A PROTECTIVE SLEEVE

FIELD OF INVENTION

The invention relates to an electronic device. More particularly, the invention relates to a protective sleeve for electronic device.

BACKGROUND OF THE INVENTION

The advancement of technologies has allowed a bank salesman to travel to their client's residence or meeting their client in public places such as shopping complexes, malls, merchants' stores, mass transit stations, and etc, to assist their client in applying bank cards or bank accounts on the spot. Conventionally, such process requires a computing device, a portable biometric device, and a card reader for authenticating and verifying the identity of their client.

There are a few patented technologies over the prior art relating to aforementioned system. Of interest in respect to a portable computer system having wireless communication functionality and global geographic positioning functionality is US20080004039A1. This patent discloses a portable computer system including wireless communication functionality and global geographic positioning functionality includes a processor coupled to a wireless module, and a global positioning unit coupled to the wireless module and the processor. The wireless module may communicate with a wireless network via a wireless connection. The global positioning unit may be configured to receive geographic location information and to determine a current geographic location of the portable computer system based upon the received geographic location information. The processor may execute system

software that may be configured to reconfigure system configuration settings such as security and authentication settings, and system clock settings, for example, dependent upon changes in the current geographic location information. In addition, an authenticated administrative level user may send one or more commands to the wireless module.

Another handheld mobile device with USB hard drive and optional biometric scanner, and systems is disclosed in US20130167226A1. This patent discloses Mobile handheld communication devices such as cellular and/or smart phones are equipped with a detachable USB drive, and optionally, a biometric scanner and/or an electronic release mechanism and/or circuitry. The communication device has a housing, a central processing unit (CPU) within the housing, a memory controller within the housing and coupled to the CPU, and a universal serial bus (USB) hard drive that electrically communicates with the memory controller. The USB hard drive has an outer surface or casing that is integrated and/or integratable with the housing. The USB device may include a USB interface, a hard drive that communicates through the USB interface, and a biometric sensor. The biometric sensor establishes or authorizes electronic communication between the hard drive and the USB interface when biometric data obtained with the biometric sensor matches data stored in the hard drive.

The main drawback of these portable systems is that technical issues may occur while the user assembles those portable components. Furthermore, the user may also forget to bring one of those portable components and causes the application process to be delayed. Therefore, a need exist for the prior system to integrate those necessary devices together to reduce the aforementioned problems and the present invention provides such an apparatus and system thereof.

SUMMARY OF INVENTION

The invention provides a protective sleeve for an electronic device comprises: a body having a recess for accommodating the electronic device; a circuit board embedded in the body, having one or more input and/or output ports; a connector tab extended to the recess for contacting with a socket connector of the electronic device; and means for retrieving biometric information of a person; wherein the biometric information retrieval means and the connector tab are connected to the input and/or output ports of the circuit board for establishing a communication link between the biometric information retrieval means and the electronic device when the electronic device is attached to the connector tab and seated in the recess. The electronic device can be a personal digital assistants (PDA), smart phones, tablets, laptops, netbooks, phablets, phoblets, iPad, or any suitable means which capable of processing data and performing data transmission.

In one embodiment of the invention, the protective sleeve further comprises a socket for receiving a card and the socket is coupled with a card reader to retrieve information stored in the card. Preferably, the card reader is connected to the input and/or output ports of the circuit board so that a communication link between the card reader and the electronic device can be established. Alternatively, the card reader is embedded in the body for retrieving information from a RFID card wirelessly.

In another embodiment of the invention, the protective sleeve further comprises at least one external connector for connecting one or more external electronic devices. Preferably, the at least one external connector are connected to the input and/or output ports of the circuit board so that a communication link between the external electronic devices and the electronic device can be established.

Advantageously, the biometric information retrieval means can be a fingerprint device, a iris device, a voice recognition device, a face recognition devices, a hand geometric reader, finger vein reader, hand palm reader, or in any combination thereof.

Advantageously, the external electronic device can be a SIM card reader, a passport reader, a printer, a scanner, a cash or card collecting machine, a cash or card dispensing machine, a card embosser machine, a pin encryption device, a kiosk terminal, a cheque collector, a cheque scanner, a cheque printer, or in any combination thereof.

Advantageously, the circuit board can include a microcontroller incorporated with: an electronic device communication module for establishing signal transmission between the electronic device and the circuit board, a biometric reading module for establishing signal transmission between the biometric information retrieval means and the circuit board, a card reading module for establishing signal transmission between the card reader and the circuit board, and an external reading module for establishing signal transmission between the external electronic device and the circuit board. In addition, the circuit board can be powered by an external power sources. Optionally, the circuit can be powered by an internal power source rechargeable through the external power source connector.

