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Securing Automatic Package Delivery Through Building Call Box System

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SECURING AUTOMATIC PACKAGE DELIVERY THROUGH BUILDING CALL BOX SYSTEM

ABSTRACT

A user places an order for delivery in a building that uses a telephone-based call box system installed at the common door or gate to the building. When the order is placed, the user selects an option to authorize automatic delivery of the package and grants an e-commerce application authorization to temporarily intercept phone calls from the user's building call box system. The user computing device application communicates the authorization to the account management computing system, which stores the user's authorization and manages the delivery process. Upon receipt of a delivery update, an application on a delivery computing device transmits a notification to the account management computing system indicating the package is ready for delivery. The account management computing system transmits an intercept notice to the user computing device signaling the application on the user computing device to intercept all calls from the selected phone number for the specified duration of time, and a single-use audio request tone to the application on the user computing device.

The application on the delivery computing device displays a set of delivery instructions for the delivery person to follow to initiate the call box call, hold the delivery computing device up to the call box, and wait. The application on the user computing device intercepts the call made from the call box, resulting in a connection between the application on the user computing device and the application on the delivery computing device, using the existing call box calling system. Once connected, the user computing device transmits a notification of the intercepted call to the account management computing system. The account management computing system transmits instructions to the delivery computing device to play the single-use audio request tone. The application on the delivery computing device plays the single-use audio request tone and the application on the user computing device compares the played audio request tone to the audio request tone saved in the application cache. If the tones match, the request for entry is granted. The application on the user computing device plays a building authorization tone. The call box receives the authorization tone played by the application on the user computing device to the delivery computing device over the existing call box calling system. If the tone is valid, the call box authorizes entry into the building by unlocking the door or opening the gate.

SUGGESTED KEYWORDS

Package Delivery, Call Box, Secure Delivery, Buzzer Entry, Apartment Delivery

BACKGROUND

An increasing number of consumers are engaging in online commerce, resulting in an increasing number of packages being delivered to consumers' homes. However, many homes, such as apartment buildings and other urban dwellings, are equipped with a buzzer entry call box system. Such systems require a delivery person to make a call from a call box installed at a common door or gate. The call is routed to the consumer's phone, from which the consumer can press a pre-defined touch tone (for example, the number nine) to allow the delivery person access to homes beyond the door/gate. If the consumer misses the call, the delivery fails and must be rescheduled for a different day or time.

Other buzzer entry call box systems use universal offer codes that can be shared with a limited amount of individuals. These codes can be entered by the delivery person at the call box to permit entry. However, these systems are error prone and result in increased security risks for the reusable shared code.

Therefore, it is desirable to provide a secure method for automating the call process using the existing call box system installed at the common door or gate.

DETAILED DESCRIPTION

A secure system for automatic package delivery through a building call box system can be integrated into a mobile e-commerce application. The system works with the existing telephone-based call box system installed at the common door or gate to the building. The user places an order for delivery. When the order is placed, the user authorizes delivery of the package using the automated call box system. For example, the user places an order using a merchant e-commerce application installed on the user computing device. As part of the order process, the user selects an option to authorize automatic delivery of the package. The user grants the application authorization to temporarily intercept phone calls from the user's building call box system. The user may select limitations on the authorization by providing a phone number for the call box system and authorizing the application only to intercept calls from the entered phone number. The user can further restrict the authorization to only intercept calls during an expected time of delivery. The authorization restrictions may be saved as user preferences and automatically applied to future authorizations. Upon completion of the authorization process, the user computing device application

communicates the authorization to an account management computing system, which stores the user's authorization and manages the delivery process (for example, by coordinating between the user computing device application and a delivery computing device application).

