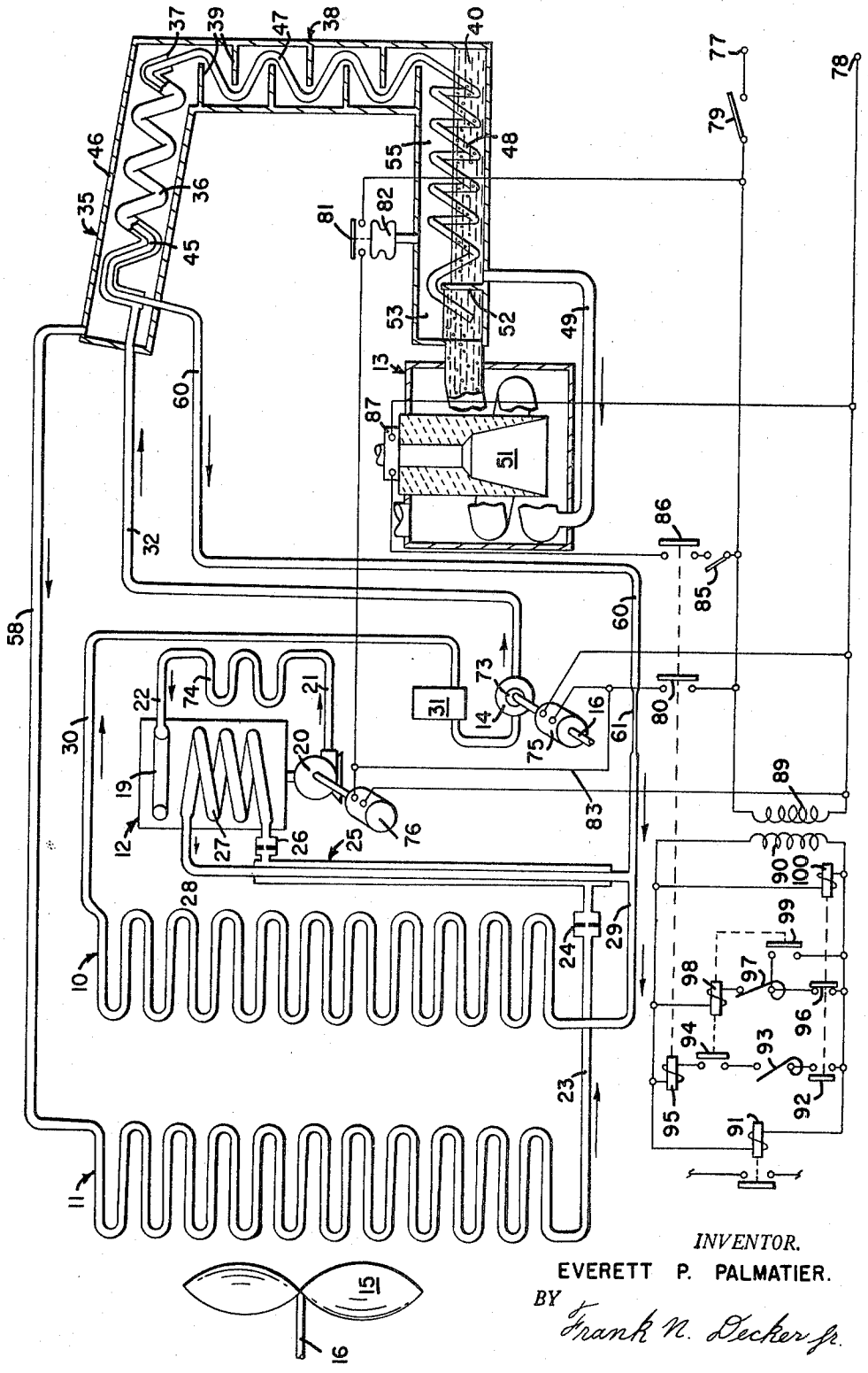
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CONTROL SYSTEM FOR SEQUENTIALLY DISCONTINUING PASSAGE OF HEATING AND COOLING MEDIA IN ABSORPTION REFRIGERATION SYSTEMS

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CONTROL SYSTEM FOR SEQUENTIALLY DISCONTINUING PASSAGE OF HEATING AND COOLING MEDIA IN ABSORPTION REFRIGERATION SYSTEMS

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This invention relates to control systems for absorption refrigeration systems, and more particularly, to control systems for absorption refrigeration systems of the type employing a solution pump having a seal which is subject to a substantial difference in pressure when the refrigeration system is not operating.

