#### 505259134 01/02/2019

#### PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2 EPAS ID: PAT5305906

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

#### **CONVEYING PARTY DATA**

Name	Execution Date
MARK BRADSHAW KRAELING	12/21/2018
GLENN ROBERT SHAFFER	12/19/2018
EMAD ANDARAWIS ANDARAWIS	12/19/2018
GLEN WILLIAM BROOKSBY	12/19/2018
CHRISTOPHER GUSHEE	12/20/2018
JEFFREY MAYTON	12/18/2018
CHENG-PO CHEN	12/20/2018
NANCY CECELIA STOFFEL	12/19/2018
WYATT SMITH	12/21/2018
JOSE LUIS R. VIRGEN	12/18/2018
DANIEL L. OLSON	12/19/2018

#### **RECEIVING PARTY DATA**

Name:	GE GLOBAL SOURCING LLC
Street Address:	901 MAIN AVENUE
City:	NORWALK
State/Country:	CONNECTICUT
Postal Code:	06851

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

Property Type	Number
Application Number:	16229305

#### **CORRESPONDENCE DATA**

**Fax Number:** (314)584-4062

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:** 314-584-4080

Email: Docket@splglaw.com, gpodckt.mail@ge.com

Correspondent Name: GE GPO- TRANSPORTATION- THE SMALL PATENT

Address Line 1:225 S. MERAMEC, SUITE 725Address Line 4:ST. LOUIS, MISSOURI 63105

PATENT 505259134 REEL: 047883 FRAME: 0481

ATTORNEY DOCKET NUMBER:	272741-7US (552-241US3)		
NAME OF SUBMITTER:	CHRISTOPHER R. CARROLL		
SIGNATURE:	/Christopher R. Carroll/		
DATE SIGNED:	01/02/2019		
Total Attachments: 13			
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## COMBINED DECLARATION AND GLOBAL ASSIGNMENT FOR UTILITY OR DESIGN PATENT APPLICATION

As the below named inventor(s), I/we hereby declare that:

This declaration and assignment are directed to:

# MINING DETECTION SYSTEM AND METHOD the specification of which is attached hereto OR United States application or PCT international application number 16/229,305 filed on December 21, 2018, as amended on [date] (if applicable). (We hereby authorize and request the Company or its delegated attorneys or agents to insert above the application number and filing date of the application when known.)

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

We believe that we are original joint inventors of a claimed invention in the application.

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

We have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment referred to above.

We acknowledge the duty to disclose information which is material to the patentability of this application as defined in 37 CFR § 1.56, including, for continuation-in-part applications, material information which became available between the filing date of the prior application and the filing date of the continuation-in-part application.

In accordance with our obligation(s) under an Employee Innovation and Proprietary Information Agreement or (as applicable) arising out of other agreements (such as, but not limited to, the Services Agreement between General Electric Company, a New York corporation, and our employers), and/or for other good and valuable consideration of which we acknowledge receipt, I/we,

Inventor First Name	Inventor Middle Name	Inventor Last Name		Residence Town	Residence State	Residence Country
Mark	Bradshaw	Kraeling	of	Melbourne	FL	US
Glenn	Robert	Shaffer	of	Erie	PA	US
Emad	Andarawis	Andarawis	of	Ballston Lake	NY	US
Glen	William	Brooksby	of	Glenville	NY	US
Christopher		Gushee	of	Marietta	GA	US

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Jeffrey		Mayton	of	Winnabow	NC	US
Cheng-Po		Chen	of	Niskayuna	NY	US
Nancy	Cecelia	Stoffel	of	Schenectady	NY	US
Wyatt		Smith	of	Media	PA	US
Jose	Luis R.	Virgen	of	Salt Lake City	UT	US
Daniel	L.	Olson	of	New Berlin	WI	US

hereby sell and assign to:

Name of Company: GE Global Sourcing LLC
Entity Type (optional): Delaware Limited Liability Company
Address: 901 Main Avenue, Norwalk Connecticut, 06851 USA

herein referred to as "Company", its successors and assigns our entire respective rights, titles and interests in and to the invention and improvements made or conceived by us described in the application(s) listed above and in the following table:

