FORM 2

THE PATENTS ACT, 1970

(39 of 1970)

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THE PATENTS RULES, 2003

COMPLETE SPECIFICATION

1. TITLE OF THE INVENTION

Method and System for Blockchain-Based Product Validation

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2. PREAMBLE TO DESCRIPTION

COMPLETE SPECIFICATION -

The following specification particularly describes the invention and the manner in which it is to be performed.

Title: Method and System for Blockchain-Based Product Validation

Field of the Invention

[0001] The invention relates to the area of product authentication, it presents a new system that uses blockchain technology to create a reliable and unchangeable way to confirm the legitimacy of products. This novel strategy tackles the mounting issues related to product counterfeiting and unauthorised replication. An unchangeable record of the product's origin and supply chain trip is ensured by the invention through the integration of blockchain, a decentralised and distributed ledger, into the product authentication process. In addition to improving product security, this approach makes transparent traceability easier, giving stakeholders and customers the confidence to confirm a product's authenticity at any point in its lifecycle. The utilisation of blockchain technology in product authentication not only provides protection against fraudulent activities but also lays the groundwork for fostering responsibility and trust across a range of businesses.

[0002] Product authentication using blockchain technology is a solution that makes use of blockchain technology to offer a reliable, transparent, and secure way to authenticate products. In order to guarantee product authenticity throughout its existence, the invention integrates supply chain management, product tracking, and verification systems with blockchain technology. The idea can be used in a variety of fields where there is a high risk of counterfeiting, such as consumer goods, pharmaceuticals, luxury

items, and more. The field of invention is concentrated on creating solutions to address the issue of counterfeit goods and boost confidence and transparency in the market.

[0003] The invention known offers a novel strategy for guaranteeing the legitimacy and trackability of goods across a range of sectors. Through the utilisation of blockchain technology's decentralised and impenetrable structure, this approach creates a transparent and safe validation procedure. By use of smart contract implementation and cryptographic verification, stakeholders may easily verify the provenance, manufacturing details, and lifecycle of a product. By offering a verifiable and unchangeable record of a product's origin, this invention not only improves supply chain integrity but also cultivates consumer trust, ultimately transforming how we authenticate the authenticity of commodities in a digitally linked world.

Background

[0004] This invention's history is based on the growing global problem of counterfeit goods, which endangers producers, customers, and supply networks' overall integrity. Conventional authentication techniques frequently fail to stop illegal duplication, which can cause financial losses as well as harm to end users. Aware of the shortcomings of current solutions, the invention uses blockchain technology's decentralised and transparent structure as inspiration to develop a ground-breaking system that transforms product authentication.

[0005] The innovation enhances the distributed ledger's built-in security characteristics by utilising blockchain technology, guaranteeing that once data is recorded, it cannot be changed or tampered with. This background highlights the dedication to creating a state-of-the-art solution that not only addresses the problems posed by counterfeiting but also creates a new standard for accountability and trust in the authentication of products.

[0006] By developing a Product Authentication system using blockchain technology offers a secure and reliable way for product identification, the issue of counterfeit goods being sold to naïve buyers will be addressed, lessening the negative effects on customers and businesses. The system attempts to give businesses a trustworthy way to authenticate their items and safeguard their brand name while also giving customers a dependable way to confirm the authenticity of the things they are buying. The technology intends to improve supply chain transparency, enabling greater

oversight and control of fake goods. The ultimate goal is to lessen the danger and damaging effects of counterfeit goods on the economy while fostering a more secure and reliable marketplace for businesses and consumers.

[0007] US20210264444A1 Techniques and frameworks are offered for using blockchain technology to provide products with immediate authentication and better customer experiences. Blockchain technology is used by a product verification system to monitor each instance (e.g., copy) of a product's supply chain process. A code included with the object is scanned when an authentication request is received. The code is used to identify a token that represents an instance of a product. The system for verifying products navigates a blockchain in order to retrieve token-related data. The data is used to authenticate the item. After verifying the item, supplementary material supplied by the maker of the product or the supply chain may be displayed on a user's device.