This invention is particularly suitable for use with absorption refrigeration systems of the type which employ ammonia as a refrigerant and water as an absorbent. With systems of this type, it is desirable to employ an absorbent solution pump for forwarding weak absorbent solution from the low pressure side of the system to the high pressure side of the system.

However, prior attempts to design a suitable system using a solution pump have met with the difficulty that a high difference in pressure exists between the inside of the pump and the outside of the pump when the refrigeration system is not operating. This difference in pressure is due to the fact that when operation of the absorption refrigeration system is discontinued, the pressure on the high side of the system, which may be on the order of 300 pounds per square inch gauge, equalizes with the pressure on the low pressure side of the system, which may be on the order of 55 pounds per square inch gauge. A typical equalized pressure in the system may be in excess of 200 pounds per square inch after it has been shut down. If the pump is externally driven, which is desirable from the standpoint of economy, this relatively high pressure exists across the seal and tends to cause leakage of refrigerant into the surrounding atmosphere. It will be appreciated that leakage of even a small amount of ammonia into the atmosphere from the machine is undesirable, both because of its noxious nature and because the refrigerant charge of the system will be eventually lost, resulting in poor performance of the system.

Accordingly, it is a principal object of this invention to provide an improved control system for an absorption refrigeration system which provides a low internal pressure in the refrigeration system when it is not operating.

In accordance with the preferred embodiment of this invention, there is provided an absorption refrigeration system having a high pressure side comprising a generator and a condenser, a low pressure side comprising an absorber and an evaporator, a fan for passing air over the absorber and the condenser to cool refrigerant therein, and a solution pump for passing weak absorbent solution from the low pressure side of the system to the high pressure side thereof. A gas valve is provided to control the supply of fuel gas to the generator for heating absorbent solution therein.

The absorption refrigeration system includes a control system having means to open the gas valve for heating absorbent solution in the generator upon sensing of a refrigeration demand on the system. The control system also includes circuit means for actuating the fan and solution pump during operation of the absorption refrigeration system. When the control system senses that there is no longer a refrigeration demand on the system, it causes the gas valve to close, thereby terminating the heating of solution in the generator. However, the control system causes the solution pump and the fan to remain in operation until the pressure in the high side of the refrigeration system is reduced below a predetermined pressure. When the high side pressure is reduced below the predetermined pressure, the control system causes the solution pump and the fan to discontinue operation.

During the period of time that the gas valve is closed and the fan and pump are operating, air is being passed over the condenser and the absorber to cool the refrigerant and solution therein, and cool solution from the absorber is being passed into the generator to reduce its temperature. This causes the temperature on the high side of the refrigeration system, and consequently the pressure, to be reduced below the normal pressure at which the system would be shut down. In turn, the lowered pressure on the high side of the system results in a lower pressure in the pump when the system pressures equalize after operation of the pump and fan are discontinued. Consequently, the difference between the internal pressure in the pump and the ambient pressure is lessened and the danger of leakage or destruction of the seal is correspondingly reduced.

Means are also provided for energizing various safety controls prior to energization of the circuit including the gas valve so that these controls can prevent opening of the gas valve in the event of a system malfunction.

Other features and objects of this invention will become more readily apparent by referring to the following specification and attached drawing wherein the figure is a schematic flow diagram of an absorption refrigeration system embodying a control in accordance with this invention.