Country of Filing	Type of Filing	Application Number	Filing Date	Title

(We hereby authorize and request the Company or its delegated attorneys or agents to insert above the application number and filing date of the application(s) when known.)

and any and all applications for patent and patents therefrom in any and all countries, including all divisions, continuations, continuations-in-part, reexaminations, renewals, and reissues thereof, and all rights of priority resulting from the filing of the application(s), and authorize and request any official whose duty it is to issue patents, to issue any patent on the inventions and improvements resulting therefrom to the Company, or its successors or assigns, and agree that on request and without further consideration, we will communicate to the Company or its representatives or nominees any facts known to us respecting the inventions and improvements and testify in any legal proceeding, make all rightful oaths, sign all lawful papers and execute all instruments or documents required or requested for the making and prosecution of any applications of any type for patent, utility model, or other similar rights in all countries including, but not limited to, any provisional, non-provisional, continuation, continuation-in-part, divisional, renewal or substitute thereof, for any derivation proceedings relating thereto, and, as to any patents that issue from such applications, for any supplemental examination, derivation proceeding, opposition, post grant review, reissue, re-examination, inter partes review, or extension thereof, and generally do everything possible to aid the Company, its successors, assigns, and nominees to obtain and enforce proper patent protection for the invention and its improvements in all countries.

Remuneration claims of the inventor(s)/assignor(s) potentially arising from German Law on Employee Inventions, or any other respective country law, remain unaffected by this assignment.

This day of, before me personally came the above-named Mark Bradshaw Kraeling to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he executed the same of his own free will for the purposes therein set forth.  Seal	INVENTOR 1	
Signature  Scott D. Nelson  Printed Name of Witness  Witnessed by: Signature  Date: D/21/B  Printed Name of Witness  SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY  Date:		Date: 21-060- 2016
Printed Name of Witness  Witnessed by: Signature  David TEETER  Printed Name of Witness  SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY  Date:		Date: 21-Dec -18
Witnessed by: Signature  David TEETER  Printed Name of Witness  SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY  Date:		
SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY  Date:  Mark Bradshaw Kraeling  STATE OF  Ss.  COUNTY OF  This day of, before me personally came the above-named Mark Bradshaw Kraeling to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he executed the same of his own free will for the purposes therein set forth.  Seal	Witnessed by:	Date: <u>12/21/15</u>
Date:    Date:     Date:     Date:     Date:	***************************************	
STATE OF  SS.  COUNTY OF  This day of, before me personally came the above-named Mark Bradshaw Kraeling to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he executed the same of his own free will for the purposes therein set forth.  Seal		
This day of, before me personally came the above-named Mark Bradshaw Kraeling to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he executed the same of his own free will for the purposes therein set forth.  Seal	Mark Bradshaw Kraeling	Date:
This day of, before me personally came the above-named Mark Bradshaw Kraeling to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he executed the same of his own free will for the purposes therein set forth.  Seal		
assignment, who acknowledged to me that he executed the same of his own free will for the purposes therein set forth.  Seal		
	assignment, who acknowledged to me that h	before me personally came the above-named nown as the individual who executed the foregoing e executed the same of his own free will for the
A TO AND A TO AND A TO A T	Seal	(Notary Public)

