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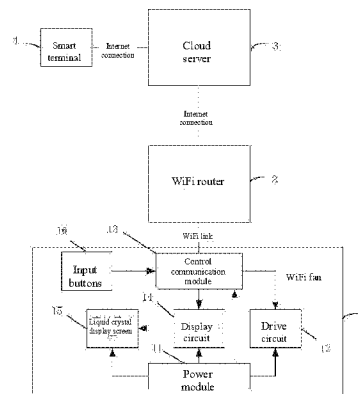
Claims 1 Page Specification 6 Pages
Attached Drawings 4 Pages

(54) Utility Model Name

A smart fan

(57) Summary

The present utility model discloses a smart fan, which includes: a WiFi fan, a smart terminal, and a cloud server. The WiFi fan is connected to the cloud server and the cloud server is connected to the smart terminal; the WiFi fan includes a power supply module for powering, a drive circuit for driving the operation of the WiFi fan, and a control communication module for controlling the operation of the drive circuit and realizing the WiFi connection. The power supply module is connected to the control communication module and the drive circuit and the control communication module is connected to the drive circuit. The smart fan of the present utility model enables a smart terminal to remotely control the WiFi fan through a cloud server and can realize new functions such as smart timing, remote restart and shutdown, smart shifting, and smart display so that the smart fan can form a smart home network with smart appliances.



1. A smart fan, wherein the smart fan comprises: WiFi fan, smart terminal, and cloud server. The WiFi fan is connected to the cloud server and the cloud server is connected to the smart terminal;

The WiFi fan includes a power supply module for powering, a drive circuit for driving the WiFi fan to operate, and a control communication module for controlling the operation of the drive circuit and implementing the WiFi connection. The power supply module is connected the control communication module and the drive circuit and the control communication module is connected to the drive circuit.

2. The smart fan according to Claim 1, wherein the smart fan further comprises a WiFi router for establishing a communication connection between the WiFi fan and the cloud server, the WiFi fan is connected to the WiFi router, and the WiFi router is connected to the cloud server.

3. The smart fan according to Claim 2, wherein the cloud server includes a communication module for communicating with the WiFi router, a storage module for storing data, and a processing module for receiving and processing user requests; the storage module and processing module are connected to the communication module, the processing module is connected to the smart terminal, and the communication module is connected to the WiFi router.

4. The smart fan according to Claim 1, wherein the smart terminal is a tablet or a cell phone and an app software program for operating and configuring the WiFi fan is provided on the smart terminal.

5. The smart fan according to Claim 1, wherein the WiFi fan further comprises a display circuit and the power supply module and control communication module are connected to the display circuit.

6. The smart fan according to Claim 5, wherein the WiFi fan further comprises a liquid crystal display screen and the display circuit is connected to the liquid crystal display screen.

7. The smart fan according to Claim 1, wherein the WiFi fan is further provided with input buttons for operating and configuring the WiFi fan and the input buttons are arranged corresponding to the drive circuit and connected to the control communication module.

8. The smart fan according to Claim 7, characterized in that the input buttons comprise a wind speed adjustment button, a rotation button, and an off button.

9. The smart fan according to Claim 1, wherein the control communication module is a control communication module that integrates a microcontroller and a WiFi communication module.

10. The smart fan according to Claim 5, characterized in that the control communication module comprises a control module for receiving and processing the control signals of the smart terminal and controlling the operation of the drive circuit and display circuit and a main communication module for communicating with the WiFi router. The main communication module is connected to the control module, the control module is connected to the drive circuit and display circuit, and the main communication module is connected to the WiFi router.

A Smart Fan

Technology

[0001] The present utility model relates to a smart fan, especially to a cloud server and WiFi-based smart fan.

Background technology

[0002] As smart terminals become more popular and the Internet of Things rapidly evolves, the demand for smart home appliances is increasing. Traditional electric fans use mechanical pushbutton switches and mechanical knob timers, which require direct human contact with buttons or knobs for operation, and timing functionality is limited. In addition, traditional mechanical buttons and mechanical knob timers have intolerable noise, which can no longer meet people's demands on smart electrical products. Existing smart fans are controlled by a microcontroller and use infrared remote control. This type of fan has a remote control function which traditional fans do not, but this adds a remote control which is inconvenient to store. In addition, only near-range remote control can be achieved and it cannot form a smart home network with other smart appliances.

Summary of the Utility Model

[0003] The present utility model is designed to solve the technical problem that existing fans require direct human touching of buttons or knobs for operation or use infrared remote control that can only achieve near-range remote control, providing a smart fan and using WiFi smart control combined with local control to achieve remote smart control.

[0004] This utility model is realized through the following technical solutions: A smart fan is provided comprising: A WiFi fan, a smart terminal, and a cloud server. The WiFi fan is connected to the cloud server and the cloud server is connected to the smart terminal; the WiFi fan includes a power supply module for powering, a drive circuit for driving the operation of the WiFi fan, and a control communication module for controlling the operation of the drive circuit and realizing the WiFi connection. The power supply module is connected to the control communication module and the drive circuit and the control communication module is connected to the drive circuit.

[0005] In the smart fan, preferably, the smart fan further comprises a WiFi router for establishing a communication connection between the WiFi fan and the cloud server, the WiFi fan is connected to the WiFi router, and the WiFi router is connected to the cloud server.

[0006] In the smart fan, preferably, the cloud server includes a communication module for communicating with the WiFi router, a storage module for storing data, and a processing module for receiving and processing user requests; the storage module and processing module are connected to the communication module, the processing module is connected to the smart terminal, and the communication module is connected to the WiFi router.

[0007] In the smart fan, preferably, the smart terminal is a tablet or a cell phone and an app software program for operating and configuring the WiFi fan is provided on the smart terminal.

[0008] In the smart fan, preferably, the WiFi fan further comprises a display circuit and the power module and control communication module are connected to the display circuit.

[0009] In the smart fan, preferably, the WiFi fan further comprises a liquid crystal display screen and the display circuit is connected to the liquid crystal display screen.

[0010] In the smart fan, preferably, the WiFi fan is further provided with input buttons for operating and configuring the WiFi fan and the input buttons are arranged corresponding to the drive circuit and connected to the control communication module.

[0011] In the smart fan, preferably, the input buttons comprise a wind speed adjustment button, a rotation button, and an off button.

[0012] In the smart fan, preferably, the control communication module is a control communication module that integrates a microcontroller and a WiFi communication module.

[0013] In the smart fan, preferably, the control communication module comprises a control module for receiving and processing the control signals of the smart terminal and controlling the operation of the drive circuit and display circuit and a main communication module for communicating with the WiFi router. The main communication module is connected to the control module, the control module is connected to the drive circuit and display circuit, and the main communication module is connected to the WiFi router.

[0014] The beneficial effects of implementing the present utility model are: The smart fan of the present utility model includes a WiFi fan, a smart terminal, and a cloud server. The WiFi fan is connected to the cloud server. The cloud server is connected to the smart terminal, thereby enabling the smart terminal to remotely control the WiFi fan through the cloud server and also enabling one smart terminal to control multiple smart fans through the cloud server; the WiFi fan includes a power supply module for powering, a drive circuit for driving the operation of the WiFi fan, and a control communication module for controlling the operation of the drive circuit and implementing the WiFi connection. The power supply module is connected to the control communication module and the drive circuit and the control communication module is connected to the drive circuit; the WiFi fan is configured with a control communication module, which can realize WiFi communication and control functions such as the power switching, timing, shifting, and display of the WiFi fan. The smart terminal can realize functions such as smart timing, remote restart and shutdown, smart shifting, intelligent display, and smart display through the communication connection between the cloud server and the control communication module, enabling the combination of the smart terminal and the smart fan so that the smart fan can form a home network with smart appliances.

Description of Drawings

[0015] Figure 1 is a schematic diagram of the main structure of the smart fan according to the first example of the present utility model.

[0016] Figure 2 is a schematic diagram of the modules of the smart fan according to the first example of the present utility model.

[0017] Figure 3 is a schematic diagram of the modules of the WiFi fan shown in Figure 1.

[0018] Figure 4 is a schematic diagram of the modules of the cloud server shown in Figure 1.

Specific Embodiments

[0019] The specific implementation method of the present utility model is further illustrated below with reference to the drawings. The specific implementation method of the present utility model is further illustrated below with reference to the drawings.