Referring particularly to the drawing, there is shown an absorption refrigeration system having an absorber **10**, a condenser **11**, an evaporator **12**, and a generator **13** connected to provide refrigeration. An absorbent solution pump **14** is employed to circulate weak absorbent solution from absorber **10** to generator **13**. As used herein, the term "weak absorbent solution" refers to a solution which is weak in absorbing power, and the term "strong absorbent solution" refers to a solution which is strong in absorbing power. A suitable absorbent solution for use in the system described is water, and a suitable refrigerant is ammonia. For convenience, the absorbent liquid will be referred to as an "absorbent solution" although it will be appreciated that pure water is not technically a solution.

A chilled water pump **20** is provided for forwarding water, or other heat exchange medium chilled in evaporator **12**, through chilled water line **21** to heat exchanger **74** in a suitable remote location for chilling a refrigeration load. The water is then returned from heat exchanger **74** through chilled water line **22** to a spray header **19** from which it is again distributed over the exterior of evaporator coil **27**.

Liquid refrigerant is passed from condenser **11** through liquid line **23**, refrigerant restrictor **24**, the exterior passage of liquid suction heat exchanger **25** and second refrigerant restrictor **26**, to evaporator coil **27** of evaporator **12**. Heat from the water to be chilled, passing over the exterior of evaporator coil **27**, is given up to the refrigerant which vaporizes in the interior passage of the evaporator coil. The refrigerant vapor passes from coil **27** through vapor line **28**, the interior passage of liquid suction heat exchanger **25**, to mixing line **29** where it is mixed with strong solution returning to the absorber from the generator.

The mixture of refrigerant vapor and strong solution passes through mixing line **29** into the heat exchange coil which forms absorber **10**. Air is passed over the exterior of the absorber coil by fan **15** to cool absorbent solution therein and increase its absorbing power. The absorbent solution is weakened as it absorbs refrigerant vapor during its passage through the absorber. By the time the

absorbent solution reaches the discharge end of the absorber coil, the refrigerant vapor is completely absorbed in the absorbent solution and the solution has become weak in absorbing power by the absorption of the vapor.

The weak absorbent solution passes through weak solution line 30 to a purge tank 31 where noncondensible gases are collected and withdrawn from the system. The weak solution is then forwarded by absorbent solution pump 14 through weak solution line 32 to combined rectifier and heat exchanger section 35.

Rectifier and heat exchanger section 35 comprises an outer shell 46 forming a vapor passage. Shell 46 contains an inner heat exchange coil 45 and a concentric outer heat exchange coil 36, as shown in the drawing. Preferably outer heat exchange coil 36 is spirally disposed along the inner wall of shell 46 and it may be provided with suitable fins for enhancing heat transfer.

Coils 36 and 45 form a solution heat exchanger between the entire quantity of relatively hot strong solution passing from the generator to the absorber and the entire quantity of relatively cool weak solution passing from the absorber to the generator. The amount of heat transfer surface provided between the strong and weak solution is designed so that the weak solution is brought to just about its boiling point so that vapor is not formed in the solution heat exchanger.

The weak solution from line 32 passes through coil 36 in the annular space between inner heat exchange coil 45 and outer heat exchange coil 36 where the weak solution is heated to substantially its boiling point by heat exchange with strong solution. After passing through coil 36, the heated weak solution is discharged from opening 37 onto one of a plurality of baffles or plates 39 in analyzer column 38.

Analyzer 38 comprises a tubular member having a plurality of plates 39 which provide surfaces for contact of vapor with the reflux and the solution which wets the surfaces of the plates. The weak solution passes successively over the plurality of plates and is discharged from the bottom of the analyzer into a generator reservoir 40. Generator reservoir 40 provides solution storage for part load operation conditions and allows for solution and refrigerant charging tolerance, and compensates for manufacturing variations in machine volume.

