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(54) **SENDING AND ACQUIRING WIFI NETWORKING INFORMATION**

(71) Applicant: **Alibaba Group Holding Limited**, Grand Cayman (KY)

(72) Inventors: **Sunliang Liu**, Hangzhou (CN); **Ming Zhang**, Hangzhou (CN)

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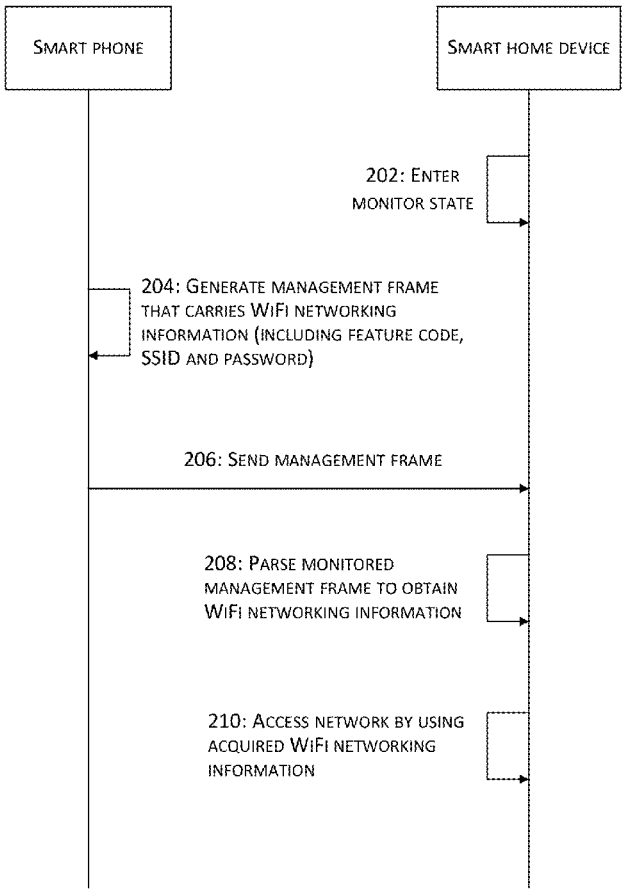
(57) **ABSTRACT**

A method for sending and acquiring WiFi networking information including generating, by a first WiFi-type smart device, a management frame that carries WiFi networking information; sending the management frame to be monitored by a second WiFi-type smart device; monitoring, by the second WiFi-type smart device, the management frame sent by the first WiFi-type smart device; and parsing the management frame to obtain the WiFi networking information, so that a network may be accessed by using the obtained WiFi networking information. The techniques of the present disclosure may reduce the time delay and technological complexity of a WiFi-type smart device in accessing a network.



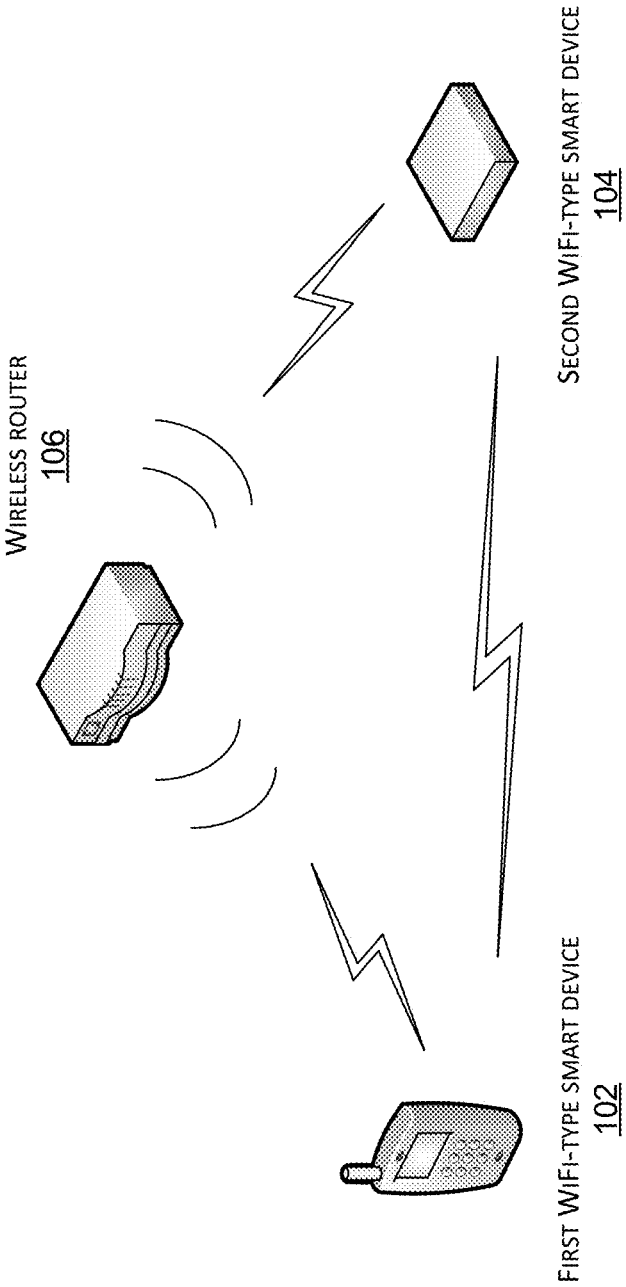

WIRELESS ROUTER
106
SECOND WIFI-TYPE SMART DEVICE
104
FIRST WIFI-TYPE SMART DEVICE
102

FIG. 1

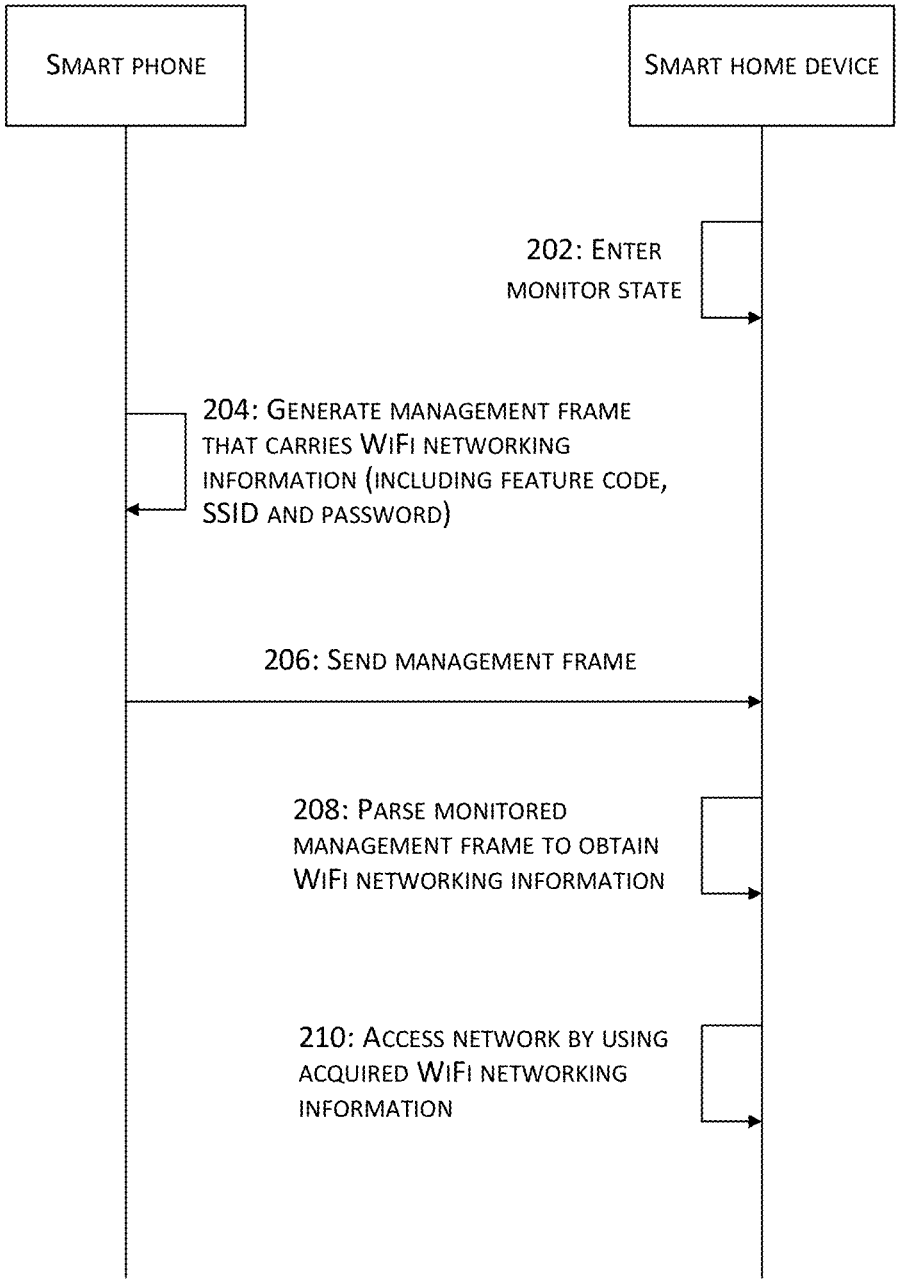

SMART PHONE
SMART HOME DEVICE
202: ENTER MONITOR STATE
204: GENERATE MANAGEMENT FRAME THAT CARRIES WIFI NETWORKING INFORMATION (INCLUDING FEATURE CODE, SSID AND PASSWORD)
206: SEND MANAGEMENT FRAME
208: PARSE MONITORED MANAGEMENT FRAME TO OBTAIN WIFI NETWORKING INFORMATION
210: ACCESS NETWORK BY USING ACQUIRED WIFI NETWORKING INFORMATION