[0008] US20150379510A1 A system and approach for monetizing data transactions including modifications to data included in a data supply chain through the use of smart contracts and a block chain infrastructure.

The invention outlines a system and procedure for monetizing data modifications utilising smart contracts and a block chain infrastructure. The system and method allows micropayments for modified data responsive to observation of changes to data included into a data supply chain on a

granular level, and it aligns the specifications of a data buyer with the data of a data producer.

[0009] INA 20231106815 The system that uses blockchain to ensure the security of medical data is the subject of the current invention. The system consists of a medical data storage facility, a user authentication mechanism, and a blockchain network. Medical data is managed and stored on the blockchain network. The purpose of user authentication mechanisms is to confirm users' identities. The health record is kept in the medical data storage. Hierarchical data structures are used to organise medical data storage within the blockchain network, facilitating better data retrieval and classification.

Objects of the Invention

[0010] The objects of invention are as follows:

- **Establishing Tamper-Resistant Verification:** The primary objective of this invention is to create a system that employs blockchain technology to establish a tamper-resistant method for verifying the authenticity of products, ensuring the integrity of the information throughout the supply chain.
- **Mitigating Counterfeiting Risks:** The invention aims to address the escalating challenges associated with counterfeiting by introducing an innovative approach that significantly reduces the risks of unauthorized replication of products, thereby safeguarding both consumers and manufacturers.
- **Enhancing Supply Chain Transparency:** Through the utilization of blockchain, the invention seeks to enhance transparency in the supply chain by creating an immutable and decentralized ledger that provides a clear and traceable record of a product's origin, manufacturing process, and distribution history.
- **Building Consumer Trust and Confidence:** The ultimate goal is to foster trust and confidence among consumers and stakeholders by offering a secure and verifiable means of product authentication. This innovative system not only protects against fraudulent activities but also establishes a foundation for accountability, promoting a higher level of trust in the authenticity of goods.