Weak solution from generator reservoir 40 passes through line 49 into generator coil 50. The solution in coil 50 is heated by suitable heating means, such as gas burner 51, causing the solution to boil thereby forming vapor. The vapor and hot solution is discharged from coil 50 into separation chamber 53, formed by a baffle or weir 52, where the vapor separates from the remaining strong solution. Preferably, some of the solution normally spills over the top of baffle 52 and is recirculated through line 49 to generator coil 50. It will be understood that the solution in separation chamber 53 has been concentrated by vaporizing refrigerant therefrom in generator 13.

Vapor formed in generator 13 passes concurrently with strong solution through the vapor passage 55 formed in the upper portion of generator reservoir 40, through analyzer 38, and through the vapor passage formed by shell 46 of rectifier 35 to condenser 11.

The concentrated or strong absorbent solution from separation region 53 is at the relatively high generator pressure and passes through heat exchange coil 48 in generator reservoir 40, heat exchange coil 47 in the analyzer column, and inner heat exchange coil 45 in the rectifier. The strong solution then passes through line 60 and restriction 61 into mixing line 29 and absorber 10 on the relatively low pressure side of the system.

Heat from the strong solution passing through coil 48 boils the weak solution in the generator reservoir to vaporize refrigerant therefrom. The heat exchange which takes place in the generator reservoir results in cooling the strong solution flowing through coil 48 so that it enters the analyzer and rectifier respectively at the best temperature to achieve maximum efficiency with minimum heat transfer surface.

A portion of coil 48 is submerged below the level of weak solution in reservoir 40 and another portion of the coil is disposed in the vapor passage above the weak solution. The boiling of the weak solution causes the portion of coil 48 which is disposed in vapor passage 55 to be wetted with solution. As the strong solution passes through coil 48, it becomes progressively cooler. Vapor formed in the generator and in the reservoir passes through the vapor passage 55 and contacts the exposed and wetted portion of coil 48 in reservoir 40, and mass and heat transfer take place with the weak solution boiling in the reservoir. It will be appreciated that ammonia vapor will be boiled from the weak solution in the reservoir and that water vapor will be condensed from the vapor space into the weak solution in proportions resulting in an enrichment of the refrigerant content of the vapor passing through the reservoir. Also the condensation of water vapor into the weak solution will liberate additional heat which assists in vaporizing the solution.

Similarly, as the vapor passes from the reservoir upwardly through analyzer column 38, a mass and heat transfer takes place between the weak solution passing downwardly over plates 39 in the column and further enriches the refrigerant content of the vapor.

The vapor then passes through rectifier 35 where it is placed in heat exchange relation with the weak solution passing through coil 36. The heat transfer which takes place in the rectifier results in condensing additional water from the vapor which then leaves the rectifier in a highly purified or enriched state.

The purified refrigerant vapor passes from rectifier 35 through line 58 into the coil of condenser 11. Fan 15 passes air over condenser 11 causing the refrigerant vapor to condense. The condensed refrigerant passes through line 23 and restriction 24 into evaporator 12, as previously explained.

As the vapor passes through rectifier 35, the reflux or solution which is condensed, flows by gravity to analyzer 38 and passes downwardly through the analyzer column along with weak solution discharged from outlet 37 of coil 36. This rectifier condensate is heated along with weak solution in the analyzer to produce additional vapor by heat exchange with strong solution passing through coil 47.

In accordance with this invention, an electric motor 75 is provided to drive absorbent solution pump 14 to pass weak solution from the low pressure side of the system to the high pressure side thereof. Electric motor 75 also serves to drive fan 15 which passes air over condenser 11 and absorber 10 for cooling the refrigerant and absorbent solution, respectively, therein. While the absorption refrigeration system described herein is preferably of the type employing air to cool the condenser and the absorber, it will be appreciated that other cooling media, such as water, could be used for this purpose, if desired. Since electric motor 75 is preferably employed to operate both fan 15, as well as pump 14, it is located outside of the pump housing and a suitable seal 73 is provided on pump drive shaft to prevent the escape of refrigerant while allowing power to be transmitted through a drive shaft from the electric motor into the pump housing in order to drive the pump. Preferably, pump 14 is of the reciprocating type which is particularly well adapted to pump against the relatively high pressures which exist between the low pressure side and the high pressure side of an air-cooled ammonia-water absorption refrigeration system.

