SYSTEMS AND METHODS FOR ONLINE AND OFFLINE CRYPTOCURRENCY MINING AND TRANSACTIONS

TECHNICAL FIELD

[0001] Aspects of the present disclosure relate generally to the exchange of digital currency. In particular, the present disclosure relates to improved methods used in the exchange of digital currency and, more particularly, for offline exchange of cryptocurrency. Additional aspects of the disclosure relate to digital currency mining.

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 bitcoin 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 digital 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.

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 flow chart showing a method of offline micro-mining from the perspective of a local device, according to an example embodiment of the present disclosure.

[0007] FIG. 2 is an example flow chart showing a method of updating an online portable device's wallet from the perspective of a web browser, according to an example embodiment of the present disclosure.

[0008] FIG. 3 is an example flow chart showing a method of updating an online portable device's wallet from the perspective of a terminal, according to an example embodiment of the present disclosure.

[0009] FIG. 4 shows a process in which digital coins move within a digital marketplace while offline and online, according to an example embodiment of the present disclosure.

[0010] FIG. 5 illustrates a ByteDrop method in which a QuickFuse device exchanges digital currency through a network, according to an example embodiment of the present disclosure.

DETAILED DESCRIPTION

[0011] 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.

[0012] 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.

[0013] 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.

[0014] 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.

[0015] 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.

[0016] 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.

[0017] 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.

[0018] Embodiments of the disclosed technology include devices and methods for exchanging digital currency. In various embodiments, the 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.

[0019] 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.

[0020] This disclosure describes methods for exchanging digital currency that can occur both while connected to a network (online) and unconnected from a network (offline). The methods and features may include methods for mining currency online and offline, adding currency to a chain of transactions, providing proof of identity of the devices involved in the transfer of digital currency, double spending prevention, and online wallet-to-wallet transactions.

[0021] In certain implementations, the disclosed methods use a CryptoByte (CBT). But while CBT is the preferred coin, other coins and cryptocurrencies understood by those in the art may be suitable for use with the disclosed methods. In some embodiments, the process of verifying a transaction can be called MicroMining, and each verified transaction can be called a ByteBlock. Further, a chain of transactions (i.e., ByteBlocks) can be referred to as a BlockChain. In some embodiments, the methods are suitable for use with 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 as disclosed

in US Provisional Patent Application 62/630,522, filed 14 February 2018. 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.

[0022] In an example implementation, a max number of 33,333,333 coins will be minted and available for circulation. Coins can be distributed in units as small as 0.00000001 of a coin. In some embodiments, CryptoFuse devices can run a CryptoFuse operating system. For example, a computing device or a terminal may run a CryptoFuse operating system. But the examples provided are not intended to limit the devices capable of running the CryptoFuse operating system. In some embodiments, as a feature of the CryptoFuse operating system, a user screen displays and receives login information, balance information, account management information, and the like. According to some embodiments, when two portable devices (e.g., two USB readers) are connected to a local device (e.g., ShortFuse, QuickFuse, or Fuse), only one device can access or be associated with the user screen at a time.

[0023] In some embodiments, the portable devices of the CryptoFuse kit can be pre-loaded with a digital currency balance. As will be appreciated, these portable devices can range in memory size. For example, a portable device may have 32 or 64 megabytes of memory, or some other amount. According to some embodiments, the more memory a portable device has, the more offline transactions it can support because, for example, it can store information relating to those transactions until the device goes back online. In some implementations, when the portable device is offline and reaches a zero balance, the device must be micro-mined to an online wallet before it can be used in further transactions. Similarly, when the portable device reaches a low amount of memory while offline, the device must be micro-mined to an online wallet before being used to conduct further transactions. The process of micro-mining will be described in further detail below.

