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(54) **CONTROL SYSTEM AND METHOD FOR A ROTATING ELECTROMAGNETIC MACHINE**

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(52) **U.S. Cl.** **318/432**; 318/434; 318/701
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(57) **ABSTRACT**

A system and method for controlling a rotating electromagnetic machine. The rotating machine, such as a permanent magnet motor or switched reluctance motor, includes a stator having a plurality of phase windings and a rotor that rotates relative to the stator. A drive is connected to the phase windings for energizing the windings. The control system includes an estimator connectable to the machine for receiving signals representing the phase winding voltage and rotor position. The estimator outputs parameter estimations for an electrical model of the machine based on the received voltage and rotor position. A torque model receives the parameter estimations from the estimator to estimate torque for associated rotor position-phase current combinations of the machine. A controller outputs a control signal to the drive in response to a torque demand and rotor position signals and the torque model. In certain embodiments, a solver uses the torque model to generate energization current profiles according to desired machine behavior, such as smooth torque and/or minimal sensitivity to errors in rotor position measurement.

35 Claims, 3 Drawing Sheets
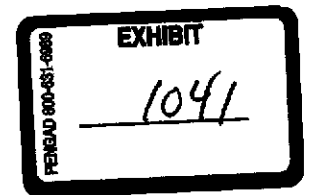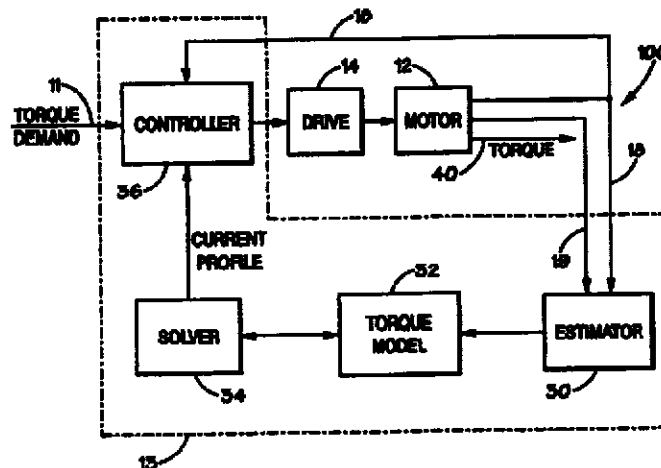
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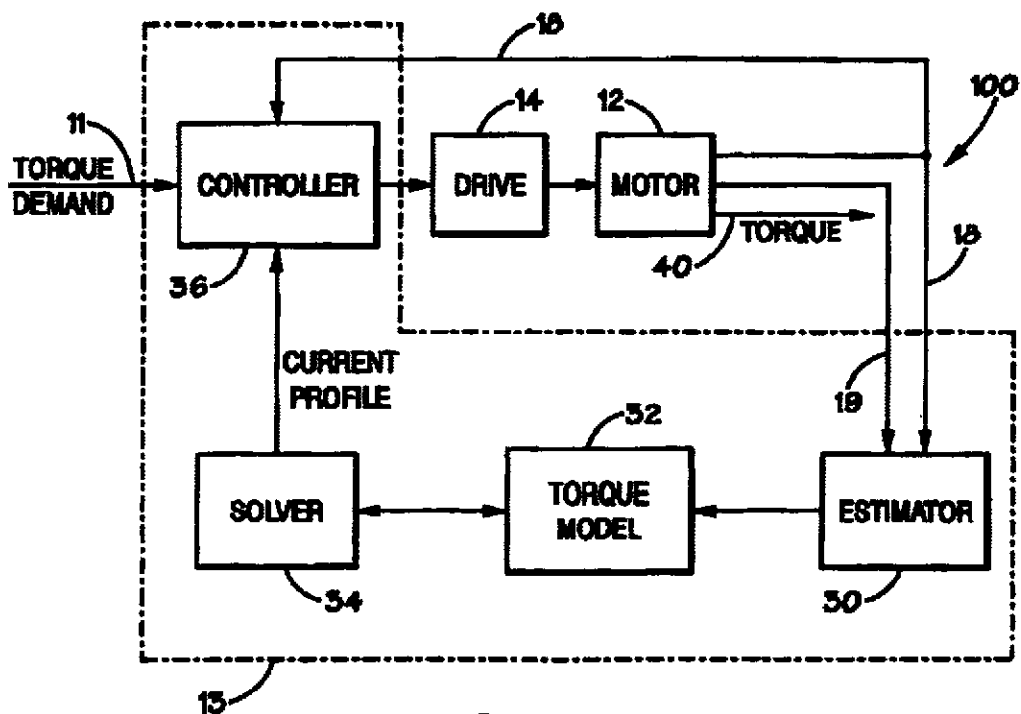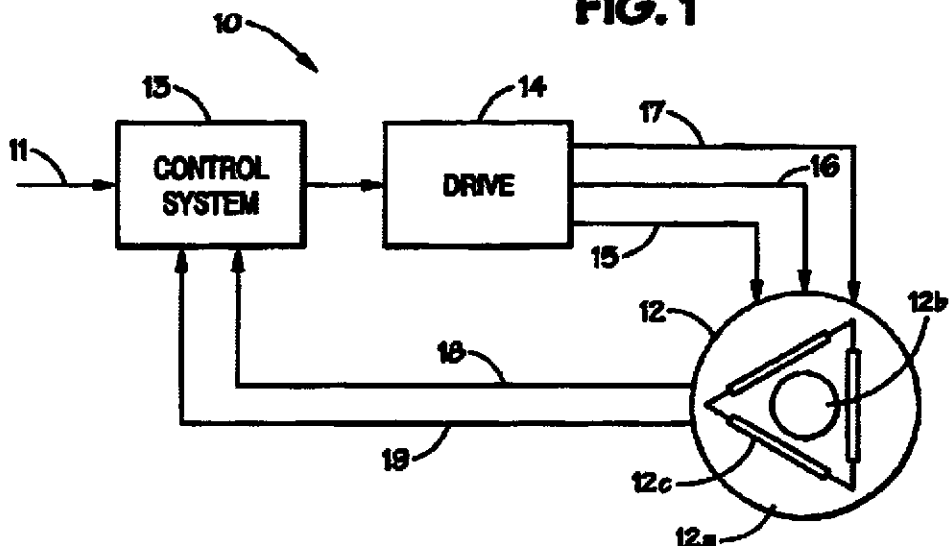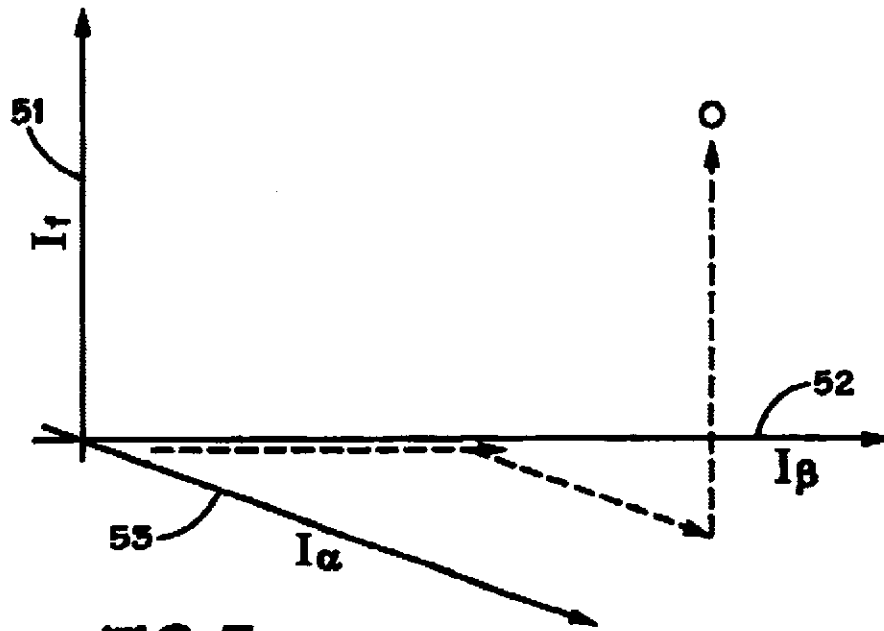
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FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 5

DOCKET ALARM
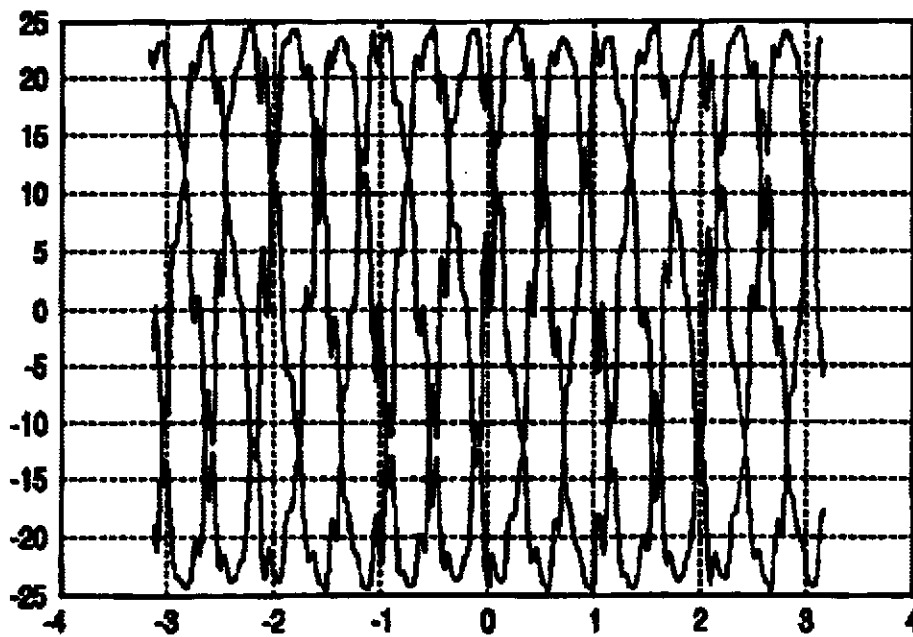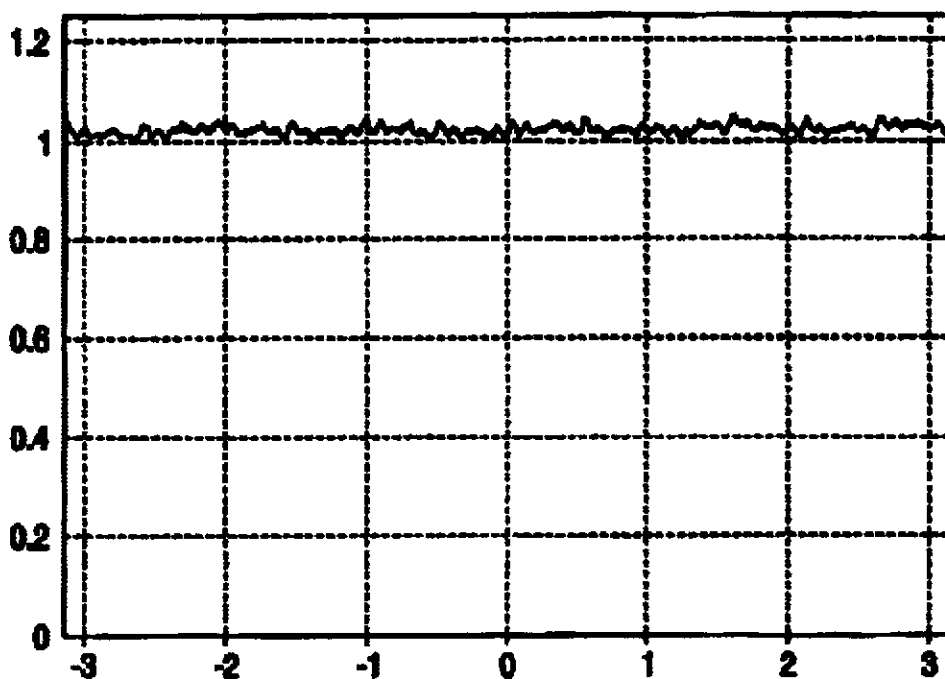
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