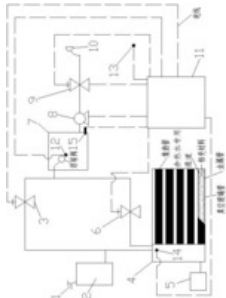
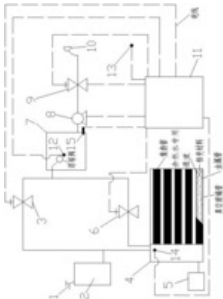


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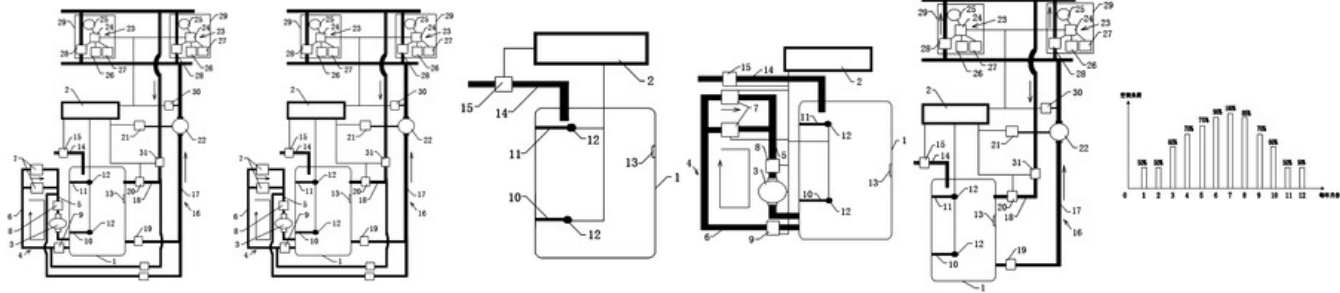
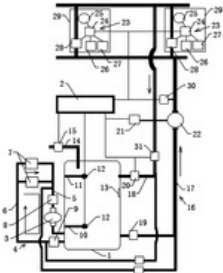
#	  Title	Publication number	1st app. date	Applicant/Assignee	1st publ. date	Publ. date
1.	Fog system capable of increasing seasonal energy efficiency ratio (seer) of air conditioning and refrigeration unit all year around	CN106642437	2015-10-22	HE DINGBING;Ye Xiudong	2017-05-10	2017-05-10

Air conditioning and refrigeration units are already quite generally applied, and however, the consequent problem of high energy consumption is not quite well solved all the time. Currently, people already try to spray running water on heat exchange fins to improve the heat exchange efficiency of a condenser so as to increase the energy consumption ratio in summer, however, energy consumption of an air conditioner in winter cannot be ignored more than ever, and therefore the invention provides a fog system capable of increasing the seasonal energy efficiency ratio (SEER) of an air conditioning and refrigeration unit all year around. By adoption of the fog system, energy consumption of the air conditioning or refrigeration unit can be reduced in summer through the method of spraying running water, and the SEER of the air conditioning and refrigeration unit can be further increased in winter by collecting solar energy or other low-grade heat energy in factories; and meanwhile, the fog system can automatically judge the seasonal operation mode of the unit and automatically adjust the temperature of fog, and has quite good energy saving value and market application prospects.



2.	Heat pump control method and heat pump control system of energy-saving air conditioner	CN104279724	2014-08-25	GUANGXI SHENNENGDA INTELLIGENT TECHNOLOGY*	2015-01-14	2015-01-14
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The invention discloses a heat pump control method and a heat pump control system of an energy-saving air conditioner. According to the heat pump control method and the heat pump control system, cold is accumulated at a power utilization valley period and low electric charge all day long, a refrigerating unit operates at full load in the cold accumulation process, and at this moment, both the refrigerating unit and a cold accumulating pump of the system operate at full load, so that highest energy efficiency in the operation process of the refrigerating unit of the air conditioner system can be kept, redundant electric energy at the valley period can be sufficiently utilized, and the water temperature of a cold accumulating water tank can be reduced to a set temperature by using the cold accumulating pump; cold is released at a power utilization peak period and high electric charge all day long, both the refrigerating unit and the cold accumulating pump of the air conditioner are powered off in the cold releasing process, and only a cold pump is powered on to supply cold by the cold accumulating water tank. According to the heat pump control method and the heat pump control system, the cold is released according to an actual load condition of a building in the cold supply process, stored cold energy can be furthest utilized, the phenomenon of 'wasting one's talent on a petty job' of the air conditioner system can be avoided, and the operation cost of the central air conditioner is greatly lowered.



