

Form PTO-1595 (Rev. 03-11)
OMB No. 0651-0027 (exp. 04/30/2015)

U.S. DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

**RECORDATION FORM COVER SHEET
PATENTS ONLY**

To the Director of the U.S. Patent and Trademark Office: Please record the attached documents or the new address(es) below.

1. Name of conveying party(ies)

James Hedrick; Robert Miller; Sampath Purushothaman; Deborah Neumeyer; Mary Rothwell; Willi Volksen; Roy Yu

Additional name(s) of conveying party(ies) attached? Yes No

3. Nature of conveyance/Execution Date(s):

Execution Date(s) 12-06;-07;-14;-14;-15-28 2015;02-08-2016

- Assignment Merger
- Security Agreement Change of Name
- Joint Research Agreement
- Government Interest Assignment
- Executive Order 9424, Confirmatory License
- Other _____

2. Name and address of receiving party(ies)

Name: International Business Machines Corporation

Internal Address: _____

Street Address: New Orchard Street

City: Armonk

State: NY

Country: US Zip: 10504

Additional name(s) & address(es) attached? Yes No

4. Application or patent number(s):

This document is being filed together with a new application.

A. Patent Application No.(s)

B. Patent No.(s)

16/004,028

Additional numbers attached? Yes No

5. Name and address to whom correspondence concerning document should be mailed:

Name: Thomas A. Beck

Internal Address: _____

Street Address: 6136 West Kimberly Way

City: Glendale

State: AZ Zip: 85308-7627

Phone Number: (623) 466-0080

Docket Number: YOR920151153US03

Email Address: tombeck.atty@mindspring.com

6. Total number of applications and patents involved: one

7. Total fee (37 CFR 1.21(h) & 3.41) \$40.00

- Authorized to be charged to deposit account
- Enclosed
- None required (government interest not affecting title)

8. Payment Information

Deposit Account Number 50-0510

Authorized User Name Thomas A. Beck (IBM)

9. Signature:

Thomas A. Beck
Signature

August 13, 2018

Date

Thomas A. Beck
Name of Person Signing

Total number of pages including cover sheet, attachments, and documents:

13

Documents to be recorded (including cover sheet) should be faxed to (571) 273-0140, or mailed to:
Mail Stop Assignment Recordation Services, Director of the USPTO, P.O.Box 1450, Alexandria, V.A. 22313-1450

CH \$50.00 16004028

YOR920151153US03

**DECLARATION (37 C.F.R. § 1.63) FOR UTILITY PATENT APPLICATION USING AN
APPLICATION DATA SHEET (37 C.F.R. § 1.76) AND ASSIGNMENT**

Title of Invention: **ENHANCED ADHESIVE MATERIALS AND PROCESSES
FOR 3D INTEGRATION APPLICATIONS**

As a below named and undersigned inventor, I hereby declare that:

This declaration is directed to the attached application, or (if following box is checked):

[X] United States application or PCT international application number 16/004,028 filed on June 8, 2018.

The above-identified 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 have reviewed and understand the contents of the application, including the claims.

I am aware of the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in 37 C.F.R. §1.56.

Whereas, I ("ASSIGNOR") have made certain inventions, improvements, and discoveries (herein referred to as the "Invention") disclosed in the above-identified patent application and further identified by the IBM Docket Number provided above in the header of this document;

Whereas, International Business Machines Corporation, a corporation of New York having a place of business at Armonk, New York (herein referred to as "ASSIGNEE"), desires to acquire, and I desire to grant to ASSIGNEE, my entire worldwide right, title, and interest in and to the Invention and in and to any and all patent applications and patents directed thereto;

Now, therefore, for good and valuable consideration, the receipt and sufficiency thereof being hereby acknowledged, I hereby sell, or have sold, assign, or have assigned and otherwise transfer, or have transferred to the ASSIGNEE, its successors, legal representatives, and assigns, my entire worldwide right, title, and interest in and to the Invention, the above-identified United States patent application, and any and all other patent applications and patents for the Invention which may be applied for or granted therefor in the United States and in all foreign countries and jurisdictions, including all divisions, continuations, reissues, reexaminations, renewals, extensions, counterparts, substitutes, and extensions thereof, and all rights of priority resulting from the filing of such applications and granting of such patents. In addition, I hereby authorize and request the Director of the United States Patent and Trademark Office to issue any United States Patent, and foreign patent authorities to issue any foreign patent, granted for the Invention, to the ASSIGNEE, its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the same to be held and enjoyed by the ASSIGNEE, its successors, legal representatives, and assigns to the full end of the terms for which any and all such patents may be granted, as fully and entirely as would have been held and enjoyed by me had this Assignment not been made; and I agree to execute any and all documents and instruments and perform all lawful acts reasonably related to recording this Assignment or perfecting title to the Invention and all related patents and applications, in the ASSIGNEE, its successors, legal representatives, and assigns, whenever requested by the ASSIGNEE, its successors, legal representatives, or assigns.

