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(54) **MOLECULAR MOTOR**

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(57) **ABSTRACT**

A molecular motor in which multiple concentric cylinders (or nested cones) rotate around a common longitudinal axis. Opposing complementary surfaces of the cylinders or cones are coated with complementary motor protein pairs (such as actin and myosin). The actin and myosin interact with one another in the presence of ATP to rotate the cylinders or cones relative to one another, and this rotational energy is harnessed to produce work. The concentration of ATP and the number of nested cylinders or cones can be used to control the rotational speed of the motor. The length of the cylinders can also be used to control the power generated by the motor. In another embodiment, the molecular motor includes at least two annular substrates wherein one annular substrate is coated with a first motor protein and the other annular substrate is coated with a second motor protein. The first and second motor proteins interact with each other to move the second annular relative to the first annular substrate.

(73) Assignee: **The Government of the U S A, as represented by the Secretary of the Dept. of Health & Human Service**

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