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COMBINED MAGNETIC DYNAMIC BURNISHER FOR FINISHING  
STRENGTHENING TREATMENT

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БЕЛОРУССКО-РОССИЙСКИЙ УНИВЕРСИТЕТ

One of the most important problems of mechanical engineering is to ensure the required wear resistance, durability, reliability and safety of the internal cylindrical surfaces of machine parts and tools.

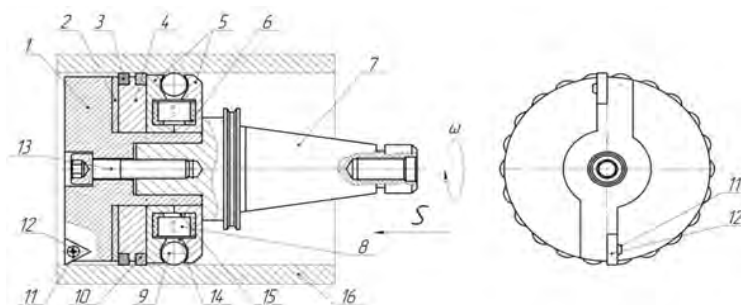


Fig. 1. Tool for combined processing: 1 – boring head; 2 – sealing ring; 3 – brush; 4 – bushing; 5 – discs; 6 – holder; 7 – milling mandrel; 8 – sources of magnetic force (cylindrical permanent magnets); 9 – deforming elements; 10 – felt bushing; 11 – screw; 12 – carbide cutting insert; 13 – screw; 14 – annular chamber; 15 – radial holes; 16 – workpiece

A distinctive feature of the combined magnetic and dynamic internal roll burnisher is its ability to perform boring and rolling in one pass. The use of this tool can significantly reduce a workpiece treatment time, improve fatigue strength, contact endurance area and wear resistance of workpieces as well as increase their microhardness and strength, creating favourable residual stresses and reduce costs to manufacture a product which leads to increased productivity.

The workpiece is installed in the device on the machine table. The milling mandrel 7 is fixed in a vertically or horizontally located spindle of the milling and boring group machine. The spindle is rotated and the workpiece 16 is axially fed. The mandrel of the combined tool 7 is rotated and inserted into the cavity of the hardened workpiece. Thus, a thin boring process is performed due to the replaceable carbide cutting inserts 12 which are fixed by screw 11.

Brush 3 serves to remove solid particles of metal formed in the process of machining. The felt sleeve 10 is pre-wetted with industrial oil and is designed to lubricate the inner cylindrical machined surface before the surface plastic deformation.

Permanent cylindrical magnets 8 are installed in the radial holes 15 of the holder 6 with a uniform angular pitch and alternation of poles N and S.