FIG. 2

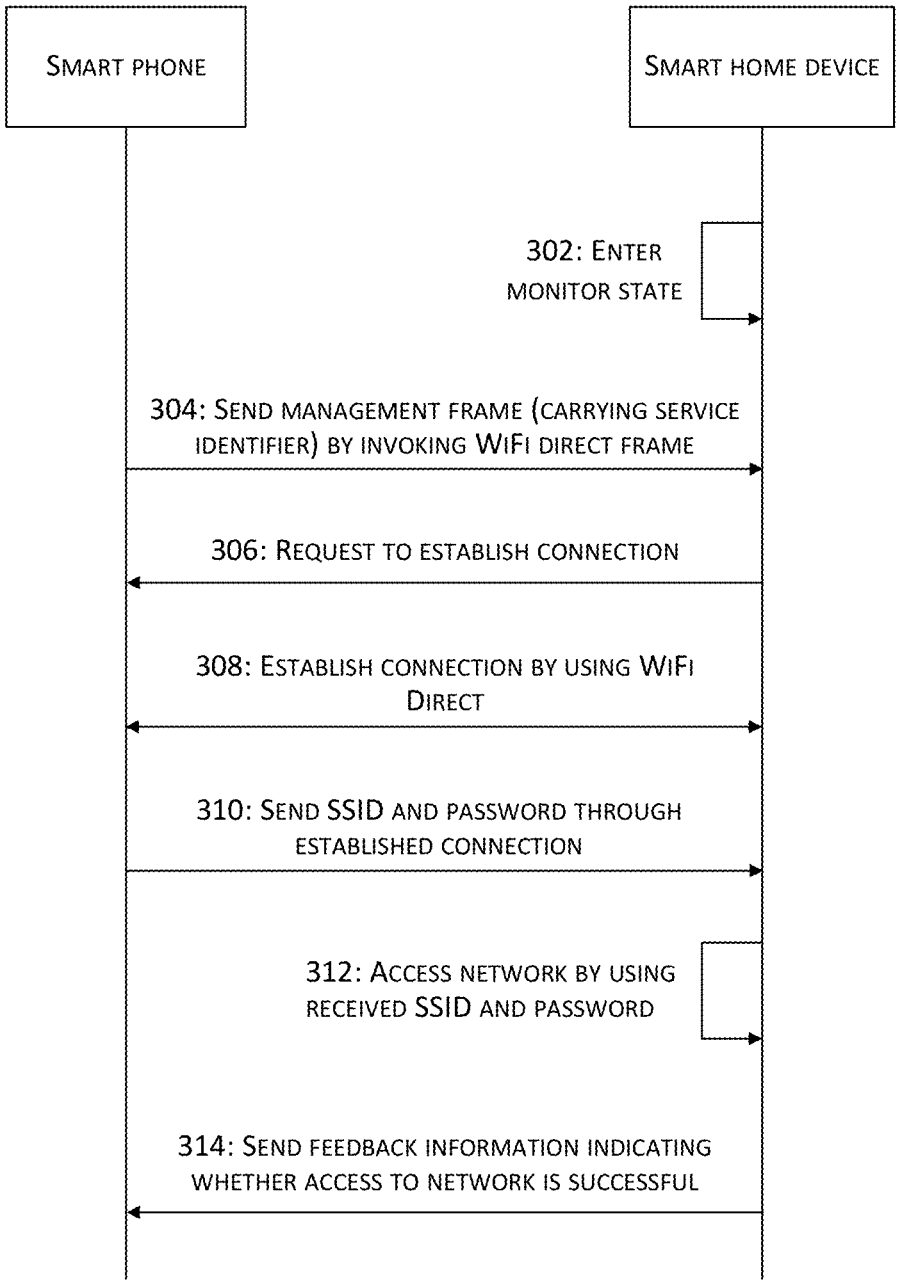

SMART PHONE
SMART HOME DEVICE
302: ENTER MONITOR STATE
304: SEND MANAGEMENT FRAME (CARRYING SERVICE IDENTIFIER) BY INVOKING WIFI DIRECT FRAME
306: REQUEST TO ESTABLISH CONNECTION
308: ESTABLISH CONNECTION BY USING WIFI DIRECT
310: SEND SSID AND PASSWORD THROUGH ESTABLISHED CONNECTION
312: ACCESS NETWORK BY USING RECEIVED SSID AND PASSWORD
314: SEND FEEDBACK INFORMATION INDICATING WHETHER ACCESS TO NETWORK IS SUCCESSFUL

FIG. 3

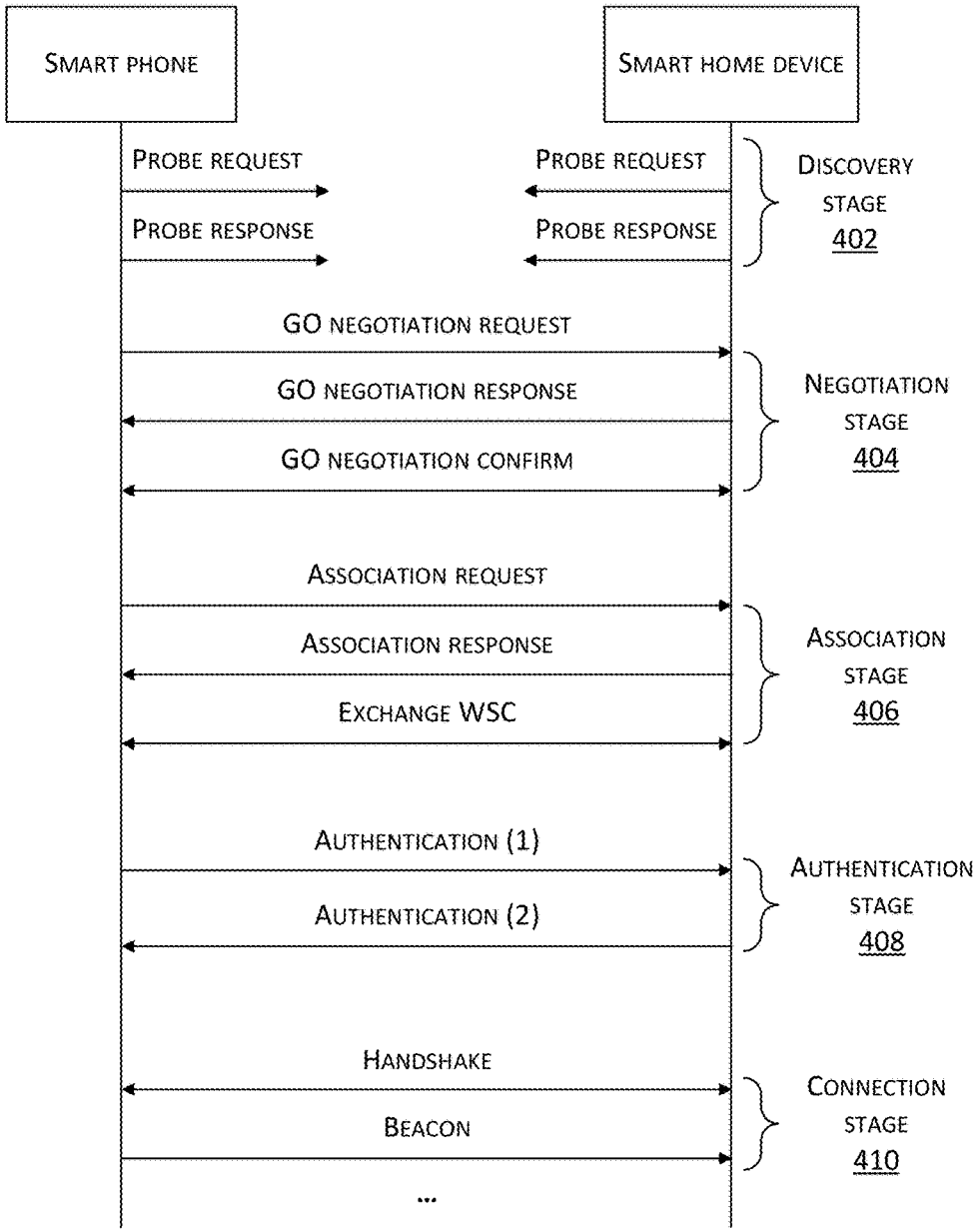

SMART PHONE
SMART HOME DEVICE
PROBE REQUEST
PROBE REQUEST
PROBE RESPONSE
PROBE RESPONSE
DISCOVERY STAGE 402
GO NEGOTIATION REQUEST
GO NEGOTIATION RESPONSE
GO NEGOTIATION CONFIRM
NEGOTIATION STAGE 404
ASSOCIATION REQUEST
ASSOCIATION RESPONSE
EXCHANGE WSC
ASSOCIATION STAGE 406
AUTHENTICATION (1)
AUTHENTICATION (2)
AUTHENTICATION STAGE 408
HANDSHAKE
BEACON
...
CONNECTION STAGE 410

FIG. 4

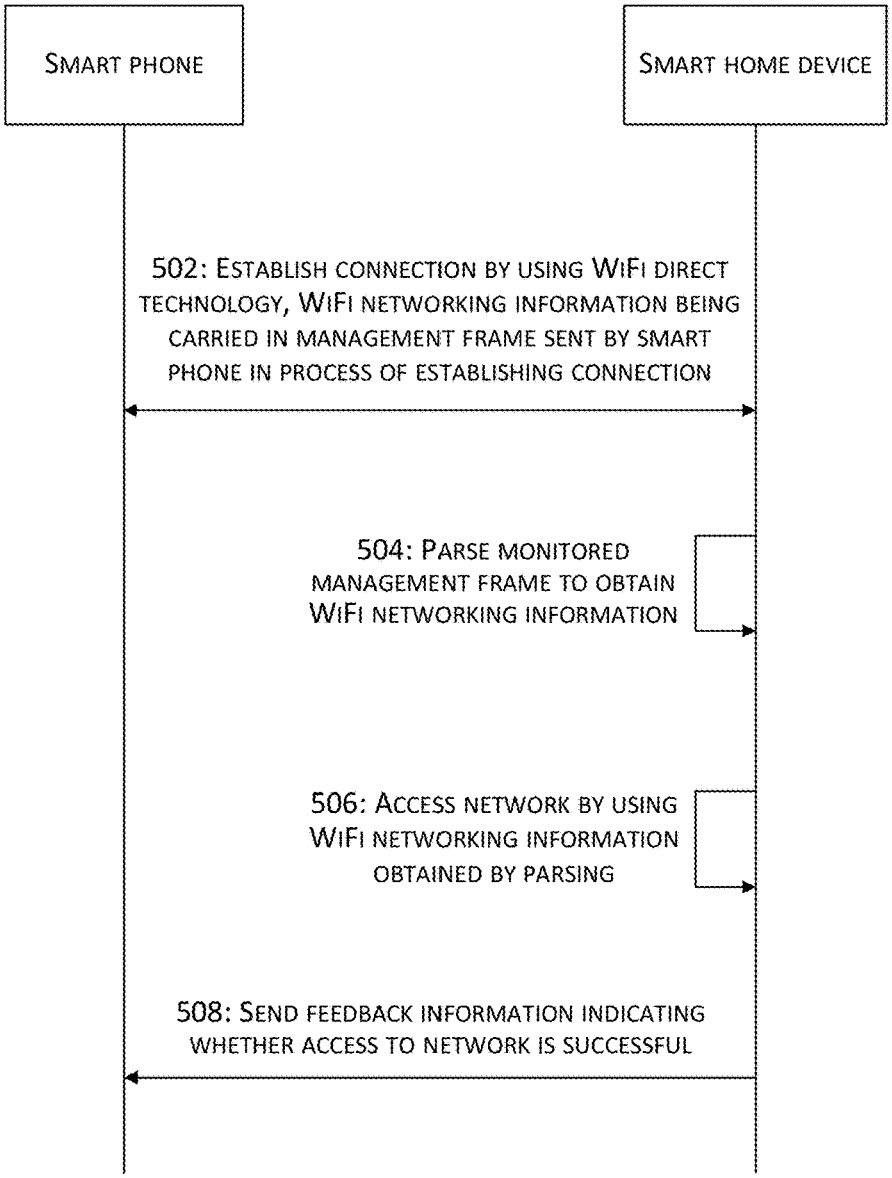

SMART PHONE
SMART HOME DEVICE
502: ESTABLISH CONNECTION BY USING WIFI DIRECT TECHNOLOGY, WIFI NETWORKING INFORMATION BEING CARRIED IN MANAGEMENT FRAME SENT BY SMART PHONE IN PROCESS OF ESTABLISHING CONNECTION
504: PARSE MONITORED MANAGEMENT FRAME TO OBTAIN WIFI NETWORKING INFORMATION
506: ACCESS NETWORK BY USING WIFI NETWORKING INFORMATION OBTAINED BY PARSING
508: SEND FEEDBACK INFORMATION INDICATING WHETHER ACCESS TO NETWORK IS SUCCESSFUL

