

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
 Stylesheet Version v1.2

EPAS ID: PAT6825251

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT
CONVEYING PARTY DATA	
Name	Execution Date
DINO PAUL D'AGOSTINO	02/08/2018
PERRY AARON JONES HALDENBY	10/16/2018
MILOS DUNJIC	02/08/2018
JEFFREY AARON ECKER	02/22/2018
ARUN VICTOR JAGGA	03/08/2018
JOHN JONG-SUK LEE	10/10/2018
ADAM DOUGLAS MCPHEE	03/07/2018
DEAN C.N. TSERETOPOULOS	02/22/2018
RECEIVING PARTY DATA	
Name:	THE TORONTO-DOMINION BANK
Street Address:	66 WELLINGTON STREET WEST
Internal Address:	TD TOWER, 15TH FLOOR
City:	TORONTO, ONTARIO
State/Country:	CANADA
Postal Code:	M5K 1A2
PROPERTY NUMBERS Total: 1	
Property Type	Number
Application Number:	17381807
CORRESPONDENCE DATA	
Fax Number:	(202)776-7801
<i>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.</i>	
Phone:	2027765252
Email:	SMHill@duanemorris.com
Correspondent Name:	DUANE MORRIS LLP
Address Line 1:	505 9TH STREET, N.W.
Address Line 4:	WASHINGTON, D.C. 20004
ATTORNEY DOCKET NUMBER:	G4144-00554
NAME OF SUBMITTER:	JAMES A. COOKE, III

SIGNATURE:	/James A. Cooke, III/
DATE SIGNED:	07/21/2021
Total Attachments: 24 source=G414400554ExecutedAssignments#page1.tif source=G414400554ExecutedAssignments#page2.tif source=G414400554ExecutedAssignments#page3.tif source=G414400554ExecutedAssignments#page4.tif source=G414400554ExecutedAssignments#page5.tif source=G414400554ExecutedAssignments#page6.tif source=G414400554ExecutedAssignments#page7.tif source=G414400554ExecutedAssignments#page8.tif source=G414400554ExecutedAssignments#page9.tif source=G414400554ExecutedAssignments#page10.tif source=G414400554ExecutedAssignments#page11.tif source=G414400554ExecutedAssignments#page12.tif source=G414400554ExecutedAssignments#page13.tif source=G414400554ExecutedAssignments#page14.tif source=G414400554ExecutedAssignments#page15.tif source=G414400554ExecutedAssignments#page16.tif source=G414400554ExecutedAssignments#page17.tif source=G414400554ExecutedAssignments#page18.tif source=G414400554ExecutedAssignments#page19.tif source=G414400554ExecutedAssignments#page20.tif source=G414400554ExecutedAssignments#page21.tif source=G414400554ExecutedAssignments#page22.tif source=G414400554ExecutedAssignments#page23.tif source=G414400554ExecutedAssignments#page24.tif	

WORLDWIDE ASSIGNMENT

WHEREAS, WE, (hereinafter referred to as the "ASSIGNORS"):

**Dino Paul D'AGOSTINO,
Perry Aaron Jones HALDENBY,
Dean C. N. TSERETOPOULOS,
Jeffrey Aaron ECKER,
Adam Douglas MCPHEE,
Milos DUNJIC,
John Jong-Suk LEE, and
Arun Victor JAGGA,**

have invented a certain new and useful invention entitled:

**REAL-TIME AUTHENTICATION AND AUTHORIZATION
BASED ON DYNAMICALLY GENERATED CRYPTOGRAPHIC DATA**

for which a United States Patent application was filed on January 31, 2018, and accorded application serial number 15/884,513 (further identified by Attorney Docket No. G4144-00209 and TD Reference No. 17045-MCH-US-PAT, hereinafter the "Patent Application"), and

WHEREAS, **The Toronto-Dominion Bank** (hereinafter "**Assignee**"), a corporation organized under the laws of the Province of Ontario, CANADA, having a place of business at 66 Wellington Street West, TD Tower, 15th Floor, Toronto, Ontario, M5K 1A2, has acquired or is desirous of acquiring the entire and exclusive right, title and interest in and to the Patent Application inclusive of any and all priority rights derived therefrom and the inventions therein disclosed or claimed, and in and to all Letters Patent, in the United States of America, Canada, and throughout the world, which may be granted and issued therefore throughout the world;

NOW THEREFORE, for valuable consideration, the receipt and sufficiency of which is hereby acknowledged by each of the undersigned, WE, ASSIGNORS does/do hereby sell, assign, transfer, and set over to the ASSIGNEE, its successors and assigns, the entire and exclusive right, title and interest in and to the Patent Application for United States Letters Patent inclusive of any and all priority rights derived therefrom, and the inventions therein disclosed or claimed, and in and to all Letters Patent and issues thereof which may be granted upon the Patent Application and in and to all Letters Patent which may be issued upon any substitutes, continuations, continuations-in-part, divisions, re-issues or extensions of the Patent Application or Letters Patent, and all rights under the International Convention for the Protection of Industrial Property, and in and to any and all Letters Patent which may be granted for the inventions in any foreign country or countries including priority rights derived from any application for the inventions in any country;