[0020] Examples of the present utility model are described in detail below. Examples of this embodiment are shown in the attached drawings, wherein the same or similar numerals throughout represent the same or similar elements or elements having the same or similar functions. The examples described below with reference to the attached drawings are exemplary, are only for the purpose of interpreting the present utility model, and should not be construed as limiting the present utility model. Rather, example of the present utility model include all variations, modifications, and equivalents that fall within the spirit and scope of the appended claims. The “connections” described in this application may be communication connections, electrical connections, or mechanical connections. The “WiFi” referred to in this application, Wireless Fidelity, is a wireless LAN based on the IEEE 802.11b standard. “App” means Application, a third-party application of a smart terminal.

[0021] As shown in Figures 1 to 4, the smart fan of the first example of the present utility model includes: a WiFi fan 1, a smart terminal 4, and a cloud server 3. The WiFi fan 1 is connected to the

cloud server 3. The cloud server 3 is connected to the smart terminal 4; the WiFi fan 1 includes a power supply module 11 for powering, a drive circuit 12 for driving the operation of the WiFi fan 1, and a control communication module 13 for controlling the operation of the drive circuit 12 and realizing the WiFi connection. The power supply module 11 is connected to the control communication module 13 and the drive circuit 12.

[0022] In this example, the smart fan further comprises a WiFi router 2 for establishing a communication connection between the WiFi fan 1 and the cloud server 3, the WiFi fan 1 is connected to the WiFi router 2, and the WiFi router 2 is connected to the cloud server 3.

[0023] As shown in Figure 1, in particular, the WiFi router 2 may be an existing conventional WiFi router 2. Its purpose is to establish a connection between the WiFi fan 1 and the cloud server 3. The WiFi fan 1 is connected to the Internet through the WiFi router 2, communicates with the cloud server 3, and then implements interaction with the smart terminal 4 through the cloud server 3. The structure and configuration of the WiFi router 2 are known to those skilled in the art and are not described here.

[0024] The cloud server 3 can be a variety of existing cloud servers 3 provided by network operators. The cloud server 3 is a platform for a variety of Internet users. The platform integrates three core elements of Internet applications in the traditional sense: Computing, storage, and networking for the convenience of Internet users. The smart fan of the present utility model adopts a cloud server 3, which is used to realize functions such as storing user data, processing user requests, and realizing sharing. It is the communication core of the smart fan system. In this example, referring to Figure 4, the cloud server 3 comprises a communication module 31 for communicating with the WiFi router 2, a storage module 32 for storing data obtained from the WiFi fan 1 and the smart terminal 4, and a processing module 33 for receiving and processing user requests. The storage module 32 and the processing module 33 are connected to the communication module 31. The processing module 33 is connected to the smart terminal 4 and is used to receive and process user requests made through the smart terminal. The communication module 31 is connected to the WiFi router 2 for communicating with the WiFi router 2 to acquire information from the WiFi fan 1 and transmit it to the smart terminal 4 or to send the requests processed by the processing module 33 to the control communication module 13 of the WiFi fan 1 through the WiFi router 2 so that the WiFi fan 1 performs the corresponding operations.

[0025] The smart terminal 4, for example: Can be an operation terminal that can be connected to the Internet, such as a cell phone, tablet, computer, etc., to provide a human-computer interaction interface and achieve remote control. In this example, the smart terminal 4 is a smartphone. The cell phone can be based on an Android platform, an iOS platform, or a Windows Phone platform. The cell phone is installed with an app software program that sends control signals to the WiFi fan 1 and receives feedback signals. Through the app software program, the WiFi fan 1 can be operated and configured, for example: To configure the WiFi fan 1, adjust the wind speed of the WiFi fan 1, turn off the WiFi fan 1, and rotate the WiFi fan 1. The app software program may be implemented by one skilled in the art according to prior art.

[0026] The above cell phone and WiFi router 2 are all conventional devices. The user's existing smartphone and WiFi router 2 can be used. No additional purchase is required, saving usage costs.

[0027] As shown in Figures 2 and 3 and as mentioned above, the WiFi fan 1 includes a power supply module 11 for powering, a drive circuit 12 for driving the operation of the WiFi fan 1, and a control communication module 13 for controlling the operation of the drive circuit 12 and realizing the WiFi connection. The power supply module 11 is connected to the control communication module 13 and the drive circuit 12 and the control communication module 13 is connected to the drive circuit 12. In particular, referring to Figure 3, the drive circuit 12 includes a switching circuit 121 for turning off the WiFi fan 1, a turning circuit 122 for turning the fan left and right, and an adjustment circuit 123 for adjusting the wind speed; the control communication module 13 controls the operation of the WiFi fan

1 through the drive circuit 12. The circuit structure of the drive circuit 12 may be realized by the prior art and is not described here. The smart fan of the present utility model uses WiFi smart control combined with local control. The smart terminal 4 is connected to the control communication module 13 via the cloud server and WiFi router and the user is able to carry out remote smart control of the WiFi fan 1 through the app software program on the smart terminal 4.

[0028] In this example, the WiFi fan 1 further includes a display circuit 14 and a liquid crystal display screen 15. The display circuit 14 is connected to the liquid crystal display screen 15 and the power supply module 11 and control communication module 13 are connected to the display circuit 14. In the present example, the display circuit 14 is provided with an interface for connecting to the liquid crystal display screen 15 and the I2C communication protocol is used. Power is supplied to the display circuit 14 and the liquid crystal display 15 through the power module 11. By controlling the communication module 13, the operating state and other information of the WiFi fan 1 are displayed on the liquid crystal display 15 through the display circuit 14. Using the liquid crystal display 15 as a display device can display more information, such as: The wind speed information, network connection status information, rotation status, timing status, and other information of the fan, and information pushed by the cloud server 3 may also be displayed, such as: Information such as weather forecasts for users to conveniently observe and use.

[0029] In this example, as shown in Figure 3, the control communication module 13 is a control communication module 13 that integrates the functions of a microcontroller and a WiFi communication module; the control communication module 13 includes a control module 131 for receiving and processing control signals of the smart terminal and controlling the operation of the drive circuit 12 and the display circuit 14 and a main communication module 132 for communicating with the WiFi router 2. The main communication module 132 is connected to the control module 131, the control module 131 is connected to the drive circuit 12 and the display circuit 14, and the main communication module 132 is connected to the WiFi router 2. The control communication module 13 is independently developed by the inventor and integrates the functions of a microcontroller and a WiFi communication module. It can enable communication with the smart terminal 4 through the WiFi router 2 and cloud server 3, receive and process the signals of the smart terminal 4, and control external circuits and devices, such as: Controlling the display circuit 14 and drive circuit 12. The control module 131 may adopt the circuit structure of a microcontroller, microprocessor, etc. and can realize signal reception and processing and external circuit and device control. The main communication module 132 is a WiFi communication module for realizing communication with the WiFi router 2.

[0030] The WiFi fan 1 is further provided with input buttons 16 for operating and configuring the WiFi fan 1. In this example, the input buttons 16 include at least a wind speed adjustment button 161, a rotation button 162, and an off button 163. The input buttons 16 are arranged corresponding to the drive circuit 12 and connected to the control communication module 13. When the control communication module 13 is used to control the WiFi fan 1, for example, when the wind speed adjustment button 161 is pressed, the fan starts to work. Each time the wind speed adjustment button is pressed, it will speed up until reaching the third level, after which the fan will return to the first level when pressing the button again and the cycle repeats; when the user presses the rotation button 162, the fan starts rotating left and right. When the rotation button 162 is pressed again, the rotation will turn off. When the user presses the off button 163, the fan will stop working. The smart fan of the present utility model uses WiFi smart control combined with local control. By setting the input buttons 16, when the WiFi fan 1 cannot communicate with the cloud server 3 normally due to network environment problems and the WiFi fan 1 cannot be operated by the smart terminal 4, the WiFi fan 1 can be controlled locally by manually pressing the input buttons 16. In addition, long-pressing the wind speed adjustment button 161 or the off button 163 can make the WiFi fan 1 enter configuration mode. In the present example, pressing them for more than 5 seconds can make the WiFi fan 1 enter configuration mode. It can be seen that the WiFi fan 1 can be operated and configured locally through the input buttons 16, whose principle is known to those skilled in the art and is not described here.

[0031] The power supply module 11 is used to convert utility power to direct current for use by the WiFi fan 1. In the present example, the power supply module 11 converts 220V AC power to a 5V DC power supply, which acts as the operating power supply for the entire WiFi fan 1. It is connected to the control communication module 13, the drive circuit 12, the display circuit 14, and the liquid crystal display screen 15 to power the control communication module 13, the drive circuit 12, the display circuit 14, and the liquid crystal display screen 15. The power supply module 11 may be implemented by the prior art and is not described here.

[0032] The configuration and work of the smart fan of this utility model include the following steps:

[0033] Before configuration, the WiFi fan 1 is powered on, and the power module 11 in the local WiFi fan 1 converts 220V AC power to 5V DC power as the working power supply of the entire WiFi fan 1; when the power supply is normal, the control communication module 13 of the WiFi fan 1 starts to operate and the WiFi fan 1 enters the working state.