[0024] Referring now to the drawings, FIG. 1 is an example flow chart of a method of offline micro-mining from the perspective of a local device (e.g., ShortFuse, QuickFuse, or Fuse), in accordance with an example embodiment. In some embodiments, two portable devices that both include a wallet (e.g., USB cards) are inserted into local devices (e.g., ShortFuse, QuickFuse, or Fuse), thus facilitating the exchange of digital currency. According to some embodiments, each portable device is verified through a process in which the timestamp of certain files included in

the device is confirmed. The process of verifying the portable devices may be performed on the local devices (e.g., ShortFuse, QuickFuse, or Fuse). In some embodiments, one or more of the hardware identification, serial number, manufacturer identification, and/or size of the portable devices are used to verify a wallet and to prevent a double spend. According to some embodiments, the terminal(s) of the CryptoFuse kit and the local devices (e.g., ShortFuse, QuickFuse, or Fuse) ensure the portable devices have not been compromised.

[0025] After the portable devices comprising the wallets are verified, they are capable of exchanging digital currency. Accordingly, in some embodiments, the sender may begin the transaction by selecting an amount to send to the receiving device. The transaction can proceed when the receiver enters an approved or registered PIN. According to some embodiments, a PIN may be required by the sender after the recipient has entered the PIN to complete the transaction.

[0026] In some embodiments, the portable devices may include a software application (e.g., MircoMiner), that allows the portable device and the local device to determine whether the transaction is verified. For example, in some embodiments, the initially verified transactions are stored as ByteBlocks on each of the portable devices. According to some embodiments, the ByteBlocks may comprise a reward that is retrievable after a final validation process by an online device. In some embodiments, the local devices mine the ByteBlocks that are stored on the local devices and the portable devices.

[0027] After two portable devices conduct a transaction using a local device, the first portable device to go online (i.e., to connect to a network device) transfers the ByteBlock relating to the transaction and to be mined to the network device, and each device having related ByteBlocks that comes online after will be confirmed, and the related ByteBlocks will be merged with the existing ones. In some embodiments, only one reward is issued per transaction. As will be appreciated, to incentivize bringing the offline wallets back online quickly, an additional fee may be charged to each block and then refunded once the wallet is brought back online. In some embodiments, the fee for the sender originates from the sender's wallet and the fee from the recipient originates from the recipient's wallet, and those fees are returned to the respective wallets once the wallets are brought online.

[0028] FIG. 2 illustrates an example flow chart for a method of updating a wallet of an online portable device from the perspective of a web browser. According to some embodiments, after a transaction occurs offline, a user may log into the marketplace via a computing device connected

to the internet (i.e., a connected device or network device). The computing device may be, for example, a laptop computer, a personal computer, a smartphone, tablet or any other device capable of displaying a browser and receiving user input. In some embodiments, the user can plug the portable device comprising a wallet (e.g., USB card) into the computing device. Next, in some embodiments, the user may select an "import wallet" function from the browser displayed on the computing device. The browser can connect to the wallet of the portable device. According to some embodiments, the browser will verify the wallet based on one or more of an assigned hardware identification, a serial number, a manufacturer identification, and/or a size. According to some embodiments, the ByteBlock will be solved in a proof of stake manner. In some embodiments, the hash rates will be limited to 10h/s, though other hash rates can be used. After verifying the wallet, the browser can remove the various ByteBlock transactions from the wallet and upload the ByteBlock transactions to the ByteChain. The browser can then write a new ByteBlock with a new balance to the wallet of the portable device. Additionally, in some embodiments, the wallets used in this manner will be refunded immediately.

[0029] FIG. 3 is an example flow chart for a method of updating a wallet of an online portable device from the perspective of a terminal belonging to the CryptoFuse Kit. In some embodiments, a user can insert a wallet of the portable device into the terminal. Based on one or more of an assigned hardware identification, serial number, manufacturer identification, and/or size, the terminal can validate the portable device comprising the wallet. According to some embodiments, the terminal will solve the ByteBlock in a proof of stake manner and the hash rates will be limited to 10h/s (or other hash rate as appropriate). After verification, the terminal removes the ByteBlock transactions from the wallet and uploads the ByteBlock transactions to the ByteChain. The terminal will write a new Block with a new balance to the wallet of the portable device. Additionally, in some embodiments, the wallets used in this manner will be refunded immediately.

