Abstract

The invention relates to a supersonic nozzle vortex tube refrigeration and nano-fluid minimal quantity lubrication coupling supply system. The system is composed of a low-temperature gas generating device, a nano-fluid minimal quantity lubrication supply system, a gas distribution control valve and a low-temperature oil gas external mixing atomizing nozzle. The low-temperature gas generating device adopts a supersonic nozzle to improve the outlet velocity of a vortex tube nozzle; different flow line types are formed for the flow channel of the vortex tube nozzle to improve the vortex strength of gas at the vortex tube nozzle and improve the energy separation degree, a heat transfer enhancement measure is adopted for a vortex tube heat pipe to effectively improve the refrigerating efficiency. A motor drives the nano-fluid minimal quantity lubrication supply system can control supplied nano-fluid flow more conveniently and precisely. The system has all advantages of the minimal quantity lubrication technology, has stronger cooling performance and excellent tribological property, effectively solves grinding burn, improves the surface quality of a workpiece, realizes low-carbon and green cleaner production in an efficient, low-consumption, environment-friendly and resource-saving manner.

Drawing of the Abstract