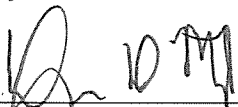
AND WE, ASSIGNORS hereby agrees/agree to execute, upon request, any and all further papers without charge which may be necessary or desirable to enable the ASSIGNEE, its successors and assigns, to file and prosecute the Patent Application, and any and all substitutes, continuations, continuations-in-part, divisions, or extensions thereof, and any and all reissues of the Letters Patent granted upon the Patent Application, and any and all applications for foreign Letters Patent on the inventions; and ASSIGNORS further agrees/agree to execute any and all further papers without charge which may be necessary or desirable to vest or perfect the title of ASSIGNEE, its successors and assigns, in and to the Patent Application and the inventions therein disclosed or claimed, and in and to any and all Letters Patent and reissues thereof, in the United States of America, Canada, and foreign countries, which may be granted upon the Patent Application, and any substitutes, continuations, continuations-in-part, divisions, re-issues or extensions thereof, and upon any foreign applications;

AND WE, ASSIGNORS hereby authorizes/authorize and requests/request the Patent Office to issue each and every Letters Patent to be granted upon the Patent Application for United States Letters Patent, and upon any and all substitutes, continuations, continuations-in-part, divisions, or extensions of the Patent Application, and each and every reissue of the Letters Patent, to the ASSIGNEE, its successors and assigns, as the assignee of the entire right, title and interest therein, in accordance with this assignment;

AND WE, ASSIGNORS each individually hereby represent and warrant that I have read and fully understand the terms and provisions hereof, have had an opportunity to obtain independent legal advice, and have executed this assignment based upon my own judgment and advice of independent legal counsel (if sought), or alternatively, have waived the right to obtain independent legal counsel.

Inventor 1:

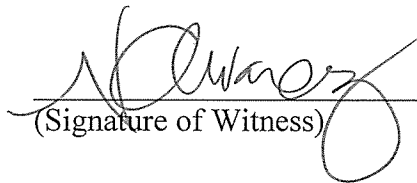
EXECUTED at (City, Province) Toronto, ON, this 8th day of February, 2018



Dino Paul D'AGOSTINO

STATEMENT BY WITNESS

I, Nicole Alvarez, whose full Post Office address is
60 Wellington St. W., 15th Floor, Toronto, ON M5K 1A2 was
personally present and did see the above named person, who is known to me, execute the above
Assignment.



(Signature of Witness)

WORLDWIDE ASSIGNMENT

WHEREAS, WE, (hereinafter referred to as the "ASSIGNORS"):

**Dino Paul D'AGOSTINO,
Perry Aaron Jones HALDENBY,
Dean C. N. TSERETOPOULOS,
Jeffrey Aaron ECKER,
Adam Douglas MCPHEE,
Milos DUNJIC,
John Jong-Suk LEE, and
Arun Victor JAGGA,**

have invented a certain new and useful invention entitled:

**REAL-TIME AUTHENTICATION AND AUTHORIZATION
BASED ON DYNAMICALLY GENERATED CRYPTOGRAPHIC DATA**

for which a United States Patent application was filed on January 31, 2018, and accorded application serial number 15/884,513 (further identified by Attorney Docket No. G4144-00209 and TD Reference No. 17045-MCH-US-PAT, hereinafter the "Patent Application"), and

WHEREAS, **The Toronto-Dominion Bank** (hereinafter "**Assignee**"), a corporation organized under the laws of the Province of Ontario, CANADA, having a place of business at 66 Wellington Street West, TD Tower, 15th Floor, Toronto, Ontario, M5K 1A2, has acquired or is desirous of acquiring the entire and exclusive right, title and interest in and to the Patent Application inclusive of any and all priority rights derived therefrom and the inventions therein disclosed or claimed, and in and to all Letters Patent, in the United States of America, Canada, and throughout the world, which may be granted and issued therefore throughout the world;

NOW THEREFORE, for valuable consideration, the receipt and sufficiency of which is hereby acknowledged by each of the undersigned, WE, ASSIGNORS does/do hereby sell, assign, transfer, and set over to the ASSIGNEE, its successors and assigns, the entire and exclusive right, title and interest in and to the Patent Application for United States Letters Patent inclusive of any and all priority rights derived therefrom, and the inventions therein disclosed or claimed, and in and to all Letters Patent and issues thereof which may be granted upon the Patent Application and in and to all Letters Patent which may be issued upon any substitutes, continuations, continuations-in-part, divisions, re-issues or extensions of the Patent Application or Letters Patent, and all rights under the International Convention for the Protection of Industrial Property, and in and to any and all Letters Patent which may be granted for the inventions in any foreign country or countries including priority rights derived from any application for the inventions in any country;

