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(54) **SYSTEM, ARCHITECTURE, AND METHOD FOR MINIMIZING POWER CONSUMPTION AND INCREASING PERFORMANCE IN ELECTRIC VEHICLES**

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(57) **ABSTRACT**

An electric vehicle accomplishes speed changes through the use of electronically controlled, multiple electric motor configurations that are coupled to an output drive shaft instead of a speed change transmission. A parallel-coupled motor configuration includes at least two motors that are each coupled to the output drive shaft through respective gear arrangements, each gear arrangement having a respective gear ratio. In a serially-coupled motor configuration, the stator of the second motor is coupled to the rotor of the first motor, where the rotor of the second motor is coupled to the output drive shaft. The required torque to reach or maintain a desired vehicle speed can be obtained by selective energization of either one or both of the motors (in both multi-motor configurations). Two motors are also coupled to a differential gear so that the rotational speed contributed by both motors are additive at the output shaft.

18 Claims, 9 Drawing Sheets