FIG. 5

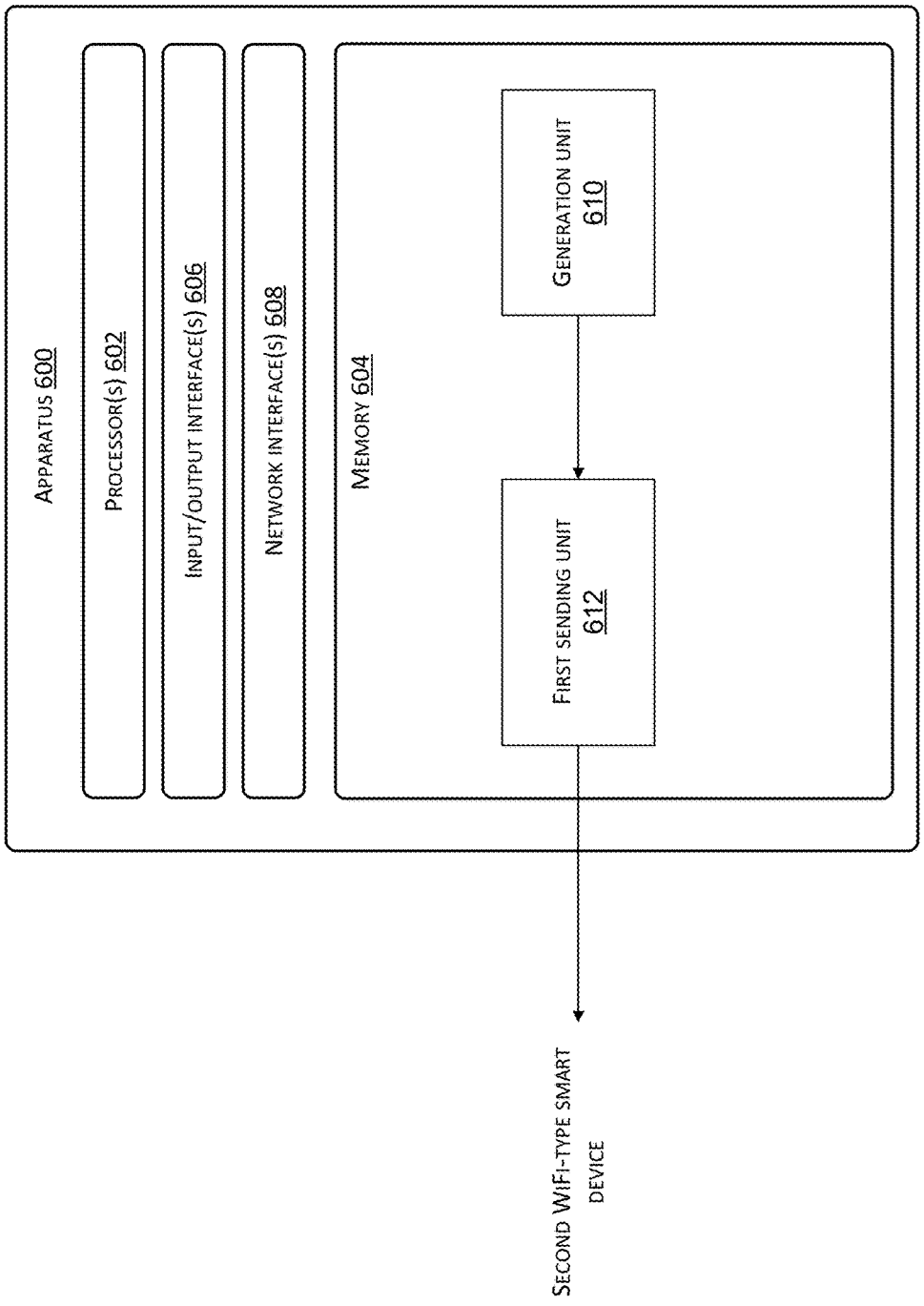

APPARATUS 600
PROCESSOR(S) 602
INPUT/OUTPUT INTERFACE(S) 606
NETWORK INTERFACE(S) 608
MEMORY 604
GENERATION UNIT 610
FIRST SENDING UNIT 612
SECOND WIFI-TYPE SMART DEVICE

FIG. 6(A)

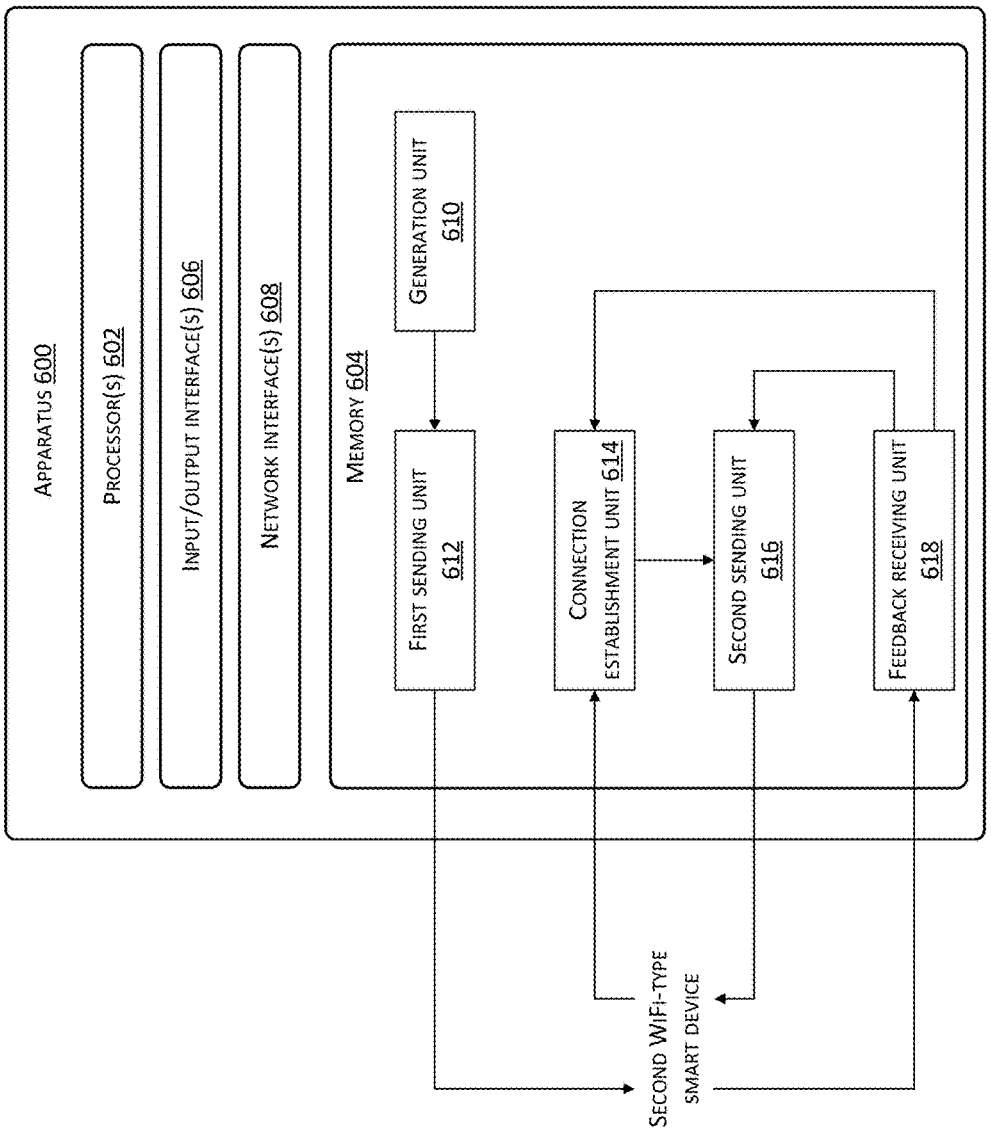

APPARATUS 600
PROCESSOR(S) 602
INPUT/OUTPUT INTERFACE(S) 606
NETWORK INTERFACE(S) 608
MEMORY 604
GENERATION UNIT 610
FIRST SENDING UNIT 612
CONNECTION ESTABLISHMENT UNIT 614
SECOND SENDING UNIT 616
FEEDBACK RECEIVING UNIT 618
SECOND WIFI-TYPE SMART DEVICE

FIG. 6(B)

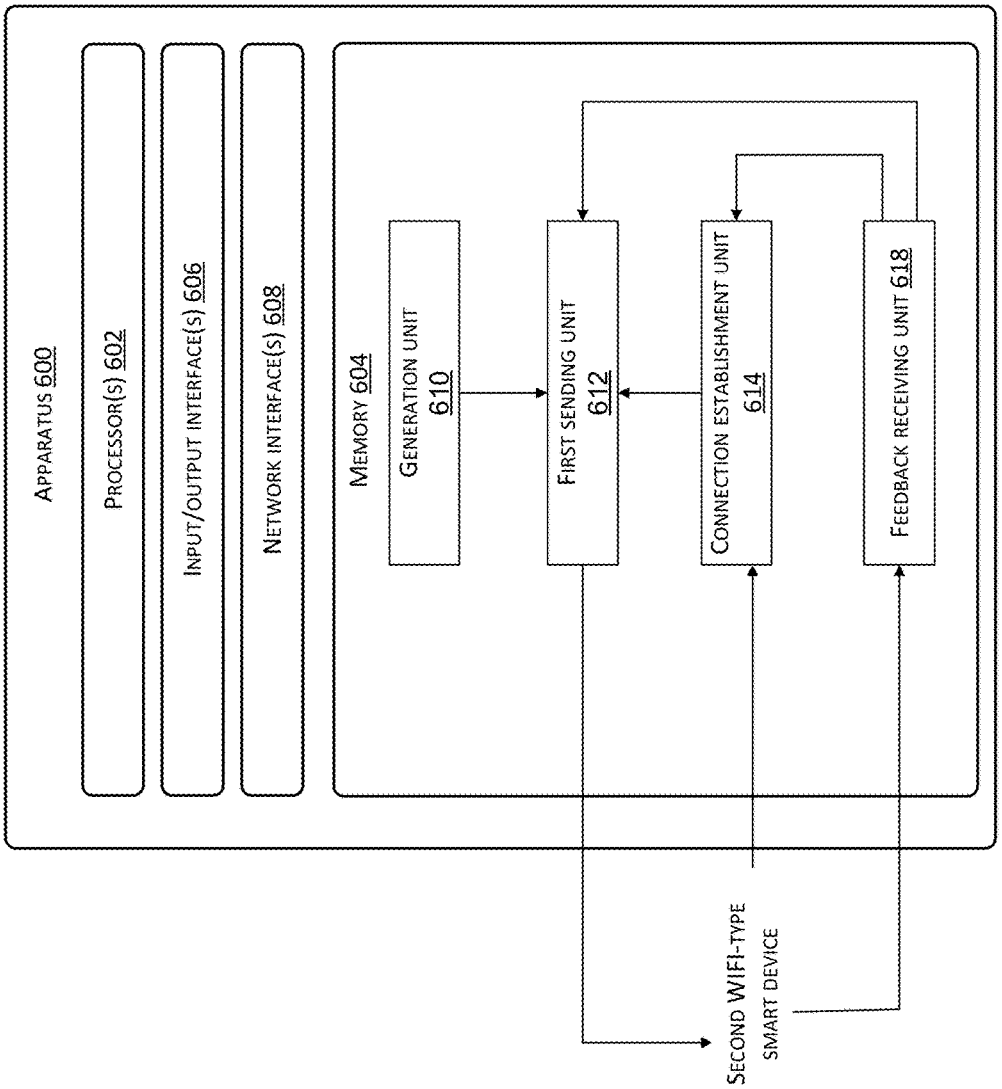

APPARATUS 600
PROCESSOR(S) 602
INPUT/OUTPUT INTERFACE(S) 606
NETWORK INTERFACE(S) 608
MEMORY 604
GENERATION UNIT 610
FIRST SENDING UNIT 612
CONNECTION ESTABLISHMENT UNIT 614
FEEDBACK RECEIVING UNIT 618
SECOND WIFI-TYPE SMART DEVICE

FIG. 6(C)

