

Project Report

AutoCAD Model of “Ceiling Fan”

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Table of Contents

Sr. No	Heading	Page No.
1	Introduction to Ceiling Fan	03
2	Reason for selecting this project	03
3	Parts List	04
4	Parts	04-07
5	Materials List	07
6	Material Selection	08
7	Assembly	09
8	Assembly Views	09-12
9	Highlights of AutoCAD modelling	12-13
10	Dimensions	13

Introduction to “Ceiling Fan”

A ceiling fan is a mechanical fan mounted on the ceiling of a room or space, usually electrically powered, that uses hub-mounted rotating blades to circulate air. They cool people effectively by increasing air speed. Fans do not reduce air temperature or relative humidity, unlike air-conditioning equipment but create a cooling effect by helping to evaporate sweat and increase heat exchange via convection.

Reason For Selecting the Project:

In the modern day, Ceiling Fans are a part of every domestic household. With the arrival of Summer Season, the usage and importance of Ceiling Fans have quadrupled. Fans use significantly less power than air conditioning as cooling air is thermodynamically expensive. In the winter, a ceiling fan can also be used to bring warm air, which naturally rises, back down to occupants.

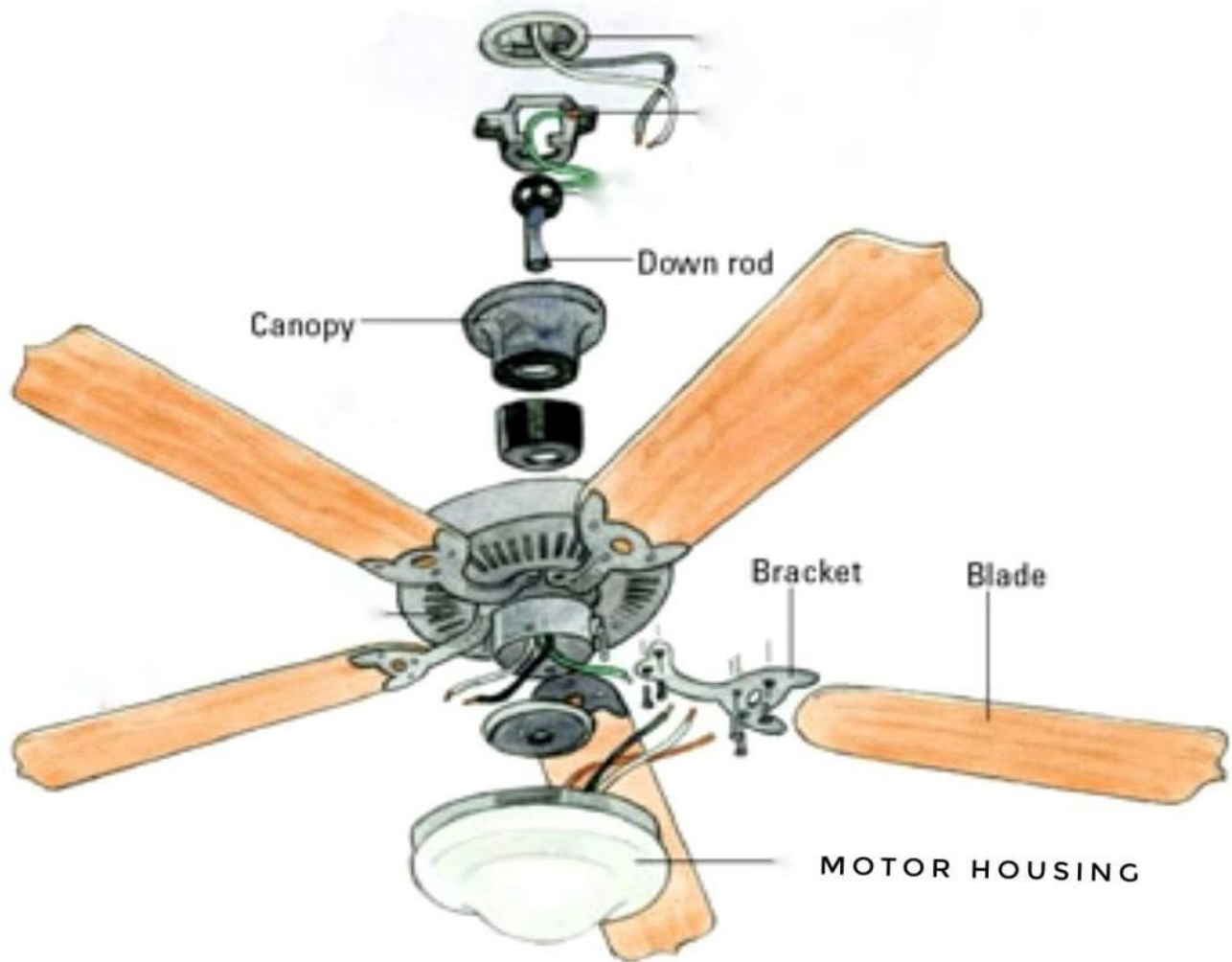
Parts List:

