Alive Rover Wheel

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Rovers play the main role in exploring and collecting physical samples from celestial bodies like planets and moons. ARW comes to strengthen and enable rovers to complete harder missions of exploring. Wherefore this idea suggests inventing a special wheel that has the smooth motion of a circle but isn't a circle. This structure benefits the purpose of steadiness and strength, as it has more contact area, is shaped like the ground surface, and its structure is continuously changing. The core factor is springs. A mathematical simulation of the wheel was made by a set of equations depending on spring's (constant, maximum length, minimum length), the radius of the wheel, the mass of the vehicle, and gravitational acceleration. Other equations were set to determine the length of all compressed springs, and breaded weight by each one. It appears to be that the greater the weight, the more springs are bearing the weight, the more are compressed, and the greater the contact area is. This study shows how by replacing springs over the rim of the wheel, we can distribute weight, not on a single angle, but a range of angles, each one bears a different amount of weight depending on its angle and the shape of the surface beneath it. And by achieving this unique structure of the system, the goal of the research is obtained.

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