SYSTEMS AND METHODS FOR ONLINE AND OFFLINE SUPPLY LINE LOGISTICS FOR DIGITAL MINING AND TRANSACTIONS

TECHNICAL FIELD

[0001] Aspects of the present disclosure relate generally to the exchange of data (e.g., digital currency, inventory). In particular, the present disclosure relates to improved systems, devices, and methods used in supply line logistics, and, more particularly, for offline and online mining and transactions.

BACKGROUND

[0002] Money serves as a medium of exchange that is generally accepted as payment for goods and services and payment of debts. Any kind of object or secure, verifiable record fulfilling these functions can be considered money. Commodity money is money whose value comes from a commodity of which it is made. Examples of commodities that have been used as mediums of exchange include gold, silver, and copper. By contrast, fiat money is a currency without intrinsic value that is established as money, often by government regulation.

[0003] Cryptocurrency is a digital currency transferred between peers and confirmed in a public ledger. The public ledger is a chronologically ordered, time-stamped transaction ledger reflecting every transaction from its inception. Mining is the process by which transactions are verified and added to the public ledger (e.g., the block chain), and also the means through which new digital currency (e.g., coins) are released. The amount of new digital currency released with each mined block is called the block reward. Traditionally, the block reward is halved every set number of blocks. When a transaction is made, wallets use an encrypted electronic signature (an encrypted piece of data called a cryptographic signature) to provide a mathematical proof that the transaction is coming from the owner of the wallet. The transaction gets submitted to a public ledger and awaits confirmation. The confirmation process takes a bit of time (e.g., ten minutes for bitcoin) while "miners" mine.

[0004] The nature of cryptocurrency requires online connectivity between two digital wallets used to exchange authorized digital currency. The online connection provides near real-time authorization of transactions between digital wallets. Therefore, a digital wallet could accept digital payment from another digital wallet offline, but that transaction would lack authorization, resulting in the possibility of a double spend (i.e., the same digital currency being spent with more than one party). Presently, no process exists allowing users to exchange authorized digital currency without an online connection. Additionally, the digital exchange of value revolves almost exclusively around currency. The present disclosed technology primarily relates to a supply line involving an exchange of data over its own independent block.

BRIEF DESCRIPTION OF THE FIGURES

[0005] Reference will now be made to the accompanying figures, which are not necessarily drawn to scale, and wherein:

[0006] FIG. 1 is an example chart of illustrating the ByteBlock protocol for an online and offline exchange.

[0007] FIG. 2 is an example flow chart for the exchange of digital currency over the ByteBlock protocol.

[0008] FIG. 3 is an example flow chart for documenting inventory and adding the information to a ByteChain.

DETAILED DESCRIPTION

[0009] The present disclosure can be understood more readily by reference to the following detailed description of exemplary embodiments and the examples included herein. Before the exemplary embodiments of the devices and methods according to the present disclosure are disclosed and described, it is to be understood that embodiments are not limited to those described within this disclosure. Numerous modifications and variations therein will be apparent to those skilled in the art and remain within the scope of the disclosure. It is also to be understood that the terminology used herein is for the purpose of describing specific embodiments only and is not intended to be limiting. Some embodiments of the disclosed technology will be described more fully hereinafter with reference to the accompanying drawings. This disclosed technology may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth therein.

[0010] In the following description, numerous specific details are set forth. But it is to be understood that embodiments of the disclosed technology may be practiced without these specific details. In other instances, well-known methods, structures, and techniques have not been shown in detail in order not to obscure an understanding of this description. References to “one embodiment,” “an embodiment,” “example embodiment,” “some embodiments,” “certain embodiments,” “various embodiments,” etc., indicate that the embodiment(s) of the disclosed technology so described may include a particular feature, structure, or characteristic, but not every embodiment necessarily includes the particular feature, structure, or characteristic. Further, repeated use of the phrase “in one embodiment” does not necessarily refer to the same embodiment, although it may.

[0011] Unless otherwise noted, the terms used herein are to be understood according to conventional usage by those of ordinary skill in the relevant art. In addition to any definitions of terms provided below, it is to be understood that as used in the specification and in the claims, “a” or “an” can mean one or more, depending upon the context in which it is used. Throughout the specification and the claims, the following terms take at least the meanings explicitly associated herein, unless the context clearly dictates otherwise. The term “or” is intended to mean an inclusive “or.” Further, the terms “a,” “an,” and “the” are intended to mean one or more unless specified otherwise or clear from the context to be directed to a singular form.