The merchant processes the order and sends the packaged order out for delivery. A delivery person updates the delivery status of the package using an application on a delivery computing device. For example, the delivery person presses or selects an option in the application to indicate the package is at the user's residence. In another example, the application provides or prompts the delivery person with this information using a location based notification or via another program, applet, or application on the delivery computing device. Upon receipt of the delivery update, the delivery computing device application transmits a notification to the account management computing system indicating the package is at the user's residence and ready for delivery. The account management computing system receives the notification and retrieves the user's saved authorization preferences. Noting that the user authorized interception of calls from the call box, the system transmits an intercept notice to the user computing device. The intercept notice can be limited in time (for example, 30 seconds or 1 minute). The intercept notice signals the user computing device application to intercept all calls from the selected phone number for the specified duration of time. The account management computing system also creates a single-use audio request tone. The single-use audio request tone comprises a tone, audio recording, or series of tones/recordings that is communicated between the delivery computing device and the user computing device to request entry into the building. The audio request tone is a unique tone that securely authenticates the delivery computing device to the user computing device and signals the user computing device application to authorize entry into the building or complex. The account management computing system transmits the single-use audio request tone to the user computing device to be stored by the user computing device in the application cache. In another example, the account management computing system generates and transmits the single-use audio request tone to the user computing device as soon as the user places the order or initially authorizes delivery.

Additionally, upon receipt of the delivery update, the delivery computing device application displays a set of delivery instructions for the delivery person. For example, the application may display:

Automatic delivery selected,
Dial #104 on the call box,
Hold your phone to the call box speaker and wait,

Door will automatically open.

The delivery person follows the instructions displayed on the delivery computing device by initiating the call box call, holding the delivery computing device up to the call box speaker, and waiting. The user computing device application intercepts the call made from the call box. The call box call results in a connection between the user computing device application and the delivery computing device application, using the existing call box calling system. No action is required by the user or the delivery person while the applications communicate.

Once connected, the user computing device application transmits a notification of the intercepted call to the account management computing system either via an audio tone played into the open phone call, or via a separate communication over the internet. The account management computing system or the delivery computing device receives the notification and transmits instructions to the delivery computing device application to play the single-use audio request tone. The delivery computing device application receives the instructions and plays the single-use audio request tone. The single-use audio request tone is received by the user computing device application and compared to the audio request tone saved in the application cache. If the received single-use audio request tone does not match the saved single-use audio request tone, the user computing device application disconnects the authorization call or may cause the call to ring through to the user. However, if the two single-use audio request tones match, the request for entry is granted, and the user computing device application plays a building authorization tone. The building authorization tone is a universal touch tone that authorizes the door or gate to open (for example, 9#). The user may enter or provide the authorization tone during the set-up process.

The call box receives the authorization tone played by the user computing device to the delivery computing device application over the existing call box calling system. If the tone is valid, the call box authorizes entry into the building by unlocking the door or opening the gate. The call between the user computing device application and the delivery computing device application is terminated. The delivery person proceeds to the user's delivery address and delivers the package. The delivery person confirms delivery of the package by selecting a button or option within the delivery computing device application.

EXAMPLE SYSTEM ARCHITECTURES

Figure 1 is a block diagram depicting a system to secure automatic package delivery through a building call box system. As depicted in Figure 1, the system comprises network

computing devices that are configured to communicate with one another via one or more networks or via any suitable communication technology.

Each network comprises a wired or wireless telecommunication mechanism by which the network computing devices can communicate and exchange data. For example, each network can be implemented as, or may be a part of, a storage area network (SAN), personal area network (PAN), a metropolitan area network (MAN), a local area network (LAN), a wide area network (WAN), a wireless local area network (WLAN), a virtual private network (VPN), an intranet, an Internet, a mobile telephone network, a card network, Bluetooth, Bluetooth Low Energy (BLE), near field communication network (NFC), any form of standardized radio frequency, infrared, sound (for example, audible sounds, melodies, and ultrasound), other short range communication channel, or any combination thereof, or any other appropriate architecture or system that facilitates the communication of signals, data, and/or messages. Throughout this discussion, it should be understood that the terms "data" and "information" are used interchangeably herein to refer to text, images, audio, video, or any other form of information that can exist in a computer-based environment. The communication technology utilized by the devices may be alternative communication technology.