[0030] FIG. 4 shows a process in which digital coins move within a digital marketplace while offline and online. As discussed, and as shown in FIG. 4, the online marketplace can allow the for the exchange of CryptoBytes and ALT coins through the ByteChain and its ByteBlocks. Although other platforms may be used, it should be noted that GleoPoint is a preferred online marketplace for users. According to some embodiments, the CryptoBytes and ALT coins may move left and right through the online marketplace. The CryptoBytes and ALT coins also are able to follow a trunk down to the offline decentralized wallet and marketplace used by the CryptoFuse devices.

In some embodiments, the CryptoFuse devices move the CBT and ALT coins left and right while offline. When the transactions are ready to be processed online, the user can plug the portable device into an online terminal or computing device, and it can be micromined back up the trunk to its online state. In some embodiments, every transaction occurring on a Fuse (or similar local device) can be stored on a portable device regardless of whether the transactions are related to the user of the portable device. As will be appreciated, the more transactions stored on a portable device, the fewer transactions it can process going forward. Accordingly, the user will be motivated to connect the portable device to a network device to free up space for conducting further transactions.

[0031] FIG. 5 illustrates a method according to the present disclosure that can be referred to as a ByteDrop method. As shown, in a ByteDrop method, a QuickFuse device exchanges digital currency through a network with a smartphone device or the like. In some embodiments, the method disclosed uses a portable device, a QuickFuse device, and a smartphone. The QuickFuse device can plug into the smartphone. Also, the QuickFuse device has a component that allows it to receive and read a portable device (e.g., a USB port). Further, the QuickFuse has a WiFi and Bluetooth chip for network connectivity. The contents read by the QuickFuse device from the portable device can be displayed and accessed on the smartphone. Turning to the ByteDrop method, the QuickFuse can pull power from the smartphone as necessary when the QuickFuse is offline. As will be appreciated, this process allows extreme privacy similar to an AirDrop concept. In some embodiments, ByteDrop 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. According to some embodiments, the QuickFuse devices can receive regular updates involving new protocols. As will be appreciated, the updates can make the network more secure. As will be further appreciated, due to frequency-hopping spread spectrum (FHSS), interference is minimized and can only occur briefly. Thus, CryptoBytes can make it to their targets for retrieval.

[0032] 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.

[0033] 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.

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.

