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WITHOUT ELECTRICITY OPERATED MECHANICAL VEHICLE AC

FIELD OF INVETION

Without electricity operated mechanical vehicle AC (WEOMVAC) is a type of newly developed mechanical mechanism which has existence especially for air conditioning system of automobile, railway & air transportation.

But it also exists everywhere at where renewable source of energy is available to perform their operation.

BACKGROUND OF INVENTION

An air-conditioning system is defined as an assembly of different parts of mechanical systems to produce a specified condition of air in terms of humidification, temperature, cleanliness etc. within a required space of building or chamber. Automobile Air Conditioning (also called A/C) systems is such an example which cools the air in a vehicle.

The basic elements of air-conditioning systems (of whatever form) are:

- **Fans:** For moving air.
- **Filters:** For cleaning air, either fresh, re-circulated or both.
- **Refrigerating plant:** Connected to heat exchange surface, such as finned coils or chilled water sprays.

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- **Means for warming:** The air such as hot water or steam heated coils or electrical elements.
 - **Means for humidification; and/or dehumidification.**
 - **Control system:** To regulate automatically the amount of cooling or warming.
- The main components of the equipment in the air-conditioning cycle are:
- Compressor
 - Fan
 - Supply ducts
 - Supply outlets
 - Space to be conditioned
 - Return outlets
 - Return ducts
 - Filters
 - Heating chamber or cooling chamber.

AIR-CONDITIONING CYCLE:

An air-conditioning cycle comprises the following steps:

- i.** The fan forces air into duct-work which is connected to the openings in the room (or chamber). These openings are commonly called outlets or terminals.
- ii.** The duct-work direct the air to the chamber through the outlets.
- iii.** The air enters to the chamber & either heats or cools as required. Dust particles from the chamber enter the air stream & are carried along with it.
- iv.** Air then flows from the chamber through a second outlet (sometimes called the return outlet) & enters the return duct- work, where dust particles are removed by a filter.
- v.** After the air is cleaned, it's either heated or cooled depending upon the condition in the chamber. If cool air is required, the air is passed over the surface of cooling coil;

if warm air required, the air is passed through a combustion chamber or over the surface of a heating coil.

vi. Finally the air flows back to the fan and the cycle is completed.

How a vehicle's (such as buses, trains, cars) air-conditioning works:

Air-conditioning like it says 'conditions' the air. It not only cools it down, but also reduces the moisture content or humidity. All air conditioners work in the same way whether they are installed in a building, bus, train or car. The fridge or freezer is in a way an air conditioner as well. Air conditioning is a field in its own right, but we'll stick to the main points used & a few hints to keep the air-conditioning system running properly. A number of people don't realize that turning on the air-conditioning actually reduces the number of miles per gallon of your car. There is energy used in removing the heat & moisture from the air in the vehicle, & this consumes petrol because of the extra engine load.

Air conditioning's main principles are evaporation & condensation then compression & expansion.

So, here is how all the various parts of vehicle's air-conditioning works:

- **Compressor:** The compressor is the work horse of the air-conditioning system, powered by a drive belt connected to the crankshaft of the engine. When the air-conditioning system is turned on the compressor pumps refrigerant vapour under high pressure to the condenser.
- **Condenser:** The condenser is a device used to change the high pressure refrigerant vapor to a liquid. It's mounted in front of the engine's radiator and it looks very similar to a radiator. The vapour is condensed to a liquid because of the high pressure that is driving it in and this generates great deal of heat. The heat is then in turn removed from the condenser by air flowing through the condenser on the outside.

- **Receiver:** Now the liquid refrigerant moves to receiver-dryer. This is a small reservoir vessel for the liquid refrigerant, and removes all moisture that may have leaked into the refrigerant. Moisture in the system causes havoc, with ice crystals causing blockages and mechanical damage.
- **Expansion valve:** The pressurized refrigerant flows from the receiver-dryer to the expansion valve removes pressure from the liquid refrigerant so that it can expand and become in the evaporator radiator. It has tubes and fins & usually mounted inside the passenger compartment behind the fascia above the footwell. As the cold low-pressure refrigerant is passed into the evaporator, it vapourises and absorbs heat from the air in the passenger compartment. The blower fan inside the passenger compartment pushes air over the outside of the evaporator, so cold air is circulated inside the vehicle. On the 'air-side' of the evaporator, the moisture in the air is reduced and drained away.
- **Compressor:** The compressor then draws in the low-pressure refrigerant vapour to start another refrigerant cycle. The refrigerant cycle then runs continuously and is regulated by the setting of the expansion valve.

The whole process is reasonably simple when explained like that. All air-conditioning systems work on the same principle, even if the exact components used may vary slightly between vehicle manufacturers.

According to the above discussion about the operating(working) principle of air-conditioning system, the energy required for working of the vehicle's air-conditioning system meets from the vehicle's engine directly which leads more fuel consumption, pollution & significant reduction in the vehicle's efficiency.

And it's the object of my invention to save the energy, makes environment pollution free, makes air-conditioning system more affordable by common men & increase the vehicle's overall efficiency tremendously by changing the method of providing input energy to air-conditioning system to perform their operations.

OBJECT OF INVENTION

A mechanical mechanism is proposed which drives by renewable source of energy & gives a rotary output.

The working principle of without electricity operated mechanical vehicle ac (WEOMVAC) is based on aerodynamic drag (renewable source of energy).

This mechanism mounts on the roof of the vehicle with the help of suitable designed mounting parts.

When the vehicle moves in forward direction, the aerodynamic drag forces the rotor which consists of spherical wings.

The aerodynamic drag forces the rotor in a particular direction. This rotor is connected to a shaft (input shaft) vertically with the help of designed gear mechanism which transmits the rotor's rotations to the AC system through the suitable designed bevel gears arrangement at 90° with the help of a horizontal shaft, this shaft is directly connected to the bevel gear arrangement at 90° & provides the desired operating power (or torque) to the AC system which is engaged at the other end of the horizontal shaft (or output shaft).

The AC system is fitted inside the vehicle which gives the output in the form of cooling effect as well as heating effect (or AC effect).

Special facts about WEOMVAC

- It's totally based on mechanical engineering.
- It's independent from other branches of engineering.
- No need of electricity & fuel (or petrol in case of automobile) to perform their operation.
- It's basically a mechanical AC.
- Entirely free from the hazardous of electrical short circuits.

- Therefore, you can say that it's without electricity operated mechanical vehicle ac of first kind.

Intangible gains

- It can use in automobile industry such as railways, buses, trucks & cars, and aeroplane etc. frequently.
- It works in moving vehicles as well as in stationary vehicles normally.
- No need of electricity to operate as it uses the renewable resources of energy in the form of air (wind) to perform its operation thereby creating no pollution.
- It reduces the operating cost of air-conditioning system as compared to conventional air-conditioning system significantly.
- Negligible operating cost.
- It improves the overall efficiency of the vehicle tremendously.
- Simple in construction and low maintenance cost as there are no need of electrical components such as electrical wires, motor & batteries etc.
- No risk of electrical short circuit & easy to operate.