Each user computing device and delivery computing device may be a personal computer, mobile device (for example, notebook, computer, tablet computer, netbook computer, personal digital assistant (PDA), video game device, GPS locator device, cellular telephone, Smartphone or other mobile device), television, wearable computing devices (for example, watches, rings, or glasses), or other appropriate technology that includes or is coupled to a web server, or other suitable application for performing a payment transaction. The user can use the user computing device to place an order and authorize automatic package delivery via an application. The package deliverer can user the delivery computing device to receive delivery instructions and communicate with an account management computing system to securely deliver the package. Each application is a program, function, routine, applet or similar entity that exists on and performs its operations on the user computing device. For example, the application may be a shopping application, merchant system application, an Internet browser, a digital wallet application, or other suitable application operating on the user computing device and/or delivery computing device. The user may install the application and/or make a feature selection on the user computing device to authorize or perform the techniques described herein.

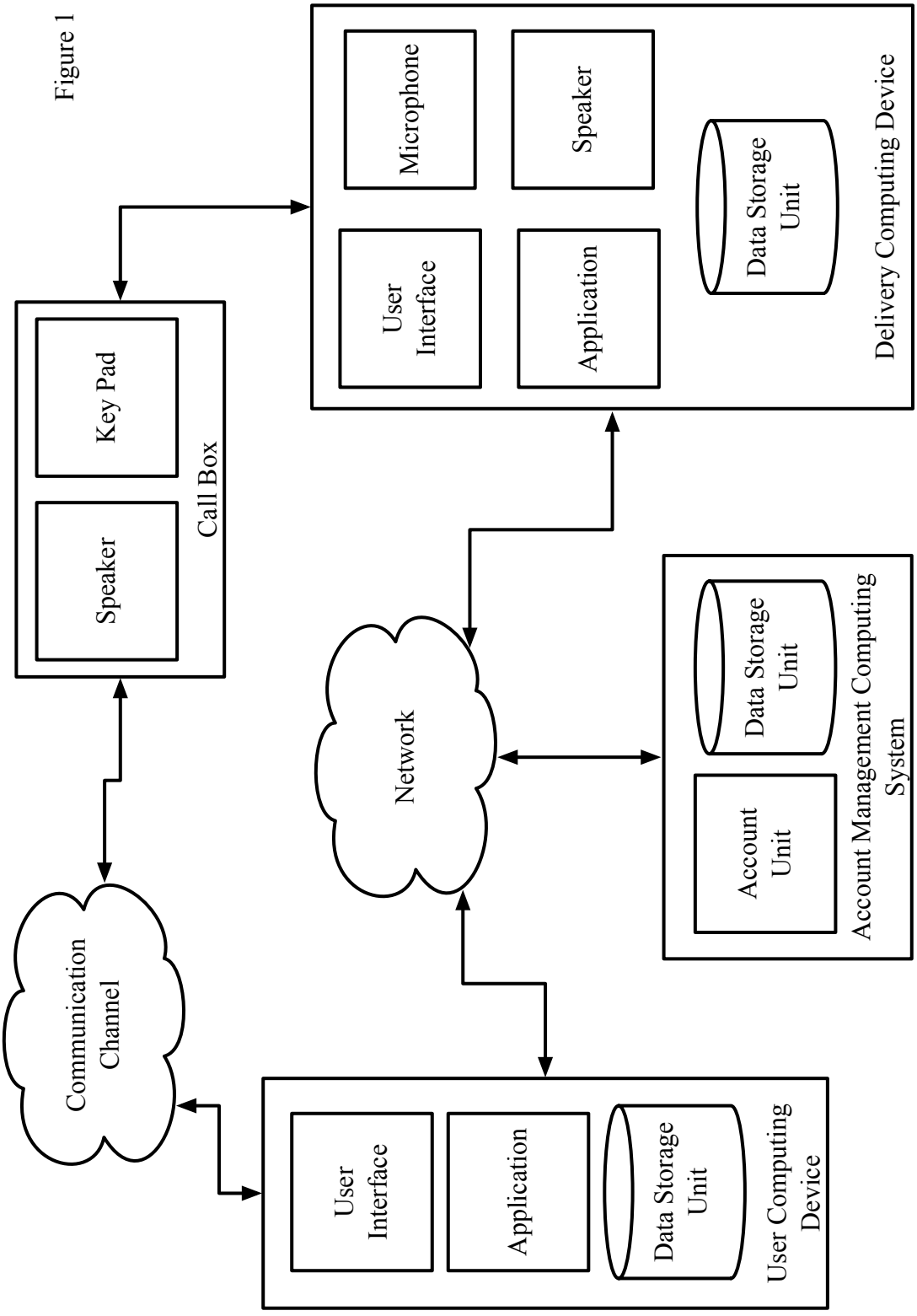
Each user computing device and delivery computing device communicates with an account management computing system to coordinate secure access to a building using the building's call box system. The account management computing system comprises an account unit that stores the automated delivery preferences for the user and coordinates communication of secure package delivery parameters to the user computing device and delivery computing device. The delivery computing device and the user computing device communicate and confirm the secure package delivery parameters through a call box.