[0034] Step 1. Configuration step: The configuration state is automatically detected after the WiFi fan 1 is powered on. If the WiFi fan 1 has been configured, the WiFi fan 1 is automatically connected to the corresponding WiFi. If the WiFi fan 1 has not been configured, the WiFi fan 1 is configured through the app software program of the smart terminal 4.

[0035] In Step 1, two substeps are included: Step 1a. If the user has not carried out configuration, the input buttons 16 of the WiFi fan 1 can be pressed for 5 seconds and the WiFi fan 1 will enter configuration mode. At this time, the WiFi signal named device ID (device identification) can be seen in the WiFi list of the smart terminal 4.

[0036] Step 1b. After the WiFi fan 1 successfully enters configuration mode, the corresponding display will appear on the liquid crystal display screen 15 of the WiFi fan 1. At this time, the user can configure the device through the app software program of the supporting smart terminal 4. First, connect the smart terminal 4 to a currently available WiFi. Click Add Device on the app software program of the smart terminal 4 and the smart terminal 4 will automatically search for an available WiFi fan 1 in the current range. When there are multiple available WiFi fans 1, the app software program lists the available WiFi fans 1 and the user can select the WiFi fan 1 that needs to be configured at the moment. Next, after selecting the WiFi fan 1 successfully, the app software program will ask the user to fill in the relevant information of the available WiFi router 2, such as filling in the password of the currently available WiFi, and then click Next. The app software program will automatically send the relevant configuration information to the WiFi fan 1 while sending the relevant configuration information to the cloud server 3. The WiFi fan 1 will automatically connect to WiFi after receiving the relevant configuration information. After the app software program of the smart terminal 4 successfully configures the WiFi fan 1, the WiFi fan 1 can be named so that the user can distinguish their own multiple WiFi fans 1.

[0037] Step 2: When the WiFi fan 1 is successfully connected to the WiFi, the connection to the cloud server 3 will be initiated. After receiving the connection request, the cloud server 3 can successfully establish a connection with the WiFi fan 1 after successfully detecting the legitimacy of the WiFi fan 1. The relevant network status is displayed on the display screen 15 of the WiFi fan 1.

[0038] Step 3. When the display screen 15 of the WiFi fan 1 shows that the network connection is normal, the user can open the app software program of the smart terminal 4. There will be a corresponding WiFi fan 1 in the device list of the app software program. The user can operate the WiFi fan 1 through the app software program, for example: Adjust the wind speed, set rotational state, set timed on/off, timed shifting, etc.

[0039] It is worth mentioning that when the app software program is used for operation, the app software program sends the user's required state to the cloud server 3 and the cloud server 3 sends the information to the WiFi fan 1 through the WiFi router 2 after processing by the processing module 33. The control communication module 13 of the WiFi fan 1 will take the corresponding actions according to the received information. Specifically, when the user uses remote control, the app software program displays the corresponding operation buttons. The user presses the corresponding buttons to send the

corresponding signal to the cloud server 3, which is processed through the cloud server 3 and then sent to the corresponding WiFi fan 1. The WiFi fan 1 will then handle the corresponding processing according to the received instructions. After the processing is completed, the current state of the WiFi fan 1 will be sent to the cloud server 3 and the cloud server 3 will then forward it to the user's smart terminal 4. On the smart terminal 4, the user can see the latest state of the smart fan at any time, thereby enabling remote operation of the WiFi fan 1 through the smart terminal 4.

[0040] In addition, when there is no network connection or when the user does not need to operate remotely, the input buttons 16 of the WiFi fan 1 can be used to operate the WiFi fan 1. Specifically, the local default state is off after the WiFi fan 1 is powered on. When the user presses the wind speed adjustment button 161, the WiFi fan 1 starts to work. Each time the wind speed adjustment button 161 is pressed, it will speed up until reaching the third level, after which the WiFi fan 1 will return to the first level when pressing the wind speed adjustment button 161 again and the cycle repeats; when the user presses the rotation button 162, the WiFi fan 1 starts rotating left and right. When the rotation button 162 is pressed again, the rotation will stop. When the user presses the off button 163, the fan will stop working. When the user changes the operating state of the WiFi fan 1, the WiFi fan 1 sends the current state to the cloud server 3 and simultaneously displays the current state on the liquid crystal display 15.

[0041] In summary, the smart fan of the present utility model includes a WiFi fan 1, a smart terminal 4, and a cloud server 3. The WiFi fan 1 is connected to the cloud server 3. The cloud server 3 is connected to the smart terminal 4, thereby enabling the smart terminal 4 to remotely control the WiFi fan 1 through the cloud server 3 and also enabling one smart terminal 4 to control multiple WiFi fans 1 through the cloud server 3; the WiFi fan 1 includes a power supply module 11 for powering, a drive circuit 12 for driving the operation of the WiFi fan 1, and a control communication module 13 for controlling the operation of the drive circuit 12 and implementing the WiFi connection. The power supply module 11 is connected to the control communication module 13 and the drive circuit 12 and the control communication module 13 is connected to the drive circuit 12; the WiFi fan 1 is configured with a control communication module 13, which can realize WiFi communication and control functions such as the power switching, timing, shifting, and display of the WiFi fan 1. The smart terminal 4 can realize new functions such as smart timing, remote restart and shutdown, smart shifting, intelligent display, and smart display through the communication connection between the cloud server 4 and the control communication module 13, enabling the combination of the smart terminal 4 and the smart fan so that the smart fan can form a home network with smart appliances.

[0042] Although examples of the present utility model have been shown and described, those of ordinary skill in the art can understand that: Various changes, modifications, substitutions, and variations can be made to these examples without departing from the principles and objectives of the present utility model and the scope of the present utility model is defined by the claims and their equivalents.

