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Design and Development of Hexacopter for Spray Painting

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ABSTRACT

In this 21st century technology increases day by day, UAV (Unmanned Arial Vehicle) is one of those. The UAV has different application like inspection and monitoring, surveying and mapping, pesticides sprayer, and painting. The UAV's are designed as per its application. It may be a quadcopter, hexacopter ,octacopter or any other multicopter. The Hexacopter painting sprayer pump is an equipment or a device which is used for painting at higher altitude by using the principle of it'slifting capacity. Motors are connected to the propellers which converts the rotary motion of the propeller into upward thrust which lifts the hexacopter. The hexacopter consist of six high speed motors that generates which utilizes battery power for it's working. The blades are connected to the DC motor. Rotation of blades produced thrust which helps in lifting the Hexacopter and moves up and dawn, to and fro .We used spraying pump for spraying colours. The proper handling of the remote will decide how to paint the Building. The application of thepaintingHexacopter is to reach at a certain height where human can't reach and paint the wall efficiently.

Keywords : UAV, Battery, BLDC Motor, Propeller

I. INTRODUCTION

In the past years the size and price of electronic components got reduced but its specification increases. And because of this any cheap and lightweight drone can be built. These UAV's can be fitted with sensors and other equipment to perform multitask work. The UAV's are also know as Remotely Piloted Vehicles (RPVs) and it can be controlled through radio frequencies. In these days the UAV's are controlled by Iphone and Tablets through Global Poisitioning System. As per the numbers of motors or propellers the name of multirotor decided. Each motors required single propellers and vice-versa.

II. COMPONENTS OF HEXACOPTER

1- **Motors** – It should be exact same in size as well as in weight also. The specification of each motors should be also same for perfect lifting.

2- **Frame-** The material used for frame is fibre because of its strength frame design is done according to the tread belt size as per space availability and clearance for reduction of friction.

3- **ESC's** - The Electronic Speed Controller. It is a circuit which control and regulates the speed of a motor. Speed is controlled on the basis of motor whether it is Brushed DC motor OR Brushless DC motor. For Brushed DC motor it depends upon the voltage Varying and for Brushless DC motor it depends upon the timing of pulses of current delivered to the winding.

4- **Transmitter and Receiver** – It is another important part of Hexacopter. Transmitter which we hold in our hands and operate and receiver is placed in the Hexacopter which accepts the radio signals and move as per the given command.

5- **Propellers** – The propellers which are used in Hexacopter are made of Carbon Fiber, Hard and light in weight.

6- **Battery** – It provide power supply to the motores

III. OBJECTIVES

The main Aim of the project is to reduce the problems that we faced while painting a building on the basis of its cost and quality. The objectives are :-

- To eliminate human life risk while painting at high altitude.
- To increase the accuracy of painting.
- To reduce excess wastage of paints
- To reduce the labour cost by using the hexacopter.

IV. RESULT

Total calculated Axial Thrust is 4.28 Kg.

Figure 1

V. REFERENCES

[1]. S. Bhandari, S. Pathak, R. Poudel "A report on Design and Development of Hexa-copter (KU-copter)"

[2]. Dupuis, M & Gibbons, J. (2008). Design optimization of quadcopter capable of autonomous flight. Worcester polytechnic Institute. Retrieved August 8, 2014

[3]. DiCesare, A. Design Optimization of a Quad-Rotor Capable of Autonomous Flight. Worcester Polytechnic Institute.

[4]. Fogelberg, J. 2013. Navigation and Autonomous Control of a Hexa-copter in Indoor Environments. Lund University.

[5]. "Development of Unmanned Aerial Vehicle (UAV) Ornithopter with Wireless Radio Control"

[6]. "Design and Development of Hexa-copter for Environmental Research"

[7]. "Design, Implementationt, and Testing of a UAV Quadcopter"

[8]. "Wireless Communications with Unmanned Aerial Vehicles: Opportunities and Challenges"

[9]. Resarch papper on Design & Fabrication Of Remote Operated 3-Axis Spray Painting "Prof. Dinesh B. Shinde".

[10]. Research pappper on Quadcopter based fertilizer and pesticide spraying system "Prof. N. Gandhiraj"