An electric motor 76 is provided for driving chilled water pump 20 to circulate water or other heat exchange medium through line 21, heat exchanger 74, and line 22. While evaporator 12 is preferably of the type which chills a heat exchange medium, such as water, for circulation to

a remote location, other types of evaporators may be employed in the system instead of that shown, if desired.

A pair of terminals 77 and 78 are connected to a suitable source of electric current, such as a 110-volt household outlet. Main power switch 79 is connected in series with a conductor connected to terminal 77 and serves to shut off the supply of current to the system when relatively permanent shutdown of the system is desired. Motors 75 and 76 are connected in parallel between terminal 78 and conductor 83. Normally open contacts 80, actuated by main relay 95, are connected in parallel with normally open low pressure switch 81 between conductor 83 and terminal 77. Low pressure switch 81 has a pressure responsive actuating mechanism 82 connected to sense the pressure on the high pressure side of the refrigeration system, preferably of vapor space 55 in generator reservoir 40.

A series circuit comprising safety switch 85, normally open contacts 86 of main relay 95, and gas valve and ignition device 87 is connected between terminals 77 and 78. Safety switch 85 is represented as a single switch, but may comprise a plurality of safety devices capable of operating in the high voltage portion of the circuit. Preferably, switch 85 comprises a sail switch responsive to the operation of fan 15 for sensing that the fan is operative. Gas valve and ignition device 87 may comprise any suitable circuit or other means to ignite the pilot light and/or main burner 51 of generator 13, as well as controlling the opening of main gas valve 87.

Primary winding 89 of a step-down transformer is also connected between terminals 77 and 78. Low voltage secondary winding 90 of the step-down transformer provides a suitable low voltage, such as 24 volts for the operation of the low voltage components of the circuit, such as a furnace fan relay coil 91 connected in parallel therewith. The furnace fan (not shown)may be used to pass air over heat exchanger 74 to cool the air for passage to a conditioned space.

A series circuit comprising normally open contacts 92 of time delay relay 100, thermostat 93, normally open contacts 94 of safety relay 98, and main relay coil 95 are connected in parallel across secondary winding 90. A second circuit comprising the parallel combination of normally closed contacts 96 of time delay relay 100 and normally open contacts 99 of safety relay 98 are connected in series with normally closed over-temperature safety switch 97, and safety relay coil 98, across secondary winding 90. Time delay relay coil 100 is also connected across secondary winding 90. Time delay relay 100 has an operating characteristic such that contacts 92 are closed and contacts 96 are opened at a predetermined short interval of time after energization of coil 100.

The operation of the control system will be described on the assumption that switch 79 is open and the entire system is therefore shut down. Under these conditions, each of the contacts and switches assume the position shown in the drawing. In order to start the absorption refrigeration system, switch 79 is closed thereby energizing secondary winding 90, safety relay coil 98 and time delay relay coil 100. Energization of safety relay 98 causes contacts 94 to close, but since time delay relay contacts 92 are open initially, main relay 95 is not energized for a period of time. Energization of relay coil 98 also closes contacts 99 which serve to hold relay coil 98 energized until such further time as the entire system is shut down by opening of switch 79.

Energization of time delay relay coil 100 causes contacts 92 to close after a suitable period of time, such as about five seconds. The energization of the time delay relay coil also opens contacts 96 which does not affect energization, however, of safety relay 98 because contacts 99 have closed. In the event of a malfunction in the system, such as an excessive generator temperature, contacts 97 will open and prevent operation of the refrigeration system by deenergizing safety relay coil 98, thus maintaining contacts 94 open and preventing energization of main relay coil 95. Various other low voltage safety switches may be included in series with safety relay coil 98 to provide appropriate safety controls, if desired.

