PAYMENT CAPABILITY EXTENSION PROCESSING METHODS, APPARATUSES, AND DEVICES

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to Chinese Patent Application No. 2025102833605, filed with the China National Intellectual Property Administration on March 11, 2025 and entitled "PAYMENT CAPABILITY EXTENSION PROCESSING METHODS, APPARATUSES, AND DEVICES", which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] This specification relates to the field of electronic payment technologies, and in particular, to payment capability extension processing methods, apparatuses, and devices.

BACKGROUND

[0003] In daily life, merchants usually collect payment from users by using cash registers deployed at checkout counters. The cash registers usually support conventional payment modes such as bank cards, credit cards, and cash. However, currently, increasingly more new payment modes are emerging and even popularized, for example, code scan-to-pay, near field communication-based payment, face scanning payment, and palm scanning payment, which poses challenges to capabilities and convenience of the cash registers.

[0004] To promote new payment modes by fully using existing cash registers at a massive quantity of merchants, payment service providers of the new payment modes launch various corresponding external payment devices to extend payment capabilities of the cash registers. Therefore, the cash registers can indirectly use, by using the external payment devices deployed for the cash registers, extended payment capabilities provided by the external payment devices, thereby supporting corresponding new payment modes. For example, an external payment device is a near field communication-based payment device. The external payment device can extend a

near field communication-based payment capability for the cash register by connecting to the cash register.

[0005] The external payment device and the cash register are usually not provided by the same service provider. Therefore, for a payment service provider that provides the external payment device, to minimize modifications to the cash register, it is mainly considered to install, on the cash register, a payment capability extension program provided by the payment service provider. Then, the payment capability extension program acts on behalf of the cash register to interact with the external payment device, and data of the cash register are obtained by the payment capability extension program in a manner such as screenshot recognition, so that no active cooperation is needed from the cash register. This helps reduce integration costs, and helps improve willingness of the merchant to access the external payment device.

[0006] A task of installing the payment capability extension program is currently executed by the merchant or a staff member of the payment service provider, who uses a USB drive having a copy of the payment capability extension program and inserts the USB drive into the cash register to perform installation. However, in actual applications, merchant operations are relatively cumbersome and prone to problems. However, if a staff member dispatched from the payment service provider performs installation, labor costs are relatively high. In addition, subsequent upgrades and maintenance of the payment capability extension program may continue to face these problems.

[0007] Based on this, there is a need for solutions that help improve access efficiency and reduce access costs for the external payment device of the cash register.

SUMMARY

[0008] One or more implementations of this specification provide payment capability extension processing methods, apparatuses, and devices, to resolve the following technical problem: there is a need for solutions that help improve access efficiency and reduce access costs for an external payment device of a cash register.

[0009] To resolve the above-mentioned technical problem, one or more implementations of this specification are implemented as follows:

[0010] One or more implementations of this specification provide a payment capability

extension processing method, applied to an external payment device configured for a cash register, where the external payment device provides at least one extended payment mode that the cash register does not have, and the method includes: determining whether the cash register is in a connected state; if yes, sending a state trigger instruction to the cash register by using an HID protocol, to trigger the cash register to open a console of the cash register to enter a command-input wait state; sending simulated keystroke information to the cash register by using the HID protocol, to trigger the cash register, in the command-input wait state, to have the simulated keystroke information automatically input and executed, and through the execution, enabling the cash register to obtain and install a payment capability extension program indicated by the simulated keystroke information; and interacting with the cash register based on the payment capability extension program to use a capability corresponding to the extended payment mode for the cash register.

[0011] One or more implementations of this specification provide a payment capability extension processing apparatus, applied to an external payment device configured for a cash register, where the external payment device provides at least one extended payment mode that the cash register does not have, and the apparatus includes: a connection state confirmation module, configured to determine whether the cash register is in a connected state; an input state trigger module, configured to: if yes, send a state trigger instruction to the cash register by using an HID protocol, to trigger the cash register to open a console of the cash register to enter a command-input wait state; a simulated keystroke execution module, configured to: send simulated keystroke information to the cash register by using the HID protocol, to trigger the cash register, in the command-input wait state, to have the simulated keystroke information automatically input and executed, and through the execution, enable the cash register to obtain and install a payment capability extension program indicated by the simulated keystroke information; and an extended capability use module, configured to interact with the cash register based on the payment capability extension program to use a capability corresponding to the extended payment mode for the cash register.

[0012] One or more implementations of this specification provide a payment capability extension processing device, applied to an external payment device configured for a cash register, where the external payment device provides at least one extended payment mode that the cash register does not have, and the device includes at least one processor and a storage

communicatively connected to the at least one processor, where the storage stores instructions executable by the at least one processor, and the instructions are executed by the at least one processor to enable the at least one processor to perform the following operations: determining whether the cash register is in a connected state; if yes, sending a state trigger instruction to the cash register by using an HID protocol, to trigger the cash register to open a console of the cash register to enter a command-input wait state; sending simulated keystroke information to the cash register by using the HID protocol, to trigger the cash register, in the command-input wait state, to have the simulated keystroke information automatically input and executed, and through the execution, enabling the cash register to obtain and install a payment capability extension program indicated by the simulated keystroke information; and interacting with the cash register based on the payment capability extension program to use a capability corresponding to the extended payment mode for the cash register.

[0013] The above-mentioned at least one technical solution used in one or more implementations of this specification can achieve the following beneficial effects: An external payment device can be automatically simulated as a keyboard, so that the external payment device sends, to the connected cash register by using the HID protocol, an instruction that appears to be input by using the keyboard, and executes the instruction, to automatically invoke a command-input interface on the cash register, and further automatically input and execute a command to obtain and install a payment capability extension program. This conveniently completes installation of the payment capability extension program on the cash register, so that the cash register can successfully use the external payment device to support more payment modes. This installation solution does not require a payment service provider to dispatch an on-site staff member, does not require a merchant to perform cumbersome operations, and does not require a USB drive, which offers low costs, high efficiency, and relatively high reliability, and also facilitates subsequently upgrades and maintenance.

BRIEF DESCRIPTION OF DRAWINGS

[0014] To describe the technical solutions in the implementations of this specification or in the existing technology more clearly, the following briefly describes the accompanying drawings needed for describing the implementations or the existing technology. Clearly, the accompanying

drawings in the following descriptions merely show some implementations of this specification, and a person of ordinary skill in the art can still derive other drawings from these accompanying drawings without creative efforts.

[0015] FIG. 1 is a schematic flowchart illustrating a payment capability extension processing method, according to one or more implementations of this specification;

[0016] FIG. 2 is a schematic flowchart illustrating an implementation of the method of FIG. 1 in a scenario in which a cash register uses a Windows operating system, according to one or more implementations of this specification;

[0017] FIG. 3 is a schematic flowchart illustrating a non-advanced installation processing solution of a payment capability extension program, according to one or more implementations of this specification;

[0018] FIG. 4 is a schematic flowchart illustrating a processing solution of a deferred settlement order, according to one or more implementations of this specification;

[0019] FIG. 5 is a schematic diagram illustrating a structure of a payment capability extension processing apparatus, according to one or more implementations of this specification; and

[0020] FIG. 6 is a schematic diagram illustrating a structure of a payment capability extension processing device, according to one or more implementations of this specification.

