

STRUCTURAL-KINEMATIC SYSTEMATIZATION OF RETRACTABLE AIRCRAFTS' LANDING GEARS MECHANISMS

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The landing gears are parts of the aircrafts structure designed to assure a well taking off and landing. The most actual aircrafts flying with a speed over 300...350 km/h have, from aerodynamically reasons, retractable landing gears. The design problem for these systems has a high degree of complexity, produced by the great number of constraints, partly mentioned in [5]. These demands lead to a large number of retractable mechanisms.

Plane retractable mechanisms are most often used having the main advantage the simplicity of its construction. Classification of retractable landing gears is made about different criteria [2, 6]. More useful is classification based on complexity of the kinematic chain that has been made. This classification will be extended below for these mechanisms, without wheel turning.

On the kinematic diagram base of some different retractable mechanisms types, will be achieved the following classification:

- single loop retractable mechanisms, built with an actuator (pivoted slider mechanism) ;
- double loops retractable mechanisms, named composed retractable mechanisms, built with an actuator mechanisms amplified with a dyad (Assur group) having the form with three revolute joints (RRR) or with two rotational joints and one prismatic joint (RRP);
- three loops retractable mechanisms, named complex retractable mechanisms

Paper made a short presentation of the principal constructive and kinematic features of the retractable mechanisms from each category.

It can be estimate that the study and the classification based from kinematic diagrams of retractable mechanisms are very useful for structural, kinematic and dynamic analysis of these important ensembles belonging to airplanes.

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