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The invention relates to the mechanical engineering, in particular to manufacture of gear wheels.
The process for smoothing the wheel teeth of the bevel gearing consists in moving a tool, the trajectory of which is coupled with the mobile system of coordinates X_1, Y_1, Z_1 about the blank, fixed into the machine tool, coupled with the fixed system of coordinates X, Y, Z. At the beginning of working, the two coordinate systems coincide in point O, called the center of space-spherical motion. The blank rotates with an angular speed ω about its axis, coinciding with the axis Z. The radius center of the tool work surface coincides at the beginning of working with the blank conic generator, and the tool movement at the angle $\delta \geq 0$ with respect to the plane formed by the axes X_1, Y_1 is provided by controlling the position of the carriage. The tool executes a circular movement about the axis O_1-O_1, at the same time it is communicated an oscillatory motion with respect to the work tooth, i.e. with respect to the OXYZ coordinate system. At the same time, the axis Z_1 of the mobile system of coordinates $OX_1Y_1Z_1$ is placed about the axis Z at a nutation angle Θ and describes a conic surface with origin in point O – the center of space-spherical motion.
The mobile system of coordinates $OX_1Y_1Z_1$ is placed with respect to the fixed coordinate system so that the axes X_1 Y_1 may execute a motion around the corresponding axes according to the trajectories with parameters corresponding to the nutation Θ and precession Ψ angles.
Thus, during rotation of axis Z_1 about the axis Z the tool is communicated an oscillatory motion with respect to the OXYZ coordinate system, described by the equations:

$$X = -R_i(1 - \cos\Theta)\cos\Psi\sin\Psi;$$

$$Y = R_i(\sin^2\Psi + \cos\Theta\cos^2\Psi);$$

$$Z = -R_i\sin\Theta\cos\Psi,$$

where:
R_i – the recurrent coordinate of the mobile axes, equal to the length from the origin of coordinates X,Y,Z up to the plane wherein the fixed point is situated;
Θ - the nutation angle;
Ψ - the precession angle.

Claims: 9
Fig.: 11