DESCRIPTION OF EMBODIMENTS

[0021] Implementations of this specification provide payment capability extension processing methods, apparatuses, and devices, and storage media.

[0022] To make a person skilled in the art better understand the technical solutions in this specification, the following clearly and comprehensively describes the technical solutions in the implementations of this specification with reference to the accompanying drawings in the implementations of this specification. Clearly, the described implementations are merely some but not all of the implementations of this application. All other implementations obtained by a person of ordinary skill in the art based on the implementations of this specification without creative efforts shall fall within the protection scope of this application.

[0023] To resolve the problem in Background, the applicant first considers remote downloading and installation of a payment capability extension program. In this way, no USB

drive is needed, and a payment service provider does not need to dispatch a staff member. A merchant can operate on a cash register. The merchant can open a browser by using a mouse of the cash register, and then enter a download website of the payment capability extension program into the browser by using a keyboard of the cash register and access the website, to obtain the latest payment capability extension program for subsequent installation. The download website can be obtained by the merchant from an official website of the payment service provider. However, this solution does not work well after attempts are made at some merchants. A reason is that an operator of the cash register usually only performs some fixed operations related to payment collection. In fact, the operator is not familiar with the above-mentioned additional operations, performs the operations inefficiently, is prone to make errors, and is afraid of errors, resulting in low willingness to perform the operations. This is even true for later upgrades and maintenance. In addition, these additional operations are still cumbersome.

[0024] Based on this, the applicant further considers that, an external payment device simulates a keyboard (which can also be a human-machine interaction device such as a mouse) to automatically perform a keyboard operation, etc. that originally needs to be performed on the cash register, sends a corresponding simulated human-machine interaction instruction by using an HID protocol, and automatically installs a payment capability extension program for the cash register. Therefore, the above-mentioned problem can be resolved without performing an operation by the merchant.

[0025] The following continues to describe the solutions of this application based on such an overall idea.

[0026] FIG. 1 is a schematic flowchart illustrating a payment capability extension processing method, according to one or more implementations of this specification. The method is applied to an external payment device configured for a cash register. The external payment device can provide one or more payment modes that the cash register does not have, and the payment mode is referred to as an extended payment mode, so that an additional payment capability can be extended for the cash register, for example, a capability such as near field communication-based payment (based on touch sensing recognition), face scanning payment (based on face recognition), palm scanning payment (based on palmprint recognition), and iris payment. Correspondingly, the external payment device, for example, belongs to at least one of the following devices: a near field communication-based payment device, a face scanning payment device, a palm scanning payment

device, and an iris payment device.

[0027] In particular, the external payment device can be portable and compact, and is more easily deployed for the cash register. The cash register is existing, so that reconstruction costs are relatively low. The cash register and the external payment device can be provided by different service parties (here mainly meaning that the cash register and the external payment device are products that are not from the same manufacturer). For example, the external payment device is provided by a certain third-party payment service provider, while the cash register may be provided by some conventional financial device manufacturers.

[0028] The procedure in FIG. 1 includes the following steps.

[0029] S102: Determine whether the cash register is in a connected state.

[0030] The cash register supports one or more standard universal interfaces, such as Bluetooth, USB (including TYPE-C), a serial port, and Wi-Fi, which can be a hardware interface or a wireless interface. Certainly, different cash registers may support different interfaces. In addition, these interfaces may overlap and support each other for implementation. For example, the serial port may be implemented based on the USB interface.

[0031] The external payment device first needs to be connected to the cash register, to facilitate subsequent information exchange. The serial port (for example, a standard serial port such as RS232 or RS485) is used as an example. The cash register can be wiredly connected to the external payment device by using a serial port data cable. Certainly, a wireless serial port may be used.

[0032] S104: If yes, send a state trigger instruction to the cash register by using an HID protocol, to trigger the cash register to open a console of the cash register to enter a command-input wait state.

[0033] A Human Interface Device Protocol (HID protocol) is a device communication protocol defined in a universal serial bus standard, and is mainly used to support data transmission between a human-machine interaction device (for example, a keyboard, a mouse, a game handle, and a touchscreen) and a computer or another host device. A core purpose of the HID protocol is to implement a plug-and-play function, so that these devices can be recognized and used by an operating system without installing an additional driver. Both the external payment device and the cash register support the HID protocol. However, the HID protocol alone is insufficient to implement payment-related service interaction between the two devices. Therefore, a payment capability extension program needs to be installed to support a higher-level protocol (for example,

a customized lightweight communication protocol), to implement service interaction between the two devices, thereby efficiently exchanging some data with specific service semantics.

[0034] To facilitate more convenient and broadly applicable use of the HID protocol, the external payment device and the cash register can be connected to each other through USB or Bluetooth. In the case of Bluetooth, wireless interaction can be supported through Bluetooth HID.

[0035] In one or more implementations of this specification, the external payment device can be without a keyboard and mouse. In this way, the external payment device is more compact and lightweight for ease of portability and deployment, and costs are lower. The external payment device can be simulated as a keyboard and/or a mouse, to automatically send, to the cash register by using the HID protocol, an "instruction that appears to be generated and sent by manually operating the keyboard and/or the mouse". However, in fact, no manual operation (for example, manually tapping the keyboard and manually clicking the mouse) is needed to perform a corresponding instruction sending operation.

[0036] For the manual operation part, it is basically sufficient for the merchant to the external payment device to the cash register by using a wired connection or by using a wireless connection through pairing, to ensure the connected state in step S102, and subsequent steps can be automatically performed by the external payment device.

[0037] In one or more implementations of this specification, instructions to be sent to the cash register can be pre-stored in the external payment device, or the instructions can be automatically generated in real time when the instructions are to be sent. The instructions are automatically sent at appropriate times based on specified logic. For example, when the external payment device is connected to the cash register for the first time, the instructions can be automatically triggered to start sending.

[0038] In addition, more flexibly, a server of a payment provider can be responsible for generating at least a part of the above-mentioned instructions, and deliver the instructions to the external payment device at appropriate times, so that the external payment device forwards the instructions to the cash register by using the HID protocol, or the external payment device can perform additional processing on the received instructions as needed, and then send the instructions to the cash register (subsequent simulated keystroke information can also be processed in a similar manner, to fully exert an advantage of the server). This server-based manner helps efficiently perform subsequent upgrades and maintenance, and also facilitates concurrent service

for a plurality of, numerous, or even massive external payment devices (corresponding to a same payment service provider) and cash registers (for example, located at a large quantity of different merchants), to more efficiently complete large-scale installation of the payment capability extension program.

[0039] In one or more implementations of this specification, it is considered that the HID protocol is used to ultimately simulate a keyboard to send a command (here mainly a command in a command-line form) to the cash register and trigger execution of the command, to complete installation of the payment capability extension program. The cash register usually does not naturally remain in an interface waiting to receive a command line. Therefore, the state trigger instruction is first sent to the cash register by using the HID protocol, to trigger entry into the interface, that is, to trigger the cash register to open the console of the cash register to enter the command-input wait state, as mentioned in step S104. There can be one or more state trigger instructions. For different cash register operating systems, specific content of the state trigger instruction may be different.

