Journal of Basic and Applied Engineering Research
p-ISSN: 2350-0077; e-ISSN: 2350-0255; Volume 2, Issue 22; October-December, 2015, pp. 1926-1928

http://www.krishisanskriti.org/Publication.html

Enhancement of Thrust in Gas Turbines using Quantum Locking Technique

V Sai Shiva Subramanian

Anna University Affiliation B4/G7 Sri Mahalakshmi Apts, Secretariat Colony Adambakkam, Ch-088
E-mail: saishivasubramanian@gmail

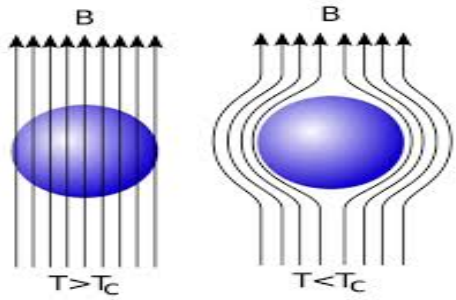
Abstract—*In this paper, using the quantum locking technique the fan blades are made to rotate in a constant and continuous speed which gives the sufficient mass flow of air to the combustion chamber for the engine to operate. This will reduce the usage of shafts and gears for rotating the fan blades. This technique needs an initial rotational energy for the fan blades to make their continuous rotation without any further motor and shaft support after the start of the engine. This idea will help in reducing the weight of engine since there will be no need of gears and shafts to rotate the fan blades continuously (ie., gears and shaft connecting turbine and fan will not be needed anymore). This reduction in weight of a turbo fan engine will definitely give more thrust.*

1. INTRODUCTION

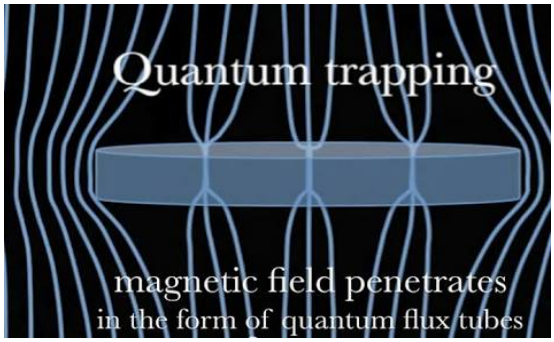
Gas Turbines have many stages of turbines which rotates the stages of compressor and a single stage fan blades by rotating the common shaft which is in connection with all the above parts. Initially the engine's fan blades are rotated by a starter motor which will suck the air and rotates the compressor and then combustion followed by expansion of hot gases through the turbine blades then through nozzle, gives the sufficient thrust for an aircraft to move forward in a steady level flight. These type of gas turbines are called as Turbofan engines, they make use of the air flow through the duct of this engine for the 80% of the thrust of this engine whereas the core jet gives only 20% of thrust. This is why because turbines in the core engine utilizes the energy of hot combusted gases and rotates the complete engine shaft which drives the fan and compressor blades. The amount of work done in rotating these compressor and fan swallows the contribution of thrust given by the core jet. To increase the thrust contribution of core jet, the removal of shaft connecting the turbine, compressor and fan is essential.

2. QUANTUM LOCKING

When an inert disc say crystal sapphire wafer, that wafer is coated with a superconductor yttrium barium copper oxide. This superconductor when cooled with liquid Nitrogen, they conduct electricity with no loss of energy. These superconductors hate magnetic fields and normally would just repel the magnetic force and float in a wobbly fashion. But a thin superconductor allows some magnetic forces to pass through and these little magnetic channels are called as flux tubes.



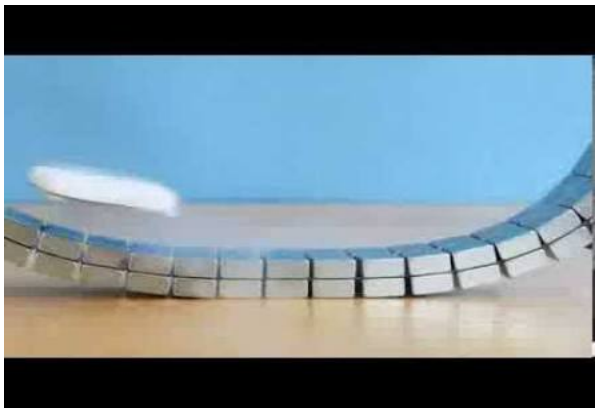
The flux tubes cause the field to be locked in all three dimensions, which is why the disk remains in whatever angle it is adjusted and they float around the magnetic field continuously once it has given an initial speed of rotation, which will rotate the disk continuously over the magnetic rails without any loss in energy.



