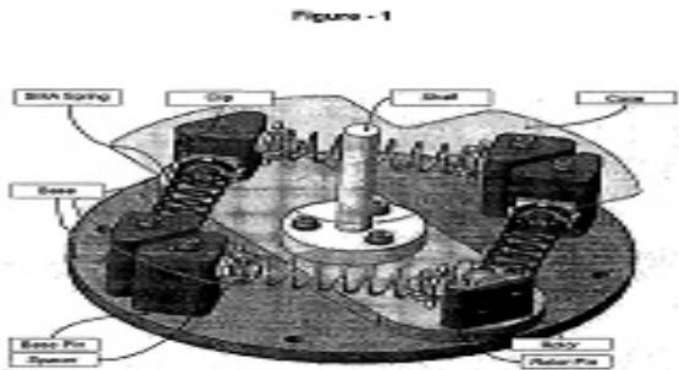


(54) Title of the invention : SHAPE MEMORY ALLOY ACTUATOR.

<p>(51) International classification :F03G0007060000, G02B0007080000, G01S0015890000, G01S0007520000, A61B0017000000</p> <p>(86) International Application No :NA Filing Date :NA</p> <p>(87) International Publication No : NA</p> <p>(61) Patent of Addition to Application Number :NA Filing Date :NA</p> <p>(62) Divisional to Application Number :NA Filing Date :NA</p>	<p>(71)Name of Applicant : 1)PANDIT DEENDAYALENERGY UNIVERSITY Address of Applicant :PANDIT DEENDAYALENERGY UNIVERSITY KNOWLEDGE CORRIDOR, RAISAN VILLAGE, GANDHINAGAR-382 007, GUJARAT, INDIA. -----</p> <p>Name of Applicant : NA Address of Applicant : NA</p> <p>(72)Name of Inventor : 1)PATEL KUNJANKUMAR KANTIBHAI Address of Applicant :PANDIT DEENDAYALENERGY UNIVERSITY KNOWLEDGE CORRIDOR, RAISAN VILLAGE, GANDHINAGAR-382 007, GUJARAT, INDIA. -----</p> <p>2)DR.NIRAVKUMAR PRAVINBHAI PATEL Address of Applicant :PANDIT DEENDAYALENERGY UNIVERSITY KNOWLEDGE CORRIDOR, RAISAN VILLAGE, GANDHINAGAR-382 007, GUJARAT, INDIA. -----</p>
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(57) Abstract :
Shape Memory Alloy Actuator is a design of a rotary thermal actuator to correct the misalignments in reflective metal mirrors used in earth observation cameras of remote sensing satellites. The proposed invention is replacing stepper motor driven actuator with a thermally driven actuator. The proposed design is based on smart material such as shape memory alloy that can deform the material and restore it to its original shape using a proper thermal process. This allows the system to achieve the desired rotation. The components and their materials are proposed considering all manufacturing aspects that makes present design more effective as well as easy. Actuator's parts like base, rotor, base pin, rotor pin, case, and shaft are proposed to be made of AI-6061-T6 because of its high mechanical efficiency, excellent thermal conductivity, comparatively high coefficient of thermal expansion, and lightweight. The springs are proposed to be made from NiTiNol that has best shape memory effect. To limit thermal conductivity between internal parts, spacers are used from FR4/GFRP material. Using simulation, the proposed design is achieving correction of misalignment required minimum angular rotation of 1 ($\approx 0.000278^\circ$). The proposed unit has excellent accuracy in terms of small and precise degrees of rotation in both clockwise and anticlockwise directions, which can be used to correct misalignments.



No. of Pages : 8 No. of Claims : 8