Space Debris Gripper (SDG): A Satellite that Captures Space Debris and Stores It to Decrease the Potential Threats on Important Space Missions

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The collision hazard in Earth orbit has increased due to Orbital debris that is all man-made objects in orbit about the Earth which no longer serve a useful purpose. More than 100 million pieces of debris, increasing daily, and every single piece is a potential danger to all space missions when traveling at these velocities. No firm plans exist for action to address the problem of space debris. This is not a simple problem, and it will not have a simple solution This report seeks to provide an invention (SDG) that captures space debris and then get rid of it, in order to decrease the potential threats on important satellites and space missions or stations in a mission called SPACTOR; space + protector. There are five main steps in SPACTOR mission; detection, access, capturing, storing, and disposal. Radars are used in SDG to guarantee a perfect detection and tracking for the space debris in the area required to be protected. Three main sources give SDG the required velocity; orbital speed around Earth, solar electric propulsion (ion propulsion), and Ambient Atmosphere Ion Thruster. In order to calculate the resulting speed of SDG required for the access and capturing process, the sum of the three main speed sources will give us the final speed. The debris entrance velocity to the bulletproof cabins that will store it (debris velocity subtracted from SDG velocity) is equal to or less than the maximum speed of the bulletproof resistance ability, we guarantee that there are no devastating impacts going to happen between the debris and SDG. Debris will be stored in the capsule in cabin two. Finally, it will be disposed in Earth's low atmosphere when the capacity of the capsule is full, and this will burn up the debris.

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