Advances in Dynamical Systems and Applications.
ISSN 0973-5321, Volume 17, Number 1, (2022) pp. 107-113

https://www.ripublication.com/adsa.htm

The Use of NFT for Patent Protection

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Abstract

The process of patents registration makes them available for theft by industry rivals, since the patent details and designs are published publically. Blockchain technology is already used for protecting intellectual contributions and copyrights. The newly introduced Non Fungible Token (NFT) is a great method for protecting patents. Using NFTs organizations can prove their ownership of a patent and can help secure the patent details since only the patent hash is deposited in the Blockchain. This shall help protect the ownership of an invention or an innovation in any field. NFTs shall provide a verification tools that is publically available in the public Blockchain. We shall see a rapid change in patent laws with the emergence of mining of patents as NFTs. This research paper proposes developing a NFT Blockchain patent protection system. The system depends on generating a non-fungible token for each patent and depositing it in the Ethierum Blockchain after using a SHA-256 hash encryption for each patnet and depositing the hash in a Blockchain network with a digital time stamp. The Blockchain network shall be used to verify the existence of the patent in the future and linking it to its original owner and thereby preserving the organization's contribution.

Keywords: Non-Fungible Token, Intellectual property, Patents

Introduction

Blockchain is a virtual digital technology described as a digitized and a decentralized, public ledger of all transactions. It is growing constantly in the form of blocks residing on decentralized servers all over the internet or world wide web. Every transaction is recorded and in a chronological order [3]. Blockchain advantage is the ability to follow and keep track of all recorded transactions which is replicated across Blockchain

servers all over the net. Blockchain servers or nodes receive a copy of each transaction and is updated automatically.

Non-fungible tokens (NFT) are an emerging technology based on the Blockchain that is used today for exchange of artworks, images and digital media cards. NFTs can be used to represent digital objects and content, and intangible concepts like intellectual property and patents. Fungible tokens are divisible and interchangeable; like everything we deal with on a daily basis. Cryptocurrency is considered Fungible tokens, however NFTs are not divisible and is unique in the since that it is not replicable [3]. This fact is registered in the token meta-data stored in the Blockcahin and is considered unchangeable certificate of authenticity. That's why we consider it a valuable proof of ownership.

NFTs are described as distributed non updatable non divisible between human or software agents [11] NFTs has no organizational structure, it is based on the Blockchain infrastructure and management functions, systems and applications for industrial enterprises [2]. Blockchain is depicted as a hub, various design options and customization is based on Blockchain that follow the design philosophy of distributed systems.

This paper proposes using the NFT technology for protecting patents. a system designed to provides confidentiality and trust in the data collection and reporting throughout the registration process [10].

LITERATURE REVIEW

This literature review provides background information about the use of NFTs as a technology used in the protection of intellectual contribution.

NFT and Blockchain Research

NFT was created to store artwork and digital objects. NFT concept can be expanded into a much larger framework for the implementation of a patent protection system [5]. Each patent can be depicted as a single state machine that can transition between states via cryptographically-secured transactions.

NFTs are traceable digital tokens of which the ownership is registered in the Blockchain. This concept prevents forgery and fraud. The following characteristics make NFT the right tool for patent protection [8]. NFT protect digital assets from forgery or fake identification. NFT makes digital assets very difficult to be copied which makes its unique asset that preserve its value by its original owner.

Since NFTs are based on the Blockchain it is by default transparent and open to everyone. However, the time stamp generated by the Blockchain preserve its ownership to the original owner. NFT time of issue, number of issuances, history of ownership and transaction data is available for everyone [7]. Therefore NFTs allows for the tokenization of its value and to trace its ownership.

The concept of a Blockchain is to be a distributed ledger open access ledger. It has a unique design so if data has been added to the Blockchain it is impossible to change NFTs [8]. Blockchain is a disruptive technology since it allows organizations to become transparent, democratic, decentralized, efficient, and secure. It has already affected many industries including the financial sector and the real estate sector [7]. It is expected for NFTs to effect the patent and intellectual contribution laws.

The Blockchain blocks are a sequential group of transactions that are linked together in a was that prevents any changes to the previous blocks [9]. Proof of Work as a consensus algorithm secure the blocks from tampering, and also share this information with all nodes participating in the system [12].

