### 503812141 05/04/2016

### PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2 EPAS ID: PAT3858789

SUBMISSION TYPE:	NEW ASSIGNMENT	
NATURE OF CONVEYANCE:	ASSIGNMENT	

#### **CONVEYING PARTY DATA**

Name	Execution Date
TIMOTHY J. BENDEL	10/29/2013
MARK V. KREIN	10/29/2013
DAVID N. JOFFE	10/26/2013
SANDI SETIAWAN	10/28/2013
WILLIAM ANTHONY NOBILI	11/08/2013
DAVID JOA	05/02/2016

#### **RECEIVING PARTY DATA**

Name:	BANK OF AMERICA CORPORATION
Street Address:	MAIL CODE NC 1-027-20-05
Internal Address:	214 N. TRYON ST.
City:	CHARLOTTE
State/Country:	NORTH CAROLINA
Postal Code:	28255

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

Property Type	Number	
Application Number:	15146345	

#### **CORRESPONDENCE DATA**

**Fax Number:** (312)463-5001

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:** 312-463-5000

Email: aonoda@bannerwitcoff.com
Correspondent Name: BANNER & WITCOFF, LTD.
Address Line 1: 10 S. WACKER DRIVE

Address Line 2: SUITE 3000

Address Line 4: CHICAGO, ILLINOIS 60606

ATTORNEY DOCKET NUMBER:	007131.01782
NAME OF SUBMITTER:	KENNETH F. SMOLIK
SIGNATURE:	/Kenneth F. Smolik/
DATE SIGNED:	05/04/2016

503812141 PATENT REEL: 038457 FRAME: 0166

	This document serves as an Oath/Declaration (37 CFR 1.63).
Total Attachments: 12	
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PATENT REEL: 038457 FRAME: 0167

### COMBINED DECLARATION (37 CFR 1.63) AND ASSIGNMENT FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention			PREDICTING ECONOMIC CONDITIONS
As the below	name	d inve	entor, I hereby declare that:
This declarati		$\boxtimes$	The attached application, or
			United States application or PCT international application number
The above-ide	entifie	d app	ilication was made or authorized to be made by me.
f believe that	Tam tl	he or	iginal inventor or an original joint inventor of a claimed invention in the application.
I 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.			
<del>2000000000000000000000000000000000000</del>	000000000000000000000000000000000000000	0000000000	ASSIGNMENT

WHEREAS, I, <u>Timothy J. Bendel</u> ("Assignor"), a citizen of the <u>United States</u> (Country), residing in <u>Charlotte, NC</u> (City, State/Province) have invented the above invention. If the following lines are blank, the above application was filed on even date herewith, otherwise, to comply with 37 C.F.R. § 3.21 for recordal of this assignment, I, an assignor below, hereby authorize the attorneys for Bank of America to insert the filing date and application number below after they become known and prior to filing the recordation.

U.S. Application No. 14/078,197 filed November 12, 2013

WHEREAS, BANK OF AMERICA CORPORATION ("Assignee"), a Corporation duly organized under the laws of the State of Delaware, and having its offices and place of business at Charlotte, North Carolina, is desirous of acquiring the entire right, title and interest in and to the aforesaid inventions and in and to all applications and Letters Patent therefor granted in the United States of America, and in any and all countries foreign thereto:

NOW, THEREFORE, TO WHOM IT MAY CONCERN, be it known that, for good and valuable consideration, including salary or payment for the making of inventions, or employee benefits, the receipt and sufficiency of which is hereby acknowledged, I said Assignor, by these presents do sell, assign and transfer unto said Assignee, its successors, assigns and legal representatives, the full and exclusive right, title and interest for the territory of the United States of America and all countries foreign thereto, and throughout the world and in space, (including the right to apply for Letters Patent in foreign countries in its own name and to claim any priority rights for such foreign applications to which such applications are entitled under international conventions, treaties, or otherwise), in and to said inventions and in and to all applications and Letters Patent granted therefor, and all non-provisionals, divisionals, reissues, reexaminations, continuations, continuationin-parts and extensions thereof, and in and to all copyrights, trademarks with their associated goodwill, trade secrets, confidential information, and compilations, necessary or useful to make, use, or sell the inventions, I hereby authorize and request the Commissioner of Patents, and any official whose duty it is to issue patents, to issue all Letters Patent on said inventions or resulting therefrom to said Assignee, or its successors and assigns, as assignee of the entire right, title and interest. I represent and warrant that I have full right to agree to, execute, and deliver this assignment. I agree that I will without further consideration, but at the expense of Assignee, communicate to said Assignee, or its successors, assigns, or nominees, any and all facts known to me regarding said inventions whenever requested, and that I will execute all nonprovisional, divisional, reissue, reexamination, continuation and continuation-in-part applications, testify in any legal proceedings, sign all lawful papers, make all rightful oaths, and generally do everything reasonable for said Assignee, its successors, assigns, and nominees, to obtain and enforce proper patent protection for said inventions in all countries.

#### WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

purposes are not retained in the application file and therefore a LEGAL NAME OF INVENTOR	ere not publicly available.
Inventor: Timothy I. Bendel	Date:
Signature:	

Title of Invention	PREDICTING ECONOMIC CONDITIONS
As the below nan	ned inventor, I hereby declare that:
This declaration is directed to:	The attached application, or
	United States application or PCT international application number
The above-identi	fied application was made or authorized to be made by me.
I believe that I an	n the original inventor or an original joint inventor of a claimed invention in the application.
	edge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or not more than five (5) years, or both.
	ASSIGNMENT
State/Province) he date herewith, of authorize the attr	k V. Krein ("Assignor"), a citizen of the (Country), residing in (City, NC) lave invented the above invention. If the following lines are blank, the above application was filed on even therwise, to comply with 37 C.F.R. § 3.21 for recordal of this assignment, I, an assignor below, hereby borneys for Bank of America to insert the filing date and application number below after they become to filing the recordation.
	U.S. Application No. 14/078,197 filed November 12, 2013
Delaware, and ha title and interest	OF AMERICA CORPORATION ("Assignee"), a Corporation duly organized under the laws of the State of Iving its offices and place of business at Charlotte, North Carolina, is desirous of acquiring the entire right, in and to the aforesaid inventions and in and to all applications and Letters Patent therefor granted in the America, and in any and all countries foreign thereto:
payment for the said Assignor, by representatives, to countries foreign countries in its owentitled under interest and extern parts and extern confidential inforrequest the Comminventions or resinterest. I represe without further comminees, any arprovisional, divisi proceedings, sign	E, TO WHOM IT MAY CONCERN, be it known that, for good and valuable consideration, including salary or making of inventions, or employee benefits, the receipt and sufficiency of which is hereby acknowledged, I these presents do sell, assign and transfer unto said Assignee, its successors, assigns and legal the full and exclusive right, title and interest for the territory of the United States of America and all thereto, and throughout the world and in space, (including the right to apply for Letters Patent in foreign who name and to claim any priority rights for such foreign applications to which such applications are ternational conventions, treaties, or otherwise), in and to said inventions and in and to all applications and anted therefor, and all non-provisionals, divisionals, reissues, reexaminations, continuations, continuation-insions thereof, and in and to all copyrights, trademarks with their associated goodwill, trade secrets, mation, and compilations, necessary or useful to make, use, or sell the inventions. I hereby authorize and missioner of Patents, and any official whose duty it is to issue patents, to issue all Letters Patent on said ulting therefrom to said Assignee, or its successors and assigns, as assignee of the entire right, title and ent and warrant that I have full right to agree to, execute, and deliver this assignment. I agree that I will onsideration, but at the expense of Assignee, communicate to said Assignee, or its successors, assigns, or and all facts known to me regarding said inventions whenever requested, and that I will execute all non-onal, reissue, reexamination, continuation and continuation-in-part applications, testify in any legal real lawful papers, make all rightful oaths, and generally do everything reasonable for said Assignee, its as, and nominees, to obtain and enforce proper patent protection for said inventions in all countries.