YOR920151153US03

I acknowledge my prior and ongoing obligations to sell, assign, and transfer the rights under this Assignment to the ASSIGNEE, and am unaware of any reason why I may not have the full and unencumbered right to sell, assign, and transfer my rights hereby sold, assigned, and transferred, and have not executed, and will not execute, any document or instrument in conflict herewith.

I also hereby grant the ASSIGNEE, its successors, legal representatives, and assigns, the right to insert in this Assignment any further identification (including, but not limited to, patent application Serial Number) which may be necessary or desirable for recordation of this Assignment. This Assignment is governed by the substantive laws of the State of New York, and any disputes will be resolved in a New York state court or federal court sited in New York.

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.

(1) Legal Name of Inventor: **JAMES L. HEDRICK**

Signature: James L Hedrick Date: 2/15/16

(2) Legal Name of Inventor: **ROBERT D. MILLER**

Signature: _____ Date: _____

(3) Legal Name of Inventor: **DEBORAH A. NEUMAYER**

Signature: _____ Date: _____

(4) Legal Name of Inventor: **SAMPATH PURUSHOTHAMAN**

Signature: _____ Date: _____

(5) Legal Name of Inventor: **MARY E. ROTHWELL**

Signature: _____ Date: _____

(6) Legal Name of Inventor: **WILLI VOLKSEN**

Signature: _____ Date: _____

(7) Legal Name of Inventor: **ROY R. YU**

Signature: _____ Date: _____

YOR920151153US03

**DECLARATION (37 C.F.R. § 1.63) FOR UTILITY PATENT APPLICATION USING AN
APPLICATION DATA SHEET (37 C.F.R. § 1.76) AND ASSIGNMENT**

Title of Invention: **ENHANCED ADHESIVE MATERIALS AND PROCESSES
FOR 3D INTEGRATION APPLICATIONS**

As a below named and undersigned inventor, I hereby declare that:

This declaration is directed to the attached application, or (if following box is checked):

United States application or PCT international application number 16/004,028 filed on June 8, 2018.

The above-identified 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 have reviewed and understand the contents of the application, including the claims.

I am aware of the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in 37 C.F.R. §1.56.

Whereas, I ("ASSIGNOR") have made certain inventions, improvements, and discoveries (herein referred to as the "Invention") disclosed in the above-identified patent application and further identified by the IBM Docket Number provided above in the header of this document;

Whereas, International Business Machines Corporation, a corporation of New York having a place of business at Armonk, New York (herein referred to as "ASSIGNEE"), desires to acquire, and I desire to grant to ASSIGNEE, my entire worldwide right, title, and interest in and to the Invention and in and to any and all patent applications and patents directed thereto;

Now, therefore, for good and valuable consideration, the receipt and sufficiency thereof being hereby acknowledged, I hereby sell, or have sold, assign, or have assigned and otherwise transfer, or have transferred to the ASSIGNEE, its successors, legal representatives, and assigns, my entire worldwide right, title, and interest in and to the Invention, the above-identified United States patent application, and any and all other patent applications and patents for the Invention which may be applied for or granted therefor in the United States and in all foreign countries and jurisdictions, including all divisions, continuations, reissues, reexaminations, renewals, extensions, counterparts, substitutes, and extensions thereof, and all rights of priority resulting from the filing of such applications and granting of such patents. In addition, I hereby authorize and request the Director of the United States Patent and Trademark Office to issue any United States Patent, and foreign patent authorities to issue any foreign patent, granted for the Invention, to the ASSIGNEE, its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the same to be held and enjoyed by the ASSIGNEE, its successors, legal representatives, and assigns to the full end of the terms for which any and all such patents may be granted, as fully and entirely as would have been held and enjoyed by me had this Assignment not been made; and I agree to execute any and all documents and instruments and perform all lawful acts reasonably related to recording this Assignment or perfecting title to the Invention and all related patents and applications, in the ASSIGNEE, its successors, legal representatives, and assigns, whenever requested by the ASSIGNEE, its successors, legal representatives, or assigns.