3. METHODOLOGY

The magnetic rail that provides the magnetic field in a given space where the superconductors being cooled by liquid Nitrogen is dropped into the field of magnetic lines which creates the quantum locking of the superconductors due to above explained principle. This setup can be seen in the below given picture.

The magnetic rail as shown in the figure is laid differently along the circumference of inner walls of the fan casing. The thin superconducting blades are used instead of conventional fan blades. This locks the fan blades in all three dimensions of space and makes the blades to float around freely without losing any energy when the blades are given some rotational energy at a certain speed. The fan blades continue to rotate without any loss in the speed of rotation around the magnetic rails.



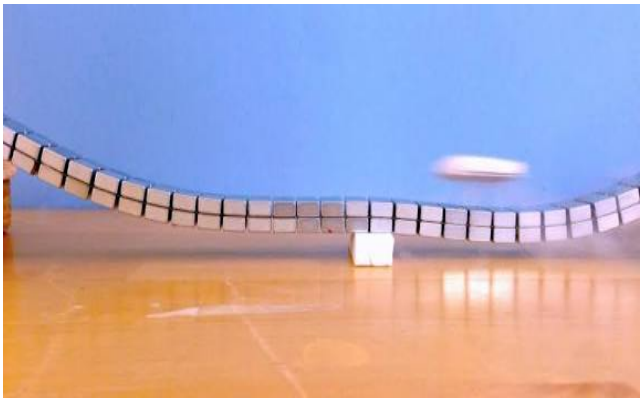
4. CHALLENGES FACED

The blades are hollow single crystals manufactured with honeycomb structures for the fans of turbofan engines, in order to make them superconductors. At the tip of the fan blades coolant should be provided from the root hub through hollow blade cross sections to the tip of the blades through some Nano-inner pipelines. Even though the coolant is provided to the blade tip the superconductors have to reach their critical cooling temperature for them to get quantum levitation and locking effect with the magnetic rails on the inner walls of fan casing. Maintaining the coldness in the blade tips is the hardest part for which there is another idea to overcome the losing of coldness in the blade tips.

Pseudo-levitation is the ability of levitation to happen even when an intermediate material is placed between the magnet and superconductor. Using this concept I have overcome the loss of coolness in the blade tips by covering them with a thermostat, which will not allow any heat transfer between the atmosphere and superconductor.

5. ADVANTAGES

- Reduction in weight of the engines since there will be no need of shaft from turbine to the fan.
- This will also makes only little usage of starting motor for the fan to achieve a good speed, after that the everlasting energy due to quantum locking is made use.
- Thrust is enhanced as the weight in the engine is reduced.
- Thrust is enhanced as the fan speed is never lost due to continuous quantum lock and levitation happening to the blades.



6. DISADVANTAGES

- It is a new technology and can have many more drawbacks due to usage of magnets in the fan casing to rotate fan blades under quantum locking technique.
- This fan will give constant mass air flow and it could not be varied in speed of rotations.
- The superconductors may give some more weakness on fan blades as they are frozen and are rotated at a certain speed continuously, they will be under cyclic loading and this may affect the durability of fan blades.

7. APPLICATIONS

The future applications of quantum locking are mainly towards the frictionless transports. In this paper this quantum

locking is applied to the aircraft gas turbine engine fan casing. Similarly this technique has various applications and they are as follows,

- It can be used in helicopter rotor blades to make them rotate continuously by placing the magnetic rail in an outer shroud covering the rotor blade tips.
- It can be used in Propeller engines blades with similar magnetic rail arrangement explained in this paper.
- It can also be used for floating the cars above the magnetic bases or ground surfaces.

8. CONCLUSION

This paper gives you the ideology of using quantum trapping in the aircraft engine blades to make them rotate continuously without any shaft support and without any loss in speed of rotation of blades using the superconducting thin blades along the magnetic rail placed in the inner walls of engine casing below the blade tips.

This application of quantum locking technique in aircraft engines would be the very first innovative idea. And also this paper will encourage the future researchers to bring these concepts and many other related concepts into existence. Like I try implementing this same concept to rule the aviation industry and complete world soon or later.

REFERENCES

The reference for this paper is not bibliographical and is only through the websites which are as follows,

[1] https://www.quantumlevitation.com
[2] https://www.tragnark.com
[3] https://www.wikipedia.com
[4] https://www.google.co.in
[5] https://www.sites.google.com
[6] https://www.sciencefocus.com
[7] https://www.youtube.com