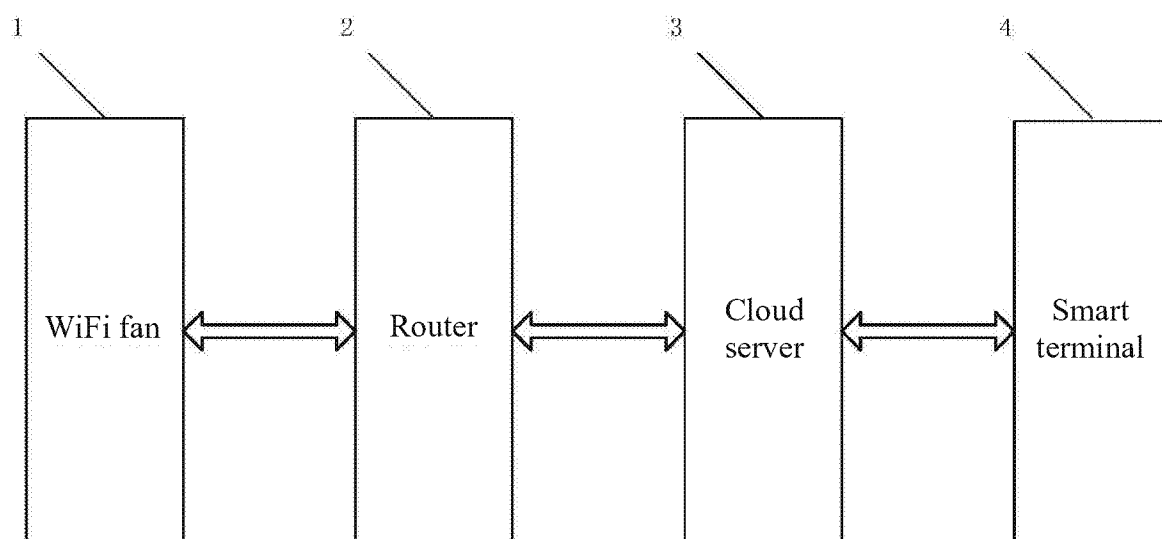


Figure 1

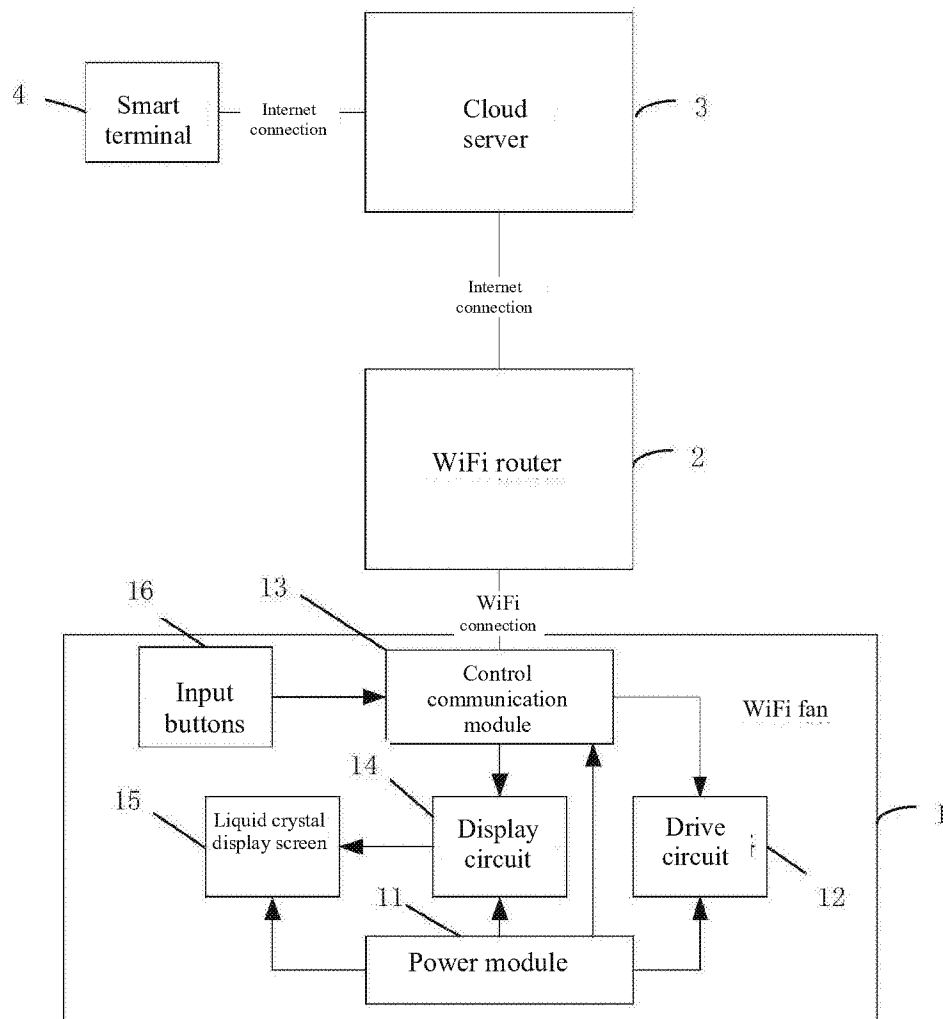


Figure 2

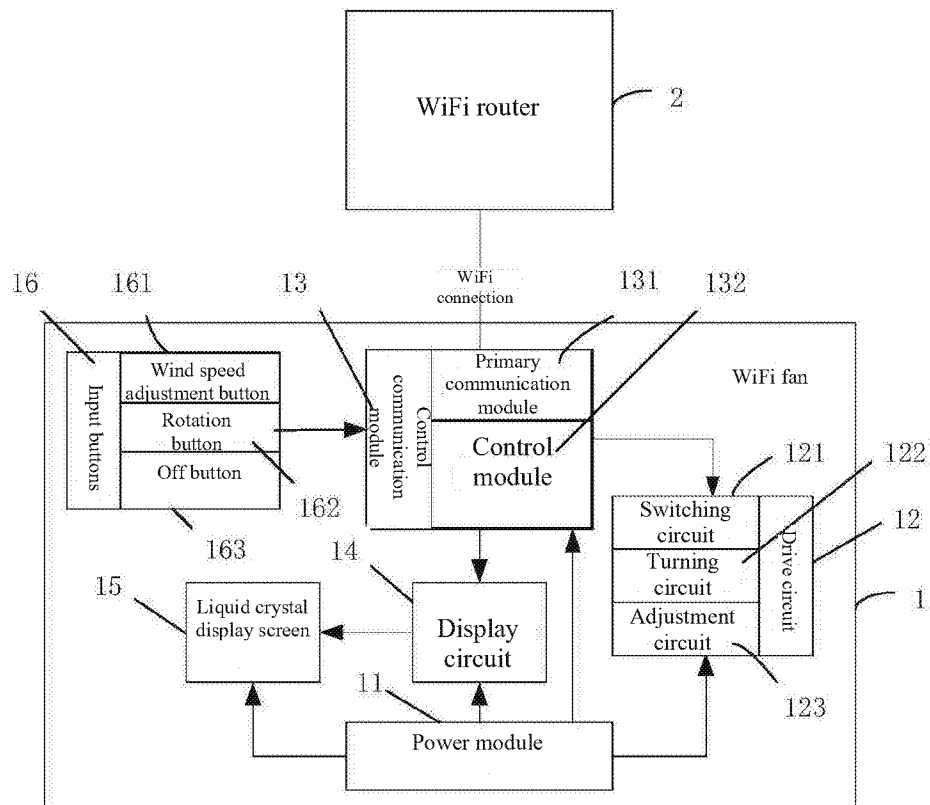


Figure 3

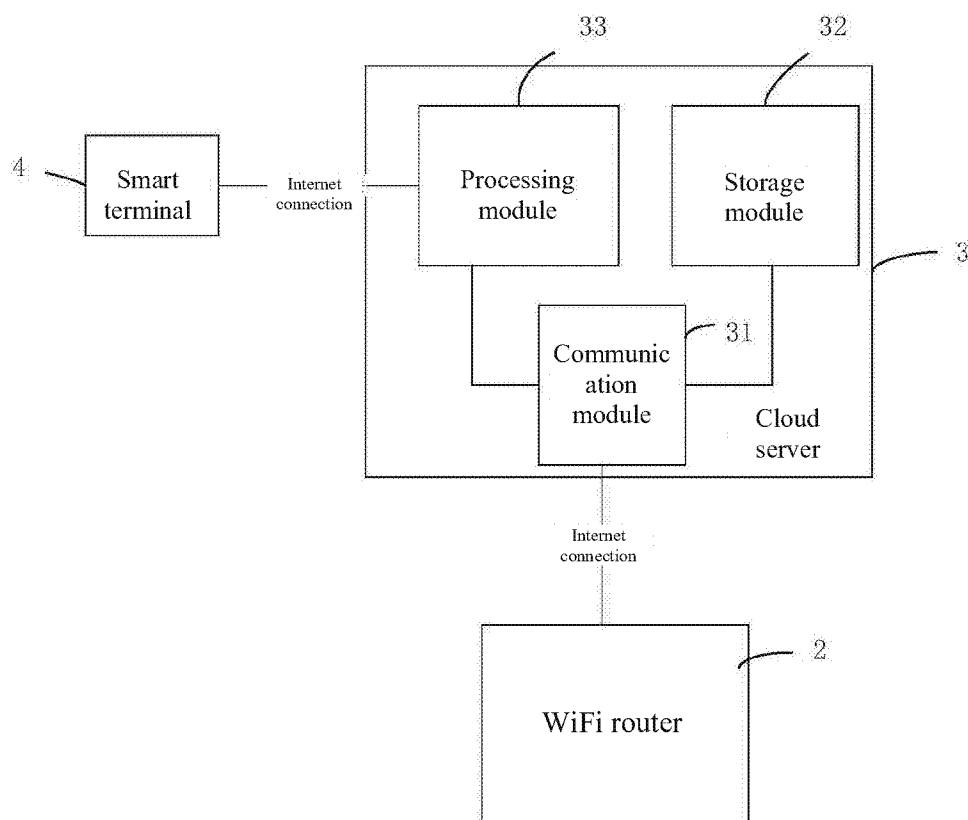


Figure 4



TRANSPERFECT

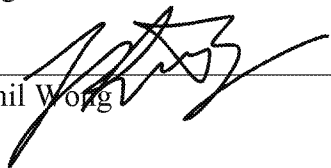
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I, Phil Wong, hereby certify that I am fluent in the [US ENGLISH] and [SIMPLIFIED CHINESE] Languages, I have been translating documents for over 24 years and am competent to translate from [SIMPLIFIED CHINESE] to [US ENGLISH].

I have a bachelor's degree in Computer Science with a minor in Classical Chinese Literature.

I hereby certify under penalty of perjury under the laws of the United States that the following is, to the best of my knowledge and belief, a true and accurate translation of the attached [CN204783774U (Yun Li)] from [SIMPLIFIED CHINESE] into [US ENGLISH].

