

Design of Smart Home Alarm System Based on Internet of Things Technology

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Abstract: The intelligent home alarm system based on the Internet of Things technology belongs to the field of alarm devices. The intelligent home alarm system based on the Internet of Things technology includes a HVAC household boiler and an alarm radiator matched with the HVAC household boiler. The upper and lower ends of the alarm radiator are fixedly connected with radiator branch pipes. The left and right ends of the radiator branch pipe are internally provided with pressure alarm cavities, which can send out sound alarms to family members located in the living quarters through the cooperation of the air drum breathing balls, electromagnetic action alarm components and self-induction alarm systems, effectively improve the transmission effectiveness of safety alarms of HVAC domestic boilers, and reduce the gas consumption risk of HVAC equipment in families. In addition, through the cooperation of the alarm radiator and the smart home controller, not only can sound alarm be given to all parts of the home, but also the home ventilation can be independently controlled by electrical signals, thus improving the dispersion effect of natural gas.

Keywords: Internet of Things, Smart Home, Alarm.

1. Preface

With the continuous development of information technology, the concept of science and technology service and life has been continuously extended and applied, and people have ushered in the era of intelligent technology. Based on the connection of network and intelligent devices, intelligent management systems and humanized devices are formed. At present, Smart homes and smart home systems are the most widely used smart devices and management systems that can reflect the development of science and technology. Smart homes are the embodiment of the Internet-influenced IOT.

Intelligent home system uses advanced computer technology, network communication technology, intelligent cloud control, integrated wiring technology and medical electronic technology to integrate individual needs according to the principle of ergonomics. All subsystems related to home life, such as security, lighting control, curtain control, gas valve control, information appliances, scene linkage, floor heating, health care, sanitation and epidemic prevention, security, etc., are organically combined together, and a "people-oriented" brand-new home life experience can be realized through networked comprehensive intelligent control and management.

At present, many southern families have installed HVAC equipment with natural gas as the main energy to provide heat for winter and improve the comfort of home life. As heating is not uniformly supplied in the south of China, most of the HVAC equipment in southern families are installed by families independently and cannot be managed and controlled in a unified way. The safety of gas consumption mainly depends on the monitor of the equipment itself. However, because the boiler of HVAC equipment is generally installed far away from the living area, its safety alarm signal cannot be effectively transmitted, thus increasing the risk of gas consumption and reducing the safety of home life.

2. Design Content

2.1. Technical Problems to Be Solved

Aiming at the problems existing in the prior art, the purpose of this design is to provide an intelligent home alarm system based on the Internet of Things technology, which can send out an audible alarm to the family members in the living area when the danger of gas leakage is found in the HVAC household boiler through the cooperation of the air-drum breathing ball, the electromagnetic action alarm assembly and the self-induction alarm system. Effectively improve the transmission effectiveness of the safety alarm of HVAC household boilers, reduce the gas risk of household HVAC equipment, improve the safety of household life, and through the cooperation of the alarm radiator and the smart home controller, not only can sound alarm be sent to all parts of the home, but also alarm information can be sent to family members who are not at home by electric signals. It can independently control the home ventilation, improve the dispersion effect of natural gas, and then reduce the possibility of danger.

2.2. Technical Scheme

To solve the above problems, this design adopts the following technical scheme.

The intelligent home alarm system based on Internet of Things technology comprises a HVAC household boiler and an alarm radiator matched with the HVAC household boiler, wherein the upper and lower ends of the alarm radiator are fixedly connected with radiator branch pipes, and the left and right ends of the radiator branch pipes are internally provided with pressure alarm cavities. The left and right ends of the radiator branch pipe are fixedly connected with a sieve-shaped ball through pipe which is communicated with the pressure alarm cavity, the middle part of the sieve-shaped ball through pipe is fixedly connected with an airflow whistle, and the end of the sieve-shaped ball through pipe far away from the radiator branch pipe is fixedly connected with an air drum

breathing ball which is communicated with the sieve-shaped ball through pipe, The pressure alarm cavity is internally provided with an electromagnetic action alarm component matched with the air drum breathing ball;

