

## PATENT ASSIGNMENT COVER SHEET

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| <b>SUBMISSION TYPE:</b>   | NEW ASSIGNMENT                          |
| <b>NATURE OF CONVEYANCE:</b>  | ASSIGNMENT                              |
| <b>CONVEYING PARTY DATA</b>   |   |
| <b>Name</b>   | <b>Execution Date</b>                   |
| ALIBABA GROUP HOLDING LIMITED   | 08/26/2020                              |
| <b>RECEIVING PARTY DATA</b>   |   |
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| <b>PROPERTY NUMBERS Total: 1</b>  |   |
| <b>Property Type</b>  | <b>Number</b>                           |
| <b>Application Number:</b>  | 17201392                                |
| <b>CORRESPONDENCE DATA</b>  |   |
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| <b>ATTORNEY DOCKET NUMBER:</b>  | 44892-0466002/PCT21708USC               |
| <b>NAME OF SUBMITTER:</b>   | SARAH NAGLE                             |
| <b>SIGNATURE:</b>   | /Sarah Nagle/                           |
| <b>DATE SIGNED:</b>   | 05/07/2021                              |
| <b>Total Attachments: 38</b>  |   |
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**Patent Assignment**

This Patent Assignment (this "Assignment") with an effective date of August 24, 2020 (the "Effective Date") by Alibaba Group Holding Limited, a company duly authorized under the laws of Cayman Islands and having an address at Fourth Floor, One Capital Place, P.O. Box 847, George Town, Grand Cayman, Cayman Islands (hereinafter the "Assignor") witnesseth:

WHEREAS, Assignor is the owner of certain rights, title and interest in and to the patents and patent applications set forth on Schedule A hereto (hereinafter the "Patents and Applications");

WHEREAS, Advantageous New Technologies Co., Ltd., a company duly organized under and pursuant to the laws of Cayman Islands and having an address at Cayman Corporate Centre, 27 Hospital Road, George Town, Grand Cayman KY1-9008, Cayman Islands (hereinafter the "Assignee"), is desirous of acquiring Assignor's entire right, title and interest in and to said Patents and Applications, and in and to any Letters Patent or Patents to be obtained therefor and thereon;

NOW, THEREFORE, for good and valuable consideration, the receipt and adequacy of which is hereby acknowledged, Assignor has as of the Effective Date sold, assigned, transferred and conveyed, and does hereby sell, assign, transfer and convey, unto Assignee, all of Assignor's rights, titles and interests in and to the Patents and Applications, and any and all Letters Patent or Patents in the United States of America and all foreign countries which may be granted therefor and thereon, for its own use and behalf and the use and behalf of its successors, legal representatives and assigns, to the full end of the term or terms for which Letters Patent or Patents may be granted, as fully and entirely as the same would have been held and enjoyed by the Assignor, had this sale and assignment not been made. Assignor does hereby sell, assign, transfer, and convey to Assignee, its successors, legal representatives, and assigns all claims for damages and all remedies arising out of any violation of the rights assigned hereby that may have accrued prior to the date of assignment to Assignee, or may accrue hereafter including, but not limited to, the right to sue for, collect, and retain damages for past, present and future infringement of the said Patents and Applications before or after issuance.

IN TESTIMONY WHEREOF, this Assignment is signed by the following duly authorized signatories of the Assignor and Assignee respectively, on this 26th day of August, 2020.

Assignor  
Alibaba Group Holding Limited

Assignee  
Advantageous New Technologies Co., Ltd.

Signature:   
Name: Min Schumann Xu  
Title: Chief Patent & Technology Counsel

Signature:   
Name: J Benjamin Bai  
Title: Director

### Schedule A to Patent Assignment

| Patent Number | Country / Region | App. #, Ser. | App. Date  | Patent Title  |
|---------------|------------------|--------------|------------|---|
| A10036US      | US               | 15/782,672   | 2017/10/12 | USER IDENTITY AUTHENTICATION USING VIRTUAL REALITY  |
| A10037US      | US               | 15/782,747   | 2017/10/12 | VIRTUAL REALITY IDENTITY VERIFICATION   |
| A10135US      | US               | 15792611     | 2017/10/24 | USER LOCATION DETERMINATION BASED ON AUGMENTED REALITY  |
| A10136US      | US               | 15/792,628   | 2017/10/24 | PERFORMING VIRTUAL REALITY INPUT  |
| A10139US      | US               | 15/794,814   | 2017/10/26 | USER INTERFACE FOR INFORMATIONAL INPUT IN VIRTUAL REALITY ENVIRONMENT                             |
| A10141US      | US               | 15/802,264   | 2017/11/2  | IMPROVING THE SUCCESS RATE OF AN ONLINE TRANSACTION   |
| A10153US      | US               | 15/833,838   | 2017/12/6  | TRANSPARENT RESOURCE MATCHING   |
| A10226US      | US               | 15/782,729   | 2017/10/12 | SERVICE CONTROL AND USER IDENTITY AUTHENTICATION BASED ON VIRTUAL REALITY                         |
| A10337US      | US               | 15/902,724   | 2018/2/22  | SECURE DATA TRANSACTIONS  |
| A10572US      | US               | 15/845,422   | 2017/12/18 | SECURE OFFLINE RESOURCE OPERATIONS  |
| A10587US      | US               | 15/837,595   | 2017/12/11 | USER CREDIT ASSESSMENT  |
| A10643US      | US               | 15/819,041   | 2017/11/21 | SERVICE CONTROL AND USER IDENTITY AUTHENTICATION BASED ON VIRTUAL REALITY                         |
| A10760US      | US               | 15/885,234   | 2018/1/31  | TRUSTED LOGIN OF USER ACCOUNTS  |
| A10775US      | US               | 15/888,617   | 2018/2/5   | EXPRESS PACKAGE DELIVERY  |
| A10778US      | US               | 15/900,647   | 2018/2/20  | HANDLING REQUESTS IN A CONSENSUS NETWORK  |
| A10803US      | US               | 15864572     | 2018/1/8   | IMAGE RECOGNITION BASED ON AUGMENTED REALITY  |
| A10853US      | US               | 15/839,512   | 2017/12/12 | ALLOCATING VIRTUAL OBJECTS BASED ON AUGMENTED REALITY   |
| A10932US      | US               | 15/900,617   | 2018/2/20  | TRANSACTION VERIFICATION IN A CONSENSUS NETWORK   |
| A10984US      | US               | 15/893,159   | 2018/2/9   | TWO DIMENSIONAL CODE GENERATION AND RECOGNITION   |
| A10985US      | US               | 15/894,761   | 2018/2/12  | GENERATING AUTHENTICATION IMAGE TO VERIFY A TWO-DIMENSIONAL CODE OFFLINE                          |
| A11149US      | US               | 15/874725    | 2018/1/18  | WORD VECTOR PROCESSING FOR FOREIGN LANGUAGES  |
| A11226US      | US               | 15/889,997   | 2018/2/6   | ORDER DETERMINATION IN AN UNMANNED STORE  |
| A11627US      | US               | 15/992,918   | 2018/5/30  | ENHANCING PROCESSING EFFICIENCY OF BLOCKCHAIN TECHNOLOGIES USING PARALLEL SERVICE DATA PROCESSING |
| A11661US      | US               | 15/950,660   | 2018/4/11  | IMAGE-BASED VEHICLE DAMAGE DETERMINING METHOD AND APPARATUS, AND ELECTRONIC DEVICE                |
| A11662US      | US               | 15/950,723   | 2018/4/11  | PICTURE-BASED VEHICLE LOSS ASSESSMENT   |
| A11663US      | US               | 15/950,786   | 2018/4/11  | IMAGE-BASED VEHICLE MAINTENANCE PLAN  |
| A11710US      | US               | 16/019,185   | 2018/6/26  | MULTI-BLOCKCHAIN NETWORK DATA PROCESSING  |
| A11825US      | US               | 16/001,670   | 2018/6/6   | DETERMINING USER AUTHENTICITY WITH FACE LIVENESS DETECTION  |
| A11890US      | US               | 16/048,573   | 2018/7/30  | BIOMETRIC FEATURE DATABASE ESTABLISHING METHOD AND APPARATUS                                      |
| A11914US      | US               | 16019840     | 2018/6/27  | WIRELESS NETWORK TYPE DETECTION METHOD AND APPARATUS, AND ELECTRONIC DEVICE                       |
| A11920US      | US               | 16/031,306   | 2018/7/10  | INSTANT-MESSAGING-BASED PICTURE SENDING METHOD AND DEVICE   |

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|-----------|----|------------|------------|---|
| A11924US  | US | 16/034,094 | 2018/7/12  | BLOCKCHAIN BASED DATA PROCESSING METHOD AND DEVICE  |
| A11925US  | US | 16/034,137 | 2018/7/12  | BLOCKCHAIN-BASED DATA PROCESSING METHOD AND DEVICE  |
| A11926US  | US | 16/034,252 | 2018/7/12  | BLOCKCHAIN SERVICE DATA PROCESSING  |
| A11927US  | US | 16/042,897 | 2018/7/23  | BLOCKCHAIN CONSENSUS NODE SELECTION   |
| A11928US  | US | 16/113,722 | 2018/8/27  | KEY DATA PROCESSING METHOD AND APPARATUS, AND SERVER  |
| A11929US  | US | 16/034,196 | 2018/7/12  | LOGIN INFORMATION DATA PROCESSING   |
| A11931US  | US | 16/045,153 | 2018/7/25  | DIGITAL CERTIFICATE MANAGEMENT METHOD, APPARATUS, AND SYSTEM  |
| A11932US  | US | 16/045,107 | 2018/7/25  | DIGITAL CERTIFICATE MANAGEMENT METHOD AND APPARATUS, AND ELECTRONIC DEVICE  |
| A11933US  | US | 16/040,347 | 2018/7/19  | METHOD, APPARATUS, AND ELECTRONIC DEVICE FOR COMMUNICATION BETWEEN BLOCKCHAIN NODES, AND METHOD, APPARATUS, AND ELECTRONIC DEVICE FOR BLOCKCHAIN-BASED CERTIFICATE MANAGEMENT |
| A11934US  | US | 16/040,376 | 2018/7/19  | METHOD AND APPARATUS FOR COMMUNICATION BETWEEN BLOCKCHAIN NODES   |
| A11935US  | US | 16/045,132 | 2018/7/25  | SECURE COMMUNICATIONS IN A BLOCKCHAIN NETWORK   |
| A11975US  | US | 16/047,399 | 2018/7/27  | DATA SECURITY ENHANCEMENT BY MODEL TRAINING   |
| A12080US  | US | 16/003,503 | 2018/6/8   | METHOD AND APPARATUS FOR SECURITY VERIFICATION BASED ON BIOMETRIC FEATURE   |
| A12233US  | US | 16/053,606 | 2018/8/2   | MODEL TRAINING METHOD AND APPARATUS BASED ON DATA SHARING   |
| A12234US  | US | 16/002,764 | 2018/6/7   | DETERMINING A CATEGORIZATION VALUE BASED ON PROCESSING OF ATTRIBUTE DATA  |
| A12235US  | US | 16/022,194 | 2018/6/28  | PREDICTION ALGORITHM BASED ATTRIBUTE DATA PROCESSING  |
| A12236US  | US | 16/014,917 | 2018/6/21  | SETTLEMENT METHOD, ENTRANCE CONTROL METHOD, AND APPARATUS   |
| A12263US  | US | 16/124,580 | 2018/9/7   | RESOURCE PROCESSING METHOD AND APPARATUS  |
| A12772US  | US | 16/160,810 | 2018/10/15 | DIGITAL CERTIFICATE APPLICATION   |
| A12881US  | US | 16/171,715 | 2018/10/26 | DIGITAL CERTIFICATE MANAGEMENT  |
| A13002US  | US | 16/210,959 | 2018/12/5  | SELF-SERVICE PAYMENT DEVICE AND CONTROL METHOD THEREOF  |
| A13029US  | US | 16/175,503 | 2018/10/30 | DATA STORAGE NODES COLLABORATION AND DATA PROCESSING FOR DATA STATISTICAL ANALYSIS  |
| A13031US  | US | 16/152,459 | 2018/10/5  | DYNAMICALLY-ORGANIZED SYSTEM FOR DISTRIBUTED CALCULATIONS   |
| A13032US  | US | 16/167,329 | 2018/10/22 | DATA AUDITING METHOD AND DEVICE   |
| A13439US  | US | 16/197,883 | 2018/11/21 | TWO-DIMENSIONAL CODE GENERATION AND PROCESSING  |
| A13592DUS | US | 29/650,450 | 2018/6/6   | SMART PAYMENT SPEAKER   |
| A13730US  | US | 16/235,653 | 2018/12/28 | TRAFFIC DETECTION METHOD, DEVICE, AND SYSTEM  |
| PCT3956US | US | 15/805,205 | 2017/11/7  | TRANSACTION SCHEME FOR OFFLINE PAYMENT  |
| PCT4035US | US | 15/694,030 | 2017/9/1   | IDENTIFYING RISKY USER BEHAVIORS IN COMPUTER NETWORKS   |
| PCT4263US | US | 15701210   | 2017/9/11  | STARTING NETWORK-BASED SERVICES USING A VOCAL INTERFACE WITH COMMUNICATION SOFTWARE ON A MOBILE COMPUTING DEVICE  |
| PCT4272US | US | 15/818,609 | 2017/11/20 | EFFICIENT ACQUISITION OF A TARGET IMAGE FROM AN ORIGINAL IMAGE  |
| PCT4319US | US | 15/816,207 | 2017/11/17 | ACCOUNT THEFT RISK IDENTIFICATION   |
| PCT4346US | US | 15/693,872 | 2017/9/1   | REDUCING AUTHENTICATION REQUIREMENTS FOR DATA TRANSMISSIONS   |

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| PCT4350US | US | 15719125   | 2017/9/28  | EFFICIENT, TIME-BASED LEADER NODE ELECTION IN A DISTRIBUTED COMPUTING SYSTEM                    |
| PCT4402US | US | 15720410   | 2017/9/29  | RISK IDENTIFICATION BASED ON ADDRESS MATCHING   |
| PCT4411US | US | 15/703,393 | 2017/9/13  | REDUCING COMPUTATIONAL COMPLEXITY IN THREE-DIMENSIONAL MODELING BASED ON TWO-DIMENSIONAL IMAGES |
| PCT4417US | US | 15/833,907 | 2017/12/6  | INFORMATION PROCESSING USING A SERVER GROUP   |
| PCT4679US | US | 15716332   | 2017/9/26  | EFFICIENT IMAGE SYNTHESIS   |
| PCT4682US | US | 15716381   | 2017/9/26  | EFFICIENT IMAGE SYNTHESIS USING SOURCE IMAGE MATERIALS  |
| PCT4710US | US | 15/809,780 | 2017/11/10 | ESTABLISHING A TRUSTED LOGIN PROCEDURE  |
| PCT4718US | US | 15/844,042 | 2017/12/15 | ELECTRONIC PAYMENT RISK PROCESSING  |
| PCT4761US | US | 15857762   | 2017/12/29 | USING BIOMETRIC FEATURES FOR USER AUTHENTICATION  |
| PCT4777US | US | 15/809,799 | 2017/11/10 | RISK IDENTIFICATION BASED ON HISTORICAL BEHAVIORAL DATA   |
| PCT4786US | US | 15/800,823 | 2017/11/1  | MATCHING PRODUCTS WITH SERVICE SCENARIOS  |
| PCT4788US | US | 15/784,912 | 2017/10/16 | MANAGING TIME CONSISTENCY IN A DISTRIBUTED COMPUTING SYSTEM                                     |
| PCT4794US | US | 15/797,537 | 2017/10/30 | DISTRIBUTED DATA PROCESSING   |
| PCT4796US | US | 15717344   | 2017/9/27  | REMOTE DATABASE SYNCHRONIZATION   |
| PCT4803US | US | 15/813,389 | 2017/11/15 | ON-DEMAND CREATION AND ACCESS OF A VIRTUAL FILE SYSTEM  |
| PCT4805US | US | 15720434   | 2017/9/29  | ACCURACY AND SECURITY OF DATA TRANSFER TO AN ONLINE USER ACCOUNT                                |
| PCT4833US | US | 15717445   | 2017/9/27  | RECOMMENDING A DATA HANDLING METHOD FOR A PENDING DATA HANDLING PROCESS                         |
| PCT4834US | US | 15717455   | 2017/9/27  | PRESENTING A DATA HANDLING METHOD ON A GRAPHICAL USER INTERFACE                                 |
| PCT4839US | US | 15/944,630 | 2018/4/3   | ROUTER ADDRESS TYPE IDENTIFICATION METHOD AND APPARATUS   |
| PCT4845US | US | 15/838,100 | 2017/12/11 | DETERMINING LOCATION INFORMATION BASED ON USER CHARACTERISTICS                                  |
| PCT4893US | US | 15/840,572 | 2017/12/13 | ENHANCING SECURITY OF APPLICATION DOWNLOADS   |
| PCT4917US | US | 15/822,381 | 2017/11/27 | SECURELY AND EFFICIENTLY SHARING DATA EXCHANGE RECORDS  |
| PCT4924US | US | 15/797,698 | 2017/10/30 | RECORDING AND RESTORING A CLICK POSITION IN A WEBPAGE   |
| PCT4926US | US | 15/818,504 | 2017/11/20 | CONTROLLING MESSAGE OUTPUT  |
| PCT4956US | US | 15/822,438 | 2017/11/27 | ASSISTED DATA INPUT   |
| PCT4967US | US | 15857730   | 2017/12/29 | IDENTIFICATION OF A RELATED COMPUTING DEVICE FOR AUTOMATIC ACCOUNT LOGIN                        |
| PCT5033US | US | 15719274   | 2017/9/28  | AUTHENTICATING A USER AND REGISTERING A WEARABLE DEVICE   |
| PCT5173US | US | 15/842,486 | 2017/12/14 | RESENDING A HYPERTEXT TRANSFER PROTOCOL REQUEST   |
| PCT5245US | US | 15/835,160 | 2017/12/7  | COMMUNICATION TOOL FOR DATA TRANSFER  |
| PCT5253US | US | 15/903,801 | 2018/2/23  | IDENTITY AUTHENTICATION USING BIOMETRICS  |
| PCT5420US | US | 15/842,531 | 2017/12/14 | LOGIN TO A SUSPENDED ACCOUNT  |
| PCT5439US | US | 15/834,976 | 2017/12/7  | TRANSACTION INTERACTIONS BETWEEN NODE GROUPS  |
| PCT5513US | US | 15/920,087 | 2018/3/13  | IDENTITY AUTHENTICATION USING A WEARABLE DEVICE   |
| PCT5518US | US | 15/836,274 | 2017/12/8  | MITIGATING AFFAIR PROCESSING REQUESTS   |
| PCT5551US | US | 15/909,640 | 2018/3/1   | DETERMINING DEPLOYMENT NEED FOR POINT OF INTEREST   |

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| PCT5623US | US | 15/989,678 | 2018/5/25  | PAGE JUMP METHOD AND APPARATUS   |
| PCT5683US | US | 15/926,711 | 2018/3/20  | LOADING SUB-APPLICATIONS FOR A TERMINAL APPLICATION                                  |
| PCT5696US | US | 15/842,395 | 2017/12/14 | PREVIEWING DYNAMIC IMAGES AND EXPRESSIONS  |
| PCT5698US | US | 15/835,113 | 2017/12/7  | ENHANCING ACCURACY OF PRESENTED SEARCH KEYWORDS                                      |
| PCT5759US | US | 15/977,576 | 2018/5/11  | FACE LOCATION TRACKING METHOD, APPARATUS, AND ELECTRONIC DEVICE                      |
| PCT5797US | US | 15/951,928 | 2018/4/12  | IDENTIFICATION OF NOISE SIGNAL FOR VOICE DENOISING DEVICE                            |
| PCT5814US | US | 15857824   | 2017/12/29 | COMMUNICATION TOOL FOR INITIATION OF SERVICES  |
| PCT5829US | US | 15870225   | 2018/1/12  | QUERYING A DATABASE  |
| PCT5830US | US | 15870048   | 2018/1/12  | VOICEPRINT RECOGNITION MODEL CONSTRUCTION  |
| PCT5831US | US | 15949338   | 2018/4/10  | TWO-DIMENSIONAL CODE PROCESSING METHOD AND APPARATUS                                 |
| PCT5841US | US | 15/980,171 | 2018/5/15  | ORDER CLUSTERING AND MALICIOUS INFORMATION COMBATING METHOD AND APPARATUS            |
| PCT5917US | US | 15/975,602 | 2018/5/9   | IDENTIFYING POTENTIAL SOLUTIONS FOR ABNORMAL EVENTS BASED ON HISTORICAL DATA         |
| PCT6088US | US | 15/914,657 | 2018/3/7   | METHOD AND DEVICE FOR IMPLEMENTING SERVICE FUNCTION                                  |
| PCT6178US | US | 15/903,995 | 2018/2/23  | DATA STORAGE FOR MOBILE TERMINALS  |
| PCT6222US | US | 15/921,461 | 2018/3/14  | METHOD AND APPARATUS FOR DISPLAYING FUNCTION INTERFACE                               |
| PCT6245US | US | 15/949,981 | 2018/4/10  | ADDRESS INFORMATION-BASED ACCOUNT MAPPING METHOD AND APPARATUS                       |
| PCT6250US | US | 16/019,812 | 2018/6/27  | LINK REQUEST PROCESSING METHOD AND APPARATUS   |
| PCT6304US | US | 16/027,083 | 2018/7/3   | SECURITY VERIFICATION METHOD AND DEVICE FOR SMART CARD APPLICATION                   |
| PCT6305US | US | 16/026,776 | 2018/7/3   | DATA INTERACTION METHOD AND DEVICE, AND OFFLINE CREDIT PAYMENT METHOD AND DEVICE     |
| PCT6309US | US | 16/042,772 | 2018/7/23  | CREDIT PAYMENT METHOD AND APPARATUS BASED ON MOBILE TERMINAL EMBEDDED SECURE ELEMENT |
| PCT6310US | US | 16/042,808 | 2018/7/23  | CREDIT PAYMENT METHOD AND APPARATUS BASED ON MOBILE TERMINAL PEER-TO-PEER            |
| PCT6311US | US | 16/043,417 | 2018/7/24  | CREDIT PAYMENT METHOD AND APPARATUS BASED ON CARD EMULATION OF MOBILE TERMINAL       |
| PCT6393US | US | 16/009,310 | 2018/6/15  | ENHANCING PERFORMANCE OF INTER-SYSTEM SERVICE OPERATIONS                             |
| PCT6494US | US | 15/963,613 | 2018/4/26  | INFORMATION SENDING METHOD AND APPARATUS   |
| PCT6500US | US | 15/976,560 | 2018/5/10  | INFORMATION RECOMMENDATION BASED ON RULE MATCHING                                    |
| PCT6508US | US | 16/009,424 | 2018/6/15  | SELECTING USER IDENTITY VERIFICATION METHODS BASED ON VERIFICATION RESULTS           |
| PCT6513US | US | 15/944,569 | 2018/4/3   | ADDRESS ANALYSIS USING MORPHEMES   |
| PCT6528US | US | 15/968,593 | 2018/5/1   | SERVICE PROCESSING METHOD AND APPARATUS  |
| PCT6543US | US | 16/008,999 | 2018/6/14  | ONLINE SHOPPING SERVICE PROCESSING   |
| PCT6548US | US | 16/026,986 | 2018/7/3   | SERVICE FALLBACK METHOD AND APPARATUS  |
| PCT6557US | US | 16/037,785 | 2018/7/17  | DATA SYNCHRONIZATION METHOD, APPARATUS, AND SYSTEM                                   |
| PCT6594US | US | 15/969,364 | 2018/5/2   | MONITORING NODE USAGE IN A DISTRIBUTED SYSTEM  |
| PCT6603US | US | 15/974,360 | 2018/5/8   | IP ADDRESS ACQUISITION METHOD AND APPARATUS  |
| PCT6663US | US | 15/979,946 | 2018/5/15  | WEIGHT-COEFFICIENT-BASED HYBRID INFORMATION RECOMMENDATION                           |
| PCT6668US | US | 16/054,577 | 2018/8/3   | ELECTRONIC PAYMENT SERVICE PROCESSING  |

