Flying Car

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***Abstract*— A Flying Car is a car which is envisioned to be a roadable aircraft which can be used as a dual purpose for both travelling on road as well as in air. Flying car is an updation of a car just to overcome problems faced by people in high traffic areas. In this car there are two guarded propellers used in front and back which will lift the car in vertical direction when car is in rest position.And also two rotors-Main rotors is on top of the car which will be flapped inside until it reaches a certain position above the cars, afterwards it will be started and has a use to control the weight of body in air and Tail rotor is on hoop of the car, used in giving direction to car in air.**

There will be two engines controlling guarded propellers as well as main rotor and tail rotors. First engine will control two guarded propellers as well as control system of car on road and second engine will control main rotor as well as tail rotor. I have tried to design a 3-D car in aerodynamic shape using AutoCAD.This car can only be used for travelling for 2-3 kilometers.

***Index Terms*— Aerodynamic, Envisioned, Guarded Propellers, Roadable**

I. INTRODUCTION

A. Flying car is envisioned to be an aircraft that can be used as a dual purpose for travelling on road as well as in air.
B. A flying car should look like a car not a helicopter, although main rotor and tail rotor concept is taken from helicopter but it doesn't needs any runway to fly.
C. Flying car must be lightweight in order to move efficiently through the air; cars must be strong and dense to survive impacts. Cars must be small to minimize air resistance.
D. The flying car typically resembles a conventional car with no visible means of propulsion.
E. It has a unique concept by using two guarded propellers for lifting car in vertical direction. Guarded propellers are different from normal propellers as propellers are covered by hollow steel plate.

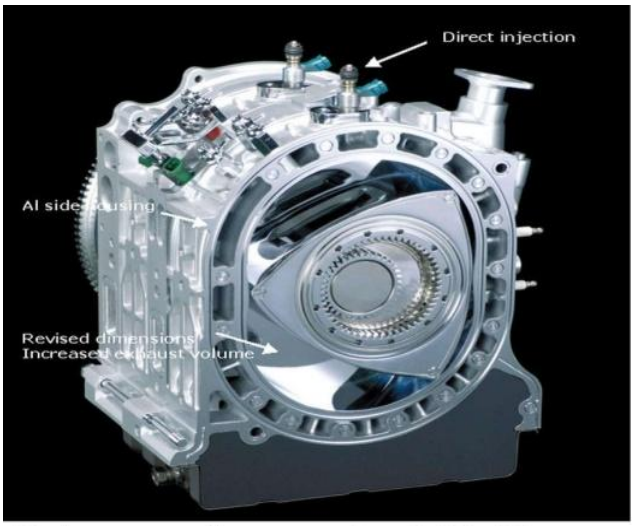
II. MECHANISM

A. This car is in aerodynamic shape (spherical).
B. The two seat flying car is powered by two engines.
C. First Wankel engine will control two guarded propellers as well as control system of car on road.
D. Second Wankel engine will control main rotor as well as tail rotor.
E. The Wankel engine replaces pistons of a conventional engine with a single triangular rotor spinning inside an oval-shaped chamber, which creates compression and expansion as the rotor turns
F. Two guarded propellers are of high power, rotate at a very high speed will easily lift up the car in vertical direction.
G. When car is lifted upto a certain height, second Wankel engine is started which starts the two rotor i.e. main rotor and tail rotor gets started. When main rotor controls the car in air then first engine is stopped.

III. COMPONENTS REQUIRED

A. Wankel engine-

A Wankel engine that's rotated one full rotation is a four-stroke based on what the chambers have done. It rotates in 360degree.[1]



Mazda next generation rotary engine called the 16B. 3.2 liters equivalent instead of the current 13B 2.6 liters. Weight and length are roughly the same as the current RX8 engine. Max torque should be up 23% to 200 foot pounds.