Energization of time delay relay coil 100 also closes contacts 92 at a predetermined time after energization thereof such as about five seconds. Assuming that safety contacts 97 are closed, thereby energizing safety relay 98 and closing contacts 94, thermostat 93 now controls energization of main relay coil 95. Thermostat 93 closes upon a refrigeration demand being sensed by the system thereby energizing main relay coil 95.

Energization of main relay coil 95 closes contacts 80 whereupon solution pump and fan motor 75 and chilled water pump motor 76 are placed in operation. Energization of main relay coil 95 also closes contacts 86 which energizes gas valve and ignition device 87. When air is passing over the condenser and evaporator due to operation of fan 15, sail switch 85 closes, thus, energizing the main gas valve and ignition device 87 to ignite burner 51 and control the supply of gas or other heating medium to heat the absorbent solution in generator 13. While the preferred heating medium compresses fuel gas which is burned in generator 13, various other heating media such as steam or hot water may be used instead by suitable modifications of the generator.

Under these conditions, the refrigeration system is fully operative and continues to operate as long as the safety switches are closed, sensing no malfunction in the system, and thermostat 93 is closed, sensing a refrigeration demand on the system. When a refrigeration demand is no longer imposed on the system, thermostat 93 opens and deenergizes main relay 95. Thermostat 93 may be located in any suitable place for sensing the refrigeration demand, such as in the space being cooled. It will be understood that the chilled water circuit including heat exchanger 74, may be regarded as a portion of the space being cooled, and therefore, the thermostat may be located in the evaporator or chilled water circuit, or in a space being cooled by the heat exchange coil.

When no refrigeration demand is sensed by thermostat 93, the thermostat opens and deenergizes main relay coil 95. Deenergization of main relay coil 95 causes contacts 80 and 86 to open. Opening of contacts 86 deenergizes the main gas valve and ignition device 87, thereby discontinuing the supply of heat to generator 13. However, since a high pressure is still present on the high pressure side of the refrigeration system, pressure switch 81 still remains closed and therefore motors 75 and 76 are still operative to circulate air over absorber 10 and condenser 11 and to pass chilled water through heat exchanger 74. The air passing over condenser 11 continues to condense and cool refrigerant which is passed to evaporator 12. The operation of fan 15 also continues to cool absorbent solution in absorber 10 which is passed by pump 14 to generator 13. Consequently, the refrigeration system still provides some refrigeration. Fan 15 continues to operate until condenser 11 has cooled sufficiently to materially reduce the pressure on the high pressure side of the refrigeration system.

When the pressure on the high pressure side of the refrigeration system has been reduced to a suitable pressure, such as about 200 lbs. per sq. inch gauge, pressure switch 81 opens and motors 75 and 76 are deenergized. The pressures in the refrigeration system are then enabled to equalize through restriction 61 until the system reaches an equilibrium pressure. However, the equilibrium pressure which is finally reached is substantially below that which would otherwise occur on shutdown of the system because fan 15 has continued to operate for a time to materially reduce the pressure on the high pressure side of the system. For example, the initial equilibrium pressure may be on the order of about 150 lbs. per sq. inch, whereas the system would otherwise initially equalize at a pressure above 200 lbs. per sq. inch if fan

15 is deenergized at the same time that gas valve 87 is closed.

Consequently, the pressure difference across seal 73 of pump 14 is substantially lessened during periods when the refrigeration system is not operating and the tendency of the seal to leak or be damaged by a high pressure across it is materially reduced. Since the design of a suitable leak tight seal in an ammonia-water absorption refrigeration system is a difficult problem, the use of this invention reduces the severity of the problem and tends to make a refrigeration system of the type described more reliable for a longer period of time.

When a refrigeration demand on the system is again sensed by closing of thermostat 93, contacts 80 and 86 close as previously explained, to again energize motors 75 and 76 and gas valve and ignition device 87. In the event of a malfunction in the system, either safety switch 85 or 97, or other safety switches in series therewith, open to deenergize gas valve 87 and terminate the supply of heating medium in generator 13.