At least one of the preceding objects is met, in whole or in part, by the present invention, in which the embodiment of the present invention describes an electronic system for personal authentication comprises: a electronic device connected to a communication network and attached to a protective sleeve as described above; and a server communicating with the electronic device, configured to obtain biometric information of a person from the electronic device, to authenticate the person via the obtained biometric information, and to send a feedback signal to the electronic device. Alternatively, the server can be configured to transmit relevant biometric information

of a person to the electronic device for authentication and verification. Furthermore, the retrieved biometric information can be directly compared with those stored in the card.

One skilled in the art will readily appreciate that the invention is well adapted to carry out the objects and obtain the ends and advantages mentioned, as well as those inherent therein. The embodiments described herein are not intended as limitations on the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

For the purpose of facilitating an understanding of the invention, there is illustrated in the accompanying drawing the preferred embodiments from an inspection of which when considered in connection with the following description, the invention, its construction and operation and many of its advantages would be readily understood and appreciated.

Figure 1 is a perspective diagram illustrating a protective sleeve which embodies therein the principle features of the invention.

Figure 2 is another perspective diagram illustrating the protective sleeve.

Figure 3 is a schematic block diagram illustrating the connections between the electronic components of the protective sleeve.

Figure 4 is schematic block diagram illustrating the microcontroller of the protective sleeve.

DETAILED DESCRIPTION OF THE INVENTION

The invention will now be described in greater detail, by way of example, with reference to the drawings.

Referring to figure 1 and figure 2, the protective sleeve (1) as illustrated therein comprises a generally rectangular body (2) having a recess for accommodating an electronic device (3), a fingerprint sensor (4) embedded on the body (2), a socket (5) extending inwardly from the bottom side of the body (2) allowing a card to be inserted and the socket (5) has a card reader integrated for retrieving information from the card, an external socket connector (6) for receiving external electronic device, and a power socket (7) to receive a power adapter for external power supply. Preferably, the card is a personal identity card.

The Personal Identity card can be any types of electronic card embedded with any suitable ID card technology for storing personal information and being readable by the card reader. It should be noted that the communication between the Personal Identity card and the card reader can be established through a wireless communication if the Personal Identity card is embedded with RFID technologies or any other suitable means for establishing wireless communication. The electronic device (3) can be a personal digital assistants (PDA), smart phones, tablets, laptops, netbooks, phablets, phoblets, iPad, or any suitable means which capable of processing data and performing data transmission. Furthermore, the fingerprint sensor can be replaced by a iris device, a voice recognition device, a face recognition devices, a hand geometric reader, finger vein reader, hand palm reader, or in any combination thereof.

Referring to figure 3, the protective sleeve (1) includes a circuit board (8) embedded in its body (2), having a electronic device USB communication layer (10) permitting

the electronic device (3) to be connected to the circuit board (8), a microcontroller (9), at least one universal asynchronous receiver and/or transmitter (UART) communication layer (11) for connecting the Personal Identity card reader (5), fingerprint sensor (4), and other external electronic devices (13) such as SIM card reader, passport reader, printer, scanner, cash or card collecting machine, cash or card dispensing machine, card embosser machine, pin encryption device, kiosk terminal, cheque collector, cheque scanner, cheque printer and etc, and a charging circuit (12) for supplying electrical power. In the event if the electronic device is an iPad, due the natural of iPad USB connector (10) being able to transmit electrical power, the iPad device (3) itself can act as a secondary power supply source. The invention can further connected to a third party system such as internet banking system, virtual banking system, virtual teller machine, mobile sales system, ATM machine, cash deposit machine, instant acquisition system, card dispenser, cheque collector, cheque printing device, cheque scanning device, instant card embosser, bill payment system, branch delivery system and etc.

Preferably, the microcontroller (9) consists of a microchip which processes all communication messages. The microchip has 4 UARTs, the first 3 UARTs are directly linked to the communication layers (11) and the fourth UART is linked to a multiplexer so that an additional 4 UARTs can be provided to the circuit board (8). The first 3 UARTs are configured to perform the function of transmit data, receive data, clear to send, and request to send, whereas the additional 4 UARTs are configured to only perform the function of transmit data and receive data. The UART communication layer (11) is designed to allow multiple types of external electronic devices (13) to be plugged in. The total number of external electronic device that can be connected to the circuit board (8) is limited by the total number of UARTs of the microcontroller (9). However, the total number of UARTs can be increased by connecting an additional microcontroller (9).

Referring to figure 4, the microcontroller (9) is provided with an electronic device connection module (14), a biometric reading module (15), a card reading module (16), a routing module (17), a battery module (18), and an external electronic device connection module (19). When a command is triggered by the electronic device (3), the electronic device connection module (14) will response to parse the messages and perform either a microcontroller setup process, a routing process, a card reading process, or biometric reading process depending on the instructions of the command.