The HVAC household boiler is connected with a smart home controller through a wire signal, a self-induction alarm system is arranged in the smart home controller, and the self-induction alarm system comprises an alarm data processing unit, and the input end of the alarm data processing unit is connected with a gas induction detection unit. The output end of the alarm data processing unit is connected with a sound alarm unit, which is matched with the electromagnetic action alarm assembly. Through the cooperation of the air-drum breathing ball, the electromagnetic action alarm assembly and the self-induction alarm system, it can send a sound alarm to family members located in the living area when the danger of gas leakage caused by the HVAC household boiler is found. Effectively improve the transmission effectiveness of the safety alarm of HVAC household boilers, reduce the gas risk of household HVAC equipment, improve the safety of household life, and through the cooperation of the alarm radiator and the smart home controller, not only can sound alarm be sent to all parts of the home, but also alarm information can be sent to family members who are not at home by electric signals. It can independently control the home ventilation, improve the dispersion effect of natural gas, and then reduce the possibility of danger.

The upper end of the household heating ventilating boiler is fixedly provided with a gas connecting pipe which is connected with the household heating ventilating boiler, the upper end of the household heating ventilating boiler is fixedly provided with a gas induction conducting sleeve which is sleeved outside the gas connecting pipe, and the upper end of the gas induction conducting sleeve is connected with a plurality of extended closed arc pieces. One end of the extended closed arc sheet close to the gas connecting pipe is fixedly connected with a parent tube envelope matched with the gas connecting pipe, the lower end of the parent tube envelope is fixedly connected with a gas concentration sensing probe, and the input end of the gas sensing detection unit is electrically connected with the gas concentration sensing probe through a wire. Because the molecular mass of natural gas is small, After the leakage occurs, it will float upwards, and the natural gas located at the leakage can be blocked by the cooperation of the gas sensing conductive sleeve and the extended closed arc sheet, so as to improve the detection accuracy of the gas concentration sensing probe, further improve the sensitivity of the self-sensing alarm system, effectively reduce the danger level of the alarm accident, and play a good protective effect.

One end of the gas induction conductive sleeve near the gas connecting pipe is provided with an inductance ring groove, and the inside of the inductance ring groove is fixedly connected with an electric heating equalizing ring; one end of the electric heating equalizing ring near the gas connecting pipe is fixedly connected with a plurality of memory deformation rods; and the memory deformation rods extend to the inside of the extended closed arc plate near one end of the gas connecting pipe and are fixedly connected with the extended closed arc plate.

The output end of the alarm data processing unit is also connected with a gas diffusion control unit, and the output end of the gas diffusion control unit is electrically connected with the electric heating equalizing ring through a wire; after the

gas concentration sensing probe detects the leakage of natural gas, the alarm data processing unit can control the electric heating equalizing ring through the gas diffusion control unit, so that the memory deformation rod generates a thermal shrinkage reaction, Drive the extended sealing arc piece to contact and seal with the parent tube envelope, so that the natural gas in the gas induction and conduction sleeve can be released, the concentration of natural gas in the gas induction and conduction sleeve can be reduced, and the safety of subsequent maintenance work can be improved.

The electromagnetic action alarm assembly comprise a reversible electromagnetic coil, wherein that inner wall of the pressure alarm cavity on one side far away from the sieve-shaped ball pipe is fixedly provide with the reversible electromagnetic coil, and the reversible electromagnetic coil is electrically connected with the sound alarm unit through a wire; and one end of the reversible electromagnetic coil close to the sieve-shaped ball pipe is fixedly connected with a magnetic equalizing plate, The pressure warning cavity is slidably connected with a homopolar permanent magnet pusher located between the magnetic force equalizing plate and the sieve-shaped ball tube, and the homopolar permanent magnet pusher is magnetically attracted or repelled by the reversible electromagnetic coil, so that the homopolar permanent magnet pusher moves in the pressure warning cavity as a piston, so that the sieve-shaped ball tube continuously passes through the air flow, and the air flow whistle sends out a whistle alarm. It is convenient to remind family members located in living quarters to inspect HVAC domestic boilers, and improve the use safety of HVAC domestic boilers.

The end of the magnetic equalizing plate close to the sieve-shaped ball tube is fixedly connected with an anti-sticking elastic piece, and the end of the anti-sticking elastic piece close to the sieve-shaped ball tube is fixedly connected with the homopolar permanent magnet pusher, so that the anti-sticking elastic piece can effectively avoid the homopolar permanent magnet pusher and the magnetic equalizing plate from sticking due to magnetic attraction, reduce the magnetic driving force of the homopolar permanent magnet pusher, and further effectively save electric energy. Improve the environmental protection of the electromagnetic action alarm component.