It will be seen that by the practice of this invention the seal of the absorbent solution pump is subjected to less severe pressure differences and the tendency for the seal to leak is greatly lessened. The control system of the instant invention is also advantageous because operation of the chilled water pump and condenser and absorber fan after termination of the supply of heating medium to the generator results in providing some refrigeration which increases the coefficient of performance of the system.

While there has been described for purpose of illustration a preferred embodiment of this invention, it will be appreciated that it may be otherwise embodied within the scope of the following claims.

I claim:

1. An absorption refrigeration system comprising:
(A) a high pressure side including a generator and a condenser;
(B) a low pressure side including an absorber and an evaporator;
(C) a pump for passing weak absorbent solution from the low pressure side of said system to the high pressure side of said system;
(D) means for passing a cooling medium in heat exchange relation with said condenser;
(E) a valve for controlling the passage of heating medium to said generator; and
(F) a control circuit for controlling the operation of said system, said control circuit comprising:
(1) thermostatic means for controlling operation of said valve means in response to a refrigeration demand on said system; and
(2) condenser cooling medium control means to control the passage of cooling medium in heat exchange relation with said condenser, said means including pressure responsive means for continuing passage of cooling medium in heat exchange relation with said condenser until the pressure on the high pressure side of said refrigeration system has decreased below a predetermined pressure.

2. An absorption refrigeration system comprising:
(A) a high pressure side including a generator and a condenser;
(B) a low pressure side including an absorber and an evaporator;
(C) a pump for passing weak absorbent solution from the low pressure side of said system to the high pressure side of said system;
(D) a fan for passing air over said condenser;
(E) a gas valve for controlling the passage of gas to heat solution in said generator; and
(F) a control circuit for controlling the operation of said system, said control circuit comprising:
(1) thermostatic means for controlling operation of said gas valve in response to a refrigeration demand on said system; and
(2) fan control means to control operation of said condenser fan, said means including pressure responsive means for continuing operation of said condenser fan after closing of said gas valve until the pressure on the high pressure side of said refrigeration system has decreased below a predetermined pressure.

3. An absorption refrigeration system comprising:
(A) a high pressure side including a generator and a condenser;
(B) a low pressure side including an absorber and an evaporator;
(C) a pump for passing weak absorbent solution from the low pressure side of said system to the high pressure side of said system;
(D) fan means for passing air over said absorber and said condenser;
(E) a gas valve for controlling the passage of gas to heat solution in said generator; and
(F) a control circuit for controlling the operation of said system, said control circuit comprising:
(1) circuit means to energize said gas valve, said fan, said chilled water pump, and said solution pump to effect operation thereof,
(2) thermostatic switch means connected to selectively deenergize said gas valve, and
(3) pressure responsive switch means to deenergize said pumps and said fan after the pressure in the high pressure side of said system drops below a predetermined pressure to thereby limit the final pressure established in said system after deenergization of said fans and said pumps.

4. An absorption refrigeration system comprising:
(A) a high pressure side including a generator and a condenser;
(B) a low pressure side including an absorber and an evaporator;
(C) a pump for passing weak absorbent solution from the low pressure side of said system to the high pressure side of said system;
(D) a fan for passing air over said condenser;
(E) a gas valve for controlling the passage of gas to heat solution in said generator; and
(F) a control circuit for controlling the operation of said system, said control circuit comprising:
(1) thermostatic means for controlling operation of said gas vave in response to a refrigeration demand on said system; and
(2) fan and pump control means to control operation of said fan and said solution pump, said fan and pump control means including pressure responsive means for continuing operation of said fan and said solution pump after closure of said gas valve until the pressure on the high pressure side of said refrigeration system has decreased below a predetermined pressure.

