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SELF-ADAPTING WHEELS

Application in mobile robotics

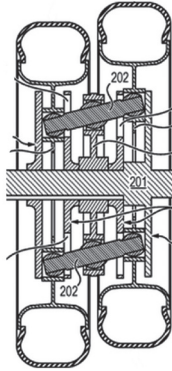
Patent pending, application no. FR2111969 - EP22206198.8

Saturn robot: multi-mission all-terrain robot fitted with self-adapting land wheels.

CONTEXT

A conventional dual-wheel system rigidly interconnects the wheels mounted in parallel, on the same axis of rotation. It decreases the contact pressure with the ground on even terrains. On uneven, rough or obstructed terrains, not all the wheels in a dual-wheel system are in contact with the terrain, resulting in a high contact pressure, which limits the usability of the dual-wheel system.

THE INVENTION



The wheels of the dual system can move relative to each other. When one wheel passes over an obstacle, the second wheel remains in contact with the ground. The load and the transmitted power are thus equally distributed on both wheels, and

the vertical displacement of the vehicle chassis is reduced by half. A device providing stiffness and damping realigns the wheels after obstacle clearance.



APPLICATION

Mobile robotics

USE

Self-adapting wheels improve all-terrain uses of land robots. They can carry heavy loads while minimizing the risk of the robotic system getting stuck or bogged down, or its wheels spinning.

PROTOTYPE'S CHARACTERISTICS

- Robot with Wi-Fi control
- 4-wheel drive without suspensions
- Speed: 10 km/h
- Ground clearance: 16 cm
- Wheel diameter: 45 cm
- Obstacle clearance ability with both wheels kept in contact with the ground: 45 mm (generally speaking, about 10% of the wheel diameter)
- Automatic wheel realignment after obstacle clearance
- Shock absorption
- Use of standard tires

6 GENERIC ADVANTAGES

1

Increases the load capacity and the torque able to be transmitted to the wheel.

2

Uses standard and economical tires and rims.

3

Increases the life of tires and limits the associated pollution.

4

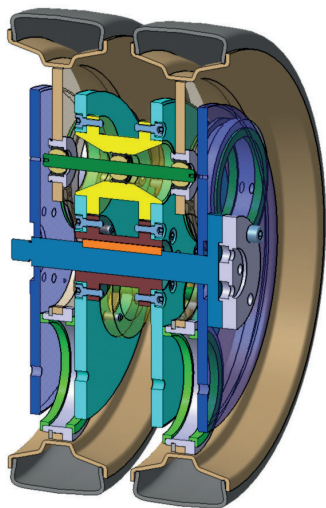
Improves obstacle clearance capability.

5

Limits soil compaction and preserves soil fertilization.

6

Increases vehicle stability and comfort.



Saturn robot: digital model of the self-adapting wheel.



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PATENTS

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