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Design and Fabrication of Portable Bladeless Fan

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Abstract--- *The aim is to provide cool breeze type air without having blades. According to the current situation fan plays an important role in our day to day life. It is the most important thing for releaving stress. Due to this equipment human being can do continuously work without any stress for a longer period. The project deals with portable bladeless fan with improved cooling. The cooling is done without rotating of blades. No blades is present in the fan. only a round hollow spherical curved is present. Bladeless fan is a high technology invention with unusual innovative characteristics. It doesn't have any visible blades thus completely safe. The bladeless fan is fully variable Air Multiplier Technology draws air at very high speed and compress it. Due to this equipment human being can do continuously work without any stress for a longer period. The project deals with portable bladeless fan with improved cooling.*

Keywords--- *Bladeless Fan, Design and Fabrication, Stream of Gentle Air, Bladeless Fans.*

I. INTRODUCTION

This project titled concentrates on providing descriptions of all the basic operation principles and design of device. In our technical education the project work plays a major role. Every student is put in to simulate life particularly where the student required the knowledge, skill and experience of the project work.

It helps how to evolve specifications under given constrains by systematic approach to the problem a construct a work device. Project work thus integrates various skills and knowledge attainment during study and gives orientation towards application.

As the students solve the various problems posted by the project work, the students get the confidence to overcome such problem in their day to day life.It helps in expanding the thinking and alternatives for future applications.

Bladeless fan is a high technology invention with unusual innovative characteristics. It doesn't have any visible blades thus completely safe. The bladeless fan is fully variable Air Multiplier Technology draws air at very high speed and compress it.

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II. WORKING PRINCIPLE

Basically it works like this: Air comes in through the pedestal and moves up through ythe circular tube that function like a ramp, forcing the air forward. Well, the air is Drawn in through the base of the machine, powered by what is called a mixed-flow impeller- this is what jet engines use to suck air inward, it has nine fins with rows of tiny holes that reduce the friction caused by colliding high and low air pressure. Air surrounding the sides of the circular tube also flows through the center of the tube through a process called entrainment, so these three sources of air combined form the total overflow. Basically it works like this: Air comes in through the pedestal and moves up through the circular tube that function like a ramp, forcing the air forward. Well, the air is Drawn in through the base of the machine, powered by what is called a mixed-flow impeller- this is what jet engines use to suck air inward, it has nine fins with rows of tiny holes that reduce the friction caused by colliding high and low air pressure. Air surrounding the sides of the circular tube also flows through the center of the tube through a process called entrainment, so these three sources of air combined form the total overflow, According to Dyson, the air Multiplier increases regular room airflow 15 times. Smooth airflow can be achieved by having a low Reynolds number. In fluid mechanis a low Reynolds number means the flow is steady (laminar is what the scientist call it) and a high Reynolds number means the low turbulent or choppy. The bladeless fan has a Reynolds number below 2000 which is considered low. The number depends on a number of variables including fluid velocity, density, and viscosity. To clarify how this number of works in real life, some refer to a common garden house. When the water has a relatively low Reynolds number it's flowing on one steady stream and you have good accurate control over aiming the spray at your trees or flower bed. If the number is high meaning that the water pressure is quite high, then the water sprays out in a choppy and less accurate direction. So the fan manages to hit the airflow sweet spot with a low Reynolds number. Bladeless fan does make use of fan but in a totally different way. Its fan is fitted in its pedestal which sucks air from its perforated pedestal and then send into circular tube which ensure the constant flow of air. The interior of the tube acts like a ramp. Air flows along the ramp, which curves around and ends in slits in the back of the fan. The air flows along the surface of the inside of the tube and out toward the front of the fan. A motor rotates nine asymmetrically aligned blades to pull air into the device.

These blades can pull in up to 20 liters of air per second.