[0012] Unless otherwise specified, the use of the ordinal adjectives “first,” “second,” “third,” etc., to describe a common object, merely indicate that different instances of like objects are being referred to, and are not intended to imply that the objects so described must be in a given sequence, either temporally, spatially, in ranking, or in any other manner.

[0013] Also, in describing the exemplary embodiments, terminology will be resorted to for the sake of clarity. It is intended that each term contemplates its broadest meaning as understood by those skilled in the art and includes all technical equivalents that operate in a similar manner to accomplish a similar purpose.

[0014] To facilitate an understanding of the principles and features of the embodiments of the present disclosure, exemplary embodiments are explained hereinafter with reference to their implementation in an illustrative embodiment. Such illustrative embodiments are not, however, intended to be limiting.

[0015] The materials described hereinafter as making up the various elements of the embodiments of the present disclosure are intended to be illustrative and not restrictive. Many suitable materials that would perform the same or a similar function as the materials described herein are intended to be embraced within the scope of the example embodiments. Such other materials not described herein can include, but are not limited to, materials that are developed after the time of the development of the disclosed technology, for example.

[0016] Embodiments of the disclosed technology include devices, systems, and methods for exchanging digital currency. In various embodiments, the systems, methods, or devices may provide improvements to the exchange of digital currency, as well as features that allow a user to more easily exchange digital currency, particularly when the user does not have an Internet connection. The devices and methods according to the present disclosure may be used by governments, companies, banks, individuals, and more to exchange digital currency.

[0017] Throughout this disclosure, certain embodiments are described in exemplary fashion in relation to exchanging digital currency. But embodiments of the disclosed technology are not so limited. In some embodiments, the disclosed technique may be effective in exchanging other digital contents.

[0018] This disclosure describes a protocol wherein methods, devices, and systems relating to a supply line capable of exchanging digital currency and other data while connected to a network (online) and unconnected from a network (offline). The devices, systems, and methods may allow for online and offline currency mining, add currency and/or data to a chain of transactions, provide proof of identity of the devices involved in the transfer of digital currency, prevent double spending, and allow online wallet-to-wallet transactions.

[0019] In aspects of the disclosed technology, the coin used in the exchange of digital currency is a CryptoByte (CBT). While CBT is the coin referenced throughout, other coins understood by those in the art may be suitable for use with the disclosed methods. Additionally, the offline and online protocol facilitating the transfer of data (e.g., digital currency, inventory) across various hardware devices, including the CryptoFuse, is referred to throughout as the ByteBlock protocol. The process of verifying a transaction is called MicroMining according to embodiments of the present disclosure. Throughout, verified transactions are referred to as ByteBlocks, and a chain of transactions (i.e., ByteBlocks) is known as a ByteChain. Although the disclosure refers to ByteChain throughout, the systems, methods, and devices disclosed herein are compatible with other digital ledgers in general including, for instance a blockchain. Embodiments of the disclosed technology are suitable for use with hardware devices of a CryptoFuse Kit including, but not limited to, one or more ShortFuse devices, one or more QuickFuse devices, one or more Fuse devices, one or more terminals, one or more USB drives, and one or more SD cards. The terminology used throughout is not meant to be limiting, and as will be appreciated, the methods disclosed herein may be used on other devices not belonging to the CryptoFuse Kit. As will be further appreciated, the methods disclosed herein may involve various software applications. Although various software applications are disclosed, other software applications not disclosed may be used to accomplish the methods disclosed herein.

[0020] In an example scenario, two users may exchange digital currency using the devices, systems, and methods disclosed herein. More specifically, in an example scenario, each user has a ShortFuse device loaded with digital currency. The users, who lack connection to an online network, plug their devices in together and select an option allowing the transfer of digital currency. The application on the ShortFuse device verifies the transaction, updates each local device to reflect a new balance, and micro-mines the currency to an offline version of the ByteChain over the ByteBlock protocol. Later, one or both of the users plugs the ShortFuse device into an online terminal. The terminal adds the ByteBlocks to an online version of the ByteChain and updates the devices.

[0021] In another scenario, two users exchange digital currency while online. Both users have a ShortFuse device connected to an online network. When the users connect their devices and transfer digital currency from one device to the other, it is done within ByteBase, an online exchange. If the digital currency exchanged is CryptoBytes, the protocol involved is the ByteBlock protocol and the transaction occurs within a CBT Wallet that is a part of ByteBase. The application on the ShortFuse device the transfer of CryptoBytes, updates each local device to reflect a new balance, and micro-mines the currency into a ByteBlock that is added to the ByteChain. But if the transaction involves a different digital currency, an open protocol different from the ByteBlock protocol is involved (e.g., BitCoin, Ethereum, NEM, Litecoin, Ripple, and the like) and the transaction only occurs within the ByteBase exchange. The application on the ShortFuse device verifies the transaction, updates each local device to reflect a new balance, and micro-mines the currency to a blockchain.