If the instruction is to perform a card reading process or biometric reading process, the microcontroller (9) will activate the fingerprint device (4) or the card reader (5). Once the fingerprint device (4) or the card reader (5) has retrieved the information, the retrieved information will be forwarded back to the electronic device (3) through the modules. All the transmissions of data are governed by the routing protocol of the routing module (17).

The battery module (18) is configured to manage the power distribution of the power sources, preferably a battery which can be recharged through the power socket (7). It can also be used for monitoring the battery status and battery power level.

In operation, the user firstly triggers the operation of the fingerprint device (4) and the Personal Identity card device (5) through the electronic device (3). Upon retrieving biometric information and identity information, the retrieved information is transmitted to the electronic device (3) through the circuit board (8). In the event of the electronic device (3) is connected to internet, the information can be forwarded to a server for authentication and verification purposes. The server may further send a feedback message to the electronic device (3). Instead of uploading the retrieved information, the electronic device (3) may also download relevant information to perform a local authentication or verification. Alternatively, the electronic device (3) can directly compare the retrieving biometric information with those retrieved from

the user’s Personal Identity card.

The present disclosure includes as contained in the appended claims, as well as that of the foregoing description. Although this invention has been described in its preferred form with a degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangements of parts may be resorted to without departing from the scope of the invention.

CLAIMS

1. A protective sleeve (1) of an electronic device (3) for use in a banking industry comprising:

a body (2) having a recess for accommodating the electronic device (3);

a circuit board (8) embedded in the body (2), having one or more input and/or output ports;

a connector tab extended to the recess for contacting with a socket connector of the electronic device (3);

means (4) for retrieving biometric information of a person;

a card reader is embedded in the body for contactlessly retrieving information from a RFID card; and

at least one external connector (6) for connecting one or more external electronic devices (13);

wherein the biometric information retrieval means (4), the card reader, the external connector (6) and the connector tab are connected to the input and/or output ports of the circuit board (8) for establishing a communication link between the biometric information retrieval means (4), the card reader, the external connector (6) and the electronic device (3) when the electronic device (3) is attached to the connector tab and seated in the recess;

characterized in that the circuit board (8) includes a microcontroller having four UARTs, the first three UARTs are directly linked to a UART communication layer (11) and the fourth UART is linked to additional four UARTs via a multiplexer..

2. A protective sleeve (1) according to claim 1, further comprising a socket (5) for receiving a card, the socket (5) is coupled with the card reader to retrieve information stored in the card.

3. A protective sleeve (1) according to claim 1 or claim 2, wherein the first three

UARTs are configured to perform the function of transmit data, receive data, clear to send, and request to send, whereas the additional four UARTs are only configured to perform the function of transmit data and receive data.

4. A protective sleeve (1) according to any one of claims 1 to 3, wherein the biometric information retrieval means (4) is a fingerprint device, a iris device, a voice recognition device, a face recognition devices, a hand geometric reader, finger vein reader, hand palm reader, or in any combination thereof.

5. A protective sleeve (1) according to any one of claims 1 to 4, wherein the external electronic device (13) is a SIM card reader, a passport reader, a printer, a scanner, a cash or card collecting machine, a cash or card dispensing machine, a card embosser machine, a pin encryption device, a kiosk terminal, a cheque collector, a cheque scanner, a cheque printer, or in any combination thereof.

6. A protective sleeve (1) according to any one of claims 1 to 5, wherein the microcontroller (9) incorporates with:
an electronic device communication module (14) for establishing signal transmission between the electronic device (3) and the circuit board (8),
a biometric reading module (15) for establishing signal transmission between the biometric information retrieval means (4) and the circuit board (8),
a card reading module (16) for establishing signal transmission between the card reader and the circuit board (8), and
an external reading module (19) for establishing signal transmission between the external electronic device (13) and the circuit board (8).

7. A protective sleeve (1) according to claim 6, wherein the circuit board (8) is powered by an external power source through an external power source connector (7).

8. A protective sleeve (1) according to claim 6, wherein the circuit board (8) is powered by an internal power source rechargeable through the external power source connector (7).

9. A protective sleeve (1) according to any one of claims 1 to 8, wherein the electronic device (3) is a personal digital assistants (PDA), smart phones, tablets, laptops, netbooks, phablets, phoblets, iPad, or any suitable means which capable of processing data and performing data transmission.

10. An electronic (1) according to any one of claims 1 to 9, wherein the electronic device (3) is in communication with a server via a communication network, configured to obtain biometric information of a person from the electronic device (3), to authenticate the person via the obtained biometric information, and to send a feedback signal to the electronic device (3).

11. A protective sleeve (1) according to any one of claims 1 to 10, wherein the electronic device (3) is in communication with a server via a communication network, configured to transmit relevant biometric information of a person to the electronic device (3) for authentication and verification.