PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2

EPAS ID: PAT3482313

| SUBMISSION TYPE: | NEW ASSIGNMENT |
|-----------------------|----------------|
| NATURE OF CONVEYANCE: | ASSIGNMENT |

CONVEYING PARTY DATA

| Name | Execution Date |
|------------------|----------------|
| MARK HEY | 08/10/2015 |
| ANAND MALLEPALLY | 08/12/2015 |
| PAUL BAKER | 08/13/2015 |

RECEIVING PARTY DATA

| Name: | MASTERCARD INTERNATIONAL INCORPORATED |
|-----------------|---------------------------------------|
| Street Address: | 2000 PURCHASE STREET |
| City: | PURCHASE |
| State/Country: | NEW YORK |
| Postal Code: | 10577 |

PROPERTY NUMBERS Total: 1

| Property Type | Number |
|---------------------|----------|
| Application Number: | 14825587 |

CORRESPONDENCE DATA

Fax Number: (314)726-7501

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent

using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Phone: 314-726-7500 Email: gwmefile@hdp.com **Correspondent Name:** BRIAN G. PANKA Address Line 1: 7700 BONHOMME

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SUITE 400

| ATTORNEY DOCKET NUMBER: | 16754-000127-US |
|-------------------------|------------------|
| NAME OF SUBMITTER: | BRIAN G. PANKA |
| SIGNATURE: | /Brian G. Panka/ |
| DATE SIGNED: | 08/13/2015 |

Total Attachments: 4

Address Line 2:

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> **PATENT** REEL: 036321 FRAME: 0232 503435689

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PATENT REEL: 036321 FRAME: 0233

ASSIGNMENT

WHEREAS, the undersigned, hereinafter referred to collectively as Assignor, has invented:

SYSTEMS AND METHODS FOR MONITORING AUTHENTICATION OF TRANSACTIONS TO PAYMENT NETWORKS

| for which Ass | ignor is | about to make or has made United States or International application for patent |
|---------------|-------------|--|
| (a) | \boxtimes | executed on even date preparatory to filing (each inventor should sign this Assignment on the same day as he/she signs the Declaration); |
| (b) | | executed on,; or |
| (c) | | filed on, and assigned Serial No or PCT International Application No ; and |

WHEREAS, MASTERCARD INTERNATIONAL INCORPORATED, 2000 PURCHASE STREET, PURCHASE, NY 10577, hereinafter referred to as Assignee, is desirous of acquiring all right, title, and interest therein:

NOW, THEREFORE, for good and valuable consideration, the receipt and adequacy whereof is hereby acknowledged. Assignor hereby confirms any prior assignment to Assignee, and to the extent that Assignor has not already done so, agrees to assign, and hereby does, sell, assign and transfer unto Assignee and its successors in interest, the full and exclusive right, title and interest in the United States of America and throughout the world, including the right to claim priority under the laws of the United States, the Paris Convention, and any foreign countries, to the inventions as described in the aforesaid application, to the aforesaid application itself, and all divisions, continuations, continuations-in-part, or other applications claiming priority directly or indirectly from the aforesaid application, and any United States or foreign Letters Patent, utility model, or other similar rights which may be granted thereon, including reissues, reexaminations and extensions thereof, and all copyright rights throughout the world in the aforesaid application and the subject matter disclosed therein, these rights, title and interest to be held and enjoyed by Assignee to the full end of the term for which the Letters Patent, utility model, or other similar rights, are granted and any extensions thereof as fully and entirely as the same would have been held by Assignor had this assignment and sale not been made, and the right to sue for, and recover for past infringements of, or liabilities for, any of the rights relating to any of the applications, patents, utility models, or other similar rights, resulting therefrom, and the copyright rights.

Assignor hereby covenants and agrees to execute all instruments or documents required or requested for the making and prosecution of any applications of any type for patent, utility model, or other similar rights, and for copyright, in the United States and in all foreign countries including, but not limited to, any provisional, continuation, continuation-in-part, divisional, renewal or substitute thereof, any derivation proceedings relating thereto, and as to Letters Patent any supplemental examination, derivation proceeding, opposition, post grant review, reissue, re-examination, inter partes review, or extension thereof, and for litigation regarding, or for the purpose of defending the validity of or protecting title to the said invention, the United States application for patent, or Letters Patent therefor, and to testify in support thereof, for the benefit of Assignee and its successors in interest without further or other compensation than that above set forth.

Assignor hereby covenants that no assignment, sale, license, agreement or encumbrance has been or will be entered into which would conflict with this Assignment. Assignor further covenants not to challenge, or assist or participate in any third party challenge to, the assigned inventions, or any patent application or patent thereon, whether by litigation, post grant review, inter partes review, covered business method review, reexamination, or otherwise.

Assignor hereby requests the United States Patent and Trademark Office to issue the Letters Patent of the United States of America to Assignee, and requests that any official of any country or countries foreign to the United States, whose duty it is to issue or grant patents and applications as aforesaid, to issue the Letters Patent, Utility Model Registration or other similar right to Assignee.

The undersigned hereby grant(s) the law firm of Harness, Dickey & Pierce, P.L.C. the power to insert on this Assignment any further identification which may be necessary or desirable in order to comply with the rules of the U.S. Patent and Trademark Office for recordation of this document.

Page 1 of 4

ASSIGNMENT

| My | |
|--------------------------------|---|
| Inventor or Assignor: Mark Hey | |
| Date: 8/10/15 | _ |

Signed in my presence and acknowledged to be an assignment of the invention and application referred to above.

| Witnessed by: Sheref foc |
|----------------------------------|
| vviinessed by. Sinverse growth |
| Printed Name: SHERYL LOCK |
| Home Address: 646 Benning ton Dr |
| St. Charles MD 63304 |
| |
| |

ASSIGNMENT

Inventor or Assignor: Anand Mallepally

Date: August 12 2015

Signed in my presence and acknowledged to be an assignment of the invention and application referred to above.

Witnessed by:

Printed Name: Shirley E. White-Ellu

Home Address: 21 Craven Dr.

Montgomery City, MO 6336

Attorney Docket No. 16754-000127-US

| ASSIGNMENT ASSIGNMENT | - |
|--|------------------------------------|
| Inventor or Assignor: Paul Baker | |
| Date: 13 August 2015 | |
| Signed in my presence and acknowledged to be application referred to above. Witnessed by: | an assignment of the invention and |
| Printed Name: PARTRIEMAN | - |
| Home Address: THE HALL FARMHOUSE | _ |
| MAIR LASE | - |
| WELDOVER. | - |