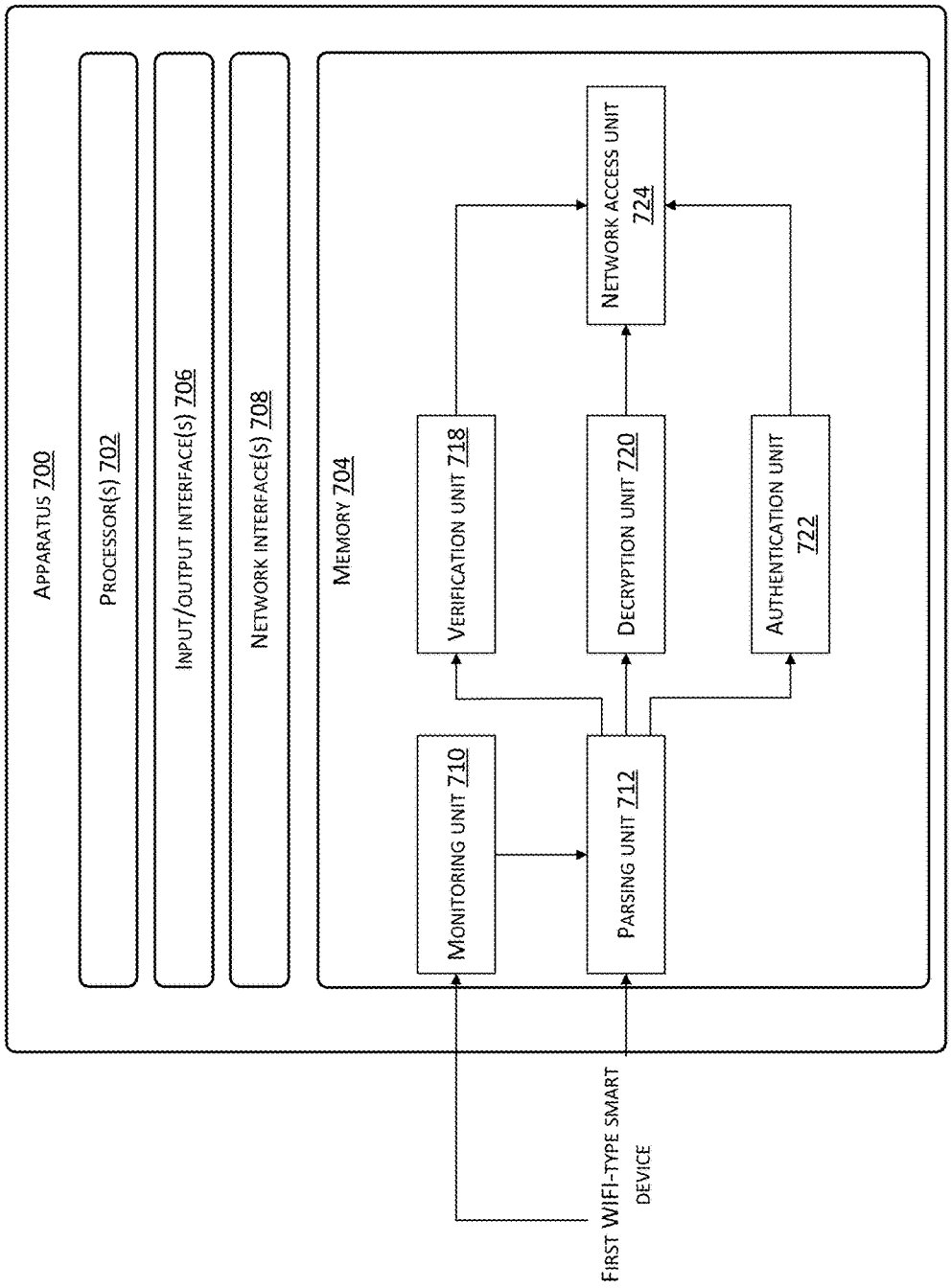

APPARATUS 700
PROCESSOR(S) 702
INPUT/OUTPUT INTERFACE(S) 706
NETWORK INTERFACE(S) 708
MEMORY 704
MONITORING UNIT 710
PARSING UNIT 712
VERIFICATION UNIT 718
DECRYPTION UNIT 720
AUTHENTICATION UNIT 722
NETWORK ACCESS UNIT 724
FIRST WIFI-TYPE SMART DEVICE

FIG. 7(A)

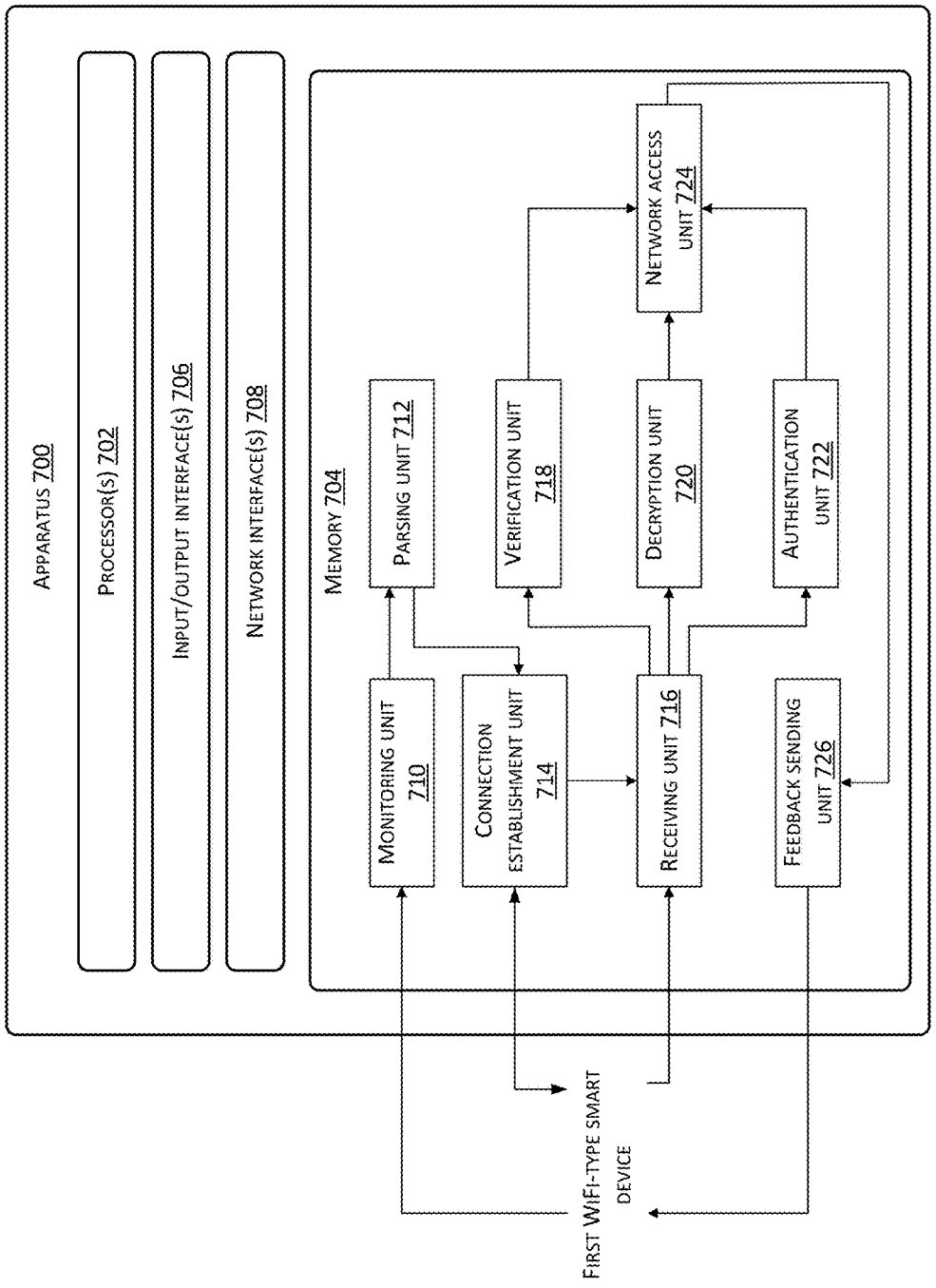

APPARATUS 700
PROCESSOR(S) 702
INPUT/OUTPUT INTERFACE(S) 706
NETWORK INTERFACE(S) 708
MEMORY 704
MONITORING UNIT 710
PARSING UNIT 712
CONNECTION ESTABLISHMENT UNIT 714
VERIFICATION UNIT 718
RECEIVING UNIT 716
DECRYPTION UNIT 720
NETWORK ACCESS UNIT 724
AUTHENTICATION UNIT 722
FEEDBACK SENDING UNIT 726
FIRST WIFI-TYPE SMART DEVICE

FIG. 7(B)

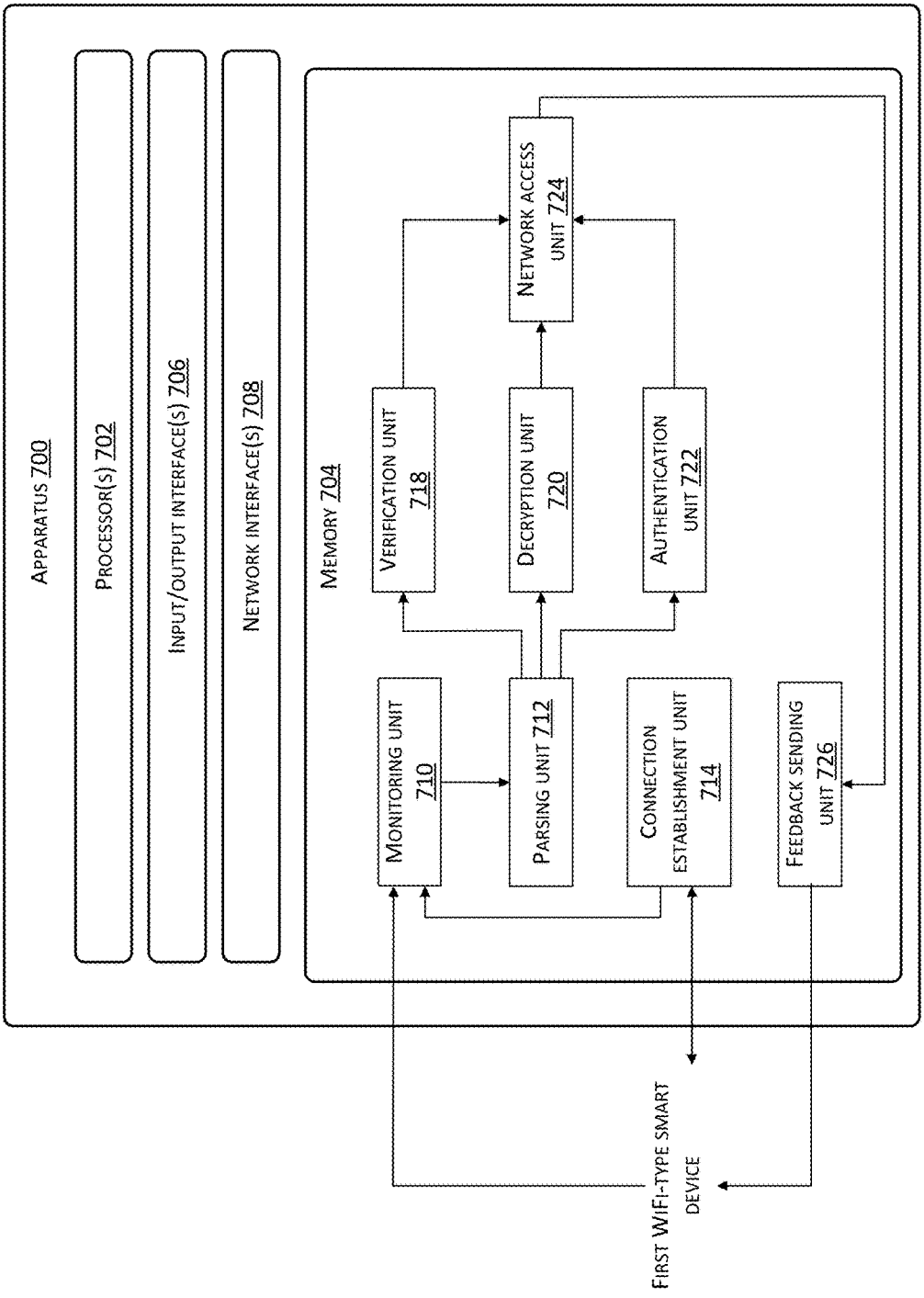

APPARATUS 700
PROCESSOR(S) 702
INPUT/OUTPUT INTERFACE(S) 706
NETWORK INTERFACE(S) 708
MEMORY 704
MONITORING UNIT 710
PARSING UNIT 712
CONNECTION ESTABLISHMENT UNIT 714
FEEDBACK SENDING UNIT 726
VERIFICATION UNIT 718
DECRYPTION UNIT 720
AUTHENTICATION UNIT 722
NETWORK ACCESS UNIT 724
FIRST WIFI-TYPE SMART DEVICE

FIG. 7(C)

SENDING AND ACQUIRING WIFI NETWORKING INFORMATION

CROSS REFERENCE TO RELATED PATENT APPLICATIONS

[0001] This application claims priority to and is a continuation of PCT Patent Application No. PCT/CN2016/098010, filed on 5 Sep. 2016, which claims priority to Chinese Patent Application No. 201510571603.1, filed on 10 Sep. 2015 and entitled "METHOD FOR SENDING AND ACQUIRING WIFI NETWORKING INFORMATION AND CORRESPONDING APPARATUS," which are incorporated herein by reference in their entirety.

TECHNICAL FIELD

[0002] The present disclosure relates to the field of computer application technologies and, more particularly, to methods and apparatuses for sending and acquiring WiFi networking information.

BACKGROUND

[0003] With the rise of smart hardware, more and more smart devices are entering people's lives. Accordingly, how to enable a WiFi-type smart device (which is a smart device with a built-in WiFi module, and may access a network by using the WiFi module) to access a network has become a problem.

