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(54) **SELF-DEFENSE ARM**

(57) The invention relates to portable fire arms intended for use by civil persons for self-defense by shooting with traumatizing elements or by audio and light signals (shot flash). The invention is characterized by a construction of the gun tubes which are embodied in the form of a cartridge case equipped with an electric spark igniter. The inventive arm comprises a bullet holder and an activating mechanism. Said activating mechanism comprises a pulse magneto electric or a pulse electrochemical current supply electrically connected to a distributor provided with a contact block. The embodiment of the gun tube in the form of a cartridge case equipped with electric spark igniter and the use of the current supply for activating the arm makes it possible to create an effective self-defense arm and to exclude a criminal use thereof.

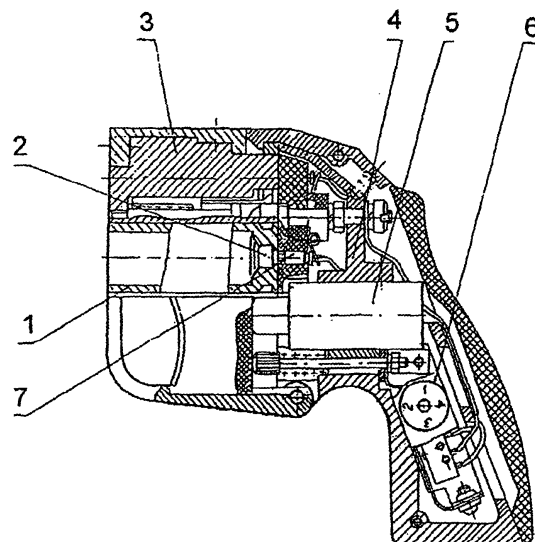


FIG. 1

Description

Technical Field

[0001] The present invention relates to a manual portable fire arm and is intended for use by civil persons for self-defense by shooting with traumatizing elements or by audio and light signals (shot flash).

Background Art

[0002] Creation of civil arm for self defense requires to satisfy some requirements. First of all, a limitation for specific energy (relationship between energy and area of a cross-section of a bullet) must be maintained. This magnitude must be less or equal to 0.5 J/mm, since when its magnitude is greater infliction of heavy body injuries is possible. At the same time, the general level of energy must be sufficiently high (~100J), otherwise effects of an arm with a stopping action will not be achieved. The stopping action is characterized by an ability to transfer a certain quantity of kinetic energy to an obstacle with a minimal depth of penetration. Action of a self-defense arm must not lead to heavy body injuries, maiming, and the arm itself must prevent a possibility of its criminal use for a direct application.

[0003] A civil self-defense arm is known, which is a so-called «gas» arm: gas guns and revolvers and cartridges for them.

[0004] Appearance, sizes, designs of main mechanisms and a caliber of the used cartridges of this arm usually corresponds to military arm, or in other words they are copies of the military arm as to its structural design. Cartridges for such arm do not contain bullets, and equipment of cases is composed of a mixture of smoke powder and any active substance. Cases of cartridges are provided with electric spark igniter of striking action. For the purpose of preventing use of in such an arm of military cartridges, various structural concepts are utilized. For example these problems are solved by making a guntube and other parts of a material which has intentionally lower strengths, which can lead to a crack of the guntube from pressure of powder gasses during shooting with a military cartridge. For providing a possibility of criminal application, the axis of the cartridge holder and a channel of the gun tube is offset, or a strong partition is installed in the channel of the guntube (without a complete blocking of the cross-section) which is composed of a hard alloy or a metal-ceramic. Nevertheless, the possibility of criminal use of this arm with the application of military cartridges is not excluded. Cases are widely known when such an arm is redesigned since it is available.

[0005] Also, arms are known in which cartridges are activated by electric current. Mainly such structural solutions are used in a high caliber arm which is installed mainly on flying apparatuses and ships. For example, aviation cassettes for signal cartridges and cartridges of

various interferences.

[0006] In a portable shooting arm, electrical methods of triggering of cartridges did not find their application.

[0007] A solution for use of electrical method of shooting in a shooting arm is known (see U.S. patent no. 3,854,231 F 41 C 19/12 December 17, 1974). In this patent an arm is considered, in which cartridges composed of a great number of successively shooting charges are used.

[0008] In this case the electrical method is used for the purpose of providing a successive shooting of charges, which would be very difficult to realize with the use of electric spark ignitors.

[0009] As a prototype, a device is selected (see patent of RF no. 2079087 C1, F 41 C 300, May 10, 1997) which discloses a self-defense arm including a gun tube and tubes formed as cases of cartridges.

[0010] This device has a substantial disadvantage—the presence of cumbersome-striking-activating mechanism. Big sizes and mass of striking-activating mechanism are substantially determined by the necessity to perform additional functions, such as distribution of strikes of a striker (main) against peripheral strikers, which in turn requires introduction into the striking-activating mechanism of additional kinematically connected massive parts.

