Independent Claim 2 (Method – IoT Data to RWA Digital Twin Token Minting)
A computer-implemented method for issuing a tokenized digital twin of any physical asset or RWA from IoT data, comprising: collecting real-time data associated with any RWA using IoT sensors, routers, and gateways; transmitting the data to an IoT cloud platform; validating the data and generating a digital RWA certificate; and minting a value token on a blockchain ledger that cryptographically binds the digital twin to a public-key address and registers devices and users for verifiable ownership and provenance.

Dependent Claims for Independent Claim 2
The following is a complete set of dependent claims (Claims 2–22) that further specify and narrow the computer-implemented method of Independent Claim 2. Each dependent claim is fully supported by the disclosures in the attached document (Patent Filing Highlights US20220180374A1.pdf), including the detailed descriptions of IoT edge hardware (sensors, routers, gateways, and wireless protocols), real-time/continuous data collection and transmission, automated validation/certification processes, digital RWA certificate generation, blockchain value token minting (cryptographic binding to public-key address, device/user registration to prevent double issuance, immutable digital asset record with timestamps/transaction data/validation metadata), primary-market issuance, verifiable ownership/provenance, and the overall IoT-sourced tokenized digital twin architecture for any physical asset or RWA as of the December 26, 2017 priority date.

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

1. A computer-implemented method for issuing a tokenized digital twin of any physical asset or RWA from IoT data, comprising: collecting real-time data associated with any RWA using IoT sensors, routers, and gateways; transmitting the data to an IoT cloud platform; validating the data and generating a digital RWA certificate; and minting a value token on a blockchain ledger that cryptographically binds the digital twin to a public-key address and registers devices and users for verifiable ownership and provenance.
2. The method of claim 1, wherein collecting the real-time data further comprises using an IoT edge hardware layout with 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 method of claim 1, wherein collecting the real-time data is performed continuously from physical facilities, infrastructure, renewable resources, or efficiency systems instrumented with the IoT sensors, routers, and gateways.
4. The method of claim 1, wherein transmitting the collected data to the IoT cloud platform occurs in real time or near real time.
5. The method of claim 1, wherein validating the data comprises performing automated processes for accuracy, sampling design, internal controls, and verification consistent with established standards for real-world asset certification.

6. The method of claim 1, wherein generating the digital RWA certificate is performed automatically by the IoT cloud platform upon successful validation of the transmitted data.
7. The method of claim 1, wherein minting the value token further comprises creating the value token as a primary market activity based on the validated digital RWA certificate generated from the IoT-sourced data.
8. The method of claim 1, wherein minting the value token further comprises recording the digital RWA certificate as an immutable digital asset on the blockchain 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.
9. The method of claim 1, wherein registering devices and users on the blockchain ledger cryptographically binds the IoT sensors, routers, gateways, the digital RWA certificate, and the value token to prevent double issuance and establish verifiable ownership and provenance of the digital twin.
10. The method of claim 1, wherein the blockchain ledger maintains multiple redundant copies across cloud environments to provide fault tolerance and Byzantine fault tolerance for the minted value token representing the digital twin.
11. The method of claim 1, wherein the immutable record employs cryptographic hashing of each new block to prior blocks to ensure permanent verifiability of ownership and provenance of the tokenized digital twin.
12. The method of claim 1, wherein the method provides permanent auditability and fraud reduction through the immutable record of the entire issuance process on the blockchain ledger.
13. The method of claim 1, further comprising integrating the minted value token with a blockchain-based trading platform that enables subsequent listing and trading of the tokenized digital twin on a commodity, crypto, security, or financial exchange.
14. The method of claim 1, wherein the method operates in a closed-loop automated process from data collection through validation, certificate generation, and automatic minting of the value token representing the digital twin.
15. The method of claim 1, wherein the value token represents an immutable digital twin of any commodity, security, physical asset, financial instrument, or other RWA that is verifiable and cannot be double-spent due to the cryptographic binding and registration on the distributed ledger.
16. The method of claim 1, wherein the method eliminates intermediaries by performing end-to-end automated issuance of the tokenized digital twin directly from IoT-sourced data to the blockchain ledger.
17. The method of claim 1, wherein registering IoT devices and users further comprises a secure registration process that links the sensor devices, edge routers, gateways, and the certified digital RWA certificate on the distributed ledger.
18. The method of claim 1, wherein the blockchain ledger records the minted value token with timestamps and transaction data to ensure real-time or near real-time provenance tracking of the digital twin.

19. The method of claim 1, wherein the method supports scalable, industrial-scale issuance of tokenized digital twins by combining real-time IoT data acquisition with automated blockchain minting.
20. The method of claim 1, further comprising automated preparation for monetization by associating the minted value token with mechanisms for ownership transfer and payment upon future trading execution on an integrated blockchain-based exchange.
21. The method of claim 1, wherein the certified digital RWA certificate and the value token are cryptographically bound such that any participant in the network can permanently verify ownership and provenance of the digital twin without reliance on off-chain records.
22. The method of claim 1, wherein the method further comprises executing wallet or payment applications within a Trusted Execution Environment (TEE) in connection with the automatic minting of the value token representing the digital twin on the blockchain ledger.

These claims form a self-contained, commercially robust claim family that directly maps to the computer-implemented method for IoT-driven issuance of a tokenized digital twin of any physical asset or RWA, including data collection, transmission, cloud validation, certificate generation, and blockchain minting with cryptographic binding and registration as described in the December 26, 2017 provisional disclosure (and the incorporated earlier provisionals). 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 and subsequent claims) to further strengthen the Parisii patent portfolio for tokenized Real World Assets and blockchain-based RWA/digital twin infrastructure.