[0004] As WiFi-type smart devices, such as a smart air conditioner, a smart humidifier, and a smart weighing machine, do not have include screen similar to PCs, mobile phones, tablet computers, and so on, a user cannot connect such WiFi-type smart devices to a network by manually finding a wireless router and entering a password. In other words, lots of WiFi-type smart devices may detect a nearby wireless router, but cannot let users know what networks the devices detect or "see". The users cannot connect the WiFi-type smart devices to the network by using direct manual interaction (for example, entering a service set identifier (SSID) and a password of the wireless router by using a keyboard or touch screen).

[0005] The following several implementation methods are mainly employed in the industry at present to solve the foregoing problem.

[0006] First method: a mobile phone sends a data packet to a router by using the User Datagram Protocol (UDP), and the router forwards the data packet. The data packet may carry only a small amount of information, that is, one packet may only carry 1-byte information at most. Therefore, a group of data packets need to be sent, and WiFi networking information is transmitted based on a regular change of the packet length. The WiFi-type smart device parses a group of data packets and acquires WiFi networking information from the data packets, to access the network.

[0007] For this method, many data packets need to be sent, and the sending process takes a long sending time, leading to an excessively long time for the WiFi-type smart device to acquire the WiFi networking information. In addition, to prevent packet loss, high development requirements or skills are imposed on the development of a fault-tolerant algorithm, increasing the technological complexity.

[0008] Second method: a mobile phone sends a multicast data packet to a router by using the UDP, and the router forwards the multicast data packet. The WiFi-type smart device parses the multicast data packet and acquires WiFi networking information from the multicast data packet, to access the network. However, this method has a prominent multicast compatibility problem. Some routers on which a specific option (e.g., IGMP Snooping) is enabled will not forward the multicast data packet. Thus, the WiFi-type smart device cannot access the network in a short time.

SUMMARY OF THE INVENTION

[0009] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify all key features or essential features of the claimed subject matter, nor is it intended to be used alone as an aid in determining the scope of the claimed subject matter. The term "technique(s) or technical solution(s)" for instance, may refer to apparatus(s), system(s), method(s) and/or computer-readable instructions as permitted by the context above and throughout the present disclosure.

[0010] The present disclosure provides methods and apparatuses for sending and acquiring WiFi networking information, so that the time delay and technological complexity of a WiFi-type smart device in accessing a network may be reduced.

[0011] The present disclosure provides a method for sending WiFi networking information, which includes:

[0012] generating, by a first WiFi-type smart device, a management frame that carries WiFi networking information; and

[0013] sending the management frame to be monitored by a second WiFi-type smart device.

[0014] According to an example implementation of the present disclosure, the management frame includes: a probe request frame, a probe response frame, an association request frame, a reassociation request frame, an action frame or a beacon frame.

[0015] According to an example implementation of the present disclosure, the WiFi networking information includes a feature code, an SSID (service set identifier) and a password.

[0016] According to an example implementation of the present disclosure, the WiFi networking information includes an identifier indicating provision of a networking information service.

[0017] The method may further include:

[0018] sending an SSID and a password through a connection that is established by the first WiFi-type smart device and the second WiFi-type smart device by a direct connection between the first WiFi-type smart device and the second WiFi-type smart device, such as WiFi direct. Such direction connection between the first WiFi-type smart device and the second WiFi-type smart device does not require using a third party device such as a router to connect the first WiFi-type smart device and the second WiFi-type smart device at first. For instance, WiFi direct is a technique that enables WiFi devices to connect directly, making it simple and convenient to do things like print, share, sync and display. Products using WiFi direct may connect to one another without joining a traditional home, office or hotspot network. For another example, such direct connection may be other direct wireless or wired connection, such as Bluetooth connection between the first WiFi-type smart device and the second WiFi-type smart device.

[0019] According to an example implementation of the present disclosure, the method further includes: establishing, by the first WiFi-type smart device, a connection with the second WiFi-type smart device by using WiFi direct; and

[0020] the management frame that carries WiFi networking information is a management frame sent in the process of establishing the connection.

[0021] According to an example implementation of the present disclosure, the WiFi networking information includes a feature code, an SSID and a password; and

[0022] the WiFi networking information includes an SSID and a password, and the WiFi networking information is carried in a specified extension field of the management frame.

[0023] According to an example implementation of the present disclosure, the information sent together with the SSID and the password further includes at least one of verification information, encryption information and router authentication information; and the SSID and the password are encrypted data when the encryption information is sent.

[0024] According to an example implementation of the present disclosure, the method further includes:

[0025] receiving, by the first WiFi-type smart device, feedback information indicating whether access to a network is successful from the second WiFi-type smart device.

[0026] According to an example implementation of the present disclosure, the step of sending the management frame includes:

[0027] sending, by the first WiFi-type smart device, the management frame by invoking a WiFi direct interface; or

[0028] sending, by the first WiFi-type smart device, the management frame by invoking a custom interface or a self-defined interface.

[0029] The present disclosure further provides another method for acquiring WiFi networking information, the method including:

[0030] monitoring, by a second WiFi-type smart device, a management frame sent by a first WiFi-type smart device; and

[0031] parsing the management frame to obtain the WiFi networking information.

[0032] According to an example implementation of the present disclosure, the management frame includes: a probe request frame, a probe response frame, an association request frame, a reassociation request frame, an action frame or a beacon frame.

[0033] According to an example implementation of the present disclosure, the WiFi networking information includes a feature code, an SSID and a password.

[0034] According to an example implementation of the present disclosure, the method further includes:

[0035] establishing a connection with the first WiFi-type smart device by using WiFi direct if the second WiFi-type smart device parses out an identifier indicating provision of a networking information service from the management frame, and receiving an SSID and a password through the established connection.

[0036] According to an example implementation of the present disclosure, the method further includes: establishing, by the second WiFi-type smart device, a connection with the first WiFi-type smart device by using WiFi direct; and

[0037] parsing, by the second WiFi-type smart device, the management frame received in the process of establishing the connection, to obtain the WiFi networking information.

[0038] According to an example implementation of the present disclosure, the WiFi networking information includes a feature code, an SSID and a password.

[0039] According to an example implementation of the present disclosure, the step of parsing the management frame to obtain the WiFi networking information includes:

[0040] determining, by the second WiFi-type smart device, a monitored management frame in which a feature code is consistent with preset feature code information; and

[0041] parsing out the SSID and the password from the management frame based on a predetermined WiFi networking information format.

[0042] According to an example implementation of the present disclosure, the WiFi networking information includes: an SSID and a password; and

[0043] the step of parsing the management frame to obtain the WiFi networking information includes: parsing out, by the second WiFi-type smart device, the SSID and the password from a specified extension field of the management frame.

[0044] According to an example implementation of the present disclosure, the method further includes at least one of the following:

[0045] verifying, by the second WiFi-type smart device, the SSID and the password by using verification information received together with the SSID and the password;

[0046] decrypting, by the second WiFi-type smart device, the SSID and the password by using encryption information received together with the SSID and the password; and

[0047] sending, by the second WiFi-type smart device, an authentication request to an accessed wireless router by using router authentication information received together with the SSID and the password.

[0048] According to an example implementation of the present disclosure, the method further includes:

[0049] sending, by the second WiFi-type smart device, feedback information indicating whether access to a network is successful to the first WiFi-type smart device after the second WiFi-type smart device attempts to access the network by using the SSID and the password.

[0050] The present disclosure further provides an apparatus for sending WiFi networking information, disposed in a first WiFi-type smart device, which including:

[0051] a generation unit configured to generate a management frame that carries WiFi networking information; and

[0052] a first sending unit configured to send the management frame to be monitored by a second WiFi-type smart device.

[0053] According to an example implementation of the present disclosure, the management frame includes: a probe request frame, a probe response frame, an association request frame, a reassociation request frame, an action frame or a beacon frame.

[0054] According to an example implementation of the present disclosure, the WiFi networking information includes a feature code, an SSID and a password.

[0055] According to an example implementation of the present disclosure, the WiFi networking information includes an identifier indicating provision of a networking information service.

[0056] The apparatus may further include:

[0057] a connection establishment unit configured to establish a connection between the first WiFi-type smart device and the second WiFi-type smart device by a direct

connection between the first WiFi-type smart device and the second WiFi-type smart device, such as WiFi direct; and

[0058] a second sending unit configured to send an SSID and a password through the connection.

[0059] According to an example implementation of the present disclosure, the apparatus further includes:

[0060] a connection establishment unit configured to establish a connection between the first WiFi-type smart device and the second WiFi-type smart device by using WiFi direct; and

[0061] the management frame that carries WiFi networking information is a management frame sent in the process of establishing the connection.

[0062] According to an example implementation of the present disclosure, the WiFi networking information includes an SSID and a password; and

[0063] the WiFi networking information includes an SSID and a password, and the WiFi networking information is carried in a specified extension field of the management frame.

[0064] According to an example implementation of the present disclosure, the information sent together with the SSID and the password further includes at least one of verification information, encryption information and router authentication information;

[0065] where the SSID and the password are encrypted data when the encryption information is sent.

[0066] According to an example implementation of the present disclosure, the apparatus further includes:

[0067] a feedback receiving unit configured to receive feedback information indicating whether access to a network is successful from the second WiFi-type smart device.

[0068] According to an example implementation of the present disclosure, the first sending unit is specifically configured to:

[0069] send the management frame by invoking a WiFi direct interface; or

[0070] send the management frame by invoking a custom interface.

[0071] The present disclosure further provides an apparatus for acquiring WiFi networking information, disposed in a second WiFi-type smart device, the apparatus including:

[0072] a monitoring unit configured to monitor a management frame sent by a first WiFi-type smart device; and

[0073] a parsing unit configured to parse the management frame to obtain the WiFi networking information.

[0074] According to an example implementation of the present disclosure, the management frame includes: a probe request frame, a probe response frame, an association request frame, a reassociation request frame, an action frame or a beacon frame.

[0075] According to an example implementation of the present disclosure, the WiFi networking information includes a feature code, an SSID and a password.

[0076] According to an example implementation of the present disclosure, the apparatus further includes:

[0077] a connection establishment unit configured to establish a connection between the first WiFi-type smart device and the second WiFi-type smart device by using WiFi direct if the parsing unit parses out an identifier indicating provision of a networking information service from the management frame; and

[0078] a receiving unit configured to receive an SSID and a password through the connection.

[0079] According to an example implementation of the present disclosure, the apparatus further includes:

[0080] a connection establishment unit configured to establish a connection between the second WiFi-type smart device and the first WiFi-type smart device by using WiFi direct; and

[0081] the parsing unit parses the management frame monitored in the process of establishing the connection, to obtain the WiFi networking information.

[0082] According to an example implementation of the present disclosure, the WiFi networking information includes a feature code, an SSID and a password.

[0083] According to an example implementation of the present disclosure, the parsing unit is specifically configured to determine a monitored management frame in which a feature code is consistent with preset feature code information; and parse out the SSID and the password from the management frame based on a predetermined WiFi networking information format.

[0084] According to an example implementation of the present disclosure, the WiFi networking information includes: an SSID and a password; and

[0085] the parsing unit is specifically configured to parse out the SSID and the password from a specified extension field of the management frame.

[0086] According to an example implementation of the present disclosure, the apparatus further includes at least one of the following units:

[0087] a verification unit configured to verify the SSID and the password by using verification information received together with the SSID and the password;

[0088] a decryption unit configured to decrypt the SSID and the password by using encryption information received together with the SSID and the password; and

[0089] an authentication unit configured to send an authentication request to an accessed wireless router by using router authentication information received together with the SSID and the password.

[0090] According to an example implementation of the present disclosure, the apparatus further includes:

[0091] a feedback sending unit configured to send feedback information indicating whether access to a network is successful to the first WiFi-type smart device after the second WiFi-type smart device attempts to access the network by using the SSID and the password.

[0092] As shown from the foregoing technical solutions, in the present disclosure, a management frame carries WiFi networking information. The management frame may carry a relatively large amount of data (at least 32 bytes), and only a small number of packets need to be sent. Correspondingly, a WiFi-type smart device has a short delay when accessing a network, and does not require a complex fault-tolerant algorithm. Thus, the technological complexity is reduced. Moreover, the management frame avoids the situation that the WiFi-type smart device cannot access the network in a short time due to the multicast data compatibility problem.