[0022] The following example scenario involves an exchange of inventory, files, and/or data. For example, a business owner may sell inventory located in an area without a stable internet connection. The owner can catalog the inventory by using a ShortFuse device that reads a bar code for each item of inventory. The ShortFuse device adds the scanned inventory to an offline

ByteChain. When the business owner has internet access, he can add each item to an online ByteChain by inserting the ShortFuse device into a terminal. To measure changes in inventory, the online ByteChain can later be compared against a newly collected offline ByteChain.

[0023] Turning to FIG. 1, which is an example overview of a ByteBlock protocol for an online and offline exchange of digital currency, in accordance with an embodiment of the present disclosure. In some embodiments, digital currency exchange occurs over the ByteBlock protocol. The ByteBlock protocol can involve both online and offline exchanges of digital currency, as explained in the example scenarios above. For example, and as shown in FIG. 1, an offline exchange of digital currency (CBT) can occur over the ByteBlock protocol and between two ShortFuse devices. As mentioned above, two users may begin a transaction by connecting their ShortFuse devices. Once connected, the ShortFuse devices display options allowing one device to transfer digital currency to the other device. The ShortFuse devices can also verify the transaction. For each transaction occurring offline, a fee can be taken. For example, a fee can be taken from each user (i.e., from each ShortFuse device), but the fee also can be taken from one of the devices depending on the scenario. While offline, each local device may act as a micro-mining device, adding an indication of the verified transaction (e.g., ByteBlock) to the offline ByteChain. According to some embodiments, the process of micro-mining occurs through a webapp/wallet of a local device (e.g., ShortFuse device). To incentivize users to go online, a refund of the fee taken while offline is issued after the local device is inserted into a terminal (e.g., the CryptoFuse shown in FIG. 1) and the transaction is verified. At this point, the terminal begins the process of online mining. After the terminal verifies the transaction, the online ledger may be updated. For example, and as shown in FIG. 1, when the CryptoFuse is online, it may operate as a mining rig, performing online mining that opens the ByteBlock chain and adds the CryptoBytes exchanged offline to the online ledger. For online connectivity, the CryptoFuse may use ethernet, Wi-Fi, Bluetooth, 2x USB, and the like.

[0024] According to some embodiments, ByteBase is the online exchange for digital currency, and also where the CBT Wallet resides. The ByteBlock protocol is a closed protocol and the transactions occurring in ByteBase use the ByteBlock protocol as well as other open protocols including, but not limited to BitCoin, Ethereum, NEM, Litecoin, and Ripple. In contrast, in certain embodiments, the CBT Wallet only uses the ByteBlock protocol. Therefore, the exchange of digital currency within the CBT Wallet exclusively involves CBT coins.

[0025] In another embodiment, and as shown in FIG. 1, the local device may be a QuickFuse device. The exchange of digital currency between QuickFuse devices involves the same or similar steps as disclosed with the ShortFuse device. Additionally, a digital transfer of currency between QuickFuse devices may involve a ByteDrop method in which the QuickFuse pulls power from the smartphone only when it is in offline use. As will be appreciated, this process allows extreme privacy similar to, for example, an AirDrop concept. In some embodiments, a ByteDrop method can perform frequency hopping, wherein the frequency rapidly changes in combination with the QuickFuse user attempting to transact. In some embodiments, the QuickFuse device can use its own sensors to change frequencies in a pre-determined order within all QuickFuse devices.

[0026] FIG. 2 is an example flow chart for the exchange of digital currency over the ByteBlock protocol, in accordance with example embodiments. As shown, in some embodiments, a portable device may be inserted into a local device, wherein an offline exchange 202 of digital currency occurs over the ByteBlock protocol. The portable device can micro-mine 204 the CryptoBytes and a fee is assessed 206 to each local device. As shown, the portable device may be inserted 208 into an online device such as a terminal or a computing device. Then the online terminal or computing device may perform online mining 210 over the ByteBlock protocol. Further, the fee assessed at 206 may be refunded 212. After successful verification of the transaction, the portable device (wallet) may be updated 214 over the ByteBlock protocol. Finally, the updated wallet may exchange 216 digital currency through ByteBase over other open protocols including, but not limited to, BitCoin, NEM, Ethereum, Litecoin, and Ripple.

