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SILENCERS WITH SPHERICAL BAFFLES FOR SUBMACHINE GUNS

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This paper presents the results of the development of new silencers with spherical baffles for submachine guns.

Submachine guns are intermediate between pistols and rifles. They provide a high fire density at close range. Submachine guns are automatic weapons that usually use pistol cartridges and are designed, as a rule, for continuous fire at a rate up to 1,000 rounds/min. Submachine guns are equipped with capacious magazines (20 to 40 rounds) and a simple sight, which provides a firing range up to 200 m. The MP5 developed by Heckler & Koch for the 9×19 mm cartridge is the most widely used submachine gun in the world.

Due to its reliability and accuracy, the MP5 has become very popular and is officially adopted in more than forty countries. In Ukraine, the MP5 is adopted by law-enforcement agencies. One of its modifications – the MKM-091 for the 9×21 mm cartridge – is produced in Ukraine. Because of this, our attention was focused on the development of silencers for MP5 submachine guns.

In this paper, the distribution of the powder gas flow inside silencers of these types is considered, the features of design solutions are shown, and the design of the internal components is described with reference to their effect on the overall performance depending on their embodiments.

Silencers with spherical baffles completely eliminate muzzle flash.

Full-scale tests of the silencers developed were conducted with cartridges of different energy capacities, and the test results showed that:

- the sound suppression efficiency of the silencers compares well with that for the best foreign silencers at comparable dimensions and mass;
- the silencers are less expensive due to the use of advanced technologies in the manufacture of their structural components and the silencers as a whole;
- the silencers do not affect the automatic operation, firing accuracy, shot grouping, or performance characteristics of submachine guns.

The technical characteristics of the silencers reported in this paper demonstrate their compactness, reliability, and high sound suppression efficiency.

Keywords: *silencer, spherical baffles, firearm sound suppression.*

1. *Shunkov V.* Combat and Service Weapons of Russia (*in Russian*). Moscow: Eksmo, 2012. 520 pp.
2. *Murakhovsky V. I.,, Fedoseyev S. L.* Infantry Weapons (*in Russian*). Moscow: Arsenal–Press, 1997. 400 pp.
3 *Murakhovsky V. I. Slutsky E. A.* Special-Purpose Weapons: handbook (*in Russian*). Moscow: Elakos, 1995. 212 pp.
4. Heckler & Koch MP5. URL: https://ru.wikipedia.org/wiki/HK_MP5 (last accessed on April 18, 2018).
5. Heckler & Koch MP5 and clones thereof (*in Russian*). URL: https://zbroya.info/ru/blog/ 12282_heckler-koch-mp5-i-ego-klony/ (last accessed on April 18, 2018).
6. Steel silencer for MP5 MKE 9 mm 15x1 right-hand (*in Russian*). URL: http://silent-steel.in.ua/glushitel9mm15x1 (last accessed on April 18, 2018).
7 *Paulson Alan C.* Silencer. History and Performance. Volume Two: QCB, Assult Rifle, and Sniper. USA, Boulder, Colorado : Paladin Press, 1996. – 412 pp.
8. 9 silencer for MP5 H&K and MKE (*in Russian*). URL: https://asturawsmd.com/node/ 99 (last accessed on April 18, 2018).
9. Dispositif d'amortisswment de bruit notamment pour armes a feu: brevet d'ĭnvention № 1469523 Paris, MPK F41C, a15H58m; 30 novembre 1965; 17 fevrier 1967, №7.

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