Signature:



Phil Wong

[February 21, 2024]



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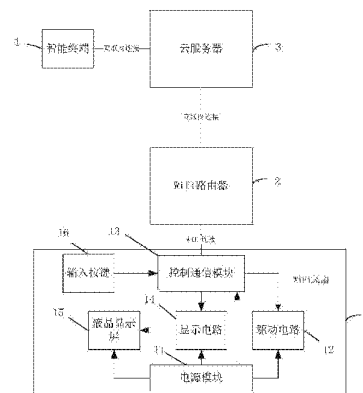
权利要求书1页 说明书6页 附图4页

(54) 实用新型名称

一种智能风扇

(57) 摘要

本实用新型公开一种智能风扇,所述智能风扇包括:WiFi 风扇、智能终端以及云服务器,所述 WiFi 风扇与云服务器相连接,云服务器与智能终端相连接;所述 WiFi 风扇包括用于供电的电源模块、用于驱动 WiFi 风扇运转的驱动电路、以及用于控制驱动电路工作并实现 WiFi 连接的控制通信模块,所述电源模块与控制通信模块、驱动电路相连接,所述控制通信模块与驱动电路相连接。本实用新型的智能风扇使得智能终端能够通过云服务器对 WiFi 风扇进行远程控制,能够实现智能定时、远程重启与关闭、智能调档、智能显示等新功能,使得智能风扇能与智能家电组成一个智能家居网络。



1. 一种智能风扇,其特征在于,所述智能风扇包括:WiFi 风扇、智能终端以及云服务器,所述 WiFi 风扇与云服务器相连接,云服务器与智能终端相连接;

所述 WiFi 风扇包括用于供电的电源模块、用于驱动 WiFi 风扇运转的驱动电路、以及用于控制驱动电路工作并实现 WiFi 连接的控制通信模块,所述电源模块与控制通信模块、驱动电路相连接,所述控制通信模块与驱动电路相连接。

2. 根据权利要求 1 所述的智能风扇,其特征在于,所述智能风扇还包括用于在 WiFi 风扇和云服务器之间建立通讯连接的 WiFi 路由器,所述 WiFi 风扇与 WiFi 路由器相连接,所述 WiFi 路由器与云服务器相连接。

3. 根据权利要求 2 所述的智能风扇,其特征在于,所述云服务器包括用于与 WiFi 路由器进行通讯的通讯模块、用于储存数据的存储模块以及用于接收和处理用户请求的处理模块;所述存储模块、处理模块与通讯模块相连接,所述处理模块与智能终端相连接,所述通讯模块与 WiFi 路由器相连接。

4. 根据权利要求 1 所述的智能风扇,其特征在于,所述智能终端为平板电脑或者手机,所述智能终端上设有用于对 WiFi 风扇进行操作和配置的 APP 软件程序。

5. 根据权利要求 1 所述的智能风扇,其特征在于,所述 WiFi 风扇还包括显示电路,所述电源模块、控制通信模块与显示电路相连接。

6. 根据权利要求 5 所述的智能风扇,其特征在于,所述 WiFi 风扇还包括液晶显示屏,所述显示电路与液晶显示屏相连接。

7. 根据权利要求 1 所述的智能风扇,其特征在于,所述 WiFi 风扇上还设有用于操作和配置 WiFi 风扇的输入按键,所述输入按键与驱动电路对应设置并与控制通信模块相连接。

8. 根据权利要求 7 所述的智能风扇,其特征在于,所述输入按键包括风速调节键、摇头键以及关闭键。

9. 根据权利要求 1 所述的智能风扇,其特征在于,所述控制通信模块为集成单片机和 WiFi 通讯模块的控制通信模块。

10. 根据权利要求 5 所述的智能风扇,其特征在于,所述控制通信模块包括用于接收和处理智能终端的控制信号、并控制驱动电路和显示电路工作的控制模块,以及用于与 WiFi 路由器进行通讯的主通讯模块,所述主通讯模块与控制模块相连接,所述控制模块与驱动电路、显示电路相连接,所述主通讯模块与 WiFi 路由器相连接。

一种智能风扇

技术领域

[0001] 本实用新型涉及一种智能风扇,尤其涉及一种基于云服务器和 WiFi 的智能风扇。

背景技术

[0002] 随着智能终端的不断普及以及物联网的快速发展,人们对智能家电的需求越来越强烈。传统的电风扇采用的是机械按键开关以及机械旋钮定时器,需要人手直接接触按键或旋钮进行操作,且定时功能有限,并且传统的机械按键和机械旋钮定时器有着让人无法忍受的噪声,已经无法满足人们对智能化电气产品的需求。现有比较智能的风扇是基于单片机控制的,使用的是红外遥控操控,这种风扇比传统风扇多了一个遥控的功能,但是多了一个遥控器,不方便保存,并且只能实现近距离遥控,并且也不能与其他智能家电连接形成一个智能家居网络。

实用新型内容

[0003] 本实用新型旨在解决现有的风扇需要人手直接触摸按键或旋钮进行操作,或者采用红外线遥控操控,但只能实现近距离遥控的技术问题,提供一种智能风扇,采用 WiFi 智能控制与本地控制相结合,能够实现远程智能控制。

[0004] 本实用新型通过如下技术方案实现:提供一种智能风扇,所述智能风扇包括:WiFi 风扇、智能终端以及云服务器,所述 WiFi 风扇与云服务器相连接,云服务器与智能终端相连接;所述 WiFi 风扇包括用于供电的电源模块、用于驱动 WiFi 风扇运转的驱动电路、以及用于控制驱动电路工作并实现 WiFi 连接的控制通信模块,所述电源模块与控制通信模块、驱动电路相连接,所述控制通信模块与驱动电路相连接。

[0005] 在所述的智能风扇中,优选地,所述智能风扇还包括用于在 WiFi 风扇和云服务器之间建立通讯连接的 WiFi 路由器,所述 WiFi 风扇与 WiFi 路由器相连接,所述 WiFi 路由器与云服务器相连接。

[0006] 在所述的智能风扇中,优选地,所述云服务器包括用于与 WiFi 路由器进行通讯的通讯模块、用于储存数据的存储模块以及用于接收和处理用户请求的处理模块;所述存储模块、处理模块与通讯模块相连接,所述处理模块与智能终端相连接,所述通讯模块与 WiFi 路由器相连接。

[0007] 在所述的智能风扇中,优选地,所述智能终端为平板电脑或者手机,所述智能终端上设有用于对 WiFi 风扇进行操作和配置的 APP 软件程序。

[0008] 在所述的智能风扇中,优选地,所述 WiFi 风扇还包括显示电路,所述电源模块、控制通信模块与显示电路相连接。

[0009] 在所述的智能风扇中,优选地,所述 WiFi 风扇还包括液晶显示屏,所述显示电路与液晶显示屏相连接。

[0010] 在所述的智能风扇中,优选地,所述 WiFi 风扇上还设有用于操作和配置 WiFi 风扇的输入按键,所述输入按键与驱动电路对应设置并与控制通信模块相连接。

[0011] 在所述的智能风扇中,优选地,所述输入按键包括风速调节键、摇头键以及关闭键。

[0012] 在所述的智能风扇中,优选地,所述控制通信模块为集成单片机和 WiFi 通讯模块的控制通信模块。

[0013] 在所述的智能风扇中,优选地,所述控制通信模块包括用于接收和处理智能终端的控制信号、并控制驱动电路和显示电路工作的控制模块,以及用于与 WiFi 路由器进行通讯的主通讯模块,所述主通讯模块与控制模块相连接,所述控制模块与驱动电路、显示电路相连接,所述主通讯模块与 WiFi 路由器相连接。

[0014] 实施本实用新型的有益效果是:本实用新型的智能风扇包括 WiFi 风扇、智能终端以及云服务器,所述 WiFi 风扇与云服务器相连接,云服务器与智能终端相连接,由此使得智能终端能够通过云服务器对 WiFi 风扇进行远程控制,并且通过云服务器,还能够实现一个智能终端对多个智能风扇进行控制;所述 WiFi 风扇包括用于供电的电源模块、用于驱动 WiFi 风扇运转的驱动电路、以及用于控制驱动电路工作并实现 WiFi 连接的控制通信模块,所述电源模块与控制通信模块、驱动电路相连接,所述控制通信模块与驱动电路相连接;所述 WiFi 风扇通过设置控制通信模块,所述控制通信模块能够实现 WiFi 通讯以及对 WiFi 风扇进行开关、定时、调档、显示等功能的控制,所述智能终端通过云服务器与控制通信模块的通讯连接,能够实现智能定时、远程重启与关闭、智能调档、智能显示等功能,从而能够实现智能终端与智能风扇的结合,使得智能风扇能与智能家电组成一个智能家居网络。

