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(54) **ELECTRIC MACHINE, DISPLACEMENT DEVICE FOR AN ELECTRIC MACHINE, AND POWERTRAIN FOR A MOTOR VEHICLE**

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(57) **ABSTRACT**

An electric machine designed as a permanently excited synchronous machine, including a rotor with a rotor body arranged on a rotor shaft, a stator, and a displacement device that generates a relative axial movement between the rotor body and the stator based on a torque produced between the rotor shaft and the rotor body. The displacement device has first and second displacement elements and at least one rolling body arranged between the first and second displacement elements. The first displacement element is axially movable and rotatable to a limited degree on the rotor shaft, and the second displacement element is connected to the rotor shaft rotationally fixed. The displacement elements provide that upon rotation of the first displacement element relative to the second or vice versa, the rotor body is pushed on the rotor shaft axially against the spring force.