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Design of Flying Disk

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Abstract - The flying object, which is the disk shape (sphere) having rotating and non-rotating parts. This can fly at both space and atmosphere having high speed by using the modified rotary wing concept, which is the vortex created by the blade tips is also used as the thrust along with the lift produced by the blades. The additional lift also created by the disk when the blade angle of attack changes. The blades do not connected in the same point and it connected in some degree in the sphere. The blades/wings attached to the iron like ring to cooperate with the high magnetic field, i.e. it rotates with the principle of magnetic levitation followed by this, and vertical takeoff and can land at any place.

Keywords: *— Vortices, Levitations, Centripetal force etc.*

I. INTRODUCTION

It has four diameter from the center point is zero. The UFO consists of wings, center empty space, space for control and accommodation and the small blades. The small blades provide rotational force that helps the UFO to move front or back and to the turning purposes. It is the part of the vehicle, it activates when it needs. The next part from the last is the control surface; it contains cabin, cockpit, storage, good and the magnetic coil. It should be large as possible as for the stability purpose. The magnetic coil helps for the high-speed rotation of the wing for producing large thrust. The magnetic coil works under the principle of magnetic levitation and the power supplied by additional battery for giving power to the magnet.

TABLE-1

SPECIFICATIONS OF FLYING DISK

SI NO	NAME	DIMENSION (mm)
1	Outer diameter	2
2	Diameter of the magnetic rod	1
3	Inner diameter	5
4	Wing length	1
5	Chord	4
6	Thickness	5

The wing comes after the control space and the number of wings depends upon the diameter of the disk. The wing trailing is attached to the next part of the magnet i.e. clips to the magnet separately. The leading edge is pointed towards the thrust zero point, but some distance away from the zero point.

II. AIRFOIL SELECTION

In the aerodynamics field, the airfoil selection is one of the important things. Because the selected airfoil should give the required lift and the drag should be minimum.

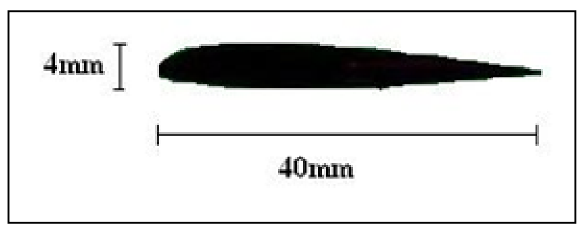

Fig 1.1 Airfoil section of wing

Here we were selecting the NACA five digit series airfoil of chord 40mm and thickness 4mm respectively. It produces the less drag and maximum lift. For the normal wings in the airplane and helicopter, if we increases the speed the lift increases and the drag also little bit reduces. This concept is same for this flying disk also. But in the normal airplane wings and helicopter, if we increase the angle of attack, the airplane stalls. In the flying disk, if increase the angle of attack in the flying disk, the whole system cannot be stalled. The direction of flying disk changes .I.e. if the flying disk moving in the upward direction means, the maximum angle of attack changes the angle of attack in the downward direction.

III. WING PROFILE

The wing depends upon the diameter of the disk and depends on the thrust required. The wings plays a major role in this disk that produces the major lift .the vortices created by the wings are actually the drawback when considered the airplane. But in this UFO the vortices is converted as the additional thrust, because all the forces pointing towards the center point due to the centripetal force acting inwards.

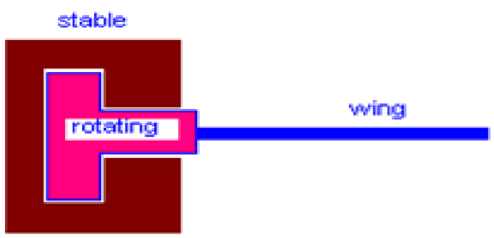

Fig.1.2.Wing attachment to the magnetic disk

The wing attached to the rotating magnetic disk and it as the tendency to change wing angle of attack. The wing is very thin airfoil section, suitable to the supersonic speed. When the iron disk is rotating, the wing also rotating and it produces the lift by every wing. The lift depends upon the speed. At the low speed the tip vortices occurs at the trailing edge of the airfoil. When rotating speed increased the vortices moves to the top and it starts from the leading edge.