The end of the viscoelastic element far away from the sieve-shaped ball pipe is fixedly connected with a plurality of stroke guide rods, the end of the stroke guide rods far away from the sieve-shaped ball pipe penetrates through the magnetic equalizing plate and is fixedly connected with a stroke baffle, so that the action of the homopolar permanent magnet pusher is guided and limited by the stroke guide rods, the action accuracy of the homopolar permanent magnet pusher is improved, and the friction force in the shearing direction is reduced. Improve its service life.

The end of the magnetic equalizing plate far away from the sieve-shaped ball pipe is fixedly connected with a distance sensing contact piece, the end of the travel baffle near the sieve-shaped ball pipe is fixedly connected with a distance sensor matched with the distance sensing contact piece, the input end of the alarm data processing unit is also connected with an action sensing unit, The input end of the action sensing unit is electrically connected with the distance sensor through a wire, and the action sensing unit can sense the action of the homopolar permanent magnet pusher, which is convenient for the alarm data processing unit to assist the

sound alarm unit to control the reversible electromagnetic coil, reduces the operation difficulty of the sound alarm unit, improves the automation and intelligence of the smart home, And the control precision and efficiency are improved.

The left and right ends of the radiator branch pipe are fixedly connected with the alarm curved cover sleeved outside the corresponding air drum breathing ball, and the alarm curved cover is fixedly connected with a plurality of alarm one-way whistles connected with the alarm curved cover, and the gas in the alarm curved cover is driven to flow by the volume change of the air drum breathing ball during the piston movement of the homopolar permanent magnet pusher, so that the alarm one-way whistles generate whistles, The alarm effect is further increased, the response efficiency of family members is improved, and the alarm curved cover can protect the air drum breathing ball and the electromagnetic action alarm component, effectively avoiding the external environment damage to the alarm radiator during its long-term use, and effectively ensuring the durability of its function.

A plurality of light-weight homogenized bubbles are filled in the air-drum breathing ball, the inner wall of one side of the air-drum breathing ball away from the sieve-shaped ball through pipe is coated with a magnetic layer, the outer end of the light-weight homogenized bubbles is fixedly connected with a plurality of wall-attached magnet pieces, and when the air-drum breathing ball is inflated, the light-weight homogenized bubbles can effectively act on each wall surface of the air-drum breathing ball, Improve the uniformity of the breathing sphere of the air drum, and then make the air flow in all directions in the alarm dome uniform, effectively maintain the whistle stability of the alarm unidirectional whistle, and reduce the difficulty for family members to distinguish the alarm signal.

2.3. Characteristics

Compared with the prior art, the design has the advantages that:

(1) Through the cooperation of the air drum breathing ball, the electromagnetic action alarm assembly and the self-induction alarm system, this scheme can send out an audible alarm to family members in the living area when the danger of gas leakage is found in the HVAC household boiler, effectively improving the transmission effectiveness of the safety alarm of the HVAC household boiler, and reducing the gas risk of the HVAC household equipment. The safety of home life is improved, and through the cooperation of the alarm radiator and the smart home controller, not only can sound alarm be sent to all parts of the home, but also alarm information can be sent to family members who are not at home by means of electrical signals, so that home ventilation can be independently controlled, the dispersion effect of natural gas is improved, and the possibility of danger is further reduced.

(2) Because the molecular weight of natural gas is small, it will float upward after leakage, and the natural gas located at the leakage can be blocked by the cooperation of the gas induction conductive sleeve and the extended closed arc sheet, so as to improve the detection accuracy of the gas concentration induction probe, further improve the sensitivity of the self-induction alarm system and effectively reduce the danger level of the alarm accident. Good protective effect is achieved.

(3) After the gas concentration sensing probe detects the

leakage of natural gas, the alarm data processing unit can control the electric heating equalizing ring through the gas diffusion control unit, so that the memory deformation rod can generate a thermal contraction reaction, drive the extended closed arc piece to contact and seal with the parent tube envelope, and make the natural gas in the gas sensing and conducting sleeve diffuse. Reduce the concentration of natural gas in the gas induction sleeve and improve the safety of subsequent maintenance work.