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Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

purposes are not retained in the application life and therefore a	TE HOT PROMICTY AVAILABLE.
LEGAL NAME OF INVENTOR	
Inventor: Mark V. Krein	Date: 10 29 2013
Signature:	

Title of Invention	PREDICTING ECONOMIC CONDITIONS		
As the below r	named inventor, I hereby declare that:		
This declaration is directed to:	The attached application, or		
	United States application or PCT international application number		
The above-ide	ntified application was made or authorized to be made by me.		
I believe that I	am the original inventor or an original joint inventor of a claimed invention in the application.		
I 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.			
	ASSIGNMENT		
State/Province date herewith authorize the	avid N. Joffe ("Assignor"), a citizen of the <u>United States</u> (Country), residing in <u>Charlotte. NC</u> (City, e) have invented the above invention. If the following lines are blank, the above application was filed on even, otherwise, to comply with 37 C.F.R. § 3.21 for recordal of this assignment, I, an assignor below, hereby attorneys for Bank of America to insert the filing date and application number below after they become or to filing the recordation.		
	U.S. Application No. <u>14/078,197</u> , filed <u>November 12, 20</u> 13		
Delaware, and title and interes	NK OF AMERICA CORPORATION ("Assignee"), a Corporation duly organized under the laws of the State of having its offices and place of business at Charlotte, North Carolina, is desirous of acquiring the entire right, est in and to the aforesaid inventions and in and to all applications and Letters Patent therefor granted in the of America, and in any and all countries foreign thereto:		
payment for the said Assignor, representative countries fore countries in its entitled under Letters Patent in-parts and exconfidential in request the Coinventions or a interest. I represent the confidential in representation or a provisional, disproceedings, so	ORE, TO WHOM IT MAY CONCERN, be it known that, for good and valuable consideration, including salary or ne making of inventions, or employee benefits, the receipt and sufficiency of which is hereby acknowledged, I by these presents do sell, assign and transfer unto said Assignee, its successors, assigns and legal is, the full and exclusive right, title and interest for the territory of the United States of America and all ign thereto, and throughout the world and in space, (including the right to apply for Letters Patent in foreign cown name and to claim any priority rights for such foreign applications to which such applications are international conventions, treaties, or otherwise), in and to said inventions and in and to all applications and granted therefor, and all non-provisionals, divisionals, reissues, reexaminations, continuations, continuation-tensions thereof, and in and to all copyrights, trademarks with their associated goodwill, trade secrets, formation, and compilations, necessary or useful to make, use, or sell the inventions. I hereby authorize and immissioner of Patents, and any official whose duty it is to issue patents, to issue all Letters Patent on said resulting therefrom to said Assignee, or its successors and assigns, as assignee of the entire right, title and esent and warrant that I have full right to agree to, execute, and deliver this assignment. I agree that I will be consideration, but at the expense of Assignee, communicate to said Assignee, or its successors, assigns, or and all facts known to me regarding said inventions whenever requested, and that I will execute all nonvisional, reissue, reexamination, continuation and continuation-in-part applications, testify in any legal ign all lawful papers, make all rightful oaths, and generally do everything reasonable for said Assignee, its signs, and nominees, to obtain and enforce proper patent protection for said inventions in all countries.		

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LEGAL NAME OF INVENTOR	
Inventor: David N. Joffe	Date: 10-26-2013
Signature:	