YOR920151153US03

I acknowledge my prior and ongoing obligations to sell, assign, and transfer the rights under this Assignment to the ASSIGNEE, and am unaware of any reason why I may not have the full and unencumbered right to sell, assign, and transfer my rights hereby sold, assigned, and transferred, and have not executed, and will not execute, any document or instrument in conflict herewith.

I also hereby grant the ASSIGNEE, its successors, legal representatives, and assigns, the right to insert in this Assignment any further identification (including, but not limited to, patent application Serial Number) which may be necessary or desirable for recordation of this Assignment. This Assignment is governed by the substantive laws of the State of New York, and any disputes will be resolved in a New York state court or federal court sited in New York.

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.

(1) Legal Name of Inventor: **JAMES L. HEDRICK**

Signature: _____ Date: _____

(2) Legal Name of Inventor: **ROBERT D. MILLER**

Signature: _____ Date: _____

(3) Legal Name of Inventor: **DEBORAH A. NEUMAYER**

Signature: _____ Date: _____

(4) Legal Name of Inventor: **SAMPATH PURUSHOTHAMAN**

Signature: S. Purushothaman Date: 12/14/2015

(5) Legal Name of Inventor: **MARY E. ROTHWELL**

Signature: _____ Date: _____

(6) Legal Name of Inventor: **WILLI VOLKSEN**

Signature: _____ Date: _____

(7) Legal Name of Inventor: **ROY R. YU**

Signature: _____ Date: _____

YOR920151153US03

**DECLARATION (37 C.F.R. § 1.63) FOR UTILITY PATENT APPLICATION USING AN
APPLICATION DATA SHEET (37 C.F.R. § 1.76) AND ASSIGNMENT**

Title of Invention: **ENHANCED ADHESIVE MATERIALS AND PROCESSES
FOR 3D INTEGRATION APPLICATIONS**

As a below named and undersigned inventor, I hereby declare that:

This declaration is directed to the attached application, or (if following box is checked):

[X] United States application or PCT international application number 16/004,028 filed on June 8, 2018.

The above-identified 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 have reviewed and understand the contents of the application, including the claims.

I am aware of the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in 37 C.F.R. §1.56.

Whereas, I ("ASSIGNOR") have made certain inventions, improvements, and discoveries (herein referred to as the "Invention") disclosed in the above-identified patent application and further identified by the IBM Docket Number provided above in the header of this document;

Whereas, International Business Machines Corporation, a corporation of New York having a place of business at Armonk, New York (herein referred to as "ASSIGNEE"), desires to acquire, and I desire to grant to ASSIGNEE, my entire worldwide right, title, and interest in and to the Invention and in and to any and all patent applications and patents directed thereto;

Now, therefore, for good and valuable consideration, the receipt and sufficiency thereof being hereby acknowledged, I hereby sell, or have sold, assign, or have assigned and otherwise transfer, or have transferred to the ASSIGNEE, its successors, legal representatives, and assigns, my entire worldwide right, title, and interest in and to the Invention, the above-identified United States patent application, and any and all other patent applications and patents for the Invention which may be applied for or granted therefor in the United States and in all foreign countries and jurisdictions, including all divisions, continuations, reissues, reexaminations, renewals, extensions, counterparts, substitutes, and extensions thereof, and all rights of priority resulting from the filing of such applications and granting of such patents. In addition, I hereby authorize and request the Director of the United States Patent and Trademark Office to issue any United States Patent, and foreign patent authorities to issue any foreign patent, granted for the Invention, to the ASSIGNEE, its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the same to be held and enjoyed by the ASSIGNEE, its successors, legal representatives, and assigns to the full end of the terms for which any and all such patents may be granted, as fully and entirely as would have been held and enjoyed by me had this Assignment not been made; and I agree to execute any and all documents and instruments and perform all lawful acts reasonably related to recording this Assignment or perfecting title to the Invention and all related patents and applications, in the ASSIGNEE, its successors, legal representatives, and assigns, whenever requested by the ASSIGNEE, its successors, legal representatives, or assigns.

YOR920151153US03

I acknowledge my prior and ongoing obligations to sell, assign, and transfer the rights under this Assignment to the ASSIGNEE, and am unaware of any reason why I may not have the full and unencumbered right to sell, assign, and transfer my rights hereby sold, assigned, and transferred, and have not executed, and will not execute, any document or instrument in conflict herewith.

