AERO PATENT MATRIX

INVENTING THE WORLD

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MLR INSTITUTE OF TECHNLOGY

DEPARTMENT OF AERONAUTICAL ENGINEERING

“AERO PATENT MATRIX”

2023

MARRI LAXMAN REDDY
GROUP OF INSTITUTIONS
MLR
Institute of Technology

Institute Vision:

Promote academic excellence, research, Innovation, and entrepreneurial skills to produce graduates with human values and leadership qualities to serve the nation

Institute Mission:

Provide student-centric education and training on cutting-edge technologies to make the students globally competitive and socially responsible citizens.

Create an environment to strengthen the research, innovation and entrepreneurship to solve societal problems.

Vision of the Department:

To be a centre of excellence in Aeronautical engineering with emphasis on Research & Innovation to serve the needs of industry with human values to build strong nation. The department's vision is derived from the institute vision and it vouches to help the institute in fulfilling its vision by becoming a center of excellence in Aeronautical Engineering.

Mission of the Department:

The mission statements are the action statements; the department intends to implement in fulfilling its vision. The key components are quality oriented technical education, multidisciplinary skills and Research & Innovation activities with human values.

M1. Provide quality oriented education, well-grounded in the fundamental principles of Aeronautical Engineering.

M2. Consistently produce top quality Aeronautical engineers with core and multidisciplinary skills, who can become ace leaders and successful entrepreneurs with human values.

M3. Continuously strive for knowledge; undertake Research and Innovation that will contribute to the industrial development of the nation.

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
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(21) Application No.202341066779 A
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(54) Title of the invention : MORPHING WING FOR UAV

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(57) Abstract :
The present invention belongs to the morphing wing, the capability and mobility of the wing to adapt according to the flying conditions. Morphing wings are adaptable wing applications that were emerged in response to the requirements for variable lift and drag forces at different phases of flight. It is a system that allows changing the wing aspect ratio, wing airfoil, airfoil camber ratio, wing reference area, and even the angle of attack in different sections of the wing. The morphing wing features are very attractive technology for UAV. Morphing wing features on UAVs improves payload ratio, reduces take-off distance and landing distance, take-off with limited runway clearance and efficient altitude change at lower engine RPMs, higher cruise speeds, lower stall speeds, and lower drag if necessary, all of which save energy and time. The aspect ratio of the airplane can be changed by varying the morphing angles f1 and f2.The chord wise morphing is used to increase the wing area. The second stage of morphing can be used as a winglet to reduce the parasite drag. 3 Claims and 4 Figures

No. of Pages : 13 No. of Claims : 3

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(54) Title of the invention : 2D PLAIN-WOVEN PATTERN KEVLAR-AL BASED REINFORCED EPOXY KLARE COMPOSITE

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(57) Abstract :
The fiber metal laminates (FMLs) composite are widely used in various structural applications including aircraft wing fuselage skin, automobiles and space vehicles due to their lighter in weight and high strength material which can be replace the steel. The proposed invention with 2D plain-woven pattern Kevlar fabric with stacking of Aluminum sheets was reinforced with epoxy resin is used as composite. The hybrid materials consisting of alternating layers of thin metal sheets and composite layers. In this article an attempt is made to fabricate the lightweight FML as replace Kevlar 49 fiber with glass fiber from GLARE which can be called as kevlar-al based composite (Kevlar Laminate Aluminum Reinforced Epoxy) and corresponding tensile, flexural test (Three-point bending). The laminates were fabricated by hand layup along with vacuum bagging technique. Specimens are cut off from water jet cutting as per ASTMD3039 standards specimen and to achieve the accurate shape and size of the composite and also it would reduce the manufacturing defects and provides the better bonding properties. The results, in which it improves structural stability of composite with increase the mechanical properties of tensile strength and flexural strength of the composite. 3 claims & 2 Figures

No. of Pages : 11 No. of Claims : 3

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(54) Title of the invention : CO-AXIAL PROPELLER FOR MORPHING WING UAV

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(57) Abstract :
Co-axial propellers, also known as dual-rotor or counter-rotating propellers, are a type of propulsion system commonly used in UAVs and other aircraft. In this co-axial setup, two propellers are mounted on the same axis, with one placed above the other. Both propellers rotate in opposite directions, which creates a number of advantages for UAV design and performance. The counter-rotating propellers produce equal and opposite torques, which cancel each other out. This reduces the UAV's tendency to spin or rotate uncontrollably, providing better stability during flight. Compared to traditional quad copters that use four separate motors and propellers, co-axial UAVs have a simpler mechanical design with only two motors. This can lead to reduced weight, fewer moving parts, and potentially lower maintenance requirements. Co-axial propellers can be more efficient in terms of power consumption and flight time. The counter-rotating propellers can also help in reducing the overall noise level produced by the UAV. 3 Claims and 3 Figures

No. of Pages : 11 No. of Claims : 3