Printed Name of Witness  Witnessed by: Signature Signatu	INVENTOR 2	
Witnessed by: Signature  Date: 12/19/18  Printed Name of Witness  Witnessed by: Signature  Signature  Merry (1919)  Printed Name of Witness  SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY  Date: Dat		Date: <u>DEC 17, 2019</u>
Printed Name of Witness  Witnessed by: Signature Signature Verry Cra19 Printed Name of Witness  SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY  Date:	Witnessed by: Signature	Date: 12/9/18
Witnessed by: Signature    Signature   Date:   12 / 19 / 18     Printed Name of Witness     SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY	Dans R. Grasol	
Printed Name of Witness  SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY  Date:  Glenn Robert Shaffer  STATE OF  Ss.  COUNTY OF  This day of before me personally came the above-named Glenn Robert Shaffer to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he executed the same of his own free will for the purposes therein set forth.  Seal	Printed Name of Witness	
SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY  Date:  Glenn Robert Shaffer  STATE OF  Ss.  COUNTY OF  This day of before me personally came the above-named Glenn Robert Shaffer to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he executed the same of his own free will for the purposes therein set forth.  Seal	Witnessed by: King Canille Signature	Date: 12/19/18
Glenn Robert Shaffer  STATE OF  Ss.  COUNTY OF  This day of, before me personally came the above-named Glenn Robert Shaffer to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he executed the same of his own free will for the purposes therein set forth.  Seal	,	
STATE OF  SS.  COUNTY OF  This day of, before me personally came the above-named Glenn Robert Shaffer to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he executed the same of his own free will for the purposes therein set forth.  Seal	SECTION BELOW IS FOR USE ONLT IF SIG	
COUNTY OF  This day of, before me personally came the above-named Glenn Robert Shaffer to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he executed the same of his own free will for the purposes therein set forth.  Seal	Glenn Robert Shaffer	Date.
This day of, before me personally came the above-named Glenn Robert Shaffer to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he executed the same of his own free will for the purposes therein set forth.  Seal		
Glenn Robert Shaffer to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he executed the same of his own free will for the purposes therein set forth.  Seal		
	Glenn Robert Shaffer to me personally known as assignment, who acknowledged to me that he executed	the individual who executed the foregoing
	Seal	(Notary Public)

913145844062 ;

272741-7 (552-241US3)

INVENTOR 3	
Signature: and Cultury Century  Emad Andarawis Andarawis	Date: 12/19/2018
Witnessed by: Signature	Date: 12/19/2018
Vietor TORRES Printed Name of Witness	
Witnessed by: Signature	Date: 12/19/2018
DONATHAN SHORT Printed Name of Witness	
SECTION BELOW IS FOR USE ONLY IF SIG	NING IN PRESENCE OF A NOTARY
	Date:
Emad Andarawis Andarawis	
STATE OF ss. COUNTY OF	
This day of, bef  Emad Andarawis Andarawis to me personally kn  foregoing assignment, who acknowledged to me that he the purposes therein set forth.	orc me personally came the above-named own as the individual who executed the executed the same of his own free will for
Seal	
	(Notary Public)

#### INVENTOR 4

Signature: Glen William Brooksby	Date:
Witnessed by:Signature	Date:
Printed Name of Witness	
Witnessed by:Signature	Date:
Printed Name of Witness	
	Juy 19 19 20/8
STATE OF NEW YORK STATE OF NEW YORK	
This 19th day of December, 2 Glen William Brooksby to me personally l	before me personally came the above-names known as the individual who executed the foregoing he executed the same of his own free will for the Company Public)

INVENTOR 5	
Signature: Christopher Gushee	Date: 12/19/18
Witnessed by:Signature	Date:
Printed Name of Witness	
Witnessed by: Signature	Date:
Printed Name of Witness	
SECTION BELOW IS FOR USE ONLY I	Date: 12/20/18
STATE OF Con, identification of State of Conty of Congression of State of Congression of State of Congression of State of Congression of Cong	
Christopher Gushee to me personally know	before me personally came the above-named on as the individual who executed the foregoing e executed the same of his own free will for the
Seal MOTARY NOTARY NOTA	(Notary Public)

INVENTOR 6	
Signature: 4444444	The 12/18/18
Witnessed by: Signature	Date
Printed Name of Witness	
Witnessed by Signature	Date:
Printed Name of Witness	
	ONLY IF SIGNING IN PRESENCE OF A NOTARY  Date
Jeffrey Mayton	
STATE OF SS. COUNTY OF	
This day of leffrey Mayton to me personally known to me personally known to me personally known to me personally known to me purposes therein set forth	before me personally came the above-named nown as the individual who executed the foregoing that he executed the same of his own free will for the
	(Notary Public)