附图说明

[0015] 图 1 是根据本实用新型第一实施例的智能风扇的主体结构示意图。

[0016] 图 2 是根据本实用新型第一实施例的智能风扇的模块示意图。

[0017] 图 3 是图 1 所示的 WiFi 风扇的模块示意图。

[0018] 图 4 是图 1 所示的云服务器的模块示意图。

具体实施方式

[0019] 以下结合附图对本实用新型的具体实施方式进行进一步的说明。以下结合附图对本实用新型的具体实施方式进行进一步的说明。

[0020] 下面详细描述本实用新型的实施例,所述实施例的示例在附图中示出,其中自始至终相同或类似的标号表示相同或类似的元件或具有相同或类似功能的元件。下面通过参考附图描述的实施例是示例性的,仅用于解释本实用新型,而不能理解为对本实用新型的限制。相反,本实用新型的实施例包括落入所附加权利要求书的精神和内涵范围内的所有变化、修改和等同物。本申请中所述的“连接”可以为通讯连接、电连接或者机械连接。本申请中所述的“WiFi”即 Wi rel ess Fide l ity,是基于 IEEE 802.11b 标准的无线局域网。“APP”即 App l ication,指的是智能终端的第三方应用程序。

[0021] 如图 1~4 所示,本实用新型第一实施例的智能风扇,包括:WiFi 风扇 1、智能终端 4 以及云服务器 3,所述 WiFi 风扇 1 与云服务器 3 相连接,云服务器 3 与智能终端 4 相连接;所述 WiFi 风扇 1 包括用于供电的电源模块 11、用于驱动 WiFi 风扇 1 运转的驱动电路 12、以及用于控制驱动电路 12 工作并实现 WiFi 连接的控制通信模块 13,所述电源模块 11 与控

制通信模块 13、驱动电路 12 相连接,所述控制通信模块 13 与驱动电路 12 相连接。

[0022] 在本实施例中,所述智能风扇还包括用于在 WiFi 风扇 1 和云服务器 3 之间建立通讯连接的 WiFi 路由器 2,所述 WiFi 风扇 1 与 WiFi 路由器 2 相连接,所述 WiFi 路由器 2 与云服务器 3 相连接。

[0023] 如图 1 所示,具体来说,所述 WiFi 路由器 2 可以为现有常规的 WiFi 路由器 2,其作用是建立 WiFi 风扇 1 与云服务器 3 之间的连接,所述 WiFi 风扇 1 通过 WiFi 路由器 2 连接到 internet,与云服务器 3 通信,再通过云服务器 3 实现与智能终端 4 的交互。WiFi 路由器 2 的结构以及设置方式已为本领域技术人员所知,在此不做赘述。

[0024] 所述云服务器 3 可以为现有的网络运营商提供的各种云服务器 3,云服务器 3 是面向各类互联网用户提供的平台,平台整合了传统意义上的互联网应用三大核心要素:计算、存储、网络,方便互联网用户使用。本实用新型的智能风扇采用云服务器 3,用于实现存储用户数据、处理用户请求以及实现分享等功能,是智能风扇系统的通信核心。在本实施例中,参阅图 4,所述云服务器 3 包括用于与 WiFi 路由器 2 进行通讯的通讯模块 31、用于储存从 WiFi 风扇 1、智能终端 4 处获取的数据的存储模块 32 以及用于接收和处理用户请求的处理模块 33,所述存储模块 32、处理模块 33 与通讯模块 31 相连接,所述处理模块 33 与智能终端 4 相连接,用于接收和处理用户通过智能终端发出的请求,所述通讯模块 31 与 WiFi 路由器 2 相连接,用于与所述 WiFi 路由器 2 进行通讯,获取 WiFi 风扇 1 的信息并传送给智能终端 4,或者将处理模块 33 处理后的请求通过 WiFi 路由器 2 发送给 WiFi 风扇 1 的控制通信模块 13,使 WiFi 风扇 1 作出相应的操作。

[0025] 所述智能终端 4,例如:可以为手机、平板电脑、电脑等可连接 Internet 的操作终端,用于提供人机交互界面,实现远程控制。在本实施例中,所述智能终端 4 为智能手机,所述手机可以基于 Android 平台、IOS 平台或者基于 Windows phone 平台,所述手机上安装有向 WiFi 风扇 1 发送控制信号并接收反馈信号的 APP 软件程序,通过所述 APP 软件程序,能够对 WiFi 风扇 1 进行操作和配置,例如:对 WiFi 风扇 1 进行配置、调节 WiFi 风扇 1 的风速、关闭 WiFi 风扇 1 以及使 WiFi 风扇 1 摇头。所述 APP 软件程序可由本领域的技术人员根据现有技术实现。

[0026] 上述的手机、WiFi 路由器 2 均为常规的设备,可以采用用户已有的智能手机和 WiFi 路由器 2,无需另外购买,节约使用成本。

[0027] 如图 2 及图 3 所示,如上所说,所述 WiFi 风扇 1 包括用于供电的电源模块 11、用于驱动 WiFi 风扇 1 运转的驱动电路 12、以及用于控制驱动电路 12 工作并实现 WiFi 连接的控制通信模块 13,所述电源模块 11 与控制通信模块 13、驱动电路 12 相连接,所述控制通信模块 13 与驱动电路 12 相连接。具体来说,参阅图 3,所述驱动电路 12 包括用于关闭 WiFi 风扇 1 的开关电路 121、用于使风扇左右转向摇头的转向电路 122 以及用于调节风速的调节电路 123;所述控制通信模块 13 通过所述驱动电路 12 控制 WiFi 风扇 1 的运转。所述的驱动电路 12 的电路结构可以通过现有技术实现,在此不做赘述。本实用新型的智能风扇采用 WiFi 智能控制与本地控制相结合,所述智能终端 4 通过云服务器、WiFi 路由器与控制通信模块 13 通讯连接,用户通过智能终端 4 上的 APP 软件程序,能够对 WiFi 风扇 1 进行远程智能控制。

[0028] 在本实施例中,所述 WiFi 风扇 1 还包括显示电路 14 和液晶显示屏 15,所述显示电

路 14 与液晶显示屏 15 相连接,所述电源模块 11、控制通信模块 13 与显示电路 14 相连接。在本实施例中,所述显示电路 14 上设有用于连接液晶显示屏 15 的接口,使用 I2C 通信协议。通过电源模块 11 给显示电路 14、液晶显示屏 15 供电,通过控制通信模块 13 将 WiFi 风扇 1 的运行状态和其它信息,通过显示电路 14 显示到液晶显示屏 15 上,采用液晶显示屏 15 作为显示设备能够显示更多的信息,例如:风扇的风速信息、网络连接状态信息、摇头状态、定时状态等信息,并且,还可以显示由云服务器 3 推送的信息,例如:天气预报等信息,便于用户观察,方便用户使用。

[0029] 在本实施例中,如图 3 所示,所述控制通信模块 13 为集成单片机和 WiFi 通讯模块功能的控制通信模块 13;所述控制通信模块 13 包括用于接收和处理智能终端的控制信号、并控制驱动电路 12 和显示电路 14 工作的控制模块 131,以及用于与 WiFi 路由器 2 进行通讯的主通讯模块 132,所述主通讯模块 132 与控制模块 131 相连接,所述控制模块 131 与驱动电路 12、显示电路 14 相连接,所述主通讯模块 132 与 WiFi 路由器 2 相连接。所述控制通信模块 13 由发明人自主研发,集成了单片机和 WiFi 通讯模块的功能,能够实现通过 WiFi 路由器 2、云服务器 3 与智能终端 4 进行通信,对智能终端 4 的信号接收和处理,以及对与之外接电路和设备的控制,例如:显示电路 14 和驱动电路 12 的控制。其中,所述控制模块 131 可采用单片机、微处理器等的电路结构,能够实现信号接收、处理以及外接电路和设备控制。所述主通讯模块 132 为 WiFi 通讯模块,用于实现与 WiFi 路由器 2 之间的通讯。

[0030] 所述 WiFi 风扇 1 上还设有用于操作和配置 WiFi 风扇 1 的输入按键 16,在本实施例中,所述输入按键 16 至少包括风速调节键 161、摇头键 162 以及关闭键 163,所述输入按键 16 与驱动电路 12 对应设置并与控制通信模块 13 相连接,通过控制通信模块 13 实现对 WiFi 风扇 1 的控制,例如,按压风速调节键 161 时,风扇开始工作,从一档开始,每按一次风速调节键,就会加一档,直到三档,然后再按按键,风扇会回到一档,如此往复循环;当用户按下摇头键 162 时,风扇开始左右摇头,再次按下摇头键 162 时会关闭摇头,用户按下关闭键 163 时风扇就会停止工作。本实用新型的智能风扇采用 WiFi 智能控制与本地控制相结合,通过设置所述输入按键 16,在 WiFi 风扇 1 因为网络环境问题而不能正常与云服务器 3 通信的情况下,不能通过智能终端 4 对 WiFi 风扇 1 进行操作时,可以在本地通过手动按压输入按键 16 的方式,对 WiFi 风扇 1 进行相应的控制。并且,长按风速调节键 161 或者关闭键 163,可使 WiFi 风扇 1 进入配置模式。在本实施例中,按压 5 秒以上,可使 WiFi 风扇 1 进入配置模式。由此可知,通过所述输入按键 16 可在本地对 WiFi 风扇 1 进行操作和配置,其原理已为本领域技术人员所知,在此不做赘述。