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|-----------|----|------------|-----------|---|
| PCT6673US | US | 15/971,386 | 2018/5/4  | METHOD AND DEVICE FOR APPLICATION INFORMATION RISK MANAGEMENT   |
| PCT6681US | US | 16/019,716 | 2018/6/27 | GENERATING A GRAPHICAL USER INTERFACE BASED ON FORMATTED STRUCTURE DATA                                   |
| PCT6689US | US | 16/019,228 | 2018/6/26 | SHORT LINK PROCESSING TO IMPROVE SERVICE EFFICIENCY   |
| PCT6690US | US | 16/019,897 | 2018/6/27 | METHOD AND DEVICE FOR PROCESSING SHORT LINK, AND SHORT LINK SERVER  |
| PCT6692US | US | 16/020,038 | 2018/6/27 | METHOD AND APPARATUS OF BARCODE-BASED MOBILE PROCESSING   |
| PCT6700US | US | 16/015,036 | 2018/6/21 | APP PROGRAM RUNNING METHOD AND APPARATUS  |
| PCT6823US | US | 16/114,945 | 2018/8/28 | METHOD AND APPARATUS FOR CHECKING INTEGRITY OF DISTRIBUTED SERVICE PROCESSING                             |
| PCT6850US | US | 15/986,939 | 2018/5/23 | INFORMATION GENERATION, ACQUISITION, AND PROCESSING TO IMPROVE SERVICE EFFICIENCY                         |
| PCT6982US | US | 16/043,636 | 2018/7/24 | IMAGE PROCESSING METHOD AND DEVICE  |
| PCT6993US | US | 16/027,030 | 2018/7/3  | PAGE POSITIONING METHOD AND APPARATUS FOR ERRONEOUS INPUT INFORMATION                                     |
| PCT7051US | US | 16/047,648 | 2018/7/27 | TRANSACTION CONFIRMATION BASED ON USER ATTRIBUTES   |
| PCT7179US | US | 16/031,507 | 2018/7/10 | METHOD AND APPARATUS FOR OBTAINING ABBREVIATED NAME OF POINT OF INTEREST ON MAP                           |
| PCT7180US | US | 16/131,701 | 2018/9/14 | ANDROID-BASED POP-UP PROMPT METHOD AND DEVICE   |
| PCT7227US | US | 16/039,006 | 2018/7/18 | SELECTIVE INFORMATION SHARING BETWEEN USERS OF A SOCIAL NETWORK   |
| PCT7236US | US | 16/015,818 | 2018/6/22 | DISPLAYING AN ONLINE PRODUCT ON A PRODUCT SHELF   |
| PCT7246US | US | 16/026,861 | 2018/7/3  | PERMISSION MANAGEMENT AND RESOURCE CONTROL  |
| PCT7249US | US | 16/115,204 | 2018/8/28 | LOCATION-BASED SERVICE IMPLEMENTING METHOD AND APPARATUS  |
| PCT7403US | US | 16/137,781 | 2018/9/21 | PAYMENT PROCESSING USING A WEARABLE DEVICE  |
| PCT7426US | US | 16/115,003 | 2018/8/28 | INFORMATION DISPLAY METHOD AND DEVICE   |
| PCT7505US | US | 16/130,510 | 2018/9/13 | TECHNIQUES TO VERIFY MESSAGE AUTHENTICITY   |
| PCT7565US | US | 16/140,039 | 2018/9/24 | METHOD AND DEVICE FOR OUTPUTTING RISK INFORMATION AND CONSTRUCTING RISK INFORMATION                       |
| PCT7633US | US | 16/107,027 | 2018/8/21 | CHARACTER STRING DISTANCE CALCULATION METHOD AND DEVICE   |
| PCT7642US | US | 16/119,470 | 2018/8/31 | AUTHORIZATION METHOD AND DEVICE FOR JOINT ACCOUNT, AND AUTHENTICATION METHOD AND DEVICE FOR JOINT ACCOUNT |
| PCT7665US | US | 16/115,176 | 2018/8/28 | METHOD AND APPARATUS FOR DETERMINING RELATIVE LOCATION  |
| PCT7680US | US | 15/999,081 | 2018/8/17 | INFORMATION PROCESSING METHOD AND DEVICE FOR DISPLAYING SERVICE COMPLETION STATUS                         |
| PCT7686US | US | 16/109,291 | 2018/8/22 | WEBPAGE DATA SYNCHRONIZATION  |
| PCT7887US | US | 16/040,256 | 2018/7/19 | METHOD AND APPARATUS FOR REALIZING COLOR TWEEN ANIMATION  |
| PCT7909US | US | 16/115,313 | 2018/8/28 | SERVICE IMPLEMENTATION METHOD, APPARATUS, AND SYSTEM BASED ON FIX PROTOCOL                                |
| PCT7916US | US | 16/119,224 | 2018/8/31 | METHOD AND APPARATUS REUSING LISTCELL IN HYBRID APPLICATION   |
| PCT7925US | US | 16/124,999 | 2018/9/7  | PUBLISHED INFORMATION PROCESSING METHOD AND DEVICE, AND INFORMATION PUBLISHING SYSTEM                     |
| PCT7935US | US | 16/123,948 | 2018/9/6  | RESOURCE LOADING AND A SERVICE FUNCTION FOR A SOFTWARE APPLICATION  |
| PCT7937US | US | 16/138,651 | 2018/9/21 | METHOD AND DEVICE FOR PAGE DISPLAY  |



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| PCT7949US | US | 16/028,510 | 2018/7/6   | METHOD AND APPARATUS FOR INVOKING FUNCTION IN APPLICATION  |
| PCT7951US | US | 16/028,174 | 2018/7/5   | INFORMATION IMAGE DISPLAY METHOD AND APPARATUS   |
| PCT8014US | US | 16/040,310 | 2018/7/19  | SERVICE OBJECT ALLOCATION  |
| PCT8068US | US | 16/221,044 | 2018/12/14 | INFORMATION PUSHING BASED ON USER LOCATION   |
| PCT8120US | US | 16/216,970 | 2018/12/11 | CROSS-APPLICATION DATA SHARING   |
| PCT8361US | US | 16/225,160 | 2018/12/19 | OFFLINE PAYMENT METHOD AND DEVICE  |
| PCT8371US | US | 16/235,770 | 2018/12/28 | METHOD AND DEVICE FOR PROCESSING HYPERLINK OBJECT  |
| PCT8375US | US | 16/202,809 | 2018/11/28 | METHOD AND DEVICE FOR PREVENTING SERVER FROM BEING ATTACKED  |
| PCT8379US | US | 16/205,397 | 2018/11/30 | ADAPTIVE RESOURCE ALLOCATION METHOD AND APPARATUS  |
| PCT8411US | US | 16/200,318 | 2018/11/26 | IDENTITY VERIFICATION METHOD AND APPARATUS   |
| PCT8685US | US | 16/184,679 | 2018/11/8  | AUTOMATIC LOGIN METHOD AND DEVICE BETWEEN MULTIPLE WEBSITES  |
| PCT8709US | US | 16/193,282 | 2018/11/16 | METHOD AND DEVICE FOR PROCESSING GROUP MESSAGE   |
| PCT8710US | US | 16/183,419 | 2018/11/7  | METHOD, DEVICE, APPARATUS, AND SYSTEM FOR DISPLAYING DYNAMIC LIST  |
| PCT8716US | US | 16/183,415 | 2018/11/7  | APPLICATION PROGRAM DATA PROCESSING METHOD AND DEVICE  |
| PCT8721US | US | 16/210,988 | 2018/12/5  | METHOD AND DEVICE FOR PUSHING INFORMATION  |
| PCT8835US | US | 16/205,411 | 2018/11/30 | VIDEO PLAYING CONTROL METHOD AND APPARATUS, AND VIDEO PLAYING SYSTEM   |
| PCT8838US | US | 16/212,316 | 2018/12/6  | METHOD, DEVICE, AND TERMINAL DEVICE FOR EXTRACTING DATA  |
| PCT8839US | US | 16/193,201 | 2018/11/16 | DATA TRANSMISSION METHOD, DATA TRANSMITTER, DATA RECEIVER, AND SYSTEM  |
| PCT9055US | US | 16/192,401 | 2018/11/15 | IDENTITY AUTHENTICATION METHOD AND APPARATUS   |
| PCT9060US | US | 16/186,068 | 2018/11/9  | METHOD AND SYSTEM FOR STARTING APPLICATION   |
| PCT9061US | US | 16/186,125 | 2018/11/9  | IDENTITY VERIFICATION METHOD AND SYSTEM, AND INTELLIGENT WEARABLE DEVICE   |
| PCT9062US | US | 16/186,161 | 2018/11/9  | METHOD AND SYSTEM FOR STARTING APPLICATION   |
| PCT9063US | US | 16/192,329 | 2018/11/15 | METHOD, SYSTEM AND INTELLIGENT TERMINAL FOR PAIRING BETWEEN INTELLIGENT WEARABLE DEVICE AND INTELLIGENT TERMINAL |
| PCT9074US | US | 16/186,197 | 2018/11/9  | PROCESSING METHOD FOR PREVENTING COPY ATTACK, AND SERVER AND CLIENT  |
| PCT9085US | US | 16/205,839 | 2018/11/30 | MOBILE PAYMENT PROCESSING  |
| PCT9097US | US | 16/210,347 | 2018/12/5  | INFORMATION PROCESSING METHOD AND DEVICE, AND METHOD AND DEVICE FOR DISPLAYING DYNAMIC INFORMATION               |
| PCT9100US | US | 16/193,401 | 2018/11/16 | METHOD AND DEVICE FOR DATA VERSION COMPARISON BETWEEN TRANS-TIME ZONE SITES                                      |
| PCT9106US | US | 16/202,609 | 2018/11/28 | IMAGE GENERATION METHOD AND DEVICE   |
| A9110US   | US | 15643963   | 2017/7/7   | COLLECTING USER INFORMATION FROM COMPUTER SYSTEMS  |
| PCT9111US | US | 16/212,210 | 2018/12/6  | METHOD AND DEVICE FOR IDENTITY AUTHENTICATION  |
| PCT9114US | US | 16/186,209 | 2018/11/9  | METHOD FOR DETERMINING USER BEHAVIOR PREFERENCE, AND METHOD AND DEVICE FOR PRESENTING RECOMMENDATION INFORMATION |
| PCT9115US | US | 16/176,766 | 2018/10/31 | AUTHENTICATION AND GENERATION OF INFORMATION FOR AUTHENTICATION  |
| PCT9120US | US | 16/210,534 | 2018/12/5  | PROCESSING IMAGE DATA OF A WEBPAGE   |
| PCT9124US | US | 16/227,813 | 2018/12/20 | RESOURCE PROCESSING METHOD AND APPARATUS   |

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| PCT9234US       | US | 16/220,293 | 2018/12/14 | ANIMATION GENERATION METHOD AND APPARATUS   |
| PCT9239US       | US | 16/227,611 | 2018/12/20 | STORING DATA IN DISTRIBUTED SYSTEMS   |
| PCT9372US       | US | 16/234,467 | 2018/12/27 | CONTROLLING METHOD AND DEVICE FOR SLIDER CONTROL, AND SLIDER SELECTOR                             |
| PCT9378US       | US | 16/234,430 | 2018/12/27 | METHOD AND DEVICE FOR PROCESSING DATA   |
| PCT9389US       | US | 16/229,810 | 2018/12/21 | HAND DETECTION AND TRACKING METHOD AND DEVICE   |
| A9933US         | US | 15792594   | 2017/10/24 | OFFLINE-SERVICE MULTI-USER INTERACTION BASED ON AUGMENTED REALITY                                 |
| A9935US         | US | 15720635   | 2017/9/29  | THREE-DIMENSIONAL GRAPHICAL USER INTERFACE FOR INFORMATIONAL INPUT IN VIRTUAL REALITY ENVIRONMENT |
| A14433DUS       | US | 29/659,615 | 2018/8/10  | COMBINED PAYMENT DEVICE AND SPEAKER   |
| PCT6976US       | US | 16/119,208 | 2018/8/31  | EFFICIENT STORAGE OF USER PERSONAL ATTRIBUTES FOR SERVICE PROVISIONING                            |
| PCT8039US       | US | 16/123,897 | 2018/9/6   | SERVICE EXECUTION METHOD AND DEVICE   |
| PCT8069US       | US | 16/128,277 | 2018/9/11  | WEBSITE LOGIN METHOD AND APPARATUS  |
| PCT8070US       | US | 16/137,306 | 2018/9/20  | SERVICE PROCESSING METHOD, DEVICE, AND SYSTEM   |
| PCT8196US       | US | 16/131,905 | 2018/9/14  | MOBILE TERMINAL APPLICATION UPDATE METHOD AND DEVICE  |
| PCT8197US       | US | 16/131,352 | 2018/9/14  | RANDOM NUMBER GENERATION AND ACQUISITION METHOD AND DEVICE  |
| PCT8365US       | US | 16/132,050 | 2018/9/14  | METHOD AND DEVICE FOR LINKING TO ACCOUNT AND PROVIDING SERVICE PROCESS                            |
| PCT8368US       | US | 16/131,540 | 2018/9/14  | DETERMINING ATTRIBUTE INFORMATION OF GEOGRAPHICAL LOCATIONS                                       |
| PCT8374US       | US | 16/135,604 | 2018/9/19  | MIXED VIEW DISPLAY METHOD AND DEVICE  |
| PCT8388US       | US | 16/137,424 | 2018/9/20  | METHOD AND DEVICE FOR CONCEALING USER INFORMATION CONTAINED IN APPLICATION                        |
| PCT8573US       | US | 16/134,750 | 2018/9/18  | IDENTITY REGISTRATION METHOD AND DEVICE   |
| PCT8608US       | US | 16/135,835 | 2018/9/19  | BIOMETRIC IDENTITY REGISTRATION AND AUTHENTICATION  |
| PCT8788US       | US | 16/142,851 | 2018/9/26  | INFORMATION DISPLAY METHOD, DEVICE, AND SYSTEM  |
| PCT9493US       | US | 16/240,604 | 2019/1/4   | AUTHORITY REVOKING METHOD AND DEVICE  |
| PCT9437US       | US | 16/240,549 | 2019/1/4   | DATABASE DATA MODIFICATION REQUEST PROCESSING   |
| PCT9528US       | US | 16/244,963 | 2019/1/10  | OBJECT SELECTION METHOD AND DEVICE  |
| PCT5831US<br>CI | US | 16/249,267 | 2019/1/16  | TWO-DIMENSIONAL CODE PROCESSING METHOD AND APPARATUS  |
| A14370US        | US | 16/251,501 | 2019/1/18  | FUND FLOW METHOD AND APPARATUS, AND ELECTRONIC DEVICE   |
| A14372US        | US | 16/251,995 | 2019/1/18  | BLOCKCHAIN BALANCE ADJUSTMENT   |
| A14371US        | US | 16/251,621 | 2019/1/18  | FUND FLOW PROCESSING METHOD AND DEVICE  |
| A14374US        | US | 16/251,648 | 2019/1/18  | FUND FLOW REPORT GENERATION METHOD AND DEVICE   |
| PCT9402US       | US | 16/251,741 | 2019/1/18  | MODELING METHOD AND DEVICE FOR EVALUATION MODEL   |
| A14373US        | US | 16/252,077 | 2019/1/18  | REGULATORY INSPECTION IN A BLOCKCHAIN NETWORK   |
| PCT9787US       | US | 16/254,284 | 2019/1/22  | METHOD AND DEVICE FOR CONTROLLING SERVICE OPERATION RISK  |
| PCT9381US       | US | 16/254,329 | 2019/1/22  | METHOD AND DEVICE FOR PUSHING APPLICATION MESSAGE   |
| PCT9784US       | US | 16/254,421 | 2019/1/22  | IDENTIFYING HIGH RISK COMPUTING OPERATIONS  |
| PCT9785US       | US | 16/254,473 | 2019/1/22  | PROCESSING SERVICE REQUESTS BASED ON RISK IDENTIFICATION  |

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| PCT9788US  | US | 16/254,493 | 2019/1/22 | TERMINAL RULE OPERATION DEVICE AND METHOD   |
| A13674US   | US | 16/257,741 | 2019/1/25 | ABNORMAL DATA DETECTION   |
| PCT9401US  | US | 16/257,847 | 2019/1/25 | AWAKENING AN APPLICATION BY MEANS OF A MOBILE BROWSER   |
| A13673US   | US | 16/257,937 | 2019/1/25 | FRAUDULENT TRANSACTION DETECTION MODEL TRAINING   |
| A13938US   | US | 16/274,930 | 2019/2/13 | VEHICLE ACCIDENT IMAGE PROCESSING METHOD AND APPARATUS  |
| A14532US   | US | 16/275,444 | 2019/2/14 | ASSET MANAGEMENT METHOD AND APPARATUS, AND ELECTRONIC DEVICE                                      |
| A14530US   | US | 16/275,403 | 2019/2/14 | ASSET MANAGEMENT METHOD AND APPARATUS, AND ELECTRONIC DEVICE                                      |
| A14531US   | US | 16/275,440 | 2019/2/14 | ASSET MANAGEMENT METHOD AND APPARATUS, AND ELECTRONIC DEVICE                                      |
| A14533US   | US | 16/275,505 | 2019/2/14 | ASSET MANAGEMENT METHOD AND APPARATUS, AND ELECTRONIC DEVICE                                      |
| A14534US   | US | 16/275,811 | 2019/2/14 | ASSET MANAGEMENT METHOD AND APPARATUS, AND ELECTRONIC DEVICE                                      |
| A14535US   | US | 16/275,868 | 2019/2/14 | ASSET MANAGEMENT SYSTEM, METHOD, APPARATUS, AND ELECTRONIC DEVICE                                 |
| A9110US    | US | 15643963   | 2017/7/7  | COLLECTING USER INFORMATION FROM COMPUTER SYSTEMS   |
| A9491US    | US | 15/691,098 | 2017/8/30 | AGGREGATING SERVICE DATA FOR TRANSMISSION AND RISK ANALYSIS                                       |
| A10030US   | US | 15/684,603 | 2017/8/23 | CALCULATING INDIVIDUAL CARBON FOOTPRINTS  |
| A14536US   | US | 16/287,590 | 2019/2/27 | EXECUTING TRANSACTIONS BASED ON BLOCKCHAIN  |
| A14537US   | US | 16/287,750 | 2019/2/27 | METHOD, APPARATUS, SYSTEM, AND ELECTRONIC DEVICE FOR CROSS-BLOCKCHAIN INTERACTION                 |
| A13140US   | US | 16/290,208 | 2019/3/1  | RECOMMENDATION SYSTEM CONSTRUCTION METHOD AND APPARATUS   |
| PCT15611US | US | 16/293,302 | 2019/3/5  | MANAGING SERVICES ASSOCIATED WITH URL-BASED TWO-DIMENSIONAL CODES                                 |
| A14501US   | US | 16/295,771 | 2019/3/7  | CONSENSUS VERIFICATION METHOD, APPARATUS, AND DEVICE  |
| A11661USC1 | US | 16/358,527 | 2019/3/19 | IMAGE-BASED VEHICLE DAMAGE DETERMINING METHOD AND APPARATUS, AND ELECTRONIC DEVICE                |
| A11663USC1 | US | 16/358,581 | 2019/3/19 | IMAGE-BASED VEHICLE MAINTENANCE PLAN  |
| A11662USC1 | US | 16/358,592 | 2019/3/19 | PICTURE-BASED VEHICLE LOSS ASSESSMENT   |
| A10337USC1 | US | 16/358,607 | 2019/3/19 | SECURE DATA TRANSACTIONS  |
| A11627USC1 | US | 16/358,614 | 2019/3/19 | ENHANCING PROCESSING EFFICIENCY OF BLOCKCHAIN TECHNOLOGIES USING PARALLEL SERVICE DATA PROCESSING |
| A11710USC1 | US | 16/358,625 | 2019/3/19 | MULTI-BLOCKCHAIN NETWORK DATA PROCESSING  |
| A13676US   | US | 16/355,439 | 2019/3/15 | FRAUDULENT TRANSACTION IDENTIFICATION METHOD AND APPARATUS, SERVER, AND STORAGE MEDIUM            |
| A13928US   | US | 16/366,794 | 2019/3/27 | RISKY TRANSACTION IDENTIFICATION METHOD AND APPARATUS   |
| A13944US   | US | 16/366,841 | 2019/3/27 | USER CLASSIFICATION USING A DEEP FOREST NETWORK   |
| A14874US   | US | 16/370,317 | 2019/3/29 | BLOCKCHAIN-BASED SERVICE EXECUTION METHOD AND APPARATUS, AND ELECTRONIC DEVICE                    |
| A10135USC1 | US | 16/295,840 | 2019/3/7  | USER LOCATION DETERMINATION BASED ON AUGMENTED REALITY  |
| A14877US   | US | 16/374,195 | 2019/4/3  | CROSS-BLOCKCHAIN AUTHENTICATION METHOD, APPARATUS, AND ELECTRONIC DEVICE                          |
| A14875US   | US | 16/374,273 | 2019/4/3  | CROSS-BLOCKCHAIN INTERACTION METHOD, APPARATUS, SYSTEM, AND ELECTRONIC DEVICE                     |