Figure 2 is a block flow diagram depicting a method to secure automatic package delivery through a building call box system.

Figure 3 is a block flow diagram depicting a method to communicate secure package delivery parameters.

Figure 4 is a block flow diagram depicting a method to complete a building authorization call between the user computing device and the call box.

Figure 1


Delivery Computing Device
Microphone
Speaker
User Interface
Application
Data Storage Unit
Call Box
Key Pad
Speaker
Network
Account Management Computing System
Data Storage Unit
Account Unit
Communication Channel
User Computing Device
User Interface
Application
Data Storage Unit

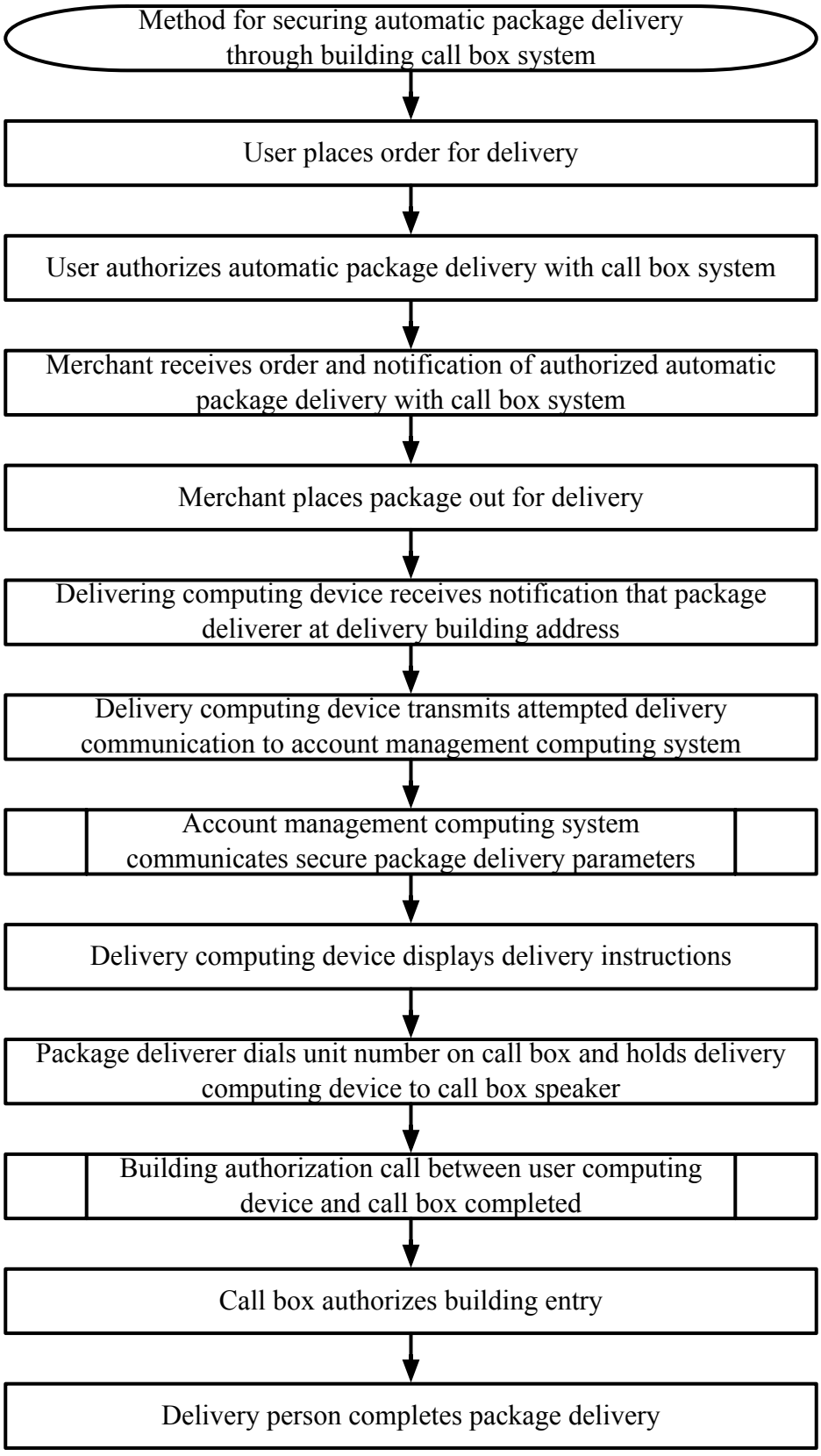

Method for securing automatic package delivery through building call box system
User places order for delivery
User authorizes automatic package delivery with call box system
Merchant receives order and notification of authorized automatic package delivery with call box system
Merchant places package out for delivery
