A New Design for an Air Conditioner with No Compressors and Cooling Gases and with Negligible Consumption of Electricity

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One main problem is the high electricity consumption of air conditioners. Therefore, we have chosen our goal to design an air conditioner system in which it heavily reduces or eliminates electricity consumption. The first part of the research was carrying number of experiments on the most common salts that dissolves in water in an endothermic process. It was found that a mixture of 2g of 59% of ammonium nitrate and 41% of sodium thiosulfate causes the drop of 1cm3 of water 0.64oC. Now that we have found the suitable solution, the next part was to make use of this solution in a design. We started off with a simple design that would guide us towards our final efficient design. The design consisted of a concave surface in which an aluminum tube was passed holding the solution. A fan was placed on one end of the tube that sucks air that come in contact with the cold aluminum tube. The design was not efficient, so we moved to a modified design which consists of a small aluminum tube that air is passed through by a fan. All packaged in a larger tube holding the solution thus increasing contact area between air and cold aluminum tube. This design proved better results however not enough. A final design was obtained which is made up from a copper tube provided with blades along its surface area, all packaged in a Teflon tube with a fan connected from one side that pushes air to bring it in contact with the cold blades of the copper tube. The copper tube can be opened into two halves after losing its efficiency for water to evaporate, thus salt mixture can be used again. The design was tested; it decreased the temperature of air from 16oC to 7oC in less than 60 seconds. It operated successfully for more than four hours and then its efficiency started to decrease slowly.

Awards Won:
Third Award of $1,000