handling method is unable to hold the die sufficiently, making it impossible to pick up the die.</p> <p>This technology applies energy such as UV or heat to the adhesive layer between the wafer and die, thereby changing the physical properties of the adhesive layer and eliminating the adhesive force, and then performs pick-up and handling in combination with a non-contact pick-up mechanism, making it possible to pick up and mount the die without touching the connection surface that has been highly cleaned and surface activated in advance in next-generation low-temperature bonding such as hybrid bonding.</p>						
Attachment	Patent specification creation sheet - None (sent separately)						
★ Intellectual property rights attribution and consent (Article 3 of Employee Invention Handling Regulations)			Confirmation mark (only for our proposers)				
I (We) have confirmed that all the rights related to the claimed invention (invention/design) belong to the company by law.			(seal) (seal)				
Implementation (announcement) schedule	Yes/No	Scheduled date of working of the invention (*3):		2021/1/31		Place at working the invention:	
						Apparatus for working the invention:	
Preferred filing date			Reasons for no working (announcement) the invention				
Applicant	Our company / Collaboration with other companies (Co-applicant:) / Others:						
Preferred application form	JP application:		Core application Reinforcement application / Regular application				
	PCT application:		Required Designated country: China, South Korea, Taiwan, USA, Singapore) / Not required				
	Foreign application:		Required Designated country: China, South Korea, Taiwan, USA, Singapore) / Not required				
	Others:						
Background of intellectual property proposal (*4)/Reason (*5)							
Remarks / contact information							
Manager evaluation	Early rights acquisition	Yes / No	Reason for Yes: due to the proximity of the date of use at the customer				Evaluation of invention
	Manager's comment	Extremely important basic technology for performing room temperature bonding using mounting apparatus.					A
Manager reception date	November 14, 2020		Manager		SEYAMA Kohei (seal)		
Approval and decision of general manager	The proposed invention is approved as an employee invention:		Yes / No		If No, it is a business invention and the inventor can file a patent application individually.		
	Necessity for filing a patent application of the proposed invention:		Yes / No		If No, consider confidentiality management as know-how.		
	Necessity of confidentiality management of the proposed invention:		Yes / No		If Yes, keep confidential in order to secure prior use right.		
	Necessity of early acquisition of patent rights:		Yes / No		If Yes, select one of the following (Japan, Taiwan, South Korea, China, Singapore, USA)		
To inventor This is to inform you that the invention proposed by you has been certified as described above.							
General manager approval date	November 16, 2020		General manager of engineering division		SAKUMA Takumi (seal)		

(*1) Please circle the applicable items. (Same for other columns)

(*2) Please enter the ranking of the inventor in numbers.

(*3) Please state the earliest known date of implementation of the present invention.

Exploitation of an invention means, in the invention of a product, any one of the actions such as production, use, assigning (whether with or without consideration), leasing, export or import, offer to sell (exhibition at an exhibition), etc.

(*4) If there are related prior applications or products that have already been commercialized, please describe the difference from them.

General manager of technical division		IP section reception stamp
File	Do not file	
(seal)		(seal)

PATENT
REEL: 068670 FRAME: 0426

(*5) In case of regular application, PCT application and foreign application, please state the necessity.