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| A10030USC1 | US | 16/355,524 | 2019/3/15 | CALCULATING A CARBON-SAVING QUANTITY FOR AN INDIVIDUAL  |
| A14876US   | US | 16/374,346 | 2019/4/3  | CROSS-BLOCKCHAIN AUTHENTICATION METHOD AND APPARATUS, AND ELECTRONIC DEVICE   |
| PCT9803US  | US | 16/380,319 | 2019/4/10 | SECURE AUTHENTICATION USING VARIABLE IDENTIFIERS  |
| PCT10361US | US | 16/380,395 | 2019/4/10 | METHOD AND APPARATUS FOR AUTHORIZED LOGIN   |
| PCT9796US  | US | 16/381,857 | 2019/4/11 | METHOD AND APPARATUS FOR ANTI-REPACKAGING   |
| PCT10343US | US | 16/384,592 | 2019/4/15 | CROSS-DEVICE LOGIN TO IMPROVE SERVICE EFFICIENCY  |
| PCT9798US  | US | 16/378,124 | 2019/4/8  | METHOD AND APPARATUS FOR IMPLEMENTING ACCESSIBILITY FUNCTION IN APPLICATIONS  |
| PCT9884US  | US | 16/380,609 | 2019/4/10 | VOICE SIGNAL DETECTION METHOD AND APPARATUS   |
| PCT10002US | US | 16/378,213 | 2019/4/8  | METHOD AND APPARATUS FOR PUSHING INFORMATION  |
| PCT9809US  | US | 16/388,599 | 2019/4/18 | Method and Apparatus for Animating Images on Mobile Devices   |
| PCT10041US | US | 16/384,539 | 2019/4/15 | METHOD AND APPARATUS FOR SHARING REGIONAL INFORMATION   |
| PCT10340US | US | 16/384,607 | 2019/4/15 | METHOD, APPARATUS, AND SYSTEM FOR PROCESSING TWO-DIMENSIONAL BARCODES   |
| PCT16711US | US | 16/390,042 | 2019/4/22 | FAST COMPUTATION OF A CONVOLUTIONAL NEURAL NETWORK  |
| PCT17191US | US | 16/390,057 | 2019/4/22 | SECRET SHARING WITH A TRUSTED INITIALIZER   |
| PCT17492US | US | 16/390,085 | 2019/4/22 | TESTING PLATFORM FOR BLOCKCHAIN NETWORKS  |
| PCT17516US | US | 16/390,119 | 2019/4/22 | PLATFORM FOR ATOMIC TRANSFER OF SMART ASSETS WITHIN BLOCKCHAIN NETWORKS   |
| PCT17192US | US | 16/390,147 | 2019/4/22 | SECRET SHARING WITH NO TRUSTED INITIALIZER  |
| PCT17193US | US | 16/390,062 | 2019/4/22 | MONITORING MULTIPLE SYSTEM INDICATORS   |
| PCT17514US | US | 16/390,088 | 2019/4/22 | FUNCTION-AS-A-SERVICE (FAAS) PLATFORM IN BLOCKCHAIN NETWORKS  |
| PCT17197US | US | 16/390,173 | 2019/4/22 | INTELLIGENT CUSTOMER SERVICES BASED ON A VECTOR PROPAGATION ON A CLICK GRAPH MODEL  |
| PCT17311US | US | 16/390,260 | 2019/4/22 | BLOCKCHAIN DATA PROTECTION USING HOMOMORPHIC ENCRYPTION   |
| PCT18627US | US | 16/390,253 | 2019/4/22 | ASYMMETRIC KEY MANAGEMENT IN CONSORTIUM BLOCKCHAIN NETWORKS   |
| PCT17491US | US | 16/390,287 | 2019/4/22 | UTILIZING NONCE TABLE TO RESOLVE CONCURRENT BLOCKCHAIN TRANSACTION FAILURE  |
| PCT17199US | US | 16/390,199 | 2019/4/22 | BLOCKCHAIN SYSTEM SUPPORTING PUBLIC AND PRIVATE TRANSACTIONS UNDER ACCOUNT MODELS   |
| PCT17200US | US | 16/390,375 | 2019/4/22 | FACILITATING PRACTICAL BYZANTINE FAULT TOLERANCE BLOCKCHAIN CONSENSUS AND NODE SYNCHRONIZATION                            |
| PCT18624US | US | 16/390,390 | 2019/4/22 | CROSS-CHAIN INTERACTIONS USING A DOMAIN NAME SCHEME IN BLOCKCHAIN SYSTEMS   |
| PCT17835US | US | 16/390,446 | 2019/4/22 | MANAGING PRIVATE TRANSACTIONS ON BLOCKCHAIN NETWORKS BASED ON WORKFLOW  |
| PCT17485US | US | 16/390,926 | 2019/4/22 | RECOVERING ENCRYPTED TRANSACTION INFORMATION IN BLOCKCHAIN CONFIDENTIAL TRANSACTIONS                                      |
| PCT10352US | US | 16/393,802 | 2019/4/24 | METHOD AND APPARATUS FOR GENERATING AND UPDATING TILES MAPS IN VIRTUAL MAPS   |
| PCT10576US | US | 16/393,839 | 2019/4/24 | VERIFICATION CODE GENERATION TO IMPROVE RECOGNITION ACCURACY BY A PERSON AND RECOGNITION DIFFICULTY BY A COMPUTER PROGRAM |
| PCT9245US  | US | 16/394,315 | 2019/4/25 | METHOD, SYSTEM AND APPARATUS FOR MANAGING PRIMARY AND SECONDARY DATABASES   |

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| PCT10325US | US | 16/394,446 | 2019/4/25 | METHODS AND APPARATUSES FOR IDENTITY AUTHENTICATION IN VIRTUAL REALITY                 |
| PCT9945US  | US | 16/395,990 | 2019/4/26 | METHOD AND APPARATUS FOR UPGRADING APPLICATION   |
| PCT9943US  | US | 16/393,648 | 2019/4/24 | METHOD AND APPARATUS FOR BARCODE IDENTIFICATION  |
| PCT18623US | US | 16/390,494 | 2019/4/22 | DOMAIN NAME MANAGEMENT SCHEME FOR CROSS-CHAIN INTERACTIONS IN BLOCKCHAIN SYSTEMS       |
| PCT17833US | US | 16/390,533 | 2019/4/22 | BLOCKCHAIN DATA PROTECTION BASED ON ACCOUNT NOTE MODEL WITH ZERO-KNOWLEDGE PROOF       |
| PCT17313US | US | 16/390,626 | 2019/4/22 | BLOCKCHAIN DATA PROTECTION USING HOMOMORPHIC ENCRYPTION                                |
| PCT17512US | US | 16/390,722 | 2019/4/22 | EXECUTING MULTI-PARTY TRANSACTIONS USING SMART CONTRACTS                               |
| PCT17513US | US | 16/390,776 | 2019/4/22 | Blockchain smart contract updates using decentralized decision                         |
| PCT17831US | US | 16/390,802 | 2019/4/22 | TRAVERSING SMART CONTRACT DATABASE THROUGH LOGIC MAP                                   |
| PCT17484US | US | 16/390,826 | 2019/4/22 | REGULATING BLOCKCHAIN CONFIDENTIAL TRANSACTIONS  |
| PCT17493US | US | 16/390,873 | 2019/4/22 | BLOCKCHAIN DATA RELATIONSHIP STRUCTURING SCHEME BASED ON BINARY LOG REPLICATION        |
| PCT17515US | US | 16/390,925 | 2019/4/22 | PLATFORM FOR ATOMIC TRANSFER OF SMART ASSETS WITHIN BLOCKCHAIN NETWORKS                |
| PCT17312US | US | 16/390,464 | 2019/4/22 | MANAGING COMMUNICATIONS AMONG CONSENSUS NODES AND CLIENT NODES                         |
| PCT18622US | US | 16/390,586 | 2019/4/22 | DOMAIN NAME SCHEME FOR CROSS-CHAIN INTERACTIONS IN BLOCKCHAIN SYSTEMS                  |
| PCT10156US | US | 16/394,660 | 2019/4/25 | METHODS AND DEVICES FOR BARCODE BASED COMMUNICATION AND PAYMENT IMPLEMENTATION         |
| PCT9877US  | US | 16/395,961 | 2019/4/26 | METHOD AND APPARATUS FOR SERVICE IMPLEMENTATION  |
| A14794US   | US | 16/427,032 | 2019/5/30 | BLOCKCHAIN-BASED DATA MIGRATION METHOD AND APPARATUS                                   |
| A16715US   | US | 16/523,440 | 2019/7/26 | BLOCKCHAIN-BASED ASSET TRANSFER METHOD AND APPARATUS, AND ELECTRONIC DEVICE            |
| A15158US   | US | 16/522,294 | 2019/7/25 | MULTI-LEVEL STORAGE METHOD AND APPARATUS FOR BLOCKCHAIN DATA                           |
| A15165US   | US | 16/523,018 | 2019/7/26 | BLOCKCHAIN-BASED SERVICE RENTAL METHODS AND DEVICES                                    |
| A15166US   | US | 16/453,866 | 2019/6/26 | BLOCKCHAIN-BASED SMART CONTRACT INVOCATION METHOD AND APPARATUS, AND ELECTRONIC DEVICE |
| A15167US   | US | 16/453,603 | 2019/6/26 | BLOCKCHAIN-BASED SMART CONTRACT INVOCATION METHOD AND APPARATUS, AND ELECTRONIC DEVICE |
| A15184US   | US | 16/409,333 | 2019/5/10 | BLOCKCHAIN-BASED MUSIC ORIGINALITY ANALYSIS METHOD AND APPARATUS                       |
| A15358US   | US | 16/523,181 | 2019/7/26 | BLOCKCHAIN-BASED CROSS-CHAIN DATA ACCESS METHOD AND APPARATUS                          |
| A15359US   | US | 16/523,383 | 2019/7/26 | BLOCKCHAIN-BASED CROSS-CHAIN DATA OPERATION METHOD AND APPARATUS                       |
| A15360US   | US | 16/424,683 | 2019/5/29 | BLOCKCHAIN-BASED TRANSACTION PROCESSING METHOD AND APPARATUS                           |
| A15361US   | US | 16/456,227 | 2019/6/28 | BLOCKCHAIN-BASED SMART CONTRACT CALL METHODS AND APPARATUS, AND ELECTRONIC DEVICE      |
| A15600US   | US | 16/415,337 | 2019/5/17 | BLOCKCHAIN-BASED RESOURCE VALUE EVALUATION METHODS AND APPARATUS                       |
| A15617US   | US | 16/405,616 | 2019/5/7  | BLOCKCHAIN DATA PROCESSING METHOD, APPARATUS, DEVICE, AND SYSTEM                       |

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| A15618US   | US | 16/408,103 | 2019/5/9  | BLOCKCHAIN DATA PROCESSING METHODS, APPARATUSES, DEVICES, AND SYSTEMS                            |
| A15619US   | US | 16/409,420 | 2019/5/10 | BLOCKCHAIN DATA PROCESSING METHODS, APPARATUSES, PROCESSING DEVICES, AND SYSTEMS                 |
| A15620US   | US | 16/408,218 | 2019/5/9  | BLOCKCHAIN DATA PROCESSING METHODS, APPARATUSES, PROCESSING DEVICES, AND SYSTEMS                 |
| A15621US   | US | 16/409,156 | 2019/5/10 | BLOCKCHAIN MEMBER MANAGEMENT DATA PROCESSING METHODS, APPARATUSES, SERVERS, AND SYSTEMS          |
| A15824US   | US | 16/424,991 | 2019/5/29 | ASSET TRANSFER METHOD AND APPARATUS, AND ELECTRONIC DEVICE                                       |
| A15825US   | US | 16/425,306 | 2019/5/29 | ASSET TRANSFER METHOD AND APPARATUS, AND ELECTRONIC DEVICE                                       |
| A15826US   | US | 16/425,381 | 2019/5/29 | BLOCKCHAIN ASSET ISSUING AND REDEMPTION METHODS AND APPARATUSES, AND ELECTRONIC DEVICE THEREFORE |
| A15827US   | US | 16/424,750 | 2019/5/29 | BLOCKCHAIN TRANSACTION RECONCILIATION METHOD AND APPARATUS, AND ELECTRONIC DEVICE                |
| A15828US   | US | 16/425,050 | 2019/5/29 | ASSET TRANSFER REVERSAL METHOD AND APPARATUS, AND ELECTRONIC DEVICE                              |
| A15829US   | US | 16/424,853 | 2019/5/29 | BLOCKCHAIN-BASED COMMODITY CLAIM METHOD AND APPARATUS, AND ELECTRONIC DEVICE                     |
| A15830US   | US | 16/425,061 | 2019/5/29 | BLOCKCHAIN-BASED MERCHANDISE TRACING METHODS AND APPARATUS                                       |
| A15831US   | US | 16/425,195 | 2019/5/29 | BLOCKCHAIN-BASED TRANSACTION PROCESSING METHOD AND APPARATUS, AND ELECTRONIC DEVICE              |
| A16716US   | US | 16/523,312 | 2019/7/26 | METHOD, APPARATUS AND ELECTRONIC DEVICE FOR BLOCKCHAIN-BASED ASSET ISSUANCE                      |
| PCT10471US | US | 16/397,382 | 2019/4/29 | METHOD FOR CONTROLLING DISPLAY OF SCREEN OF MOBILE TERMINAL, AND MOBILE TERMINAL                 |
| PCT10323US | US | 16/397,792 | 2019/4/29 | METHOD AND APPARATUS FOR MATCHING NAMES  |
| PCT9954US  | US | 16/405,343 | 2019/5/7  | MAP INTERFACE INTERACTION  |
| PCT10574US | US | 16/405,563 | 2019/5/7  | METHOD AND APPARATUS FOR INFORMATION EXCHANGE  |
| PCT10569US | US | 16/563,294 | 2019/9/6  | TRAFFIC SECTION FEE PAYMENT METHOD, FEE SYSTEM, AND PAYMENT SYSTEM                               |
| PCT10924US | US | 16/562,911 | 2019/9/6  | METHOD AND APPARATUS FOR GUIDING SERVICE FLOW  |
| PCT11062US | US | 16/421,133 | 2019/5/23 | RISK CONTROL EVENT AUTOMATIC PROCESSING METHOD AND APPARATUS                                     |
| PCT11225US | US | 16/447,536 | 2019/6/20 | VOICE FUNCTION CONTROL METHOD AND APPARATUS  |
| PCT11227US | US | 16/418,877 | 2019/5/21 | ORDER INFORMATION DETERMINATION METHOD AND APPARATUS   |
| PCT11389US | US | 16/419,905 | 2019/5/22 | METHOD AND APPARATUS FOR OFFLINE INTERACTION BASED ON AUGMENTED REALITY                          |
| PCT11390US | US | 16/507,944 | 2019/7/10 | VIRTUAL REALITY ENVIRONMENT-BASED IDENTITY AUTHENTICATION METHOD AND APPARATUS                   |
| PCT11433US | US | 16/516,841 | 2019/7/19 | METHODS AND DEVICES FOR BROADCASTING MESSAGES  |
| PCT11434US | US | 16/523,580 | 2019/7/26 | METHODS AND DEVICES FOR SENDING TRANSACTION INFORMATION AND FOR CONSENSUS VERIFICATION           |
| PCT11436US | US | 16/585,407 | 2019/9/27 | BLOCKCHAIN CONSENSUS METHOD AND DEVICE   |
| PCT11437US | US | 16/516,483 | 2019/7/19 | MULTI-SERVER NODE SERVICE PROCESSING AND CONSENSUS METHOD AND DEVICE                             |
| PCT11438US | US | 16/508,715 | 2019/7/11 | BLOCKCHAIN-BASED DATA PROCESSING METHOD AND EQUIPMENT  |

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| PCT11439US | US | 16/586,051 | 2019/9/27  | BLOCKCHAIN-BASED DATA PROCESSING METHOD AND DEVICE   |
| PCT11440US | US | 16/585,472 | 2019/9/27  | BLOCKCHAIN-BASED DATA STORAGE AND QUERY METHOD AND DEVICE  |
| PCT11441US | US | 16/440,782 | 2019/6/13  | METHOD FOR VIEW SWITCHING IN A BLOCKCHAIN NETWORK  |
| PCT11442US | US | 16/502,612 | 2019/7/3   | BLOCKCHAIN-BASED CONSENSUS METHOD AND DEVICE   |
| PCT11443US | US | 16/507,822 | 2019/7/10  | METHOD AND DEVICE FOR PROCESSING SERVICE REQUEST   |
| PCT11452US | US | 16/598,586 | 2019/10/10 | RESOURCE TRANSMISSION METHODS AND APPARATUS  |
| PCT11467US | US | 16/663,977 | 2019/10/25 | SERVICE PROCESSING METHODS AND DEVICES   |
| PCT11479US | US | 16/663,009 | 2019/10/24 | METHOD AND DEVICE FOR DETERMINING INTER-CUT TIME RANGE IN MEDIA ITEM                             |
| PCT11481US | US | 16/440,834 | 2019/6/13  | INSTANT MESSAGING GROUP MANAGEMENT METHOD AND APPARATUS  |
| PCT11609US | US | 16/593,211 | 2019/10/4  | METHOD AND DEVICE FOR INPUTTING PASSWORD IN VIRTUAL REALITY SCENE                                |
| PCT11610US | US | 16/536,041 | 2019/8/8   | METHOD AND DEVICE FOR IN-VEHICLE PAYMENT   |
| PCT11611US | US | 16/425,364 | 2019/5/29  | IDENTITY AUTHENTICATION METHOD, DEVICE, AND SYSTEM   |
| PCT11618US | US | 16/600,016 | 2019/10/11 | IC CARD-BASED TRANSACTION PROCESSING AND CREDIT PAYMENT AUTHORIZATION METHOD, DEVICE, AND SYSTEM |
| PCT11619US | US | 16/664,020 | 2019/10/25 | SERVICE EXECUTION METHOD AND DEVICE  |
| PCT11620US | US | 16/507,896 | 2019/7/10  | SERVICE EXECUTION METHOD AND DEVICE  |
| PCT11621US | US | 16/502,523 | 2019/7/3   | BLOCKCHAIN SERVICE ACCEPTANCE AND CONSENSUS METHOD AND DEVICES                                   |
| PCT11622US | US | 16/529,873 | 2019/8/2   | CONSENSUS VERIFICATION METHOD AND DEVICE   |
| PCT11623US | US | 16/560,520 | 2019/9/4   | BLOCKCHAIN-BASED DATA PROCESSING METHOD AND DEVICE   |
| PCT11624US | US | 16/422,618 | 2019/5/24  | BLOCKCHAIN-BASED DATA PROCESSING METHOD AND DEVICE   |
| PCT11625US | US | 16/561,288 | 2019/9/5   | BLOCKCHAIN-BASED DATA PROCESSING METHOD AND DEVICE   |
| PCT11626US | US | 16/507,920 | 2019/7/10  | BLOCKCHAIN CONSENSUS METHOD AND DEVICE   |
| PCT11628US | US | 16/665,200 | 2019/10/28 | DATABASE STATE DETERMINING METHOD AND DEVICE, AND CONSISTENCY VERIFYING METHOD AND DEVICE        |
| PCT9939US  | US | 16/418,797 | 2019/5/21  | METHOD AND APPARATUS FOR PUBLISHING WORK IN NETWORK  |
| PCT17832US | US | 16/421,170 | 2019/5/23  | DATA ISOLATION IN A BLOCKCHAIN NETWORK   |
| PCT10344US | US | 16/419,742 | 2019/5/22  | METHODS, SYSTEMS, AND DEVICES FOR DISPLAYING MAPS  |
| PCT10642US | US | 16/419,842 | 2019/5/22  | INFORMATION PRESENTATION METHOD AND APPARATUS  |
| PCT17834US | US | 16/421,260 | 2019/5/23  | EVENT-DRIVEN BLOCKCHAIN WORKFLOW PROCESSING  |
| PCT10174US | US | 16/432,646 | 2019/6/5   | METHOD AND DEVICE FOR IMPLEMENTING SERVICE OPERATIONS BASED ON IMAGES                            |
| PCT10371US | US | 16/433,608 | 2019/6/6   | AUTOMATICALLY DISPLAYING PAYMENT PAGES BASED ON PROXIMITY TO A PAYMENT DEVICE                    |
| PCT17152US | US | 16/421,236 | 2019/5/23  | SHARED SECRET-BASED BLOCKCHAIN STORAGE   |
| PCT17837US | US | 16/421,357 | 2019/5/23  | VERIFYING INTEGRITY OF DATA STORED IN A CONSORTIUM BLOCKCHAIN USING A PUBLIC SIDECHAIN           |
| PCT18164US | US | 16/421,384 | 2019/5/23  | BLOCKCHAIN TRANSACTION SPEEDS USING GLOBAL ACCELERATION NODES                                    |

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| PCT18162US       | US | 16/422,198 | 2019/5/24 | ACCELERATING TRANSACTION DELIVERIES IN BLOCKCHAIN NETWORKS USING TRANSACTION RESENDING                                    |
| PCT17823US       | US | 16/422,333 | 2019/5/24 | ACHIEVING CONSENSUS AMONG NETWORK NODES IN A DISTRIBUTED SYSTEM   |
| PCT12634US       | US | 16/422,765 | 2019/5/24 | METHOD AND APPARATUS FOR VERIFYING CERTIFICATES AND IDENTITIES  |
| PCT18606US       | US | 16/422,853 | 2019/5/24 | BLOCKCHAIN DATA PROTECTION BASED ON GENERIC ACCOUNT MODEL AND HOMOMORPHIC ENCRYPTION                                      |
| PCT18142US       | US | 16/421,922 | 2019/5/24 | PERFORMING A RECOVERY PROCESS FOR A NETWORK NODE IN A DISTRIBUTED SYSTEM  |
| PCT18160US       | US | 16/422,110 | 2019/5/24 | SMART CONTRACT WHITELISTS   |
| PCT17823US<br>C1 | US | 16/422,472 | 2019/5/24 | ACHIEVING CONSENSUS AMONG NETWORK NODES IN A DISTRIBUTED SYSTEM   |
| PCT9883US        | US | 16/422,641 | 2019/5/24 | METHOD, SYSTEM AND APPARATUS FOR DATA STORAGE AND DATA ACCESS   |
| A11914USC1       | US | 16/422,777 | 2019/5/24 | WIRELESS NETWORK TYPE DETECTION METHOD AND APPARATUS, AND ELECTRONIC DEVICE   |
| PCT18628US       | US | 16/422,881 | 2019/5/24 | VISUAL BLOCKCHAIN BROWSER   |
| PCT18165US       | US | 16/421,395 | 2019/5/23 | BLOCKCHAIN-BASED CROWDSOURCING OF MAP APPLICATIONS  |
| PCT18163US       | US | 16/421,377 | 2019/5/23 | ACCELERATING TRANSACTION DELIVERIES IN BLOCKCHAIN NETWORKS USING ACCELERATION NODES                                       |
| PCT17836US       | US | 16/421,329 | 2019/5/23 | DATA ISOLATION IN A BLOCKCHAIN NETWORK  |
| PCT18143US       | US | 16/421,953 | 2019/5/24 | PERFORMING A CHANGE OF PRIMARY NODE IN A DISTRIBUTED SYSTEM   |
| PCT18159US       | US | 16/421,995 | 2019/5/24 | PARALLEL EXECUTION OF TRANSACTIONS IN A BLOCKCHAIN NETWORK  |
| PCT18161US       | US | 16/422,192 | 2019/5/24 | PARALLEL EXECUTION OF TRANSACTIONS IN A BLOCKCHAIN NETWORK BASED ON SMART CONTRACT WHITELISTS                             |
| A9933USC1        | US | 16/422,798 | 2019/5/24 | OFFLINE-SERVICE MULTI-USER INTERACTION BASED ON AUGMENTED REALITY   |
| PCT18625US       | US | 16/422,868 | 2019/5/24 | OFF-CHAIN SMART CONTRACT SERVICE BASED ON TRUSTED EXECUTION ENVIRONMENT   |
| PCT10163US       | US | 16/422,689 | 2019/5/24 | METHODS AND DEVICES FOR GENERATING SECURITY QUESTIONS AND VERIFYING IDENTITIES  |
| PCT18605US       | US | 16/422,828 | 2019/5/24 | BLOCKCHAIN DATA PROTECTION BASED ON GENERIC ACCOUNT MODEL AND HOMOMORPHIC ENCRYPTION                                      |
| PCT10645US       | US | 16/427,087 | 2019/5/30 | AUGMENTED-REALITY-BASED OFFLINE INTERACTION METHOD AND APPARATUS  |
| PCT10466US       | US | 16/426,928 | 2019/5/30 | PARALLEL PROCESSING OF SERVICE DATA CORRESPONDING TO MULTIPLE TARGET OBJECTS  |
| PCT10578US       | US | 16/440,895 | 2019/6/13 | METHOD AND APPARATUS FOR IDENTIFYING FALSE ADDRESS INFORMATION  |
| PCT10575US       | US | 16/434,441 | 2019/6/7  | SERVICE PROCESSING USING A DIGITAL OBJECT IDENTIFIER  |
| PCT10469US       | US | 16/442,062 | 2019/6/14 | METHOD AND APPARATUS FOR ALLOCATING VIRTUAL RESOURCES   |
| PCT10363US       | US | 16/453,764 | 2019/6/26 | METHOD, APPARATUS, USER DEVICE AND SERVER FOR DISPLAYING PERSONAL HOMEPAGE  |
| PCT10355US       | US | 16/440,868 | 2019/6/13 | METHOD AND APPARATUS FOR VERIFYING ENTITY INFORMATION   |
| PCT10339US       | US | 16/441,543 | 2019/6/14 | METHOD AND APPARATUS FOR VERIFYING BLOCK DATA IN A BLOCKCHAIN   |
| PCT10038US       | US | 16/432,572 | 2019/6/5  | METHOD, APPARATUS, AND SYSTEM FOR SERVICE DATA PROCESSING AND VERIFICATION  |
| PCT12226US       | US | 16/587,977 | 2019/9/30 | METHOD AND APPARATUS FOR ENCRYPTING DATA, METHOD AND APPARATUS FOR TRAINING MACHINE LEARNING MODEL, AND ELECTRONIC DEVICE |



