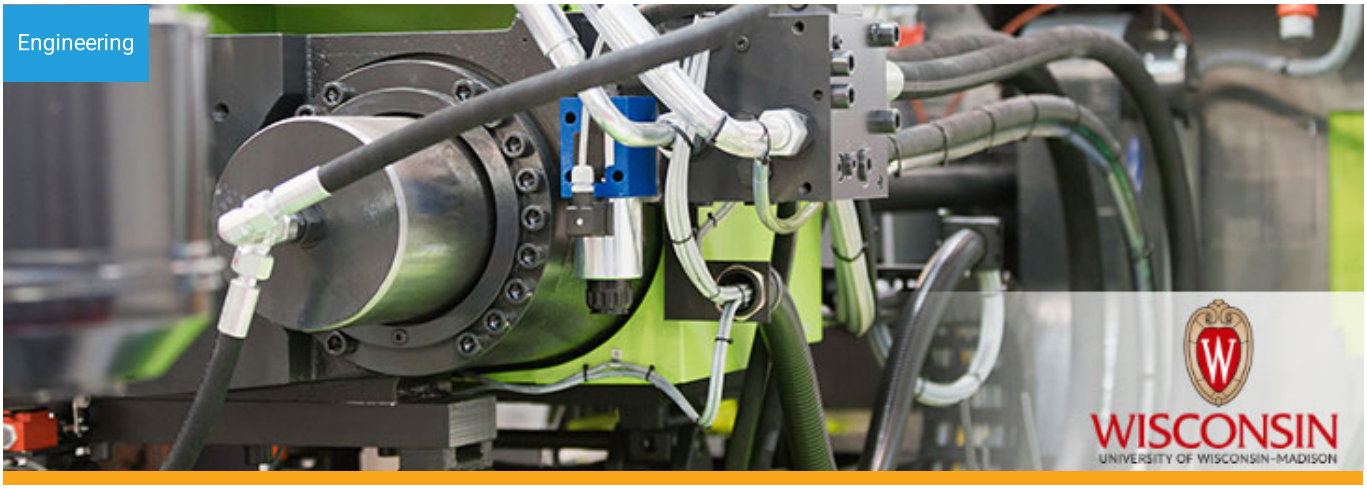
Engineering



BEARINGLESS ELECTRICAL MACHINES WITH REDUCED NUMBER OF INVERTERS

View U.S. Patent No. 12,126,223 in PDF format.

WARF: P220108US01

Inventors: Eric Severson, Zhouzhou Wang

The Invention

UW researchers invented a novel twin bearingless machine drive configuration that uses a reduced number of inverters. Twin bearingless machine configurations have two bearingless machines rated for half the power of the overall compressor system. Splitting the power between two distinct bearingless motors enables the machines to provide 4 degree of freedom (DOF) active actuation, which is desired over a 2 DOF. However, this also doubles the number of power electronic inverters and required supporting components. These add to the cost and complexity of the machine. The inventors found that by employing a parallel dual purpose no voltage (DPNV) winding in the stator of each machine, the stator winding connections can be reconfigured to reduce the required number of inverters in the twin bearingless machine. In one configuration, only three three-phase inverters are required, which can be implemented as standard two-level voltage source inverters. Besides reducing the number of required components, the balanced winding currents and improved torque distribution are two major benefits of this configuration.

Additional Information

For More Information About the Inventors

- Eric Severson

Tech Fields

- Engineering : Electric machines

For current licensing status, please contact Michael Carey at mcarey@warf.org or 608-960-9867