株式会社新川 技術本部長 殿

発明提案書 兼 発明認定通知書

平成28年4月1日改定

届出日	2020年11月14日	*知的財産権記入欄 受付番号 整理番号		1367P-XX-000	
知的財産の種類	(特許)・実用新案・意匠・ノウハウ・その他() (注1)				
発明等の仮名称	非接触ピックアップ工法と粘着力低下機構を組み合わせたダイのピックアップ方法				
社内提案者 (発明者等)	所属(部署名)	氏名	フリガナ(半角)	順位(注2)	
	フリップチップグループ	瀬山耕平	セヤマコウヘイ	1	
	フリップチップグループ	清水孝寛	シミス タヒロ	2	
社外提案者 (発明者等)	所属(機関名・部署名)	氏名	フリガナ(半角)	電話番号	共同出願の有無
知的財産の概要 (発明のエッセンス)	<p>従来技術では フリップチップ工法のうちハイブリッドボンディングに代表される次世代接合技術において、ウェハーからダイをピックアップし移送する際にダイの接合面となる面を接触保持したうえでハンドリングするため、接合面が改質し接合が出来ない問題があった。その解決策として浮上式非接触ハンドリング方法がいくつか提案されているが、依然ピックアップ時にウェハーテープからのダイの剥離で従来技術(例えば針付き上げ、スライド式ピックアップ工法)を使用した場合、浮上式非接触ハンドリングでは十分に保持できないためピックアップが出来なかった。</p> <p>本技術では ウェハーとダイの間の粘着層にUVや熱などのエネルギーを加えることで、粘着層の物性を変化させて粘着力を消失させ、その後非接触のピックアップ機構を組み合わせたピックアップ、ハンドリングを行うことにより、ハイブリッドボンディングなどの次世代低温接合においてあらかじめ高クリーン度及び表面活性化された接合面に触れることなくピックアップ、実装することが可能となった。</p>				
添付資料	出願明細書作成シート ・ 無(別途送付)				
★知的財産権の会社帰属および同意 (職務発明取扱規程第3条)					
私(達)は、標記の発明(考案・意匠)に関する全ての権利が法の定めにより会社に帰属することを確認します。		確認印(当社提案者のみ) (株新川) 20.11.14 (株新川) 20.11.14 清水			
実施(発表)予定	<input checked="" type="radio"/> 有 <input type="radio"/> 無	実施(予定)日(注3)	2021年 1月 31日	実施装置	
出願希望日		実施(発表)予定日 無い場合の理由			
出願人	<input checked="" type="radio"/> 当社単独 ・ 他社と共同 (共同出願人:) ・ その他:				
希望出願形態	日本出願:	<input checked="" type="radio"/> コア出願 ・ 補強出願 ・ 通常出願			
	PCT出願:	<input checked="" type="radio"/> 要(移行国:中国、韓国、台湾、米、シンガポール) ・ 不要			
	外国出願:	<input checked="" type="radio"/> 要(移行国:中国、韓国、台湾、米、シンガポール) ・ 不要			
	その他:				
知的財産提案の経緯(注4)・理由(注5)					
備考・連絡事項					
所屬長評価	早期権利化	要 <input checked="" type="radio"/> 不要	要の理由:		発明の評価
	所屬長コメント	常温接合を実装装置で行う上で極めて重要な基礎技術			A
所屬長受付日	2020年11月14日	所屬長 瀬山 耕平		(株新川) 20.11.14 瀬山	
本部長の認定・決定	本発明を職務発明と認定:	<input checked="" type="radio"/> 要 <input type="radio"/> 不要	不要の場合は、業務発明となり発明者は個人で出願が可能。		
	本発明の特許出願:	<input checked="" type="radio"/> 要 <input type="radio"/> 不要	不要の場合は、ノウハウとして秘密管理を検討する。		
	本発明のノウハウ秘密管理:	要 <input checked="" type="radio"/> 不要	要の場合は、先使用权確保のため秘密管理する。		
	本発明の早期権利の取得:	要 <input checked="" type="radio"/> 不要	要の場合は、次のいずれかを選択 (日本・台湾・韓国・中国・シンガポール・米国)		
発明者殿 貴殿より提案がありました発明について上記のとおり通知致します。					
本部長認定日	2020年11月16日	技術本部長	佐久間 巧	(株新川) 20.11.16 佐久間巧 印	

(注1) 該当項目をマルで囲んでください。(他の欄も同様)

(注2) 発明者の順位を数字で記載ください。

(注3) 本発明を実施した公知となる最先の日を記載ください。

発明の実施とは、物の発明では、その物を生産、使用、譲渡(有償無償は不問)、貸し出し、輸出又は輸入、譲渡の申し出(展示会へ出品)等の行為のいずれか1つでも該当した場合です。

(注4) 関連の先出願・既に製品化されたものがある場合は、それらとの違いも記載ください。

(注5) 通常出願、PCT出願及び外国出願の場合は、その必要性も記載ください。

技術本部長		知財課受付印
出 願	不 出 願	
(株新川) 20.11.16 佐久間巧		(株新川) 20.11.17 伊勢

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RECORDED: 09/24/2024

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