3.

Air conditioner cooling unit and anti-freezing control method thereof

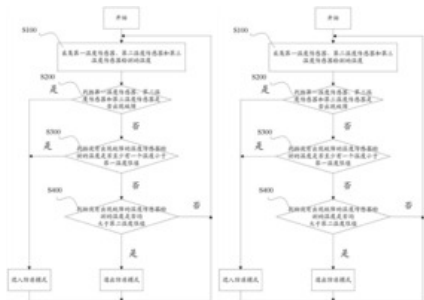
CN104422076

2013-08-21

GREE ELECTRIC APPLIANCES*

2015-03-18 2015-03-18

The invention provides an air conditioner cooling unit and an anti-freezing control method thereof. The air-conditioner cooling unit comprises at least three temperature sensors. The anti-freezing control method comprises collecting the temperatures of the temperature sensors, and when all the temperature sensors break down, entering an anti-freezing mode; if at least one of the collected temperatures is lower than a first temperature threshold, entering the anti-freezing mode; when all the collected temperatures are higher than a second temperature threshold, exiting the anti-freezing mode. According to the air conditioner cooling unit, the water inlet, the water outlet and the inside of the shell tube of a shell-tube heat exchanger are provided with the temperature sensor, so that anti-freezing failure due to drifting or fault of certain temperature sensors can be avoided, effective anti-freezing effects on the shell-tube heat exchanger can be achieved, and the reliability of the shell-tube heat exchanger of the air conditioner cooling unit can be improved.



4.