Fig. 1 Diagram of a Wankel engine

B. Tail rotors-

The tail rotor is a smaller rotor mounted so that it rotates vertically or near-vertically at the end of the tail of a traditional *single-rotor helicopter*. The tail rotor's position and distance from the center of gravity allow it to develop thrust in the same direction as the main rotor's rotation, to counter the torque effect created by the main rotor. Tail rotors are simpler than main rotors since they require only collective changes in pitch to vary thrust.[2]

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Fig. 2 Tail Rotor

C. Main rotors-

Main rotor or rotor system is the combination of a rotary wing and a control system that generates the aerodynamic *lift* force that supports the weight of the car and the *thrust*that counteracts aerodynamicdragin forward flight. Main rotor is mounted over the top of the car, which connects through a combination of *drive shaft(*s) and gearboxes along the tail boom. A rotor is generally made of two or more rotor blades but I am using two rotor blades.[3]

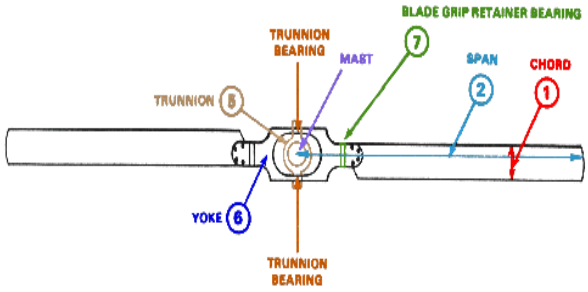

Fig. 3 Semigrid Rotor System

D. GUARDED PROPELLERS-

Propeller guards, or prop guards as they are commonly called, are devices that mount on the lower unit of an outboard motor. These propeller guards surround the propeller and protect it from damage. It is important to protect a propeller from even the slightest contact with a solid object. Even the smallest chip or dent can cause a propeller to vibrate and damage the motor. Performance is also lessened by a damaged propeller. Guarded propellers or prop guard are different from other propellers as it is made up of light weight but strong, high impact flexible injection moulded plastic .the major difference between prop guard and normal propellers is that guarded propellers increases the performance of the propeller thereby it can improve the efficiency of car.[4]

Fig. 4 Guarded propeller

Materials -BORON ALLOY STEEL having superior durability for an axle shaft comprises C-0.38-.43 weight %, Mn-.60-.85 weight %,Cr-.80-1.05weight %,Al-.015-.070 weight %,Ti-.02-.06 weight %,B-.002-.003 weight%,V-.004-.01 weight % and the remnant including Fe and inevitable impurities. This material is used for the covering of rotary blades of both main and tail rotor.

Materials used for engines are aluminum alloy for cylindrical and crank cases. Materials used for body of the car are NANO STEEL.Nano Steel combines basic raw material constituents commonly used to make existing conventional steel alloys and uses them in different ratios to create proprietary alloy chemistries.NANOSTEEL DOES NOT USE ANY EXPENSIVE RARE AND EXOTIC CONSTITUENTS WHICH COULD BE TOXIC AND HARMFUL TO THE ENVIRONMENT.

Fig. 5 Nano Steel

IV. ADVANTAGE

A. LEVEL OF THE TRAFFIC WILL BE DECREASED.
B. TIME WILL BE SAVED.
C. IT DOESN'T NEED ANY RUNWAY FOR TAKEOFF.IT CAN EASILY FLY IN VERTICAL DIRECTION USING GUARDED PROPELLERS.

V. CONCLUSION

Flying cars have been around in various forms since the '30s but have never "taken off". This doesn't mean that the concept was bad, only that the mechanization always left much to be desired.

Besides bringing immediate benefits in simplicity, cost and reliability to today's flyer, it will spawn regulatory changes that will open reliable low cost flight to the next generation of fly/drivers to the point where learning to fly will become a family project just like the rite of passage, learning to drive. Simultaneously, a whole new industry will spring up to provide these flying cars and to expand the line into analogues of the entire recreation and commercial vehicle line of today. There will also be an exploration of the current amphibious and waterborne family of machines for application of fly/drive technology.

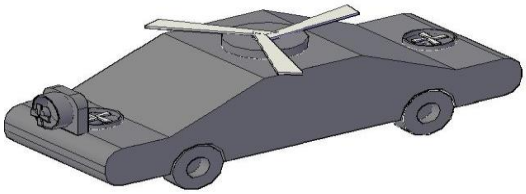

Fig. 6A 3d prototype of A Flying Car using AutoCAD

ACKNOWLEDGMENT

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