Blockchain nodes can query the state machines at any time and can get a result accepted by the entire network with high degree of certainty. Blockchain stores transactions across a network of connected computers all around the world, making them not just decentralized but also a distributed network that has no real owner [15]. It is a collective effort by volunteers, computers, and networks who run and maintain the network which makes it extremely difficult for anyone to disrupt or corrupt the network.

Computers making the network store all generated records and blocks submitted by others in a chronological chain. Cryptography is used by the Blockchain to ensure that records can't be hacked or faked or changed by any mean. Bitcoin is the Blockchain first application that opened up possibilities for the network to grow and prosper [13]. Bitcoins is a crypto currency that is generaly accepted among the users of Blockchain technology, and it can be exchanged in a digital manner with complete privacy [14].

Applications of Blockchain in intellectual property

Intellectual property move to the digital world resulted in mass breaching of the rights of non-material assets woners. That is due to the fact that there is an absence of available legal mans of transferring intellectual resources on the Internet [16].

Blockchain technology us for the ordinary person has been simplified for the maximum level [11]. An intellectual property is registered by the rights holder in the journal by including and hashing a digital image of the asset. Timestamping of digital media ensure the legitimacy of the statement about ownership of assets. Hashing of original documents is used for verification purposes.

Hashing is described as the coding of the exact content of the document, via a mathematical algorithm of data synchronization [17]. The end results of such process is called Hash, which is a line of 64 symbols, that serve as a unique identification of the document. Since the hash is small in size, it is easily inserted into any Blockchain transaction, making it a unique identifier for the transaction and the Blockchain becomes a register of approved digital objects.

Blockai platform allows the right holders of a document to control the transfer of intellectual property in the Internet and is governed by agreed terms by third parties

[11]. Once an object is registered is issued a digital certificate of authenticity, that allows third parties to identify the author of the object or any other right holder.

Proposed System

Blockchain technology is the optimal solution to protect the intellectual contributions of authors. It provides a reliable technology used for authentication and verification. We propose a NFT Patent Protection system. The system is secure and allows organizations and people to retain ownership over their own patents.

The system built on smart contract and Blockchain technology, provides a reliable means for depositing intellectual contributions in the Blockchain. The intellectual contribution is certified by depositing its generated SHA-256 hash in the hyperleder. To do that a new transaction is generated which encodes the generated hash through OP_RETURN ready script. The OP-RETURN opcode defines the transaction output as an approved un-spendable and allows for a specific amount of data to be inserted in the block chain records, and this is represented in our system as a document's hash, in addition to plus a marker that identifies our system transactions.

For every confirmed transaction, the deposited NFT is permanently certified and proven to exist in the Blockchain. This is why once the Blockchain confirms the transaction generated for the NFT, its existence is proven, permanently, with no trust required**.**

The process of confirming the document is existing in the Blockchain manually using the NFT timestamp, they need to perform the following steps:

- Finding the NFT's SHA-256 Hash.
- Searching for the Blockchain transaction that contains the OP_RETURN output with the NFT's hash prepended by our system marker bytes, which are 0x444f4350524f4f46.
- Use online services like to find OP_RETURN transactions with ease.
- Once the transaction in located in the Blockchain that is a proof that the document existed at the time the transaction was added to the block.

Generating a unique hash

The **hash** is a unique string of characters that is generated from the NFT itself using a crypto algorithm called SHA256. This functionality is widely use in the world of computer to assert that a certain file is what is pretend to be. The generated hash for the same digital object will *always* be the same. In the following example, we use two different hash generating applications (shasum and openssl) to calculate the hash of the same oject *"nft.png"*. As you can see, results are identical.

