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NOVEL DESIGN OF AEROLEAF FOR MODIFIED WIND TREE

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Abstract: Energy from wind is the fastest growing source of electricity in the world. In this design wind energy is used to induce electricity with the help of aero leaves. Several splint shaped aero leaves are placed in the form of tree called Wind Tree. Wind Tree uses bitsy blades housed in the aero leaves to induce power from wind energy. These wind trees are suitable to induce power anyhow of the wind direction and with minimal wind speed of 7Kmph. In this design we've used tree shaped structure, covered with splint shaped mini turbines called aero- leaves which are of sarvonius type turbine and designed to produce the power which will catch the wind from all the directions. All lines and creators are integrated into the leaves and branches. Artificial leaves operate as mini perpendicular turbines each around the tree. When the wind blows, the splint turbines rotate and still produce the energy. This design concludes that, the power generated from wind tree is environmental friendly, substantially it generates power with least noise and it can be installed at different locales.

Index Terms - Aero leaves, sarvonius, wind tree, Artificial leaves

I. INTRODUCTION

Wind Turbine Tree – Aero- leaves After decades of extermination, rendering the natural coffers nearly defunct, the world moment after important compulsion and blarneying from the activists' knot and the fast reduction of renewable coffers and environmental pollution have eventually begun to dawn on the conception of clean energy. Enter the Biometric Aero- leaves Energy Trees. Up until now, employing these unlimited capabilities from the noway end form of natural coffers has come at an considerably great price, literally. Looking at the howl of the leaves to the wind, French entrepreneur Jerome Michaud- Larivière, has come up with a cost-effective ingenious idea that can harness the wind around us into consumable clean energy. The silent "Aero- splint" as he calls it, an S- type conical volume, a perfect reproduction of the leaves makes up the Wind Turbine Trees, and are modular factors placed along the sword branches that are fixed to a glamorous assembly that go into gyration hence generating the electrical jolts. The plurality helps in capturing, indeed the lowest of wind movement and converting into electrical beats hence generating a durability. Though it has a stammer in its affair presently, 4.1 kW, which isn't significant compared to the humongous appetite to besatisfied. However, it'll be ready for deployment in a large range and will effectively check both pollution and destruction of spare energy, which can be commanded from a minimum space, If any advancement is made to significantly ameliorate the wattage with minimum changes to design and going

1.1 Literature survey

Over the fast few decades, generation of electricity from renewable sources has gradually increased to a fair percentage. In this Wind energy play a vital role for the generation of electricity. Lot of Researchers submit their research towards the various module of generation by wind energy. Manoj M Koushik Narayana H B, Gowtham V et al "Design and Fabrication of Small VAWT for Turbine Tree using PVC Blades" – IJIRSET, 2018. An existing, Anantha approach is made to harness the wind energy from the moving vehicles in highways, railway tracks and truck application to generate electricity. Turbine tree is a concept in which a number of small vertical axis wind turbines (VAWT) are mounted on a single arrangement and coupled to obtain high power output. Presently metals and composites are being used as material for blades in turbines. So, use of alternate materials other than metals in wind turbines yet to be researched. Also Integration of wind turbines in vehicles and road yet to be thoroughly researched and tested. (1) T. Hayashi, Y. Li and Y. Hara [1]: Two types of control were implemented: constant rpm and constant load torque. When subjected to a step change in wind speed from 10m/s to 11m/s under constant rpm control, the VAWT torque was observed to respond almost instantaneously and attained a steady state in less than 3s. (2) . S. J Kooiman, S.W. Tullis [2]: experimentally tested a VAWT within the urban environment to assess the effects of unsteady wind on aerodynamic performance. Independence of the performance in directional fluctuations was seen while amplitude-based wind speed fluctuation decreased the performance linearly. (3) Alexander K. da Costa, et al "Electrical Impacts of the Distributed Generation with Incineration of Urban Solid Waste" – IEEE, 2019. They studied

the potential of Distributed Generation (DG) using energy source from USW incineration. This generation plant proposal is linked to a private university of Santo Angelo – RS – Brazil, which is connected in medium voltage grid (MT), in 23.1 kV. It was estimated a self-consumption of generation capacity through the waste generated in the city using computer made calculations and the Open DSS software. With the results obtained was possible to estimate the impacts of this DG in the medium voltage grid, relating it to the power flow, voltage levels and conductor loading. (4) Sangita S. Chaudhari, Varsha Y. Bhole et al “Solid Waste Collection as a Service using IoT- Solution for Smart Cities” – IEEE, 2018. (5).