[0031] 所述电源模块 11 用于将市电转换为直流电,以供 WiFi 风扇 1 使用。在本实施例中,电源模块 11 会将 220V 的交流电转换为 5V 直流电源,作为整个 WiFi 风扇 1 的工作电源,其与控制通信模块 13、驱动电路 12、显示电路 14 以及液晶显示屏 15 相连接,给控制通信模块 13、驱动电路 12、显示电路 14 以及液晶显示屏 15 供电。所述电源模块 11 可以通过现有技术实现,在此不做赘述。

[0032] 本实用新型的智能风扇的配置以及工作包括下述步骤:

[0033] 在进行配置前,将 WiFi 风扇 1 接通电源,本地 WiFi 风扇 1 中的电源模块 11 会将 220V 的交流电转换为 5V 直流电源,作为整个 WiFi 风扇 1 的工作电源;当电源正常后,WiFi 风扇 1 的控制通信模块 13 开始工作,WiFi 风扇 1 进入工作状态。

[0034] 步骤1、配置步骤：当WiFi风扇1上电以后会自动检测配置状态，如果WiFi风扇1已进行过配置，则WiFi风扇1自动连接相应的WiFi，如果WiFi风扇1没有进行过配置，则通过智能终端4的APP软件程序对WiFi风扇1进行配置。

[0035] 在步骤1中包括两个子步骤：步骤1a、如果用户没有进行过配置，可将WiFi风扇1的输入按键16长按5秒，WiFi风扇1会进入配置模式，此时可以在智能终端4的WiFi列表中看到以device ID(设备身份识别)为名的WiFi信号。

[0036] 步骤1b、当WiFi风扇1成功进入配置模式后，WiFi风扇1的液晶显示屏15上会有相应的显示，此时用户可以通过配套的智能终端4的APP软件程序对设备进行配置。首先、将智能终端4连接上当前一个可用的WiFi，在智能终端4的APP软件程序上点击添加设备，智能终端4会自动搜索当前范围内可用的WiFi风扇1。当有多个可用的WiFi风扇1时，APP软件程序会将可用的WiFi风扇1列出来，用户可自行选择当前需要配置的WiFi风扇1。其次、选择WiFi风扇1成功后，APP软件程序会要求用户将可用的WiFi路由器2的相关信息填好，例如填写当前可用WiFi的密码，然后点击下一步，APP软件程序会自动将相关配置信息发送给WiFi风扇1，同时将相关配置信息发送给云服务器3，WiFi风扇1接收到相关配置信息后会自动连接WiFi。智能终端4的APP软件程序成功配置WiFi风扇1后，可对WiFi风扇1进行命名，方便用户区分自己的多个WiFi风扇1。

[0037] 步骤2：当WiFi风扇1成功连接WiFi后，会向云服务器3发起连接，云服务器3在收到连接请求后，检测WiFi风扇1合法性成功以后就能成功与WiFi风扇1建立连接。此时WiFi风扇1的显示屏15上会显示相关的网络状态。

[0038] 步骤3、当WiFi风扇1的显示屏15上显示网络连接正常后，用户可以打开智能终端4的APP软件程序，APP软件程序的设备列表中会有相应的WiFi风扇1，用户可以通过APP软件程序对WiFi风扇1进行操作，例如：进行风速调档，设定摇头状态，设置定时启动/关闭，定时调档等操作。

[0039] 值得一提的是，当采用APP软件程序进行操作时，APP软件程序将用户需要的状态发送给云服务器3，云服务器3经过处理模块33进行处理后将信息通过WiFi路由器2发送给WiFi风扇1，WiFi风扇1的控制通信模块13会根据接收到的信息做相应的动作。具体来说，当用户使用远程控制时，APP软件程序上显示相应的操作按键，用户按下相应的按键会将对应的信号发给云服务器3，通过云服务器3处理后发给对应的WiFi风扇1，然后WiFi风扇1会根据收到的指令做相应的处理。处理完成后会将当前WiFi风扇1的状态发给云服务器3，云服务器3再转发给用户的智能终端4，在智能终端4上，用户可以随时看到智能风扇的最新状态，由此，可以通过智能终端4实现对WiFi风扇1的远程操作。

[0040] 另外，当没有网络连接时或者用户无需远程操作时，可以采用WiFi风扇1的输入按键16对WiFi风扇1进行操作，具体来说，WiFi风扇1上电后本地默认处于关闭状态，当用户按下风速调节键161后，WiFi风扇1开始工作，从一档开始，每按一次风速调节键161就会加一档，直到三档，然后再按风速调节键161，WiFi风扇1会回到一档，如此往复循环；当用户按下摇头键162时，WiFi风扇1开始左右摇头，再次按下摇头键162时会停止摇头，用户按下关闭键163时风扇就会停止工作。当用户在改变WiFi风扇1的运行状态时，WiFi风扇1会将当前状态发送到云服务器3上，并且同时在液晶显示屏15上将当前状态显示出来。

[0041] 综上所述,本实用新型的智能风扇包括 WiFi 风扇 1、智能终端 4 以及云服务器 3,所述 WiFi 风扇 1 与云服务器 3 相连接,云服务器 3 与智能终端 4 相连接,由此使得智能终端 4 能够通过云服务器 3 对 WiFi 风扇 1 进行远程控制,并且通过云服务器 3,还能够实现一个智能终端 4 对多个 WiFi 风扇 1 进行控制;所述 WiFi 风扇 1 包括用于供电的电源模块 11、用于驱动 WiFi 风扇 1 运转的驱动电路 12、以及用于控制驱动电路 12 工作并实现 WiFi 连接的控制通信模块 13,所述电源模块 11 与控制通信模块 13、驱动电路 12 相连接,所述控制通信模块 13 与驱动电路 12 相连接;所述 WiFi 风扇 1 通过设置控制通信模块 13,所述控制通信模块 13 能够实现 WiFi 通讯以及对 WiFi 风扇 1 进行开关、定时、调档、显示等功能的控制,所述智能终端 4 通过云服务器与控制通信模块 13 的通讯连接,能够实现智能定时、远程重启与关闭、智能调档、智能显示等新功能,从而能够实现智能终端 4 与智能风扇的结合,使得智能风扇能与智能家电组成一个智能家居网络。

[0042] 尽管已经示出和描述了本实用新型的实施例,本领域的普通技术人员可以理解:在不脱离本实用新型的原理和宗旨的情况下可以对这些实施例进行多种变化、修改、替换和变形,本实用新型的范围由权利要求及其等同物限定。

