504854210 04/05/2018

PATENT ASSIGNMENT COVER SHEET

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SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
XIA TING FENG	03/07/2018
GAO MING LU	03/07/2018
YUAN HUI LI	03/07/2018
XI WEI ZHANG	03/07/2018

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State/Country:	CHINA
Postal Code:	110819

PROPERTY NUMBERS Total: 1

Property Type	Number
Application Number:	15764668

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NAME OF SUBMITTER:	JOE MCKINNEY MUNCY
SIGNATURE:	/Joe McKinney Muncy/
DATE SIGNED:	04/05/2018

Total Attachments: 2

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> **PATENT REEL: 045445 FRAME: 0259** 504854210

ASSIGNMENT BY INVENTOR(S) OF U.S. APPLICATION

WHEREAS, I am the original, first and sole inventor and I own (if only one name is listed below) or an original, first and joint inventor and the joint inventors own (if plural names are listed below) (referred to as "ASSIGNOR" below) the subject matter which is claimed and for which a patent is sought on the invention (referred to as the "INVENTION" below) entitled:

Ti	tle:	CUTTER HEAD FOR MICROWAVE PRESPLIT	TING TYPE HARD-ROCK TUN	NEL BORING MACHINE
th	e spe	ecification of which (check one):		
		is executed on even date herewith.		
L	_	was filed on (day-month-year)	as U.S. Application Number	
	x	was filed on (day-month-year) 9-6-2017	as PCT Application Number	PCT/CN2017/087699
L		was executed on the following date(s)		;
		WHEREAS, Northeastern University;		•

having a postal address of

No.11, Lane 3, Wenhua Road, Heping District, Shenyang City, Liaoning Province, 110819, China;

(referred to as "ASSIGNEE" below) desires to acquire the entire right, title and interest in and to the same in the U.S.;

NOW, THEREFORE, for good and valuable consideration, the receipt and adequacy of which is hereby acknowledged, ASSIGNOR, by these presents does sell, assign and transfer unto ASSIGNEE, the entire right, title, and interest in and to said INVENTION and application throughout the United States of America, including any and all patents granted on any division, continuation, continuation-in-part and reissue of said application.

ALSO, ASSIGNOR hereby agrees to execute any documents that legally may be required in connection with the filing, prosecution and maintenance of said application or any other patent applications in the United States for said INVENTION, including additional documents that may be required to affirm the rights of ASSIGNEE in and to said INVENTION, all without further consideration. ASSIGNOR also agrees, without further consideration and at ASSIGNEE's expense, to identify and communicate to ASSIGNEE at ASSIGNEE's request documents and information concerning the INVENTION that are within ASSIGNOR's possession or control, and to provide further assurances and testimony on behalf of ASSIGNEE that lawfully may be required of ASSIGNOR in respect of the prosecution, maintenance and defense of any patent application or patent encompassed within the terms of this instrument. ASSIGNOR's obligations under this instrument shall extend to ASSIGNOR's heirs, executors, administrators and other legal representatives.

ALSO, ASSIGNOR hereby authorizes and requests the Commissioner of Patents and Trademarks to issue any and all patents referred to above to ASSIGNEE, as the ASSIGNEE of the entire right, title and interest in and to the same, for ASSIGNEE's sole use and behoof; and for the use and behoof of ASSIGNEE's legal representatives and successors, to the full end of the term for which such patent may be granted, as fully and entirely as the same would have been held by ASSIGNOR had this assignment and sale not been made.

Full Name of First or Sole Inventor Post Office Address No.11, Lane 3, Wenhua Road, Heping District, Shenyang City, Liaoning Province, 110819, China	
Citizenship Chinese	Residence (city, and either state or foreign country, MPEP §605.02) No.11, Lane 3, Wenhua Road, Heping District, Shenyang City, Liaoning Province, 110819, China
Date March 7, 2018	Signature Feng Xinting

Chinese No.11, Lane 3, Wenhua Road, Heping District, Shenyang Ci Liaoning Province, 110819, China Date Signature LU Gaoming	III Name of Second Inventor LU, Gao ming	Post Office Address No.11, Lane 3, Wenhua Road, Heping District, Shenyang City, Liaoning Province, 110819, China
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1411011 7, 2010	March 7, 2018	Signature LU Gasming

REEL: 045445 FRAME: 0260

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Date	Signature

PATENT REEL: 045445 FRAME: 0261

RECORDED: 04/05/2018