2. EXISTING SYSTEM

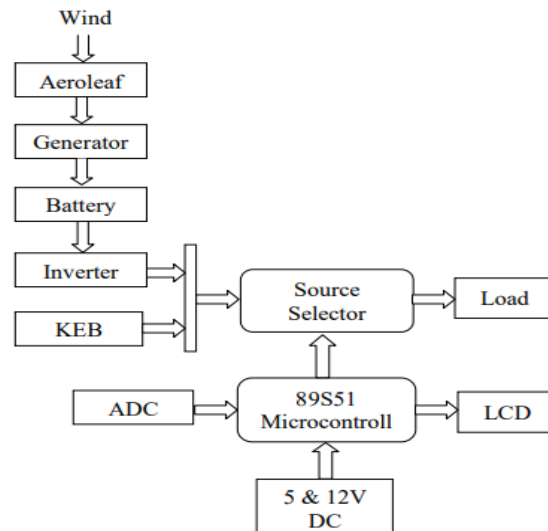


Fig -1: Block diagram of Existing system

In the existing system the minimum cut in speed is 8m/s and the rated wind speed is 25m/s. Cut in speed is nothing but the speed at which the turbine can rotate and generate power. The rated speed of turbine is at which the wind speed spells above the cut in speed to generate the rated output power. So for mild wind speed variation there is no change in the position of wind turbine to generate the electrical Power. To overcome this we design a aero leaf to give response for even a for a small variation in the wind speed.

3. PROPOSED SYSTEM:

In the proposed system we design a new modified aero leaves to generate the electrical power even for small wind variations. According to our experiment the cut in speed of the proposed aero leaves is 5m/s and rated speed is 15m/s.

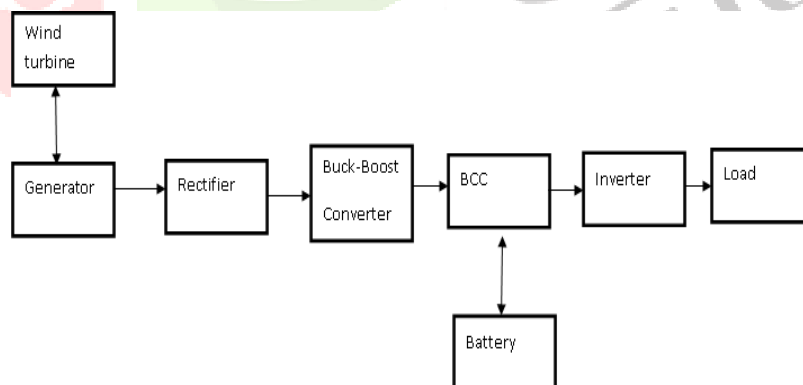


Fig -2: Block diagram of Proposed system

Eventhough in a small speed of wind we gain A certain quantum of electrical energy .so we geta nominal power without any interruption Due to that we achieve greater effectiveness in using this modified aeroleaves wind tree for power generation.

