The Development and Analysis of Eddy Current Braking on The Fitness Equipments

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ABSTRACT

The goal of this research is to put forth a kind of eddy braking system that is used on the fitness equipments, utilizing the electromagnetic field produced by the eddy current theory of electromagnetics, converting the sports kinetic energy produced by a trainer into the electric energy inside the braking flywheel, converting from the thermal energy, and hence consuming the kinetic energy of a trainer of it. The system is of simple structure, and without the problems of friction loss and noise. The chief target of this research is to establish the study of fitness equipments eddy current braking system design and analysis. To analyze the model from the reluctance braking theory, i could get the key parameters that affected the reluctance braking force, such as: the number of turns of magnetic coils N, the wire diameter t, the input current value I, the air gap d between the braking flywheel and the electromagnet, the output power W, the operation and temperature increasing, and the mechanical design. Finally, through the experiment, the relative data of the practical product was measured, and the key data of the development of the entire design flow process were completed by the test and verification of the results of the experiment in order to develop the capacity of a complete fitness equipments reluctance braking system.

Keywords : The fitness equipments, eddy current, reluctance braking, electromagnet, magnetic coil

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