[0027] FIG. 3 is an example flow chart for documenting inventory and adding information to a ByteChain, in accordance with example embodiments. As shown in FIG. 3, the terminal or computing device can scan 302 the files, inventory, and/or data while the terminal or computing device is online. As will be understood, the associated files, inventory, and/or data can have an associated QR code (Quick Response code, e.g., a barcode). The scanned files, inventory, and/or data may then be added 304 to the ByteChain. Further, a local device can scan 306 at least a portion of the files, inventory, and/or data. The scanned files, inventory, and/or data can be added 308 to a portable device inserted into the local device. The ByteChain can then be updated 310 in offline mode. Subsequently, a local device can be inserted 312 into an online terminal, which allows the online terminal or computing device to mine 314 the local device. Finally, the ByteChain and the portable device (wallet) can be updated 316 by the online terminal.

[0028] While certain embodiments of the disclosed technology have been described in connection with what is presently considered to be the most practical embodiments, it is to be understood that the disclosed technology is not to be limited to the disclosed embodiments, but on the contrary, is intended to cover various modifications and equivalent arrangements included within the scope of the appended claims. Although specific terms are employed herein, they are used in a generic and descriptive sense only and not for purposes of limitation.

[0029] This written description uses examples to disclose certain embodiments of the disclosed technology, including the best mode, and also to enable any person skilled in the art to practice certain embodiments of the disclosed technology, including making and using any devices or systems and performing any incorporated methods. The patentable scope of certain embodiments of the disclosed technology is defined in the claims, and may include other examples that occur to those skilled in the art. Such other examples are intended to be within the scope of the claims if they have structural elements that do not differ from the literal language of the claims, or if they include equivalent structural elements with insubstantial differences from the literal language of the claims.

Example Use Cases

[0030] The following example use cases describe examples of particular implementations of systems, devices, and methods used in supply line logistics, and, more particularly, for offline and online mining and transactions. These are intended solely for explanatory purposes and not limitation. In one case, a buyer attempts to purchase a car from a private seller and the car title is transferred through a distributed ledger system (e.g., ByteChain), documenting the transaction. The car title information may be stored as a unique, identifiable, and encrypted piece of information that cannot be manipulated. After the buyer and the seller reach an agreement, both parties may connect their data storage devices (e.g., USB card) to a local device (e.g., ShortFuse device). This transaction creates three points of contact: a buyer, a seller, and the ShortFuse device. The car title will then be transferred to the buyer and the ShortFuse device records the transaction. At a later time, the ShortFuse connects to the internet and uploads the transaction to the ByteChain.

[0031] In another case, a rural clothing warehouse manually manages its inventory; a time-consuming process. For more efficiency and effectiveness, a ShortFuse device can track all the inventory through QR codes assigned to each item of inventory. At the end of each day, the inventory data can be uploaded using a stable internet connection. The inventory data will be saved to the ByteChain and all inventory management will be stored in the same place daily.

[0032] Another case may involve a person creating a will with his attorney. The will is stored as unique encrypted data incapable of being manipulated. After completion of the will, which is stored on portable devices of both the attorney and the client, the portable devices are connected to the ShortFuse device. Three points of contact are created: the client, the attorney, and the ShortFuse. The will continues in perpetuity on the digital ledger—available for all heirs to access.

[0033] In another scenario, an airline flight attendant offers in air products like a protein box including cheese, salami, and nuts. In air, connectivity issues occur often while the attendant runs credit card transactions. Instead, a ShortFuse can collect all payment transactions and customer credit card information. Upon landing, the collected data can be uploaded through a stable internet connection and the transactions will all save to the ByteChain.

[0034] The following case involves a prepaid cellular plan with a particular carrier. Cellular data can be stored in various amounts accessible from the ByteChain. A traveler may have no data plan in a foreign country. However, there is a local resident with a surplus of data available on his cellular plan. He does not intend to utilize this extra data, so he decides to make it available through the ByteChain. The information (access/rights to data) can then be transferred to the traveler. Essentially, this is a peer-to-peer market for cellular data. Consequently, the traveler can save money (instead of paying international fees) and the seller may receive a payment for his unused data.

[0035] In another case, two individuals plan to attend a sporting event. Ticketing information can be stored on a USB wallet. When a seller transfers the ticket to a buyer, the credentials can be verified and the transaction can be documented through the ByteChain. This process allows the buyer to purchase authentic tickets.

[0036] In this next case, a concertgoer must pay for parking. The parking lot attendant does not take credit cards and the concertgoer does not have cash. However, the attendant has a CryptoFuse reader. The ShortFuse can be used to pay for parking while the parking lot attendant uploads all of the transactions at the end of each day. Parking receipts are stored and saved on the digital ledger giving management the ability to review all of the transactions each day.