Multi-connection refrigeration system and control method thereof

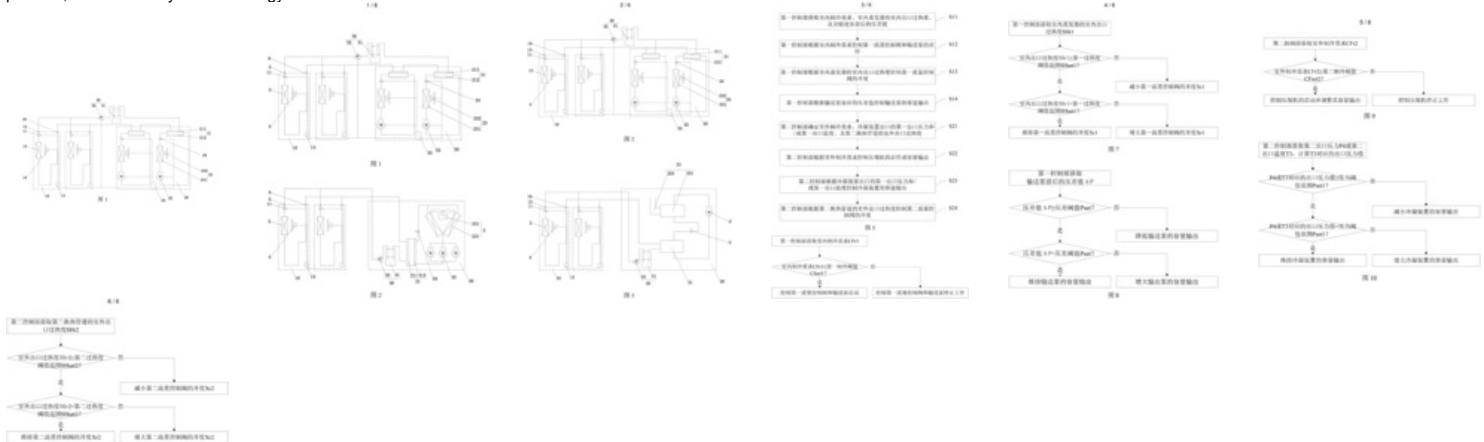
CN104896630

2015-03-10

SHENZHEN ITEAQ
SHENZHEN ITEAQ NETWORK POWER
TECHNOLOGY*

2015-09-09 2015-09-09

A multi-connection refrigeration system, comprising at least one indoor refrigerating unit (10), at least one outdoor refrigerating unit (20), and a cold energy transfer unit (30) connecting the indoor refrigerating unit (10) to the outdoor refrigerating unit (20). The cold energy transfer unit (30) comprises a liquid storage device (31) for storing a phase-change refrigerant, and a transporting pump (32) connected to the liquid storage device (31). The outdoor refrigerating unit (20) comprises a recuperative heat exchanging unit (21) comprising a first heat exchanging pipe (211) and a second heat exchanging pipe (212) independent of each other and used to exchange heat. The outdoor refrigerating unit (20) further comprises a compressor (22), a condensing device (23), a second flow control valve (24) and a second control portion (25). The indoor refrigerating unit (10) comprises a first flow control valve (11), an indoor evaporator (12) and a first control portion (13). The indoor refrigerating unit (10), the cold energy transfer unit (30) and the first heat exchanging pipe (211) form a closed cycle. Also provided is a control method of the multi-connection refrigeration system. The multi-connection refrigeration system and the control method enable a high heat exchange efficiency, have a simple structure and a convenient and simple system control process, and effectively reduce energy waste.



5.

Heating and refrigerating system with solar heat collector and ultralow-temperature air source heat pump

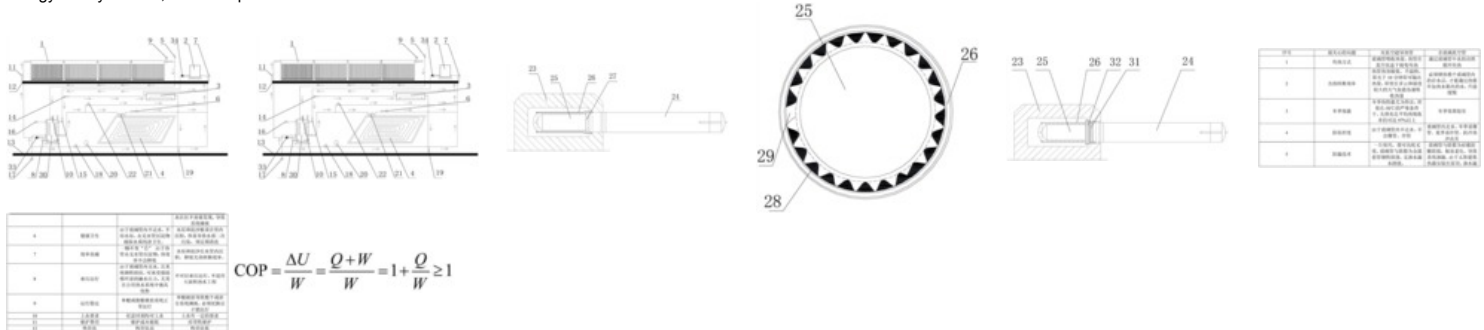
CN104315751

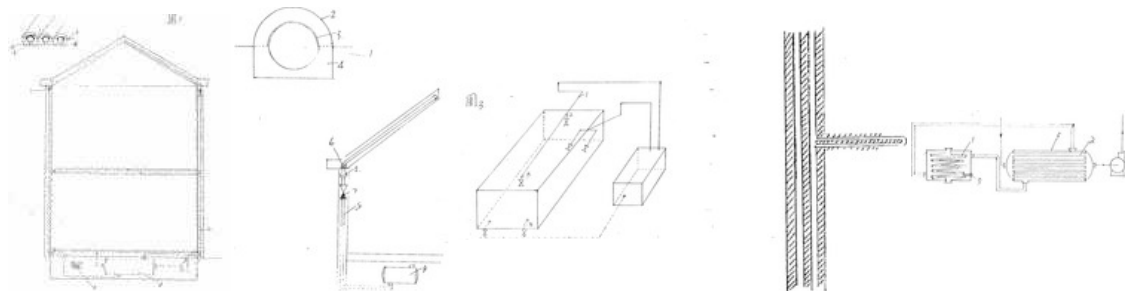
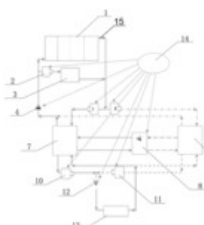
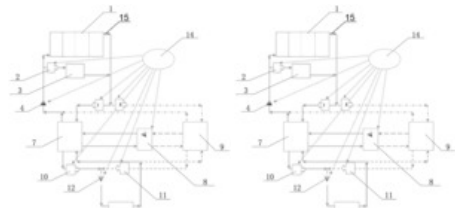
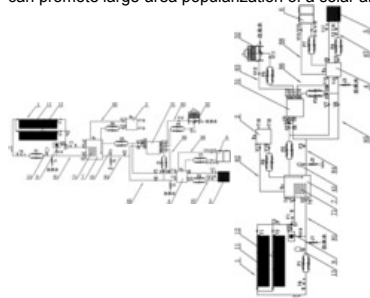
2014-08-28

