

<b>Title</b>	<b>Digital gear manufacturing technologies with non-standardized profiles from precessional planetary transmissions</b>
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<b>Institution</b>	<b>Technical University of Moldova</b>
<b>Patent no.</b>	<b>Research project</b>
<b>Description</b>	<p>The success of the competition in which the producers of ts are engaged is based on the time consumed in the activities of designing, making prototypes, testing and putting them into manufacturing. The main performance factors in the development of a new product are the reduction of the time and the costs of carrying out all the steps prior to its launch on the market.</p> <p>The research field refers to the technological development of precessional transmissions.</p> <p>The time and costs of achieving the precessional transmissions mostly refer to the manufacture of central wheels with non-standard convex-concave profiles and to the satellites with circular arch profiles of the teeth.</p> <p>These objectives were achieved by developing non-conventional technologies based on digital manufacturing.</p> <p>In case of precessional kinematic transmissions for the manufacture of wheels and satellite of the precessional gear with non-standard profiles of the teeth, three non-conventional technologies have been used:</p> <ol style="list-style-type: none"><li>1. Plastic injection molding of the wheels of the precessional gear with small diameters up to 42mm and averages up to 105mm. The innovative elements consist in</li></ol>

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the construction of wheels with metallic reinforcements which substantially reduce the inevitable deformations characteristic of the process. The inserts of the molds with negative profiles to the real ones are produced by digital manufacturing on numerically controlled machine tools based on the CAD /CAM system;

2. Pressing technology from metal powders. The innovative elements consist in the construction of pressing forms (double pressing) that provide airship porosity and lubrication regime with dry lubrication for operation in vacant spaces. The insertions of the pressing forms also have negative profiles to the real ones and are produced by CNC digital fabrication;

3. Direct digital manufacturing technology - 3D printing. Direct digital manufacturing is a process of obtaining the physical parts directly from a 3D CAD file. The main advantages of the process are: low energy consumption, small losses of material, high manufacturing speed, parts with complex geometries can be realized, reducing the time required to execute the industrial product. Implemented at laboratory level, prototype inside the Technical University of Moldova