(4) The reversible electromagnetic coil exerts magnetic attraction or repulsion on the homopolar permanent magnet pusher, so that the homopolar permanent magnet pusher moves as a piston in the pressure alarm cavity, so that the inside of the sieve-shaped ball through pipe continuously flows through, so that the airflow whistle sends out a whistle alarm, which is convenient for reminding family members located in the living area to check the HVAC household boiler. Improve the use safety of HVAC domestic boilers.

(5) The sticking of the homopolar permanent magnet pusher and the magnetic equalizing plate due to magnetic attraction is effectively avoided by the anti-sticking elastic member, so that the magnetic driving force of the homopolar permanent magnet pusher is reduced, thereby effectively saving electric energy and improving the environmental protection of the electromagnetic action alarm assembly.

(6) The gas flow in the alarm curved cover is driven by the volume change of the gas drum breathing ball when the homopolar permanent magnet pusher moves as a piston, so that the alarm unidirectional whistle generates a whistle, further increasing the alarm effect and improving the reaction efficiency of family members, and the alarm curved cover can protect the gas drum breathing ball and the electromagnetic action alarm assembly. It can effectively prevent the alarm radiator from being damaged by the external environment during its long-term use, and effectively ensure the durability of its function.

(7) When the air-drum breathing ball is inflated, the light uniform bubble can effectively act on all walls of the air-drum breathing ball, improve the uniformity of the air-drum breathing ball, and then make the air flow in all directions in the alarm dome uniform, effectively maintain the whistle stability of the alarm one-way whistle, and reduce the difficulty for family members to distinguish the alarm signal.

3. Specific Implementation Method

The intelligent home alarm system based on Internet of Things technology comprises a HVAC household boiler and an alarm radiator matched with the HVAC household boiler. The upper and lower ends of the alarm radiator are fixedly connected with radiator branch pipes, and the left and right ends of the radiator branch pipes are internally provided with pressure alarm cavities. The left and right ends of the radiator branch pipe are fixedly connected with a sieve-shaped ball through pipe connected with the pressure alarm cavity, and the middle part of the sieve-shaped ball through pipe is fixedly connected with an airflow whistle; the end of the sieve-shaped ball through pipe far away from the radiator branch pipe is fixedly connected with an air drum breathing ball connected with the sieve-shaped ball through pipe, and an electromagnetic action alarm component matched with the air drum breathing ball is installed in the pressure alarm cavity; Please refer to Figure-,The left and right ends of the radiator branch pipe are fixedly connected with an alarm curved cover sleeved outside the corresponding air drum breathing ball,

and a plurality of alarm one-way whistles connected with the alarm curved cover are fixedly connected, and the gas in the alarm curved cover is driven to flow by the volume change of the air drum breathing ball when the homopolar permanent magnet pusher moves as a piston, so that the alarm one-way whistles generate whistles. The alarm effect is further increased, the response efficiency of family members is improved, and the alarm curved cover can protect the air drum breathing ball and the electromagnetic action alarm component, effectively avoiding the external environment damage to the alarm radiator during its long-term use, and effectively ensuring the durability of its function. Refer to the figure and figure, A plurality of light homogenization bubbles are filled in the air-drum breathing ball, the inner wall of the air-drum breathing ball on one side away from the sieve-shaped ball through pipe is coated with a magnetic layer, and the outer end of the light homogenization bubbles is fixedly connected with a plurality of wall-attached magnet pieces, so that when the air-drum breathing ball is inflated, the light homogenization bubbles can effectively act on all wall surfaces of the air-drum breathing ball, thereby improving the uniformity of air-drum breathing sphericity. Therefore, the air flow in all directions in the alarm hood is uniform, the whistle stability of the alarm unidirectional whistle is effectively maintained, and the difficulty for family members to identify alarm signals is reduced.

The household heating and ventilating boiler is connected with a smart home controller through a wire signal, and a self-induction alarm system is arranged in the smart home controller, and the self-induction alarm system comprises an alarm data processing unit, the input end of the alarm data processing unit is connected with a gas induction detection unit, and the output end of the alarm data processing unit is connected with a sound alarm unit. The sound alarm unit is matched with the electromagnetic action alarm component, and through the cooperation of the air drum breathing ball, the electromagnetic action alarm component and the self-induction alarm system, when the danger of gas leakage is found in the HVAC domestic boiler, the sound alarm can be sent to the family members in the living area, thus effectively improving the transmission effectiveness of the safety alarm of the HVAC domestic boiler. The danger of gas consumption of household HVAC equipment is reduced, and the safety of household life is improved. Through the cooperation of the alarm radiator and the smart home controller, not only can sound alarms be sent to all parts of the home, but also alarm information can be sent to family members who are not at home by means of electrical signals, so that the home ventilation can be independently controlled, and the dispersion effect of natural gas can be improved. Thereby reducing the possibility of danger.

