



(12) **United States Patent**  
**Grantz et al.**

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(54) **FLUID PUMPING CAPILLARY SEAL FOR A FLUID DYNAMIC BEARING**

USPC ..... 310/67 R, 90; 384/100, 107, 112, 131, 384/132, 123  
See application file for complete search history.

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**Related U.S. Application Data**

(63) Continuation of application No. 12/328,710, filed on Dec. 4, 2008, now Pat. No. 8,618,706.

(57) **ABSTRACT**

(51) **Int. Cl.**  
**H02K 5/16** (2006.01)  
**F16C 32/06** (2006.01)  
**F16C 33/74** (2006.01)  
**F16C 41/00** (2006.01)

An apparatus and method are provided for a robust and shock resistant fluid dynamic bearing. A fluid sealing system with fluid pumping and capillary features provides increased reliability and performance for small form factor disc drive memory systems. Concerns of motor jog are addressed, jog being the rapid and repeated opening and closing of spaces between relatively rotatable components that can dispel oil from, or draw air into, these spaces. The fluid pumping capillary sealing system includes a fluid pumping groove with a rib portion and a slot portion for pumping fluid. The fluid pumping capillary sealing system also includes a capillary seal. In an aspect, a sweeping rib sweeps fluid toward the bearing. A truncated rib is situated adjacent to the sweeping rib, the truncated rib extending a shorter radial distance as compared to the sweeping rib and forming a plenum region.

(52) **U.S. Cl.**  
CPC ..... **F16C 32/064** (2013.01); **F16C 33/745** (2013.01); **F16C 41/008** (2013.01); **F16C 2370/12** (2013.01)

(58) **Field of Classification Search**  
CPC .... H02K 7/086; H02K 5/1675; F16C 32/064; F16C 2370/12; F16C 33/745

**20 Claims, 7 Drawing Sheets**

