

# DESIGN AND FABRICATION OF ECONOMICAL AIR CONDITIONING USING TABLE FAN

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**Abstract---** This project is to present the details to develop a homemade air conditioning system with the help of table fan. Use of air conditioning is increasing day by day by which the environment is affected. In order to reduce the bad effect of conventional air conditioning system, it is required to develop an air conditioning system ecofriendly. This project shows that how we can develop an air conditioning system with the help of table fan and other related equipment. This project will be beneficial for young researchers working in this area and this technique opens the door for further investigation for improving the quality of this type of air conditioning system. Due to climate change we need cool air in summer climate. In this our point is to make a compact air conditioner to withstand in summer conditions with economical and portable table fan to use any where we need. An air conditioner is a common household appliance used to regulate the temperature and humidity of indoor spaces. It works by circulating cool water in copper tube air throughout with the help of a table fan. However using an air conditioner can be expensive cost. For this reason some people may choose to use a table fan instead of an air conditioner to save money.

**Keywords—** table fan, a homemade air conditioning, summer climate, economical and portable

## 1. INTRODUCTION

Air conditioning (AC) and table fans are both commonly used to cool indoor small spaces. AC systems use refrigerants and compressors to cool and dehumidify air while table fans simply circulate air in a room. One of the main advantages of AC is that it can quickly and effectively cool a room to a desired temperature, regardless of how hot it is outside. AC systems are available in a variety of sizes and styles. Additionally many modern AC systems are designed to be energy efficient, which can help to reduce energy costs and

environmental impact. This can lead to higher utility bills, especially during the hot summer months when the AC is running more frequently. Table fans, on the other hand, are a simpler and more affordable cooling option. They are typically less expensive to purchase and operate than AC systems, and they can be moved easily from room to room. They also use less energy than AC systems, which can help to reduce energy costs and environmental impact. However table fans have some limitations as well. For one, they are not as effective at cooling a room as AC systems. If you need to cool a large living room in a hot climate AC may be the better option, despite its higher cost and energy usage. On the other hand, if you only need to cool a small space or want a more affordable and portable option, a table fan may be the better choice. These electrical devices consumed more electrical power and it is not benefit for the poor people. In practice power shortage is also occurred. These problems are rectified by modification of ordinary table fan. In summer season, the ordinary table fan gives small amount of cold air in the room.

## 2. LITERATURE REVIEW

Prof. Ravichandran, M. R. V. Theoretical Use of cooling is expanding step by step which the climate is influenced. To lessen the impact of regular cooling framework. In make a compact forced air system that is reasonable, Dependably cool and little restricted for a restricted measure of time and space.

Prof. Ma, Ke, Zhengxing Zuo, and Wei Wang. The goal of this research is to identify appropriate microclimate cooling systems for reducing heat stress and improving human thermal comfort. A portable thermoelectric air conditioner was developed for this purpose to provide local cooling to the human body.

Prof. Ko-Ying Tseng<sup>2</sup> and Sheng-Fuu Lin. The objective of this study was to develop a heating, ventilation, and air

conditioning (HVAC) system optimization control strategy involving fan coil unit (FCU) temperature control for energy conservation in chilled water systems to enhance the operating efficiency of HVAC system.

Prof. Mallappa and Mane Amit. The limitation of evaporative coolers is that they are not suitable for humid environments and perform poorly in places where ventilation is inadequate. The goal of this project is to improve the effectiveness of a standard table fan by employing a simple mechanism and overcoming the limitations of an evaporative cooler.

3. PROBLEM IDENTIFICATION

The problem identified is the need for an economical and efficient air conditioning system that can be constructed using a table fan. Traditional air conditioning units can be expensive and consume a lot of energy, making them costly to operate. Additionally, many people cannot afford to install and maintain such systems, particularly in developing countries or regions with hot climates. This leads to discomfort during hot weather and may even have adverse health effects. The solution proposed is to design and fabricate an air conditioning system that utilizes a table fan, which is a widely available and inexpensive appliance. The system would work by circulating air over a chilled surface, such as a block of ice or a container filled with a cooling liquid. The chilled air would then be blown out by the fan, providing a cooling effect for the surrounding area.

4. PROBLEM RECTIFICATION

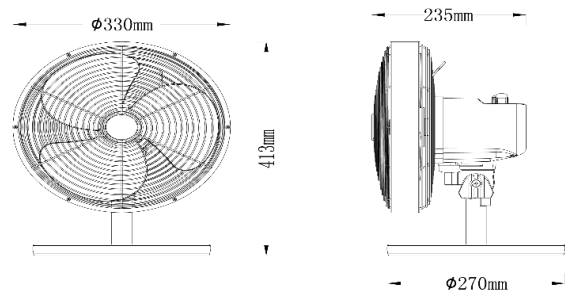
The basic principle behind an air conditioning system is to remove heat and humidity from the air, and then circulate cool and dry air back into the room. An economical air conditioning system can be achieved by using a combination of a table fan and a cooling medium such as ice or chilled water. The design of the system can be divided into three main components: the fan, the cooling medium, and the circulation system. The fan is the primary component that circulates the air in the room. A table fan is a suitable choice for this purpose as it is easy to use and requires minimal maintenance. The fan should be placed in a strategic location in the room to ensure maximum air circulation.