A ceiling Fan comprises of the following parts:

- 1) Blades or Wings
- 2) Brackets or Blade irons which hold the blades and connect them to the motor.
- 3) A down rod, a metal pipe used to suspend the fan from the ceiling.
- 4) Canopy
- 5) Motor Housing which is a decorative encasement for the motor.

Parts:

Rendered Images are pasted below along with a general diagram showing all the parts of a Ceiling Fan.



1) Blades:



2) Down Rod:



3) Canopy:



4) Motor Housing and Brackets:



Materials List:

1) Aluminum:

- A) Blades
- B) Brackets

2) Steel:

- A) Down Rod
- B) Motor Housing

3) Plastic: Canopy

Materials Selection:

- 1) **Aluminum Blades:** Solent aluminum blades are epoxy coated, making them corrosion resistant. The aluminum blades are aerodynamically shaped, ensuring that they cut through air much more effectively, something that cannot be achieved with wooden blades. Aluminum blades are lighter which makes them spin faster and generate more air, providing highly effective cooling.
- 2) **Aluminum Brackets:** As they hold the blades and connect them to the motor, so Aluminum is used for Durability.
- 3) **Steel Motor Housing:** Ceiling Fans that use heavier materials, such as Steel, for housing tend to vibrate less, provide more stability for longer down rods, and provide a good surface for high quality finishes.
- 4) **Steel Down Rod:** Steel Down Rod is used for Durability and long-term use.
- 5) **Plastic Canopy:** Plastic is used for designing Canopy to reduce weight. In this way, Fan completes more rotations.