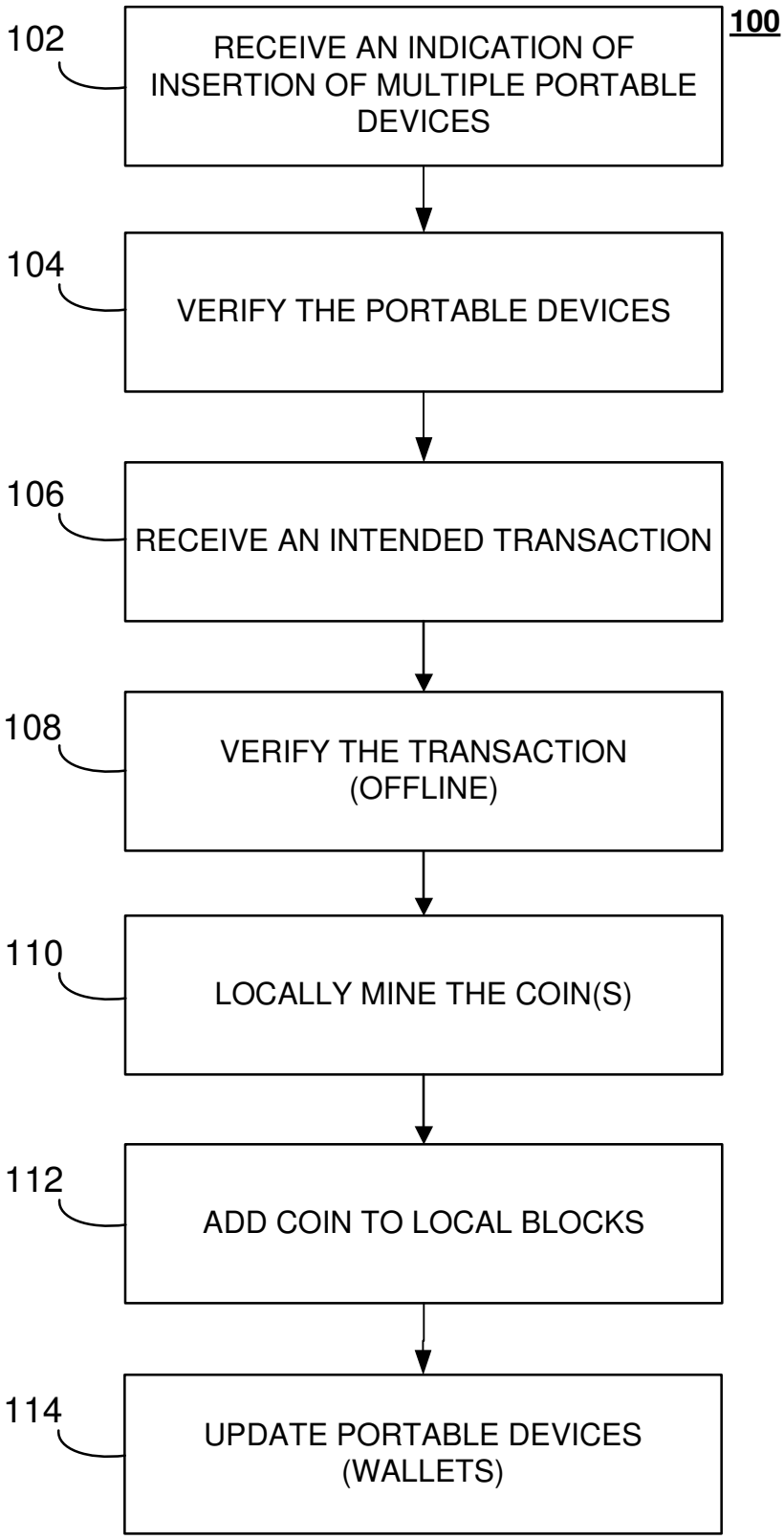
100
102
RECEIVE AN INDICATION OF INSERTION OF MULTIPLE PORTABLE DEVICES
104
VERIFY THE PORTABLE DEVICES
106
RECEIVE AN INTENDED TRANSACTION
108
VERIFY THE TRANSACTION (OFFLINE)
110
LOCALLY MINE THE COIN(S)
112
ADD COIN TO LOCAL BLOCKS
114
UPDATE PORTABLE DEVICES (WALLETS)