[0037] The following scenario involves a citizen in a communist country where voting rights have been granted to all citizens. At the voting booths, cameras watch each point (frontward facing camera, over the shoulder, etc.). Each vote can be time-stamped and a picture can be taken so whomever is on the other side of the camera can see exactly who the voter is for based on the timestamp and camera footage. There is a new voting booth enabled to perform ShortFuse voting. The booth has a CryptoFuse terminal allowing voters to plug their ShortFuse into the terminal, make their selections, and give the voting staff the ability to upload each voter's data to the ByteChain at the end of every voting day. Consequently, ShortFuse may allow for encrypted voting and prevents any voter fraud.

[0038] In the following case, a small business owner and a merchant are on the streets of Thailand. The business depends on daily sales from tourists. Most tourists lack the nation's currency and do not accept credit cards. As a result, sales may be lost daily. However, a CryptoFuse terminal enables merchants to use ShortFuse to pay the business owner directly with their device. The transactions for each day may be uploaded to the ByteChain that acts as a digital ledger keeping record of all transactions.

[0039] Another case may involve a Navy Seal with a specific mission. This mission includes going covert, traveling overseas, and transferring Top Secret information to another Seal. The Navy Seal will be offline the entire mission. His co-seal has a ShortFuse and has been given orders to meet at a secret location at 0600 hours. They meet and transfer information over the ShortFuse device and leave. The mission is a success.

[0040] The following scenario involves an operations manager at Cedars Sinai's emergency department. The patient's records are the most important documents containing private information about each past and current patient. The system is somewhat outdated with older documents in hard copy form and newer documents in digital form, and not well organized. The department wants to create an online/offline system where patients' information can be stored, secured, and encrypted. Patients and staff are given their own ShortFuse devices. When staff needs a patient's information, they plug into the patient's ShortFuse and transfer the data. The patient's data is then stored on the ByteChain and secured for future use. This provides a timestamp of all patient records and patient information.

[0041] In another scenario, a startup team has a mission to change the way the world works. The startup has very important founder agreements requiring a time stamped, the ability to be saved indefinitely, and encrypted. The startup creates a private ByteChain to store this important data.

[0042] The following case involves an inmate at Pelican Bay's maximum security unit in San Francisco. There has been a string of inmate escapes resulting in the Warden issuing a new protocol. Instead of a standard prison ID, inmates will be forced to carry around a ShortFuse. Anytime an inmate is released from his cell, he will have to plug into a guard's ShortFuse to create a timestamp of when he left his cell. This process will deter future escapes by keeping record of all offline movement.

[0043] The next case involves a Unity developer working on an augmented reality app. The developer wants to enable offline and online augmented reality use cases that are updated onto the ByteBlock protocol through the use of the ARFuse plug-in. Inventory and data can be stored offline via the ShortFuse. Connecting the QuickFuse with the ShortFuse into the bottom of the mobile phone enables users to have augmented reality experiences from an app without an internet connection. Inventory allows Smart contracts to be shared and crypto to be collected in location based AR while offline as long as the QuickFuse and ShortFuse are plugged into the bottom of the phone. The ShortFuse is the Inventory AC.

[0044] The next scenario involves a DOE or DOD worker needing to transfer ownership of classified information to another individual he has not met. With the ShortFuse, he is able to both verify the other person's identity and safely transfer the classified information without the need to compromise security by going online.

[0045] In a scenario involving international travel, the travel is difficult enough without having to worry about identification. With ShortFuse, the potential of fake documents is lessened.

[0046] In this case, an indie developer is trying to protect his IP from larger companies. He adds a hash of his ideas to the ByteBlock and is able to later easily prove he was first to create the IP.

[0047] In the following case, a marijuana dispensary has an hourly employee who picks up and delivers products. Sometimes packages go missing or customers fail to get the full amount they paid. Also, there has been a string of robberies lately. The dispensary uses a ShortFuse to add into a lockbox to create a locked and secure box that cannot be opened until the client sticks his ShortFuse into the female port of the lockbox. Their transactions are secure and they receive the package as intended. By pickup and drop off packages being time stamped onto the block, this ensures all packages are accounted for.

CLAIMS

What is claimed is:

1. An apparatus as shown and described herein.

2. The apparatus of Claim 1, including each and every novel feature or combination of features shown and described herein.

