



21-23 May 2020, Iași - România

12th EUROPEAN EXHIBITION OF CREATIVITY AND INNOVATION

“EUROINVENT”

invention



Technical University of Moldova,
Department of Manufacturing Engineering

Process of regular microrelief forming on the surface of the gearwheel.

Sergiu Mazuru, *dr. hab., conf. univ.*; Maxim Vaculenco, *dr., conf. univ.*;
Serghei Scaticailov *drd.*; Ion Bostan, *academician al AȘM, dr. hab., prof. univ.*

Goal:

Increasing the quality of the surface of the gearwheel teeth and providing the lubrication of the meshing zones with insufficient lubrication.

Solution:

The process for the formation of a regular microrelief on the surface of the gearwheel teeth consists in that the tool in the form of a profiled on the edge disk with the radius R is communicated a motion that simulates the real operating conditions by movements coordinated about the mobile $X_1Y_1Z_1$ and fixed XYZ coordinate systems. The tool is also communicated a linear motion along the gearwheel tooth, at an angle of $\delta \geq 0$ about the plane formed by the axes X_1 and Y_1 .

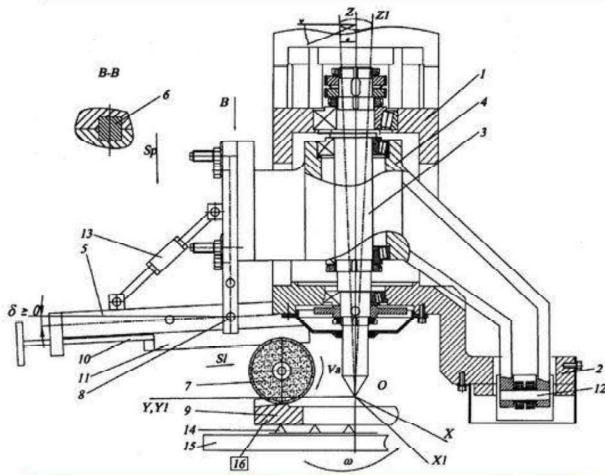


Advantages:

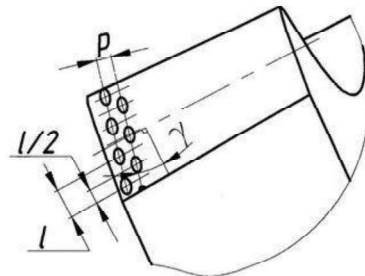
The gearwheel is communicated a rotary motion and ultrasonic vibrations modeled by the amplitude. The tool periodically comes in contact with the gearwheel, carrying out deformations on the surface of the teeth and forming a regular microrelief in the form of a grating of grooves with the necessary parameters along and by the depth of the tooth.

Stage:

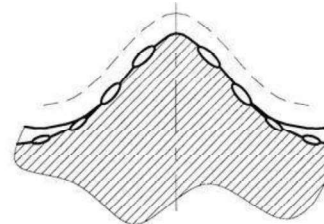
Technical project, industrial prototype.



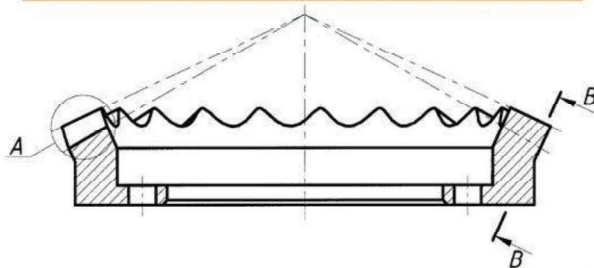
The scheme for obtaining of the regular microrelief



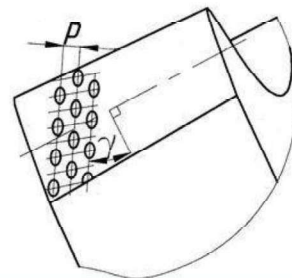
The variant with an enlarged scale of the regular microrelief with all parameters of the tooth



The sectional view of a tooth



Gearwheel with regular microrelief



Another form of regular microrelief with several beginnings