"Circular Finned Radiator"

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ABSTRACT

- *THE HEAT EXCHANGERS OR RADIATORS USED IN AUTOMOBILES/IC ENGINES ARE EITHER RECTANGULAR OR SQUARE IN SHAPE, BUT THE AIR BLOWN/SUCKED BY MEANS OF THE FAN IS IN CIRCULAR IN AREA, DEVELOPING LOW VELOCITY ZONES IN THE CORNERS-HENCE IT IS PROPOSED TO ELIMINATE CORNERS AND DEVELOP CIRCULAR RADIATORS.*
- *THE OBJECT OF WORK IS TO HAVE A CIRCULAR RADIATOR WHICH IS COMPACT-MADE WITH MINIMUM MATERIAL-MORE EFFICIENT-THAT WILL WORK WITH MINIMUM POWER CONSUMPTION OF FAN AND MAXIMUM UTILIZATION OF AIR FLOW.*

Keyword : - *Circular, Finned, High Heat Transfer Rate etc….*

1. Introduction

Modern automotive internal combustion engines generate a huge amount of heat. This heat is created when the gasoline and air mixture is ignited in the combustion chamber. This explosion causes the piston to be forced down inside the engine, levering the connecting rods, and turning the crankshaft, creating power. Metal temperatures around the combustion chamber can exceed1000° F. In order to prevent the overheating of the engine oil, cylinder walls, pistons, valves, and other components by these extreme temperatures, it is necessary to effectively dispose of the heat.

1.1 Condition:

It has been stated that a typical average-sized vehicle can generate enough heat to keep a 5-room house comfortably warm during zero degree weather (and I'm not talking about using the exhaust pipe). Approximately 1/3 of the heat in combustion is converted into power to drive the vehicle and its accessories. Another 1/3 of the heat is carried off into the atmosphere through the exhaust system.

1.2 Heat Transfer Effect:

The remaining 1/3 must be removed from the engine by the cooling system. Modern automotive engines have basically dumped the Air Cooled System for the more effective Liquid Cooled System to handle the job. In a liquid cooled system, heat is carried away by the use of a heat absorbing coolant that circulates through the engine, especially around the combustion chamber in the cylinder head area of the engine block. The coolant is pumped through the engine, then after absorbing the heat of combustion is circulated to the radiator where the heat is transferred to the atmosphere. The cooled liquid is then transferred back into the engine to repeat the process.

2. Performance:

Excessive cooling system capacity can also be harmful, and may affect engine life and performance. You must understand that coolant temperatures also affect oil temperatures and more engine wear occurs when the engine oil is below 190° F. An effective cooling system controls the engine temperature within a specific range so that the engine stays within peak performance

fig-1: Design of Radiator

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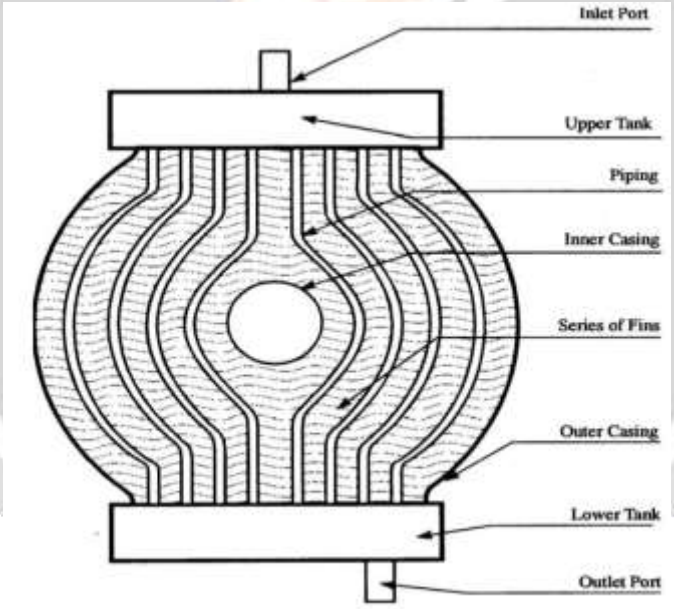

2.1 Energy Transfer:

Radiators are heat exchangers used to transfer thermal energy from one medium to another for the purpose of cooling and heating. The majority of radiators are constructed to function in automobiles, buildings, and electronics. The radiator is always a source of heat to its environment, although this may be for either the purpose of heating this environment, or for cooling the fluid or coolant supplied to it, as for engine cooling.

2.2 Power Production:

In an automobile, fuel and air produce power within the engine through combustion. Only a portion of the total generated power actually supplies the automobile with power -- the rest is wasted in the form of exhaust and heat. If this excess heat is not removed, the engine temperature becomes too high which results in overheating and viscosity breakdown of the lubricating oil, metal weakening of the overheated engine parts, and stress between engine parts resulting in quicker wear, among other things.

3. Experimental Setup:

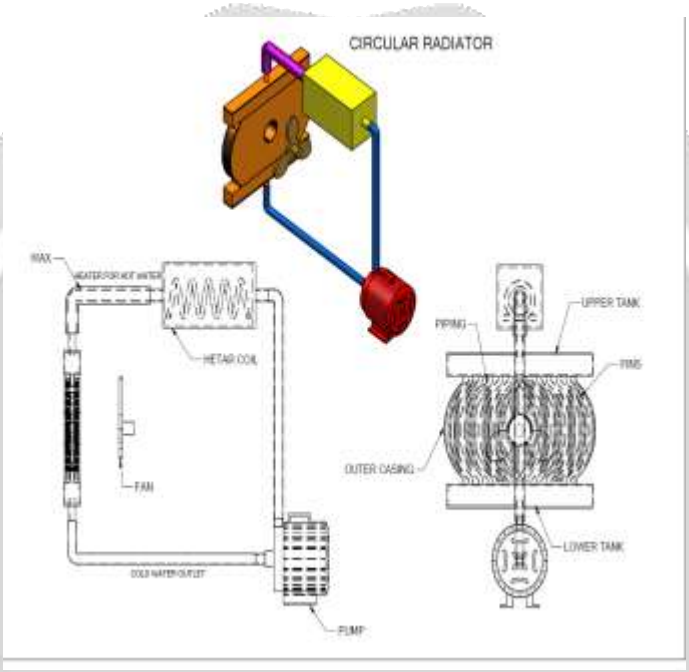

Fig-2: Experimental Setup (Font-10)

4. CONCLUSIONS:

In this work first of all after arranging all the parts/ components as shown in figure initially submersible pump started and then fan there afterwards heater is switch on and then using thermocouples at the interval of 2 minutes radiator in, radiator out and air out from fan temperatures are taken

Effectiveness	
simple	**proposed**
0.83	0.75
0.91	0.93
0.80	0.73

5. Advantages:

1. Increase heat transfer rate and maximize air flow rate
2. Easy and quick starting
3. Compact and lite weight
4. Saves time & energy.

5.1 Disadvantages:

1. Increased complexity: It requires complex mechanism for manufacturing.
2. Cost increases: More complications lead to increase in cost.
3. Delicate structure

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