I also hereby grant the ASSIGNEE, its successors, legal representatives, and assigns, the right to insert in this Assignment any further identification (including, but not limited to, patent application Serial Number) which may be necessary or desirable for recordation of this Assignment. This Assignment is governed by the substantive laws of the State of New York, and any disputes will be resolved in a New York state court or federal court sited in New York.

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.

(1) Legal Name of Inventor: **JAMES L. HEDRICK**

Signature: _____ Date: _____

(2) Legal Name of Inventor: **ROBERT D. MILLER**

Signature: Robert D. Miller Date: 12/04/2015

(3) Legal Name of Inventor: **DEBORAH A. NEUMAYER**

Signature: _____ Date: _____

(4) Legal Name of Inventor: **SAMPATH PURUSHOTHAMAN**

Signature: _____ Date: _____

(5) Legal Name of Inventor: **MARY E. ROTHWELL**

Signature: _____ Date: _____

(6) Legal Name of Inventor: **WILLI VOLKSEN**

Signature: Willi Volkse Date: 12/07/2015

(7) Legal Name of Inventor: **ROY R. YU**

Signature: _____ Date: _____

YOR920151153US03

**DECLARATION (37 C.F.R. § 1.63) FOR UTILITY PATENT APPLICATION USING AN
APPLICATION DATA SHEET (37 C.F.R. § 1.76) AND ASSIGNMENT**

Title of Invention: **ENHANCED ADHESIVE MATERIALS AND PROCESSES
FOR 3D INTEGRATION APPLICATIONS**

As a below named and undersigned inventor, I hereby declare that:

This declaration is directed to the attached application, or (if following box is checked):

United States application or PCT international application number 16/004,028 filed on June 8, 2018.

The above-identified 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 have reviewed and understand the contents of the application, including the claims.

I am aware of the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in 37 C.F.R. §1.56.

Whereas, I ("ASSIGNOR") have made certain inventions, improvements, and discoveries (herein referred to as the "Invention") disclosed in the above-identified patent application and further identified by the IBM Docket Number provided above in the header of this document;

Whereas, International Business Machines Corporation, a corporation of New York having a place of business at Armonk, New York (herein referred to as "ASSIGNEE"), desires to acquire, and I desire to grant to ASSIGNEE, my entire worldwide right, title, and interest in and to the Invention and in and to any and all patent applications and patents directed thereto;

Now, therefore, for good and valuable consideration, the receipt and sufficiency thereof being hereby acknowledged, I hereby sell, or have sold, assign, or have assigned and otherwise transfer, or have transferred to the ASSIGNEE, its successors, legal representatives, and assigns, my entire worldwide right, title, and interest in and to the Invention, the above-identified United States patent application, and any and all other patent applications and patents for the Invention which may be applied for or granted therefor in the United States and in all foreign countries and jurisdictions, including all divisions, continuations, reissues, reexaminations, renewals, extensions, counterparts, substitutes, and extensions thereof, and all rights of priority resulting from the filing of such applications and granting of such patents. In addition, I hereby authorize and request the Director of the United States Patent and Trademark Office to issue any United States Patent, and foreign patent authorities to issue any foreign patent, granted for the Invention, to the ASSIGNEE, its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the same to be held and enjoyed by the ASSIGNEE, its successors, legal representatives, and assigns to the full end of the terms for which any and all such patents may be granted, as fully and entirely as would have been held and enjoyed by me had this Assignment not been made; and I agree to execute any and all documents and instruments and perform all lawful acts reasonably related to recording this Assignment or perfecting title to the Invention and all related patents and applications, in the ASSIGNEE, its successors, legal representatives, and assigns, whenever requested by the ASSIGNEE, its successors, legal representatives, or assigns.

YOR920151153US03

I acknowledge my prior and ongoing obligations to sell, assign, and transfer the rights under this Assignment to the ASSIGNEE, and am unaware of any reason why I may not have the full and unencumbered right to sell, assign, and transfer my rights hereby sold, assigned, and transferred, and have not executed, and will not execute, any document or instrument in conflict herewith.

I also hereby grant the ASSIGNEE, its successors, legal representatives, and assigns, the right to insert in this Assignment any further identification (including, but not limited to, patent application Serial Number) which may be necessary or desirable for recordation of this Assignment. This Assignment is governed by the substantive laws of the State of New York, and any disputes will be resolved in a New York state court or federal court sited in New York.