3. A method as shown and described herein.

4. The method of Claim 3, including each and every novel feature or combination of features shown and described herein.

5. A device as shown and described herein.

6. The device of Claim 5, including each and every novel feature or combination of features shown and described herein.

100

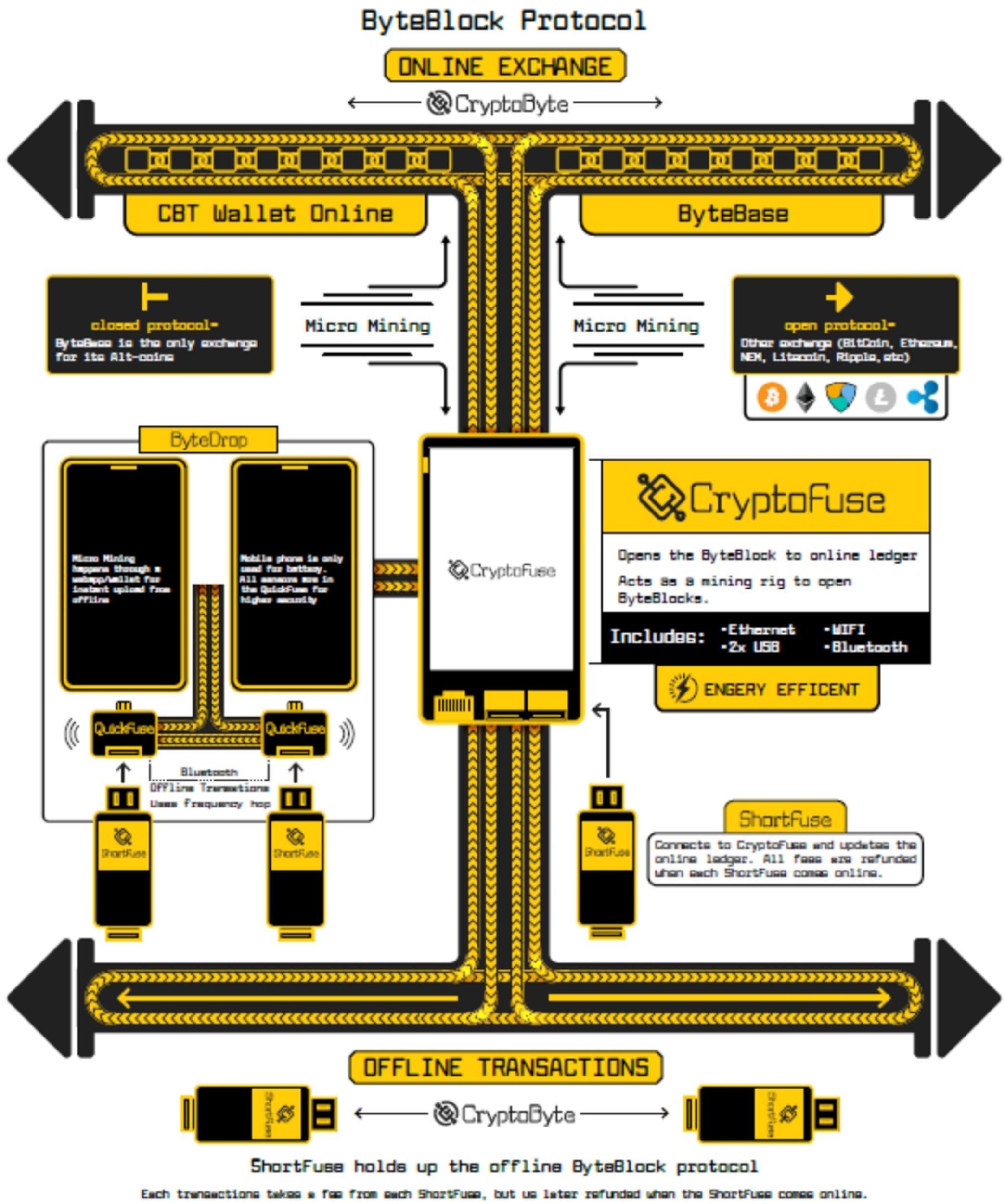
ByteBlock Protocol
ONLINE EXCHANGE
CryptoByte
CBT Wallet Online
ByteBase
closed protocol-
ByteBase is the only exchange for its Alt-coins
Micro Mining
Micro Mining
open protocol-
Other exchange (BitCoin, Ethereum, NEM, Litecoin, Ripple, etc)
ByteDrop
Micro Mining happens through a webapp/wallet for instant upload from offline
Mobile phone is only used for battery. All sensors are in the QuickFuse for higher security
QuickFuse
QuickFuse
Bluetooth
Offline Transactions
Uses frequency hop
ShortFuse
CryptoFuse
CryptoFuse
Opens the ByteBlock to online ledger
Acts as a mining rig to open ByteBlocks.
Includes: •Ethernet •2x USB •WIFI •Bluetooth
ENGERY EFFICENT
ShortFuse
Connects to CryptoFuse and updates the online ledger. All fees are refunded when each ShortFuse comes online.
OFFLINE TRANSACTIONS
CryptoByte
ShortFuse holds up the offline ByteBlock protocol
Each transactions takes a fee from each ShortFuse, but us later refunded when the ShortFuse comes online.

