LEONARDO

PATENT BROCHURE

ANTENNA BASE FOR MOBILE RADAR EQUIPMENT WITHOUT GEARS

Main Technological Area ⟶ Mechanics

Keyword ⟶ Antenna Base | Torque Motor /Rotor /Stator / Direct Drive

The present invention was born in the design activity of the bases for radar antennas and aims to overcome the problems that in the past have been encountered in this type of devices , such as:

- Heavy Weights placed on a different axis from the main one of the device (the weights are the result of the presence of a gearmotor, its shaft and the mechanical gear transmission), with a consequent considerable asymmetry in the total volume of the antenna base, from which play and weight balance problems arise
- Considerable dimensions due to the presence of the components indicated above and placed mainly outside of the base support body
- Significant wear on transmission components, especially in critical work environments such as those with presence of dust, salt spray, etc., which involves frequent maintenance operations
- Use of oils for the lubrication of transmission components, with the relative need for non-disposal always easily practicable.

In the solution exposed by the patent the external motor reducer is replaced by a direct synchronous electric motor , placed inside the annular chamber with its axis coinciding with that of rotation of the base antenna, and comprising a stator integral with the lower and fixed portion of the antenna base, while the rotor is integral with the upper and rotating portion of the antenna base.
In this way all the problems highlighted above are eliminated with cost reductions both in the implementation and exercise phases.

TECHNICAL FEATURES

As can be seen from the reported drawings, the solution consists in making the fixed and rotating parts of a solid and coaxial
considerable mass and dimensions respectively with the stator and the rotor of the motorization constituted by a motor
synchronous commonly known as "torque motor"..
The result is a great simplification of the mechanical parts involved, especially for the elimination of the series of

gearboxes that in the previous solutions required an accurate sizing with respect to the to which they were subjected.

INNOVATION/BENEFITS

- Reduction of moving parts
- Weight reduction, especially for eccentric ones with respect to the device's rotation axis (moving part compared to the fixed one)
- Space saving
- Noise reduction
- Improvement of dynamic performance following a higher level of torque motor control
- Longer service life due to the reduced number of moving parts in direct contact
- Reduction of manufacturing and operating costs
- Simplification of maintenance operations due to the better accessibility of the main parts making up the device (also due to the possibility of accessing the engine and bearings without disassembling the antenna)
- Significant reduction of waste oils (to be disposed of according to regulations).

AREAS OF USE

Radar	*Naval & Terrestrian Radar, both Fixed and Mobile*
Industrial Machine	*Cranes, carousels, fans for wind tunnels, etc.*

PATENT INFORMATION

Priority Date – 2011/12/02
Priority Number - *TO2011A001107*
IPC Codes – *H01Q 1/12 H01Q 3/02*

Active Worldwide Extensions

EPO - EP2463954B1; Filing Date: 2011/12/09; Grant Date 2017/02/08
Italy – Germany – France – United Kingdom
MALAYSIA PI 2011005970; Filing Date: 2011/12/08; Grant Date 2015/03/13
BRAZIL PI 2011005970 ; Filing Date: 2011/12/09 ; Grant Date PENDING
INDIA 3587/DEL/2011 ; Filing Date: 2011/12/09 ; Grant Date PENDING

Leonardo internal code

LDO-0448

Leonardo References

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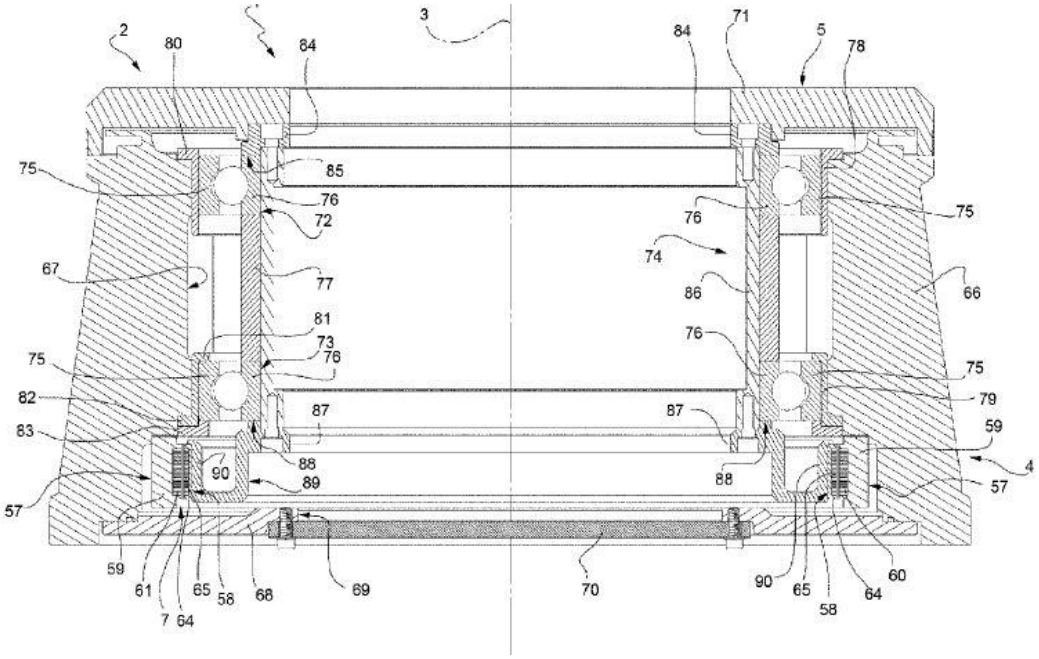

Figure 1. Antenna base made according to the patented solution

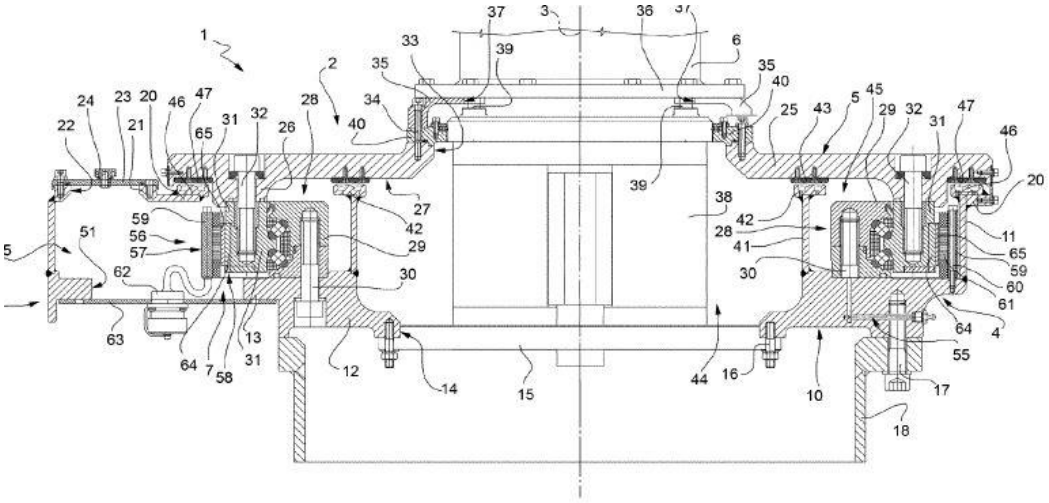

Figure 2 Antenna base manufactured according to the known art