VISVESVARAYA TECHNOLOGICAL UNIVERSITY

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DESIGN AND FABRICATION OF ENERGY EFFICIENT AIR COOLER

A Project Report

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ABSTRACT

Living style of humankind has been in the process of continuous evolution. In the recent decades, several different devices have been evolved to increase comfort. One such area of human comfort is providing convenient ambient temperature in living space at home or in office or when driving away. In meeting these requirements manually powered fan, electric fan, air conditioner, and air cooler have been developed from time to time and are being used.

In this work, it is aimed at developing an energy efficient air cooler. The air cooler available in the market works employing simple principle of removal of latent heat of water. In this device, water stored in the upper tankis allowed to flow over a permeable screen. A fan creating draft of air through the screen becomes cool and blows it out to the user. The excess water dripping down is collected in the sump is pumped back to the upper tank.

The energy efficient air cooler also employs the above principle to provide cool air. In this device air is made to flow through a permeable membrane which is wet due to capillary rise of water in fibers dipped in a tank kept below. In a way the need for providing upper tank and pumping work is saved, thus energy is saved.

An air cooler based on the above concept has been developed employing a fan to blow cool air, which creates the required suction to draft air through the wet permeable membrane. The membrane is immersed in water in a container below. An updraft fan (25Watt)is used in this air cooler and produces cool breeze, which is 2-3°C below the ambient. Cost of developing this air cooler is Rs.5270/-. However, commercially available air cooler cost about Rs.8000/- and consumes more power (175watt at the minimum).