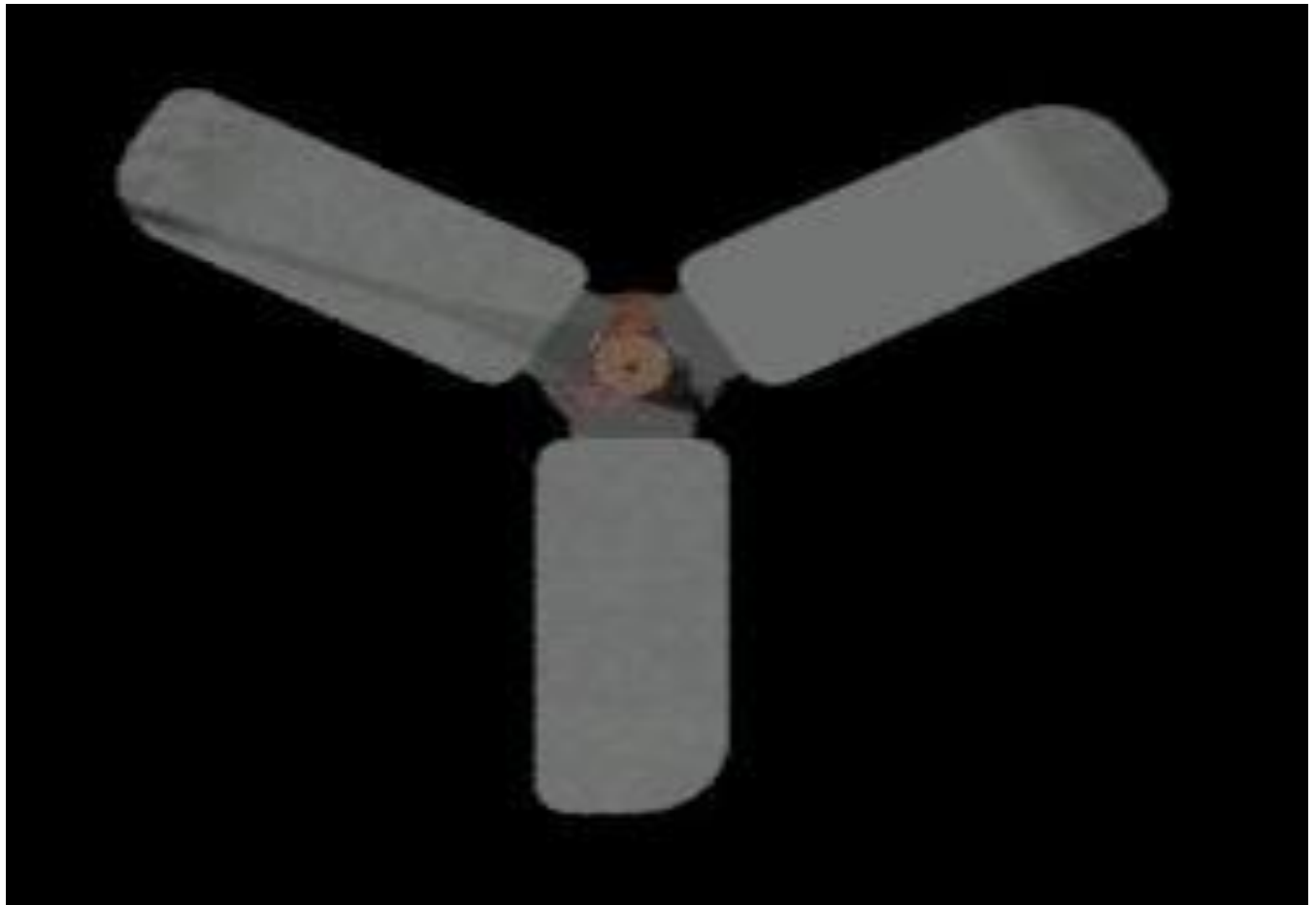
Assembly:

- 1) The blades are joined with Brackets.
- 2) The brackets in turn connect the blades with Motor Housing.
- 3) The Motor Housing is connected with Down Rod with a Plastic Canopy.
- 4) The Down Rod is connected with the Ceiling with another Canopy.

