

(54) Title of the invention : EFFICIENT WIND TURBINE BLADE DESIGN USING AEROELASTIC TAILORING

(51) International classification :F03D0001060000, G06F0030200000, F03D0007020000, F03D0009110000, F03D0003060000

(86) International Application No :NA  
 Filing Date :NA

(87) International Publication No : NA

(61) Patent of Addition to Application Number :NA  
 Filing Date :NA

(62) Divisional to Application Number :NA  
 Filing Date :NA

(71)Name of Applicant :  
**1)Dr. M. RAMAMOCHAN RAO**  
 Address of Applicant :ASSISTANT PROFESSOR, DEPARTMENT OF MECHANICAL ENGINEERING, GITAM SCHOOL OF TECHNOLOGY, GITAM DEEMED TO BE UNIVERSITY, RUSHIKONDA, VISAKHAPATNM- 530045, ANDHRA PRADESH, INDIA. -----

**2)AMBATI SUPRAJA**  
**3)R.SURENDRAN**  
**4)KANCHARLA BULLIBABU**  
**5)Dr. GVR SESHAGIRI RAO**  
**6)KATHIRAVAN R**  
**7)J.BALAJI PRAVEEN**  
**8)AMAN KALRA**  
**9)JALLI RAVI KUMAR**  
**10)N.C. AJAY VISHWATH**  
 Name of Applicant : NA  
 Address of Applicant : NA

(72)Name of Inventor :  
**1)Dr. M. RAMAMOCHAN RAO**  
 Address of Applicant :ASSISTANT PROFESSOR, DEPARTMENT OF MECHANICAL ENGINEERING, GITAM SCHOOL OF TECHNOLOGY, GITAM DEEMED TO BE UNIVERSITY, RUSHIKONDA, VISAKHAPATNM- 530045, ANDHRA PRADESH, INDIA. -----

**2)AMBATI SUPRAJA**  
 Address of Applicant :ASSISTANT PROFESSOR, DEPARTMENT OF CIVIL ENGINEERING, B V RAJU INSTITUTE OF TECHNOLOGY, NARSAPUR, TELANGANA, 502313, INDIA. -----

**3)R.SURENDRAN**  
 Address of Applicant :ASSISTANT PROFESSOR, DEPARTMENT OF MECHANICAL ENGINEERING, K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY, TIRUCHENGODE- 637215, INDIA. -----

**4)KANCHARLA BULLIBABU**  
 Address of Applicant :ASSISTANT PROFESSOR, DEPARTMENT OF MECHANICAL ENGINEERING, ANURAG ENGINEERING COLLEGE, ANANTHAGIRI, KODAD-508206, TELANGANA, INDIA. -----

**5)Dr. GVR SESHAGIRI RAO**  
 Address of Applicant :PROFESSOR, DEPARTMENT OF MECHANICAL ENGINEERING, INSTITUTE OF AERONAUTICAL ENGINEERING, DUNDIGAL, HYDERABAD, TELANGANA, INDIA. -----

**6)KATHIRAVAN R**  
 Address of Applicant :RESEARCH SCHOLAR, DEPARTMENT OF ENGLISH, KARUNYA INSTITUTE OF TECHNOLOGY AND SCIENCES, KARUNYA NAGAR, COIMBATORE-641114, TAMILNADU, INDIA. -----

**7)J.BALAJI PRAVEEN**  
 Address of Applicant :ASSISTANT PROFESSOR, DEPARTMENT OF CIVIL ENGINEERING, DHANALAKSHMI SRINIVASAN COLLEGE OF ENGINEERING, PALAKKAD MAIN ROAD, NAVAKKARAI (PO), COIMBATORE- 641105, TAMIL NADU, INDIA. -----

**8)AMAN KALRA**  
 Address of Applicant :DESIGN ENGINEER, DESIGN AND DEVELOPMENT DEPARTMENT, TCS, GURUGRAM, H.NO. 1602, SECTOR 8, FARIDABAD, HARYANA (121006), INDIA. -----

**9)JALLI RAVI KUMAR**  
 Address of Applicant :ASSISTANT PROFESSOR, DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING, GMR INSTITUTE OF TECHNOLOGY, RAJAM-532127, ANDHRA PRADESH, INDIA. -----

**10)N.C. AJAY VISHWATH**  
 Address of Applicant :ASSISTANT PROFESSOR, AERONAUTICAL DEPARTMENT, AEROMODELLING LAB, AERONAUTICAL DEPARTMENT, PARUL UNIVERSITY, POST LIMDA, WAGHODIA, GUJARAT- 391760, INDIA. -----

(57) Abstract :  
 The invention pertains to a wind turbine blade design leveraging aeroelastic tailoring principles. By strategically manipulating material properties and layup configurations, the blade achieves optimized aerodynamic performance while ensuring structural resilience. This design is adaptable to advanced manufacturing techniques and can integrate with sensor systems, providing real-time feedback on performance metrics. The result is a blade that promises enhanced energy capture, prolonged operational lifespan, and a potential reduction in maintenance costs, marking a significant advancement in wind energy technology.

No. of Pages : 20 No. of Claims : 10