[0040] It is worthwhile to note that the external payment device can also simulate a mouse to send an instruction. However, in this manner, a coordinate position to which the instruction is intended to target in the interface of the cash register needs to be determined more accurately, and an implementation threshold is relatively higher. For a keyboard simulation solution, because the cash register also supports some operation manners of a keyboard shortcut key and a key combination shortcut, an instruction is relatively more easily and accurately sent, and the cash register can respond more reliably and correctly. In this case, this application tends to have the external payment device to simulate a keyboard to send an instruction that appears to be sent by manually operating the keyboard.

[0041] S106: Send simulated keystroke information (which is essentially also an instruction) to the cash register by using the HID protocol, to trigger the cash register, in the command-input wait state, to have the simulated keystroke information automatically input and executed, and through the execution, enable the cash register to obtain and install a payment capability extension program indicated by the simulated keystroke information.

[0042] In one or more implementations of this specification, after the cash register enters the command-input wait state, and before the external payment device sends the simulated keystroke information, the external payment device may further send more instructions to the cash register

by using the HID protocol as needed. For example, a certain command is further sent to trigger the cash register, in the command-input wait state, to first execute the command and then wait for the external payment device to further send the simulated keystroke information. In terms of form, the simulated keystroke information appears to be an executable command that is input by using a keyboard, but is actually sent by simulating keyboard input, and therefore is briefly referred to as "simulated keystroke" here.

[0043] The simulated keystroke information can include a download address of the payment capability extension program. In response to execution of the simulated keystroke information, the cash register automatically downloads the payment capability extension program from the download address, and automatically installs the downloaded payment capability extension program, thereby avoiding cumbersome manual operations. For example, the download address does not need to be manually entered.

[0044] S108: Interact with the cash register based on the payment capability extension program to use a capability corresponding to the extended payment mode for the cash register.

[0045] After the cash register successfully performs installation, higher-layer protocol service interaction can be performed between the external payment device and the cash register based on the payment capability extension program. For example, payment-related information (for example, an amount to be paid, a payment interface invoking request, a membership number, or an auxiliary screenshot) is transmitted to the external payment device based on a specified service operation performed by a cashier on the cash register, to trigger the external payment device to use an extended payment mode supported by the external payment device to deduct money from a current user or perform other service processing.

[0046] The specified service operation is, for example, a payment request operation, a membership login request operation, or a biometric information registration request operation. It is worthwhile to note that these service operations can be additional service operations that correspond to new service semantics and that are newly defined based on or beyond existing service semantics of the cash register through intent recognition or in another manner. Therefore, an additional function is first extended for the cash register in an operation form, so that the cashier can still mainly operate the cash register, while this function is actually implemented by the external payment device.

[0047] Subsequently, if the payment capability extension program needs to be upgraded, the

payment capability extension program can be upgraded through a network based on a capability of an existing version, or the solution in FIG. 1 can be still used to install a higher version. Certainly, the payment capability extension program may be subdivided into different parts, and some of the parts can be similarly installed by using the above-mentioned solution as needed.

[0048] In one or more implementations of this specification, a risk of interaction reliability is further considered. For example, due to a weak network signal, a delay, etc., an instruction that is actually automatically input into the cash register is incomplete or even incorrect. In addition, due to a variety of types of existing cash register on the market, some instructions cannot be correctly executed, resulting in compatibility problems. Therefore, an exemplary solution is provided here. The solution includes: determining whether the cash register is in a connected state, where a camera of the external payment device is in a state of photographing a screen of the cash register; if yes, determining, based on photographed screen display content, the simulated keystroke information that needs to be obtained; obtaining the simulated keystroke information, sending the simulated keystroke information to the cash register by using the HID protocol, to trigger the cash register to have the simulated keystroke information automatically input and executed, and through the execution, enabling the cash register to obtain and install the payment capability extension program indicated by the simulated keystroke information; and interacting with the cash register based on the payment capability extension program to use the capability corresponding to the extended payment mode for the cash register.

[0049] Based on instant screen capture analysis by the external device, a potential abnormal input can be found in a timely manner, and adjusted accordingly, so that reliability can be improved. In addition, this helps recognize and select more appropriate simulated keystroke information for different cash registers, thereby helping improve compatibility.

[0050] According to the method in FIG. 1, the external payment device can be automatically simulated as a keyboard, so that the external payment device sends, to the connected cash register by using the HID protocol, an instruction that appears to be input by using the keyboard, and executes the instruction, to automatically invoke a command-input interface on the cash register, and further automatically input and execute a command to obtain and install a payment capability extension program. This conveniently completes installation of the payment capability extension program on the cash register, so that the cash register can successfully use the external payment device to support more payment modes. This installation solution does not require a payment

service provider to dispatch an on-site staff member, does not require a merchant to perform cumbersome operations, and does not require a USB drive, which offers low costs, high efficiency, and relatively high reliability, and also facilitates subsequently upgrades and maintenance.

[0051] Based on the method shown in FIG. 1, this specification further provides some specific implementations and extension solutions of the method, which are further described below.

[0052] In one or more implementations of this specification, to more reliably enter the command-input wait state, the above-mentioned state trigger instruction is divided into a first shortcut sub-instruction, a second shortcut sub-instruction, and a simulated keystroke sub-instruction, which are respectively used to sequentially achieve different segmented objectives.

[0053] In this case, after it is determined that the cash register is in a connected state, if the payment capability extension program needs to be installed, the external payment device can first send the first shortcut sub-instruction to the cash register by using the HID protocol, to trigger the cash register to display a desktop (here, which can mean bringing the desktop to the foreground, to prevent subsequent commands from being executed incorrectly. For example, if payment collection software remains on a certain service page, the subsequent commands may not be executed correctly as intended). After the desktop is successfully displayed, the second shortcut sub-instruction is sent to the cash register by using the HID protocol, to trigger the cash register to display a running window (here, which can refer to a window in which a command line can be input and run) on the desktop. After the running window is displayed successfully, the simulated keystroke sub-instruction (here, which can refer to a name of a command line program that needs to be run, namely, a console) is sent to the cash register to trigger the simulated keystroke sub-instruction to be automatically input and executed in the running window, so that through execution, the console of the cash register is opened to enter the command-input wait state.

[0054] The first shortcut sub-instruction and the second shortcut sub-instruction can be simulated keyboard and/or mouse shortcut operation instructions. The keyboard is used as an example. The shortcut operation instruction can be an instruction triggered by pressing a specified combination key on the keyboard. Then, the mouse is used as an example. The shortcut operation instruction can be an instruction triggered by clicking a specified system button with the mouse, or by clicking a physical button that is on the mouse and that is bounded to a specified macro.

[0055] The above-mentioned solution of entering the command-input wait state is particularly applicable to a scenario in which a running window needs to be invoked on the desktop. For

example, if the cash register uses a Windows operating system, this belongs to the type of scenario. For ease of implementation, more intuitively, one or more implementations of this specification further provide a schematic flowchart illustrating an implementation of the method of FIG. 1 in this scenario. References can be made to FIG. 2.