ZHU JIANYU;ZHU WANXIN

2015-01-28 2015-01-28

The invention provides a heating and refrigerating system with a solar heat collector and an ultralow-temperature air source heat pump. The heating and refrigerating system comprises the solar heat collector, the ultralow-temperature air source heat pump, a heat exchange water tank, a refrigerating air disk and a heating pipeline, wherein the solar heat collector and the heat exchange water tank are connected through a running water circulation pipeline to form a solar heating loop; the ultralow-temperature air source heat pump, the heat exchange water tank and the heating pipeline are connected through another running water circulation pipeline to form a heating loop; the ultralow-temperature air source heat pump and the refrigerating air disk are connected to form a refrigerating loop; the ultralow-temperature air source heat pump comprises a compressor, a condenser, an expansion valve and an evaporator which are connected in sequence; the compressor, the condenser, the expansion valve and the evaporator form a refrigerant loop; air blown by the refrigerating air disk flows through the evaporator. Heating is realized by using solar energy, and the system is energy-saving and environmentally-friendly; a heating supplementation function and a refrigerating function are realized by virtue of the ultralow-temperature air source heat pump; energy is fully utilized, and the operation cost can be reduced.



6.	Solar air-conditioning house capable of storing energy	CN1341832	2001-10-15	SUN BOLU	2002-03-27	2002-03-27
The present invention relates to an all-weather usable solar phase-changing energy-storage air-conditioning room, and its main function lies in that using solar heat-collecting tile to collect solar radiation energy, utilizing the phase-changing energy-storing medium to store energy to implement heating and hot water supply for complete suite of rooms, and utilizing heat energy to start the absorption lithium bromide-ammonia water heat pump refrigerating machine unit to make room temperature constant to proper and comfortable temperature. Said invention is applicable to villa, farm house, military camp and other field houses.						
						
7.	Solar energy storage type cooling and heating air-conditioning apparatus	CN104930630	2015-07-02	Juan	2015-09-23	2015-09-23
The present invention discloses a solar energy storage type cooling and heating air-conditioning apparatus comprising: a solar heat collector used for heat collection; a high temperature accumulator and a low temperature accumulator which are used for energy storage; a heat pump used for heat energy conversion; and an air-conditioning circulating pump and a blower fan coil pipe which are used for temperature adjustment. The solar heat collector is connected with the high temperature accumulator and the low temperature accumulator to supply heat successively via electromagnetic valves and a solar energy conversion liquid pump; the heat pump is communicated with the high temperature accumulator and the low temperature accumulator in a single circulation manner; the high temperature accumulator and the low temperature accumulator are connected with the blower fan coil pipe successively via electromagnetic valves and the air-conditioning circulating pump; and the solar energy storage type cooling and heating air-conditioning apparatus is regulated by a controller. The structure design of the high temperature accumulator, the low temperature accumulator and a water source heat pump is effectively utilized, solar energy is comprehensively and fully utilized, stable low temperature low level heat energy is provided for the water source heat pump through the low temperature accumulator, energy efficiency ratio of the water source heat pump is effectively improved, and peak load shifting of electric power is achieved.						
						
8.	Solar air conditioner and phase change energy storage all-in-one system and working method thereof	CN106610068	2016-12-05	NINGBO UNIVERSITY*	2017-05-03	2017-05-03
The invention discloses a solar air conditioner and phase change energy storage all-in-one system. By integration of a solar air conditioner and a back-up system (a heat pump chiller/heater) and control over connection between the solar air conditioner and the back-up system, seamless switching between solar energy and electric energy is realized, and the solar air conditioner and phase change energy storage all-in-one system has two operation modes: a summer refrigeration mode and a winter heating mode; in an operation process of the system, the solar energy is used first; when the solar energy is not enough to supply stable and continuous energy, the heat pump chiller/heater serving as the back-up system can fill the blank; therefore, the starting frequency and the operation time of the back-up system are effectively reduced, and the whole system operates in a more energy-saving way; and furthermore, a phase change heat accumulation water tank can realize automatic heat accumulation and release functions of a phase change material so as to effectively prevent overheat of a first circulating pipe. By the combination of a phase change energy storage technology and a solar air conditioner technology, the solar air conditioner and phase change energy storage all-in-one system provided by the invention is an innovation for development of the air conditioner technology and can promote large-area popularization of a solar air conditioner system.						
						