It is well known that all the wings are rotating at high speed , so the tip vortices rotates and it forms swirl with high velocity and it moves downwards . The downward movement of the vortices created by the wing at high speed acts as thrust; this thrust helps to take off the disk along with the lift created by the wings difference of low pressure and high pressure

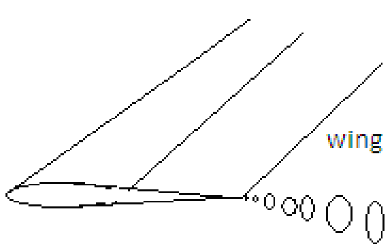

Fig 1.3 Vortices produced at low speed

The above wing in the diagram shows the tip vortices which is created by high-speed .if speed is increased furthermore the vortices moves sideward as shown in the below diagram.

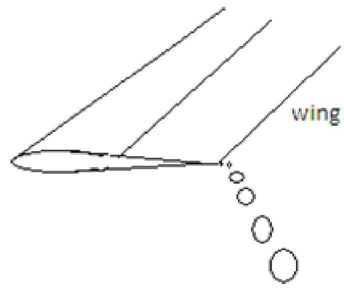

Fig 1.4 Vortices produced at high speed

Therefore, the variation of the increasing speed changes the angle of attack of the vortices as shown in the figure. Actually, wing pointing towards the center point. The velocity is zero at the center and it increases moving outwards near to the tip of the wing. If we change the angle of attack of the wing, the lift increases and vortices also increase. Therefore, the total thrust is increased.

The wingtip vortices produce at every part of the leading edge of the wing. The wing is rotating part and it rotated by the principle of magnetic levitation. The magnetic pulse created by the rod acting towards the center same as the vortices. The vortices acts as a storms so the pressure at the center is maximum; the magnetic field also rotates along with the wings. We already known the high magnetic field rotation makes the body weight reducing, when kept body above the rotating magnetic field.

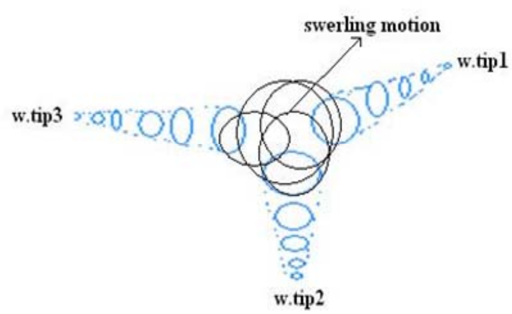

Fig 1.5 Wing tip vortices of each wing meet at center.

center is maximum; the magnetic field also rotates along with the wings. We already known the high magnetic field rotation makes the body weight reducing, when kept body above the rotating magnetic field.

IV. DERIVATION FOR THE MAXIMUM NO OF WINGS FOR MAXIMUM DIAMETER AND THRUST EQUATION

To find the equation for the lift, drag, maximum no wings for maximum diameter, and thrust the basic assumption can done. That is give below

***Assumption*:**

1. The centripetal force acting on the center of the disk, when the wing is rotating.
2. The centripetal forces created at the center are, due to the individual wings. So the total centripetal force created at the center is the summation of the 'n' number of wings.
3. The total centripetal force is equal to the str5ength of the circulation (swirling) created by the vortex by the number of wings.
4. Laminar flow.
5. No external force acting on the disk.

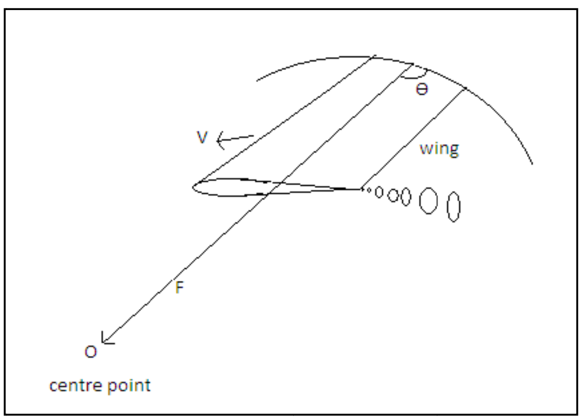

Fig 1.6 Formation of centripetal force and vortices.