[0056] The instruction in FIG. 2 does not need to be manually operated by the merchant. The instruction can be automatically sent to the cash register by the external payment device by simulating keyboard input by using the HID protocol.

[0057] First, the first shortcut sub-instruction is sent, which is specifically an instruction triggered by pressing a combination key "Win+D" on the keyboard through simulation. In response to the instruction, the cash register is switched to the desktop.

[0058] Then, the second shortcut sub-instruction is sent, which is specifically an instruction triggered by pressing a combination key "Win+R" on the keyboard through simulation. In response to the instruction, the cash register pops up a running window from the desktop, and waits to receive a next sub-instruction in an input box of the running window.

[0059] Next, the simulated keystroke sub-instruction is sent, which is specifically an instruction triggered by inputting text "CMD" and pressing the Enter key through keyboard simulation. In response to the instruction, the cash register starts the console, reaches a “command prompt” in the console interface, and waits for command-line input. It can be considered that the command-input wait state is entered at this point.

[0060] Next, the simulated keystroke information is sent, which is specifically a specific command line that is input through keyboard simulation, and simulated keystroke is used to trigger execution of the command line. The command line instructs to download a corresponding program (namely, the payment capability extension program) from the download address in the instruction and install the program.

[0061] Based on the solution in FIG. 2, operations are simple, and can be automatically triggered and executed during startup of the external payment device without manual input. Compared with a manner of manual keyboard input, the solution is more reliable, and batch operations can be further performed with support of a remote server, thereby achieving higher efficiency.

[0062] In addition to a cash register using a Windows operating system, a cash register using another operating system (for example, Linux) can also perform processing based on a similar idea,

and a difference mainly lies in specific content of corresponding sub-instructions or simulated keystroke information.

[0063] How to install the payment capability extension program for the cash register efficiently and automatically is mainly considered above. Such operations can be performed in advance to prepare for potentially serving a user who may need to use a corresponding extended payment mode.

[0064] However, in this application, a case in which the payment capability extension program is not installed in advance is further considered, or a case in which the payment capability extension program is not allowed to permanently reside on the cash register is further considered. These cases may be needed in actual applications.

[0065] For example, many cash registers (especially some customized small cash registers) have weak performance, and the payment capability extension program may increase a burden on the cash registers. For another example, some payment capability extension programs may have many optional modules. In different scenarios, only a part of modules may be needed. For another example, some cash registers may have security policy requirements for external software, and so on. In these examples, there may be the above-mentioned requirements, and installation of the payment capability extension program may be considered only when the extended payment mode needs to be used or when the extended payment mode needs to be used frequently. In addition, such installation may be temporary. This helps reduce an impact on the cash register, to enable the cash register to perform much of original work of the cash register more normally.

[0066] To satisfy the above-mentioned requirements and minimize an impact on use of an extended payment capability by the user (whether the user uses the extended payment capability, which users use the extended payment capability, and how often the extended payment capability is used, which may vary significantly across different merchants), one or more implementations of this specification provide a schematic flowchart illustrating a non-advanced installation processing solution of a payment capability extension program. References can be made to FIG. 3.

[0067] The procedure in FIG. 3 includes the following steps.

[0068] S302: After it is determined that the cash register is in a connected state, if a payment interaction operation of a user on the external payment device is received, determine whether the cash register has installed the payment capability extension program.

[0069] For example, the payment capability extension program on the external payment device can be used to attempt to send probe information to the cash register to determine whether the cash register responds correctly. The cash register needs to install the payment capability extension program to respond correctly by using the payment capability extension program.

[0070] If the payment capability extension program is installed, normal interaction can be performed based on step S108. However, if the payment capability extension program is not installed, it is currently not convenient for the cash register to effectively communicate with the external payment device in terms of service. As a result, it is difficult for the cash register to use a capability of the external payment device. In this case, the user currently waits beside the cash register to perform payment, and intends to use the extended payment mode of the external payment device for payment. Therefore, the following special processing enables the merchant to normally collect payment from the user by using the cash register.

[0071] S304: If no, generate a deferred settlement order for the payment interaction operation.

[0072] In one or more implementations of this specification, deferred settlement here is relative to the cash register. Compared with a normal payment collection process of the cash register, a payment collection process for the payment interaction operation is substantially completed more slowly for the merchant. It should be emphasized that, however, this has little impact on the user, and may even provide better experience.

[0073] Further, credential information (for example, an order number is used as the credential information, or to improve security, other identification information can be encrypted or additionally generated) corresponding to the deferred settlement order is determined, and the credential information corresponding to the deferred settlement order can be sent to the cash register by using the HID protocol. The credential information here can alternatively be simulated keystroke information, so that no support from a higher-layer protocol is needed. For example, the credential information includes an identification character string (which can be unique within a corresponding service range, for example, uniquely identifies an order) used to represent the deferred settlement order. The credential information can be input into the cash register by simulating a keyboard operation, so that the cash register stores the credential information. For example, the cash register is triggered to open a log or another text file, and write the credential information into the log or the text file for storage.

[0074] S306: Send, to the cash register by using the HID protocol, a payment success trigger

instruction that carries the credential information corresponding to the deferred settlement order, to trigger the cash register to forcibly and successfully end a current payment collection process for the user.

[0075] In one or more implementations of this specification, if there is a control on the cash register that can be used to trigger representation of payment collection success, the payment success trigger instruction can be generated and sent by simulating a keyboard operation and/or a mouse operation, to trigger the control, so as to automatically and successfully end the payment collection process. Certainly, a cashier can manually and forcibly end the process. It is worthwhile to note that, normally, the payment collection process is actually not ended. A reason is that complete and effective payment service cooperation between the cash register and the external payment device is not completed. In this case, this is referred to as forcibly and successfully ending the process here.

[0076] In some scenarios, on the cash register, the cash register may need the server to return correct information to automatically end the payment collection process. For example, in a card swiping payment mode, the process can be ended only after a card swiping success notification returned by a server of a bank card or a credit card issuer is received. Based on this, to prevent the cash register from being in a state in which a local control cannot be manually operated to successfully end the payment collection process, a payment collection manner of the cash register can be forcibly switched to change the state. For example, the cash register can be triggered to automatically switch to a cash payment mode, and to automatically determine that the user has successfully paid amount to be paid in cash this time. Certainly, the user does not paid the amount in cash. The switching here is only to facilitate forcibly and successfully ending the payment collection process.

[0077] S308: Request the server of the payment provider to deliver the state trigger instruction and the simulated keystroke information, or request delivery of only a part, with remaining parts being locally obtained and sent by the external payment device.

[0078] To facilitate the cash register to subsequently perform normal service interaction with the external payment device in terms of the deferred settlement order to totally complete a related transaction of the deferred settlement order, such as correct settlement, the cash register needs to install the payment capability extension program. Therefore, the cash register can actively request the server to implement installation. Here, an example in which the server delivers an instruction

to trigger installation is used. Certainly, a manner in which only the external payment device triggers installation can be used. In this case, after generating the deferred settlement order or forcibly and successfully ending the payment collection process, the external payment device can trigger installation at appropriate times (for example, perform installation as soon as possible during an idle period).