5. LIST OF COMPONENTS USED

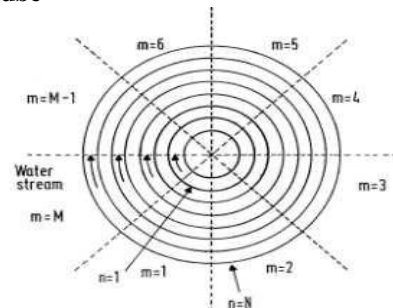
S.no	Name of the Component	Range
1	Axial fan	900 rpm
2	Copper tube	8mm-outer diameter, 6mm-inner diameter. 5ft length
3	Thermal container	2 Liter Capacity
4	Hydraulic pump	1100 L/hr.
5	Silicone tube	8mm OD - 6 ID
6	Cable ties	Nil
7	Thermometer	-200 to 1800°C

6. DESIGN

1. Table fan



2. Copper tube

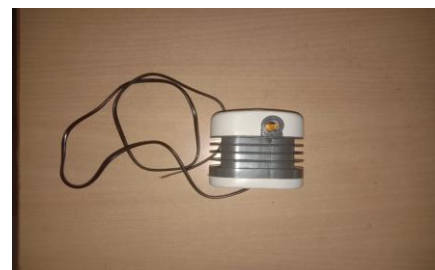


3. Hydraulic pump

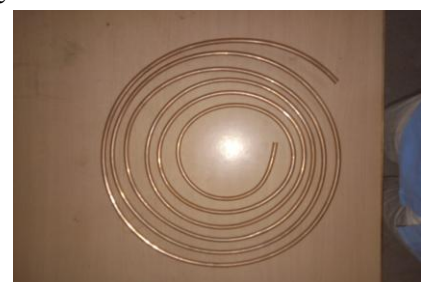


7. FABRICATION

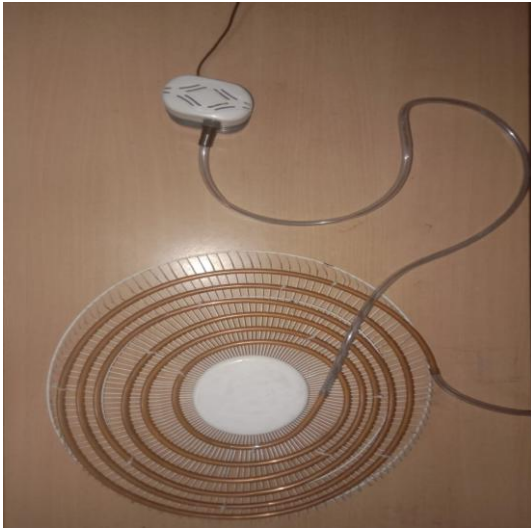
1. Hydraulic pump



2. Copper tube



### 3. Fan grill with copper tube setup



### 8. WORKING PRINCIPLE

The working principle of an economical air conditioning system using a table fan and a copper coil involves the transfer of heat from the room to the outside environment. The system consists of a copper coil, a fan, and a container of water. The copper coil is shaped into a spiral and attached to the back of the table fan. The fan blows air over the coil, which causes the water inside the coil to evaporate. As the water evaporates, it absorbs heat from the surrounding air, which cools the air. The cooled air is then blown out into the room by the fan. The hot air that is generated during the cooling process is expelled out of the room through an exhaust vent or an open window. To operate the system, the container of water is filled with enough water to cover the copper coil. The fan is then turned on, which causes the air to circulate over the coil, cooling the air in the process. This economical air conditioning system can be used in small rooms or spaces and is an affordable alternative to traditional air conditioning units. It is also an environmentally friendly option as it does not use harmful refrigerants or chemicals in its operation.

### APPLICATION.

1. It helps you deal with weather changes and provides a comfortable Environment in home.
2. Eco-friendly
3. Low cost and convenient to use
4. Lower price compared to AC or other electrical products

### 9. CONCLUSION

Through the project, we have demonstrated that a table fan can be used as a viable alternative to traditional air conditioning systems, especially in situations where a smaller area needs to be cooled. The use of ice and water as a cooling agent is an effective way to lower the temperature and increase the humidity of the air, making it more comfortable to breathe.

Moreover, by using a table fan, we have been able to reduce the energy consumption and the overall cost of cooling a room, making it a more sustainable solution in the long run. In addition, the project can be modified to suit different needs, such as adding a filter to improve air quality or incorporating renewable energy sources to reduce the reliance on the grid. Overall, the design and fabrication of an economical air conditioning using a table fan is a promising project that can provide a sustainable and affordable solution for cooling small spaces.

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