FIG. 1

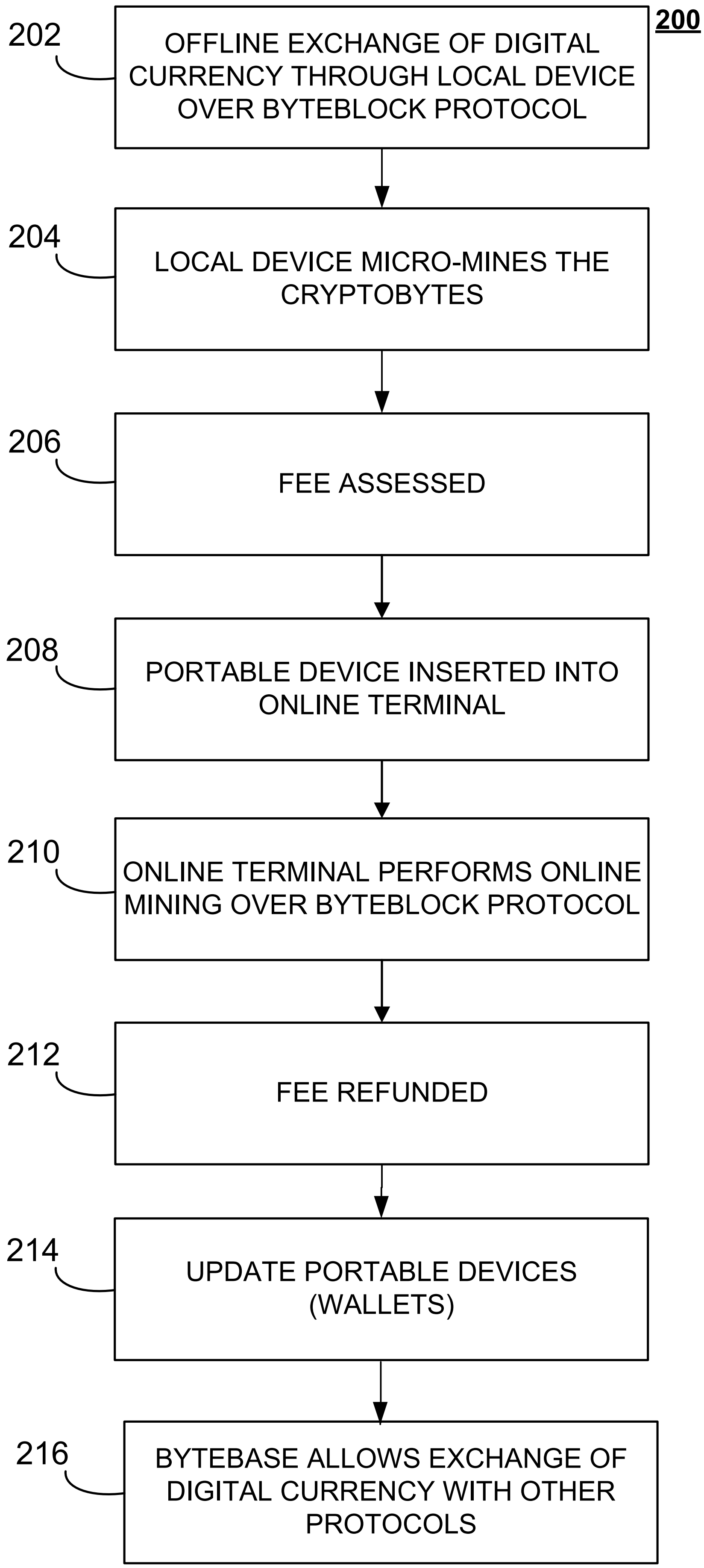
200
202
OFFLINE EXCHANGE OF DIGITAL CURRENCY THROUGH LOCAL DEVICE OVER BYTEBLOCK PROTOCOL
204
LOCAL DEVICE MICRO-MINES THE CRYPTOBYTES
206
FEE ASSESSED
208
PORTABLE DEVICE INSERTED INTO ONLINE TERMINAL
210
ONLINE TERMINAL PERFORMS ONLINE MINING OVER BYTEBLOCK PROTOCOL
212
FEE REFUNDED
214
UPDATE PORTABLE DEVICES (WALLETS)
216
BYTEBASE ALLOWS EXCHANGE OF DIGITAL CURRENCY WITH OTHER PROTOCOLS