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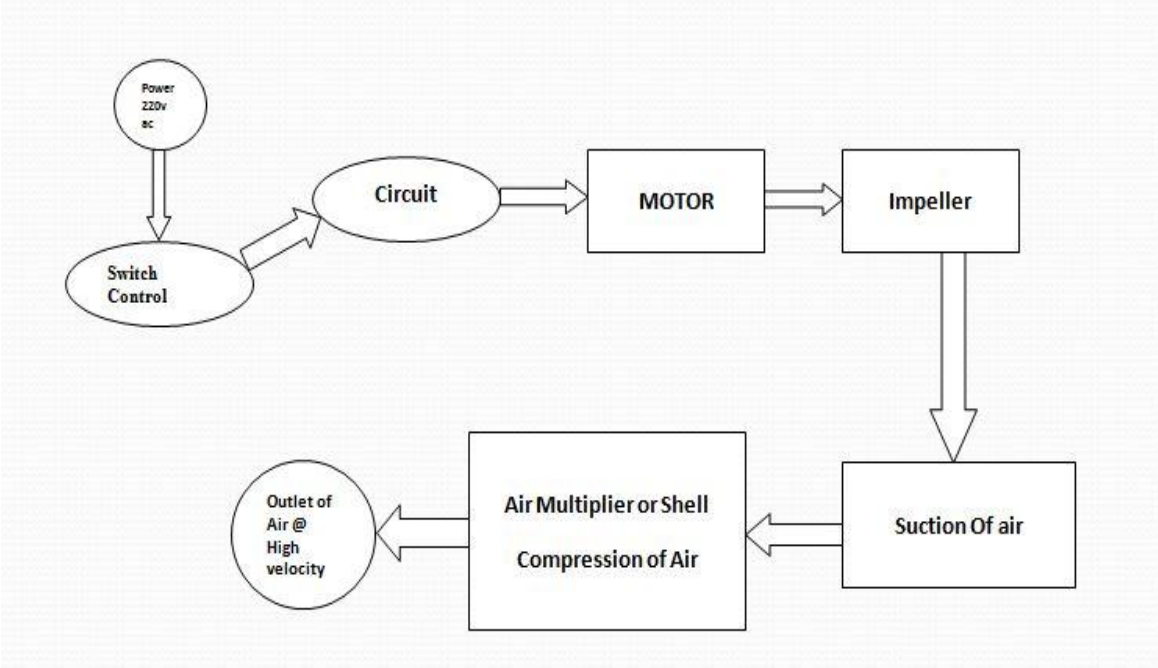
III. PRINCIPLE

This efficient bladeless fan is installed with energy saving brushless motor which is located in its pedestal. It takes in air and makes it flow into a circular tube from where it is let out from a slit. This produces more streamlined air flow which provides great experience of feeling the flow of air.

The air multiplier provided in this fan produces more consistent and steady air breezes than one from a standard fan with blades.

Along with ability to produce an airstream that is off the chart in power, the bladeless fan also offer the smoothest and most uninterrupted blast of air yet, due to bladeless design. Blades on conventional fans tend to create an unpleasant buffeting in the airflow, as they chop up the air before it reaches you. With a bladeless fan, this problem is a thing of the past. Utilizing revolutionary bladeless fan technology, air is drawn in and amplified up to 18 times, offering an uninterrupted stream of gentle air.