AND WE, ASSIGNORS hereby agrees/agree to execute, upon request, any and all further papers without charge which may be necessary or desirable to enable the ASSIGNEE, its successors and assigns, to file and prosecute the Patent Application, and any and all substitutes, continuations, continuations-in-part, divisions, or extensions thereof, and any and all reissues of the Letters Patent granted upon the Patent Application, and any and all applications for foreign Letters Patent on the inventions; and ASSIGNORS further agrees/agree to execute any and all further papers without charge which may be necessary or desirable to vest or perfect the title of ASSIGNEE, its successors and assigns, in and to the Patent Application and the inventions therein disclosed or claimed, and in and to any and all Letters Patent and reissues thereof, in the United States of America, Canada, and foreign countries, which may be granted upon the Patent Application, and any substitutes, continuations, continuations-in-part, divisions, re-issues or extensions thereof, and upon any foreign applications;

AND WE, ASSIGNORS hereby authorizes/authorize and requests/request the Patent Office to issue each and every Letters Patent to be granted upon the Patent Application for United States Letters Patent, and upon any and all substitutes, continuations, continuations-in-part, divisions, or extensions of the Patent Application, and each and every reissue of the Letters Patent, to the ASSIGNEE, its successors and assigns, as the assignee of the entire right, title and interest therein, in accordance with this assignment;

AND WE, ASSIGNORS each individually hereby represent and warrant that I have read and fully understand the terms and provisions hereof, have had an opportunity to obtain independent legal advice, and have executed this assignment based upon my own judgment and advice of independent legal counsel (if sought), or alternatively, have waived the right to obtain independent legal counsel.

Inventor 6:

EXECUTED at (City, Province) Toronto, ON, this 2 day of Feb, 2018

Milos Dunjic
Milos DUNJIC

STATEMENT BY WITNESS

I, Nicole A. Wang, whose full Post Office address is
660 Wellington St. W. 15th Floor Toronto, ON M5K 1A2 was
personally present and did see the above named person, who is known to me, execute the above
Assignment.

Nicole A. Wang
(Signature of Witness)

WORLDWIDE ASSIGNMENT

WHEREAS, WE, (hereinafter referred to as the "ASSIGNORS"):

**Dino Paul D'AGOSTINO,
Perry Aaron Jones HALDENBY,
Dean C. N. TSERETOPOULOS,
Jeffrey Aaron ECKER,
Adam Douglas MCPHEE,
Milos DUNJIC,
John Jong-Suk LEE, and
Arun Victor JAGGA,**

have invented a certain new and useful invention entitled:

**REAL-TIME AUTHENTICATION AND AUTHORIZATION
BASED ON DYNAMICALLY GENERATED CRYPTOGRAPHIC DATA**

for which a United States Patent application was filed on January 31, 2018, and accorded application serial number 15/884,513 (further identified by Attorney Docket No. G4144-00209 and TD Reference No. 17045-MCH-US-PAT, hereinafter the "Patent Application"), and

WHEREAS, **The Toronto-Dominion Bank** (hereinafter "**Assignee**"), a corporation organized under the laws of the Province of Ontario, CANADA, having a place of business at 66 Wellington Street West, TD Tower, 15th Floor, Toronto, Ontario, M5K 1A2, has acquired or is desirous of acquiring the entire and exclusive right, title and interest in and to the Patent Application inclusive of any and all priority rights derived therefrom and the inventions therein disclosed or claimed, and in and to all Letters Patent, in the United States of America, Canada, and throughout the world, which may be granted and issued therefore throughout the world;

NOW THEREFORE, for valuable consideration, the receipt and sufficiency of which is hereby acknowledged by each of the undersigned, WE, ASSIGNORS does/do hereby sell, assign, transfer, and set over to the ASSIGNEE, its successors and assigns, the entire and exclusive right, title and interest in and to the Patent Application for United States Letters Patent inclusive of any and all priority rights derived therefrom, and the inventions therein disclosed or claimed, and in and to all Letters Patent and issues thereof which may be granted upon the Patent Application and in and to all Letters Patent which may be issued upon any substitutes, continuations, continuations-in-part, divisions, re-issues or extensions of the Patent Application or Letters Patent, and all rights under the International Convention for the Protection of Industrial Property, and in and to any and all Letters Patent which may be granted for the inventions in any foreign country or countries including priority rights derived from any application for the inventions in any country;

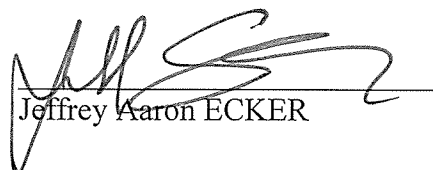
AND WE, ASSIGNORS hereby agrees/agree to execute, upon request, any and all further papers without charge which may be necessary or desirable to enable the ASSIGNEE, its successors and assigns, to file and prosecute the Patent Application, and any and all substitutes, continuations, continuations-in-part, divisions, or extensions thereof, and any and all reissues of the Letters Patent granted upon the Patent Application, and any and all applications for foreign Letters Patent on the inventions; and ASSIGNORS further agrees/agree to execute any and all further papers without charge which may be necessary or desirable to vest or perfect the title of ASSIGNEE, its successors and assigns, in and to the Patent Application and the inventions therein disclosed or claimed, and in and to any and all Letters Patent and reissues thereof, in the United States of America, Canada, and foreign countries, which may be granted upon the Patent Application, and any substitutes, continuations, continuations-in-part, divisions, re-issues or extensions thereof, and upon any foreign applications;

AND WE, ASSIGNORS hereby authorizes/authorize and requests/request the Patent Office to issue each and every Letters Patent to be granted upon the Patent Application for United States Letters Patent, and upon any and all substitutes, continuations, continuations-in-part, divisions, or extensions of the Patent Application, and each and every reissue of the Letters Patent, to the ASSIGNEE, its successors and assigns, as the assignee of the entire right, title and interest therein, in accordance with this assignment;

AND WE, ASSIGNORS each individually hereby represent and warrant that I have read and fully understand the terms and provisions hereof, have had an opportunity to obtain independent legal advice, and have executed this assignment based upon my own judgment and advice of independent legal counsel (if sought), or alternatively, have waived the right to obtain independent legal counsel.

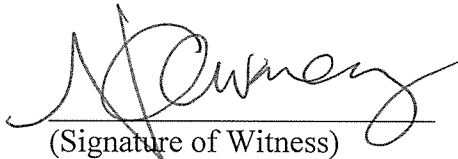
Inventor 4:

EXECUTED at (City, Province) Toronto, ON, this 22 day of February, 2018


Jeffrey Aaron ECKER

STATEMENT BY WITNESS

I, Nicole AWAREZ, whose full Post Office address is
66 Wellington St. W. 15th Floor Toronto, ON M5K 1A2 was
personally present and did see the above named person, who is known to me, execute the above
Assignment.


(Signature of Witness)

WORLDWIDE ASSIGNMENT

WHEREAS, WE, (hereinafter referred to as the "ASSIGNORS"):

**Dino Paul D'AGOSTINO,
Perry Aaron Jones HALDENBY,
Dean C. N. TSERETOPOULOS,
Jeffrey Aaron ECKER,
Adam Douglas MCPHEE,
Milos DUNJIC,
John Jong-Suk LEE, and
Arun Victor JAGGA,**

have invented a certain new and useful invention entitled:

**REAL-TIME AUTHENTICATION AND AUTHORIZATION
BASED ON DYNAMICALLY GENERATED CRYPTOGRAPHIC DATA**

for which a United States Patent application was filed on January 31, 2018, and accorded application serial number 15/884,513 (further identified by Attorney Docket No. G4144-00209 and TD Reference No. 17045-MCH-US-PAT, hereinafter the "Patent Application"), and

WHEREAS, **The Toronto-Dominion Bank** (hereinafter "Assignee"), a corporation organized under the laws of the Province of Ontario, CANADA, having a place of business at 66 Wellington Street West, TD Tower, 15th Floor, Toronto, Ontario, M5K 1A2, has acquired or is desirous of acquiring the entire and exclusive right, title and interest in and to the Patent Application inclusive of any and all priority rights derived therefrom and the inventions therein disclosed or claimed, and in and to all Letters Patent, in the United States of America, Canada, and throughout the world, which may be granted and issued therefore throughout the world;

NOW THEREFORE, for valuable consideration, the receipt and sufficiency of which is hereby acknowledged by each of the undersigned, WE, ASSIGNORS does/do hereby sell, assign, transfer, and set over to the ASSIGNEE, its successors and assigns, the entire and exclusive right, title and interest in and to the Patent Application for United States Letters Patent inclusive of any and all priority rights derived therefrom, and the inventions therein disclosed or claimed, and in and to all Letters Patent and issues thereof which may be granted upon the Patent Application and in and to all Letters Patent which may be issued upon any substitutes, continuations, continuations-in-part, divisions, re-issues or extensions of the Patent Application or Letters Patent, and all rights under the International Convention for the Protection of Industrial Property, and in and to any and all Letters Patent which may be granted for the inventions in any foreign country or countries including priority rights derived from any application for the inventions in any country;

AND WE, ASSIGNORS hereby agrees/agree to execute, upon request, any and all further papers without charge which may be necessary or desirable to enable the ASSIGNEE, its successors and assigns, to file and prosecute the Patent Application, and any and all substitutes, continuations, continuations-in-part, divisions, or extensions thereof, and any and all reissues of the Letters Patent granted upon the Patent Application, and any and all applications for foreign Letters Patent on the inventions; and ASSIGNORS further agrees/agree to execute any and all further papers without charge which may be necessary or desirable to vest or perfect the title of ASSIGNEE, its successors and assigns, in and to the Patent Application and the inventions therein disclosed or claimed, and in and to any and all Letters Patent and reissues thereof, in the United States of America, Canada, and foreign countries, which may be granted upon the Patent Application, and any substitutes, continuations, continuations-in-part, divisions, re-issues or extensions thereof, and upon any foreign applications;

AND WE, ASSIGNORS hereby authorizes/authorize and requests/request the Patent Office to issue each and every Letters Patent to be granted upon the Patent Application for United States Letters Patent, and upon any and all substitutes, continuations, continuations-in-part, divisions, or extensions of the Patent Application, and each and every reissue of the Letters Patent, to the ASSIGNEE, its successors and assigns, as the assignee of the entire right, title and interest therein, in accordance with this assignment;

AND WE, ASSIGNORS each individually hereby represent and warrant that I have read and fully understand the terms and provisions hereof, have had an opportunity to obtain independent legal advice, and have executed this assignment based upon my own judgment and advice of independent legal counsel (if sought), or alternatively, have waived the right to obtain independent legal counsel.

