LEONARDO

PATENT BROCHURE

BRAKING SYSTEM FOR AIRCRAFT UNDERCARRIAGE

Main Technological Area ⟶ Electromechanics

Keywords ⟶ Brake | Undercarriage | Reversible electrical machine | Axial flux | Epiciclic reducer | Resistor | Accumulator | Anti-Skid

Braking system developed for an aircraft undercarriage which:
1. Use the rolling of the wheels of the aircraft during landing to produce electricity
2. Produces an "Anti-Skid" effect similar to cars ABS
3. Reduces the wear of the mechanical parts, due to the replacement of the mechanical braking action effect with one of electrical/magnetic type.

TECHNICAL SPECIFICATIONS

The braking system transforms the kinetic energy of the landing aircraft into electrical energy through an “axial-flux reversible electrical machine". This braking machine works as a current generator connected to the wheels, and which rotates with themselves, using an epicyclic reduction gear. The electric current generated during the rotation produces an anti-skid braking effect that is proportional to the speed of rotation; this current can be dissipated through resistors or accumulated and used. The pilot can modulate the value of the resistances which results in increasing or reducing the braking effect.

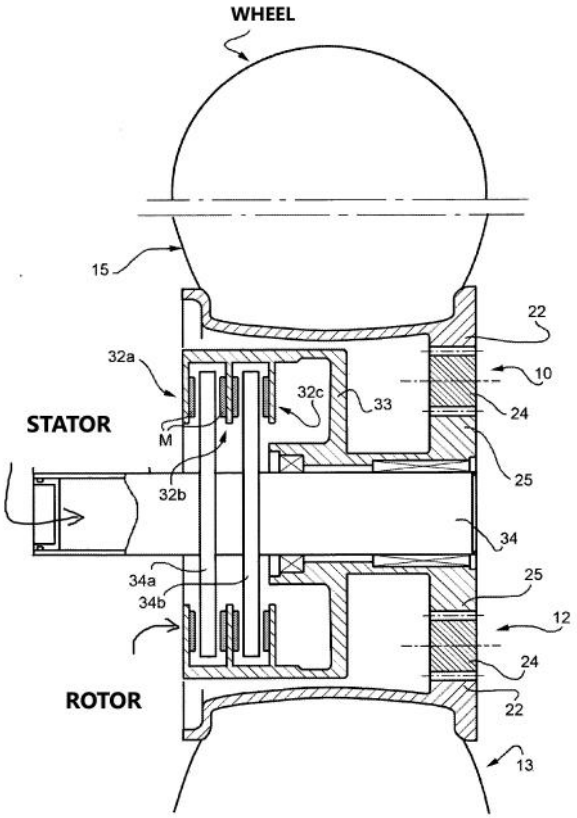

Figure 1 – Mechanical particular of an undercarriage

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INNOVATION/ADVANTAGES

The advantageous impacts of the patented method are:

a) Important reduction of maintenance work of the braking system, since high temperatures are not reached anymore in the mechanical parts
b) Important reduction of noise pollution
c) "Anti-Skid" effect (avoiding"wheel block on braking") because the braking effect is proportional with the wheel speed (theoretically zero, if the wheel stops)
d) Possibility of transforming part of the initial kinetic energy of the aircraft at time of landing into accumulable, or immediately usable, electrical energy.

FIELDS OF APPLICATION

Aircrafts	Undercarriage braking systems
Automotive	Braking systems for land vehicles

PATENT INFORMATION

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