[0079] S310: After installing the payment capability extension program, the cash register requests, based on the payment capability extension program by using the credential information, corresponding settlement from the external payment device or a server of the external payment device.

[0080] The cash register indicates, based on the credential information, that the corresponding payment collection process and the deferred settlement order actually belong to services of the cash register, and therefore settlement needs to be completed correctly to ensure interests of the merchant.

[0081] The solution in FIG. 3 helps make a more flexible decision regarding when to install the payment capability extension program without necessarily installing the payment capability extension program in advance, and the payment capability extension program does not necessarily need to reside permanently on the cash register. This helps reduce a burden on the cash register, and does not affect use of the extended payment mode of the external payment device by the user.

[0082] Further, in the solution in FIG. 3, because the payment capability extension program is not installed, the external payment device may not obtain a correct amount to be paid in a timely manner. This case may affect generation of the deferred settlement order. To resolve this problem, one or more implementations of this specification further provide a schematic flowchart illustrating a processing solution of a deferred settlement order. References can be made to FIG. 4.

[0083] The procedure in FIG. 4 includes the following steps.

[0084] S402: After generating the deferred settlement order for the payment interaction operation, determine a first amount to be paid that is estimated in the deferred settlement order, where the first amount to be paid is estimated to be less than a second amount to be paid that the user should actually pay this time.

[0085] For ease of distinguishing, an amount to be paid that the user should actually pay this time is referred to as the second amount to be paid. However, because the payment capability extension program is not installed, the external payment device may currently not know the second

amount to be paid. To resolve this problem, the external payment device conservatively estimates the amount to be paid, which is used as the first amount to be paid and is included in the deferred settlement order.

[0086] It is expected that the first amount to be paid should be not greater than the second amount to be paid, and it may not be easy to accurately estimate the second amount to be paid. Therefore, as a compromise, it is expected that the estimated first amount to be paid is less than and relatively close to the second amount to be paid. In this way, it can be ensured that most of the amount can be collected in a timely manner to protect interests of the merchant, and the user can be prevented from being mistakenly overcharged to affect user experience.

[0087] In one or more implementations of this specification, the external payment device has a camera, and a to-be-paid product placement platform corresponding to the cash register is within a framing range of the camera. Based on this, when the deferred settlement order is generated for the payment interaction operation, the method specifically includes: estimating a price of a product photographed within the framing range based on the product; determining, based on the price, a first amount to be paid that is less than and close to the price; and generating, for the payment interaction operation, a deferred settlement order indicating the first amount to be paid

[0088] In addition to this image recognition-based order amount estimation solution, another estimation solution can be used, for example, estimation is performed based on historical shopping of a current user.

[0089] S404: Deduct the first amount to be paid from the user.

[0090] To avoid user confusion, the user can be notified more explicitly that only a part of the amount is currently deducted immediately, and subsequent deduction is performed at appropriate times.

[0091] S406: After requesting, by using the credential information, the corresponding settlement from the external payment device or the server of the external payment device, based on the request, determine a remaining amount to be paid and deduct the remaining amount to be paid from the user for settlement with a merchant corresponding to the cash register.

[0092] The amount to be paid, for example, is equal to a difference between the second amount to be paid and the first amount to be paid. Alternatively, assume that the user performs payment in this case. To improve user experience, an additional benefit (for example, amount reduction) can be offered to the user during subsequent deduction. In this case, the amount to be paid is less than

the difference between the second amount to be paid and the first amount to be paid.

[0093] Based on the solution in FIG. 4, even if the cash register has not installed the payment capability extension program, the cash register can still temporarily and indirectly rely on the capability of the external payment device to serve the user and subsequently perform correct settlement for the cash register, which is particularly friendly to the cash register.

[0094] Based on the same idea, one or more implementations of this specification further provide apparatuses and devices corresponding to the above-mentioned methods, as shown in FIG. 5 and FIG. 6. The apparatuses and the devices can correspondingly perform the above-mentioned methods and related optional solutions.

[0095] FIG. 5 is a schematic diagram illustrating a structure of a payment capability extension processing apparatus, according to one or more implementations of this specification. The apparatus is applied to an external payment device configured for a cash register, where the external payment device provides at least one extended payment mode that the cash register does not have, and the apparatus includes: a connection state confirmation module 502, configured to determine whether the cash register is in a connected state; an input state trigger module 504, configured to: if yes, send a state trigger instruction to the cash register by using an HID protocol, to trigger the cash register to open a console of the cash register to enter a command-input wait state; a simulated keystroke execution module 506, configured to: send simulated keystroke information to the cash register by using the HID protocol, to trigger the cash register, in the command-input wait state, to have the simulated keystroke information automatically input and executed, and through the execution, enable the cash register to obtain and install a payment capability extension program indicated by the simulated keystroke information; and an extended capability use module 508, configured to interact with the cash register based on the payment capability extension program to use a capability corresponding to the extended payment mode for the cash register.

[0096] Optionally, the external payment device does not have a keyboard and a mouse.

[0097] Optionally, the state trigger instruction includes a first shortcut sub-instruction, a second shortcut sub-instruction, and a simulated keystroke sub-instruction.

[0098] The simulated keystroke execution module 506 is configured to: send the first shortcut sub-instruction to the cash register by using the HID protocol, to trigger the cash register to display a desktop; send the second shortcut sub-instruction to the cash register to trigger the cash register

to display a running window on the desktop; and send the simulated keystroke sub-instruction to the cash register to trigger the simulated keystroke sub-instruction to be automatically input and executed in the running window, so that through the execution, the console of the cash register is opened to enter the command-input wait state.

[0099] Optionally, the simulated keystroke information includes a download address of the payment capability extension program.

[0100] The simulated keystroke execution module 506 is configured to enable the cash register to download the payment capability extension program from the download address and install the payment capability extension program.

[0101] Optionally, there are a plurality of external payment devices corresponding to a same payment provider, and the plurality of external payment devices are distributed at a plurality of different merchants.

[0102] Before the interacting with the cash register based on the payment capability extension program to use a capability corresponding to the extended payment mode for the cash register, the simulated keystroke execution module 506 is configured to: receive the simulated keystroke information delivered remotely by a server of the payment provider; and forward the simulated keystroke information to the cash register to complete the corresponding triggering for the cash register.

[0103] Optionally, after the determining whether the cash register is in a connected state, after it is determined that the cash register is in a connected state, if a payment interaction operation of a user on the external payment device is received, the extended capability use module 508 is configured to: determine whether the cash register has installed the payment capability extension program; and if no, generate a deferred settlement order for the payment interaction operation, and send, to the cash register by using the HID protocol, credential information corresponding to the deferred settlement order, so that after installing the payment capability extension program, the cash register requests, based on the payment capability extension program by using the credential information, corresponding settlement from the external payment device or a server of the external payment device.

[0104] Optionally, the extended capability use module 508 is configured to: send, to the cash register, a payment success trigger instruction that carries the credential information, to trigger the cash register to forcibly and successfully end a current payment collection process for the user;

and request the server of the payment provider to deliver the simulated keystroke information.