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| PCT12256US       | US | 16/597,459 | 2019/10/9  | INFORMATION DISPLAY METHOD AND APPARATUS   |
| PCT12261US       | US | 16/685,210 | 2019/11/15 | PAGE METHOD AND APPARATUS  |
| PCT12464US       | US | 16/698,327 | 2019/11/27 | METHOD AND DEVICE FOR ACCOUNT CREATION, ACCOUNT REFILLING AND DATA SYNCHRONIZATION                   |
| PCT12467US       | US | 16/691,290 | 2019/11/21 | ARTICLE ESTIMATION METHOD AND APPARATUS  |
| PCT12474US       | US | 16/685,358 | 2019/11/15 | METHOD AND APPARATUS FOR OFFLINE PAYMENT SERVICE PROCESSING AND PAYMENT PROCESSING                   |
| PCT12481US       | US | 16/598,686 | 2019/10/10 | SMART BROADCASTING METHOD AND APPARATUS  |
| PCT12487US       | US | 16/698,253 | 2019/11/27 | SHORT-LINK PARSING METHODS, APPARATUS, AND DEVICES   |
| PCT12490US       | US | 16/686,415 | 2019/11/18 | IMAGE DISPLAY METHOD AND DEVICE, AND ELECTRONIC DEVICE   |
| PCT12631US       | US | 16/673,199 | 2019/11/4  | RESOURCE TRANSFER METHOD, FUND PAYMENT METHOD, AND ELECTRONIC DEVICE                                 |
| PCT12755US       | US | 16/698,271 | 2019/11/27 | METHOD AND APPARATUS FOR GENERATING AND IDENTIFYING IDENTIFICATION CODE                              |
| PCT17484US<br>CI | US | 16/742,612 | 2020/1/14  | REGULATING BLOCKCHAIN CONFIDENTIAL TRANSACTIONS  |
| PCT18607US       | US | 16/448,808 | 2019/6/21  | CROSS-ASSET TRADING WITHIN BLOCKCHAIN NETWORKS   |
| PCT19671US       | US | 16/448,947 | 2019/6/21  | STRATEGY SEARCHING IN STRATEGIC INTERACTION BETWEEN PARTIES  |
| PCT17150US       | US | 16/447,859 | 2019/6/20  | A LOGISTIC REGRESSION MODELING SCHEME USING SECRETE SHARING  |
| PCT17487US       | US | 16/448,739 | 2019/6/21  | A DISTRIBUTED MULTI-PARTY SECURITY MODEL TRAINING FRAMEWORK FOR PRIVACY PROTECTION                   |
| PCT19524US       | US | 16/448,390 | 2019/6/21  | SAMPLING SCHEMES FOR STRATEGY SEARCHING IN STRATEGIC INTERACTION BETWEEN PARTIES                     |
| PCT17488US       | US | 16/587,142 | 2019/9/30  | PREVENTING MISREPRESENTATION OF INPUT DATA BY PARTICIPANTS IN A SECURE MULTI-PARTY COMPUTATION       |
| PCT18144US       | US | 16/587,155 | 2019/9/30  | UPDATING BLOCKCHAIN WORLD STATE MERKLE PATRICIA TRIE SUBTREE   |
| PCT18145US       | US | 16/587,234 | 2019/9/30  | DATA ISOLATION IN BLOCKCHAIN NETWORKS  |
| PCT18147US       | US | 16/587,236 | 2019/9/30  | CONSTRUCTING BLOCKCHAIN WORLD STATE MERKLE PATRICIA TRIE SUBTREE                                     |
| PCT18626US       | US | 16/587,277 | 2019/9/30  | PROPERTY MANAGEMENT SYSTEM UTILIZING A BLOCKCHAIN NETWORK  |
| PCT18629US       | US | 16/587,371 | 2019/9/30  | SOFTWARE INTERFACE FOR SMART CONTRACTS   |
| PCT19665US       | US | 16/587,494 | 2019/9/30  | AUTHENTICATION BASED ON A RECOVERED PUBLIC KEY   |
| PCT19666US       | US | 16/587,451 | 2019/9/30  | FIELD-PROGRAMMABLE GATE ARRAY BASED TRUSTED EXECUTION ENVIRONMENT FOR USE IN A BLOCKCHAIN NETWORK    |
| PCT19669US       | US | 16/588,436 | 2019/9/30  | PROGRAM EXECUTION AND DATA PROOF SCHEME USING MULTIPLE KEY PAIR SIGNATURES                           |
| PCT19677US       | US | 16/587,470 | 2019/9/30  | RETRIEVING PUBLIC DATA FOR BLOCKCHAIN NETWORKS USING HIGHLY AVAILABLE TRUSTED EXECUTION ENVIRONMENTS |
| PCT19965US       | US | 16/587,541 | 2019/9/30  | RETRIEVING ACCESS DATA FOR BLOCKCHAIN NETWORKS USING HIGHLY AVAILABLE TRUSTED EXECUTION ENVIRONMENTS |
| PCT20954US       | US | 16/587,901 | 2019/9/30  | CRYPTOGRAPHY CHIP WITH IDENTITY VERIFICATION   |
| PCT20955US       | US | 16/588,106 | 2019/9/30  | CRYPTOGRAPHIC KEY MANAGEMENT BASED ON IDENTITY INFORMATION   |
| PCT20956US       | US | 16/587,978 | 2019/9/30  | MANAGING CRYPTOGRAPHIC KEYS BASED ON IDENTITY INFORMATION  |
| PCT20957US       | US | 16/587,593 | 2019/9/30  | SECURELY PERFORMING CRYPTOGRAPHIC OPERATIONS   |

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| PCT21107US      | US | 16/587,641 | 2019/9/30  | MANAGING SENSITIVE DATA ELEMENTS IN A BLOCKCHAIN NETWORK   |
| PCT21109US      | US | 16/587,791 | 2019/9/30  | MANAGING HOUSING SCORES USING SMART CONTRACTS IN BLOCKCHAIN NETWORKS                                       |
| PCT12785US      | US | 16/697,833 | 2019/11/27 | QR Code Positioning Method and Apparatus   |
| PCT12784US      | US | 16/702,829 | 2019/12/4  | OFFLINE INFORMATION PUSHING METHOD AND APPARATUS   |
| PCT12627US      | US | 16/668,857 | 2019/10/30 | METHOD, APPARATUS, AND ELECTRONIC DEVICE FOR DETECTING MODEL SECURITY                                      |
| PCT12623US      | US | 16/697,913 | 2019/11/27 | METHOD AND DEVICE FOR VIRTUAL RESOURCE ALLOCATION, MODELING, AND DATA PREDICTION                           |
| PCT12462US      | US | 16/702,776 | 2019/12/4  | METHOD, APPARATUS, AND DEVICE FOR PROCESSING WEB APPLICATION PACKAGE                                       |
| PCT12107US      | US | 16/684,435 | 2019/11/14 | AUTHENTICATION METHOD, DEVICE, VR TERMINAL, AND VR SERVER BASED ON VR SCENE                                |
| PCT11896US      | US | 16/692,316 | 2019/11/22 | GOODS ORDER PROCESSING METHOD AND APPARATUS, SERVER, SHOPPING TERMINAL, AND SYSTEM                         |
| PCT19725US      | US | 16/671,010 | 2019/10/31 | PROCESSING AND STORING BLOCKCHAIN DATA UNDER A TRUSTED EXECUTION ENVIRONMENT                               |
| PCT19724US      | US | 16/670,646 | 2019/10/31 | PROCESSING BLOCKCHAIN DATA BASED ON SMART CONTRACT OPERATIONS EXECUTED IN A TRUSTED EXECUTION ENVIRONMENT  |
| PCT19235US      | US | 16/668,945 | 2019/10/30 | SECURE MULTI-PARTY COMPUTATION WITH NO TRUSTED INITIALIZER   |
| PCT21106US      | US | 16/671,072 | 2019/10/31 | TRANSFERRING DIGITAL TICKETS BASED ON BLOCKCHAIN NETWORKS  |
| PCT21108US      | US | 16/671,076 | 2019/10/31 | PRODUCT PROMOTION USING SMART CONTRACTS IN BLOCKCHAIN NETWORKS   |
| PCT19186US      | US | 16/668,903 | 2019/10/30 | PERFORMING PARALLEL EXECUTION OF TRANSACTIONS IN A DISTRIBUTED LEDGER SYSTEM                               |
| PCT19187US      | US | 16/668,937 | 2019/10/30 | PERFORMING PARALLEL EXECUTION OF TRANSACTIONS IN A DISTRIBUTED LEDGER SYSTEM                               |
| PCT19673US      | US | 16/670,587 | 2019/10/31 | PERFORMING PARALLEL EXECUTION OF TRANSACTIONS IN A DISTRIBUTED LEDGER SYSTEM                               |
| PCT19988US      | US | 16/671,032 | 2019/10/31 | RETRIEVING VALUES OF DIGITAL TICKETS USING SMART CONTRACTS IN BLOCKCHAIN NETWORKS                          |
| PCT20765US      | US | 16/671,046 | 2019/10/31 | DISTRIBUTED RESOURCE ALLOCATION  |
| PCT20996US      | US | 16/671,061 | 2019/10/31 | DISTRIBUTED RESOURCE ALLOCATION  |
| PCT20997US      | US | 16/671,069 | 2019/10/31 | DISTRIBUTED RESOURCE ALLOCATION  |
| PCT19519US      | US | 16/670,533 | 2019/10/31 | IDENTIFYING ENTITIES IN ELECTRONIC MEDICAL RECORDS   |
| PCT18146US      | US | 16/668,812 | 2019/10/30 | ANTI-REPLAY ATTACK AUTHENTICATION PROTOCOL   |
| PCT19723US      | US | 16/670,620 | 2019/10/31 | SECURELY EXECUTING SMART CONTRACT OPERATIONS IN A TRUSTED EXECUTION ENVIRONMENT                            |
| PCT19726US      | US | 16/671,024 | 2019/10/31 | DISTRIBUTED KEY MANAGEMENT FOR TRUSTED EXECUTION ENVIRONMENTS  |
| PCT19989US      | US | 16/671,055 | 2019/10/31 | METHOD AND DEVICE FOR AVOIDING DOUBLE-SPENDING PROBLEM IN READ-WRITE SET-MODEL-BASED BLOCKCHAIN TECHNOLOGY |
| PCT4272US<br>C1 | US | 16/570,381 | 2019/9/13  | EFFICIENT ACQUISITION OF A TARGET IMAGE FROM AN ORIGINAL IMAGE   |
| A15360USC1      | US | 16/655,989 | 2019/10/17 | BLOCKCHAIN-BASED TRANSACTION PROCESSING METHOD AND APPARATUS   |
| A9935USC1       | US | 15/678,442 | 2019/11/8  | THREE-DIMENSIONAL GRAPHICAL USER INTERFACE FOR INFORMATIONAL INPUT IN VIRTUAL REALITY ENVIROMENT           |
| A10036USC1      | US | 16/659,008 | 2019/10/21 | USER IDENTITY AUTHENTICATION USING VIRTUAL REALITY   |

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| PCT5759US<br>C1 | US | 16/561,918 | 2019/9/5   | FACE LOCATION TRACKING METHOD, APPARATUS,<br>AND ELECTRONIC DEVICE                                      |
| PCT4411US<br>C1 | US | 16/564,342 | 2019/9/9   | REDUCING COMPUTATIONAL COMPLEXITY IN<br>THREE-DIMENSIONAL MODELING BASED ON TWO-<br>DIMENSIONAL IMAGES  |
| PCT7249US<br>C1 | US | 16/579,335 | 2019/9/23  | Location-Based Service Implementing Method and Apparatus  |
| PCT23728US      | US | 16/712,506 | 2019/12/12 | LOG-STRUCTURED STORAGE SYSTEMS  |
| PCT23730US      | US | 16/712,696 | 2019/12/12 | LOG-STRUCTURED STORAGE SYSTEMS  |
| PCT23727US      | US | 16/712,323 | 2019/12/12 | LOG-STRUCTURED STORAGE SYSTEMS  |
| PCT23729US      | US | 16/712,393 | 2019/12/12 | LOG-STRUCTURED STORAGE SYSTEMS  |
| PCT23731US      | US | 16/712,440 | 2019/12/12 | LOG-STRUCTURED STORAGE SYSTEMS  |
| PCT23733US      | US | 16/712,532 | 2019/12/12 | LOG-STRUCTURED STORAGE SYSTEMS  |
| PCT23735US      | US | 16/712,785 | 2019/12/12 | LOG-STRUCTURED STORAGE SYSTEMS  |
| PCT23732US      | US | 16/712,469 | 2019/12/12 | LOG-STRUCTURED STORAGE SYSTEMS  |
| PCT23734US      | US | 16/712,436 | 2019/12/12 | LOG-STRUCTURED STORAGE SYSTEMS  |
| PCT23724US      | US | 16/712,828 | 2019/12/12 | SHARED BLOCKCHAIN DATA STORAGE BASED ON<br>ERROR CORRECTION CODING IN TRUSTED<br>EXECUTION ENVIRONMENTS |
| PCT23725US      | US | 16/713,332 | 2019/12/13 | SHARED BLOCKCHAIN DATA STORAGE BASED ON<br>ERROR CORRECTION CODING IN TRUSTED<br>EXECUTION ENVIRONMENTS |
| PCT23914US      | US | 16/713,574 | 2019/12/13 | MANAGING BLOCKCHAIN-BASED CENTRALIZED<br>LEDGER SYSTEMS   |
| PCT23915US      | US | 16/713,899 | 2019/12/13 | MANAGING BLOCKCHAIN-BASED CENTRALIZED<br>LEDGER SYSTEMS   |
| PCT23919US      | US | 16/713,841 | 2019/12/13 | MANAGING BLOCKCHAIN-BASED CENTRALIZED<br>LEDGER SYSTEMS   |
| PCT23916US      | US | 16/713,639 | 2019/12/13 | MANAGING BLOCKCHAIN-BASED CENTRALIZED<br>LEDGER SYSTEMS   |
| PCT23918US      | US | 16/713,966 | 2019/12/13 | MANAGING BLOCKCHAIN-BASED CENTRALIZED<br>LEDGER SYSTEMS   |
| PCT23197US      | US | 16/712,727 | 2019/12/12 | BLOCKCHAIN DATA STORAGE BASED ON SHARED<br>NODES AND ERROR CORRECTION CODE                              |
| PCT23930US      | US | 16/713,991 | 2019/12/13 | BLOCKCHAIN-BASED PAPERLESS DOCUMENTATION  |
| PCT23929US      | US | 16/714,379 | 2019/12/13 | BLOCKCHAIN-BASED JUDGMENT EXECUTION   |
| PCT23931US      | US | 16/714,136 | 2019/12/13 | BLOCKCHAIN-BASED DISPUTE RESOLUTION   |
| PCT19667US      | US | 16/714,325 | 2019/12/13 | INTEGRITY OF COMMUNICATIONS BETWEEN<br>BLOCKCHAIN NETWORKS AND EXTERNAL DATA<br>SOURCES                 |
| PCT19668US      | US | 16/714,414 | 2019/12/13 | RETRIEVING PUBLIC DATA FOR BLOCKCHAIN<br>NETWORKS USING TRUSTED EXECUTION<br>ENVIRONMENTS               |
| PCT19676US      | US | 16/714,460 | 2019/12/13 | IMPROVING INTEGRITY OF COMMUNICATIONS<br>BETWEEN BLOCKCHAIN NETWORKS AND EXTERNAL<br>DATA SOURCES       |
| PCT21692US      | US | 16/713,446 | 2019/12/13 | MUTUAL AID NETWORK BASED ON SMART<br>CONTRACT AND BLOCKCHAIN  |
| PCT19739US      | US | 16/713,409 | 2019/12/13 | ANTI-REPLAY DEVICE BASED ON MEMORY SPACE<br>INTERCHANGE   |
| PCT23933US      | US | 16/714,455 | 2019/12/13 | BLOCKCHAIN-BASED TRUSTED PLATFORM   |
| PCT23932US      | US | 16/714,378 | 2019/12/13 | BLOCKCHAIN-BASED SERVICE OF PROCESS   |
| PCT23064US      | US | 16/713,961 | 2019/12/13 | SHARED BLOCKCHAIN DATA STORAGE BASED ON<br>ERROR CORRECTION CODE  |
| PCT23065US      | US | 16/712,702 | 2019/12/12 | SHARED BLOCKCHAIN DATA STORAGE BASED ON<br>ERROR CORRECTION CODE  |
| PCT23066US      | US | 16/712,935 | 2019/12/12 | SHARED BLOCKCHAIN DATA STORAGE BASED ON<br>ERROR CORRECTION CODE  |

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| PCT22963US       | US | 16/714,087 | 2019/12/13 | SHARED BLOCKCHAIN DATA STORAGE  |
| PCT22964US       | US | 16/714,197 | 2019/12/13 | SHARED BLOCKCHAIN DATA STORAGE  |
| PCT22965US       | US | 16/714,484 | 2019/12/13 | SHARED BLOCKCHAIN DATA STORAGE  |
| PCT21729US       | US | 16/712,340 | 2019/12/12 | MANAGING CYBERSECURITY VULNERABILITIES USING BLOCKCHAIN NETWORKS                          |
| PCT21738US       | US | 16/712,412 | 2019/12/12 | IMPLEMENTING A BLOCKCHAIN-BASED WORKFLOW  |
| PCT22310US       | US | 16/711,952 | 2019/12/12 | IMPLEMENTING A BLOCKCHAIN-BASED WORKFLOW  |
| PCT21693US       | US | 16/714,201 | 2019/12/13 | METHOD FOR RESTORING PUBLIC KEY BASED ON SM2 SIGNATURE                                    |
| PCT21703US       | US | 16/714,232 | 2019/12/13 | IDENTIFYING COPYRIGHTED MATERIAL USING EMBEDDED COPYRIGHT INFORMATION                     |
| PCT21704US       | US | 16/713,859 | 2019/12/13 | IDENTIFYING COPYRIGHTED MATERIAL USING EMBEDDED TIMESTAMPED COPYRIGHT INFORMATION         |
| PCT21705US       | US | 16/713,819 | 2019/12/13 | IDENTIFYING COPYRIGHTED MATERIAL USING EMBEDDED COPYRIGHT INFORMATION                     |
| PCT21706US       | US | 16/713,693 | 2018/12/13 | IDENTIFYING COPYRIGHTED MATERIAL USING EMBEDDED COPYRIGHT INFORMATION                     |
| PCT21707US       | US | 16/713,904 | 2019/12/13 | IDENTIFYING COPYRIGHTED MATERIAL USING EMBEDDED COPYRIGHT INFORMATION                     |
| PCT21708US       | US | 16/713,829 | 2019/12/13 | IDENTIFYING COPYRIGHTED MATERIAL USING COPYRIGHT INFORMATION EMBEDDED IN TABLES           |
| PCT21710US       | US | 16/713,855 | 2019/12/13 | COPYRIGHT PROTECTION BASED ON HIDDEN COPYRIGHT INFORMATION                                |
| PCT21711US       | US | 16/713,920 | 2019/12/13 | IDENTIFYING COPYRIGHTED MATERIAL USING COPYRIGHT INFORMATION EMBEDDED IN ELECTRONIC FILES |
| PCT21712US       | US | 16/714,014 | 2019/12/13 | COPYRIGHT PROTECTION BASED ON HIDDEN COPYRIGHT INFORMATION                                |
| PCT21100US       | US | 16/713,428 | 2019/12/13 | PROCESSING DATA ELEMENTS STORED IN BLOCKCHAIN NETWORKS                                    |
| PCT21694US       | US | 16/714,351 | 2019/12/13 | MULTI-CARD OVERLAY DISPLAY  |
| PCT20980US       | US | 16/712,092 | 2019/12/12 | DETERMINING ACTION SELECTION POLICIES OF AN EXECUTION DEVICE                              |
| PCT21753US       | US | 16/712,017 | 2019/12/12 | DETERMINING ACTION SELECTION POLICIES OF AN EXECUTION DEVICE                              |
| PCT21754US       | US | 16/712,509 | 2019/12/12 | DETERMINING ACTION SELECTION POLICIES OF AN EXECUTION DEVICE                              |
| PCT19922US       | US | 16/712,037 | 2019/12/12 | DETERMINING ACTION SELECTION POLICIES OF AN EXECUTION DEVICE                              |
| PCT17834US<br>CI | US | 16/744,003 | 2020/1/15  | EVENT-DRIVEN BLOCKCHAIN WORKFLOW PROCESSING   |
| A14874USC1       | US | 16/752,248 | 2020/1/24  | BLOCKCHAIN-BASED SERVICE EXECUTION METHOD AND APPARATUS, AND ELECTRONIC DEVICE            |
| A14874USC2       | US | 16/752,345 | 2020/1/24  | BLOCKCHAIN-BASED SERVICE EXECUTION METHOD AND APPARATUS, AND ELECTRONIC DEVICE            |
| A10136USC1       | US | 16/697,974 | 2019/11/27 | PERFORMING VIRTUAL REALITY INPUT  |
| PCT10471US<br>CI | US | 16/601,344 | 2019/10/14 | METHOD FOR CONTROLLING DISPLAY OF SCREEN OF MOBILE TERMINAL, AND MOBILE TERMINAL          |
| A21053US         | US | 16/794,971 | 2020/2/19  | METHOD, APPARATUS, AND ELECTRONIC DEVICE FOR IMPROVING PARALLEL PERFORMANCE OF CPU        |
| A20484US         | US | 16/787,288 | 2020/2/11  | BLOCKCHAIN-BASED RESOURCE ALLOCATION METHOD AND APPARATUS                                 |
| A19605US         | US | 16/779,531 | 2020/1/31  | DATA STORAGE APPARATUS, TRANSLATION APPARATUS, AND DATABASE ACCESS METHOD                 |
| A21665US         | US | 16/796,088 | 2020/2/20  | SOLUTION FOR IMPLEMENTING COMPUTING SERVICE BASED ON STRUCTURED QUERY LANGUAGE STATEMENT  |
| A19948US         | US | 16/743,971 | 2020/1/15  | METHOD, APPARATUS, AND ELECTRONIC DEVICE FOR IMPROVING CPU PERFORMANCE                    |
| A19934US         | US | 16/749,345 | 2020/1/22  | BLOCKCHAIN-BASED SERVICE PROCESSING   |