FIG. 1

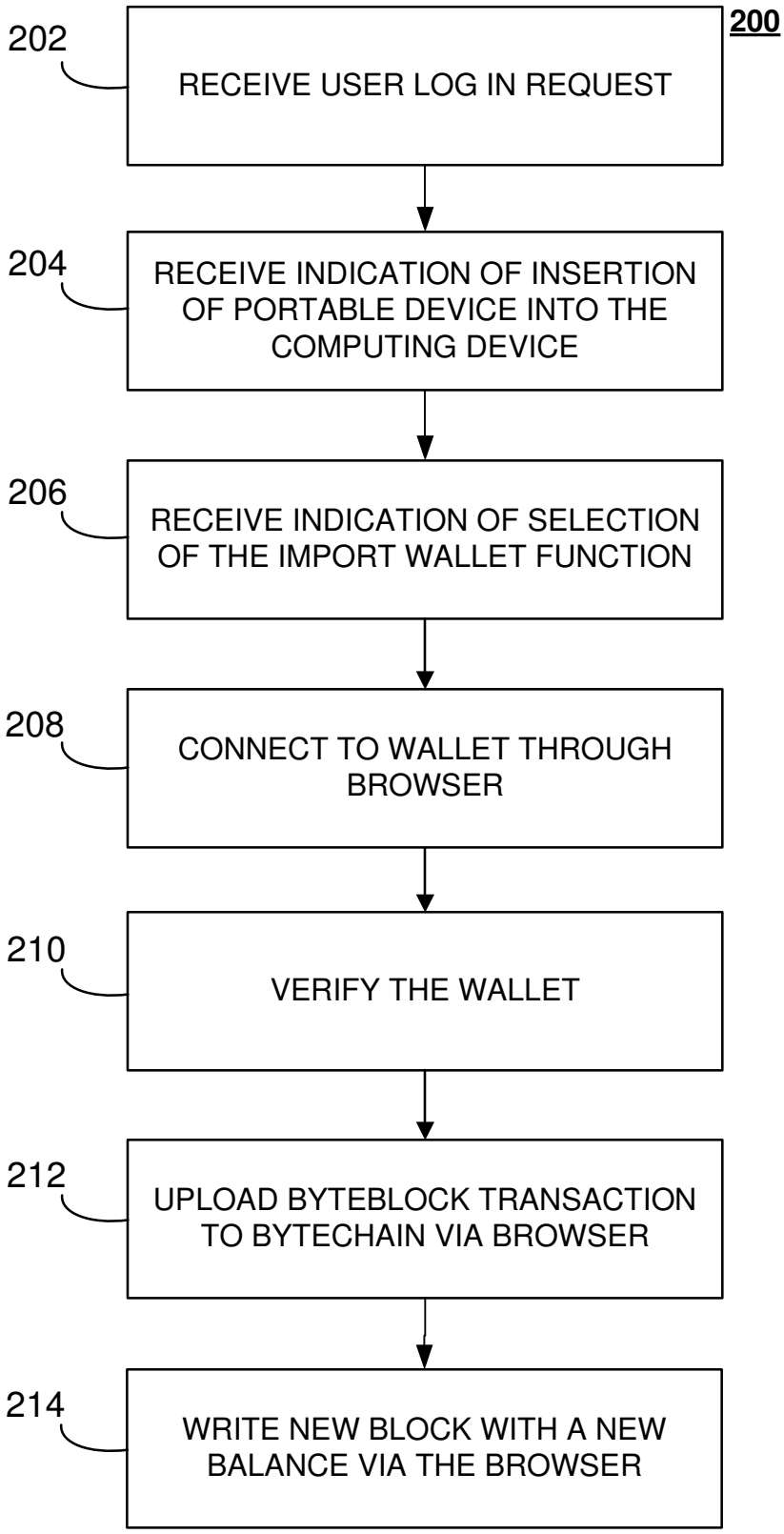
200
202
RECEIVE USER LOG IN REQUEST
204
RECEIVE INDICATION OF INSERTION OF PORTABLE DEVICE INTO THE COMPUTING DEVICE
206
RECEIVE INDICATION OF SELECTION OF THE IMPORT WALLET FUNCTION
208
CONNECT TO WALLET THROUGH BROWSER
210
VERIFY THE WALLET
212
UPLOAD BYTEBLOCK TRANSACTION TO BYTECHAIN VIA BROWSER
214
WRITE NEW BLOCK WITH A NEW BALANCE VIA THE BROWSER