PATENT REEL: 047883 FRAME: 0490

INVENTOR 7	
Signature: Cheng-Po Chen	Date: 17/70/7018
Witnessed by:  Signature	Date: 12/20/24(5
Printed Name of Witness	
Witnessed by: Signature	Date: <u>(2/20/20/8</u>
<u>Down M. Shookhok</u> Printed Name of Witness	
SECTION BELOW IS FOR USE ONI	LY IF SIGNING IN PRESENCE OF A NOTARY
Cheng-Po Chen	Date:
chong a v chan	
STATE OF SS.	
Cheng-Po Chen to me personally know	before me personally came the above-named wn as the individual who executed the foregoing the executed the same of his own free will for the
Seal	
	(Notary Public)

INVENTOR 8	
Signature: Nancy Occia Stoffel	Date:
Witnessed by:	Date: 12/19/2018
Printed Name of Witness  Witnessed by: Apple Color Spenature  Printed Name of Witness	Date: <u>[2]19]2018</u>
SECTION BELOW IS FOR USE ONLY IF SIG	
Nancy Cecelia Stoffel	Date:
STATE OF ss. COUNTY OF	
This day of be Nancy Cecelia Stoffel to me personally known as taking assignment, who acknowledged to me that he execupurposes therein set forth.	fore me personally came the above-named the individual who executed the foregoing ted the same of his own free will for the
Seal	(Notary Public)

Printed Name of Witness	INVENTOR 9	
Printed Name of Witness  Witnessed by: Katherine M Vinci Signature  Katherine M Vinci Printed Name of Witness  SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY  Date:  Wyatt Smith  STATE OF  88.	Signature: Wyatt Smith	Date: 12/21/20/8
Witnessed by: Katherine M. Vinci  Signature  Katherine M. Vinci  Printed Name of Witness  SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY  Wyatt Smith  STATE OF  SS.	Winnessed by: <u>Lectrick Boldsm</u> Signature	が Date: 114/21/2014
Printed Name of Witness  SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY  Date:  Wyatt Smith  STATE OF  88.	T Patrick Goldsmith Printed Name of Witness	
Printed Name of Witness  SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY  Date:  Wyatt Smith  STATE OF  SS.	Witnessed by: <u>Katherine M. Vin</u> Signature	Date: 12/21/2018
SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY  Date: Wyatt Smith  STATE OF ss.		·
Wyatt Smith  STATE OF  ss.		
SS.	Wyatt Smith	Date:
COUNTROL	\$8.	
	COUNTROF	
This day of, before me personally came the above-name <b>Wyatt Smith</b> to me personally known as the individual who executed the foregoing assignment who acknowledged to me that he executed the same of his own free will for the purposes thereis set forth.	Wyatt Smith to me personally known as the who acknowledged to me that he executed to	ne individual who executed the foregoing assignment,
Seal (Notary Public)	Seal	(Notary Public)

### INVENTOR 10 Date: Signature: Jose Luis R. Virgen Witnesout by: \_\_\_\_\_\_\_Signature Printed Name of Witness Winesed by: Signature Date: Printed Name of Witness SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY Date: 12-18-18 Jose Lujs R. Vidgen STATE OF UHAY COUNTY OF SAIT LAIKE This $10^9$ day of 1260000, 200 before me personally came the above-named Jose Luis R. Virgen to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he executed the same of his own free will for the purposes therein set forth. MANAGER PARTIES Seal AMY L. MCKENZIE Notary Public - State of Utah Comm No. 698875 Commission Expression

INVENTOR 11	
Signature: Daniel L. Olson	Date: 12/19/19
Witnessed by: Marcy M. Asselin	Date: 12/19/18
Mercey M Asselin	
Printed Name of Witness Witnessed by:	Date: 12/19/18
Signature Scott Abendroth	, ,
Printed Name of Witness	
SECTION BELOW IS FOR USE ONLY IF SIG	
Daniel L. Olson	Date:
STATE OF	
county of	
This day of, bed  Daniel L. Olson to me personally known as the assignment, who acknowledged to me that he execu purposes therein set forth.	fore me personally came the above-named individual who executed the foregoing ted the same of his own free will for the
Seal	(Notary