BRIEF DESCRIPTION OF THE DRAWINGS

[0093] The accompanying drawings described herein are used to provide further understanding of the present disclosure, and constitute a part of the present disclosure. The drawings are used to explain the present disclosure, but are not to be interpreted as limiting the present disclosure.

[0094] FIG. **1** is a schematic diagram of a system on which an example embodiment of the present disclosure is based;
[0095] FIG. **2** is a flowchart of a first method according to an example embodiment of the present disclosure;
[0096] FIG. **3** is a flowchart of a second method according to an example embodiment of the present disclosure;
[0097] FIG. **4** is a schematic diagram of a process of establishing a connection by using a WiFi direct technology according to an example embodiment of the present disclosure;
[0098] FIG. **5** is a flowchart of a third method according to an example embodiment of the present disclosure;
[0099] FIG. **6***a* is a structural diagram of a first apparatus disposed in a first WiFi-type smart device according to an example embodiment of the present disclosure;
[0100] FIG. **6***b* is a structural diagram of a second apparatus disposed in a first WiFi-type smart device according to an example embodiment of the present disclosure;
[0101] FIG. **6***c* is a structural diagram of a third apparatus disposed in a first WiFi-type smart device according to an example embodiment of the present disclosure;
[0102] FIG. **7***a* is a structural diagram of a first apparatus disposed in a second WiFi-type smart device according to an example embodiment of the present disclosure;
[0103] FIG. **7***b* is a structural diagram of a second apparatus disposed in a second WiFi-type smart device according to an example embodiment of the present disclosure; and
[0104] FIG. **7***c* is a structural diagram of a third apparatus disposed in a second WiFi-type smart device according to an example embodiment of the present disclosure.

DETAILED DESCRIPTION

[0105] In order to make the objectives, the technical solutions and the advantages of the present disclosure clearer, the present disclosure is described in detail below with reference to the accompanying drawings and specific example embodiments.
[0106] A first WiFi-type smart device creates a management frame that carries WiFi networking information and sends the management frame, so that a second WiFi-type smart device monitors and parses the management frame to obtain the WiFi networking information. Here, the management frame may include, but is not limited to, a probe request frame, a probe response frame, an association request frame, a reassociation request frame, an action frame or a beacon frame.
[0107] FIG. **1** is a schematic diagram of a system of which an example embodiment of the present disclosure is based, where a first WiFi-type smart device **102** may be a smart device such as a smart phone, a tablet computer, or a notebook computer that includes a WiFi module and an input device. The input device may include a touch screen, a keyboard, a writing pad and the like. An SSID, a password and other WiFi networking information may be input conveniently by using these input devices. A second WiFi-type smart device **104** may be a smart home device such as a smart air conditioner, a smart humidifier, a smart weighing machine or a smart washing machine, and may also be a smart office device such as a WiFi-type printer. The second WiFi-type smart device generally includes a WiFi module, but may not necessarily include an input device such as a touch screen, a keyboard or a writing pad. A wireless router **106** may be connected with the first WiFi-type smart device **102** and the second WiFi-type device **104** through a wireless network. The first WiFi-type smart device **102** may directly connect with the second WiFi-type smart device **104** by using WiFi direct without through the wireless router **106**.
[0108] The following example embodiments are all described by using a smart phone as an example of the first WiFi-type smart device and a smart home device as an example of the second WiFi-type smart device.
[0109] FIG. **2** is a flowchart of a first method according to an example embodiment of the present disclosure. As shown in FIG. **2**, the method may include the following steps:
[0110] In step **202**, a smart home device enters a monitor state.
[0111] A WiFi module in a WiFi-type smart home device generally has two modes. One is a monitor mode, and the other is a station mode. Here, the monitor mode is mainly used for monitoring data packets in a wireless network, while the station mode is a working mode after the WiFi device is networked (connected to a router). When the smart home device enters the monitor mode, it enters a monitor state. In the example embodiment of the present disclosure, the smart home device may be in a monitor state by default, and may also be switched to the monitor state by a user manually.
[0112] In step **204**, the smart phone generates a management frame that carries WiFi networking information, where the WiFi networking information includes a feature code, an SSID and a password of a target router, and so on.
[0113] The management frame in this step may be a probe request frame, a probe response frame, an action frame, a beacon frame, or the like.
[0114] The management frame may carry the feature code as well as the SSID and password of the target router based on a predetermined format. The feature code is used to represent that the management frame carries WiFi networking information. The SSID and password of the target router are used for connecting a smart terminal device to a wireless router, so that the smart terminal device may access a target network.
[0115] For example, the management frame carries a feature code, an SSID and a password by using a contiguous storage space of 50 bytes. Here, it is assumed that an "APCP" identifier agreed on by two sides is employed as the feature code, which occupies 4 bytes, and the remaining 46 bytes are used to carry the SSID and the password.
[0116] In addition, the WiFi networking information may also include at least one of verification information, encryption information and router authentication information, in addition to the feature code, the SSID and the password. Here, the verification information is used for verifying the WiFi networking information. The encryption information is used for indicating an encryption scheme. For example, the Data Encryption Standard (DES), the International Data Encryption Algorithm (IDEA) or other encryption schemes may be employed. The router authentication information is used for indicating the type of authentication required during access to a network. For example, wired equivalent privacy (WEP), Wi-Fi protected access (WPA), WPA2, and the like may be employed.
[0117] For another example, the management frame carries a feature code, an SSID a password and verification information by using a contiguous storage space of 50 bytes. Here, it is assumed that an APCP identifier occupying 4 bytes is employed as the feature code. The last 2 bytes are used to carry a check code. The remaining 44 bytes are used

to carry the SSID and the password. Other methods of carrying information are similar to this method, and are not exemplified.

[0118] In order to ensure security, the SSID and the password in the WiFi networking information may be encrypted. The encryption may be carried out in a predetermined method or in a method indicated by the encryption information carried in the WiFi networking information.

[0119] In step **206**, the management frame that carries the WiFi networking information is sent by invoking a WiFi direct interface.

[0120] The smart phone may send the management frame by invoking a WiFi direct interface. At present, most smart phones may support a WiFi direct technology, and may send the management frame directly by invoking a WiFi direct interface. For example, in an iOS platform, APPLE has launched MultipeerConnectivity.framework after iOS7.0, which mainly provides a solution for point-to-point communication between iOS devices without access to the Internet. In this case, the solution may employ a service publishing API (MCNearbyService Advertiser or MCAdvertiser Assistant) in the framework to send the management frame that carries WiFi networking information.

[0121] If a self-developed smart phone is used, an interface may also be customized during development, and the management frame is sent through the custom interface.

[0122] Steps **204** and **206** may be performed when triggered by a user. For example, a user enters an SSID and a password to a smart phone or selects a scanned SSID and enters a password, and then triggers the smart phone to perform steps **204** and **206** by clicking on a function button or the like.

[0123] In addition, step **202** may also be performed after steps **204** and **206**, or performed concurrently with steps **204** and **206**. For example, a user may switch a smart home device to a monitor state while or after a smart phone sends a management frame that carries WiFi networking information.

[0124] It should be noted that, in the example embodiment of the present application, the management frame sent by the smart phone does not need to pass through a router, but may be directly sent to a WiFi-type smart device in a monitor state based on a WiFi direct technology.

[0125] In step **208**, the smart home device parses the monitored management frame to obtain the WiFi networking information.

[0126] In this step, feature code information may be preset in the smart home device, and the smart home device first determines whether feature codes included in the monitored management frames are consistent with the preset feature code information, and filters out management frames whose feature codes are not consistent with the preset feature code information. For management frames whose feature codes are consistent with the preset feature code information, SSIDs and passwords are parsed from the management frames based on a predetermined WiFi networking information format.

[0127] For example, APCP is preset as feature code information in the smart home device. Content included in a received management frame is compared with the APCP to determine whether the management frame includes the APCP. It is determined that the management frame does not include WiFi networking information if it does not include the APCP. It is determined that the management frame includes WiFi networking information if it includes the APCP, and parsing may be carried out based on a predetermined WiFi networking information format. For example, an SSID and a password are acquired from 44 bytes following the feature code information, and verification is carried out by using a check code in the next 2 bytes.

[0128] In addition, if the SSID and the password are encrypted, the smart home device may carry out decryption based on a predetermined encryption scheme or an encryption scheme indicated by encryption information acquired from the WiFi networking information, to obtain a decrypted SSID and a decrypted password.

[0129] According to this parsing method, the WiFi networking information may be carried without being limited by an invoked interface or limited by a specific type of a management frame used.

[0130] In step **210**, the smart home device accesses a network by using the acquired WiFi networking information.

[0131] The smart home device may connect to a wireless router by using the parsed out SSID and password to access a network, and may further send an authentication request to the connected wireless router by using router authentication information parsed from the WiFi networking information.

[0132] FIG. **3** is a flowchart of a second method according to an example embodiment of the present disclosure. As shown in FIG. **3**, the method may include the following steps:

[0133] In step **302**, a smart home device enters a monitor state.

[0134] This step is similar to step **202**, and is not described in detail again.

[0135] In step **304**, the smart phone invokes a WiFi direct interface to send a management frame that carries a service identifier. The service identifier indicates provision of a networking information service.

[0136] For the interface invoked to send the management frame, reference may be made to the related description about step **206** shown in FIG. **2**, and details are not described again.

[0137] In this step, the management frame may not carry a specific SSID or password, but carries a service identifier used for indicating provision of a networking information service. The service identifier may be a feature code or a specific service name.

[0138] Similarly, step **302** and step **304** may be performed in any sequence or performed at the same time.

[0139] In step **306**, the smart home device requests to connect to a smart phone after monitoring the management frame that carries the service identifier.

[0140] In step **308**, the smart phone receives the request and establishes a connection with the smart home device.

[0141] A connection may be established between the smart home device and the smart phone by using a WiFi direct technology. The process of establishing a connection by using a WiFi direct technology is briefly introduced in the following. The establishment of the connection is as shown in FIG. **4**, and mainly includes the following stages:

[0142] Discovery stage **402**: the smart phone and the smart home device are both in a monitor state, and send a probe request frame to each other. The probe request frame carries an identifier of the device that sends the frame. The device

that detects the probe request frame returns a probe response frame. The probe response frame carries a device identifier of the frame.

[0143] Negotiation stage **404**: this stage mainly includes negotiating a GroupOwner (GO) between the smart phone and the smart home device, and includes a GO negotiation request frame, a GO negotiation response frame, and a GO negotiation confirm frame. The negotiated GO plays a role similar to an AP.

[0144] Association stage **406**: WiFi Simple Config (WSC, WiFi configuration information) is associated and exchanged, where the association process includes an association request frame and an association response frame.

[0145] Authentication stage **408**: information is negotiated and authenticated. The authentication here mainly refers to negotiating a method in which a device serving as a GO authenticates another device. Here, the smart phone and the smart home device may further authenticate the identity of the other side.

[0146] Connection stage **410**: a connection is established by a handshake.

[0147] In step **310**, the smart phone sends an SSID and a password by using the connection established with the smart home device.

[0148] At least one of verification information, encryption information and router authentication information may also be sent at the same time in addition to the SSID and the password. Here, the SSID and the password may be encrypted information. The encryption may be carried out based on a predetermined scheme or a scheme indicated by encryption information carried in the WiFi networking information.

[0149] In step **312**, the smart home device accesses a network by using the received SSID and password.

[0150] The smart home device may connect to a wireless router by using the received SSID and password, to access a network, and may further send an authentication request to the connected wireless router by using the received router authentication information.

[0151] In step **314**, the smart home device sends feedback information indicating whether access to the network is successful to the smart phone.

[0152] In this method, the smart phone may acquire the feedback information indicating whether access to the network is successful from the smart home device. The smart phone may cut off the connection established with the smart home device if access to the network is successful. The smart phone may re-send an SSID and a password by using the connection established with the smart home device if access to the network fails.

