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(54) **AIR CONDITIONER COMPRESSOR BYPASS**

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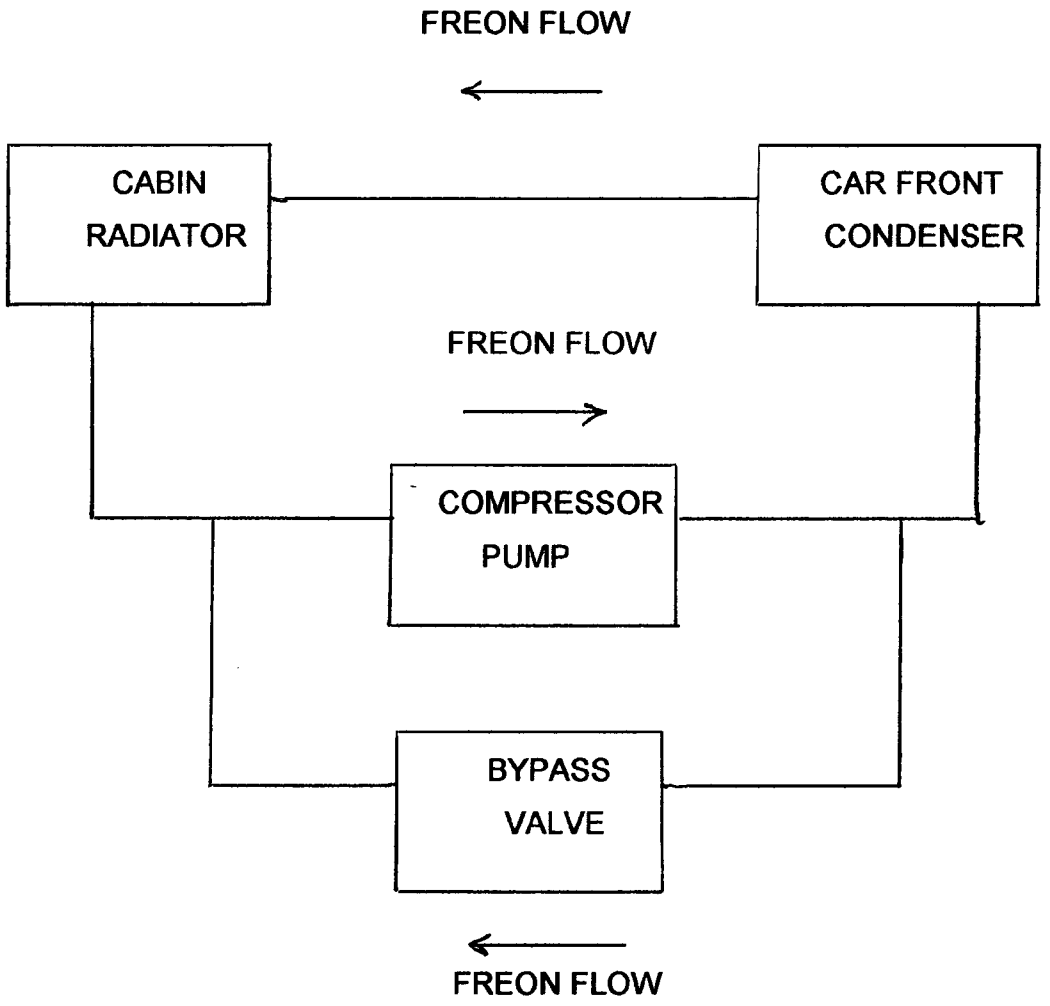
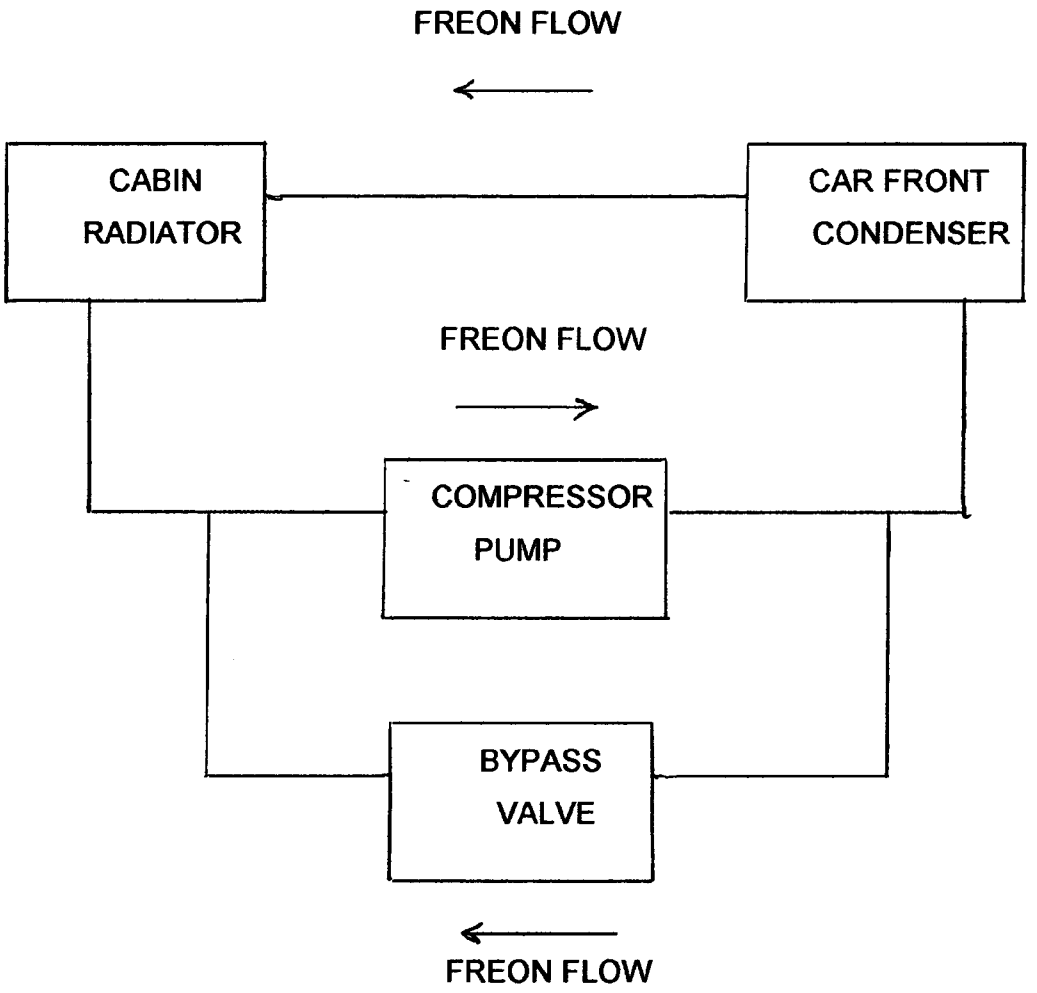
(57) **ABSTRACT**