FIG. 2

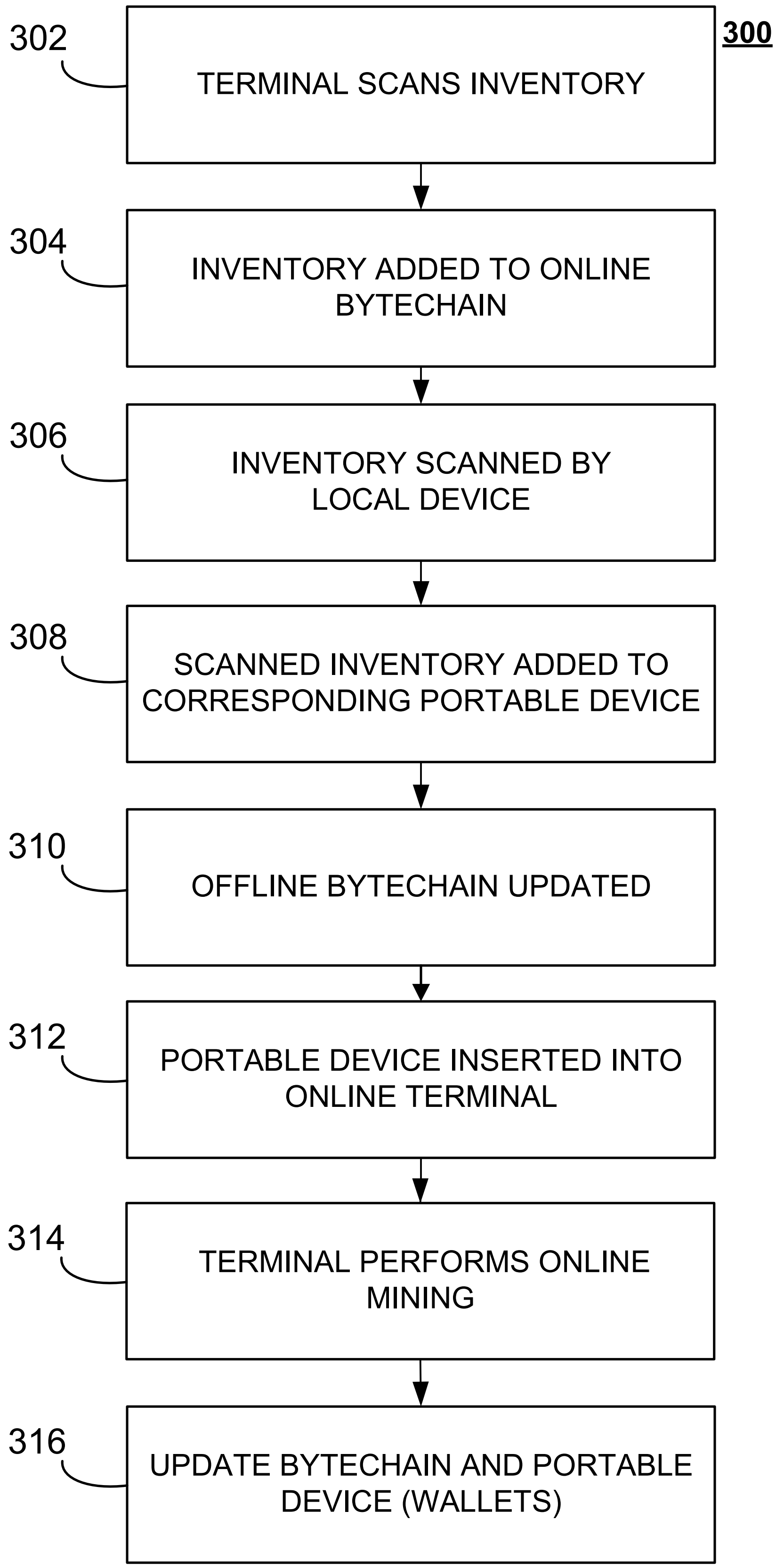
300
302
TERMINAL SCANS INVENTORY
304
INVENTORY ADDED TO ONLINE BYTECHAIN
306
INVENTORY SCANNED BY LOCAL DEVICE
308
SCANNED INVENTORY ADDED TO CORRESPONDING PORTABLE DEVICE
310
OFFLINE BYTECHAIN UPDATED
312
PORTABLE DEVICE INSERTED INTO ONLINE TERMINAL
314
TERMINAL PERFORMS ONLINE MINING
316
UPDATE BYTECHAIN AND PORTABLE DEVICE (WALLETS)

FIG. 3