

## ABSTRACT OF THE DISCLOSURE

In a magnetic recording and reproducing apparatus having a solenoid-driven actuator to move a magnetic head in the tracking direction, a magnetic head position controller comprises: a state estimator for estimating the moving speed of the actuator from a drive voltage and a drive current supplied to the actuator; and a damping control loop for feeding back the estimated speed signal estimated by the state estimator to the actuator drive voltage.

The state estimator is formed of a combination of equivalent circuits that electrically simulate modeled characteristics of the solenoid-driven actuator, and the state estimator takes in the drive voltage and the drive current for the actuator and produces the estimated speed signal representing the speed of the actuator.

The state estimator includes equivalent circuits that electrically simulate a drive coil resistance and inductance characteristic of the solenoid-driven actuator, a force constant of the magnetic circuit, an inertia, a spring constant, and a counter electromotive force.

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