[0153] FIG. **5** is a flowchart of a third method according to an example embodiment of the present disclosure. As shown in FIG. **5**, the method may include the following steps:

[0154] In step **502**, a smart home device establishes a connection with a smart phone by using a WiFi direct technology, and a management frame sent by the smart phone in the process of establishing the connection carries WiFi networking information.

[0155] It may be seen from the connection establishment process shown in FIG. **4** that, the smart phone may send a probe request frame, a probe response frame, an association request frame, a reassociation request frame, an action frame (which is optionally sent at the discovery stage and the negotiation stage), and a beacon frame (which will be sent after a successful handshake) in this process. In the example embodiment of the present disclosure, the smart phone may send WiFi networking information by using the frames.

[0156] Here, the WiFi networking information may be carried in, but not limited to, the following two methods:

[0157] First method: the WiFi networking information at least includes a feature code, an SSID and a password, and the method of carrying the WiFi networking information is similar to that in the example embodiment shown in FIG. **2**, which is not described here again. The WiFi networking information may further include at least one of verification information, encryption information and router authentication information. For this method, it is unnecessary to limit a specific field of the WiFi networking information in the management frame, and the implementation is relatively flexible.

[0158] Second method: the WiFi networking information at least includes an SSID and a password, and may not include a feature code. The SSID and the password are carried in a specified extension field of the management frame. In other words, a field of the management frame is extended to carry the WiFi network information at a specified position. Likewise, the WiFi networking information may further include at least one of verification information, encryption information and router authentication information.

[0159] In step **504**, the smart home device parses a monitored management frame, to obtain the WiFi networking information.

[0160] If the WiFi networking information is carried by using the first method, the smart home device first determines whether a feature code included in the monitored management frame is consistent with preset feature code information, and filters out management frames whose feature codes are inconsistent with the preset feature code information. The management frame whose feature code is consistent with the preset feature code information is parsed based on a predetermined WiFi networking information format, to obtain the SSID and the password.

[0161] If the WiFi networking information is carried by using the second method, the smart home device may parse out the SSID and the password from the specified extension field of the management frame.

[0162] In step **506**, the home smart device accesses a network by using the acquired WiFi networking information.

[0163] In step **508**, the home smart device sends feedback information indicating whether access to the network is successful to the smart phone.

[0164] The method provided in the present disclosure is described above, and the apparatus provided in the present disclosure will be described in detail below in combination with example embodiments.

[0165] FIG. **6***a* is a structural diagram of an apparatus **600** according to an example embodiment of the present disclosure. The apparatus **600** may be configured at a first WiFi-type smart device. As shown in FIG. **6***a*, the apparatus **600** includes one or more processor(s) **602** or data processing unit(s) and memory **604**. The apparatus **600** may further include one or more input/output interface(s) **606** and one or more network interface(s) **608**. The memory **604** is an example of computer readable media.

[0166] Computer readable media, including both permanent and non-permanent, removable and non-removable media, may be stored by any method or technology for storage of information. The information can be computer readable instructions, data structures, modules of programs, or other data. Examples of computer storage media include, but are not limited to, phase change memory (PRAM), static random access memory (SRAM), dynamic random access memory (DRAM), other types of random access memory (RAM), read only memory Such as ROM, EEPROM, flash memory or other memory technology, CD-ROM, DVD, or other optical storage, Magnetic cassettes, magnetic tape magnetic tape storage or other magnetic storage devices, or any other non-transitory medium, may be used to store information that may be accessed by a computing device. As defined herein, computer-readable media do not include transitory media such as modulated data signals and carriers.

[0167] The memory **604** may store therein a plurality of modules or units including a generation unit **610** and a first sending unit **612**.

[0168] The generation unit **610** is responsible for generating a management frame that carries WiFi networking information. Here, the management frame may include, but not limited to, a probe request frame, a probe response frame, an association request frame, a reassociation request frame, an action frame or a beacon frame.

[0169] The first sending unit **612** is configured to send the management frame to be monitored by a second WiFi-type smart device. The first sending unit **612** may send the management frame by invoking a WiFi direct interface. If the apparatus is a self-developed WiFi-type smart device, the first sending unit may also send the management frame by invoking a custom interface.

[0170] As an implementation, the WiFi networking information may include a feature code, an SSID and a password. In addition, the WiFi networking information may also include at least one of verification information, encryption information and router authentication information. An apparatus structure corresponding to this implementation is as shown in FIG. **6***a*.

[0171] The feature code and the SSID and password of the target router may be carried in the management frame based on a predetermined format. The feature code is used to represent that the management frame carries WiFi networking information. The SSID and password of the target router are used for connecting a smart terminal device to a wireless router, so that the smart terminal device may access a target network. The verification information is used for verifying the WiFi networking information. The encryption information is used for indicating an encryption scheme. For example, a DES, an IDEA or other encryption schemes may be employed. The router authentication information is used for indicating the type of authentication required during access to a network. For example, WEP, WPA, WPA2, and the like may be employed.

[0172] As another implementation, the WiFi networking information includes an identifier indicating provision of a networking information service. A connection establishment unit **614** stored on memory **604** may establish a connection between the first WiFi-type smart device and the second WiFi-type smart device by using WiFi direct. A second sending unit **616** stored on memory **604** may send an SSID and a password through the connection. In other words, the first WiFi-type smart device may first send a service identifier by using the management frame, and then establish a connection and sends an SSID and a password through the connection after the second WiFi-type smart device detects the service identifier and sends a connection request. An apparatus structure corresponding to the apparatus may be as shown in FIG. **6***b*.

[0173] As a further implementation, the connection establishment unit **614** may establish a connection between the first WiFi-type smart device and the second WiFi-type smart device by using WiFi direct. The frame sent by the first sending unit **612** is a management frame sent in the process of establishing the connection. An apparatus structure corresponding to this implementation may be as shown in FIG. **6***c*.

[0174] Corresponding to this case, the WiFi networking information may include a feature code, an SSID and a password. Alternatively, the WiFi networking information may not include a feature code but only include an SSID and a password. For the latter method, the WiFi networking information may be carried in a specified extension field of the management frame.

[0175] Here, information sent together with the SSID and the password may further include at least one of verification information, encryption information and router authentication information. Here, the SSID and the password are encrypted data when the encryption information is sent.

[0176] In the latter two implementations, a feedback receiving unit **618** stored on memory **604** is responsible for receiving feedback information indicating whether access to a network is successful from the second WiFi-type smart device. If access to the network is successful, the connection establishment unit **614** may cut off the connection established with the smart home device. If access to the network fails, the first sending unit **612** or the second sending unit **616** may re-send the SSID and the password through the connection established with the smart home device.

[0177] FIG. **7***a* is a structural diagram of a second apparatus **700** according to an example embodiment of the present disclosure. The apparatus **700** is configured at a second WiFi-type smart device. As shown in FIG. **7***a*, the apparatus **700** includes one or more processor(s) **702** or data processing unit(s) and memory **704**. The apparatus **700** may further include one or more input/output interface(s) **706** and one or more network interface(s) **708**. The memory **704** is an example of computer readable media.

[0178] The memory **704** may store therein a plurality of modules or units including a monitoring unit **710** and a parsing unit **712**.

[0179] The monitoring unit **710** is responsible for monitoring a management frame sent by a first WiFi-type smart device.

[0180] The parsing unit **712** is responsible for parsing the management frame to obtain WiFi networking information. Here, the management frame includes: a probe request frame, a probe response frame, an association request frame, a reassociation request frame, an action frame or a beacon frame.

[0181] As an implementation, the parsing unit **712** may parse out a feature code, an SSID and a password from the WiFi networking information. Specifically, the parsing unit **712** may determine a monitored management frame in which a feature code is consistent with preset feature code information, and parse out the SSID and the password from the management frame based on a predetermined WiFi

networking information format. A structural diagram of an apparatus in this implementation is as shown in FIG. **7***a*.

[0182] As another implementation, the parsing unit **712** may parse out an identifier indicating provision of a networking information service from the WiFi networking information, and then a connection establishment unit **714** may establish a connection between the first WiFi-type smart device and the second WiFi-type smart device by using WiFi direct. A request for establishing a connection may be sent by the connection establishment unit **714**. A receiving unit **716** may receive an SSID and a password through the connection. A structural diagram of an apparatus in this implementation is as shown in FIG. **7***b*.

[0183] As a further implementation, the connection establishment unit **714** may establish a connection between the first WiFi-type smart device and the second WiFi-type smart device by using WiFi direct. The parsing unit **712** may parse the management frame monitored by the monitoring unit **710** in the process of establishing the connection, to obtain the WiFi networking information. A structural diagram of an apparatus in this implementation is as shown in FIG. **7***c*.

[0184] In this implementation, the WiFi networking information may include: a feature code, an SSID and a password. The parsing unit **712** may determine a monitored management frame in which a feature code is consistent with preset feature code information, and parse the management frame based on a predetermined WiFi networking information format to obtain the SSID and the password.

[0185] Alternatively, the WiFi networking information may include: an SSID and a password. The parsing unit **712** parses out the SSID and the password from a specified extension field of the management frame.

[0186] In the above three implementations, information sent together with the SSID and the password may further include, but is not limited to, at least one of verification information, encryption information and router authentication information.

[0187] In FIGS. **7**(*a*)-**7**(*c*), the memory **704** may further store therein a plurality of modules or units including a verification unit **718**, a decryption unit **720**, an authentication unit **722**, and a network access unit **724**.

[0188] The verification unit **718** is responsible for verifying the SSID and the password by using verification information received together with the SSID and the password.

[0189] The decryption unit **720** is responsible for decrypting the SSID and the password by using encryption information received together with the SSID and the password. The decryption unit **720** may also be responsible for decrypting the SSID and the password by using predetermined encryption information.

[0190] The authentication unit **722** is responsible for sending an authentication request to an accessed wireless router by using router authentication information received together with the SSID and the password.

[0191] The network access unit **724** is responsible for accessing to a network. For example, the network access unit **724** is responsible for connecting to a wireless router by using an SSID and a password to access the network. The network access unit **724** may store in memory **704**. Alternatively, the network access unit **724** may be a unit that already exists in the second WiFi-type smart device.

[0192] In FIGS. **7**(*b*) and **7**(*c*), a feedback sending unit **726** stored on memory **704** is responsible for sending feedback information indicating whether access to a network is successful to the first WiFi-type smart device after a network access unit **724** attempts to access the network.

[0193] In the several example embodiments provided in the present disclosure, it should be understood that the disclosed apparatuses and methods may be implemented in other methods. The apparatus example embodiments described above are only exemplary. For example, the unit division is merely division based on logical functions and there may be other division methods in an actual implementation.

[0194] In addition, functional units in the example embodiments of the present disclosure may be integrated into one processing unit, or each of the units may exist alone physically, or two or more units may be integrated into one unit. The integrated unit may be implemented in the form of hardware, or may be implemented in the form of a software functional unit.

[0195] The integrated unit implemented in the form of a software functional unit may be stored in a computer readable storage medium. The software functional unit is stored in a storage medium, and includes several instructions for instructing a computer device (which may be a personal computer, a server, a network device or the like) or a processor to perform all or a part of the steps of the methods described in the example embodiments of the present disclosure. The foregoing storage medium includes: any medium that may store program code, such as a USB flash drive, a removable hard disk, a Read-Only Memory (ROM), a Random Access Memory (RAM), a magnetic disk, or an optical disc.

[0196] Any process or method described in the flowchart or in other manners here may be construed as a module, segment or part representing code that includes one or more executable instructions for implementing an example logic function or process step. In addition, the scope of the example embodiments of the present disclosure includes other implementations, wherein the functions may be executed in a sequence different from the shown or discussed sequence, including executing the functions basically simultaneously or in a reverse order according to the related functions. This should be understood by persons skilled in the technical field to which the example embodiments of the present disclosure belong.

[0197] The above descriptions are only example embodiments of the present disclosure, but are not intended to limit the present disclosure. Any modification, equivalent replacement, improvement and the like made within the spirit and principle of the present disclosure should be encompassed in the protection scope of the present disclosure.

[0198] The present disclosure may further be understood with clauses as follows.

[0199] Clause 1. A method for sending WiFi networking information comprising:

[0200] generating, by a first WiFi-type smart device, a management frame that carries WiFi networking information; and

[0201] sending the management frame to be monitored by a second WiFi-type smart device.

