

Independent Claim 4 (Article of Manufacture Claim)

A non-transitory computer-readable medium storing instructions that, when executed by processors of an IoT cloud platform, cause the platform to:
receive data from IoT edge hardware associated with any Real World Asset (RWA);
validate the data and generate a digital RWA certificate;
create a value token on a blockchain representing the certificate; and
operate a blockchain-based exchange that supports market orders, limit orders, options, forwards, futures, swaps, and other instruments to complete automated trading and monetization of the token.

Dependent Claims for Independent Claim 4

The following is a complete set of dependent claims (Claims 2–22) that further specify and narrow the non-transitory computer-readable medium of Independent Claim 4. Each dependent claim is fully supported by the disclosures in the attached document (Patent Filing Highlights US20200027096A1.docx), including the detailed descriptions of the IoT cloud platform's receipt and processing of data from edge hardware, automated validation/verification processes, digital RWA certificate generation, blockchain value token creation (immutable digital asset with public-key linking and cryptographic protection), registration mechanisms, operation of the integrated blockchain-based trading/exchange layer (order types, advanced orders, time-in-force rules, automated matching/execution/settlement/monetization), real-time/continuous operation, redundant ledger copies, fraud reduction, permanent auditability, primary-market issuance, and the overall end-to-end IoT-to-blockchain tokenized RWA platform as of the November 7, 2017 priority date.

Full Claim Set in Formal USPTO-Style Format (Reordered to Start with Claim 1)

1. A non-transitory computer-readable medium storing instructions that, when executed by processors of an IoT cloud platform, cause the platform to: receive data from IoT edge hardware associated with any Real World Asset (RWA); validate the data and generate a digital RWA certificate; create a value token on a blockchain representing the certificate; and operate a blockchain-based exchange that supports market orders, limit orders, options, forwards, futures, swaps, and other instruments to complete automated trading and monetization of the token.
2. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the IoT cloud platform to receive data from an IoT edge hardware layout comprising sensor devices, edge routers, and edge gateways configured to communicate using one or more wireless protocols selected from the group consisting of Bluetooth, Zigbee, WiFi, Z-Wave, Sub-Gigahertz, Cellular, Satellite, LoRaWAN, Sigfox, and combinations thereof.
3. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the IoT cloud platform to receive the data continuously or in real time from physical facilities or infrastructure instrumented with the IoT edge hardware.
4. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the IoT cloud platform to perform automated validation of the received data

using processes for accuracy, sampling design, internal controls, and verification consistent with established standards for real-world asset certification.

5. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the IoT cloud platform to automatically generate the digital RWA certificate upon successful validation of the received data.
6. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the creation of the value token by recording the digital RWA certificate as an immutable digital asset on a distributed ledger that includes one or more of public-key addresses, cryptographic block linking, timestamps, transaction data, user identifiers, equipment identifiers, validation reports, and verification statements.
7. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the blockchain to register all participants and equipment associated with the RWA on the distributed ledger to prevent double-spending or fraud.
8. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the value token to be created and recorded as a primary market activity based on the validated digital RWA certificate generated from the IoT-sourced data.
9. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the blockchain-based exchange to process buyer bids and execute trades using market orders, limit orders, options, forwards, futures, swaps, or pre-market contracts.
10. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the blockchain-based exchange to support advanced order types selected from the group consisting of short selling, trailing stop orders, conditional orders, One-Triggers-the-Other (OTO) orders, One-Cancels-the-Other (OCO) orders, One-Triggers-a-One-Cancels-the-Other (OTOCO) orders, and combinations thereof.
11. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the blockchain-based exchange to apply time-in-force rules to orders, the time-in-force rules selected from the group consisting of day orders, good-'til-canceled orders (up to 180 days), fill-or-kill orders, immediate-or-cancel orders, on-the-open orders, on-the-close orders, and combinations thereof.
12. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the blockchain-based exchange to automatically match, execute, and settle trades by recording each transaction as a new cryptographically linked block on the distributed ledger, thereby transferring ownership of the value token to the buyer and delivering payment to the seller in real time or near real time.
13. The non-transitory computer-readable medium of claim 1, wherein the instructions cause all buy/sell transactions, ownership transfers, and payments to be permanently recorded on the blockchain to reduce fraud and ensure permanent verification and auditability of the tokenized RWA.
14. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the blockchain-based exchange to maintain multiple redundant copies of the distributed ledger across cloud environments to provide fault tolerance and Byzantine fault tolerance.
15. The non-transitory computer-readable medium of claim 1, wherein the instructions cause automated monetization of the tokenized RWA by transferring funds to the seller

upon execution of a winning bid while simultaneously delivering the value token to the buyer.

16. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the IoT cloud platform and blockchain-based exchange to operate in a closed-loop automated process to enable continuous measurement, validation, token creation, listing, and trading of the tokenized RWA.
17. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the distributed ledger to employ cryptographic hashing of each new block to prior blocks to ensure immutability of all tokenized RWA records and trading transactions.
18. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the blockchain-based exchange to function as an integrated commodity, crypto, security, or financial exchange without requiring separate centralized custodians or clearinghouses.
19. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the value token to represent a digital representation of any commodity, security, physical asset, financial instrument, or other RWA that is verifiable and cannot be double-spent due to the immutable nature of the blockchain.
20. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the system to eliminate intermediaries by performing end-to-end automated data receipt, validation, certificate generation, token creation, and trading directly on the integrated IoT cloud platform and blockchain.
21. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the blockchain-based exchange to support high-frequency, derivative, and institutional trading of tokenized RWAs while maintaining permanent auditability and fraud reduction through immutable ledger recording.
22. The non-transitory computer-readable medium of claim 1, wherein the instructions cause the IoT cloud platform to cryptographically bind the received IoT edge hardware data, the digital RWA certificate, and the value token on the distributed ledger through a secure registration process.

These claims form a self-contained, commercially robust claim family that directly maps to the article-of-manufacture embodiments of the IoT cloud platform instructions for end-to-end tokenized Real World Asset (RWA) generation, value token creation, and integrated blockchain-based exchange operation described in the November 7, 2017 provisional disclosure. The full set (renumbered to begin with Claim 1) can be incorporated into a non-provisional, continuation, or continuation-in-part application (alone or in combination with the claim families of Independent Claims 1–3) to further strengthen the Parisii patent portfolio for tokenized Real World Assets and blockchain-based RWA infrastructure.