

a USB interface **2122** in communication with the protocol/sequence controller **2108**. In this exemplary embodiment, the USB interface **2122** may be a RS22 serial data interface. Alternatively, the RFID reader **104** may include a serial interface such as, for example, a RS232 interface in communication with the protocol/sequence controller **2108**. In either embodiment, the interface may be in communication with the protocol/sequence controller **2108** for providing user account data from the RF module **20** for transaction processing, using, for example, the transaction processing method of **FIG. 20**.

[**0137**] To facilitate the user account data transfer from the RF module **20** to the interface **2122**, the mobile phone **300** may be equipped with a USB interface **304** (shown in **FIG. 13**) or the like. The mobile device USB interface **304** may be included in the mobile device **300**, when the phone **300** is manufactured and prior to providing the phone to the end user. The mobile device USB interface **304** may be placed in communication with the USB interface **2122**. In that regard, USB interface **304** may be compatible with USB interface **2122**, such that the data received from the mobile phone **300** is recognizable by the RFID reader **104**.

[**0138**] In a typical embodiment, the RF module **20** is in physical and logical communication with the mobile device (e.g., mobile phone **300**) microprocessor **1702**, for transmitting user account data from the RF module **20** to the RFID reader **104**. The module protocol/sequence controller **208** may retrieve the user account data from the module database **212** and provide the data to the microprocessor **1702**. The microprocessor **1702** may then provide the user account data to the USB interface **304** for providing to the RFID reader USB interface **2122**. USB interface **2122** may receive the user account data and provide the data to a merchant POS **110** for processing as described above.

[**0139**] It should be noted that although the present invention is described with respect to the mobile device USB being connected to a USB of a RFID reader **104**, the invention is not so limited. For example, the mobile device USB may be connected to a similar port (e.g., USB port) included on a kiosk, or personal computer, stand alone computing device, or the like. In this case, the user account data may be transmitted from the mobile device to the kiosk or other computer and to an offline or online account issuer or merchant system for transaction processing via an open or closed network. In this instance, an "open" network is one susceptible to eavesdropping.

[**0140**] Placing the RF module **20** in physical and logical communication has the advantage in that the RF module **20** may be powered by a power source of the mobile device. That is, the RF module **20** may share a similar power source as does the functional components of the mobile device. Another advantage is that the mobile device's user interface may be used to verify secondary information from the end user.

[**0141**] For example, the RF module **20** may need to be switched on prior to use for transaction completion. In this case, the end user may use the mobile device user interface (e.g., keyboard **306**) to enter a alphanumeric code for powering the RF module **20**. The alphanumeric code may be received by the microprocessor **1702** and forwarded to the protocol sequence controller **2108** to commence a transaction using the RF module **20**. In another instance, the end

user may provide an alphanumeric code in response to a request from the RFID reader **104** for further authentication of the end user's identity. For example, the RFID reader **104** may send a message to the RF module **20** that a secondary form of identification, such as a personal identification number (PIN), is required before a transaction may proceed. The RFID reader authentication circuit **2110** may receive a signal from the RF module **20** and recognize that the end user's identity may need to be verified using a PIN. The authentication circuit **2110** may then provide the RF module **20** with a request for the end user to provide the PIN before the RF module provides the user account data to the RFID reader **104**.

[**0142**] In one exemplary embodiment, the reader **104** may provide the request for a PIN to the RF module **20** at antenna **204**. The RF module transponder **214** may receive the request and provide the request for PIN to the protocol/sequence controller **208**. The protocol/sequence controller **208** may provide the request to the mobile phone microprocessor **1702**, and the microprocessor **1702** may send a prompt to the mobile device display unit, such as the display unit **308** of mobile phone **300**. The display unit **308** may be any conventional display units that are used with mobile personal communication devices, such as, mobile phones, PDAs, personal computers or the like. Suitable display units which may be used with the invention include a liquid crystal display unit (LCD), image display device, or the like. The display unit may be any display unit capable of displaying messages to the end user.

[**0143**] The end user may then be permitted to input the PIN using the keypad user interface **306**. The PIN may be provided to the microprocessor **1702**, which may provide the PIN to the module protocol/sequence controller **208**. The protocol/sequence controller **208** may provide the PIN to the module authentication circuit **210**, which may retrieve from the database **212** (or from encryption circuit **216**) a PIN verification key and use the verification key to authenticate the PIN. The authentication circuit **210** may use any authentication method as is found in the art, or disclosed herein to verify the PIN. In one exemplary embodiment, the authentication circuit **210** may compare the PIN provided by the end user to the PIN verification key using any comparison method permitting the authenticity of the PIN to be verified.

[**0144**] Alternatively, the RF module protocol/sequence controller **208** may provide the PIN to the RFID reader **104** for authentication. The RFID reader authentication circuit **210** may receive the PIN and verify the PIN in a similar manner as is discussed with respect to the RF module **20**.

[**0145**] Notably, the method by which the end user provides the PIN to the microprocessor **1702** may vary. For example, the user interface may include a touch screen display and a stylus as is found in the art. Additionally, the secondary form of identification may be provided using biometric or voice recognition technology. The mobile device may receive the biometric or voice data and convert it into data recognizable by the RF module protocol/sequence controller **208** for verification using the methods discussed above.

[**0146**] The preceding detailed description of exemplary embodiments of the invention makes reference to the accompanying drawings, which show the exemplary embodiment by way of illustration. While these exemplary