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.

(1) Legal Name of Inventor: JAMES L. HEDRICK

Signature: _____ Date: _____

(2) Legal Name of Inventor: ROBERT D. MILLER

Signature: _____ Date: _____

(3) Legal Name of Inventor: DEBORAH A. NEUMAYER

Signature: _____ Date: _____

(4) Legal Name of Inventor: SAMPATH PURUSHOTHAMAN

Signature: _____ Date: _____

(5) Legal Name of Inventor: MARY E. ROTHWELL

Signature: _____ Date: _____

(6) Legal Name of Inventor: WILLI VOLKSEN

Signature: _____ Date: _____

(7) Legal Name of Inventor: ROY R. YU

Signature:  _____ Date: 12-24-2015

YOR920151153US03

**DECLARATION (37 C.F.R. § 1.63) FOR UTILITY PATENT APPLICATION USING AN
APPLICATION DATA SHEET (37 C.F.R. § 1.76) AND ASSIGNMENT**

Title of Invention: **ENHANCED ADHESIVE MATERIALS AND PROCESSES
FOR 3D INTEGRATION APPLICATIONS**

As a below named and undersigned inventor, I hereby declare that:

This declaration is directed to the attached application, or (if following box is checked):

[X] United States application or PCT international application number 16/004,028 filed on June 8, 2018.

The above-identified 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 have reviewed and understand the contents of the application, including the claims.

I am aware of the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in 37 C.F.R. §1.56.

Whereas, I ("ASSIGNOR") have made certain inventions, improvements, and discoveries (herein referred to as the "Invention") disclosed in the above-identified patent application and further identified by the IBM Docket Number provided above in the header of this document;

Whereas, International Business Machines Corporation, a corporation of New York having a place of business at Armonk, New York (herein referred to as "ASSIGNEE"), desires to acquire, and I desire to grant to ASSIGNEE, my entire worldwide right, title, and interest in and to the Invention and in and to any and all patent applications and patents directed thereto;

Now, therefore, for good and valuable consideration, the receipt and sufficiency thereof being hereby acknowledged, I hereby sell, or have sold, assign, or have assigned and otherwise transfer, or have transferred to the ASSIGNEE, its successors, legal representatives, and assigns, my entire worldwide right, title, and interest in and to the Invention, the above-identified United States patent application, and any and all other patent applications and patents for the Invention which may be applied for or granted therefor in the United States and in all foreign countries and jurisdictions, including all divisions, continuations, reissues, reexaminations, renewals, extensions, counterparts, substitutes, and extensions thereof, and all rights of priority resulting from the filing of such applications and granting of such patents. In addition, I hereby authorize and request the Director of the United States Patent and Trademark Office to issue any United States Patent, and foreign patent authorities to issue any foreign patent, granted for the Invention, to the ASSIGNEE, its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the same to be held and enjoyed by the ASSIGNEE, its successors, legal representatives, and assigns to the full end of the terms for which any and all such patents may be granted, as fully and entirely as would have been held and enjoyed by me had this Assignment not been made; and I agree to execute any and all documents and instruments and perform all lawful acts reasonably related to recording this Assignment or perfecting title to the Invention and all related patents and applications, in the ASSIGNEE, its successors, legal representatives, and assigns, whenever requested by the ASSIGNEE, its successors, legal representatives, or assigns.

YOR920151153US03

I acknowledge my prior and ongoing obligations to sell, assign, and transfer the rights under this Assignment to the ASSIGNEE, and am unaware of any reason why I may not have the full and unencumbered right to sell, assign, and transfer my rights hereby sold, assigned, and transferred, and have not executed, and will not execute, any document or instrument in conflict herewith.

I also hereby grant the ASSIGNEE, its successors, legal representatives, and assigns, the right to insert in this Assignment any further identification (including, but not limited to, patent application Serial Number) which may be necessary or desirable for recordation of this Assignment. This Assignment is governed by the substantive laws of the State of New York, and any disputes will be resolved in a New York state court or federal court sited in New York.

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.