The upper end of the household heating and ventilating boiler is fixedly provided with a gas connecting pipe connected with it, the upper end of the household heating and ventilating boiler is fixedly provided with a gas induction and conduction sleeve sleeved outside the gas connecting pipe, the upper end of the gas induction and conduction sleeve is connected with a plurality of extended closed arc pieces, and one end of the extended closed arc pieces close to the gas connecting pipe is fixedly connected with a parent tube envelope matched with the gas connecting pipe. The lower end of the parent tube envelope is fixedly connected with the gas concentration sensing probe, and the input end of the gas sensing detection unit is electrically connected with the gas

concentration sensing probe through wires. Because the molecular mass of natural gas is small, it will float upward after leakage, and the natural gas at the leakage can be blocked by the cooperation of the gas sensing conductive sleeve and the extended closed arc piece. Improve the detection accuracy of gas concentration sensing probe, and then improve the sensitivity of self-sensing alarm system, effectively reduce the danger level of alarm accidents, and play a good protective effect.

One end of the gas induction conductive sleeve near the gas connecting pipe is provided with an inductance ring groove, and an electric heating equalizing ring is fixedly connected inside the inductance ring groove; one end of the electric heating equalizing ring near the gas connecting pipe is fixedly connected with a plurality of memory deformation rods; and the memory deformation rods extend to the inside of the extended closed arc plate near one end of the gas connecting pipe and are fixedly connected with the extended closed arc plate. Refer to the figure, The output end of the alarm data processing unit is also connected with a gas diffusion control unit, and the output end of the gas diffusion control unit is electrically connected with the electric heating equalizing ring through wires; after the gas concentration sensing probe detects the natural gas leakage, the alarm data processing unit can control the electric heating equalizing ring through the gas diffusion control unit, so that the memory deformation rod can generate a thermal contraction reaction, Drive the extended sealing arc piece to contact and seal with the parent tube envelope, so that the natural gas in the gas induction and conduction sleeve can be released, the concentration of natural gas in the gas induction and conduction sleeve can be reduced, and the safety of subsequent maintenance work can be improved.

The electromagnetic action alarm assembly comprises a reversible electromagnetic coil, the reversible electromagnetic coil is fixedly installed on the inner wall of the pressure alarm cavity on one side away from the sieve-shaped ball pipe, and the reversible electromagnetic coil () is electrically connected with the sound alarm unit through a wire, and one end of the reversible electromagnetic coil close to the sieve-shaped ball pipe is fixedly connected with a magnetic equalizing plate. The pressure cavity is slidably connected with the homopolar permanent magnet pusher located between the magnetic equalizing plate and the sieve-shaped ball tube, and the homopolar permanent magnet pusher is magnetically attracted or repelled by the reversible electromagnetic coil, so that the homopolar permanent magnet pusher moves as a piston in the pressure alarm cavity, so that the sieve-shaped ball tube continuously passes through the air flow, and the air flow whistle sends out a whistle alarm. It is convenient to remind family members located in living quarters to inspect HVAC domestic boilers, and improve the use safety of HVAC domestic boilers. Please refer to Figure, the end of the magnetic equalizing plate near the sieve-shaped ball tube is fixedly connected with an anti-sticking elastic piece, and the end of the anti-sticking elastic piece near the sieve-shaped ball tube is fixedly connected with the homopolar permanent magnet pusher. The anti-sticking elastic member can effectively prevent the homopolar permanent magnet pusher from sticking to the magnetic equalizing plate due to magnetic attraction, reduce the magnetic driving force of the homopolar permanent magnet pusher, effectively save electric energy, and improve the environmental protection of the electromagnetic action alarm

assembly.

