

## Durable Grinding Head for Universal Machines

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**Abstract**—A grinding head has been developed for a universal grinding machine. Operational tests confirm its long life and high performance.

**Keywords:** grinding, grinding head, universal grinding machine, delta grinding plate

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Manufacturers are producing grinding machines of different types for different purposes: belt, disk, plane, and eccentric machines. They are mainly used for the grinding of open and extended surfaces (Figs. 1a–1d). In relatively inaccessible locations, where traditional

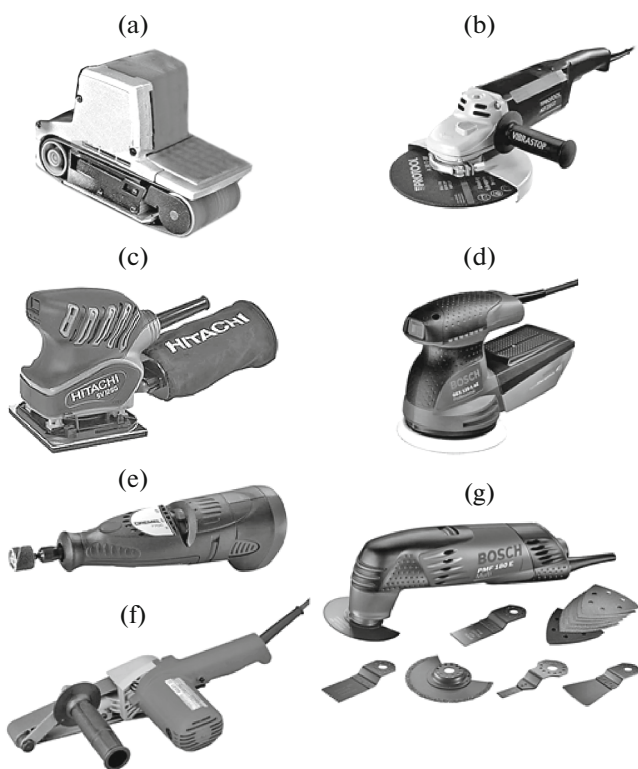
machines cannot be used, drilling machines, special belt grinding machines, and multifunctional machines are employed (Figs. 1e–1g).

Multifunctional grinding machines are most effective. Radial oscillation ensures rapid removal of material and a machined surface of high quality.

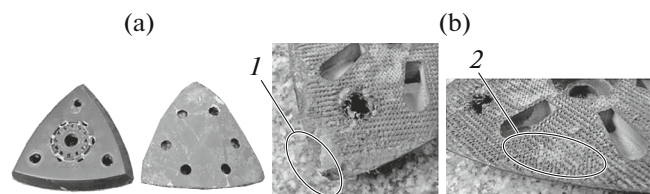
Standard grinding heads for multifunctional machines (produced outside Russia) consist of a triangular plastic plate. The upper part includes the attachment elements, while the lower part has plastic hooks for the abrasive cloth. Soft felt on the back of the abrasive cloth is used for attachment to the mandrel.

Experience shows that such grinding heads are of poor durability. After grinding, signs of wear are visible (Fig. 2) at the corners of the plate (on account of the high pressure and the pliability of the material) and at the hooks (first at the periphery and then closer to the center). In the light of its high cost, the life of the standard grinding head seems very short.

Experience shows that the grinding of wooden parts to commercial form takes a time  $T = 20$  min. In grinding, a sequence of five cloths is used, with grain size  $P$  ranging from 60 to 240. Each grinding pass must remove the scratches from the previous pass.



**Fig. 1.** Belt (a), disk (b), plane (c), and eccentric (d) grinding machines for the grinding of open and extended surfaces; and drilling machines (e), special belt grinding machines (f), and multifunctional machines (g) for relatively inaccessible locations.



**Fig. 2.** Wear of standard grinding heads at the corners (1) and edges (2) in the operation of a multifunctional machine.