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| A19513US         | US | 16/703,088 | 2019/12/4  | METHOD AND APPARATUS FOR PROCESSING VIDEO STREAM  |
| A18110US         | US | 16/698,227 | 2019/11/27 | PARTITION SPLITTING METHOD AND APPARATUS, ELECTRONIC DEVICE, AND READABLE STORAGE MEDIUM            |
| A19229US         | US | 16/795,091 | 2020/2/19  | METHOD AND APPARATUS FOR DISPLAYING PAGE TO USER THROUGH REINFORCEMENT LEARNING                     |
| A17875US         | US | 16/742,441 | 2020/1/14  | FPGA HARDWARE-BASED SECURE COMPUTING METHOD AND APPARATUS   |
| A10037USC1       | US | 16/593,758 | 2019/10/4  | VIRTUAL REALITY IDENTITY VERIFICATION   |
| PCT9883US<br>C1  | US | 16/656,990 | 2019/10/18 | METHOD, SYSTEM AND APPARATUS FOR DATA STORAGE AND DATA ACCESS                                       |
| PCT10361US<br>C1 | US | 16/597,521 | 2019/10/9  | METHOD AND APPARATUS FOR AUTHORIZED LOGIN   |
| A11149USC1       | US | 16/587,676 | 2019/9/30  | WORD VECTOR PROCESSING FOR FOREIGN LANGUAGES  |
| PCT10355US<br>C1 | US | 16/693,595 | 2019/11/25 | METHOD AND APPARATUS FOR VERIFYING ENTITY INFORMATION   |
| A11934USC1       | US | 16/691,011 | 2019/11/21 | METHOD AND APPARATUS FOR COMMUNICATION BETWEEN BLOCKCHAIN NODES                                     |
| PCT13728US       | US | 16/810,785 | 2020/3/5   | SMART BROADCASTING DEVICE   |
| PCT13665US       | US | 16/802,147 | 2020/2/26  | URL ATTACK DETECTION METHOD AND APPARATUS, AND ELECTRONIC DEVICE                                    |
| PCT13546US       | US | 16/809,490 | 2020/3/4   | WRITING AND PAYMENT FOR NFC PORTABLE DEVICES  |
| PCT13544US       | US | 16/812,139 | 2020/3/6   | AUGMENTED REALITY-BASED VIRTUAL OBJECT ALLOCATION METHOD AND APPARATUS                              |
| PCT13537US       | US | 16/808,704 | 2020/3/4   | SOCIAL CONTENT RISK IDENTIFICATION  |
| PCT13527US       | US | 16/812,025 | 2020/3/6   | METHOD, APPARATUS, AND DEVICE FOR TRAINING RISK MANAGEMENT MODELS                                   |
| PCT13440US       | US | 16/805,316 | 2020/2/28  | VERIFICATION-BASED SERVICE AUTHORIZATION  |
| PCT13438US       | US | 16/810,961 | 2020/3/6   | METHOD AND DEVICE FOR DETERMINING DATA ANOMALY  |
| PCT13427US       | US | 16/805,525 | 2020/2/28  | RECOGNIZING CARBON-SAVING BEHAVIORS FROM IMAGES   |
| PCT13421US       | US | 16/805,538 | 2020/2/28  | GRAPHICAL STRUCTURE MODEL-BASED CREDIT RISK CONTROL   |
| PCT13420US       | US | 16/809,308 | 2020/3/4   | GRAPHICAL STRUCTURE MODEL-BASED PREVENTION AND CONTROL OF ABNORMAL ACCOUNTS                         |
| PCT13418US       | US | 16/812,121 | 2020/3/6   | METHOD AND APPARATUS FOR CLASSIFYING SAMPLES  |
| PCT13394US       | US | 16/810,921 | 2020/3/6   | ARTICLE PROCESSING METHOD, TERMINAL, SYSTEM AND LPWAN GATEWAY                                       |
| PCT13298US       | US | 16/806,693 | 2020/3/2   | INFORMATION ALERTS METHOD, APPARATUS AND DEVICE   |
| PCT13294US       | US | 16/811,976 | 2020/3/6   | METHOD AND DEVICE FOR PUSHING INFORMATION AND METHOD AND DEVICE FOR DETERMINING DEFAULT INPUT VALUE |
| PCT13287US       | US | 16/809,391 | 2020/3/4   | DOI DISPLAY AND TRANSACTION INFORMATION VERIFICATION  |
| PCT13278US       | US | 16/810,619 | 2020/3/5   | LOGIN METHOD AND APPARATUS AND ELECTRONIC DEVICE  |
| PCT13271US       | US | 16/796,679 | 2020/2/20  | METHOD AND DEVICE FOR HANDLING MULTI-TENANT REQUEST   |
| PCT13265US       | US | 16/810,462 | 2020/3/5   | INFORMATION TRANSMISSION METHOD AND DEVICE  |
| PCT13150US       | US | 16/811,863 | 2020/3/6   | DATA AUDITING METHOD AND DEVICE   |
| PCT13149US       | US | 16/807,679 | 2020/3/3   | PRODUCT ANTI-COUNTERFEITING VERIFICATION METHOD, APPARATUS, AND DEVICE                              |
| PCT13148US       | US | 16/805,446 | 2020/2/28  | KEY MANAGEMENT  |

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| PCT13137US       | US | 16/805,079 | 2020/2/28  | CLUSTER-BASED RANDOM WALK PROCESSING   |
| PCT13136US       | US | 16/805,387 | 2020/2/28  | GRAPHICAL STRUCTURE MODEL-BASED TRANSACTION RISK CONTROL                                       |
| PCT12890US       | US | 16/805,141 | 2020/2/28  | RISK IDENTIFICATION MODEL BUILDING AND RISK IDENTIFICATION                                     |
| PCT12883US       | US | 16/827,536 | 2020/3/23  | ASSESSING SHARED VEHICLE POPULARITIES  |
| PCT12880US       | US | 16/806,919 | 2020/3/2   | RECOMMENDING SHARED PRODUCTS   |
| PCT4350US<br>C1  | US | 16/737,262 | 2020/1/8   | EFFICIENT, TIME-BASED LEADER NODE ELECTION IN A DISTRIBUTED COMPUTING SYSTEM                   |
| PCT5173US<br>C1  | US | 16/735,300 | 2020/1/6   | RESENDING A HYPERTEXT TRANSFER PROTOCOL REQUEST  |
| PCT17197US<br>C1 | US | 16/791,209 | 2020/2/14  | INTELLIGENT CUSTOMER SERVICES BASED ON A VECTOR PROPAGATION ON A CLICK GRAPH MODEL             |
| PCT18164US<br>C1 | US | 16/707,850 | 2019/12/9  | IMPROVING BLOCKCHAIN TRANSACTION SPEEDS USING GLOBAL ACCELERATION NODES                        |
| PCT5551US<br>C1  | US | 16/720,571 | 2019/12/19 | DETERMINING DEPLOYMENT NEED FOR POINT OF INTEREST  |
| A10775USC1       | US | 16/717,440 | 2019/12/17 | EXPRESS PACKAGE DELIVERY   |
| A22478US         | US | 16/792,028 | 2020/2/14  | MANAGING TRANSACTIONS ON BLOCKCHAIN NETWORKS   |
| PCT5623US<br>C1  | US | 16/782,274 | 2020/2/5   | PAGE JUMP METHOD AND APPARATUS   |
| PCT10340US<br>C1 | US | 16/802,640 | 2020/2/27  | METHOD, APPARATUS, AND SYSTEM FOR PROCESSING TWO-DIMENSIONAL BARCODES                          |
| PCT17485US<br>C1 | US | 16/791,594 | 2020/2/14  | RECOVERING ENCRYPTED TRANSACTION INFORMATION IN BLOCKCHAIN CONFIDENTIAL TRANSACTIONS           |
| A15600USC1       | US | 16/780,221 | 2020/2/3   | BLOCKCHAIN-BASED RESOURCE VALUE EVALUATION METHODS AND APPARATUS                               |
| PCT18623US<br>C1 | US | 16/791,771 | 2020/2/14  | DOMAIN NAME MANAGEMENT SCHEME FOR CROSS-CHAIN INTERACTIONS IN BLOCKCHAIN SYSTEMS               |
| A15825USC1       | US | 16/739,420 | 2020/1/10  | ASSET TRANSFER METHOD AND APPARATUS, AND ELECTRONIC DEVICE                                     |
| A15619USC1       | US | 16/736,357 | 2020/1/7   | BLOCKCHAIN DATA PROCESSING METHODS, APPARATUS, PROCESSING DEVICES, AND SYSTEMS                 |
| PCT17488US<br>C1 | US | 16/799,632 | 2020/2/24  | PREVENTING MISREPRESENTATION OF INPUT DATA BY PARTICIPANTS IN A SECURE MULTI-PARTY COMPUTATION |
| PCT15611US<br>C1 | US | 16/799,421 | 2020/2/24  | MANAGING SERVICES ASSOCIATED WITH URL-BASED TWO-DIMENSIONAL CODES                              |
| A11928USC1       | US | 16/719,762 | 2019/12/18 | KEY DATA PROCESSING METHOD AND APPARATUS, AND SERVER   |
| A11931USC1       | US | 16/720,258 | 2019/12/19 | DIGITAL CERTIFICATE MANAGEMENT METHOD, APPARATUS, AND SYSTEM                                   |
| A12236USC1       | US | 16/721,739 | 2019/12/19 | SETTLEMENT METHOD, ENTRANCE CONTROL METHOD, AND APPARATUS                                      |
| A13029USC1       | US | 16/721,245 | 2019/12/19 | DATA STORAGE NODES COLLABORATION AND DATA PROCESSING FOR DATA STATISTICAL ANALYSIS             |
| A13032USC1       | US | 16/721,363 | 2019/12/19 | DATA AUDITING METHOD AND DEVICE  |
| A11890USC1       | US | 16/719,807 | 2019/12/18 | BIOMETRIC FEATURE DATABASE ESTABLISHING METHOD AND APPARATUS                                   |
| A11924USC1       | US | 16/721,542 | 2019/12/19 | BLOCKCHAIN BASED DATA PROCESSING METHOD AND DEVICE   |
| A11926USC1       | US | 16/720,394 | 2019/12/19 | BLOCKCHAIN SERVICE DATA PROCESSING   |
| A11927USC1       | US | 16/722,356 | 2019/12/20 | BLOCKCHAIN CONSENSUS NODE SELECTION  |
| A11929USC1       | US | 16/722,477 | 2019/12/20 | LOGIN INFORMATION DATA PROCESSING  |
| A11932USC1       | US | 16/723,057 | 2019/12/20 | DIGITAL CERTIFICATE MANAGEMENT METHOD AND APPARATUS, AND ELECTRONIC DEVICE                     |
| A11933USC1       | US | 16/720,647 | 2019/12/19 | METHOD, APPARATUS, AND ELECTRONIC DEVICE FOR COMMUNICATION BETWEEN BLOCKCHAIN                  |

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|                 |    |            |            | NODES, AND METHOD, APPARATUS, AND ELECTRONIC DEVICE FOR BLOCKCHAIN-BASED CERTIFICATE MANAGEMENT |
| A11935USC1      | US | 16/722,603 | 2019/12/20 | SECURE COMMUNICATIONS IN A BLOCKCHAIN NETWORK   |
| A11975USC1      | US | 16/723,008 | 2019/12/20 | DATA SECURITY ENHANCEMENT BY MODEL TRAINING   |
| A12233USC1      | US | 16/720,931 | 2019/12/19 | MODEL TRAINING METHOD AND APPARATUS BASED ON DATA SHARING                                       |
| A12772USC1      | US | 16/720,522 | 2019/12/19 | DIGITAL CERTIFICATE APPLICATION   |
| A12881USC1      | US | 16/723,015 | 2019/12/20 | DIGITAL CERTIFICATE MANAGEMENT  |
| A13938USC1      | US | 16/722,919 | 2019/12/20 | VEHICLE ACCIDENT IMAGE PROCESSING METHOD AND APPARATUS  |
| A14370USC1      | US | 16/722,929 | 2019/12/20 | FUND FLOW METHOD AND APPARATUS, AND ELECTRONIC DEVICE   |
| A14374USC1      | US | 16/723,748 | 2019/12/20 | FUND FLOW REPORT GENERATION METHOD AND DEVICE   |
| A14530USC1      | US | 16/724,642 | 2019/12/23 | ASSET MANAGEMENT METHOD AND APPARATUS, AND ELECTRONIC DEVICE                                    |
| A14531USC1      | US | 16/725,236 | 2019/12/23 | ASSET MANAGEMENT METHOD AND APPARATUS, AND ELECTRONIC DEVICE                                    |
| A14533USC1      | US | 16/725,918 | 2019/12/23 | ASSET MANAGEMENT METHOD AND APPARATUS, AND ELECTRONIC DEVICE                                    |
| A14535USC1      | US | 16/725,686 | 2019/12/23 | ASSET MANAGEMENT SYSTEM, METHOD, APPARATUS, AND ELECTRONIC DEVICE                               |
| A13140USC1      | US | 16/725,589 | 2019/12/23 | RECOMMENDATION SYSTEM CONSTRUCTION METHOD AND APPARATUS   |
| A13673USC1      | US | 16/722,899 | 2019/12/20 | FRAUDULENT TRANSACTION DETECTION MODEL TRAINING   |
| A13674USC1      | US | 16/722,946 | 2019/12/20 | ABNORMAL DATA DETECTION   |
| A14371USC1      | US | 16/725,619 | 2019/12/23 | FUND FLOW PROCESSING METHOD AND DEVICE  |
| A14372USC1      | US | 16/723,365 | 2019/12/20 | ENHANCED BLOCKCHAIN BALANCE ADJUSTMENT OPERATION  |
| A14373USC1      | US | 16/725,196 | 2019/12/23 | REGULATORY INSPECTION IN A BLOCKCHAIN NETWORK   |
| A14501USC1      | US | 16/725,266 | 2019/12/23 | CONSENSUS VERIFICATION METHOD, APPARATUS, AND DEVICE  |
| A14532USC1      | US | 16/724,785 | 2019/12/23 | ASSET MANAGEMENT METHOD AND APPARATUS, AND ELECTRONIC DEVICE                                    |
| A14534USC1      | US | 16/723,313 | 2019/12/20 | ASSET MANAGEMENT METHOD AND APPARATUS, AND ELECTRONIC DEVICE                                    |
| A14536USC1      | US | 16/723,543 | 2019/12/20 | EXECUTING TRANSACTIONS BASED ON BLOCKCHAIN  |
| PCT5841US<br>C1 | US | 16/721,824 | 2019/12/19 | ORDER CLUSTERING AND MALICIOUS INFORMATION COMBATING METHOD AND APPARATUS                       |
| PCT6245US<br>C1 | US | 16/720,916 | 2019/12/19 | ADDRESS INFORMATION-BASED ACCOUNT MAPPING METHOD AND APPARATUS                                  |
| A14537USC1      | US | 16/725,715 | 2019/12/23 | METHOD, APPARATUS, SYSTEM, AND ELECTRONIC DEVICE FOR CROSS-BLOCKCHAIN INTERACTION               |
| PCT6310US<br>C1 | US | 16/722,252 | 2019/12/20 | CREDIT PAYMENT METHOD AND APPARATUS BASED ON MOBILE TERMINAL PEER-TO-PEER                       |
| PCT5033US<br>C1 | US | 16/813,613 | 2020/3/9   | AUTHENTICATING A USER AND REGISTERING A WEARABLE DEVICE   |
| PCT6309US<br>C1 | US | 16/720,400 | 2019/12/19 | CREDIT PAYMENT METHOD AND APPARATUS BASED ON MOBILE TERMINAL EMBEDDED SECURE ELEMENT            |
| PCT6543US<br>C1 | US | 16/722,400 | 2019/12/20 | ONLINE SHOPPING SERVICE PROCESSING  |
| PCT6850US<br>C1 | US | 16/720,360 | 2019/12/19 | INFORMATION GENERATION, ACQUISITION, AND PROCESSING TO IMPROVE SERVICE EFFICIENCY               |
| PCT7246US<br>C1 | US | 16/719,819 | 2019/12/18 | PERMISSION MANAGEMENT AND RESOURCE CONTROL  |

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| PCT7505US<br>C1 | US | 16/722,166 | 2019/12/20 | TECHNIQUES TO VERIFY MESSAGE AUTHENTICITY                                      |
| PCT8365US<br>C1 | US | 16/722,209 | 2019/12/20 | METHOD AND DEVICE FOR LINKING TO ACCOUNT AND PROVIDING SERVICE PROCESS         |
| PCT6311US<br>C1 | US | 16/719,348 | 2019/12/18 | CREDIT PAYMENT METHOD AND APPARATUS BASED ON CARD EMULATION OF MOBILE TERMINAL |
| PCT6500US<br>C1 | US | 16/722,202 | 2019/12/20 | INFORMATION RECOMMENDATION BASED ON RULE MATCHING                              |
| PCT6508US<br>C1 | US | 16/720,337 | 2019/12/19 | SELECTING USER IDENTITY VERIFICATION METHODS BASED ON VERIFICATION RESULTS     |
| PCT6528US<br>C1 | US | 16/721,814 | 2019/12/19 | SERVICE PROCESSING METHOD AND APPARATUS  |
| PCT6557US<br>C1 | US | 16/719,402 | 2019/12/18 | DATA SYNCHRONIZATION METHOD, APPARATUS, AND SYSTEM                             |
| PCT6663US<br>C1 | US | 16/722,444 | 2019/12/20 | WEIGHT-COEFFICIENT-BASED HYBRID INFORMATION RECOMMENDATION                     |
| PCT6668US<br>C1 | US | 16/721,622 | 2019/12/19 | ELECTRONIC PAYMENT SERVICE PROCESSING  |
| PCT6982US<br>C1 | US | 16/719,474 | 2019/12/18 | IMAGE PROCESSING METHOD AND DEVICE   |
| PCT8361US<br>C1 | US | 16/724,711 | 2019/12/23 | OFFLINE PAYMENT METHOD AND DEVICE  |
| PCT7051US<br>C1 | US | 16/719,627 | 2019/12/18 | TRANSACTION CONFIRMATION BASED ON USER ATTRIBUTES                              |
| PCT7935US<br>C1 | US | 16/723,063 | 2019/12/20 | RESOURCE LOADING AND A SERVICE FUNCTION FOR A SOFTWARE APPLICATION             |
| PCT7951US<br>C1 | US | 16/719,836 | 2019/12/18 | INFORMATION IMAGE DISPLAY METHOD AND APPARATUS                                 |
| PCT8014US<br>C1 | US | 16/719,811 | 2019/12/18 | SERVICE OBJECT ALLOCATION  |
| PCT8371US<br>C1 | US | 16/721,092 | 2019/12/19 | METHOD AND DEVICE FOR PROCESSING HYPERLINK OBJECT                              |
| PCT8375US<br>C1 | US | 16/722,326 | 2019/12/20 | METHOD AND DEVICE FOR PREVENTING SERVER FROM BEING ATTACKED                    |
| PCT8379US<br>C1 | US | 16/724,713 | 2019/12/23 | ADAPTIVE RESOURCE ALLOCATION METHOD AND APPARATUS                              |
| PCT8573US<br>C1 | US | 16/722,284 | 2019/12/20 | IDENTITY REGISTRATION METHOD AND DEVICE  |
| PCT8608US<br>C1 | US | 16/722,876 | 2019/12/20 | BIOMETRIC IDENTITY REGISTRATION AND AUTHENTICATION                             |
| PCT8685US<br>C1 | US | 16/722,591 | 2019/12/20 | AUTOMATIC LOGIN METHOD AND DEVICE BETWEEN MULTIPLE WEBSITES                    |
| PCT8710US<br>C1 | US | 16/721,104 | 2019/12/19 | METHOD, DEVICE, APPARATUS, AND SYSTEM FOR DISPLAYING DYNAMIC LIST              |
| PCT8721US<br>C1 | US | 16/721,857 | 2019/12/19 | METHOD AND DEVICE FOR PUSHING INFORMATION                                      |
| PCT8839US<br>C1 | US | 16/721,591 | 2019/12/19 | DATA TRANSMISSION METHOD, DATA TRANSMITTER, DATA RECEIVER, AND SYSTEM          |
| PCT8709US<br>C1 | US | 16/724,692 | 2019/12/23 | METHOD AND DEVICE FOR HIDING MESSAGES IN A MESSAGING GROUP                     |
| PCT9062US<br>C1 | US | 16/722,211 | 2019/12/20 | METHOD AND SYSTEM FOR STARTING APPLICATION                                     |
| PCT9788US<br>C1 | US | 16/725,728 | 2019/12/23 | TERMINAL RULE OPERATION DEVICE AND METHOD                                      |
| PCT9074US<br>C1 | US | 16/722,832 | 2019/12/20 | PROCESSING METHOD FOR PREVENTING COPY ATTACK, AND SERVER AND CLIENT            |
| PCT9085US<br>C1 | US | 16/725,913 | 2019/12/23 | MOBILE PAYMENT PROCESSING  |
| PCT9111US<br>C1 | US | 16/725,922 | 2019/12/23 | METHOD AND DEVICE FOR IDENTITY AUTHENTICATION                                  |
| PCT9115US<br>C1 | US | 16/721,663 | 2019/12/19 | AUTHENTICATION AND GENERATION OF INFORMATION FOR AUTHENTICATION                |