[0202] Clause 2. The method of clause 1, wherein the management frame comprises: a probe request frame, a probe response frame, an association request frame, a reassociation request frame, an action frame or a beacon frame.

[0203] Clause 3. The method of clause 1, wherein the WiFi networking information comprises a feature code, a service set identifier (SSID) and a password.

[0204] Clause 4. The method of clause 1, wherein:

[0205] the WiFi networking information comprises an identifier indicating provision of a networking information service; and

[0206] the method further comprises:

[0207] sending an SSID and a password through a connection that is established by the first WiFi-type smart device and the second WiFi-type smart device by using WiFi direct.

[0208] Clause 5. The method of clause 1, wherein the method further comprises: establishing, by the first WiFi-type smart device, a connection with the second WiFi-type smart device by using WiFi direct; and

[0209] the management frame that carries WiFi networking information is a management frame sent in the process of establishing the connection.

[0210] Clause 6. The method of clause 1, 2 or 5, wherein the WiFi networking information comprises an SSID and a password, and the WiFi networking information is carried in a specified extension field of the management frame.

[0211] Clause 7. The method of clause 3 or 4, wherein the information sent together with the SSID and the password further comprises at least one of verification information, encryption information and router authentication information; and

[0212] the SSID and the password are encrypted data when the encryption information is sent.

[0213] Clause 8. The method of clause 4 or 5, wherein the method further comprises:

[0214] receiving, by the first WiFi-type smart device, feedback information indicating whether access to a network is successful from the second WiFi-type smart device.

[0215] Clause 9. The method of any of clauses 1 to 5, wherein the step of sending the management frame comprises:

[0216] sending, by the first WiFi-type smart device, the management frame by invoking a WiFi direct interface; or

[0217] sending, by the first WiFi-type smart device, the management frame by invoking a custom interface.

[0218] Clause 10. A method for acquiring WiFi networking information, comprising:

[0219] monitoring, by a second WiFi-type smart device, a management frame sent by a first WiFi-type smart device; and

[0220] parsing the management frame to obtain the WiFi networking information.

[0221] Clause 11. The method of clause 10, wherein the management frame comprises: a probe request frame, a probe response frame, an association request frame, a reassociation request frame, an action frame or a beacon frame.

[0222] Clause 12. The method of clause 10, wherein the WiFi networking information comprises a feature code, an SSID and a password.

[0223] Clause 13. The method of clause 10, further comprising:

[0224] establishing a connection with the first WiFi-type smart device by using WiFi direct if the second WiFi-type smart device parses out an identifier indicating provision of a networking information service from the management frame, and receiving an SSID and a password through the established connection.

[0225] Clause 14. The method of clause 10, further comprising: establishing, by the second WiFi-type smart device, a connection with the first WiFi-type smart device by using WiFi direct; and

[0226] parsing, by the second WiFi-type smart device, the management frame received in the process of establishing the connection, to obtain the WiFi networking information.

[0227] Clause 15. The method of clause 14, wherein the WiFi networking information comprises a feature code, an SSID and a password.

[0228] Clause 16. The method of clause 12 or 15, wherein the step of parsing the management frame to obtain the WiFi networking information comprises:

[0229] determining, by the second WiFi-type smart device, a monitored management frame in which a feature code is consistent with preset feature code information; and

[0230] parsing out the SSID and the password from the management frame based on a predetermined WiFi networking information format.

[0231] Clause 17. The method of clause 14, wherein the WiFi networking information comprises: an SSID and a password; and

[0232] the step of parsing the management frame to obtain the WiFi networking information comprises: parsing out, by the second WiFi-type smart device, the SSID and the password from a specified extension field of the management frame.

[0233] Clause 18. The method of clause 12, 13, 15 or 17, further comprising at least one of the following:

[0234] verifying, by the second WiFi-type smart device, the SSID and the password by using verification information received together with the SSID and the password;

[0235] decrypting, by the second WiFi-type smart device, the SSID and the password by using encryption information received together with the SSID and the password; and

[0236] sending, by the second WiFi-type smart device, an authentication request to an accessed wireless router by using router authentication information received together with the SSID and the password.

[0237] Clause 19. The method of clause 13, 14, 15 or 17, further comprising:

[0238] sending, by the second WiFi-type smart device, feedback information indicating whether access to a network is successful to the first WiFi-type smart device after the second WiFi-type smart device attempts to access the network by using the SSID and the password.

[0239] Clause 20. An apparatus for sending WiFi networking information, disposed in a first WiFi-type smart device, wherein the apparatus comprises:

[0240] a generation unit configured to generate a management frame that carries WiFi networking information; and

[0241] a first sending unit configured to send the management frame to be monitored by a second WiFi-type smart device.

[0242] Clause 21. The apparatus of clause 20, wherein the management frame comprises: a probe request frame, a probe response frame, an association request frame, a reassociation request frame, an action frame or a beacon frame.

[0243] Clause 22. The apparatus of clause 20, wherein the WiFi networking information comprises a feature code, an SSID and a password.

[0244] Clause 23. The apparatus of clause 20, wherein the WiFi networking information comprises an identifier indicating provision of a networking information service; and

[0245] the apparatus further comprises:

[0246] a connection establishment unit configured to establish a connection between the first WiFi-type smart device and the second WiFi-type smart device by using WiFi direct; and

[0247] a second sending unit configured to send an SSID and a password through the connection.

[0248] Clause 24. The apparatus of clause 20, wherein the apparatus further comprises:

[0249] a connection establishment unit configured to establish a connection between the first WiFi-type smart device and the second WiFi-type smart device by using WiFi direct; and

[0250] the management frame that carries WiFi networking information is a management frame sent in the process of establishing the connection.

[0251] Clause 25. The apparatus of clause 20, 21 or 24, wherein the WiFi networking information comprises a feature code, an SSID and a password; and

[0252] the WiFi networking information comprises an SSID and a password, and the WiFi networking information is carried in a specified extension field of the management frame.

[0253] Clause 26. The apparatus of clause 22 or 23, wherein the information sent together with the SSID and the password further comprises at least one of verification information, encryption information and router authentication information; and

[0254] the SSID and the password are encrypted data when the encryption information is sent.

[0255] Clause 27. The apparatus of clause 23 or 24, further comprising:

[0256] a feedback receiving unit configured to receive feedback information indicating whether access to a network is successful from the second WiFi-type smart device.

[0257] Clause 28. The apparatus of any of clauses 20 to 24, wherein the first sending unit is specifically configured to:

[0258] send the management frame by invoking a WiFi direct interface; or

[0259] send the management frame by invoking a custom interface.

[0260] Clause 29. An apparatus for acquiring WiFi networking information, disposed in a second WiFi-type smart device, wherein the apparatus comprises:

[0261] a monitoring unit configured to monitor a management frame sent by a first WiFi-type smart device; and

[0262] a parsing unit configured to parse the management frame to obtain the WiFi networking information.

[0263] Clause 30. The apparatus of clause 29, wherein the management frame comprises: a probe request frame, a probe response frame, an association request frame, a reassociation request frame, an action frame or a beacon frame.

[0264] Clause 31. The apparatus of clause 29, wherein the WiFi networking information comprises a feature code, an SSID and a password.

[0265] Clause 32. The apparatus of clause 29, further comprising:

[0266] a connection establishment unit configured to establish a connection between the first WiFi-type smart device and the second WiFi-type smart device by using WiFi direct if the parsing unit parses out an identifier indicating provision of a networking information service from the management frame; and

[0267] a receiving unit configured to receive an SSID and a password through the connection.

[0268] Clause 33. The apparatus of clause 29, wherein the apparatus further comprises:

[0269] a connection establishment unit configured to establish a connection between the second WiFi-type smart device and the first WiFi-type smart device by using WiFi direct; and

[0270] the parsing unit parses the management frame monitored in the process of establishing the connection, to obtain the WiFi networking information.

[0271] Clause 34. The apparatus of clause 33, wherein the WiFi networking information comprises a feature code, an SSID and a password.

[0272] Clause 35. The apparatus of clause 31 or 34, wherein the parsing unit is specifically configured to determine a monitored management frame in which a feature code is consistent with preset feature code information; and parse out the SSID and the password from the management frame based on a predetermined WiFi networking information format.

[0273] Clause 36. The apparatus of clause 33, wherein the WiFi networking information comprises: an SSID and a password; and

[0274] the parsing unit is specifically configured to parse out the SSID and the password from a specified extension field of the management frame.

[0275] Clause 37. The apparatus of clause 31, 34, 35 or 36, wherein the apparatus further comprises at least one of the following units:

[0276] a verification unit configured to verify the SSID and the password by using verification information received together with the SSID and the password;

[0277] a decryption unit configured to decrypt the SSID and the password by using encryption information received together with the SSID and the password; and

[0278] an authentication unit configured to send an authentication request to an accessed wireless router by using router authentication information received together with the SSID and the password.

[0279] Clause 38. The apparatus of clause 32, 33, 34 or 36, further comprising:

[0280] a feedback sending unit configured to send feedback information indicating whether access to a network is successful to the first WiFi-type smart device after the second WiFi-type smart device attempts to access the network by using the SSID and the password.

What is claimed is:

1. A method comprising:

generating, by a first device, a management frame that carries networking information; and

sending the management frame to a second device to request the second device to access to a network based on the networking information.

2. The method of claim **1**, further comprising receiving feedback information from the second device indicating a result of access to the network.

3. The method of claim **1**, further comprising establishing a direct connection between the first device and the second device.

4. The method of claim **3**, wherein the network is distinct from the direct connection.

5. The method of claim 1, wherein:
the first device is a first WiFi-type smart device;
the second device is a second WiFi-type smart device;
the networking information includes WiFi networking information; and
the direct connection uses a WiFi direct connection.

6. The method of claim 5, wherein the management frame includes:
a probe request frame;
a probe response frame;
an association request frame;
a reassociation request frame;
an action frame; or
a beacon frame.

7. The method of claim 5, wherein the WiFi networking information includes a feature code, a service set identifier (SSID) and a password.

8. The method of claim 5, wherein the WiFi networking information includes an identifier indicating provision of a networking information service.

9. The method of claim 5, further comprising:
sending an SSID and a password to the second WiFi-type smart device by using WiFi direct.

10. The method of claim 5, wherein the WiFi networking information is carried in a specified extension field of the management frame.

11. The method of claim 1, wherein the network information includes at least one of verification information, encryption information and router authentication information.

12. The method of claim 1, wherein the sending the management frame includes:
sending the management frame by invoking a WiFi direct interface.

13. A method comprising:
monitoring, by a second device, a management frame sent by a first device;
parsing the management frame to obtain networking information to access a network; and
accessing the network by using the networking information.

14. The method of claim 13, further comprising:
establishing a direct connection with the first device.

15. The method of claim 14, wherein:
the first device is a first WiFi-type smart device;
the second device is a second WiFi-type smart device;
the networking information includes WiFi networking information; and
the direct connection uses a WiFi direct connection.

16. The method of claim 15, wherein the parsing the management frame includes:
determining a monitored management frame in which the feature code is consistent with preset feature code information; and
parsing out SSID and password from the management frame based on a predetermined WiFi networking information format.

17. The method of claim 16, further comprising at least one of the following:
verifying the SSID and the password by using verification information received together with the SSID and the password;
decrypting the SSID and the password by using encryption information received together with the SSID and the password; or
sending an authentication request to an accessed wireless router by using router authentication information received together with the SSID and the password.

18. The method of claim 13, further comprising:
sending feedback information to the first device indicating a result of access to the network.

19. An apparatus comprising:
one or more processors; and
one or more memories storing thereon computer-readable instructions that, when executed by the one or more processors, cause the one or more processors to perform acts comprising:
establishing a wireless connection with a first device;
determining a management frame sent by the first device via the WiFi connection, the management frame including a feature code that is consistent with preset feature code information;
parsing out login information from the management frame based on a predetermined information format;
accessing a wireless network by using the login information, the wireless network being distinct from the wireless connection; and
sending feedback information to the first device indicating a result of access to the wireless network.

20. The apparatus of claim 19, wherein:
the wireless connection is a WiFi connection;
the wireless network is a WiFi network.

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