Reduced-noise screw machine

Centre for Compressor Technology

Modified rotors for silent operation
Source: Centre for Compressor Technology, City, University of London

BACKGROUND

The 'N' profile and noise-reduction technologies used in this machine have been adopted by several leading industry partners. A significant part of the noise generated in screw machines originates from contact involving its moving parts, in particular the rotors, the gears and the bearings. This mechanical noise is caused by contact between the rotors due to pressure and inertial torque, oil-dragged forces, contact between the rotor shafts and bearings. These forces should be as uniform as possible, but they are not. In addition, noise can also be caused due to imperfections in rotor manufacture and compressor assembly. Previous attempts to reduce noise in screw machines suffered from a loss in efficiency. To solve this problem, researchers from the Centre for Compressor Technology at City, University of London developed a screw machine that generates less noise than standard screw machines with no or insignificant loss.

TECHNOLOGY OVERVIEW

The machine comprises a main rotor and a gate rotor, each having an 'N' profile, designed so that the pressure torque and the draw torque on the gate rotor act in the same direction. The invention also includes a method of designing that makes it more convenient to determine the direction of the torque resulting from pressure forces (N Stosic, E Mujic, I K Smith, A Kovacevic, 2007)

BENEFITS

- The 'N' profile has many advantages over other rotor profiles including: small contact forces between the rotors, strong female rotors and low leakage.
- The resulting compressor rotors are significantly quieter than the standard rotors and do not suffer materially from chatter and rattle, with no significant loss in efficiency (N Stosic, E Mujic, I K Smith, A Kovacevic, 2007)

APPLICATION

The design can be used for most types of compressors and expanders.

STAGE OF DEVELOPMENT:

Experimental tests have been performed with positive results.

OPPORTUNITY

Seeking development and commercial partners
Licensing

IP STATUS

SUBMITTED APPLICATION
Patent: "Reduced-noise screw machine"
Inventors: Nikola Rudi Stosic, Application number: GB1206894.6

REFERENCE

N Stosic, E Mujic, I K Smith, A Kovacevic (2007). Development of a rotor profile for silent screw compressor operation. Available at: http://www.staff.city.ac.uk/~ra601/london2007.pdf

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