IV. BLOCK DIAGRAM



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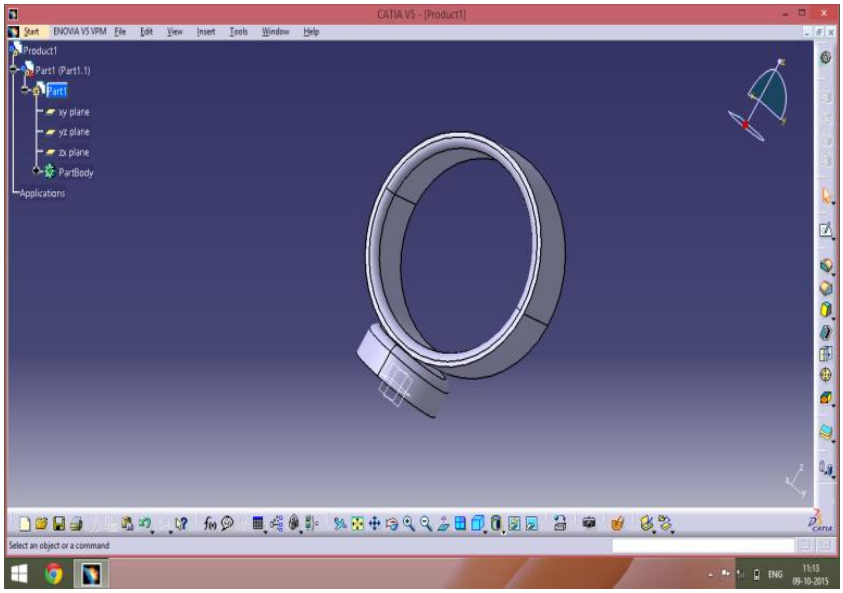
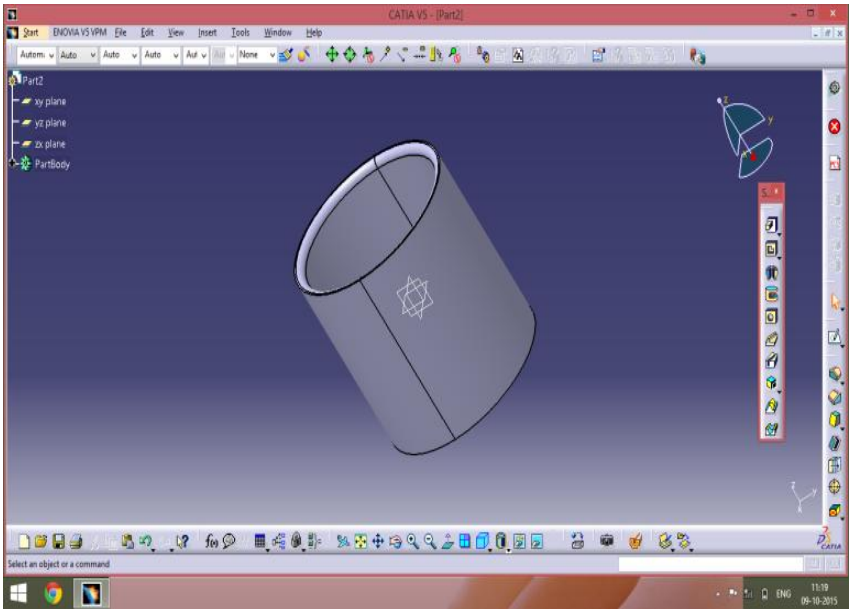
V. CATIA DESIGNING





VI. NEED OF THE PROJECT

- Rapidly rotating blades is a safety issues if any object or body comes in contact with then.
- Forward flow of current produced by the rotating blades of the fan is not uniformly felt by the user.
- These bladed fans tend to be noisy due to sound of the blades moving through air. Hence these disadvantages are overcome using bladeless fans.

VII. ADVANTAGES

- This fan takes its own gravity as its central fulcrum and users change the angle of the fan by pressing
- Air flow is soft and natural

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- Pets control air flow by dimmer switch
- Easy to clean
- Good in appearance
- Same function as traditional fan
- No noise

VIII. CHARACTERISTIC FEATURES

The rotating blades are replace with a graceful ring set atop a cylindrical base. in essence, the device work like a vacuum cleaner in reverse. The motor in base of the fan sucks in air and pushes it up into the ring. The air rushes out of tiny, millimeter –long slots that run along the circular frame and flows down a gently sloping ramp. As the air emerges from the ramp, it creates a circular low pressure region that pulls in the air from behind – creating a fairly uniform flow of air through ring.

IX. FULL PHOTOGRAPHIC DISASSEMBLED MODEL

X. CONCLUSION

The portable bladeless fan is thus successfully assembled and the model is made to work. The air flow is soft and natural There is no fear of any type of distruction damage. There is no fear of child to be get hurted. The air flow is constant and cool air is supplied. It is of low cost with less energy consumption. Its appearence is good and easy to clean. Its function is also same as the traditional fan but there is no noise like the traditional fan.

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