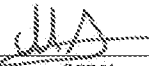
Inventor 2:

EXECUTED at (City, Province) Toronto, ON, this 16th day of October, 2018


Perry Aaron Jones ~~HALDENBY~~

STATEMENT BY WITNESS

I, Madalina Kinnear, whose full Post Office address is
66 Wellington St. W. 15th Floor, Toronto, ON M5K 1A2 was
personally present and did see the above named person, who is known to me, execute the above
Assignment.


(Signature of Witness)

WORLDWIDE ASSIGNMENT

WHEREAS, WE, (hereinafter referred to as the "ASSIGNORS"):

**Dino Paul D'AGOSTINO,
Perry Aaron Jones HALDENBY,
Dean C. N. TSERETOPOULOS,
Jeffrey Aaron ECKER,
Adam Douglas MCPHEE,
Milos DUNJIC,
John Jong-Suk LEE, and
Arun Victor JAGGA,**

have invented a certain new and useful invention entitled:

**REAL-TIME AUTHENTICATION AND AUTHORIZATION
BASED ON DYNAMICALLY GENERATED CRYPTOGRAPHIC DATA**

for which a United States Patent application was filed on January 31, 2018, and accorded application serial number 15/884,513 (further identified by Attorney Docket No. G4144-00209 and TD Reference No. 17045-MCH-US-PAT, hereinafter the "Patent Application"), and

WHEREAS, **The Toronto-Dominion Bank** (hereinafter "**Assignee**"), a corporation organized under the laws of the Province of Ontario, CANADA, having a place of business at 66 Wellington Street West, TD Tower, 15th Floor, Toronto, Ontario, M5K 1A2, has acquired or is desirous of acquiring the entire and exclusive right, title and interest in and to the Patent Application inclusive of any and all priority rights derived therefrom and the inventions therein disclosed or claimed, and in and to all Letters Patent, in the United States of America, Canada, and throughout the world, which may be granted and issued therefore throughout the world;

NOW THEREFORE, for valuable consideration, the receipt and sufficiency of which is hereby acknowledged by each of the undersigned, WE, ASSIGNORS does/do hereby sell, assign, transfer, and set over to the ASSIGNEE, its successors and assigns, the entire and exclusive right, title and interest in and to the Patent Application for United States Letters Patent inclusive of any and all priority rights derived therefrom, and the inventions therein disclosed or claimed, and in and to all Letters Patent and issues thereof which may be granted upon the Patent Application and in and to all Letters Patent which may be issued upon any substitutes, continuations, continuations-in-part, divisions, re-issues or extensions of the Patent Application or Letters Patent, and all rights under the International Convention for the Protection of Industrial Property, and in and to any and all Letters Patent which may be granted for the inventions in any foreign country or countries including priority rights derived from any application for the inventions in any country;

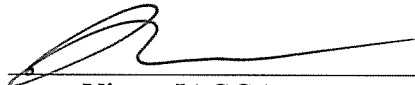
AND WE, ASSIGNORS hereby agrees/agree to execute, upon request, any and all further papers without charge which may be necessary or desirable to enable the ASSIGNEE, its successors and assigns, to file and prosecute the Patent Application, and any and all substitutes, continuations, continuations-in-part, divisions, or extensions thereof, and any and all reissues of the Letters Patent granted upon the Patent Application, and any and all applications for foreign Letters Patent on the inventions; and ASSIGNORS further agrees/agree to execute any and all further papers without charge which may be necessary or desirable to vest or perfect the title of ASSIGNEE, its successors and assigns, in and to the Patent Application and the inventions therein disclosed or claimed, and in and to any and all Letters Patent and reissues thereof, in the United States of America, Canada, and foreign countries, which may be granted upon the Patent Application, and any substitutes, continuations, continuations-in-part, divisions, re-issues or extensions thereof, and upon any foreign applications;

AND WE, ASSIGNORS hereby authorizes/authorize and requests/request the Patent Office to issue each and every Letters Patent to be granted upon the Patent Application for United States Letters Patent, and upon any and all substitutes, continuations, continuations-in-part, divisions, or extensions of the Patent Application, and each and every reissue of the Letters Patent, to the ASSIGNEE, its successors and assigns, as the assignee of the entire right, title and interest therein, in accordance with this assignment;

AND WE, ASSIGNORS each individually hereby represent and warrant that I have read and fully understand the terms and provisions hereof, have had an opportunity to obtain independent legal advice, and have executed this assignment based upon my own judgment and advice of independent legal counsel (if sought), or alternatively, have waived the right to obtain independent legal counsel.