[0105] Optionally, the extended capability use module 508 is configured to trigger the cash register to automatically switch to a cash payment mode, and to automatically determine that the user has successfully paid an amount to be paid in cash this time.

[0106] Optionally, after the generating a deferred settlement order for the payment interaction operation, the extended capability use module 508 is configured to: determine a first amount to be paid that is estimated in the deferred settlement order, where the first amount to be paid is estimated to be less than a second amount to be paid that the user should actually pay this time; deduct the first amount to be paid from the user; and after the requesting, by using the credential information, corresponding settlement from the external payment device or a server of the external payment device, based on the request, determine a remaining amount to be paid and deduct the remaining amount to be paid from the user for settlement with a merchant corresponding to the cash register.

[0107] Optionally, the external payment device has a camera, and a to-be-paid product placement platform corresponding to the cash register is within a framing range of the camera.

[0108] The extended capability use module 508 is configured to: estimate a price of a product photographed within the framing range based on the product; determine, based on the price, a first amount to be paid that is less than and close to the price; and generate, for the payment interaction operation, a deferred settlement order indicating the first amount to be paid.

[0109] Optionally, the cash register uses a Windows operating system.

[0110] Optionally, the extended payment mode includes a near field communication-based payment mode.

[0111] FIG. 6 is a schematic diagram illustrating a structure of a payment capability extension processing device, according to one or more implementations of this specification. The apparatus is applied to an external payment device configured for a cash register, where the external payment device provides at least one extended payment mode that the cash register does not have, and the device includes at least one processor and a storage communicatively connected to the at least one processor, where the storage stores instructions executable by the at least one processor, and the instructions are executed by the at least one processor to enable the at least one processor to perform the following operations: determining whether the cash register is in a connected state; if yes, sending a state trigger instruction to the cash register by using an HID protocol, to trigger the cash register to open a console of the cash register to enter a command-input wait state; sending

simulated keystroke information to the cash register by using the HID protocol, to trigger the cash register, in the command-input wait state, to have the simulated keystroke information automatically input and executed, and through the execution, enabling the cash register to obtain and install a payment capability extension program indicated by the simulated keystroke information; and interacting with the cash register based on the payment capability extension program to use a capability corresponding to the extended payment mode for the cash register.

[0112] Based on the same idea, one or more implementations of this specification provide a non-volatile computer storage medium, applied to an external payment device configured for a cash register. The external payment device provides at least one extended payment mode that the cash register does not have. The storage medium stores computer-executable instructions, and the computer-executable instructions are set as follows: determining whether the cash register is in a connected state; if yes, sending a state trigger instruction to the cash register by using an HID protocol, to trigger the cash register to open a console of the cash register to enter a command-input wait state; sending simulated keystroke information to the cash register by using the HID protocol, to trigger the cash register, in the command-input wait state, to have the simulated keystroke information automatically input and executed, and through the execution, enabling the cash register to obtain and install a payment capability extension program indicated by the simulated keystroke information; and interacting with the cash register based on the payment capability extension program to use a capability corresponding to the extended payment mode for the cash register.

[0113] In the 1990s, whether a technical improvement is a hardware improvement (for example, an improvement to a circuit structure, such as a diode, a transistor, or a switch) or a software improvement (an improvement to a method procedure) can be clearly distinguished. However, as technologies develop, current improvements to many method procedures can be considered as direct improvements to hardware circuit structures. Almost all designers obtain the corresponding hardware circuit structure by programming the improved method process into the hardware circuit. Therefore, a method procedure can be improved by using a hardware entity module. For example, a programmable logic device (PLD) (for example, a field programmable gate array (FPGA)) is such an integrated circuit, and a logical function of the PLD is determined by a user through device programming. The designer performs programming to "integrate" a digital system into a PLD without requesting a chip manufacturer to design and produce an

application-specific integrated circuit chip. In addition, currently, instead of manually manufacturing an integrated circuit chip, such programming is mostly implemented by using "logic compiler" software. The "logic compiler" software is similar to a software compiler used to develop and write a program. Original code needs to be written in a particular programming language before being compiled. The language is referred to as a hardware description language (HDL). There are many HDLs such as the Advanced Boolean Expression Language (ABEL), the Altera Hardware Description Language (AHDL), Confluence, the Cornell University Programming Language (CUPL), HDCal, the Java Hardware Description Language (JHDL), Lava, Lola, MyHDL, PALASM, and the Ruby Hardware Description Language (RHDL). Currently, the Very-High-Speed Integrated Circuit Hardware Description Language (VHDL) and Verilog are most commonly used. It should also be clear to a person skilled in the art that a hardware circuit for implementing a logical method procedure can be easily obtained by performing slight logic programming on the method procedure by using the above-mentioned several hardware description languages and programming the method procedure into an integrated circuit.

[0114] A controller can be implemented by using any appropriate method. For example, the controller can be in a form of a microprocessor or a processor, a computer-readable medium that stores computer-readable program code (such as software or firmware) that can be executed by the microprocessor or the processor, a logic gate, a switch, an application-specific integrated circuit (ASIC), a programmable logic controller, or an embedded microcontroller. Examples of the controller include but are not limited to the following microcontrollers: ARC 625D, Atmel AT91SAM, Microchip PIC18F26K20, and Silicone Labs C8051F320. A memory controller can also be implemented as a part of control logic of a memory. A person skilled in the art also knows that in addition to implementing the controller by using only the computer-readable program code, logic programming can be performed on method steps to enable the controller to implement the same function in a form of a logic gate, a switch, an application-specific integrated circuit, a programmable logic controller, an embedded microcontroller, etc. Therefore, the controller can be considered as a hardware component, and an apparatus that is configured to implement various functions and that is included in the controller can also be considered as a structure in the hardware component. Alternatively, the apparatus configured to implement various functions can even be considered as both a software module implementing a method and a structure in the hardware component.

[0115] Systems, apparatuses, modules, or units that are set forth in the above-mentioned implementations can be embodied by a computer chip or an entity or by a product with a specific function. A typical implementation device is a computer. Specifically, the computer can be, for example, a personal computer, a laptop computer, a cellular phone, a camera phone, a smartphone, a personal digital assistant, a media player, a navigation device, an email device, a game console, a tablet computer, a wearable device, or a combination of any of these devices.

[0116] For ease of description, the above-mentioned apparatus is divided into units based on functions for separate description. Certainly, when this specification is implemented, the functions of the units can be implemented in one or more pieces of software and/or hardware.

[0117] A person skilled in the art should understand that implementations of this specification can be provided as methods, systems, or computer program products. Therefore, the implementations of this specification can use a form of hardware only implementations, software only implementations, or implementations with a combination of software and hardware. In addition, a form of a computer program product that is implemented on one or more computer-usable storage media (including but not limited to a disk storage, a CD-ROM, an optical storage, etc.) that include computer-usable program code can be used in the implementations of this specification.