Disclosure of Invention

[0011] The objective of the present invention is to create an efficient and reliable self-defense arm, which excludes the possibility of its direct criminal application with the use of military cartridges, even also after an available conversion in household conditions.

[0012] This objective is achieved in that in a self-defense arm, containing a holder of cartridges, gun barrels formed as cartridges with an electrical spark igniter, and in which an activating mechanism of triggering includes a pulse magneto-electric or pulse electro-chemical current source, electrically connected with a distributing device which contains a contact block.

[0013] A comparative analysis of the proposed solution with the prototype and other technical solutions in this technical area shows that the claimed solution is characterized by a gun tube formed as a cartridge case with an electric spark ignitor and an activating mechanism. This allowed to completely exclude a possibility of direct criminal application of this self-defense device. At the same time, a general level of energy is provided for achieving a stopping action, but a limitation of specific energy is maintained. A total speed of a bullet can not be increased over 150 m/s (speed of bullet for inflicting heavy body injuries must be 180-200 m/s). Moreover, electric spark ignitors are not in a free commerce and during its manufacture a very strict account is carried out.

[0014] In the claimed self-defense arm, the design of the activating mechanism with the source of electrical

current allows to exclude a possibility of its criminal use, since all military cartridges of a shooting arm are provided with capsules-spark igniters of a striking action.

[0015] For providing a shooting with special cartridges, the arm is equipped with a distributing device (a switching mechanism, which provides a predetermined sequence of shooting and indexing of gun tube which has been activated.

Brief Description of the Drawings

[0016]

Figure 1 shows a general view of a self-defense arm.

Figure 2 shows a front view.

Figure 3 shows a variant of use of the arm with a cartridge case.

Variant of Carrying Out the Invention

[0017] The arm is composed of four cartridge cases (1) with an electric spark igniter (2) installed in a casing (3). A source of electric current (5) and a distributing device (switching mechanism) (6) are arranged in a handle (4). As a source of electric current, a mechanical magneto-electric pulse generator is used. It is possible to use other sources of current, for example an electrochemical source (battery). Cartridge cases are retained in nests of the casing and pressed to contacts (7) by springy elements. A block of contacts is formed as a separate assembly which is immovably fixed in the handle. The mechanism of switching is controlled by a starting key through a rod, simultaneously the starting controls a button of a car generator.

[0018] The arm operates in the following manner. One or several cartridges composed of a case with an electric spark igniter, a throwing charge and a body to be thrown (signal pyrotechnical element, rubber bullet, light-sound element) are introduced into the casing of the arm, and the starting key is pressed.

[0019] During pressing, a displacement of a pusher of the distributing device is performed (in other words a switching (of channels) of contacts in the contact block is carried out), and also a displacement of the button of the current generator which is triggered during a further movement of the key. Current pulse passes through the switch to a corresponding contact and electric spark igniter. The cartridge is triggered. During subsequent pressing, a successive triggering of the remaining cartridges is performed.

[0020] The operation of the self-defense arm when the cassette is formed with one nest is performed analogously.

Industrial Application

[0021] The design of the gun tube as a cartridge with an electric spark igniter and the use of a source of electric current for activation allowed to create an efficient self-defense arm, excluding the possibility of its criminal use for direct application (possibility of increasing a striking factor).

Claims

1. A self-defense arm, containing a holder of cartridges, guntubes formed as cartridge cases, and an activating mechanism, **characterized in that** the cartridges cases are formed with an electric spark igniters, and the activating mechanism includes a pulse magneto electric or a pulse electrochemical current source which is electrically connected with a distributing device which contains a contact block.

