

"Variable-diameter rotor with centrifugal forces compensation mechanism"

Description

This invention relates to a variable-diameter rotor for aircrafts which entails a compensation system for the effects of centrifugal forces on the rotor blades.

The existing fixed-diameter rotors have as major disadvantages the limited speed in cruise flight mode and big centrifugal forces that act on the rotor blades. Current solutions use variable-diameter rotors but the mechanism for compensating centrifugal forces increases the weight of the rotor blades, which may cause undesirable effects.

This invention comprises a hub with a shaft and rotor blades mounted on it. Each of the rotor blades in turn, comprises a radially stationary internal part and a radially movable external part mounted on the internal one. A jackscrew mechanism for moving the external relative to the internal part is arranged on each of the rotor blades. The rotor further comprises an energy storage system which includes a compressed-gas accumulator arranged directly on the shaft. This accumulator comprises a volume of gas and a piston for compressing and expanding the volume of the pressurized gas. The purpose of this energy storage system is to convert the radial motion of the external blade part into a linear motion of the piston and vice-versa. The energy storage system is the one compensating for the centrifugal forces acting on the jackscrew mechanism.

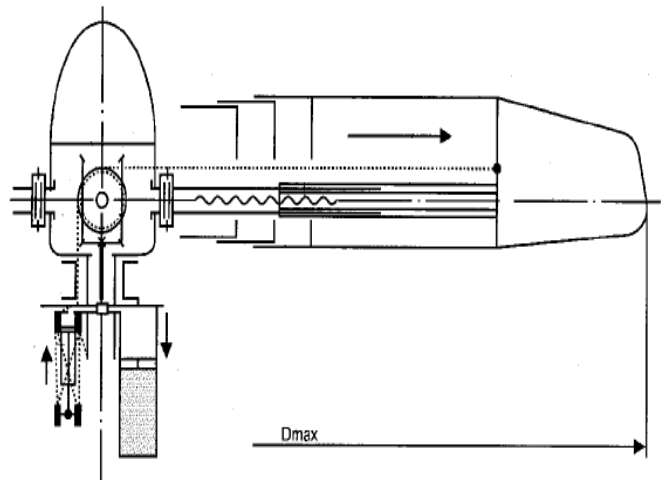
Having the gas accumulator directly mounted on the rotor shaft reduces the weight of the blades and therefore solves the limitations observed in current solutions. Furthermore in this arrangement, the moments of inertia are lower than in the conventional rotors.

Innovative aspects and main advantages

- Centrifugal Forces compensated
- Reduced weight of rotor blades
- Lower moments of inertia on the rotor blades

Areas of application

- Aviation Industry
- Wind Energy installations
- Water transport vehicles



Stages of development

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Licensing contact

Intellectual Property and Scientific Collaboration Unit
JRC - European Commission
B-1049 Brussels, Belgium
Email: JRC-TechTransfer@ec.europa.eu

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