5. An absorption refrigeration system comprising:
(A) a high pressure side including a generator and a condenser;
(B) a low pressure side including an absorber and an evaporator;
(C) a pump for passing weak absorbent solution from the low pressure side of said system to the high pressure side of said system;
(D) fan means for passing air over said absorber and said condenser;
(E) a gas valve for controlling the passage of gas to heat solution in said generator; and
(F) a control circuit for controlling the operation of said system, said control circuit comprising:
(1) means to energize a safety circuit to defeat opening of said gas valve in the event of malfunction in said system,

(2) means to energize a circuit for opening said gas valve a predetermined period of time after said safety circuit is operative to open said gas valve in the event that said malfunction is not present,

(3) thermostatic means for controlling the operation of said gas valve in response to a demand imposed on said system, and

(4) means to continue operation of said solution pump, and said condenser fan after closing of said gas valve until a pressure in the high pressure side of said system has been reduced below a predetermined pressure.

6. In a method of operating an absorption refrigeration system of the type having a high pressure side comprising a generator and a condenser, a low pressure side comprising an evaporator and an absorber, a pump having a seal exposed to internal and ambient pressures for passing absorbent solution from the low pressure side of said system to the high pressure side thereof, condenser cooling means for passing a cooling medium in heat exchange relation with said condenser, and heating medium valve means controlling the supply of heating medium to said generator; the steps comprising:

(A) sensing the presence or absence of a refrigeration demand on said system,

(B) opening said heating medium valve and passing heating medium to said generator for heating absorbent solution therein, and passing cooling medium in heat exchange relation with said condenser, upon sensing of the presence of a refrigeration demand on said system,

(C) closing said heat medium valve on the sensing of an absence of a refrigeration demand on said system,

(D) continuing to pass cooling medium in heat exchange relation with said condenser after closing of said heating medium valve,

(E) sensing the pressure on the high pressure side of said system, and

(F) discontinuing passage of cooling medium in heat exchange relation with said condenser upon sensing that the pressure on the high pressure side of said system has decreased below a predetermined pressure.

7. In a method of operating an absorption refrigeration system of the type having a high pressure side comprising a generator and a condenser, a low pressure side comprising an evaporator and an absorber, a pump having a seal exposed to internal and ambient pressures for passing absorbent solution from the low pressure side of said system to the high pressure side thereof, a condenser fan for passing air over said condenser, and a gas valve controlling the supply of fuel gas to said generator; the steps comprising:

(A) sensing the temperature in a region to be cooled,

(B) opening said gas valve and passing gas to said generator for heating absorbent solution therein and operating said condenser fan to pass air over said condenser, upon sensing of a temperature higher than a predetermined temperature in the region being cooled,

(C) closing said gas valve on the sensing of a temperature below a predetermined temperature in the region being cooled,

(D) continuing to operate said condenser fan after closing of said gas valve,

(E) sensing the pressure on the high pressure side of said system, and

(F) discontinuing operation of said condenser fan upon sensing that the pressure on the high pressure side of said system has decreased below a predetermined pressure.

8. In a method of operating an absorption refrigeration system of the type having a high pressure side comprising a generator and a condenser, a low pressure side comprising an evaporator and an absorber, an absorbent solution pump having a seal exposed to internal and ambient pressures for passing absorbent solution from the low pressure side of said system to the high pressure side thereof, a condenser fan for passing air over said condenser, and a gas valve controlling the suppy of fuel gas to said generator; the steps comprising:

(A) sensing the temperature in a region to be cooled,

(B) opening said gas valve and passing gas to said generator for heating absorbent solution therein and operating said condenser fan to pass air over said condenser, upon sensing of a temperature higher than a predetermined temperature in the region being cooled,

(C) closing said gas valve on the sensing of a temperature below a predetermined temperature in the region being cooled,

(D) continuing to operate said condenser fan after closing of said gas valve,

(E) continuing to operate said solution pump for passing absorbent solution from the low pressure side of the system to the high pressure side thereof after closing of said gas valve,

(F) sensing the pressure on the high pressure side of said system,

(G) discontinuing operation of said condenser fan upon sensing that the pressure on the high pressure side of said system has decreased below a predetermined pressure, and

(H) discontinuing operation of said solution pump upon sensing that the pressure on the high pressure side of said system has decreased below a predetermined pressure.

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