

HYDRAULIC ROTATING JOINT WITHOUT GASKET



Main Technological Area —> Mechanics/Hydraulics

Keyword —> Hydraulic circuit | rotary joint | gasket | antenna | cooling

Hydraulic rotating joint without gasket designed for the assembly of rotating antenna, having the function of transferring power supply, signals, RF radiation and cooling liquid for the RF amplifier to a rotating part.

The solution is highly innovative and applicable to all those situations where a rotating sub-system (not necessarily an antenna) produces high levels of heat, that must be removed through the circulation of a liquid with high thermal capacity conveyed in a fixed refrigerating unit (e.g. the fixed base). It, in fact, allows the hydraulic circuit to operate at atmospheric pressure, unlike what is available on the market, thus enabling the use of fluids with low viscosity and lubricating capacity with high flow rates even in large systems having not excessively high rotation speed.

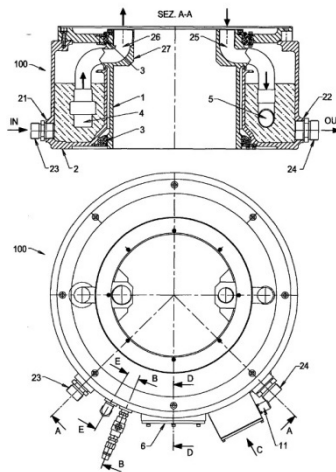


Figura 1. Mechanic Structure of the Hydraulic Joint

TECHNICAL FEATURES

The solution has been implemented, and is still operating, on the basis of requirement specifications, having the following main parameters:

- fluid type: a mixture of water (40%) - ethylenic glicole (60%);
- flow rate: 5000 - 11000 lt/h;
- rotation speed: 6 - 15 rounds/minute;
- diameter of the joint in correspondence of the gasket contact surface: 400 mm.
- qualification for operative environmental conditions.

INNOVATIONS/ADVANTAGES

Opportunity to operate with a low pressure cooling circuit with lower leakage requirements and consequent minimization of the sliding friction of the gaskets between the fixed and movable elements.

Benefits:

- use of low viscosity cooling fluids with limited lubrication capability (e.g. water and glycol);
- high flow rate between the rotating and fixed parts;
- low pressure exchange circuit;
- reduced consumption of sealing elements without loss of coolant;
- low inspection and maintenance costs;
- reduced dimensional limitations to allow a large number of non-hydraulic coaxial users;
- extensibility of the solution to multiple fluids by replicating the concentric toroidal structures.

FIELDS OF APPLICATION

Antennas	Rotors, ham radio tracking
Heavy Machinery	Swivel turrets - Excavators -- Roundabouts
Miscellaneous	Panoramic rotating platforms in which it is required to transfer one or more kinds of fluids between the fixed and the rotating parts

PATENT INFORMATION

Priority Date - 19/12/2007

Priority Code - PCT/IT2007/000888

IPC Codes – H01P1/062 -- H01P1/30

Active worldwide applications

EPO - EP2235787B1; filing date: 19/12/2007; grant date: 05/11/2014

National Extensions: Italy – Germany – Spain - Turkey

Malaysia - PI2010002741; filing date: 11/06/2010; grant date: 26/02/2016

Leonardo internal code

LDO-0423

References:

Emanuela Barbi (emanuela.barbi@leonardocompany.com)

Giorgio Assenza (giorgio.assenza@leonardocompany.com)