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(51) International classification :B29C0064118000, B33Y0010000000, H01Q0015160000, H01Q0015140000, B33Y0070000000 (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)INDIAN INSTITUTE OF TECHNOLOGY (INDIAN SCHOOL OF MINES), DHANBAD Address of Applicant :Dhanbad - 826004, Jharkhand, India Dhanbad ----- Name of Applicant : NA Address of Applicant : NA (72)Name of Inventor : 1)Jaya Kori Address of Applicant :Department of Mechanical Engineering, Indian Institute of Technology (Indian School of Mines) Dhanbad, Dhanbad - 826004, Jharkhand, India Dhanbad ----- 2)Prof. Somnath Chattopadhyaya Address of Applicant :Department of Mechanical Engineering, Indian Institute of Technology (Indian School of Mines) Dhanbad, Dhanbad - 826004, Jharkhand, India Dhanbad ----- 3)Prof. Sayan Chatterjee Address of Applicant :Department of Mechanical Engineering, Indian Institute of Technology (Indian School of Mines) Dhanbad, Dhanbad - 826004, Jharkhand, India Dhanbad -----
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(57) Abstract :

The reflector antenna serves as a critical component in satellite technology, facilitating wireless communication between space and Earth. The deployability feature of this antenna is essential for its integration into orbiting satellites, making it stowed into the satellite during the launch and deployable when placed into orbit. The deployment mechanism for the deploying and stowing the reflector is the conversion of rotatory motion to linear motion facilitated by mechanical screw pair. Nevertheless, the conventional manufacturing approach for such a sophisticated reflector design entails significant time and cost investments. Enter additive manufacturing or 3D printing, is a cutting-edge technique that addresses these challenges by constructing components layer-by-layer material deposition. This innovative method not only accommodates intricate designs but also offers rapid on-demand production. This work focuses on designing and developing a lightweight antenna reflector that resembles the shape of an umbrella and offers a deployable feature. We employed CAD software to create an umbrella-like deployable parabolic reflector, which was then transformed into an STL file and subsequently manufactured using the Fused Filament Fabrication (FFF) method through 3D printing. This streamlined process resulted in a lightweight reflector, reduced manufacturing costs, and time savings.

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