$ echo -n " *nft.png* " | shasum -a 256

549ed26c0ac7e5b4a42b32c1e698d31e64d44be82f631b76d9e700e04f56b1fe

$ echo -n " Blockchain research for patent protection " | openssl dgst -sha256

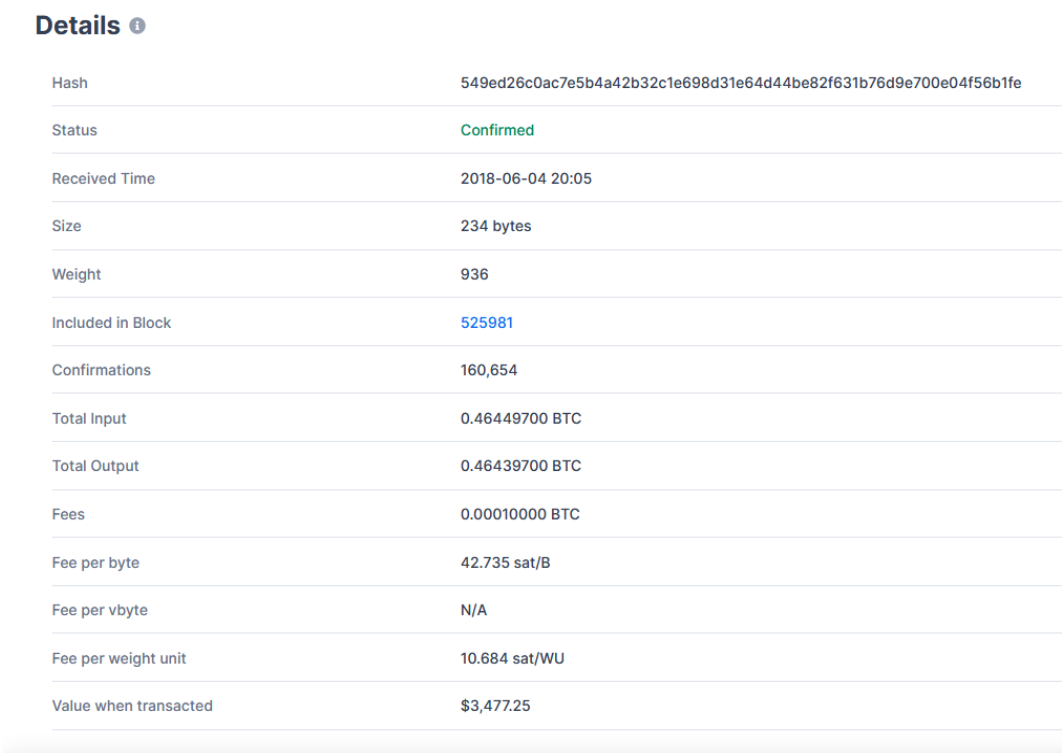
549ed26c0ac7e5b4a42b32c1e698d31e64d44be82f631b76d9e700e04f56b1fe

The Proof of Existence server shall calculate the hash automatically. Once the hash is calculated, the transaction is deposited in the Blockchain and is confirmed by 160,654 nodes on the Blockchain as shown in (Figure 1).

The hash uses the object itself to calculate the hash. Changing the name of the objet will not change the hash. By browsing the transaction, we can see that the OP_RETURN code contains our hash with a prefix.

OP_RETURN
00c73e1a637ff8046b5dc56cf508aec019b17df4d590e790c80bb495aeec0d4b

The transaction number is the official Proof of Existence. This shall serve as a proof of existence for the patent deposited and verified by thousands of nodes in the Blockchain.



Details

Hash	549ed26c0ac7e5b4a42b32c1e698d31e64d44be82f631b76d9e700e04f56b1fe
Status	Confirmed
Received Time	2018-06-04 20:05
Size	234 bytes
Weight	936
Included in Block	525981
Confirmations	160,654
Total Input	0.46449700 BTC
Total Output	0.46439700 BTC
Fees	0.00010000 BTC
Fee per byte	42.735 sat/B
Fee per vbyte	N/A
Fee per weight unit	10.684 sat/WU
Value when transacted	$3,477.25

Figure 1. NTF Transaction confirmation in the Blockchain

CONCLUSION

In this paper, we introduced a NFT technology system, that introduces a decentralized management, and unchallengeable audit trail, data attribution, sturdiness, readiness, security, and privacy proof of patent protection. There are many challenges to the

adoption of NFTs in patent protection, however, these challenges can be tackled through cautious application design and implementation. The protection of patents by depositing its hash-256 in the Blockchain proves to be a successful solution. Blockchain technology can be used to give access to patent ownership verification data to all people in all countries around the world, even to people that have no access to traditional verification systems. Blockchain distributed ledger technology is designed to protect and preserve patents in new novel approach, and many new applications are expected to emerge soon.

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