

FDB MOTOR WITH TAPERED SHAFT FOR IMPROVED PUMPING EFFICIENCY

ABSTRACT

For motors having a journal with one or more groove regions and a shaft for relative rotation in the journal, aspects include providing a dual tapered shaft. The shaft may be tapered by the application of a wear resistant coating at least opposite the groove regions. The coating introduces a shaft taper from near a top end and from near a bottom end towards the shaft middle. The shaft taper may provide for improved pumping efficiency. The coating may be applied in various processes such as chemical vapor deposition or physical vapor deposition to establish a thickness gradient of coating material from near the top end and near the bottom end towards the shaft middle. In one example, the coating includes a DLC coating. Additionally, shaft portions may be shielded to prevent coatings thereon.

Figure 5