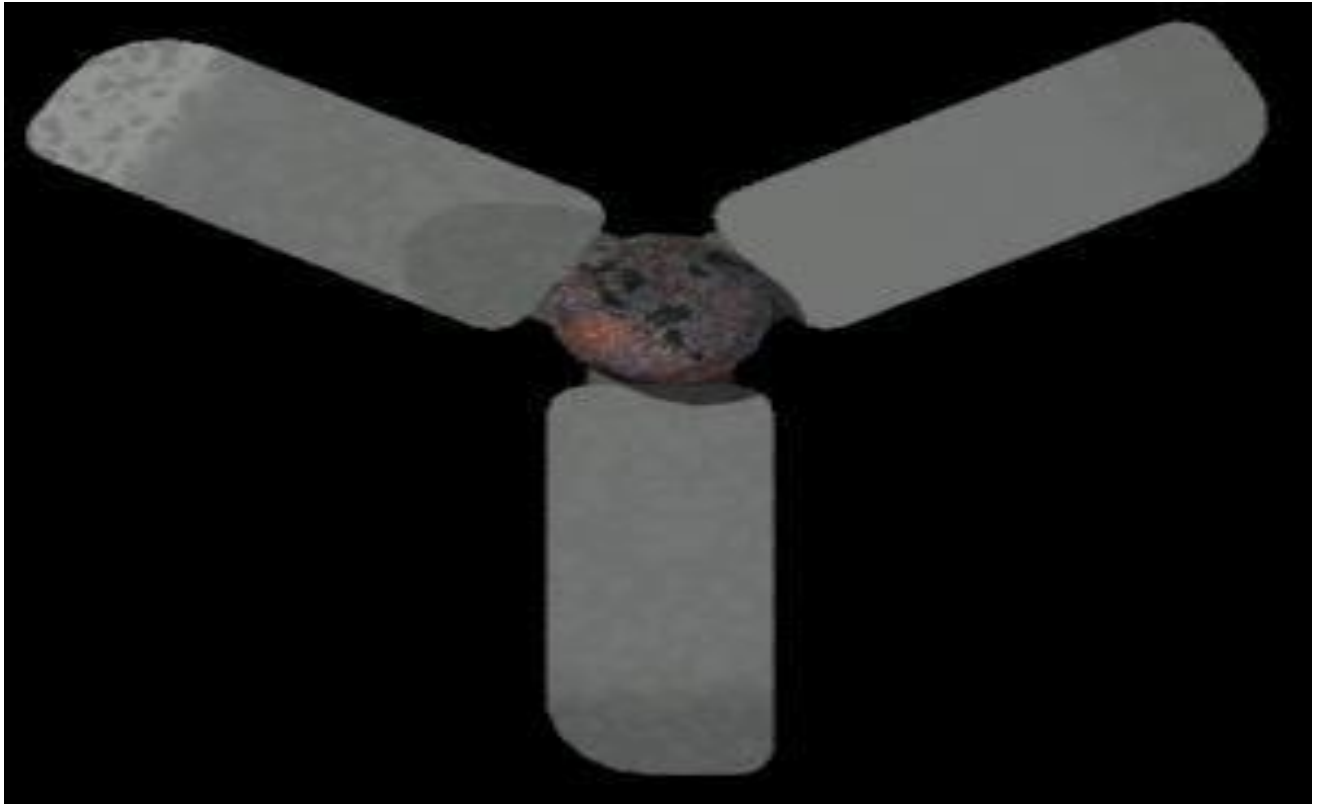
Assembly Views

Rendered Images are attached below:

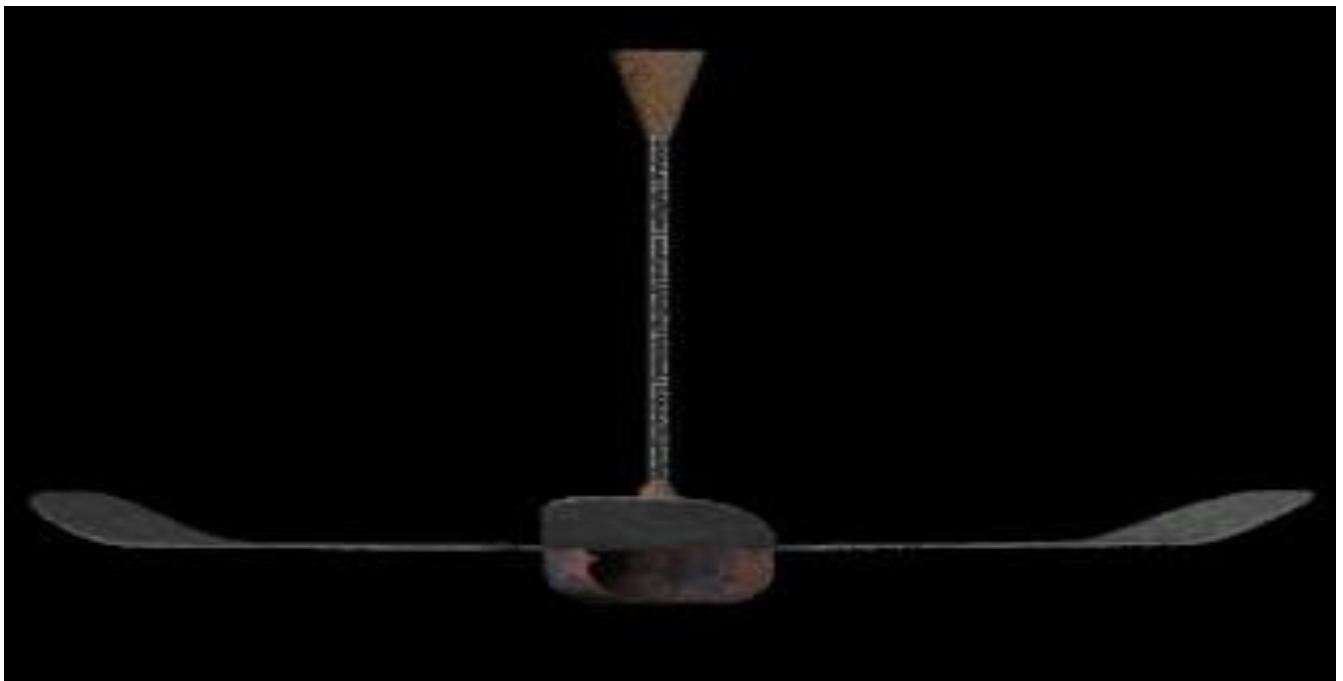
Top View:



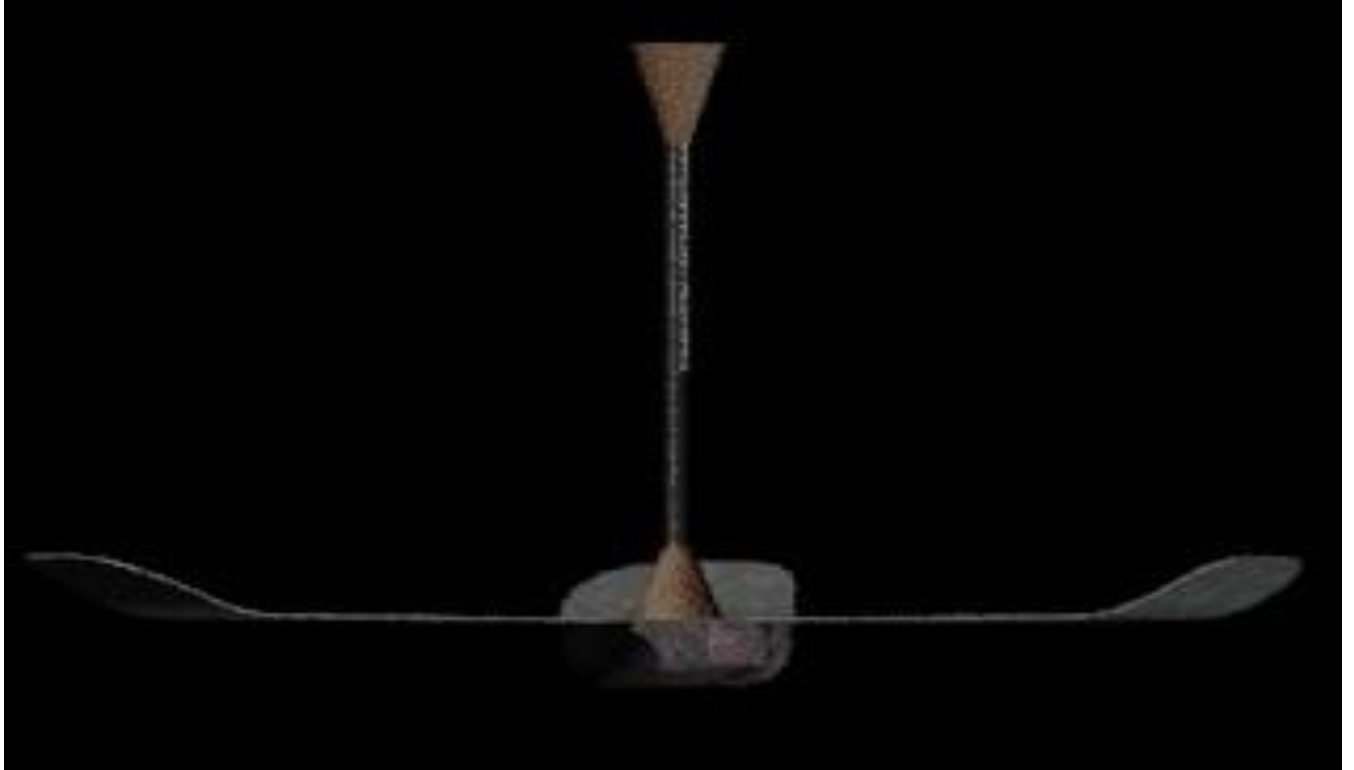
Bottom View:



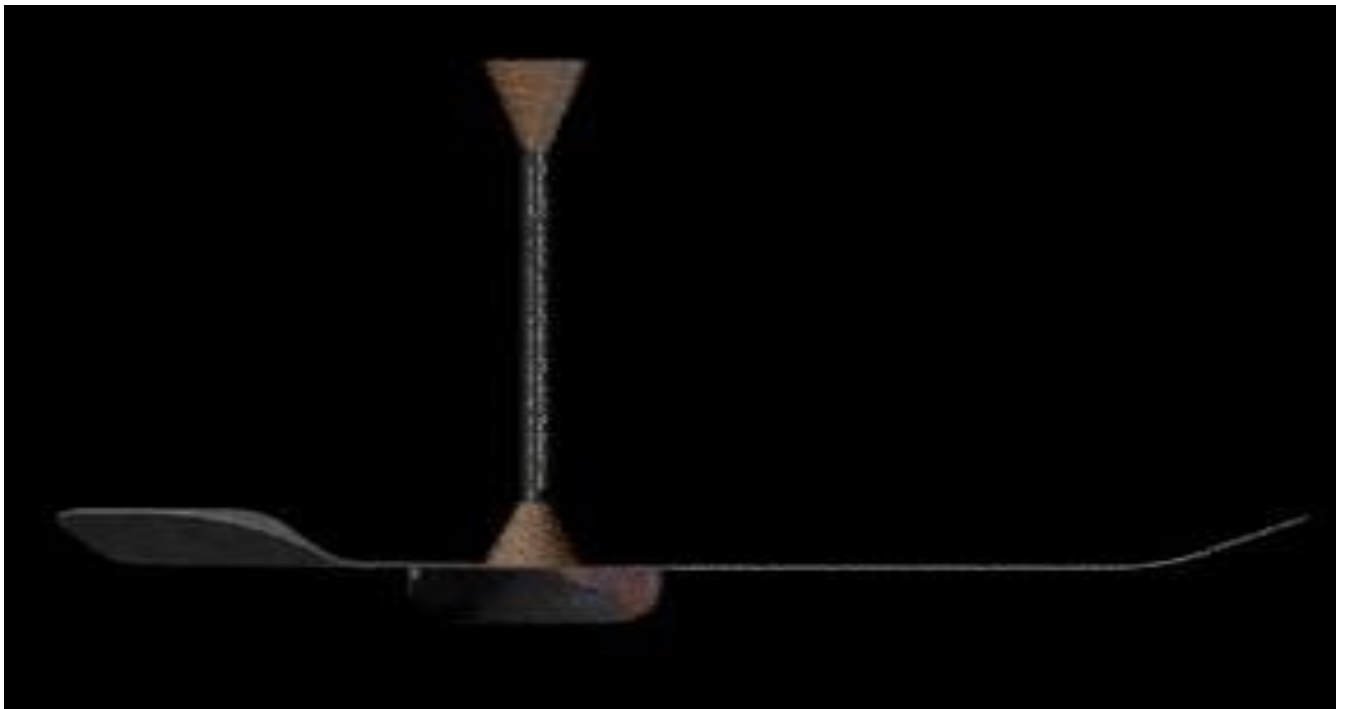
Front View:



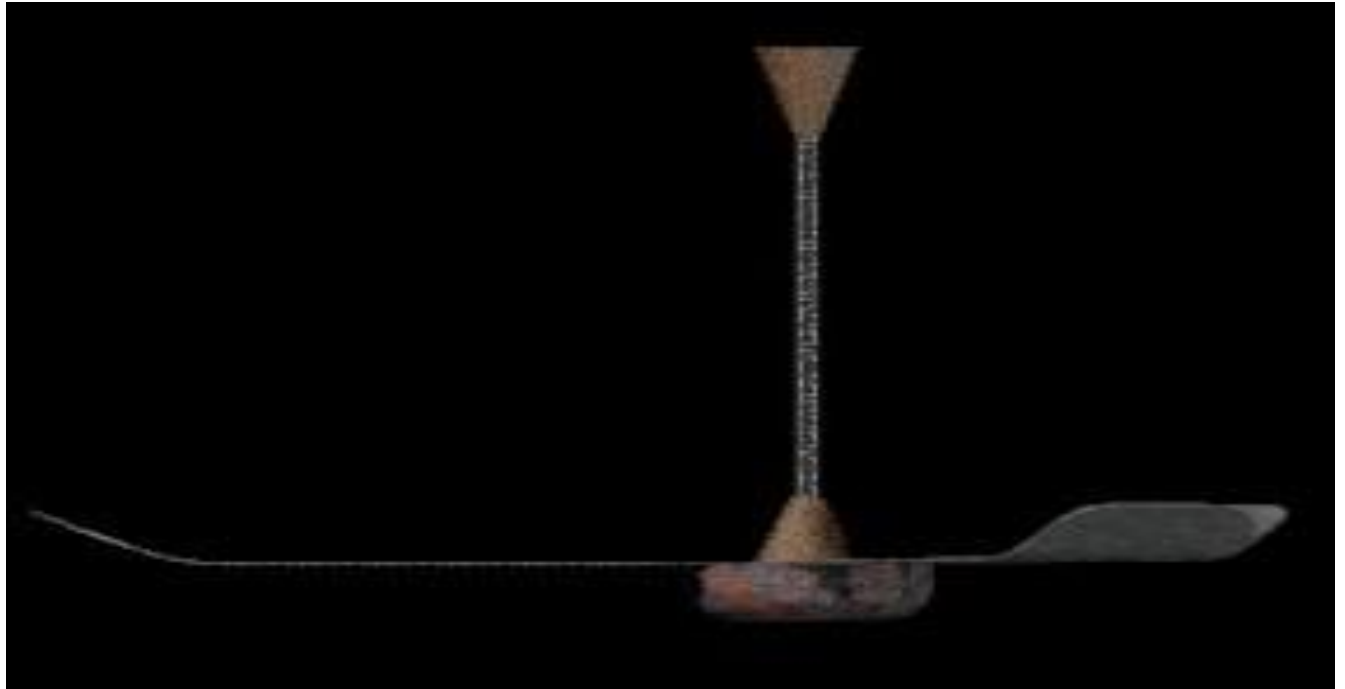
Back View:



Left View:



Right View:



Highlights of AutoCAD Modelling:

- 1) The Blades are designed from a rectangular shape by giving curvature to it's edges by using the "FILLET" Command.
- 2) The "Rotate 3-D" Command has also been used to give curvature to Blades.
- 3) The "Thicken" Command has been used to increase thickness of Blades.
- 4) Motor Housing is designed by drawing a Circle and by using "Extrude" Command.
- 5) (Extrude + Taper Angle) Command is used to design Canopy.

- 6) All the Individual Parts are then assembled into one assembly by using the “Move” Command.
- 7) Our 3-D Model is ready, and we create different Assembly views.
- 8) We give Dimensions to our Model.

Dimensions:

