UDC 533.6;534.83:623.443(048.8)

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SOUND SUPPRESSORS FOR SMALL ARMS WITH ELASTIC DEFORMABLE STRUCTURAL MEMBERS

The paper deals with information about firearms sound suppressors using elastic deformable members, significantly springs.

The results of analysis of their designs are presented and three groups of sound suppressors are classified by concepts and operations of the springs used. The basic problems to be solved in designing such sound suppressors are specified. The possible sources of the results for multi-mass designs with springs are examined. Current sound suppressors produced by Advanced Armament Corporation (USA) are presented for .22LR and 9.0 mm caliber firearm.

The most popular MAE Kilwell Whisper .22LR sound suppressor with movable spring-actuated baffles (New Zealand) is examined. The authors developed such design for sound suppressors suitable for 5.6mm (two modifications) and 9.0 mm caliber firearm. Special features of the development work of the sound suppressor design for 9.0 mm caliber firearm are presented.

Conclusions are made for the designs developed and lines for continuing these works are proposed.

Keywords: sound suppressors, elastic deformable members, springs, multi-mass system.

1. *Ponomarev S. D.* Calculations of Elastic Members for Machines and Instruments (in Russian) / *S. D. Ponomarev, L. Ye. Andreeva*. – Moscow: Mashinostroyenie, 1980. – 326 p.
2. *Babak F. K.* Bases of Small Arms (in Russian) / *F. K. Babak*. – St.-Petersburg: Poligon, 2003. – 253 p.
3. *Siegfried F. Huebner* Silencers for Hand Firearms / *Siegfried F. Huebner*. – Paladin Press, Printed in the United States of America, 1976. – 97 p.
4. *Alan C. Paulson Silencers*. History and Performance, Sporting and Tactical Silencers. V. 1 / *Alan C. Paulson Silencers*. – Paladin Press, Boulder, Colorado, 1996. – 413 p.
5. *Klenkin V.* Sound Suppressor (in Russian) / *V. Klenkin* // Oruzhie i Okhota. – 2001. – No 6. – P. 17 -20.
6. Application for Invention of Ukraine a 2013 13818, IPC[7] F41A21/30. Sound Suppressors for Small Arms (in Ukrainian) / *Konovalov N. A., Pylypenko O. V., Skoryk A. D., Kovalenko V. I.*; applicant and patentee Institute of Technical Mechanics, NASU&SSAU. – filed 28.11.2013.
7. *Shein A. I.* Optimization of multi-mass oscillation dampers in harmonic affecting (in Russian) / *A. I. Shein, O. G. Zemtsova* // Izvestiya Vysshykh Uchebnykh Zavedeniy. Povolzhsky Region. Tekhnicheskie Nauki. – 2010. – No 1 (13). – P. 113 – 122.
8. *Ilyinsky V. S.* Protection of Instruments Against Dynamic Effects (in Russian) / *V. S. Ilyinsky*. – Moscow: Energiya, 1970. – 320 p.
9. *Konovalov A. A.* Impacts for Arms (in Russian) / *A. A. Konovalov*. – Izhevsk: Publishing House of Udmurd University, 2001. – 90 p.
10. *Aleksandrov Ye. V.* Applied Theory and Calculations of Impact Systems (in Russian) / *Ye. V. Aleksandrov, V. B. Sokolinsky.* – Moscow: Nauka, 1969. – 201 p.
11. *Kurendash R. S.* Design of Springs (in Russian) / *R. S. Kurendash.* – Kiev, Moscow: Mashgiz, 1958. – 108 p.
12. http:www.mirpruzhin.ru/volnovye.
13. http:www.lesjforsab.com/techishefedern/standard_stock_ springs_catalogue_13_russian_id 1377.pdf
14. Advanced Armament Corporation Product Catalog, 2013, Lawrenceville, GA USA, 36 p.
15. http://www.silensershop.com/shop/aac-element.
16. http://www.thetrthabboutguns.com2001/07/foghorn/silencer-review.
17. http://www.Silentprecision.com/#lrimfire/c85r.
18. http://www.KneseKungs.com/commtrcsal/Advanced-Armament-AAC.
19. http://www.Silencers-kop.com/shop/aaac-pilot.
20. http://www.translate.govglensercontent.com/-translate_c?depth=&hl=ru&.
21. http://www.silucershop.com/shop/aac-ti-rant-9.
22. http://www.mae.co.nz,01.10.2013.