(1) Legal Name of Inventor: JAMES L. HEDRICK

Signature: _____ Date: _____

(2) Legal Name of Inventor: ROBERT D. MILLER

Signature: _____ Date: _____

(3) Legal Name of Inventor: DEBORAH A. NEUMAYER

Signature: _____ Date: _____

(4) Legal Name of Inventor: SAMPATH PURUSHOTHAMAN

Signature: _____ Date: _____

(5) Legal Name of Inventor: MARY E. ROTHWELL

Signature: *Mary E. Rothwell* _____ Date: *1.2/15/2015*

(6) Legal Name of Inventor: WILLI VOLKSEN

Signature: _____ Date: _____

(7) Legal Name of Inventor: ROY R. YU

Signature: _____ Date: _____

YOR920151153US03

**DECLARATION (37 C.F.R. § 1.63) FOR UTILITY PATENT APPLICATION USING AN
APPLICATION DATA SHEET (37 C.F.R. § 1.76) AND ASSIGNMENT**

Title of Invention: **ENHANCED ADHESIVE MATERIALS AND PROCESSES
FOR 3D INTEGRATION APPLICATIONS**

As a below named and undersigned inventor, I hereby declare that:

This declaration is directed to the attached application, or (if following box is checked):

[X] United States application or PCT international application number 16/004,028 filed on June 8, 2018.

The above-identified 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 have reviewed and understand the contents of the application, including the claims.

I am aware of the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in 37 C.F.R. §1.56.

Whereas, I ("ASSIGNOR") have made certain inventions, improvements, and discoveries (herein referred to as the "Invention") disclosed in the above-identified patent application and further identified by the IBM Docket Number provided above in the header of this document;

Whereas, International Business Machines Corporation, a corporation of New York having a place of business at Armonk, New York (herein referred to as "ASSIGNEE"), desires to acquire, and I desire to grant to ASSIGNEE, my entire worldwide right, title, and interest in and to the Invention and in and to any and all patent applications and patents directed thereto;

Now, therefore, for good and valuable consideration, the receipt and sufficiency thereof being hereby acknowledged, I hereby sell, or have sold, assign, or have assigned and otherwise transfer, or have transferred to the ASSIGNEE, its successors, legal representatives, and assigns, my entire worldwide right, title, and interest in and to the Invention, the above-identified United States patent application, and any and all other patent applications and patents for the Invention which may be applied for or granted therefor in the United States and in all foreign countries and jurisdictions, including all divisions, continuations, reissues, reexaminations, renewals, extensions, counterparts, substitutes, and extensions thereof, and all rights of priority resulting from the filing of such applications and granting of such patents. In addition, I hereby authorize and request the Director of the United States Patent and Trademark Office to issue any United States Patent, and foreign patent authorities to issue any foreign patent, granted for the Invention, to the ASSIGNEE, its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the same to be held and enjoyed by the ASSIGNEE, its successors, legal representatives, and assigns to the full end of the terms for which any and all such patents may be granted, as fully and entirely as would have been held and enjoyed by me had this Assignment not been made; and I agree to execute any and all documents and instruments and perform all lawful acts reasonably related to recording this Assignment or perfecting title to the Invention and all related patents and applications, in the ASSIGNEE, its successors, legal representatives, and assigns, whenever requested by the ASSIGNEE, its successors, legal representatives, or assigns.

YOR920151153US03

I acknowledge my prior and ongoing obligations to sell, assign, and transfer the rights under this Assignment to the ASSIGNEE, and am unaware of any reason why I may not have the full and unencumbered right to sell, assign, and transfer my rights hereby sold, assigned, and transferred, and have not executed, and will not execute, any document or instrument in conflict herewith.

I also hereby grant the ASSIGNEE, its successors, legal representatives, and assigns, the right to insert in this Assignment any further identification (including, but not limited to, patent application Serial Number) which may be necessary or desirable for recordation of this Assignment. This Assignment is governed by the substantive laws of the State of New York, and any disputes will be resolved in a New York state court or federal court sited in New York.

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.

(1) Legal Name of Inventor: **JAMES L. HEDRICK**

Signature: _____ Date: _____

(2) Legal Name of Inventor: **ROBERT D. MILLER**

Signature: _____ Date: _____

(3) Legal Name of Inventor: **DEBORAH A. NEUMAYER**

Signature: *Deborah Neumayer* Date: *12/28/15*

(4) Legal Name of Inventor: **SAMPATH PURUSHOTHAMAN**

Signature: _____ Date: _____

(5) Legal Name of Inventor: **MARY E. ROTHWELL**

Signature: _____ Date: _____

(6) Legal Name of Inventor: **WILLI VOLKSEN**

Signature: _____ Date: _____

(7) Legal Name of Inventor: **ROY R. YU**

Signature: _____ Date: _____