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| PCT9061US<br>C1  | US | 16/724,701 | 2019/12/23 | IDENTITY VERIFICATION METHOD AND SYSTEM, AND INTELLIGENT WEARABLE DEVICE   |
| PCT9100US<br>C1  | US | 16/722,310 | 2019/12/20 | METHOD AND DEVICE FOR DATA VERSION COMPARISON BETWEEN TRANS-TIME ZONE SITES                                      |
| PCT9114US<br>C1  | US | 16/720,416 | 2019/12/19 | METHOD FOR DETERMINING USER BEHAVIOR PREFERENCE, AND METHOD AND DEVICE FOR PRESENTING RECOMMENDATION INFORMATION |
| PCT9120US<br>C1  | US | 16/722,844 | 2019/12/20 | PROCESSING IMAGE DATA OF A WEBPAGE   |
| PCT9239US<br>C1  | US | 16/722,531 | 2019/12/20 | STORING DATA IN DISTRIBUTED SYSTEMS  |
| PCT9372US<br>C1  | US | 16/721,428 | 2019/12/19 | CONTROLLING METHOD AND DEVICE FOR SLIDER CONTROL, AND SLIDER SELECTOR  |
| PCT9389US<br>C1  | US | 16/721,449 | 2019/12/19 | HAND DETECTION AND TRACKING METHOD AND DEVICE  |
| PCT9528US<br>C1  | US | 16/722,559 | 2019/12/20 | OBJECT SELECTION METHOD AND DEVICE   |
| PCT9787US<br>C1  | US | 16/725,477 | 2019/12/23 | METHOD AND DEVICE FOR CONTROLLING SERVICE OPERATION RISK   |
| PCT7565US<br>C1  | US | 16/722,609 | 2019/12/20 | METHOD AND DEVICE FOR OUTPUTTING RISK INFORMATION AND CONSTRUCTING RISK INFORMATION                              |
| PCT9124US<br>C1  | US | 16/722,495 | 2019/12/20 | RESOURCE PROCESSING METHOD AND APPARATUS   |
| PCT9381US<br>C1  | US | 16/723,676 | 2019/12/20 | METHOD AND DEVICE FOR PUSHING APPLICATION MESSAGE  |
| PCT9402US<br>C1  | US | 16/723,606 | 2019/12/20 | MODELING METHOD AND DEVICE FOR EVALUATION MODEL  |
| PCT9437US<br>C1  | US | 16/722,469 | 2019/12/20 | DATABASE DATA MODIFICATION REQUEST PROCESSING  |
| PCT9493US<br>C1  | US | 16/723,699 | 2019/12/20 | AUTHORITY REVOKING METHOD AND DEVICE   |
| PCT9785US<br>C1  | US | 16/725,751 | 2019/12/23 | PROCESSING SERVICE REQUESTS BASED ON RISK IDENTIFICATION   |
| PCT9784US<br>C1  | US | 16/722,943 | 2019/12/20 | IDENTIFYING HIGH RISK COMPUTING OPERATIONS   |
| PCT11436US<br>C1 | US | 16/736,644 | 2020/1/7   | BLOCKCHAIN CONSENSUS METHOD AND DEVICE   |
| PCT10575US<br>C1 | US | 16/802,725 | 2020/2/27  | SERVICE PROCESSING USING A DIGITAL OBJECT IDENTIFIER   |
| PCT19965US<br>C1 | US | 16/944,931 | 2020/7/31  | RETRIEVING ACCESS DATA FOR BLOCKCHAIN NETWORKS USING HIGHLY AVAILABLE TRUSTED EXECUTION ENVIRONMENTS             |
| PCT4679US<br>C1  | US | 16/749,060 | 2020/1/22  | EFFICIENT IMAGE SYNTHESIS  |
| PCT17837US<br>C1 | US | 16/780,334 | 2020/2/3   | VERIFYING INTEGRITY OF DATA STORED IN A CONSORTIUM BLOCKCHAIN USING A PUBLIC SIDECHAIN                           |
| PCT4794US<br>C1  | US | 16/800,641 | 2020/2/25  | DISTRIBUTED DATA PROCESSING  |
| PCT11440US<br>C1 | US | 16/800,756 | 2020/2/25  | BLOCKCHAIN-BASED DATA STORAGE AND QUERY METHOD AND DEVICE  |
| PCT11438US<br>C1 | US | 16/773,301 | 2020/1/27  | BLOCKCHAIN-BASED DATA PROCESSING METHOD AND EQUIPMENT  |
| A14875USC1       | US | 16/814,458 | 2020/3/10  | CROSS-BLOCKCHAIN INTERACTION METHOD, APPARATUS, SYSTEM, AND ELECTRONIC DEVICE                                    |
| A10985USC1       | US | 16/858,096 | 2020/4/24  | GENERATING AUTHENTICATION IMAGE TO VERIFY A TWO-DIMENSIONAL CODE OFFLINE   |
| PCT18605US<br>C1 | US | 16/797,985 | 2020/2/21  | BLOCKCHAIN DATA PROTECTION BASED ON GENERIC ACCOUNT MODEL AND HOMOMORPHIC ENCRYPTION                             |
| PCT17823US<br>C2 | US | 16/800,459 | 2020/2/25  | ACHIEVING CONSENSUS AMONG NETWORK NODES IN A DISTRIBUTED SYSTEM  |

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| PCT19956US | US | 16/779,189 | 2020/1/31 | DATA PROCESSING METHOD AND DEVICE, BLOCKCHAIN CLIENT, AND BLOCKCHAIN NODE        |
| PCT19960US | US | 16/779,073 | 2020/1/31 | COMPUTER DATA PROCESSING METHOD AND APPARATUS FOR LARGE NUMBER OPERATIONS        |
| PCT19967US | US | 16/777,451 | 2020/1/30 | CIPHERTEXT PREPROCESSING AND ACQUISITION   |
| A15620USC1 | US | 16/750,993 | 2020/1/23 | BLOCKCHAIN DATA PROCESSING METHODS, APPARATUSES, PROCESSING DEVICES, AND SYSTEMS |
| PCT19685US | US | 16/778,989 | 2020/1/31 | ENCRYPTED DATA EXCHANGE  |
| PCT19698US | US | 16/777,110 | 2020/1/30 | MANAGING A SMART CONTRACT ON A BLOCKCHAIN  |
| PCT19684US | US | 16/776,216 | 2020/1/29 | PROVIDING OBLIVIOUS DATA TRANSFER BETWEEN COMPUTING DEVICES                      |
| PCT20905US | US | 16/779,033 | 2020/1/31 | CHANGING A MASTER NODE IN A BLOCKCHAIN SYSTEM                                    |
| PCT19955US | US | 16/776,067 | 2020/1/29 | BLOCKCHAIN-BASED DATA PROCESSING METHOD, APPARATUS, AND BLOCKCHAIN NODE          |
| PCT20488US | US | 16/776,301 | 2020/1/29 | METHOD, APPARATUS, AND ELECTRONIC DEVICE FOR RESTORING STATE DATA OF BLOCKCHAIN  |
| PCT20490US | US | 16/775,155 | 2020/1/28 | METHOD AND APPARATUS FOR STORING BLOCKCHAIN STATE DATA AND ELECTRONIC DEVICE     |
| PCT19957US | US | 16/777,392 | 2020/1/30 | DATA EXCHANGE METHOD, APPARATUS, SERVER, AND ELECTRONIC DEVICE                   |
| PCT16017US | US | 16/888,421 | 2020/5/29 | BLOCKCHAIN-BASED FINANCING   |
| PCT15836US | US | 16/889,760 | 2020/6/1  | OPEN ROAD TOLLING METHOD, APPARATUS, AND ELECTRONIC DEVICE                       |
| PCT15835US | US | 16/889,681 | 2020/6/1  | PARKING CHARGING METHOD, APPARATUS, AND ELECTRONIC DEVICE                        |
| PCT15834US | US | 16/889,649 | 2020/6/1  | NON-STOP CHARGING METHODS, APPARATUSES, AND ELECTRONIC DEVICES                   |
| PCT15833US | US | 16/889,673 | 2020/6/1  | PARKING FEE COLLECTION METHOD, APPARATUS, AND ELECTRONIC DEVICE                  |
| PCT15779US | US | 16/888,350 | 2020/5/29 | BLOCKCHAIN-BASED VIRTUAL RESOURCE DELIVERY AND CROWDFUNDING                      |
| PCT15743US | US | 16/888,582 | 2020/5/29 | NETWORK INFORMATION PROCESSING   |
| PCT15341US | US | 16/888,549 | 2020/5/29 | CREDIT GUARANTEE-BASED SERVICE PROCESSING  |
| PCT15187US | US | 16/888,531 | 2020/5/29 | DATA ENCRYPTION AND DECRYPTION   |
| PCT15185US | US | 16/889,607 | 2020/6/1  | BLOCKCHAIN-BASED COPYRIGHT REVENUE ALLOCATION METHODS AND APPARATUSES            |
| PCT15180US | US | 16/888,580 | 2020/5/29 | BLOCKCHAIN-BASED DATA VERIFICATION METHOD AND APPARATUS, AND ELECTRONIC DEVICE   |

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| PCT14588US | US | 16/888,614 | 2020/5/29 | BLOCKCHAIN-BASED DATA PROCESSING METHOD AND DEVICE                       |
| PCT14568US | US | 16/888,513 | 2020/5/29 | DISPLAYING RICH TEXT ON 3D MODELS  |
| PCT14567US | US | 16/888,475 | 2020/5/29 | PAYMENT PROCESSING   |
| PCT14563US | US | 16/889,653 | 2020/6/1  | METHOD AND APPARATUS FOR DATA PROCESSING IN ONLINE PAYMENT PROCESS       |
| PCT14527US | US | 16/886,609 | 2020/5/28 | MODEL TEST METHODS AND APPARATUSES                                       |
| PCT14519US | US | 16/889,695 | 2020/6/1  | GBDT MODEL FEATURE INTERPRETATION METHOD AND APPARATUS                   |
| PCT14434US | US | 16/888,494 | 2020/5/29 | PRODUCT CHECKOUT USING A CLIENT DEVICE                                   |
| PCT14416US | US | 16/888,526 | 2020/5/29 | DATABASE ACCESS EXECUTION  |
| PCT14376US | US | 16/888,504 | 2020/5/29 | FARE PAYMENT   |
| PCT14368US | US | 16/884,923 | 2020/5/27 | AUTOMATED MULTI-CURRENCY REFUND SERVICE                                  |
| PCT14342US | US | 16/886,568 | 2020/5/28 | DATA SYNCHRONIZATION METHODS, APPARATUSES, AND DEVICES                   |
| PCT14339US | US | 16/888,568 | 2020/5/29 | ARTICLE DAMAGE DETECTION   |
| PCT14198US | US | 16/886,029 | 2020/5/28 | DISPLAYING AND RECOGNIZING TWO-DIMENSIONAL CODE                          |
| PCT14190US | US | 16/888,553 | 2020/5/29 | FILE PACKAGING AND UNPACKAGING METHODS, APPARATUSES, AND NETWORK DEVICES |
| PCT14189US | US | 16/888,598 | 2020/5/29 | ARTICLE DAMAGE EVALUATION  |
| PCT14188US | US | 16/888,575 | 2020/5/29 | ABNORMAL SAMPLE PREDICTION   |
| PCT13736US | US | 16/888,573 | 2020/5/29 | IDENTITY VERIFICATION METHODS, SYSTEMS, APPARATUSES, AND DEVICES         |
| PCT13724US | US | 16/888,541 | 2020/5/29 | AUTOMATIC VENDING  |
| PCT13721US | US | 16/889,622 | 2020/6/1  | ACTIVE/INACTIVE STATE DETECTION METHOD AND APPARATUS                     |
| PCT13719US | US | 16/888,498 | 2020/5/29 | SHORT-RANGE WIRELESS COMMUNICATION FOR PAYMENT ASSISTANCE                |
| PCT13711US | US | 16/888,605 | 2020/5/29 | SORTING TEXT REPORT CATEGORIES   |
| PCT13564US | US | 16/886,450 | 2020/5/28 | DOI SCANNING-BASED INFORMATION PROCESSING                                |
| PCT13540US | US | 16/888,570 | 2020/5/29 | BARCODE GENERATION METHODS AND APPARATUSES                               |
| PCT13539US | US | 16/888,547 | 2020/5/29 | EXECUTING APPLICATION WITHOUT UNLOCKING MOBILE DEVICE                    |
| PCT13437US | US | 16/888,329 | 2020/5/29 | BLOCKCHAIN-BASED CONTENT VERIFICATION                                    |
| PCT13399US | US | 16/888,560 | 2020/5/29 | INTERACTION BEHAVIOR DETECTION METHOD, APPARATUS, SYSTEM, AND DEVICE     |

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| PCT13398US | US | 16/888,491 | 2020/5/29 | MULTI-MODAL IDENTITY RECOGNITION  |
| PCT13264US | US | 16/888,533 | 2020/5/29 | DETERMINING TARGET USER GROUP   |
| PCT13164US | US | 16/886,235 | 2020/5/28 | SERVICE DATA PROCESSING METHOD, APPARATUS, AND ELECTRONIC DEVICE                        |
| PCT21115US | US | 16/779,250 | 2020/1/31 | PERFORMING DATA PROCESSING BASED ON DECISION TREE                                       |
| PCT21696US | US | 16/776,272 | 2020/1/29 | BLOCKCHAIN-BASED RECORDING AND QUERYING OPERATIONS                                      |
| PCT21114US | US | 16/779,534 | 2020/1/31 | DATA-BASED PREDICTION RESULTS USING DECISION FORESTS                                    |
| PCT21117US | US | 16/779,285 | 2020/1/31 | PERFORMING DATA PROCESSING BASED ON DECISION TREE                                       |
| PCT21118US | US | 16/779,231 | 2020/1/31 | PERFORMING DATA PROCESSING BASED ON DECISION TREE                                       |
| PCT21688US | US | 16/779,201 | 2020/1/31 | BLOCKCHAIN-BASED TRANSACTION VERIFICATION   |
| PCT21699US | US | 16/779,328 | 2020/1/31 | CREATING A BLOCKCHAIN ACCOUNT AND VERIFYING BLOCKCHAIN TRANSACTIONS                     |
| PCT21709US | US | 16/776,685 | 2020/1/30 | DATA STORAGE ON TREE NODES  |
| PCT21733US | US | 16/779,239 | 2020/1/31 | OBJECT DISTRIBUTION PROCESSING  |
| PCT22005US | US | 16/779,455 | 2020/1/31 | UPDATING A STATE MERKLE TREE  |
| PCT22308US | US | 16/779,498 | 2020/1/31 | PROVIDING DATA VERIFICATION IN A BLOCKCHAIN LEDGER                                      |
| PCT22961US | US | 16/779,482 | 2020/1/31 | DEPLOYING A SMART CONTRACT  |
| PCT22307US | US | 16/777,735 | 2020/1/30 | SIGNATURE VERIFICATION FOR A BLOCKCHAIN LEDGER  |
| PCT22315US | US | 16/775,945 | 2020/1/29 | DATA TRANSMISSION METHOD AND APPARATUS IN TEE SYSTEM                                    |
| PCT22320US | US | 16/779,499 | 2020/1/31 | CONFIDENTIAL TRANSACTION IN A BLOCKCHAIN NETWORK  |
| PCT22892US | US | 16/779,449 | 2020/1/31 | BLOCKCHAIN-BASED REIMBURSEMENT SPLITTING  |
| PCT22897US | US | 16/779,198 | 2020/1/31 | BLOCKCHAIN-BASED E-BILL NUMBER APPLICATION METHOD, APPARATUS, AND ELECTRONIC DEVICE     |
| PCT23895US | US | 16/779,228 | 2020/1/31 | PROVIDING DATA AUTHORIZATION BASED ON BLOCKCHAIN  |
| PCT23896US | US | 16/779,488 | 2020/1/31 | PROVIDING DATA AUTHORIZATION BASED ON BLOCKCHAIN  |
| PCT22894US | US | 16/779,173 | 2020/1/31 | BLOCKCHAIN-BASED ELECTRONIC BILL REIMBURSEMENT METHOD, APPARATUS, AND ELECTRONIC DEVICE |
| PCT23897US | US | 16/779,320 | 2020/1/31 | BLOCKCHAIN-BASED DATA AUTHORIZATION METHOD AND APPARATUS                                |

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| PCT19677US<br>C1 | US | 16/944,115 | 2020/7/30 | RETRIEVING PUBLIC DATA FOR BLOCKCHAIN NETWORKS USING HIGHLY AVAILABLE TRUSTED EXECUTION ENVIRONMENTS |
| A15829USC1       | US | 16/943,970 | 2020/7/30 | BLOCKCHAIN-BASED COMMODITY CLAIM METHOD AND APPARATUS, AND ELECTRONIC DEVICE                         |
| PCT18143US<br>C1 | US | 16/801,729 | 2020/2/26 | PERFORMING A CHANGE OF PRIMARY NODE IN A DISTRIBUTED SYSTEM  |
| A21778US         | US | 16/791,858 | 2020/2/14 | METHODS AND DEVICES FOR QUANTIFYING TEXT SIMILARITY  |
| A22025US         | US | 16/792,035 | 2020/2/14 | METHOD AND SYSTEM FOR EVALUATING AN OBJECT DETECTION MODEL   |
| A21785US         | US | 16/791,936 | 2020/2/14 | AUTOMATIC OPTICAL CHARACTER RECOGNITION (OCR) CORRECTION   |
| PCT19961US       | US | 16/790,596 | 2020/2/13 | BLOCKCHAIN-BASED HIERARCHICAL DATA STORAGE   |
| PCT10343US<br>C1 | US | 16/789,913 | 2020/2/13 | CROSS-DEVICE LOGIN TO IMPROVE SERVICE EFFICIENCY   |
| PCT19682US       | US | 16/786,481 | 2020/2/10 | TRANSACTION PROCESSING IN A SERVICE BLOCKCHAIN   |
| PCT19534US       | US | 16/786,337 | 2020/2/10 | LOSS FUNCTION VALUE DETERMINATION METHOD AND DEVICE AND ELECTRONIC EQUIPMENT                         |
| PCT19962US       | US | 16/790,599 | 2020/2/13 | BLOCKCHAIN BASED HIERARCHICAL DATA STORAGE   |
| PCT20903US       | US | 16/785,319 | 2020/2/7  | OBTAINING BLOCKCHAIN DATA IN STAGES  |
| PCT21701US       | US | 16/786,794 | 2020/2/10 | BLOCKCHAIN-BASED DATA COMPRESSION AND SEARCHING  |
| PCT22000US       | US | 16/786,949 | 2020/2/10 | SENDING CROSS-CHAIN AUTHENTICATABLE MESSAGES   |
| PCT19964US       | US | 16/790,605 | 2020/2/13 | BLOCKCHAIN-BASED HIERARCHICAL DATA STORAGE   |
| PCT21063US       | US | 16/785,451 | 2020/2/7  | TRANSFERRING METHOD AND SYSTEM BASED ON BLOCKCHAIN SMART CONTRACT                                    |
| PCT20487US       | US | 16/786,502 | 2020/2/10 | BLOCKCHAIN-BASED LEASING   |
| PCT20489US       | US | 16/786,713 | 2020/2/10 | PROCESSING LEDGER TRANSACTIONS IN A BLOCKCHAIN   |
| PCT21057US       | US | 16/785,371 | 2020/2/7  | BLOCKCHAIN-BASED PAYMENT   |
| PCT22001US       | US | 16/786,437 | 2020/2/10 | SENDING CROSS-CHAIN AUTHENTICATABLE MESSAGES   |
| PCT20740US       | US | 16/783,862 | 2020/2/6  | ALLOCATING VIRTUAL RESOURCE BASED ON BLOCK CHAIN   |
| PCT22002US       | US | 16/786,807 | 2020/2/10 | SENDING CROSS-CHAIN AUTHENTICATABLE MESSAGES   |

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| PCT22011US | US | 16/815,615 | 2020/3/11 | RING SIGNATURE-BASED ANONYMOUS TRANSACTION  |
| PCT24349US | US | 16/786,856 | 2020/2/10 | METHOD AND APPARATUS FOR INTERPRETING BYTECODE INSTRUCTION STREAM                                 |
| PCT24161US | US | 16/813,524 | 2020/3/9  | METHOD AND APPARATUS FOR PERFORMING MULTI-PARTY SECURE COMPUTING BASED-ON ISSUING CERTIFICATE     |
| PCT23955US | US | 16/813,516 | 2020/3/9  | BLOCKCHAIN TRANSACTION PROCESSING METHOD AND APPARATUS  |
| PCT23954US | US | 16/813,634 | 2020/3/9  | BLOCKCHAIN TRANSACTION PROCESSING METHOD AND APPARATUS  |
| PCT23953US | US | 16/816,983 | 2020/3/12 | BLOCKCHAIN TRANSACTION QUERY METHOD AND SYSTEM  |
| PCT23927US | US | 16/812,036 | 2020/3/6  | DATA STORAGE IN BLOCKCHAIN-TYPE LEDGER  |
| PCT23865US | US | 16/813,627 | 2020/3/9  | METHOD AND APPARATUS FOR PROCESSING USER INTERACTION SEQUENCE DATA                                |
| PCT23685US | US | 16/807,237 | 2020/3/3  | CREATING INDEX IN BLOCKCHAIN-TYPE LEDGER  |
| PCT23681US | US | 16/815,906 | 2020/3/11 | METHOD, APPARATUS, AND DEVICE FOR STORING OPERATION RECORD BASED ON TRUSTED EXECUTION ENVIRONMENT |
| PCT23677US | US | 16/806,937 | 2020/3/2  | MULTI-THREAD PROCESSING   |
| PCT23608US | US | 16/782,938 | 2020/2/5  | BLOCKCHAIN-BASED TEXT SIMILARITY DETECTION METHOD, APPARATUS AND ELECTRONIC DEVICE                |
| PCT23598US | US | 16/785,403 | 2020/2/7  | METHOD AND APPARATUS FOR MULTITHREADED DATA TRANSMISSION IN A TEE SYSTEM                          |
| PCT23597US | US | 16/785,328 | 2020/2/7  | METHOD AND APPARATUS FOR MULTITHREADED DATA TRANSMISSION IN A TEE SYSTEM                          |
| PCT23596US | US | 16/785,312 | 2020/2/7  | METHOD AND APPARATUS FOR DATA TRANSMISSION IN A TEE SYSTEM  |
| PCT23593US | US | 16/788,247 | 2020/2/11 | TRANSACTION SCHEDULING METHOD AND APPARATUS   |
| PCT23538US | US | 16/815,596 | 2020/3/11 | PROVIDING HIGH AVAILABILITY COMPUTING SERVICE BY ISSUING A CERTIFICATE                            |
| PCT23442US | US | 16/812,093 | 2020/3/6  | RFID INFORMATION PROCESSING   |
| PCT23438US | US | 16/786,764 | 2020/2/10 | CROSS-BLOCKCHAIN RESOURCE TRANSMISSION  |