9.

High -efficient solar water heating system of safe type

CN205332566

2015-12-08

YANG MINJIE

2016-06-22 2016-06-22

Traditional solar water heater, the temperature is too high when sunny, scalds user, especially old man and child easily. The utility model provides a high -efficient solar water heating system of safe type, utilize solar energy with the hot -water heating after, thermal cycle in the pipeline reaches the high -efficient effect of utilizing of hot water, set up safe water tank and holding water box among the while the system, safe water tank sets up safe control by temperature change, and safe water inlet pipe establishes security solenoid valve, and when the high temperature was intake to safe water tank, security solenoid valve was closed in safe control by temperature change control, avoids hot water directly to get into safe water tank to adjust safety water tank temperature, avoid scalding.

10.

Intelligent air conditioner with humidity regulation function

CN105509158

2016-01-26

TAICANG SUSHENG ELECTRICAL TECHNOLOGY*

2016-04-20 2016-04-20

The invention discloses an intelligent air conditioner with a humidity regulation function, comprising a refrigerating unit, a pneumatic unit, a humidity regulation device and a control device, wherein a water tank and an evaporator are disposed inside the humidity regulation device and all the refrigerating unit, the pneumatic unit and the temperature regulation device are connected with the control device. The intelligent air conditioner with the humidity regulation function described in the invention enables indoor humidity regulation and increased interior humidity of an air conditioning room by providing the humidity regulation device in the pneumatic unit, thus well solving the problem that excessive interior dryness of the air conditioning room causes discomfort to the human body; the intelligent air conditioner improves indoor air quality and also omits a household air purifier, is very practical for a family with smaller house area at present, saves space, saves power for a humidifier, provides improved comfort of the air conditioning room, saves both space and electricity, and thus better meets the present needs of people.

11.

Solar energy air conditioner

CN2467977

2001-03-02

CHEN SHICHAO;GAO HONGREN;QIU SHIYE

2001-12-26 2001-12-26

The utility model relates to a solar energy air conditioner. An upper and a lower ports of each of two pressure vessels filled with liquid ammonia are communicated with a pipeline which is connected in series with two upper one-way valves corresponding to a liquid outlet and two lower one-way valves corresponding to a liquid inlet, and the two upper one-way valves are orderly connected with a condenser, a pressure reducing valve and a heat exchanger in series and then are communicated with the two lower one-way valves; a box body of the heat exchanger passes through an electromagnetic valve and then is communicated with the lower end port of an evaporator, and the other valve port of the electromagnetic valve passes through a solar energy collector and then is communicated with a heat storage box; the heat storage box is respectively connected with the upper end of the evaporator and a water outlet of a water pump, and a water inlet of the water pump is communicated with the box body of the heat exchanger. The utility model has the advantages of simple structure, long service life, and high work efficiency.

12.

Household direct current variable-frequency air-conditioning system comprehensively utilizing solar photo-thermal energy and photoelectric technique

CN104833027

2015-05-14

ANHUI ZHONGJIA ZHIRUI TECHNOLOGY*

2015-08-12 2015-08-12

The invention discloses a household direct current variable-frequency air-conditioning system comprehensively utilizing solar photo-thermal energy and photoelectric technique. The household direct current variable-frequency air-conditioning system comprises a solar photoelectric system, a solar photo-thermal system, a dehumidification system, a direct current variable-frequency air conditioner and a control system; the solar photoelectric system comprises a solar photovoltaic panel, a control module, a storage battery and a boost circuit; the solar photo-thermal system comprises a solar evacuated collector tube, a heat preservation water tank, a dehumidification heat exchanger, a defrosting heat exchanger, and a circulating water pump; the dehumidification system comprises a dehumidifier, a dehumidification liquid storage pot, a dehumidification system heat exchanger, a solution circulating pump, a regenerator and a regeneration liquid storage pot; the direct current variable-frequency air conditioner comprises an indoor unit and an outdoor unit; the control system comprises a temperature controller, a humidity controller and a power supply controller. The household direct current variable-frequency air-conditioning system comprehensively utilizing solar photo-thermal energy and photoelectric technique has the advantages that solar energy can be converted into heat energy and electric energy for providing the air-conditioning system with heat and power, demand on mains supply is reduced, energy is saved, and the like.