The wing attachment to the magnetic disk is shown in the fig. the velocity 'v' is acting when it rotates .'θ' is the angle between the wing and the curvilinear motion of the magnetic disk.we will knoe the centripetal force is acting at eh center ,when the body ratates. Consider here the body 'θ' wing rotates force at the angle .And the force acting towards the center point 'o'. So the centripwtal force created by the wing is

$$F = mv^2/2$$

$$F = mr\omega^2$$

$$\omega = 2\pi/T$$

First, we have to find the number of wings suitable to the diameter of the disk. The numbers of wings depend upon the diameter and lift required to the takeoff. The lift created by the wings and it depends upon the frontal facing the air, density of the air. The lift force also depends upon the rotational motion and the curvilinear motion of the magnetic disk. Therefore, we can simply relate the lift force and the centripetal force .we can get the number of wings to the diameter of the disk.

$$n = \frac{1}{2}\rho v^2 A \qquad (1)$$

The equation '1' relates the centripetal force and the lift force for the single wing. But we need the maximum number of wing for the diameter of the disk .So multiplying by 'n' to the lift force gives the maximum number of wings.

$$n = n\frac{1}{2}\rho v^2 A \qquad (2)$$

$$r = \frac{2m}{n\rho A C_L} \qquad (3)$$

The equation '3' gives the maximum radius of the disk for the maximum number of wings. From this we derive the number of wings formula.

$$n = \frac{2m}{r\rho A C_L} \qquad (4)$$

The above equation gives the maximum number of wings for the maximum diameter of the flying disk. From this formula we well known that,the number of wings depend upon the radius of the wing,density of the air, co-efficient of the lift and th total mass of the wing. If the radius is increases the numbers of wings are minimum. Becsuse the lift depends upon the ,then amount of air faced by the wing area.

V. CIRCULATION FORMULA AT THE CENTER POINT OF THE DISK CREATED BY THE WINGS:(THRUST)

The wing produces lift when it moves at the speed and rotates at high speed .at high speed subsonic speed the wing produces vortices .this vortices form acircular motion (swirling) when it rotating .here the rotational motion so the circulation motion is formed , thestrength of the circulation formula is given as

$$V = \frac{\Gamma}{2\pi r}(\cos A + \cos) \quad (5)$$

The equation '5' represents the induced velocity formation with relatio to the strength of the circulation for a single wing.Then, for the general the circualtion formula is given as

$$\sum_{i=1}^{\pi} \frac{\Gamma}{2\pi r}(\cos A + \cos) \quad (6)$$

The thrust produced by the flying disk is the summation of the strength of the circulation and the total lift created by all the wings the lift force created by the wings is given as

$$\sum_{i=1}^{n} \frac{1}{2}\rho v^2 A \quad (7)$$

$$T = \sum_{i=1}^{n} \frac{1}{2}\rho v^2 A + \sum_{i=1}^{n} \frac{\Gamma}{2\pi r}(\cos A + \cos) \quad (8)$$

$$T = \frac{1}{2}\sum_{i=1}^{n}\left(\frac{\pi r \rho v^2 C_l + \Gamma(\cos A + \cos}{\pi r}\right)$$

$$T = \frac{\pi v^2}{2\pi r}\sum_{i}^{n}[\rho A C_L r + 2m]$$

$$T = \frac{V^2}{2r}\sum_{i=1}^{n}[\rho A C_L r + 2m] \quad (9)$$

The equation'9'(T)gives the thrust formula for the flying disk. The thrust produced is depednds on the mass of the wing, radius of the inner diameter of the disk, density, and are of the wing.

VI. STRUCTURAL ANALYSIS

The wings for the flying disk may vary from 2 – 8 no's depends uopn the thrust required . if the wing part is rotated means ,the tip of the wing gives the maximum diflection and the maximum stress occurs at the part wing connected to the magnetic disk.

The deflction for all types of the wings are done and finally to the conclustion .for the structural analysis the basic pressure load 100 N/mm^2 is applied to the leading edge of the rotating part.the stationary

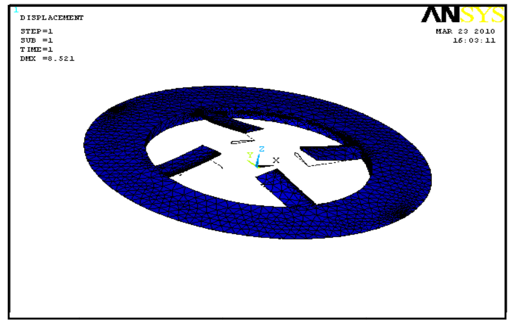

Fig 1.7 Structural analysis of four wing.

part is arrested .the angular velocity 30000 rpm is applied to the wings of the flying disk.The youngs modules of the material consider is $2.5e^5$ N/mm^2 .The density and the poisons ratio is 8314 kg/m^3 and 0.3 respectively.