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| PCT23437US | US | 16/783,112 | 2020/2/5  | METHOD AND APPARATUS FOR INTER-BLOCKCHAIN TRANSMISSION OF AUTHENTICABLE MESSAGE      |
| PCT23435US | US | 16/805,649 | 2020/2/28 | BLOCKCHAIN AUTHORIZATION   |
| PCT23433US | US | 16/803,388 | 2020/2/27 | BLOCKCHAIN USER ACCOUNT DATA   |
| PCT23212US | US | 16/804,732 | 2020/2/28 | GEOGRAPHIC LOCATION-BASED MULTIMEDIA INFORMATION DISPLAY                             |
| PCT23193US | US | 16/783,102 | 2020/2/5  | HOMOMORPHIC DATA ENCRYPTION METHOD AND APPARATUS FOR IMPLEMENTING PRIVACY PROTECTION |
| PCT23184US | US | 16/815,539 | 2020/3/11 | BLOCKCHAIN-TYPE DATA STORAGE   |
| PCT23176US | US | 16/818,898 | 2020/3/13 | LANGUAGE PROCESSING USING A NEURAL NETWORK   |
| PCT23163US | US | 16/804,660 | 2020/2/28 | SECURE ACCOUNT MODIFICATION  |
| PCT23067US | US | 16/805,269 | 2020/2/28 | IDENTITY IDENTIFICATION AND PREPROCESSING  |
| PCT23063US | US | 16/812,205 | 2020/3/6  | FOOD ORDERING CONSOLE AND FOOD ORDERING DEVICE                                       |
| PCT23061US | US | 16/812,159 | 2020/3/6  | ELECTRONIC PAYMENT DEVICE  |
| PCT22984US | US | 16/803,237 | 2020/2/27 | BLOCKCHAIN LEDGER AUTHENTICATION   |
| PCT22983US | US | 16/804,680 | 2020/2/28 | BLOCKCHAIN LEDGER COMPRESSION  |
| PCT22982US | US | 16/811,502 | 2020/3/6  | SERVICE IDENTIFIER-BASED DATA INDEXING   |
| PCT22981US | US | 16/809,251 | 2020/3/4  | VERIFYING A BLOCKCHAIN-TYPE LEDGER   |
| PCT22980US | US | 16/810,691 | 2020/3/5  | DATA STORAGE METHOD, APPARATUS, AND DEVICE FOR MULTI-LAYER BLOCKCHAIN-TYPE LEDGER    |
| PCT22979US | US | 16/806,875 | 2020/3/2  | BLOCKCHAIN-TYPE DATA STORAGE   |
| PCT22962US | US | 16/792,070 | 2020/2/14 | SECRET SHARING DATA EXCHANGE FOR GENERATING A DATA PROCESSING MODEL                  |
| PCT22960US | US | 16/787,151 | 2020/2/11 | GENERATION OF A MODEL PARAMETER  |
| PCT22953US | US | 16/810,934 | 2020/3/6  | IDENTITY VERIFICATION  |
| PCT22941US | US | 16/802,226 | 2020/2/26 | USER CLASSIFICATION  |
| PCT22940US | US | 16/805,025 | 2020/2/28 | SELECTING AN AUTHENTICATION SYSTEM FOR HANDLING AN AUTHENTICATION REQUEST            |
| PCT22919US | US | 16/779,524 | 2020/1/31 | DETERMINING DATA PROCESSING MODEL PARAMETERS THROUGH MULTIPARTY COOPERATION          |
| PCT22915US | US | 16/815,917 | 2020/3/11 | VIRTUAL RESOURCE ALLOCATION METHOD AND DEVICE BASED ON BLOCKCHAIN                    |
| PCT22909US | US | 16/803,449 | 2020/2/27 | METHOD AND DEVICE FOR DIVIDING STORAGE DEVICES INTO DEVICE GROUPS                    |
| PCT22908US | US | 16/803,469 | 2020/2/27 | BLOCKCHAIN DATA STORAGE METHOD AND APPARATUS   |

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| PCT22903US | US | 16/803,330 | 2020/2/27 | DATA MANIPULATION RECORD STORAGE METHOD, SYSTEM, APPARATUS, AND DEVICE                   |
| PCT22902US | US | 16/803,289 | 2020/2/27 | TIME AUTHENTICATION METHOD, APPARATUS AND DEVICE IN BLOCKCHAIN-TYPE LEDGER               |
| PCT22898US | US | 16/783,094 | 2020/2/5  | BLOCKCHAIN-BASED BILL NUMBER ALLOCATION METHOD, APPARATUS AND ELECTRONIC DEVICE          |
| PCT22896US | US | 16/783,075 | 2020/2/5  | BLOCKCHAIN-BASED BILL WRITE-OFF METHOD, APPARATUS, ELECTRONIC DEVICE, AND STORAGE MEDIUM |
| PCT22895US | US | 16/783,098 | 2020/2/5  | BLOCKCHAIN-BASED ELECTRONIC BILL CANCELLATION METHOD, APPARATUS, AND ELECTRONIC DEVICE   |
| PCT22893US | US | 16/779,511 | 2020/1/31 | OBTAINING A BLOCKCHAIN-BASED, REAL-NAME, ELECTRONIC BILL                                 |
| PCT22662US | US | 16/809,856 | 2020/3/5  | IDENTIFICATION PREPROCESSING   |
| PCT22617US | US | 16/818,927 | 2020/3/13 | EXTENDING QUESTION AND ANSWER SAMPLES  |
| PCT22499US | US | 16/802,973 | 2020/2/27 | RECOMMENDING TARGET TRANSACTION CODE SETTING REGION                                      |
| PCT22495US | US | 16/808,002 | 2020/3/3  | PREDICTING FUTURE USER TRANSACTIONS  |
| PCT22491US | US | 16/808,208 | 2020/3/3  | SEGMENTATION-BASED DAMAGE DETECTION  |
| PCT22486US | US | 16/813,355 | 2020/3/9  | RECOGNIZING DAMAGE THROUGH IMAGE ANALYSIS  |
| PCT22485US | US | 16/814,842 | 2020/3/10 | GENERATING RECOMMENDATION INFORMATION  |
| PCT22476US | US | 16/792,031 | 2020/2/14 | DETERMINING MODEL PARAMETERS USING SECRET SHARING  |
| PCT22346US | US | 16/803,510 | 2020/2/27 | BLOCKCHAIN-BASED ACCOUNT MANAGEMENT  |
| PCT22322US | US | 16/805,641 | 2020/2/28 | BLOCKCHAIN-BASED DATA PROCESSING   |
| PCT22312US | US | 16/805,179 | 2020/2/28 | BLOCKCHAIN TRANSACTIONS WITH RING SIGNATURES   |
| PCT22306US | US | 16/790,628 | 2020/2/13 | STORING AN ASSET UPDATE RECORD   |
| PCT22026US | US | 16/815,896 | 2020/3/11 | SPLIT-TYPE CODE READING APPARATUS  |
| PCT22010US | US | 16/808,217 | 2020/3/3  | BLOCKCHAIN-BASED INFORMATION PROCESSING METHOD, APPARATUS AND DEVICE                     |
| PCT21992US | US | 16/806,956 | 2020/3/2  | VIDEO OBJECT PROCESSING  |
| PCT21990US | US | 16/815,907 | 2020/3/11 | CERTIFICATE APPLICATION OPERATIONS   |
| PCT21983US | US | 16/812,211 | 2020/3/6  | MONITORING TIME CERTIFICATE GENERATION REQUESTS  |
| PCT21982US | US | 16/815,902 | 2020/3/11 | DATA VERIFICATION METHOD, APPARATUS, AND SYSTEM AND DEVICE                               |



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| PCT21981US | US | 16/815,893 | 2020/3/11 | DATA STORAGE METHOD, APPARATUS, SYSTEM AND DEVICE                              |
| PCT21980US | US | 16/815,882 | 2020/3/11 | LEDGER VERIFICATION METHOD AND APPARATUS, AND DEVICE                           |
| PCT21969US | US | 16/810,683 | 2020/3/5  | PAYMENT PROOF GENERATION METHOD AND SYSTEM, AND DEVICE                         |
| PCT21968US | US | 16/814,824 | 2020/3/10 | METHOD, SYSTEM, AND DEVICE FOR OBTAINING BANK CARD SIGNING INFORMATION ELEMENT |
| PCT21955US | US | 16/802,655 | 2020/2/27 | LOADING MODELS ON NODES HAVING MULTIPLE MODEL SERVICE FRAMEWORKS               |
| PCT21912US | US | 16/811,966 | 2020/3/6  | IDENTITY VERIFICATION  |
| PCT21906US | US | 16/810,772 | 2020/3/5  | SECURE SMART UNLOCKING   |
| PCT21905US | US | 16/806,959 | 2020/3/2  | FACIAL DATA COLLECTION AND VERIFICATION  |
| PCT21900US | US | 16/809,809 | 2020/3/5  | SCANNING INTERFACE DISPLAY   |
| PCT21858US | US | 16/804,635 | 2020/2/28 | DETECTING FRAUDULENT FACIAL RECOGNITION  |
| PCT21847US | US | 16/804,335 | 2020/2/28 | NEAR FIELD COMMUNICATION DEVICE AND INFORMATION PROCESSING METHOD              |
| PCT21846US | US | 16/813,210 | 2020/3/9  | RESOURCE TRANSFER OPERATIONS   |
| PCT21798US | US | 16/805,331 | 2020/2/28 | BLOCKCHAIN-BASED TRANSACTION PROCESSING  |
| PCT21759US | US | 16/816,719 | 2020/3/12 | PROCESSING SEQUENTIAL INTERACTION DATA   |
| PCT21747US | US | 16/812,105 | 2020/3/6  | DETERMINING COMPUTER-EXECUTED ENSEMBLE MODEL                                   |
| PCT21690US | US | 16/814,848 | 2020/3/10 | SERVICE EXECUTION RESULT OBTAINING METHOD AND SYSTEM BASED ON BLOCKCHAIN       |
| PCT21687US | US | 16/803,262 | 2020/2/27 | BLOCKCHAIN-BASED COPYRIGHT DISTRIBUTION  |
| PCT21680US | US | 16/801,998 | 2020/2/26 | OBTAINING STABLE FRAMES  |
| PCT21678US | US | 16/809,256 | 2020/3/4  | TWO-DIMENSIONAL CODE IDENTIFICATION AND POSITIONING                            |
| PCT21677US | US | 16/803,317 | 2020/2/27 | TRAFFIC DETERMINATION  |
| PCT21647US | US | 16/802,189 | 2020/2/26 | SERVICE RECOMMENDATION   |
| PCT21620US | US | 16/809,273 | 2020/3/4  | DATA TRANSMISSION AND NETWORK INTERFACE CONTROLLER                             |
| PCT21608US | US | 16/818,887 | 2020/3/13 | DATA TRANSCIVING OPERATIONS AND DEVICES  |
| PCT21606US | US | 16/811,590 | 2020/3/6  | CASCADE CACHE REFRESHING   |
| PCT21184US | US | 16/810,670 | 2020/3/5  | SELF-SERVICE CHECKOUT COUNTER CHECKOUT   |
| PCT21182US | US | 16/816,503 | 2020/3/12 | SELF-SERVICE CHECKOUT COUNTER  |
| PCT21166US | US | 16/809,224 | 2020/3/4  | DATA PROCESSING METHOD, APPARATUS, MEDIUM AND DEVICE                           |

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| PCT21165US       | US | 16/802,780 | 2020/2/27 | DATA ENCAPSULATION CONVERSION AND TRANSMISSION  |
| PCT21164US       | US | 16/803,830 | 2020/2/27 | USER IDENTITY VERIFICATION  |
| PCT21150US       | US | 16/809,219 | 2020/3/4  | OBTAINING DYNAMIC EMBEDDING VECTORS OF NODES IN RELATIONSHIP GRAPHS                                 |
| PCT21131US       | US | 16/805,531 | 2020/2/28 | MONITORING VIDEO BROADCASTS   |
| PCT21130US       | US | 16/877,235 | 2020/5/18 | PROCESSING ACCOUNT TRANSFER REQUESTS  |
| PCT21069US       | US | 16/803,807 | 2020/2/27 | BLOCKCHAIN AUTHORIZATION INFORMATION GENERATION   |
| PCT21049US       | US | 16/818,476 | 2020/3/13 | UPDATING AND QUERYING A BITMAP INDEX  |
| PCT21046US       | US | 16/805,320 | 2020/2/28 | MANAGEMENT CLIENT AND DEVICE MONITORING   |
| PCT20995US       | US | 16/805,530 | 2020/2/28 | IMAGE RECOGNITION AND AUTHENTICATION  |
| PCT20994US       | US | 16/807,914 | 2020/3/3  | CERTIFICATE VERIFICATION  |
| PCT20972US       | US | 16/803,007 | 2020/2/27 | PAYMENT CHANNEL RECOMMENDATION  |
| PCT20907US       | US | 16/805,162 | 2020/2/28 | BLOCKCHAIN-BASED VIRTUAL RESOURCE ALLOCATION  |
| PCT20900US       | US | 16/811,542 | 2020/3/6  | NETWORK CONFIGURATION USING MULTICAST ADDRESS MODULATION  |
| PCT20895US       | US | 16/804,669 | 2020/2/28 | DATA STORING AND SHARING USING TWO-DIMENSIONAL CODES  |
| PCT20737US       | US | 16/810,653 | 2020/3/5  | BLOCKCHAIN-BASED INVOICE CREATION METHOD APPARATUS, AND ELECTRONIC DEVICE                           |
| PCT20734US       | US | 16/803,955 | 2020/2/27 | BLOCKCHAIN-BASED SERVICE SOURCE TRACING METHOD, APPARATUS, AND ELECTRONIC DEVICE                    |
| PCT20732US       | US | 16/803,720 | 2020/2/27 | BLOCKCHAIN-BASED SETTLEMENT METHOD, APPARATUS, AND ELECTRONIC DEVICE                                |
| PCT20499US       | US | 16/802,905 | 2020/2/27 | BLOCKCHAIN-BASED PAYMENT WITHHOLDING AND AGREEMENT SIGNING METHOD, APPARATUS, AND ELECTRONIC DEVICE |
| PCT20493US       | US | 16/801,329 | 2020/2/26 | BLOCKCHAIN-BASED WITHHOLDING OPERATIONS   |
| PCT20491US       | US | 16/775,195 | 2020/1/28 | BLOCK CHAIN STATE DATA SYNCHRONIZATION METHOD, APPARATUS, AND ELECTRONIC DEVICE                     |
| PCT20476US       | US | 16/804,433 | 2020/2/28 | FACIAL RECOGNITION PAYMENT  |
| PCT19951US       | US | 16/804,775 | 2020/2/28 | STORAGE AND EXECUTION OF SMART CONTRACTS IN BLOCKCHAINS   |
| PCT19920US       | US | 16/803,150 | 2020/2/27 | TRANSACTION FEATURE GENERATION  |
| PCT19713US       | US | 16/850,792 | 2020/4/16 | OPTIMIZATION PROCESSING FOR NEURAL NETWORK MODEL  |
| PCT19195US       | US | 16/801,953 | 2020/2/26 | DETERMINING GENERATION TIME FOR BLOCKCHAIN DATA   |
| PCT21999US       | US | 16/811,469 | 2020/3/6  | CONFIDENTIAL BLOCKCHAIN TRANSACTIONS  |
| PCT9954US<br>CI  | US | 16/914,065 | 2020/6/26 | MAP INTERFACE INTERACTION   |
| PCT11439US<br>CI | US | 16/796,105 | 2020/2/20 | BLOCKCHAIN-BASED DATA PROCESSING METHOD AND DEVICE  |
| PCT23918US<br>CI | US | 16/829,866 | 2020/3/25 | MANAGING BLOCKCHAIN-BASED CENTRALIZED LEDGER SYSTEMS  |
| PCT17514US<br>CI | US | 16/834,559 | 2020/3/30 | FUNCTION-AS-A-SERVICE (FAAS) PLATFORM IN BLOCKCHAIN NETWORKS  |

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| PCT11433US<br>C1 | US | 16/917,393 | 2020/6/30  | METHODS AND DEVICES FOR BROADCASTING MESSAGES                                       |
| PCT11442US<br>C1 | US | 16/806,917 | 2020/3/2   | BLOCKCHAIN-BASED CONSENSUS METHOD AND DEVICE  |
| A10030USC2       | US | 16/824,459 | 2020/3/19  | CALCULATING INDIVIDUAL CARBON FOOTPRINTS  |
| PCT18163US<br>C1 | US | 16/837,736 | 2020/4/1   | ACCELERATING TRANSACTION DELIVERIES IN BLOCKCHAIN NETWORKS USING ACCELERATION NODES |
| PCT17487US<br>C1 | US | 16/852,177 | 2020/4/17  | A DISTRIBUTED MULTI-PARTY SECURITY MODEL TRAINING FRAMEWORK FOR PRIVACY PROTECTION  |
| PCT19682US<br>C1 | US | 16/870,503 | 2020/5/8   | TRANSACTION PROCESSING IN A SERVICE BLOCKCHAIN                                      |
| PCT23897US<br>C1 | US | 16/779,052 | 2020/1/31  | BLOCKCHAIN-BASED DATA AUTHORIZATION METHOD AND APPARATUS                            |
| PCT21063US<br>C1 | US | 16/938,042 | 2020/7/24  | TRANSFERRING OPERATIONS BASED ON BLOCKCHAIN SMART CONTRACT                          |
| PCT21115US<br>C1 | US | 16/890,626 | 2020/6/2   | PERFORMING DATA PROCESSING BASED ON DECISION TREE                                   |
| PCT21117US<br>C1 | US | 16/890,850 | 2020/6/2   | PERFORMING DATA PROCESSING BASED ON DECISION TREE                                   |
| PCT21118US<br>C1 | US | 16/945,780 | 2020/7/31  | PERFORMING DATA PROCESSING BASED ON DECISION TREE                                   |
| PCT21696US<br>C1 | US | 16/945,670 | 2020/7/31  | BLOCKCHAIN-BASED RECORDING AND QUERYING OPERATIONS                                  |
| PCT22307US<br>C1 | US | 16/945,677 | 2020/7/31  | SIGNATURE VERIFICATION FOR A BLOCKCHAIN LEDGER                                      |
| PCT22961US<br>C1 | US | 16/944,122 | 2020/7/30  | DEPLOYING A SMART CONTRACT  |
| A13928USC1       | US | 16/802,627 | 2020/2/27  | RISKY TRANSACTION IDENTIFICATION METHOD AND APPARATUS                               |
| PCT6689US<br>C1  | US | 16/833,021 | 2020/3/27  | SHORT LINK PROCESSING TO IMPROVE SERVICE EFFICIENCY                                 |
| PCT17832US<br>C1 | US | 16/805,492 | 2020/2/28  | DATA ISOLATION IN A BLOCKCHAIN NETWORK  |
| PCT10339US<br>C1 | US | 16/660,412 | 2019/10/22 | METHOD AND APPARATUS FOR VERIFYING BLOCK DATA IN A BLOCKCHAIN                       |
| PCT12465US       | US | 16/697,882 | 2019/11/27 | SMART BROADCAST DEVICE  |
| PCT7887US<br>C1  | US | 16/673,621 | 2019/11/4  | METHOD AND APPARATUS FOR REALIZING COLOR TWEEN ANIMATION                            |
| PCT10352US<br>C1 | US | 16/852,147 | 2020/4/17  | METHOD AND APPARATUS FOR GENERATING AND UPDATING TILES MAPS IN VIRTUAL MAPS         |
| A21772US         | US | 16/791,749 | 2020/2/14  | System And Method For Training Neural Networks                                      |
| PCT8069US<br>C1  | US | 16/897,412 | 2020/6/10  | WEBSITE LOGIN METHOD AND APPARATUS  |
| PCT23062US       | US | 16/813,619 | 2020/3/9   | ELECTRONIC PAYMENT DEVICE   |
| PCT5513US<br>C1  | US | 16/822,467 | 2020/3/18  | IDENTITY AUTHENTICATION USING A WEARABLE DEVICE                                     |
| PCT7180US<br>C1  | US | 16/820,543 | 2020/3/16  | ANDROID-BASED POP-UP PROMPT METHOD AND DEVICE                                       |
| A14794USC1       | US | 16/869,298 | 2020/5/7   | BLOCKCHAIN-BASED DATA MIGRATION METHOD AND APPARATUS                                |
| PCT4761US<br>C1  | US | 16/876,584 | 2020/5/18  | USING BIOMETRIC FEATURES FOR USER AUTHENTICATION                                    |
| PCT23064US<br>C1 | US | 16/852,212 | 2020/4/17  | SHARED BLOCKCHAIN DATA STORAGE BASED ON ERROR CORRECTION CODE                       |
| PCT20765US<br>C1 | US | 16/904,903 | 2020/6/18  | DISTRIBUTED RESOURCE ALLOCATION   |
| PCT10344US<br>C1 | US | 16/904,071 | 2020/6/17  | METHODS, SYSTEMS, AND DEVICES FOR DISPLAYING MAPS                                   |
| PCT23437US<br>C1 | US | 16/945,326 | 2020/7/31  | METHOD AND APPARATUS FOR INTER-BLOCKCHAIN TRANSMISSION OF AUTHENTICABLE MESSAGE     |