FIG. 2

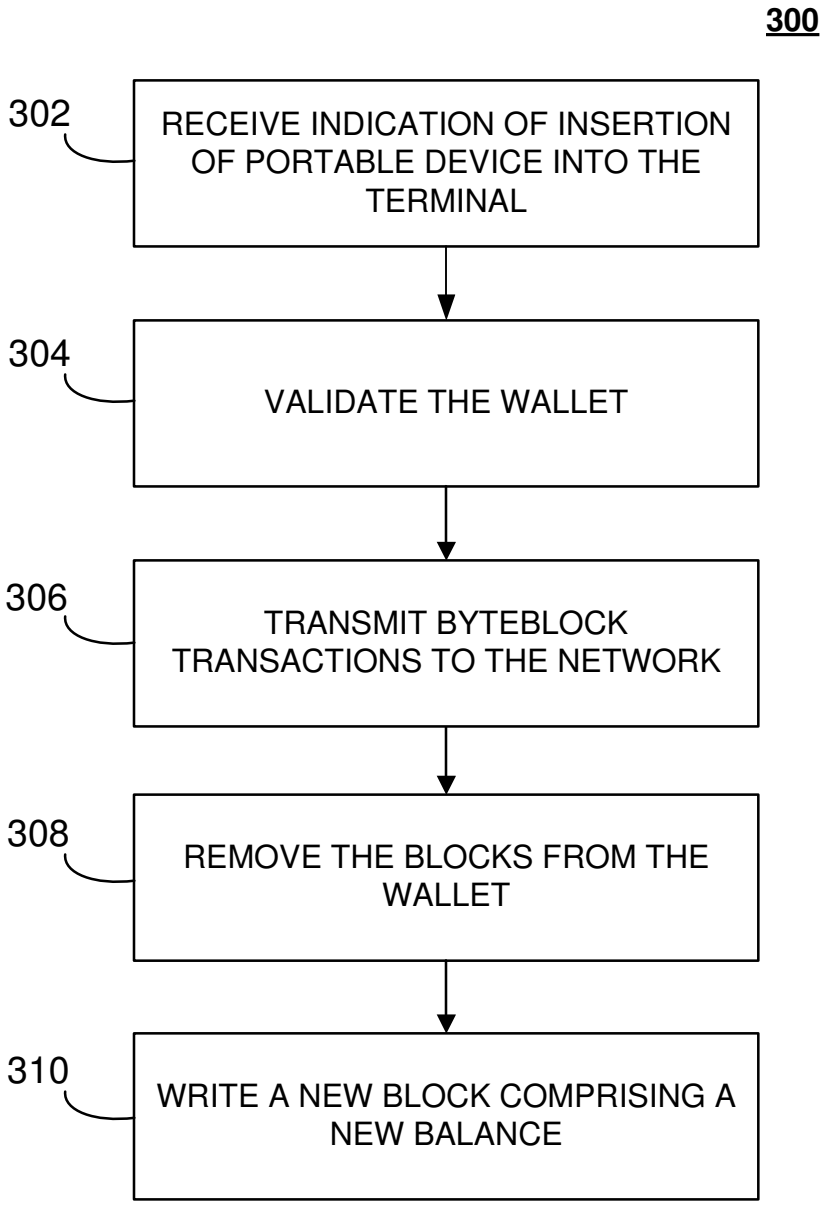
300
302
RECEIVE INDICATION OF INSERTION OF PORTABLE DEVICE INTO THE TERMINAL
304
VALIDATE THE WALLET
306
TRANSMIT BYTEBLOCK TRANSACTIONS TO THE NETWORK
308
REMOVE THE BLOCKS FROM THE WALLET
310
WRITE A NEW BLOCK COMPRISING A NEW BALANCE

FIG. 2

400

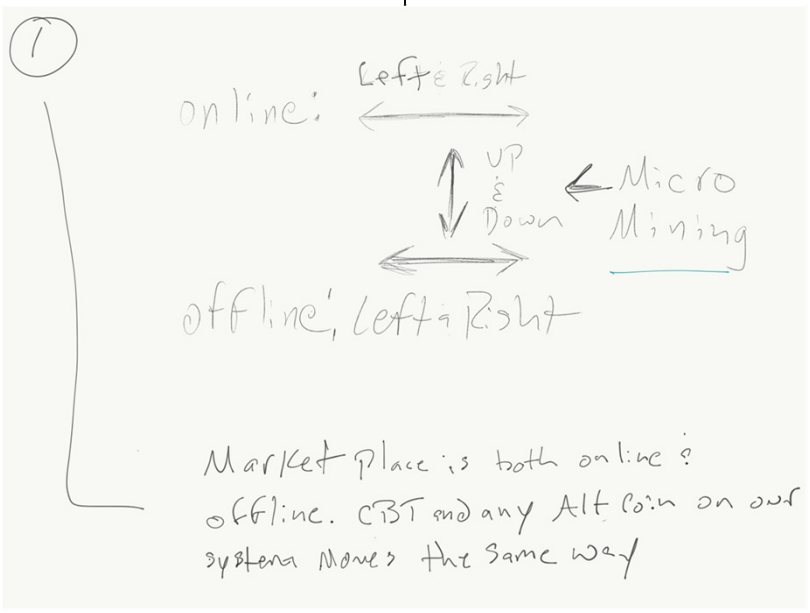
1
online: Left & Right
UP & Down
Micro Mining
offline, Left & Right
Marketplace is both online & offline. CBT and any Alt coin on our systems Moves the same way