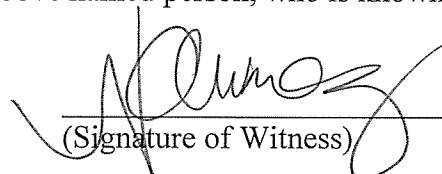
Inventor 8:

EXECUTED at (City, Province) TORONTO, ON, this 8 day of MARCH, 2018


Arun Victor JAGGA

STATEMENT BY WITNESS

I, Nicole Alvarez, whose full Post Office address is
66 Wellington St. W. 15th Floor Toronto, ON M5K 1A2 was
personally present and did see the above named person, who is known to me, execute the above
Assignment.


(Signature of Witness)

WORLDWIDE ASSIGNMENT

WHEREAS, WE, (hereinafter referred to as the "ASSIGNORS"):

**Dino Paul D'AGOSTINO,
Perry Aaron Jones HALDENBY,
Dean C. N. TSERETOPOULOS,
Jeffrey Aaron ECKER,
Adam Douglas MCPHEE,
Milos DUNJIC,
John Jong-Suk LEE, and
Arun Victor JAGGA,**

have invented a certain new and useful invention entitled:

**REAL-TIME AUTHENTICATION AND AUTHORIZATION
BASED ON DYNAMICALLY GENERATED CRYPTOGRAPHIC DATA**

for which a United States Patent application was filed on January 31, 2018, and accorded application serial number 15/884,513 (further identified by Attorney Docket No. G4144-00209 and TD Reference No. 17045-MCH-US-PAT, hereinafter the "Patent Application"), and

WHEREAS, **The Toronto-Dominion Bank** (hereinafter "**Assignee**"), a corporation organized under the laws of the Province of Ontario, CANADA, having a place of business at 66 Wellington Street West, TD Tower, 15th Floor, Toronto, Ontario, M5K 1A2, has acquired or is desirous of acquiring the entire and exclusive right, title and interest in and to the Patent Application inclusive of any and all priority rights derived therefrom and the inventions therein disclosed or claimed, and in and to all Letters Patent, in the United States of America, Canada, and throughout the world, which may be granted and issued therefore throughout the world;

NOW THEREFORE, for valuable consideration, the receipt and sufficiency of which is hereby acknowledged by each of the undersigned, WE, ASSIGNORS does/do hereby sell, assign, transfer, and set over to the ASSIGNEE, its successors and assigns, the entire and exclusive right, title and interest in and to the Patent Application for United States Letters Patent inclusive of any and all priority rights derived therefrom, and the inventions therein disclosed or claimed, and in and to all Letters Patent and issues thereof which may be granted upon the Patent Application and in and to all Letters Patent which may be issued upon any substitutes, continuations, continuations-in-part, divisions, re-issues or extensions of the Patent Application or Letters Patent, and all rights under the International Convention for the Protection of Industrial Property, and in and to any and all Letters Patent which may be granted for the inventions in any foreign country or countries including priority rights derived from any application for the inventions in any country;

AND WE, ASSIGNORS hereby agrees/agree to execute, upon request, any and all further papers without charge which may be necessary or desirable to enable the ASSIGNEE, its successors and assigns, to file and prosecute the Patent Application, and any and all substitutes, continuations, continuations-in-part, divisions, or extensions thereof, and any and all reissues of the Letters Patent granted upon the Patent Application, and any and all applications for foreign Letters Patent on the inventions; and ASSIGNORS further agrees/agree to execute any and all further papers without charge which may be necessary or desirable to vest or perfect the title of ASSIGNEE, its successors and assigns, in and to the Patent Application and the inventions therein disclosed or claimed, and in and to any and all Letters Patent and reissues thereof, in the United States of America, Canada, and foreign countries, which may be granted upon the Patent Application, and any substitutes, continuations, continuations-in-part, divisions, re-issues or extensions thereof, and upon any foreign applications;

AND WE, ASSIGNORS hereby authorizes/authorize and requests/request the Patent Office to issue each and every Letters Patent to be granted upon the Patent Application for United States Letters Patent, and upon any and all substitutes, continuations, continuations-in-part, divisions, or extensions of the Patent Application, and each and every reissue of the Letters Patent, to the ASSIGNEE, its successors and assigns, as the assignee of the entire right, title and interest therein, in accordance with this assignment;

AND WE, ASSIGNORS each individually hereby represent and warrant that I have read and fully understand the terms and provisions hereof, have had an opportunity to obtain independent legal advice, and have executed this assignment based upon my own judgment and advice of independent legal counsel (if sought), or alternatively, have waived the right to obtain independent legal counsel.