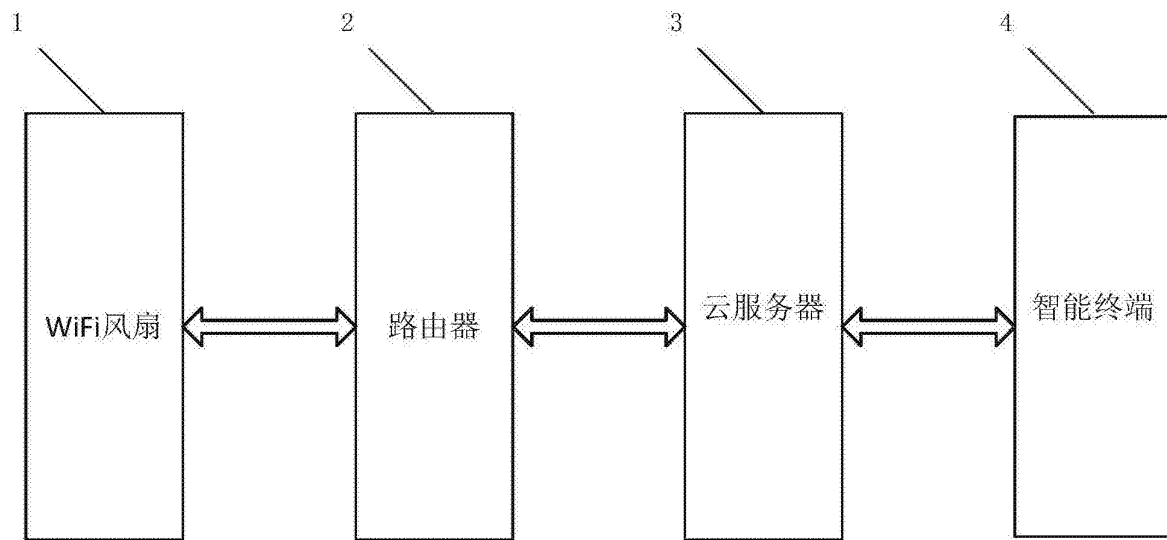


图 1

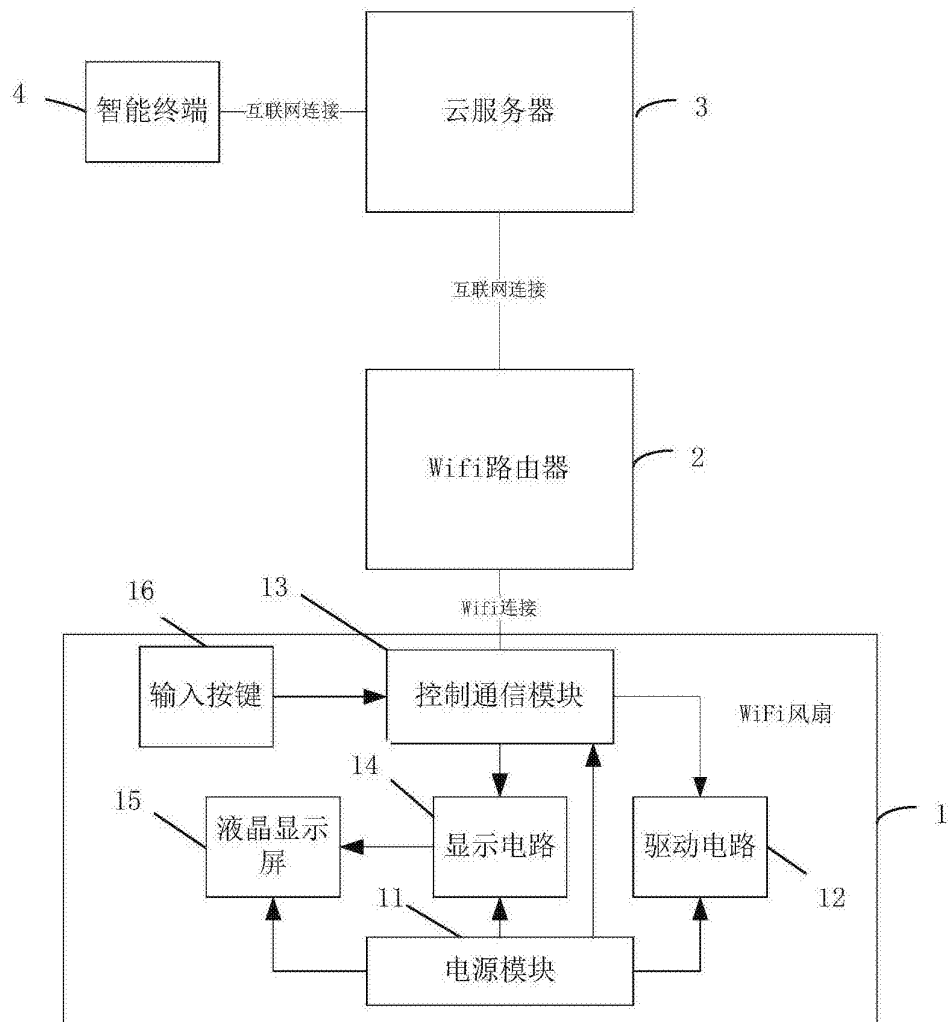


图 2

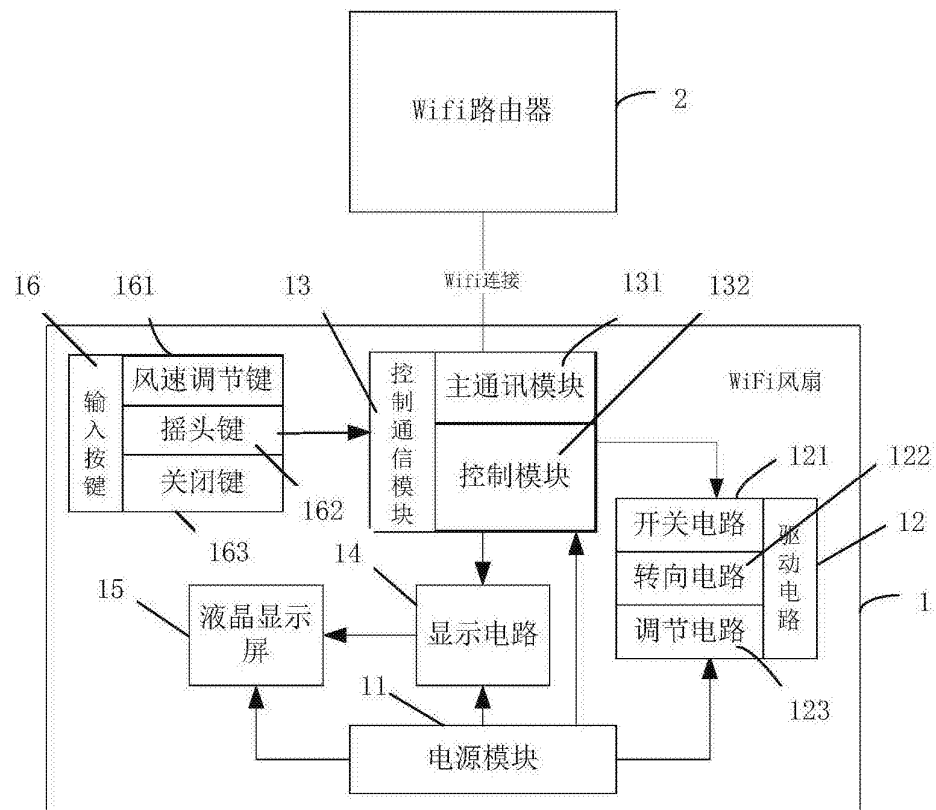


图 3

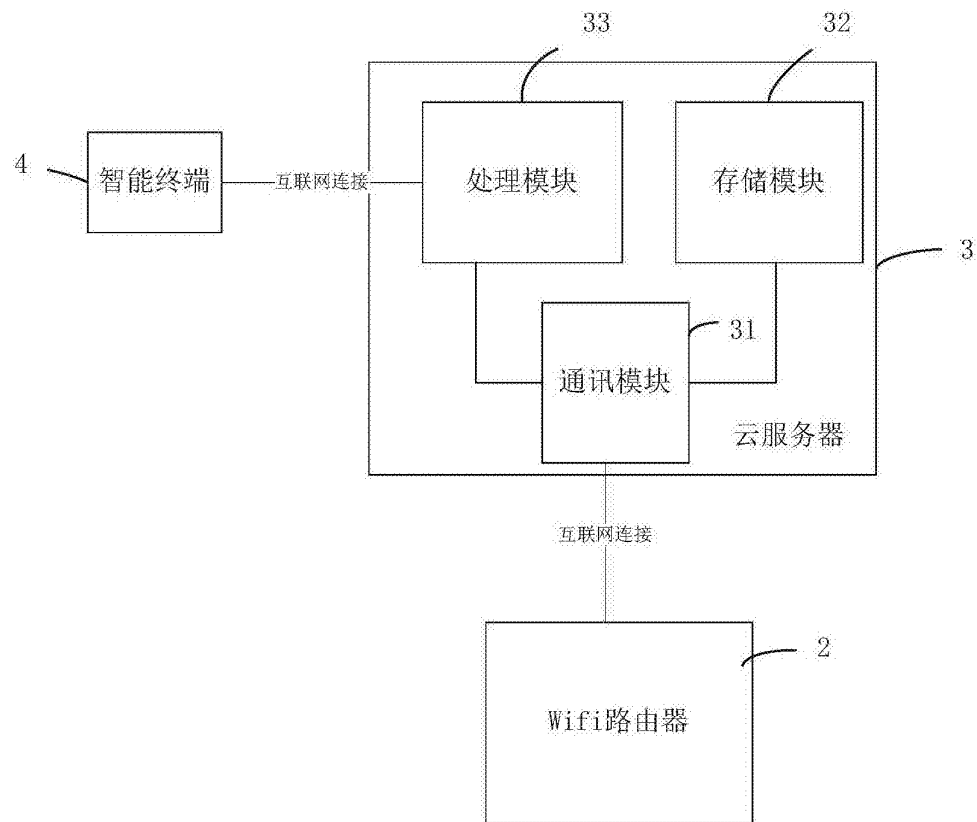


图 4