HYBRID JOURNAL BEARING

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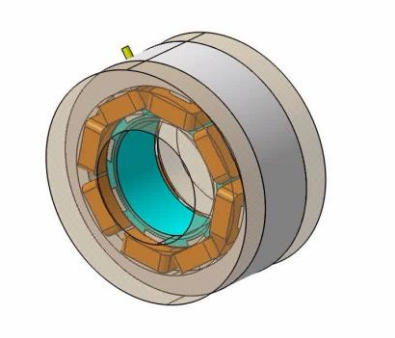
ABSTRACT

A Hybrid journal bearing, which can operate either as hydrodynamic or as electromagnetic, or as hybrid (hydrodynamic and electromagnetic simultaneously), aiming at the exploitation of advantages of both types of bearings, is also presented and patented *(under Greek and European patent office legislation)* by the research team of the Machine Design Laboratory of the Department of Mechanical and Aeronautics, (http://mdl.mech.upatras.gr/) of the University of Patras(www.upatras.gr), Greece .

The hybrid journal bearing, that comprises an electromagnetic part and a hydrodynamic part, wherein both parts are in a common nutshell, are regulated by the same control system and are operating also in the same control volume. The electromagnetic field of the hybrid journal bearing may be used while the hydrodynamic field operates, aiming at (a) the increase of load carrying capacity, (b) the control of the response of the rotating shaft during instabilities (oil whirl and oil whip) and (c) the imposition of external parametric excitation for diagnosis of damage of the rotating system. This invention, can be applied in experimental level and also in industrial applications, such as in turbine vacuum machines and in energy production, in natural gas compressors, in plants of electric power production or in aeronautics applications, where the need of continuous operation of the machines for a long time in high revolutions (> 20.000RPM), or in low revolutions in waiting situation, as well as in thrust systems of boats, is necessary.



The new hybrid Journal bearing