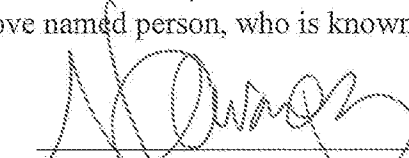
Inventor 7:

EXECUTED at (City, Province) Toronto, ON, this 10th day of October, 2018


John Jong-Suk LEE

STATEMENT BY WITNESS

I, Nicole Anwar, whose full Post Office address is
66 Wellington St. W. 15th Floor, Toronto, ON M5X 1C2 was
personally present and did see the above named person, who is known to me, execute the above
Assignment.


(Signature of Witness)

WORLDWIDE ASSIGNMENT

WHEREAS, WE, (hereinafter referred to as the "ASSIGNORS"):

**Dino Paul D'AGOSTINO,
Perry Aaron Jones HALDENBY,
Dean C. N. TSERETOPOULOS,
Jeffrey Aaron ECKER,
Adam Douglas MCPHEE,
Milos DUNJIC,
John Jong-Suk LEE, and
Arun Victor JAGGA,**

have invented a certain new and useful invention entitled:

**REAL-TIME AUTHENTICATION AND AUTHORIZATION
BASED ON DYNAMICALLY GENERATED CRYPTOGRAPHIC DATA**

for which a United States Patent application was filed on January 31, 2018, and accorded application serial number 15/884,513 (further identified by Attorney Docket No. G4144-00209 and TD Reference No. 17045-MCH-US-PAT, hereinafter the "Patent Application"), and

WHEREAS, **The Toronto-Dominion Bank** (hereinafter "**Assignee**"), a corporation organized under the laws of the Province of Ontario, CANADA, having a place of business at 66 Wellington Street West, TD Tower, 15th Floor, Toronto, Ontario, M5K 1A2, has acquired or is desirous of acquiring the entire and exclusive right, title and interest in and to the Patent Application inclusive of any and all priority rights derived therefrom and the inventions therein disclosed or claimed, and in and to all Letters Patent, in the United States of America, Canada, and throughout the world, which may be granted and issued therefore throughout the world;

NOW THEREFORE, for valuable consideration, the receipt and sufficiency of which is hereby acknowledged by each of the undersigned, WE, ASSIGNORS does/do hereby sell, assign, transfer, and set over to the ASSIGNEE, its successors and assigns, the entire and exclusive right, title and interest in and to the Patent Application for United States Letters Patent inclusive of any and all priority rights derived therefrom, and the inventions therein disclosed or claimed, and in and to all Letters Patent and issues thereof which may be granted upon the Patent Application and in and to all Letters Patent which may be issued upon any substitutes, continuations, continuations-in-part, divisions, re-issues or extensions of the Patent Application or Letters Patent, and all rights under the International Convention for the Protection of Industrial Property, and in and to any and all Letters Patent which may be granted for the inventions in any foreign country or countries including priority rights derived from any application for the inventions in any country;

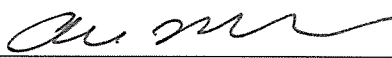
AND WE, ASSIGNORS hereby agrees/agree to execute, upon request, any and all further papers without charge which may be necessary or desirable to enable the ASSIGNEE, its successors and assigns, to file and prosecute the Patent Application, and any and all substitutes, continuations, continuations-in-part, divisions, or extensions thereof, and any and all reissues of the Letters Patent granted upon the Patent Application, and any and all applications for foreign Letters Patent on the inventions; and ASSIGNORS further agrees/agree to execute any and all further papers without charge which may be necessary or desirable to vest or perfect the title of ASSIGNEE, its successors and assigns, in and to the Patent Application and the inventions therein disclosed or claimed, and in and to any and all Letters Patent and reissues thereof, in the United States of America, Canada, and foreign countries, which may be granted upon the Patent Application, and any substitutes, continuations, continuations-in-part, divisions, re-issues or extensions thereof, and upon any foreign applications;

AND WE, ASSIGNORS hereby authorizes/authorize and requests/request the Patent Office to issue each and every Letters Patent to be granted upon the Patent Application for United States Letters Patent, and upon any and all substitutes, continuations, continuations-in-part, divisions, or extensions of the Patent Application, and each and every reissue of the Letters Patent, to the ASSIGNEE, its successors and assigns, as the assignee of the entire right, title and interest therein, in accordance with this assignment;

AND WE, ASSIGNORS each individually hereby represent and warrant that I have read and fully understand the terms and provisions hereof, have had an opportunity to obtain independent legal advice, and have executed this assignment based upon my own judgment and advice of independent legal counsel (if sought), or alternatively, have waived the right to obtain independent legal counsel.

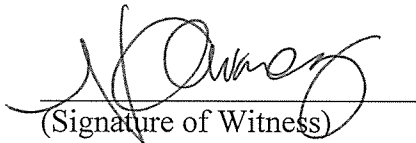
Inventor 5:

EXECUTED at (City, Province) Toronto, ON, this 7th day of MARCH, 2018


Adam Douglas MCPHEE

STATEMENT BY WITNESS

I, Nicole Alvarez, whose full Post Office address is
66 Wellington St. W. 15th Flar Toronto, ON M5K 1A2 was
personally present and did see the above named person, who is known to me, execute the above
Assignment.