Title of Invention	PREDICTING ECONOMIC CONDITIONS	
As the below	named inventor, I hereby declare that:	
This declaration is directed to:	No the account obbitation of	
	United States application or PCT international application number	
The above-ide	entified application was made or authorized to be made by me.	
I believe that	I am the original inventor or an original joint inventor of a claimed invention in the application.	
	owledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or tof not more than five (5) years, or both.	
	ASSIGNMENT	
State/Province date herewith authorize the	iandi Setiawan ("Assignor"), a citizen of the VX (Country), residing in CHARCOTE, NO (City, e) have invented the above invention. If the following lines are blank, the above application was filed on even a cherwise, to comply with 37 C.F.R. § 3.21 for recordal of this assignment, I, an assignor below, hereby attorneys for Bank of America to insert the filing date and application number below after they become for to filing the recordation.	
	U.S. Application No. <u>14/078.197</u> filed <u>November 12, 2</u> 013	
Delaware, and title and inter	NNK OF AMERICA CORPORATION ("Assignee"), a Corporation duly organized under the laws of the State of discussion duly organized under the laws of the State of discussions and place of business at Charlotte, North Carolina, is desirous of acquiring the entire right, lest in and to the aforesaid inventions and in and to all applications and Letters Patent therefor granted in the of America, and in any and all countries foreign thereto:	
NOW, THEREFORE, TO WHOM IT MAY CONCERN, be it known that, for good and valuable consideration, including salary or payment for the making of inventions, or employee benefits, the receipt and sufficiency of which is hereby acknowledged, I said Assignor, by these presents do sell, assign and transfer unto said Assignee, its successors, assigns and legal representatives, the full and exclusive right, title and interest for the territory of the United States of America and all countries foreign thereto, and throughout the world and in space, (including the right to apply for Letters Patent in foreign countries in its own name and to claim any priority rights for such foreign applications to which such applications are entitled under international conventions, treaties, or otherwise), in and to said inventions and in and to all applications and Letters Patent granted therefor, and all non-provisionals, divisionals, reissues, reexaminations, continuations, continuation-in-parts and extensions thereof, and in and to all copyrights, trademarks with their associated goodwill, trade secrets, confidential information, and compilations, necessary or useful to make, use, or sell the inventions. I hereby authorize and request the Commissioner of Patents, and any official whose duty it is to issue patents, to issue all Letters Patent on said inventions or resulting therefrom to said Assignee, or its successors and assigns, as assignee of the entire right, title and interest. I represent and warrant that I have full right to agree to, execute, and deliver this assignment. I agree that I will without further consideration, but at the expense of Assignee, communicate to said Assignee, or its successors, assigns, or nominees, any and all facts known to me regarding said inventions whenever requested, and that I will execute all non-provisional, divisional, reissue, reexamination, continuation and continuation-in-part applications, testify in any legal proceedings, sign all lawful papers, make all rightful oaths, and generally do		

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purposes are not retained in the application file and therefore are not publicly available.				
LEGAL NAME OF INVENTOR				
Inventor: Sandi Setiawan	Date:			
The state of the s				
Signature:				

Title of Invention	PREDICTING ECONOMIC CONDITIONS	
As the below	named Inventor, I hereby declare that:	
This deciaration is directed to:	(/ X	
	United States application or PCT international application number	
The above-Ide	entified application was made or authorized to be made by me.	
l believe that	I am the original inventor or an original joint inventor of a claimed invention in the application.	
imprisonmen	owledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or tof not more than five (5) years, or both.	
State/Provinc date herewith authorize the	ASSIGNMENT  Charlo He,  William Anthony Nobili ("Assignor"), a citizen of the  (Country), residing in Miss Carlin (City,  e) have invented the above invention. If the following lines are blank, the above application was filed on even  to therwise, to comply with 37 C.F.R. § 3.21 for recordal of this assignment, I, an assignor below, hereby  attorneys for Bank of America to insert the filing date and application number below after they become  for to filing the recordation.	
	U.S. Application No. <u>14/078,197</u> , filed <u>November 12, 2</u> 013	
Delaware, and little and linter	NK OF AMERICA CORPORATION ("Assignee"), a Corporation duly organized under the laws of the State of I having its offices and place of business at Charlotte, North Caroline, is desirous of acquiring the entire right, est in and to the aforesald inventions and in and to all applications and Letters Patent therefor granted in the of America, and in any and all countries foreign thereto:	
payment for it said Assignor, representative countries for countries in it entitled under Letters Paten in-parts and confidential is request the Conventions or interest. I repwithout furth nominees, an provisional, diproceedings,	FORE, TO WHOM IT MAY CONCERN, be it known that, for good and valuable consideration, including salary or the making of inventions, or employee benefits, the receipt and sufficiency of which is hereby acknowledged, I by these presents do sell, assign and transfer unto said Assignee, its successors, assigns and legal es, the full and exclusive right, title and interest for the territory of the United States of America and all sign thereto, and throughout the world and in space, (including the right to apply for Letters Patent in foreign is own name and to claim any priority rights for such foreign applications to which such applications are international conventions, treaties, or otherwise), in and to said inventions and in and to all applications and to granted therefor, and all non-provisionals, divisionals, reissues, reexaminations, continuations, continuations, internation, and compilations, necessary or useful to make, use, or sell the inventions. I hereby authorize and ommissioner of Patents, and any official whose duty it is to issue patents, to issue all Letters Patent on said resulting therefrom to said Assignee, or its successors and assigns, as assignee of the entire right, title and resent and warrant that I have full right to agree to, execute, and deliver this assignment. I agree that I will are consideration, but at the expense of Assignee, communicate to said Assignee, or its successors, assigns, or y and all facts known to me regarding said inventions whenever requested, and that I will execute all non-ivisional, reissue, reexamination, continuation and continuation-in-part applications, testify in any legal sign all lawful papers, make all rightful oaths, and generally do everything reasonable for said Assignee, its signs, and nominees, to obtain and enforce proper patent protection for said inventions in all countries.	