The end of the viscoelastic element far away from the sieve-shaped ball pipe is fixedly connected with a plurality of stroke guide rods, the end of the stroke guide rods far away from the sieve-shaped ball pipe penetrates through the magnetic equalizing plate and is fixedly connected with a stroke baffle, so that the action of the homopolar permanent magnet pusher is guided and limited by the stroke guide rods, the action accuracy of the homopolar permanent magnet pusher is improved, and the friction force in the shearing direction is reduced. Improve its service life. Please refer to the figure, the end of the magnetic equalizing plate far away from the sieve-shaped ball pipe is fixedly connected with a distance sensing contact piece, the end of the travel baffle near the sieve-shaped ball pipe is fixedly connected with a distance sensor matched with the distance sensing contact piece, and the input end of the alarm data processing unit is also connected with an action sensing unit. The input end of the action sensing unit is electrically connected with the distance sensor through wires, and the action sensing unit can sense the action of the homopolar permanent magnet pusher, which is convenient for the alarm data processing unit to assist the sound alarm unit to control the reversible electromagnetic coil, reduces the operation difficulty of the sound alarm unit, and improves the automation and intelligence of the smart home. And the control precision and efficiency are improved.

In the use process of HVAC domestic boiler, if natural gas leaks from the gas connecting pipe, natural gas will accumulate at the upper end of the gas sensing and conducting sleeve because the extended sealing arc piece and the parent sleeve keep the sealing of the gas sensing and conducting sleeve for a long time, and the gas concentration sensing probe will detect the concentration data of natural gas and send it to the gas sensing and detecting unit. The gas sensing detection unit analyzes the data of the concentration. After more natural gas accumulates or leaks, the larger the concentration value obtained by the gas sensing detection unit. When the value exceeds the safe range value, the gas sensing detection unit transmits the dangerous data signal to the alarm data processing unit. The alarm data processing unit calculates and converts the dangerous data signal, and transmits the alarm data to the sound alarm unit. The sound alarm unit first controls the reversible electromagnetic coil to introduce forward current, so that the reversible electromagnetic coil generates the magnetic force with the same polarity as the homopolar permanent magnet pusher, so that the homopolar permanent magnet pusher moves towards the sieve-shaped ball pass tube under the limit of the stroke guide rod. And drives the anti-sticking elastic piece to stretch, the homopolar permanent magnet push piece slides in the pressure warning cavity toward the sieve-shaped ball through pipe, and the gas in the pressure warning cavity is continuously pushed into the air drum breathing ball, and when the air flows through the sieve-shaped ball through pipe, the air flow whistle in the air flow whistle gives a whistle alarm, so that family members located in different living areas can receive the safety alarm of HVAC household boilers. And in the process of constant movement of the homopolar permanent magnet pusher, air is introduced into the air-drum breathing ball, so that the air-drum breathing ball expands, and the travel baffle on the travel guide rod gradually approaches the magnetic equalizing plate, so that the distance

sensor transmits a distance signal to the action sensing unit, and the action sensing unit analyzes the distance signal and transmits the analysis data to the alarm data processing unit. The alarm data processing unit feeds back the data conversion to the sound alarm unit, so that the sound alarm unit controls the reverse current to flow into the reversible electromagnetic coil, so that the reversible electromagnetic coil generates a magnetic force different from that of the homopolar permanent magnet pusher, so that the homopolar permanent magnet pusher moves away from the sieve-shaped ball through tube under the limit of the stroke guide rod, and drives the anti-sticking elastic member to compress. When the homopolar permanent magnet push piece moves away from the sieve-shaped ball through pipe, the gas in the air-drum breathing ball is extracted, so that the gas in the air-drum breathing ball is discharged into the pressure alarm cavity, thereby reducing the volume of the air-drum breathing ball. Under the condition of continuous reciprocating motion, the gap between the air-drum breathing ball and the alarm curved cover is constantly changed, so that the air-drum breathing ball drives the gas in the alarm curved cover to flow. So that the alarm unidirectional whistle generates a whistle, further increases the alarm effect and improves the response efficiency of family members; and the self-induction alarm system can also send alarm information to family members who are not at home through the smart home controller, and independently control the home ventilation, thereby improving the diffusivity of natural gas, and further, when it is found that the HVAC household boiler is in danger of gas leakage, Sound alarm is sent to family members located in living quarters, which effectively improves the transmission effectiveness of safety alarm of HVAC household boilers, reduces the gas risk of household HVAC equipment, and improves the safety of home life. Besides, through the cooperation of alarm radiator and smart home controller, not only can sound alarm be sent to all parts of the home, It can also send alarm information to family members who are not at home by means of electrical signals, and can independently control home ventilation, improve the dispersion effect of natural gas, and further reduce the possibility of danger.

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