[0118] This specification is described with reference to the flowcharts and/or block diagrams of the method, the device (system), and the computer program product according to implementations of this specification. It should be understood that computer program instructions can be used to implement each process and/or each block in the flowcharts and/or the block diagrams and a combination of a process and/or a block in the flowcharts and/or the block diagrams. These computer program instructions can be provided for a general-purpose computer, a special-purpose computer, an embedded processor, or a processor of another programmable data processing device to generate a machine, so that the instructions executed by the computer or the processor of the another programmable data processing device generate an apparatus for implementing a specific function in one or more procedures in the flowcharts and/or in one or more blocks in the block diagrams.

[0119] These computer program instructions can alternatively be stored in a computer-readable memory that can instruct the computer or the another programmable data processing device to work in a specific way, so the instructions stored in the computer-readable memory

generate an artifact that includes an instruction apparatus. The instruction apparatus implements a specific function in one or more procedures in the flowcharts and/or in one or more blocks in the block diagrams.

[0120] These computer program instructions can alternatively be loaded onto the computer or the another programmable data processing device, so that a series of operation steps are performed on the computer or the another programmable device, thereby generating computer-implemented processing. Therefore, the instructions executed on the computer or the another programmable device provide steps for implementing a specific function in one or more procedures in the flowcharts and/or in one or more blocks in the block diagrams.

[0121] In a typical configuration, a computing device includes one or more central processing units (CPU), input/output interfaces, network interfaces, and memories.

[0122] The memory can include a non-persistent memory, a random access memory (RAM), a non-volatile memory, and/or another form in a computer-readable medium, for example, a read-only memory (ROM) or a flash random access memory (flash RAM). The memory is an example of the computer-readable medium.

[0123] Computer-readable media, including permanent and non-permanent, removable and non-removable media, can be implemented by any method or technology for information storage. The information can be computer-readable instructions, a data structure, a program module, or other data. Examples of the computer storage medium include but are not limited to a phase-change random access memory (PRAM), a static random access memory (SRAM), a dynamic random access memory (DRAM), another type of random access memory (RAM), a read-only memory (ROM), an electrically erasable programmable read-only memory (EEPROM), a flash memory or another memory technology, a compact disc read-only memory (CD-ROM), a digital versatile disc (DVD) or another optical storage, a cassette magnetic tape, a magnetic tape/magnetic disk storage or another magnetic storage device, or any other non-transmission medium. The computer storage medium can be configured to store information accessible to a computing device. As described in this specification, the computer-readable medium does not include computer-readable transitory media such as a modulated data signal and a carrier.

[0124] It is worthwhile to further note that the terms "include", "comprise", or their any other variants are intended to cover a non-exclusive inclusion, so that a process, a method, a product, or a device that includes a list of elements not only includes those elements but also includes other

elements which are not expressly listed, or further includes elements inherent to such a process, method, product, or device. Without more constraints, an element preceded by "includes a …" does not preclude the presence of additional identical elements in the process, method, product, or device that includes the element.

[0125] This specification can be described in the general context of computer-executable instructions executed by a computer, for example, a program module. Generally, the program module includes a routine, a program, an object, a component, a data structure, etc. executing a specific task or implementing a specific abstract data type. This specification can alternatively be practiced in distributed computing environments. In the distributed computing environments, tasks are performed by remote processing devices connected through a communication network. In a distributed computing environment, the program module can be located in both local and remote computer storage media including storage devices.

[0126] The implementations of this specification are described in a progressive method. For same or similar parts in the implementations, references can be made to each other. Each implementation focuses on a difference from another implementation. Particularly, the apparatus, device, and non-volatile computer storage medium implementations are basically similar to the method implementation, and therefore is briefly described. For a related part, references can be made to some descriptions in the method implementation.

[0127] Specific implementations of this specification are described above. Other implementations fall within the scope of the appended claims. In some cases, the actions or steps described in the claims can be performed in an order different from that in the implementations and desired results can still be achieved. In addition, the process depicted in the accompanying drawings does not necessarily require the shown particular execution order to achieve the desired results. In some implementations, multitasking and parallel processing are feasible or may be advantageous.

[0128] The above-mentioned content is merely one or more implementations of this specification, and is not intended to limit this specification. A person skilled in the art knows that one or more implementations of this specification can have various modifications and changes. Any modification, equivalent replacement, improvement, etc. made within the spirit and principle of one or more implementations of this specification shall fall within the scope of the claims of this specification.

CLAIMS

What is claimed is:

1. A payment capability extension processing method, applied to an external payment device configured for a cash register, wherein the external payment device provides at least one extended payment mode that the cash register does not have, and the method comprises:

determining whether the cash register is in a connected state;

if yes, sending a state trigger instruction to the cash register by using an HID protocol, to trigger the cash register to open a console of the cash register to enter a command-input wait state;

sending simulated keystroke information to the cash register by using the HID protocol, to trigger the cash register, in the command-input wait state, to have the simulated keystroke information automatically input and executed, and through the execution, enabling the cash register to obtain and install a payment capability extension program indicated by the simulated keystroke information; and

interacting with the cash register based on the payment capability extension program to use a capability corresponding to the extended payment mode for the cash register.

2. The method according to claim 1, wherein the external payment device does not have a keyboard and a mouse.

3. The method according to claim 1, wherein the state trigger instruction comprises a first shortcut sub-instruction, a second shortcut sub-instruction, and a simulated keystroke sub-instruction; and

the sending a state trigger instruction to the cash register by using an HID protocol, to trigger the cash register to open a console of the cash register to enter a command-input wait state specifically comprises:

sending the first shortcut sub-instruction to the cash register by using the HID protocol, to trigger the cash register to display a desktop;

sending the second shortcut sub-instruction to the cash register to trigger the cash register to display a command-line running window on the desktop; and

sending the simulated keystroke sub-instruction to the cash register to trigger the simulated keystroke sub-instruction to be automatically input and executed in the command-line running window, so that through the execution, the console of the cash register is opened to enter the

command-input wait state.

4. The method according to claim 1, wherein the simulated keystroke information comprises a download address of the payment capability extension program; and

the enabling the cash register to obtain and install a payment capability extension program indicated by the simulated keystroke information specifically comprises:

enabling the cash register to download the payment capability extension program from the download address and install the payment capability extension program.

5. The method according to claim 1, wherein there are a plurality of external payment devices corresponding to a same payment provider, and the plurality of external payment devices are distributed at a plurality of different merchants; and

before the interacting with the cash register based on the payment capability extension program to use a capability corresponding to the extended payment mode for the cash register, the method further comprises:

receiving the simulated keystroke information delivered remotely by a server of the payment provider; and

forwarding the simulated keystroke information to the cash register to complete the corresponding triggering for the cash register.

6. The method according to claim 1 or 5, wherein after the determining whether the cash register is in a connected state, the method further comprises:

after it is determined that the cash register is in a connected state, if a payment interaction operation of a user on the external payment device is received, determining whether the cash register has installed the payment capability extension program; and

if no, generating a deferred settlement order for the payment interaction operation, and sending, to the cash register by using the HID protocol, credential information corresponding to the deferred settlement order, so that after installing the payment capability extension program, the cash register requests, based on the payment capability extension program by using the credential information, corresponding settlement from the external payment device or a server of a payment provider corresponding to the external payment device.