FIG. 4

500

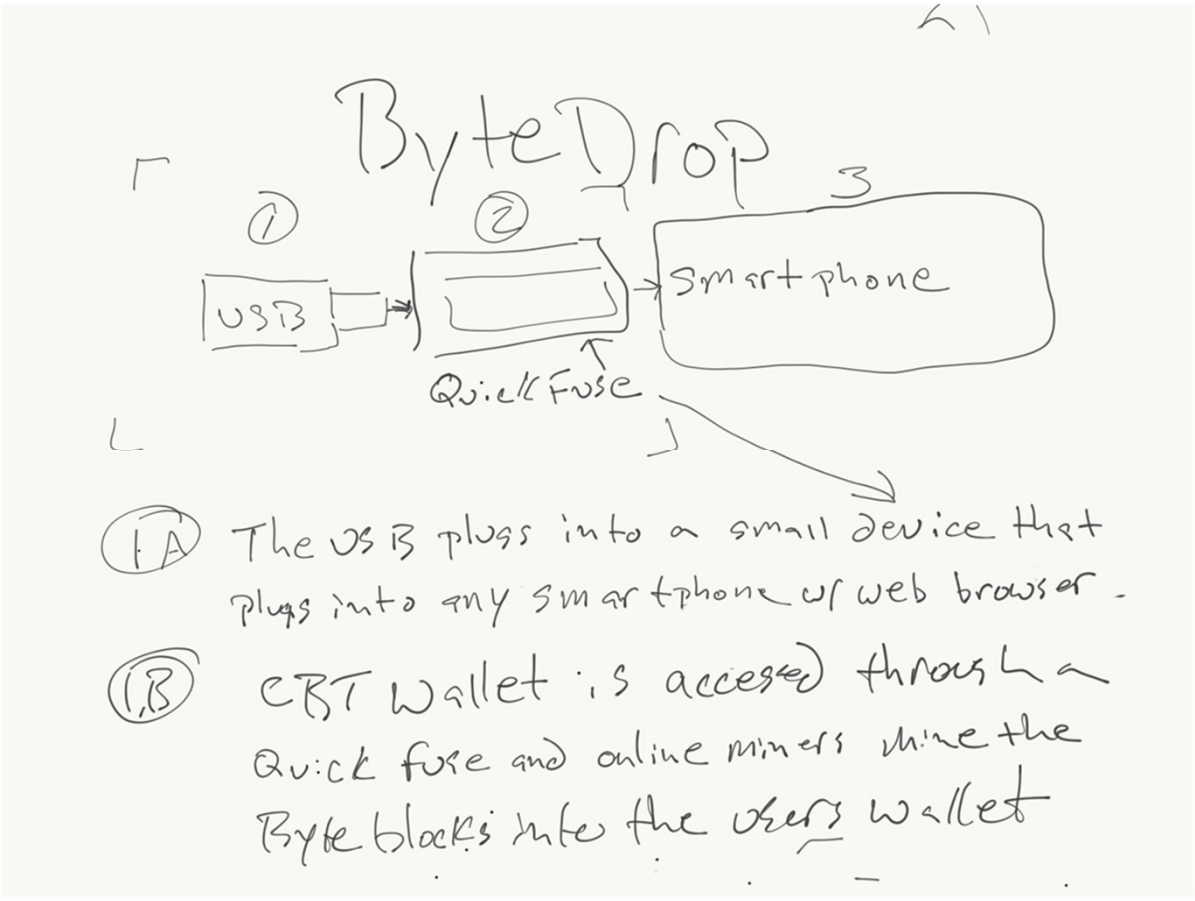
ByteDrop
1
2
3
USB
Smartphone
Quick Fuse
1A
The USB plugs into a small device that plugs into any smartphone or web browser.
1B
CRT Wallet is accessed through a Quick fuse and online miners mine the Byte blocks into the users wallet

FIG. 5