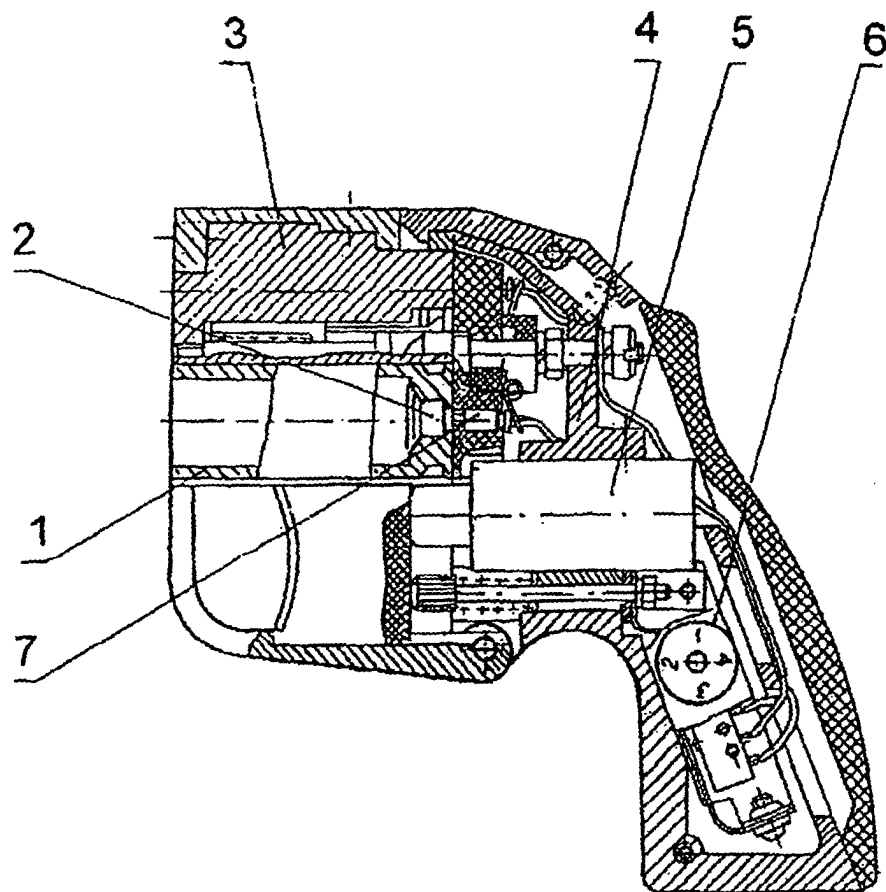


FIG. 1

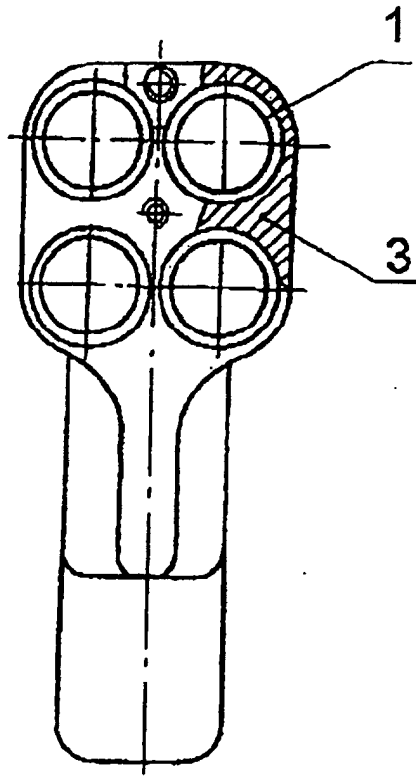


FIG. 2

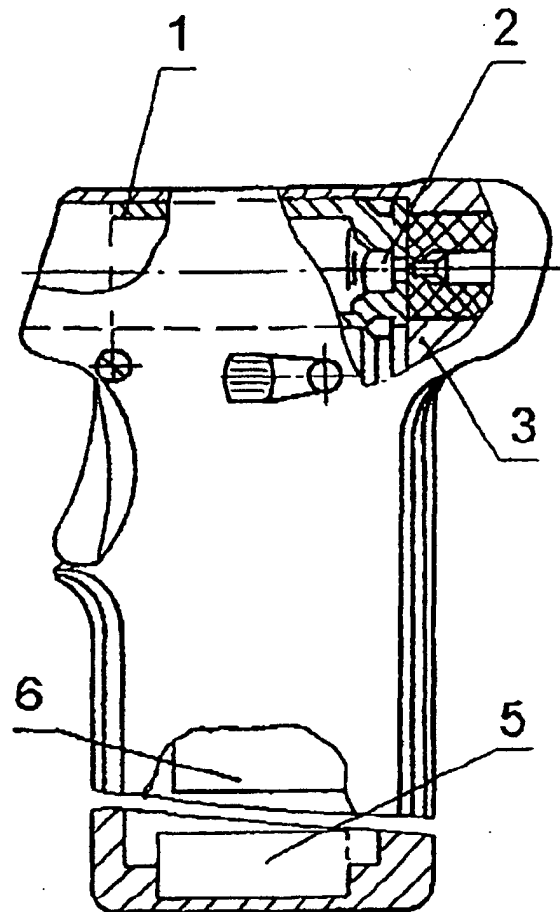


FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/RU 01/00082

A. CLASSIFICATION OF SUBJECT MATTER ⁶: F41C 3/00, F41A 19/58 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) F41C 3/00, 3/02, F41A 19/00, 19/57-19/63, 19/68, 19/70, 21/00, 21/02, 21/06, 21/12 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	RU 2079087 C1 (VOISKOVAYA CHAST 44239) 10 May 1997 (10.05.1997)	1
A	RU 2091691 C1 (KOCHEDYKOV SERGEI VLADIMIROVICH), 27 September 1997 (27.09.1997), the abstract, figures 1-6	1
A	RU 94009462 A1 (PROIZVODSTVENNOE OBIEDINENIE "KIROVSKY ZAVOD "MAYAK" et al.), 27 April 1996 (27.04.1996), the abstract, figures 1-3	1
A	US 5625972 A (ALBERT I.KING et al.), 6 May 1997 (06. 05 1997), the abstract, figures 1-2	1
☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 10 May 2001 (10.05.2001)		Date of mailing of the international search report 14 June 2001 (14.06.2001)
Name and mailing address of the ISA/ Facsimile No.		Authorized officer Telephone No.