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| PCT23596US<br>C1 | US | 16/915,585 | 2020/6/29 | METHOD AND APPARATUS FOR DATA TRANSMISSION IN A TEE SYSTEM  |
| PCT23597US<br>C1 | US | 16/944,866 | 2020/7/31 | METHOD AND APPARATUS FOR MULTITHREADED DATA TRANSMISSION IN A TEE SYSTEM                            |
| PCT23916US<br>C1 | US | 16/925,985 | 2020/7/10 | MANAGING BLOCKCHAIN-BASED CENTRALIZED LEDGER SYSTEMS  |
| PCT23914US<br>C2 | US | 16/944,129 | 2020/7/30 | MANAGING BLOCKCHAIN-BASED CENTRALIZED LEDGER SYSTEMS  |
| PCT23914US<br>C1 | US | 16/944,126 | 2020/7/30 | MANAGING BLOCKCHAIN-BASED CENTRALIZED LEDGER SYSTEMS  |
| A28151US         | US | 16/448,995 | 2019/6/21 | SPOOF DETECTION BY ESTIMATING SUBJECT MOTION FROM CAPTURED IMAGE FRAMES                             |
| A28149US         | US | 16/370,691 | 2019/3/29 | SPOOF DETECTION VIA 3D RECONSTRUCTION   |
| A28147US         | US | 16/447,762 | 2019/6/20 | AUTHENTICATION BY TRANSMITTING INFORMATION THROUGH MAGNETIC FIELDS                                  |
| A28152US         | US | 16/182,372 | 2018/11/6 | CAPTURING IMAGES UNDER CODED ILLUMINATION PATTERNS TO REDUCE EFFECTS OF AMBIENT LIGHTING CONDITIONS |
| A28148US         | US | 16/447,802 | 2019/6/20 | VALIDATING TRANSACTIONS USING INFORMATION TRANSMITTED THROUGH MAGNETIC FIELDS                       |
| A28146US         | US | 16/368,508 | 2019/3/28 | SPOOF DETECTION USING VIBRATION RESPONSE  |
| A28145US         | US | 16/368,385 | 2019/3/28 | SPECULAR REFLECTION REDUCTION USING POLARIZED LIGHT SOURCES   |
| A28144US         | US | 16/361,453 | 2019/3/22 | FUSING MULTI-SPECTRAL IMAGES FOR IDENTITY AUTHENTICATION  |
| A28142US         | US | 16/370,575 | 2019/3/29 | BIOMETRIC IDENTIFICATION USING COMPOSITE HAND IMAGES  |
| A28143US         | US | 16/361,078 | 2019/3/21 | SPOOF DETECTION USING OPTOKINETIC RESPONSE  |
| PCT18624US<br>C1 | US | 16/879,117 | 2020/5/20 | CROSS-CHAIN INTERACTIONS USING A DOMAIN NAME SCHEME IN BLOCKCHAIN SYSTEMS                           |
| PCT8788US<br>C1  | US | 16/882,847 | 2020/5/26 | INFORMATION DISPLAY METHOD, DEVICE, AND SYSTEM  |
| PCT19673US<br>C1 | US | 16/945,696 | 2020/7/31 | PERFORMING PARALLEL EXECUTION OF TRANSACTIONS IN A DISTRIBUTED LEDGER SYSTEM                        |
| PCT20955US<br>C1 | US | 16/945,341 | 2020/7/31 | CRYPTOGRAPHIC KEY MANAGEMENT BASED ON IDENTITY INFORMATION  |
| PCT19726US<br>C1 | US | 16/893,122 | 2020/6/4  | DISTRIBUTED KEY MANAGEMENT FOR TRUSTED EXECUTION ENVIRONMENTS                                       |
| A13730USC1       | US | 16/881,213 | 2020/5/22 | TRAFFIC DETECTION METHOD, DEVICE, AND SYSTEM  |
| PCT10355US<br>C2 | US | 16/895,778 | 2020/6/8  | METHOD AND APPARATUS FOR VERIFYING ENTITY INFORMATION   |
| PCT11437US<br>C1 | US | 16/882,057 | 2020/5/22 | MULTI-SERVER NODE SERVICE PROCESSING AND CONSENSUS METHOD AND DEVICE                                |
| PCT20997US<br>C1 | US | 16/915,627 | 2020/6/29 | DISTRIBUTED RESOURCE ALLOCATION   |
| A18110USC1       | US | 16/899,251 | 2020/6/11 | PARTITION SPLITTING METHOD AND APPARATUS, ELECTRONIC DEVICE, AND READABLE STORAGE MEDIUM            |
| A15166USC1       | US | 16/934,737 | 2020/7/21 | BLOCKCHAIN-BASED SMART CONTRACT INVOCATION METHOD AND APPARATUS, AND ELECTRONIC DEVICE              |
| PCT19725US<br>C1 | US | 16/902,864 | 2020/6/16 | PROCESSING AND STORING BLOCKCHAIN DATA UNDER A TRUSTED EXECUTION ENVIRONMENT                        |
| PCT20994US<br>C1 | US | 16/945,778 | 2020/7/31 | CERTIFICATE VERIFICATION  |
| PCT22984US<br>C1 | US | 16/945,707 | 2020/7/31 | BLOCKCHAIN LEDGER AUTHENTICATION  |
| PCT11610US<br>C1 | US | 16/912,236 | 2020/6/25 | METHOD AND DEVICE FOR IN-VEHICLE PAYMENT  |
| PCT5759US<br>C2  | US | 16/925,072 | 2020/7/9  | FACE LOCATION TRACKING METHOD, APPARATUS, AND ELECTRONIC DEVICE                                     |

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| A10853USC1       | US | 16/903,993 | 2020/6/17  | ALLOCATING VIRTUAL OBJECTS BASED ON AUGMENTED REALITY   |
| A13439USC1       | US | 16/915,658 | 2020/6/29  | TWO-DIMENSIONAL CODE GENERATION AND PROCESSING  |
| PCT5173US<br>C2  | US | 16/894,445 | 2020/6/5   | RESENDING A HYPERTEXT TRANSFER PROTOCOL REQUEST   |
| PCT21847US<br>C1 | US | 16/915,639 | 2020/6/29  | NEAR FIELD COMMUNICATION DEVICE AND INFORMATION PROCESSING METHOD   |
| PCT16696US       | US | UNFILED    | UNFILED    | BENEFIT ALLOCATION METHOD, APPARATUS, AND ELECTRONIC DEVICE   |
| A28139US         | US | 16/256,371 | 2019/1/24  | SYSTEMS AND METHODS FOR DEEP-LEARNING BASED SUPER-RESOLUTION USING MULTIPLE DEGRADATIONS ON-DEMAND LEARNING |
| A28141US         | US | 16/361,038 | 2019/3/21  | AUTHENTICATION VERIFICATION USING SOFT BIOMETRIC TRAITS   |
| A28136US         | US | 16/269,059 | 2019/2/6   | SPOOF DETECTION USING DUAL-BAND NEAR-INFRARED (NIR) IMAGING   |
| A28135US         | US | 16/172,601 | 2018/10/26 | SPOOF DETECTION USING MULTIPLE IMAGE ACQUISITION DEVICES  |
| A28134US         | US | 16/171,029 | 2018/10/25 | SPOOF DETECTION USING STRUCTURED LIGHT ILLUMINATION   |
| A28140US         | US | 16/370,525 | 2019/3/29  | USING AN ILLUMINATION SEQUENCE PATTERN FOR BIOMETRIC AUTHENTICATION   |
| A28131US         | US | 16/355,374 | 2019/3/15  | SPOOF DETECTION BY COMPARING IMAGES CAPTURED USING VISIBLE-RANGE AND INFRARED (IR) ILLUMINATIONS            |
| A28127US         | US | 16/353,876 | 2019/3/14  | AUTHENTICATION BY TRANSMITTING INFORMATION THROUGH A HUMAN BODY   |
| A28138US         | US | 16/247,450 | 2019/1/14  | METHODS FOR DEEP-LEARNING BASED SUPER-RESOLUTION USING HIGH-FREQUENCY LOSS                                  |
| A28117US         | US | 16/183,274 | 2018/11/7  | NEURAL NETWORKS FOR BIOMETRIC RECOGNITION   |
| A28116US         | US | 16/520,839 | 2019/7/24  | SPOOF DETECTION BY GENERATING 3D POINT CLOUDS FROM CAPTURED IMAGE FRAMES                                    |
| A28133US         | US | 16/172,546 | 2018/10/26 | SPOOF DETECTION USING IRIS IMAGES   |
| A28132US         | US | 16/172,447 | 2018/10/26 | CAPTURING IMAGES USING SUB-FRAME ILLUMINATION   |
| A28130US         | US | 16/224,479 | 2018/12/18 | CREATING AN IRIS IDENTIFIER TO REDUCE SEARCH SPACE OF A BIOMETRIC SYSTEM                                    |
| A28129US         | US | 16/281,935 | 2019/2/21  | AUTHENTICATION OF A USER BASED ON ANALYZING TOUCH INTERACTIONS WITH A DEVICE                                |
| A28128US         | US | 16/250,873 | 2019/1/17  | CAPACITIVE THROUGH-BODY COMMUNICATION   |
| A28126US         | US | 16/216,862 | 2018/12/11 | AUTHENTICATION BASED ON CORRELATION OF MULTIPLE PULSE SIGNALS   |
| A28124US         | US | 16/241,508 | 2019/1/7   | PASSIVE IDENTIFICATION OF A KIOSK USER  |
| A28120US         | US | 16/250,795 | 2019/1/17  | IDENTITY AUTHENTICATION USING LENS FEATURES   |
| A28119US         | US | 16/370,467 | 2019/3/29  | SYNCHRONIZING AN ILLUMINATION SEQUENCE OF ILLUMINATION SOURCES WITH IMAGE CAPTURE IN ROLLING SHUTTER MODE   |
| A28125US         | US | 16/216,811 | 2018/12/11 | AUTHENTICATION USING SOUND BASED MONITOR DETECTION  |
| A28123US         | US | 16/140,746 | 2018/9/25  | REDUCTION OF SEARCH SPACE IN BIOMETRIC AUTHENTICATION SYSTEMS   |
| A28121US         | US | 16/160,881 | 2018/10/15 | EMPLOYING PRESSURE SIGNATURES FOR PERSONAL IDENTIFICATION   |
| A28114US         | US | 16/154,263 | 2018/10/8  | PASSIVE AFFECTIVE AND KNOWLEDGE-BASED AUTHENTICATION THROUGH EYE MOVEMENT TRACKING                          |
| A28113US         | US | 16/154,244 | 2018/10/8  | DYNAMIC GRIP SIGNATURE FOR PERSONAL AUTHENTICATION  |
| A28122US         | US | 16/212,516 | 2018/12/6  | HIGH DEFINITION, LARGE CAPTURE VOLUME, CAMERA ARRAY SYSTEM  |

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| A28115US         | US | 16/024,106 | 2018/6/29 | ONE CLICK APPLICATION ASSET DISTRIBUTION  |
| PCT11481US<br>C1 | US | 16/901,959 | 2020/6/15 | INSTANT MESSAGING GROUP MANAGEMENT METHOD AND APPARATUS   |
| PCT13438US<br>C1 | US | 16/911,078 | 2020/6/24 | METHOD AND DEVICE FOR DETERMINING DATA ANOMALY  |
| PCT18163US<br>C2 | US | 16/945,235 | 2020/7/31 | ACCELERATING TRANSACTION DELIVERIES IN BLOCKCHAIN NETWORKS USING ACCELERATION NODES               |
| PCT22964US<br>C1 | US | 16/928,794 | 2020/7/14 | SHARED BLOCKCHAIN DATA STORAGE  |
| PCT12490US<br>C1 | US | 16/945,713 | 2020/7/31 | IMAGE DISPLAY METHOD AND DEVICE, AND ELECTRONIC DEVICE  |
| PCT11626US<br>C1 | US | 16/921,212 | 2020/7/6  | BLOCKCHAIN CONSENSUS METHOD AND DEVICE  |
| A11710USC2       | US | 16/901,585 | 2020/6/15 | MULTI-BLOCKCHAIN NETWORK DATA PROCESSING  |
| PCT23193US<br>C1 | US | 16/945,434 | 2020/7/31 | HOMOMORPHIC DATA ENCRYPTION METHOD AND APPARATUS FOR IMPLEMENTING PRIVACY PROTECTION              |
| PCT18147US<br>C1 | US | 16/908,502 | 2020/6/22 | CONSTRUCTING BLOCKCHAIN WORLD STATE MERKLE PATRICIA TRIE SUBTREE                                  |
| PCT23197US<br>C1 | US | 16/945,302 | 2020/7/31 | BLOCKCHAIN DATA STORAGE BASED ON SHARED NODES AND ERROR CORRECTION CODE                           |
| PCT5830US<br>C1  | US | 16/906,829 | 2020/6/19 | VOICEPRINT RECOGNITION MODEL CONSTRUCTION   |
| PCT22983US<br>C1 | US | 16/944,111 | 2020/7/30 | BLOCKCHAIN LEDGER COMPRESSION   |
| PCT8197US<br>C1  | US | 16/906,840 | 2020/6/19 | RANDOM NUMBER GENERATION AND ACQUISITION METHOD AND DEVICE  |
| PCT18606US<br>C1 | US | 16/945,533 | 2020/7/31 | BLOCKCHAIN DATA PROTECTION BASED ON GENERIC ACCOUNT MODEL AND HOMOMORPHIC ENCRYPTION              |
| PCT21955US<br>C1 | US | 16/939,740 | 2020/7/27 | LOADING MODELS ON NODES HAVING MULTIPLE MODEL SERVICE FRAMEWORKS                                  |
| A14535USC2       | US | 16/908,430 | 2020/6/22 | ASSET MANAGEMENT SYSTEM, METHOD, APPARATUS, AND ELECTRONIC DEVICE                                 |
| PCT12474US<br>C1 | US | 16/906,862 | 2020/6/19 | METHOD AND APPARATUS FOR OFFLINE PAYMENT, SERVICE PROCESSING, AND PAYMENT PROCESSING              |
| PCT23725US<br>C1 | US | 16/917,426 | 2020/6/30 | SHARED BLOCKCHAIN DATA STORAGE BASED ON ERROR CORRECTION CODING IN TRUSTED EXECUTION ENVIRONMENTS |
| PCT19957US<br>C1 | US | 16/942,549 | 2020/7/29 | DATA EXCHANGE FOR MULTI-PARTY COMPUTATION   |
| PCT10575US<br>C2 | US | 16/945,184 | 2020/7/31 | SERVICE PROCESSING USING A DIGITAL OBJECT IDENTIFIER  |
| PCT21100US<br>C1 | US | 16/945,296 | 2020/7/31 | PROCESSING DATA ELEMENTS STORED IN BLOCKCHAIN NETWORKS  |
| PCT19187US<br>C1 | US | 16/945,749 | 2020/7/31 | PERFORMING PARALLEL EXECUTION OF TRANSACTIONS IN A DISTRIBUTED LEDGER SYSTEM                      |
| PCT23919US<br>C1 | US | 16/925,123 | 2020/7/9  | MANAGING BLOCKCHAIN-BASED CENTRALIZED LEDGER SYSTEMS  |
| PCT21693US<br>C1 | US | 16/945,004 | 2020/7/31 | METHOD FOR RESTORING PUBLIC KEY BASED ON SM2 SIGNATURE  |
| PCT11611US<br>C1 | US | 16/945,362 | 2020/7/31 | IDENTITY AUTHENTICATION METHOD, DEVICE, AND SYSTEM  |
| PCT19669US<br>C1 | US | 16/933,629 | 2020/7/20 | PROGRAM EXECUTION AND DATA PROOF SCHEME USING MULTIPLE KEY PAIR SIGNATURES                        |
| PCT21707US<br>C1 | US | 16/945,757 | 2020/7/31 | IDENTIFYING COPYRIGHTED MATERIAL USING EMBEDDED COPYRIGHT INFORMATION                             |
| PCT23685US<br>C1 | US | 16/945,593 | 2020/7/31 | CREATING INDEX IN BLOCKCHAIN-TYPE LEDGER  |
| PCT23435US<br>C1 | US | 16/945,772 | 2020/7/31 | BLOCKCHAIN AUTHORIZATION  |

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|-------------------|----|------------|-----------|---|
| PCT21711US<br>C1  | US | 16/945,316 | 2020/7/31 | IDENTIFYING COPYRIGHTED MATERIAL USING COPYRIGHT INFORMATION EMBEDDED IN ELECTRONIC FILES                 |
| PCT12623US<br>C1  | US | 16/907,637 | 2020/6/22 | METHOD AND DEVICE FOR VIRTUAL RESOURCE ALLOCATION, MODELING, AND DATA PREDICTION                          |
| A14535USC3        | US | 16/908,490 | 2020/6/22 | ASSET MANAGEMENT SYSTEM, METHOD, APPARATUS, AND ELECTRONIC DEVICE   |
| PCT4710US<br>C1   | US | 16/884,966 | 2020/5/27 | ESTABLISHING A TRUSTED LOGIN PROCEDURE  |
| PCT7916US<br>C1   | US | 16/904,031 | 2020/6/17 | METHOD AND APPARATUS REUSING LISTCELL IN HYBRID APPLICATION   |
| A11920USC1        | US | 16/908,369 | 2020/6/22 | INSTANT-MESSAGING-BASED PICTURE SENDING METHOD AND DEVICE   |
| PCT12785US<br>C1  | US | 16/908,967 | 2020/6/23 | QR Code Positioning Method and Apparatus  |
| PCT9060US<br>C1   | US | 16/913,863 | 2020/6/26 | METHOD AND SYSTEM FOR STARTING APPLICATION  |
| PCT22303US        | US | 16/885,958 | 2020/5/28 | INDEX CREATION FOR DATA RECORDS   |
| PCT22890US        | US | 16/888,471 | 2020/5/29 | BLOCKCHAIN-BASED STATE MACHINE MAINTENANCE  |
| PCT23067US<br>C1  | US | 16/945,759 | 2020/7/31 | IDENTITY IDENTIFICATION AND PREPROCESSING   |
| A28113USC1        | US | 16/793,909 | 2020/2/18 | DYNAMIC GRIP SIGNATURE FOR PERSONAL AUTHENTICATION  |
| A28119USC1        | US | 16/797,954 | 2020/2/21 | SYNCHRONIZING AN ILLUMINATION SEQUENCE OF ILLUMINATION SOURCES WITH IMAGE CAPTURE IN ROLLING SHUTTER MODE |
| A28121USC1        | US | 16/735,333 | 2020/1/6  | EMPLOYING PRESSURE SIGNATURES FOR PERSONAL IDENTIFICATION   |
| A28115USC1        | US | 16/780,284 | 2020/2/3  | ONE CLICK APPLICATION ASSET DISTRIBUTION  |
| A28152USC1        | US | 16/795,464 | 2020/2/19 | CAPTURING IMAGES UNDER CODED ILLUMINATION PATTERNS TO REDUCE EFFECTS OF AMBIENT LIGHTING CONDITIONS       |
| A28123USC1        | US | 16/796,529 | 2020/2/20 | REDUCTION OF SEARCH SPACE IN BIOMETRIC AUTHENTICATION SYSTEMS   |
| A28140USC1        | US | 16/795,148 | 2020/2/19 | USING AN ILLUMINATION SEQUENCE PATTERN FOR BIOMETRIC AUTHENTICATION                                       |
| A28141USC1        | US | 16/796,595 | 2020/2/20 | AUTHENTICATION VERIFICATION USING SOFT BIOMETRIC TRAITS   |
| A28145USC1        | US | 16/795,271 | 2020/2/19 | SPECULAR REFLECTION REDUCTION USING POLARIZED LIGHT SOURCES   |
| A28147USC1        | US | 15/930,260 | 2020/5/12 | AUTHENTICATION BY TRANSMITTING INFORMATION THROUGH MAGNETIC FIELDS  |
| A28148USC1        | US | 16/795,224 | 2020/2/19 | VALIDATING TRANSACTIONS USING INFORMATION TRANSMITTED THROUGH MAGNETIC FIELDS                             |
| A28147USC2        | US | 15/930,269 | 2020/5/12 | AUTHENTICATION BY TRANSMITTING INFORMATION THROUGH MAGNETIC FIELDS  |
| PCT22026U<br>USC1 | US | 16/945,447 | 2020/7/31 | SPLIT-TYPE CODE READING APPARATUS   |
| PCT4967US<br>C1   | US | 16/945,764 | 2020/7/31 | IDENTIFICATION OF A RELATED COMPUTING DEVICE FOR AUTOMATIC ACCOUNT LOGIN                                  |
| PCT18162US<br>C1  | US | 16/945,396 | 2020/7/31 | ACCELERATING TRANSACTION DELIVERIES IN BLOCKCHAIN NETWORKS USING TRANSACTION RESENDING                    |
| PCT21705US<br>C1  | US | 16/944,119 | 2020/7/30 | IDENTIFYING COPYRIGHTED MATERIAL USING EMBEDDED COPYRIGHT INFORMATION                                     |
| PCT10924US<br>C1  | US | 16/945,688 | 2020/7/31 | METHOD AND APPARATUS FOR SERVICE DIVERSION IN CONNECTION WITH MOBILE PAYMENT TRANSACTIONS                 |
| PCT21710US<br>C1  | US | 16/945,662 | 2020/7/31 | COPYRIGHT PROTECTION BASED ON HIDDEN COPYRIGHT INFORMATION  |
| PCT23184US<br>C1  | US | 16/945,128 | 2020/7/31 | BLOCKCHAIN-TYPE DATA STORAGE  |

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| PCT21999US<br>C1 | US | 16/945,157 | 2020/7/31 | CONFIDENTIAL BLOCKCHAIN TRANSACTIONS   |
| PCT22491US<br>C1 | US | 16/945,774 | 2020/7/31 | SEGMENTATION-BASED DAMAGE DETECTION  |
| PCT10156US<br>C1 | US | 16/921,275 | 2020/7/6  | METHODS AND DEVICES FOR BARCODE BASED COMMUNICATION AND PAYMENT IMPLEMENTATION     |
| PCT23929US<br>C1 | US | 16/921,546 | 2020/7/6  | BLOCKCHAIN-BASED JUDGMENT EXECUTION  |
| A22025USC1       | US | 16/944,985 | 2020/7/31 | METHOD AND SYSTEM FOR EVALUATING AN OBJECT DETECTION MODEL                         |
| PCT11225US<br>C1 | US | 16/820,098 | 2020/3/16 | VOICE FUNCTION CONTROL METHOD AND APPARATUS  |
| PCT21906US<br>C1 | US | 16/945,591 | 2020/7/31 | SECURE SMART UNLOCKING   |
| PCT12465US<br>C1 | US | 16/945,551 | 2020/7/31 | SMART BROADCAST DEVICE   |
| PCT11436US<br>C2 | US | 16/945,267 | 2020/7/31 | BLOCKCHAIN CONSENSUS METHOD AND DEVICE   |
| PCT9100US<br>C2  | US | 16/945,767 | 2020/7/31 | METHOD AND DEVICE FOR DATA VERSION COMPARISON BETWEEN TRANS-TIME ZONE SITES        |
| PCT21620US<br>C1 | US | 16/945,621 | 2020/7/31 | DATA TRANSMISSION AND NETWORK INTERFACE CONTROLLER                                 |
| PCT11896US<br>C1 | US | 16/945,650 | 2020/7/31 | GOODS ORDER PROCESSING METHOD AND APPARATUS, SERVER, SHOPPING TERMINAL, AND SYSTEM |
| PCT7236US<br>C1  | US | 16/941,098 | 2020/7/28 | DISPLAYING AN ONLINE PRODUCT ON A PRODUCT SHELF                                    |
| A13031USC1       | US | 16/945,655 | 2020/7/31 | DYNAMICALLY-ORGANIZED SYSTEM FOR DISTRIBUTED CALCULATIONS                          |
| PCT21712US<br>C1 | US | 16/945,683 | 2020/7/31 | COPYRIGHT PROTECTION BASED ON HIDDEN COPYRIGHT INFORMATION                         |
| PCT11609US<br>C1 | US | 16/843,001 | 2020/4/8  | METHOD AND DEVICE FOR INPUTTING PASSWORD IN VIRTUAL REALITY SCENE                  |
| PCT11609US<br>C2 | US | 16/944,916 | 2020/7/31 | METHOD AND DEVICE FOR INPUTTING PASSWORD IN VIRTUAL REALITY SCENE                  |
| A21053USC1       | US | 16/945,589 | 2020/7/31 | METHOD, APPARATUS, AND ELECTRONIC DEVICE FOR IMPROVING PARALLEL PERFORMANCE OF CPU |
| A10803USC1       | US | 16/841,467 | 2020/4/6  | IMAGE RECOGNITION BASED ON AUGMENTED REALITY                                       |
| PCT23184US<br>C2 | US | 16/945,162 | 2020/7/31 | BLOCKCHAIN-TYPE DATA STORAGE   |
| PCT23437US<br>C2 | US | 16/945,425 | 2020/7/31 | METHOD AND APPARATUS FOR INTER-BLOCKCHAIN TRANSMISSION OF AUTHENTICABLE MESSAGE    |
| PCT10575US<br>C3 | US | 16/945,488 | 2020/7/31 | SERVICE PROCESSING USING A DIGITAL OBJECT IDENTIFIER                               |
| PCT10041US<br>C1 | US | 16/872,022 | 2020/5/11 | METHOD AND APPARATUS FOR SHARING REGIONAL INFORMATION                              |
| PCT21057US<br>C1 | US | 16/938,042 | 2020/7/24 | TRANSFERRING OPERATIONS BASED ON BLOCKCHAIN SMART CONTRACT                         |