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LEGAL NAME OF INVENTOR			
Inventor: William Anthony Nobili	Date:		
Signature: 2. Phas buck	PSUC.		

Firm No.: 007131.01782 PMN: 5924 US3CIP1

# COMBINED DECLARATION (37 CFR 1.63) AND ASSIGNMENT FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention		PREDICTING ECONOMIC CONDITIONS
As the below name	d inven	rtor, I hereby declare that:
This declaration is directed to:		The attached application, or
		United States application or PCT international application number
The above-identific	ed appli	cation was made or authorized to be made by me.
I believe that I am	the orig	inal inventor or an original joint inventor of a claimed invention in the application.
·		t any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or than five (5) years, or both.
		ASSIGNMENT
State/Province) ha date herewith, oth	ve inver erwise, neys fo	Assignor"), a citizen of United States (Country), residing in <u>San Francisco, CA</u> (City, nited the above invention. If the following lines are blank, the above application was filed on even to comply with 37 C.F.R. §3,21 for recordal of this assignment, I, an assignor below, hereby r Bank of America to insert the filing date and application number below after they become he recordation.
	Ĭ.	J.S. Application No. 15/146,345 filed 05/04/2016
Delaware, and hav title and interest ir	ing its o and to	RICA CORPORATION ("Assignee"), a Corporation duly organized under the laws of the State of iffices and place of business at Charlotte, North Carolina, is desirous of acquiring the entire right, the aforesald inventions and in and to all applications and Letters Patent therefor granted in the and in any and all countries foreign thereto:
NOW, THEREFORE, TO WHOM IT MAY CONCERN, be it known that, for good and valuable consideration, including salary or payment for the making of inventions, or employee benefits, the receipt and sufficiency of which is hereby acknowledged, I said Assignor, by these presents do sell, assign and transfer unto said Assignee, its successors, assigns and legal representatives, the full and exclusive right, title and interest for the territory of the United States of America and all countries foreign thereto, and throughout the world and in space, (including the right to apply for Letters Patent in foreign countries in its own name and to claim any priority rights for such foreign applications to which such applications are entitled under international conventions, treaties, or otherwise), in and to said inventions and in and to all applications and Letters Patent granted therefor, and all non-provisionals, divisionals, reissues, reexaminations, continuations, continuations in-parts and extensions thereof, and in and to all copyrights, trademarks with their associated goodwill, trade secrets, confidential information, and compilations, necessary or useful to make, use, or sell the inventions. I hereby authorize and request the Commissioner of Patents, and any official whose duty it is to issue patents, to issue all Letters Patent on said inventions or resulting therefrom to said Assignee, or its successors and assigns, as assignee of the entire right, title and interest. I represent and warrant that I have full right to agree to, execute, and deliver this assignment. I agree that I will without further consideration, but at the expense of Assignee, communicate to said Assignee, or its successors, assigns, or nominees, any and all facts known to me regarding said inventions whenever requested, and that I will execute all non-provisional, divisional, reissue, reexamination, continuation and continuation-in-part applications, testify in any legal proceedings, sign all lawful papers, make all rightful oaths, and generally do		
proceedings, sign a successors, assigns	ill lawfu , and no	I papers, make all rightful oaths, and generally do everything reasonable for said Assignee, its princes, to obtain and enforce proper patent protection for said inventions in all countries.

[Page 1 of 2]

PATENT REEL: 038457 FRAME: 0178

Firm No.: 007131.01782 PMN: 5924 US3CIP1

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Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR	.ar
inventor: David loa	Date: <u>5-2-2016</u>
Signature: 000	

[Page 2 of 2]

PATENT REEL: 038457 FRAME: 0179