

Design and Testing of Electro-Rheological Leg Press Exercise Machine

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In the present study an electro-rheological (ER) exercise leg press machine is designed and tested. The innovation reduced otherwise the heavy traditional equipment with a light versatile machine that can be easily mounted in rehabilitation centers, dwellings as well as office buildings. The design included two concentric cylinders acting as electrodes to a film of the ER-fluid of thickness 1 mm. The relatively small thickness allowed for a minimal electric discharge to produce the required torque. The results were obtained at a very low power consumption of approximately 9 watts. Adequate protection against oil leakage and electric insulation was arranged in the design. The high voltage was obtained from a power supply circuit designed amongst the scope of the present work. The governing equations, detailed working drawings and design calculations are presented together with a performance test of the newly designed device.

Biography:

Dr. Mohamed Yehia was He received his BSc degree in Mechanical Power Engineering with honors in 1983. Then he received his Msc degree in 1987, from the Mechanical Power Department, Faculty of Engineering, Cairo University, and with a master thesis titled: *"Effect of Different Parameters on Heat Transfer to Immersed Bodies in Fluidized Beds"*

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