(Signature of Witness)

WORLDWIDE ASSIGNMENT

WHEREAS, WE, (hereinafter referred to as the "ASSIGNORS"):

**Dino Paul D'AGOSTINO,
Perry Aaron Jones HALDENBY,
Dean C. N. TSERETOPOULOS,
Jeffrey Aaron ECKER,
Adam Douglas MCPHEE,
Milos DUNJIC,
John Jong-Suk LEE, and
Arun Victor JAGGA,**

have invented a certain new and useful invention entitled:

**REAL-TIME AUTHENTICATION AND AUTHORIZATION
BASED ON DYNAMICALLY GENERATED CRYPTOGRAPHIC DATA**

for which a United States Patent application was filed on January 31, 2018, and accorded application serial number 15/884,513 (further identified by Attorney Docket No. G4144-00209 and TD Reference No. 17045-MCH-US-PAT, hereinafter the "Patent Application"), and

WHEREAS, **The Toronto-Dominion Bank** (hereinafter "**Assignee**"), a corporation organized under the laws of the Province of Ontario, CANADA, having a place of business at 66 Wellington Street West, TD Tower, 15th Floor, Toronto, Ontario, M5K 1A2, has acquired or is desirous of acquiring the entire and exclusive right, title and interest in and to the Patent Application inclusive of any and all priority rights derived therefrom and the inventions therein disclosed or claimed, and in and to all Letters Patent, in the United States of America, Canada, and throughout the world, which may be granted and issued therefore throughout the world;

NOW THEREFORE, for valuable consideration, the receipt and sufficiency of which is hereby acknowledged by each of the undersigned, WE, ASSIGNORS does/do hereby sell, assign, transfer, and set over to the ASSIGNEE, its successors and assigns, the entire and exclusive right, title and interest in and to the Patent Application for United States Letters Patent inclusive of any and all priority rights derived therefrom, and the inventions therein disclosed or claimed, and in and to all Letters Patent and issues thereof which may be granted upon the Patent Application and in and to all Letters Patent which may be issued upon any substitutes, continuations, continuations-in-part, divisions, re-issues or extensions of the Patent Application or Letters Patent, and all rights under the International Convention for the Protection of Industrial Property, and in and to any and all Letters Patent which may be granted for the inventions in any foreign country or countries including priority rights derived from any application for the inventions in any country;

AND WE, ASSIGNORS hereby agrees/agree to execute, upon request, any and all further papers without charge which may be necessary or desirable to enable the ASSIGNEE, its successors and assigns, to file and prosecute the Patent Application, and any and all substitutes, continuations, continuations-in-part, divisions, or extensions thereof, and any and all reissues of the Letters Patent granted upon the Patent Application, and any and all applications for foreign Letters Patent on the inventions; and ASSIGNORS further agrees/agree to execute any and all further papers without charge which may be necessary or desirable to vest or perfect the title of ASSIGNEE, its successors and assigns, in and to the Patent Application and the inventions therein disclosed or claimed, and in and to any and all Letters Patent and reissues thereof, in the United States of America, Canada, and foreign countries, which may be granted upon the Patent Application, and any substitutes, continuations, continuations-in-part, divisions, re-issues or extensions thereof, and upon any foreign applications;

AND WE, ASSIGNORS hereby authorizes/authorize and requests/request the Patent Office to issue each and every Letters Patent to be granted upon the Patent Application for United States Letters Patent, and upon any and all substitutes, continuations, continuations-in-part, divisions, or extensions of the Patent Application, and each and every reissue of the Letters Patent, to the ASSIGNEE, its successors and assigns, as the assignee of the entire right, title and interest therein, in accordance with this assignment;

AND WE, ASSIGNORS each individually hereby represent and warrant that I have read and fully understand the terms and provisions hereof, have had an opportunity to obtain independent legal advice, and have executed this assignment based upon my own judgment and advice of independent legal counsel (if sought), or alternatively, have waived the right to obtain independent legal counsel.

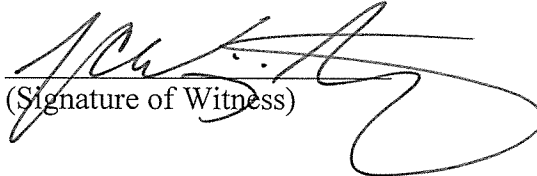
Inventor 3:

EXECUTED at (City, Province) TORONTO, ONTARIO this 22 day of FEBRUARY, 2018


(Dean C. N. TSERETOPOULOS)

STATEMENT BY WITNESS

I, JEREMY WIJETUNGE, whose full Post Office address is
66 WELLINGTON ST. W. 15th FLOOR, TORONTO, ON M5K 1A2 was
personally present and did see the above named person, who is known to me, execute the above
Assignment.


(Signature of Witness)