TABLE II

COMPARISION BETWEEN DEFLECTOIN OF BLADES

SI.NO	INNER DIA(MM)	NO OF BLADES	DEFLECTION
1	75	THREE	8.515
2	75	FOUR	8.521
3	50	FIVE	39.595
4	50	SIX	11.525

The above table explains the comparision of the three, four ,five and six blades. The three blades as 8.515 mm as deflection , but there is no much difference in the four blades. i.e 8.521mm.The five blades gives the maximum deflection compared to all the blades(39.595mm). so it is well known that four blades can be used for flying and the inner diameter also high that it can produce a maximum thrust force with less deflection.

VII. FLUID ANALYSIS

The fluid is one of the most important factors in the analysis part as seen earlier. Here we will seen the fluid analysis of flying disk at three different types of wings.in the fliud analysis ,the variation of the pressure and the velocity at were is maximum and were minimum were find. And the flow variation of the air in the vertical and horizontal movement of flying disk as clerly shown.

By using the pressure and the velocity value ,the maximum lift can be found.The boundary conditions o the flying disks velocity gravity , and density are 10000 m/s, 9.81m/s^2 and 1.104 kg/m^3 respectively. Consider the pressure at the outlet is zero and the flow is laminar and adiabatic process

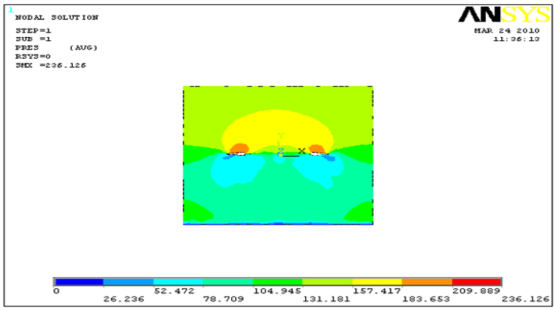

Fig 1.8 Fluid analysis of four blades

The above fig is four blade flud analysis result that gives the maximum pressure value of 209.809 N/m at the top of the flying disk ,this pressure is reduced to the 26.236 N/m value i.e pressure value decreases.thus the velocity at the center automactically increases, so the lift value also increases . the comparision table for the number blades in the flying disk are given below.

TABLE III

VELOCITY AND PRESSURE DIFFERENCE BETWEEN NO BLADES

SI.NO	NO OF BLADES	VELOCITY (mm/s)	PRESSURE (N/mm)
1	THREE	13326	96
2	FOUR	14878	209.89
3	FIVE	13198	121.745
4	SIX	13543	105.605

Here the pressure is maximum for the flying disk is given by the four blades as 209.89 N/m compared to all other blades . Because the pressure velue is depends upon the vortices created by the wing tips and the area for the swerling motion. That's why the four blades gives the maximum pressure at the center.

VIII. EXPERIMENTAL ANALYSIS

We were conducting the a test in a water flow in the dam. The test specimen in the fig is kept or immersed in a water and varying the flow speed .Here we wre going to find the flow variation over the flying disk at both the vertical and the horizontal section.The flow is laminar and the speed of 5m/s and 10m/s resepectively.

Fig 1.9 Experimental analysis of disk over water

The above fig shows the vertical flow analysis of the flying disk. It separates the flow along the sides of the surfaces as this is same for the horizontal flow also. Because the flying disk is circular and all sides are facing the air while flying.

Fig1.10 Flow separation of water over tip of the flying disk.

The flow separation in the wing tips was shown in the above fig.1.10. It shows the vortices created at the each tip of the wings. And it shows the velocity increases form before the wing tip to after the wing tip.

IX. CONCLUSION

The aircraft, at the subsonic or the supersonic speed the vortices and boundary are which cannot becomes as zero, but here it as converted as thrust for the flying disk at any speed i.e. if an aircraft flying in subsonic, supersonic and more the vortices does not acts as drag

.The vortices and drag at any speed acts as thrust. From the analysis, the four wings of the flying disk as the higher tendency to move both space and the atmosphere without any structural damage when compared to other wings, because the volume of the air facing the wing is less simultaneously all properties changes.

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