This invention describes a bypass valve, which allows a controlled, variable amount of Freon to continuously flow from the high pressure side of an air conditioning system to the low pressure side without passing through the compressor or radiator. Said valve is only fully closed when maximum cooling is desired. Said valve requires only a simple set-point thermostat and servo motor to automatically control automobile cabin temperature, while giving maximum savings of engine power and fuel economy.




FREON FLOW
CABIN RADIATOR
CAR FRONT CONDENSER
FREON FLOW
COMPRESSOR PUMP
BYPASS VALVE
FREON FLOW

AIR CONDITIONER COMPRESSOR BYPASS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] Not Applicable

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH

[0002] Not Applicable

REFERENCE TO A SEQUENCE LISTING, TABLE, ETC.

[0003] Not Applicable

BACKGROUND OF THE INVENTION

[0004] The purpose of this invention is to reduce the power consumption of air conditioning systems. The most obvious application is automobile air conditioning. In auto air conditioning, a constant temperature of the cooling air into the cabin was originally maintained by mixing warm outside air with the air conditioned air. The air conditioner was going full blast all the time, even if only minimal cooling is desired. This is an unnecessary drain on fuel economy, and has a noticeable effect on passing and hill climbing power for vehicles with small engines. If the air conditioner were cycled on and off, as is normal for a larger space, the passengers would be subject to alternate drafts of warm and very cold air, and the compressor clutch would take heavy wear. It is possible now to use various forms of a variable volume compressor. This deals with the above mentioned problems, but is complex and expensive.

BRIEF SUMMARY OF THE INVENTION

[0005] When the compressor seals of an air conditioning unit begin to fail, Freon passes around them to the low pressure side. This reduces the cooling effectiveness of the unit, but decreases the power consumption nearly in proportion. The result for a household refrigerator is that, for a period prior to failure, the unit runs almost constantly to maintain the cooling that usually results from running for only a few minutes an hour. This constant running does not add to the electric bill nearly as much as if it were fully cooling the entire time. This invention mimics the effect of a partially failed compressor seal, allowing a controlled, variable amount of Freon to pass around the compressor. This lowers both the amount of cooling produced and the amount of engine power consumed. The Freon flows back in a continuous flow, except when maximum cooling is desired, and requires only one simple valve to regulate, rather than elaborately controlled rapid on/off valves or swash plate.

BRIEF DESCRIPTION OF DRAWING

[0006] The drawing shows a very simplified schematic diagram of a typical auto air conditioning system, with added invention. The solid lines not forming boxes are tubing for Freon. Liquid Freon flows from the condenser to the radiator, evaporates to cool the cabin and the vapor then is forced by the compressor back to the condenser. In this invention, some of the Freon is allowed by the bypass valve to return to the inlet side of the compressor in a continuous stream, only completely stopped when maximum cooling is desired.

DETAILED DESCRIPTION OF THE INVENTION

[0007] To demonstrate this invention as a retrofit on a vehicle, it is necessary to cut two Freon lines, one on each side of the compressor. The Freon must first be pumped out and recovered by an authorized mechanic. It is best to keep the connecting lines short, but the length is not of primary importance. It is only necessary not to cut the line from the condenser to the compressor. The cuts are reconnected with a T joint. If rubber lines are cut, barbed fittings and clamps may be used to reconnect them. Swagelock type compression fittings are preferred for metal tubes. The open ports on the two T joints are connected to each other by a needle valve fitted to flexible copper tubing with ¼ inch outside diameter.

[0008] For this demonstration model, this valve was turned manually to adjust the cooling rate. The various temperature sensors that are part of currently manufactured cars, and appropriate valve actuators and motors which would run this valve either automatically or manually from the dashboard, are not part of this invention. The preferred controller is a set-point thermostat controlling a servo motor valve actuator. Economy models could have the valve position changed by direct control of the servo motor by a dashboard switch.

[0009] It is expected that it is feasible for production models to include the bypass channel and valve into the compressor body. The key to this invention is the steady, not pulsed, backflow of Freon controlled by a continuously variable valve. This provides a simple way to lower the system pressure even while the compressor is turning at a constant rate, resulting in fuel savings and increased engine power during times when less than maximum cabin cooling is desired.

1. I claim that the invention consists of a pathway for a portion of the refrigerant working fluid to bypass from the high pressure side of the compressor to the low pressure side in continuous flow, at all times except maximum cooling demand, without passing through the condenser or radiator.

2. I claim that the bypass of working fluid around the compressor as described in claim 1 is controlled by a variable valve.

3. I claim that the bypass of working fluid around the compressor as described in claim 1 is controlled by a needle valve.

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