7. The method according to claim 6, wherein the sending, to the cash register, credential information corresponding to the deferred settlement order specifically comprises:

sending, to the cash register, a payment success trigger instruction that carries the credential

information, to trigger the cash register to forcibly and successfully end a current payment collection process for the user; and

requesting the server of the payment provider to deliver the simulated keystroke information.

8. The method according to claim 7, wherein the triggering the cash register to forcibly and successfully end a current payment collection process for the user specifically comprises:

triggering the cash register to automatically switch to a cash payment mode, and to automatically determine that the user has successfully paid an amount to be paid in cash this time.

9. The method according to claim 7, wherein after the generating a deferred settlement order for the payment interaction operation, the method further comprises:

determining a first amount to be paid that is estimated in the deferred settlement order, wherein the first amount to be paid is estimated to be less than a second amount to be paid that the user should actually pay this time; and

deducting the first amount to be paid from the user; and

after the requesting, by using the credential information, corresponding settlement from the external payment device or a server of a payment provider corresponding to the external payment device, the method further comprises:

based on the request, determining a remaining amount to be paid and deducting the remaining amount to be paid from the user for settlement with a merchant corresponding to the cash register.

10. The method according to claim 7, wherein the external payment device has a camera, and a to-be-paid product placement platform corresponding to the cash register is within a framing range of the camera; and

the generating a deferred settlement order for the payment interaction operation specifically comprises:

estimating a price of a product photographed within the framing range based on the product; and

determining, based on the price, a first amount to be paid that is less than and close to the price; and

generating, for the payment interaction operation, a deferred settlement order indicating the first amount to be paid.

11. The method according to claim 3, wherein the cash register uses a Windows operating system.

12. The method according to any one of claims 1 to 5, wherein the extended payment mode comprises a near field communication-based payment mode.

13. A payment capability extension processing apparatus, applied to an external payment device configured for a cash register, wherein the external payment device provides at least one extended payment mode that the cash register does not have, and the apparatus comprises:

a connection state confirmation module, configured to determine whether the cash register is in a connected state;

an input state trigger module, configured to: if yes, send a state trigger instruction to the cash register by using an HID protocol, to trigger the cash register to open a console of the cash register to enter a command-input wait state;

a simulated keystroke execution module, configured to: send simulated keystroke information to the cash register by using the HID protocol, to trigger the cash register, in the command-input wait state, to have the simulated keystroke information automatically input and executed, and through the execution, enable the cash register to obtain and install a payment capability extension program indicated by the simulated keystroke information; and

an extended capability use module, configured to interact with the cash register based on the payment capability extension program to use a capability corresponding to the extended payment mode for the cash register.

14. The apparatus according to claim 13, wherein the external payment device does not have a keyboard and a mouse.

15. The apparatus according to claim 13, wherein the state trigger instruction comprises a first shortcut sub-instruction, a second shortcut sub-instruction, and a simulated keystroke sub-instruction; and

the simulated keystroke execution module is configured to: send the first shortcut sub-instruction to the cash register by using the HID protocol, to trigger the cash register to display a desktop;

send the second shortcut sub-instruction to the cash register to trigger the cash register to display a command-line running window on the desktop; and

send the simulated keystroke sub-instruction to the cash register to trigger the simulated keystroke sub-instruction to be automatically input and executed in the command-line running window, so that through the execution, the console of the cash register is opened to enter the

command-input wait state.

16. The apparatus according to claim 13, wherein the simulated keystroke information comprises a download address of the payment capability extension program; and

the simulated keystroke execution module is configured to enable the cash register to download the payment capability extension program from the download address and install the payment capability extension program.

17. The apparatus according to claim 13, wherein there are a plurality of external payment devices corresponding to a same payment provider, and the plurality of external payment devices are distributed at a plurality of different merchants; and

before the interacting with the cash register based on the payment capability extension program to use a capability corresponding to the extended payment mode for the cash register, the simulated keystroke execution module is configured to: receive the simulated keystroke information delivered remotely by a server of the payment provider; and

forward the simulated keystroke information to the cash register to complete the corresponding triggering for the cash register.

18. The apparatus according to claim 13 or 17, wherein after the determining whether the cash register is in a connected state, after it is determined that the cash register is in a connected state, if a payment interaction operation of a user on the external payment device is received, the extended capability use module is configured to: determine whether the cash register has installed the payment capability extension program; and

if no, generate a deferred settlement order for the payment interaction operation, and send, to the cash register by using the HID protocol, credential information corresponding to the deferred settlement order, so that after installing the payment capability extension program, the cash register requests, based on the payment capability extension program by using the credential information, corresponding settlement from the external payment device or a server of a payment provider corresponding to the external payment device.

19. The apparatus according to claim 18, wherein the extended capability use module is configured to: send, to the cash register, a payment success trigger instruction that carries the credential information, to trigger the cash register to forcibly and successfully end a current payment collection process for the user; and

request the server of the payment provider to deliver the simulated keystroke information.

20. The apparatus according to claim 19, wherein the extended capability use module is configured to trigger the cash register to automatically switch to a cash payment mode, and to automatically determine that the user has successfully paid an amount to be paid in cash this time.

21. The apparatus according to claim 19, wherein after the generating a deferred settlement order for the payment interaction operation, the extended capability use module is configured to: determine a first amount to be paid that is estimated in the deferred settlement order, wherein the first amount to be paid is estimated to be less than a second amount to be paid that the user should actually pay this time;

deduct the first amount to be paid from the user; and

after the requesting, by using the credential information, corresponding settlement from the external payment device or a server of a payment provider corresponding to the external payment device, based on the request, determine a remaining amount to be paid and deduct the remaining amount to be paid from the user for settlement with a merchant corresponding to the cash register.

22. The apparatus according to claim 19, wherein the external payment device has a camera, and a to-be-paid product placement platform corresponding to the cash register is within a framing range of the camera; and

the extended capability use module is configured to: estimate a price of a product photographed within the framing range based on the product;

determine, based on the price, a first amount to be paid that is less than and close to the price; and

generate, for the payment interaction operation, a deferred settlement order indicating the first amount to be paid.

23. The apparatus according to claim 15, wherein the cash register uses a Windows operating system.

24. The apparatus according to any one of claims 13 to 17, wherein the extended payment mode comprises a near field communication-based payment mode.

25. A payment capability extension processing device, applied to an external payment device configured for a cash register, wherein the external payment device provides at least one extended payment mode that the cash register does not have, and the device comprises:

at least one processor; and

a storage communicatively connected to the at least one processor, wherein

the storage stores instructions executable by the at least one processor, and the instructions are executed by the at least one processor to enable the at least one processor to perform the following operations:

determining whether the cash register is in a connected state;

if yes, sending a state trigger instruction to the cash register by using an HID protocol, to trigger the cash register to open a console of the cash register to enter a command-input wait state;

sending simulated keystroke information to the cash register by using the HID protocol, to trigger the cash register, in the command-input wait state, to have the simulated keystroke information automatically input and executed, and through the execution, enabling the cash register to obtain and install a payment capability extension program indicated by the simulated keystroke information; and

interacting with the cash register based on the payment capability extension program to use a capability corresponding to the extended payment mode for the cash register.