Delivering computing device receives notification that package deliverer at delivery building address
Delivery computing device transmits attempted delivery communication to account management computing system
Account management computing system communicates secure package delivery parameters
Delivery computing device displays delivery instructions
Package deliverer dials unit number on call box and holds delivery computing device to call box speaker
Building authorization call between user computing device and call box completed
Call box authorizes building entry
Delivery person completes package delivery

Figure 2

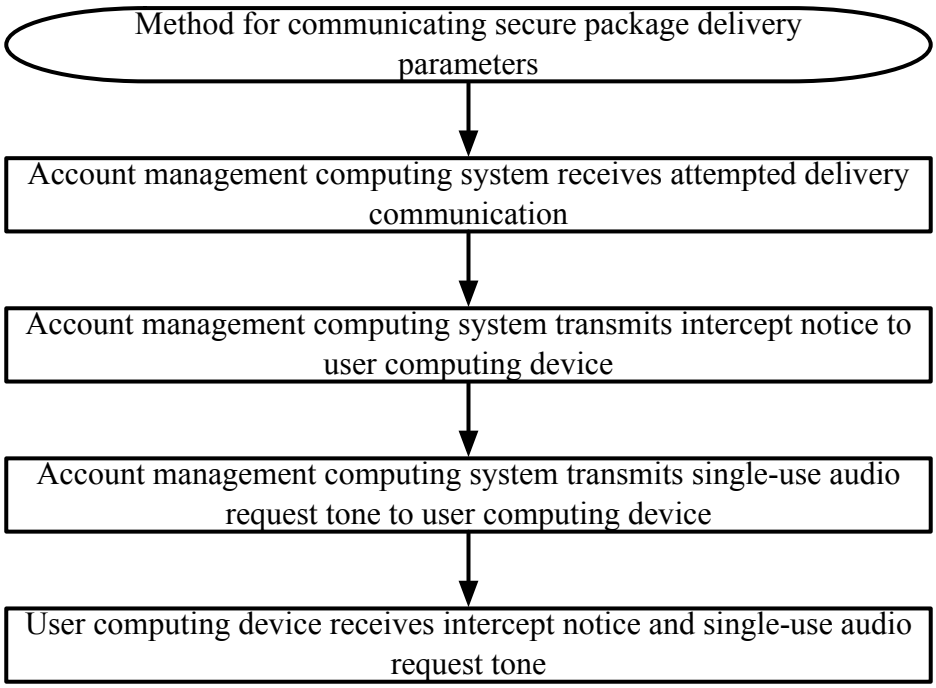

Method for communicating secure package delivery parameters
Account management computing system receives attempted delivery communication
Account management computing system transmits intercept notice to user computing device
Account management computing system transmits single-use audio request tone to user computing device
User computing device receives intercept notice and single-use audio request tone