Drawings

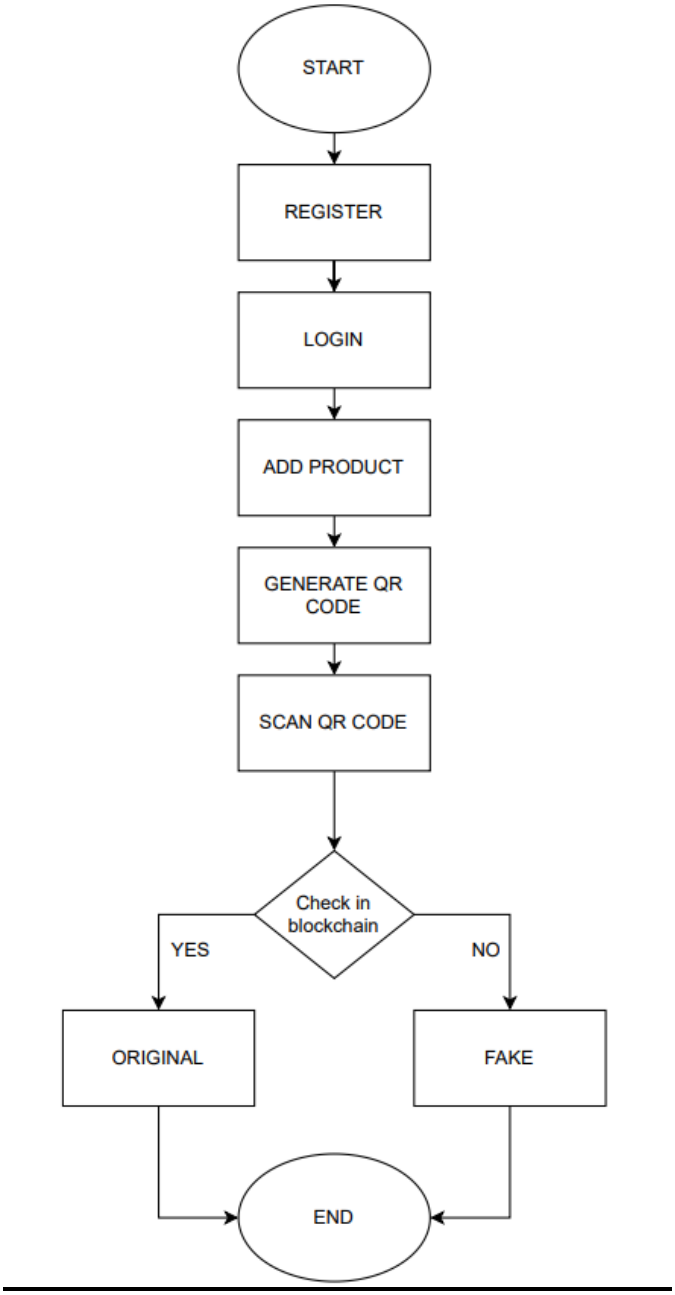

Figure 1 Flowchart of Invention

Brief Description of the Drawing

[0011] The flowchart of the proposed product authentication system using blockchain unfolds as a seamless and secure process. Initiated with product creation, the blockchain ledger captures and encrypts pertinent information, including origin details and manufacturing specifics. As the product progresses through the supply chain, each transaction, from production to distribution, is chronologically recorded as an immutable block on the decentralized network. The verification process involves consumers or stakeholders accessing the blockchain via a secure interface, where they can input a unique identifier associated with the product. The system then retrieves the corresponding blockchain data, allowing for real-time authentication. Any attempt to tamper with the product information is thwarted by the cryptographic security of the blockchain. This intuitive and transparent flowchart ensures a robust and trustworthy method for product authentication, setting a new standard for combating counterfeiting and enhancing consumer confidence.

Claims

We Claim:

[1] A method for product authentication utilizing blockchain technology, comprising the steps of recording and encrypting product-specific information on a decentralized blockchain ledger, thereby establishing a tamper-resistant system for verifying the authenticity of goods throughout the supply chain.

[2] A system for mitigating counterfeiting risks, wherein the blockchain-based authentication process significantly reduces the likelihood of unauthorized product replication, thereby safeguarding consumers and manufacturers from economic losses and potential harm associated with counterfeit products.

[3] An innovative approach to supply chain transparency, incorporating the use of blockchain to create an immutable ledger that chronicles the origin, manufacturing details, and distribution history of each product, thereby enhancing overall transparency and traceability within the supply chain.

[4] A product verification interface, enabling consumers and stakeholders to access the blockchain securely, input a unique product identifier, and retrieve real-time authentication data, thereby facilitating a user-friendly and efficient means of verifying the legitimacy of goods and promoting trust in the authenticity of products.

Abstract

This invention presents a groundbreaking solution in the form of a blockchain-based product authentication system designed to combat counterfeiting. The abstract encapsulates a method that not only ensures tamper-resistant verification but also enhances supply chain transparency, providing a user-friendly interface for consumers to confidently authenticate product legitimacy in real-time. For years, there has been an issue with fake items being sold to unwary buyers, costing both consumers and real businesses a great deal of money. Customers now find it more challenging to distinguish between real and counterfeit goods due to the growth of e-commerce and online marketplaces. Blockchain technology can be used to solve this problem by developing a reliable and secure system for product authentication. Businesses may guarantee that customers can buy genuine products with trust by utilizing the transparency and immutability of the blockchain. A visible and auditable trail of all product operations will be provided by this software system, which will log all supply chain transactions, product transfers, and ownership changes on the blockchain network. Customers will be able to scan the QR code to confirm its validity through the system, and only those with permission will be able to view and edit product data stored on the blockchain. All product data and transaction privacy and security will be guaranteed by the system, which complies with all applicable laws and regulations. The overall goal of this software solution is to reduce the issue of fake goods and rebuild consumer and company confidence.

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