4. SIMULATION RESULTS (DESIGN OF NOVEL AERO LEAF)

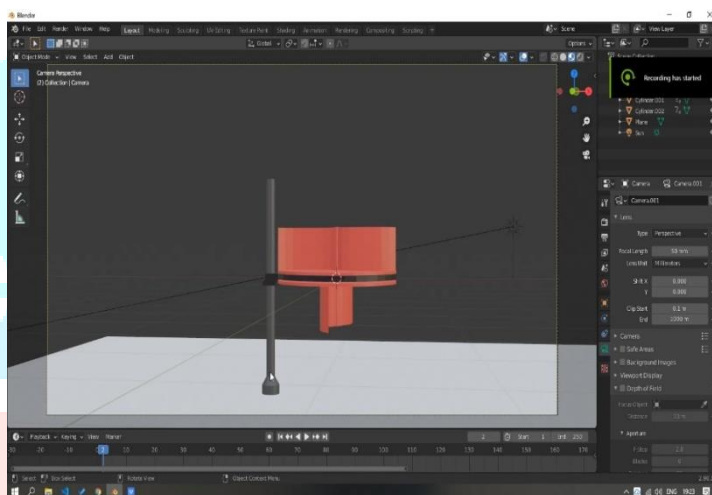
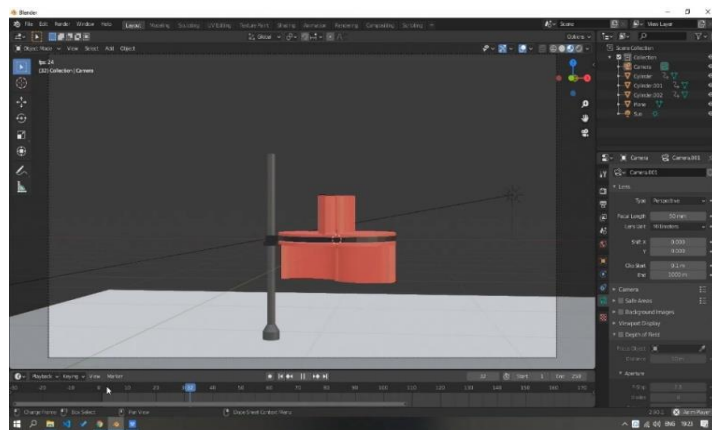


Fig -3: Design of wind turbine model

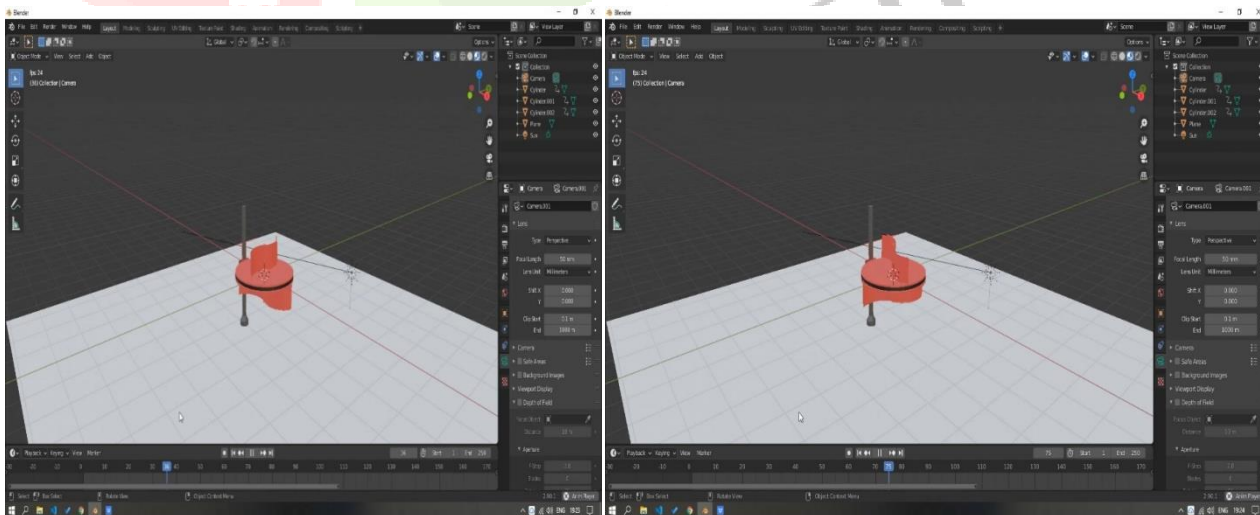


Fig -4: Design of wind turbine model

5. CONCLUSIONS

Wind power is an affordable, effective and abundant source of domestic electricity. It's pollution free and cost competitive with energy from wind tree shops in numerous reasons. The paper first deals with the current script of the wind energy in India. Wind energy is available without any cost and it doesn't emit any hothouse feasts. This makes it a great source of energy product for any developing state. The field of wind energy has tremendous compass for invention, rephrasing to real world operations and tremendous profitable occasion. It's crucially important for India, as our frugality continues to evolve. For that we will need lesser coffers. Clean, sustainable, renewable and inversely important, domestic sources of energy are essential to fulfill the eventuality

of India in the coming times and it's certain that wind energy will play a major part in shaping India's future. Wind power has surfaced as the biggest source of renewable energy in the world.

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