Figure 3

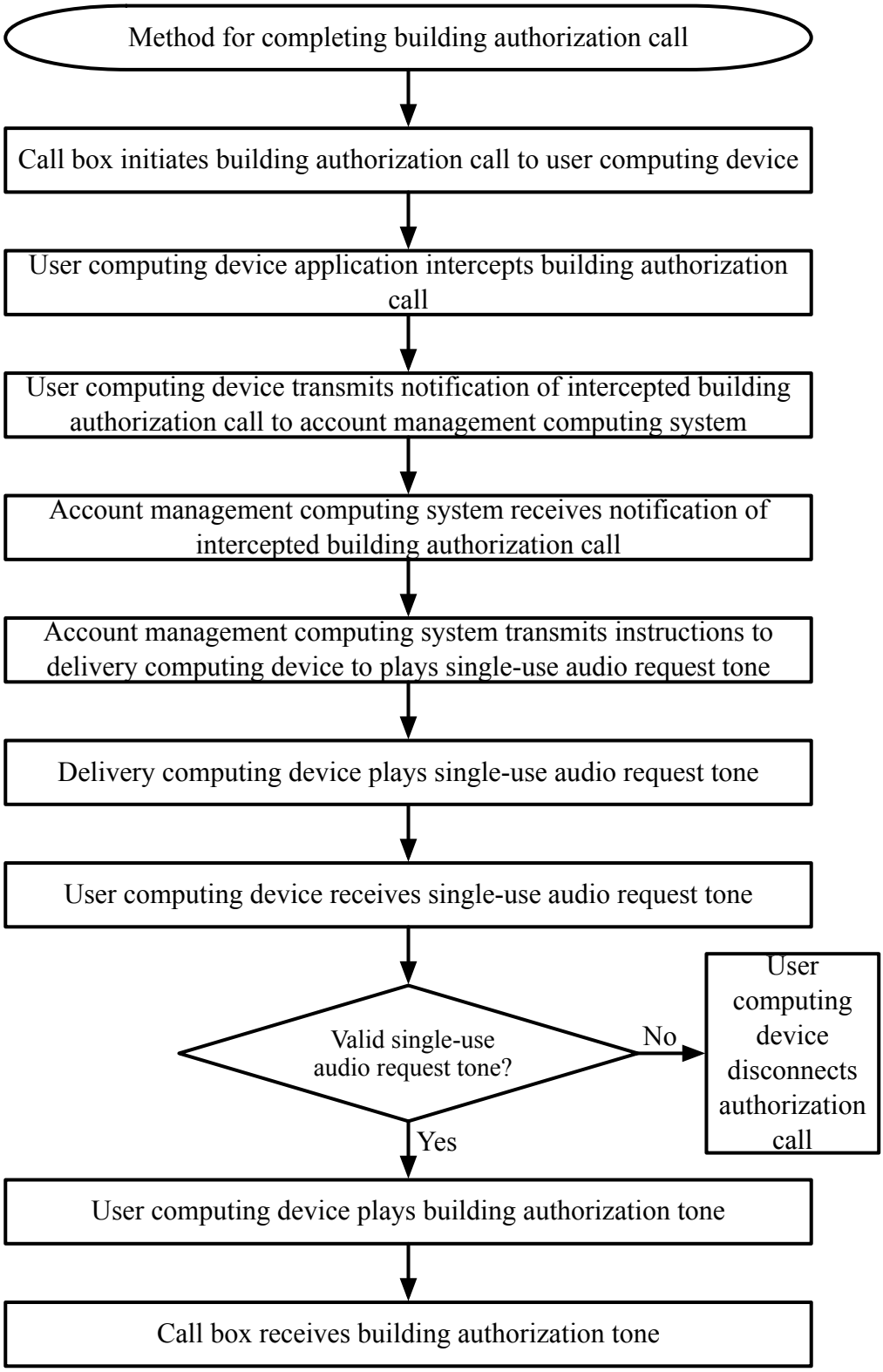

Method for completing building authorization call
Call box initiates building authorization call to user computing device
User computing device application intercepts building authorization call
User computing device transmits notification of intercepted building authorization call to account management computing system
Account management computing system receives notification of intercepted building authorization call
Account management computing system transmits instructions to delivery computing device to plays single-use audio request tone
Delivery computing device plays single-use audio request tone
User computing device receives single-use audio request tone
Valid single-use audio request tone?
No
User computing device disconnects authorization call
Yes
User computing device plays building authorization tone
Call box receives building authorization tone

Figure 4