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(54) TRAUMATIC CARTRIDGE AND TRAUMATIC ELEMENT FOR A BARRELLESS WEAPON

(57) The invention relates to cartridges for portable barrelless weapon for self- defense. Said weapon can be used by civil persons for self-defense by shooting with traumatic elements. The inventive cartridge comprises a cartridge case, a powder charge, an ignition element embodied in a form of an electrical ignition fuse and a gas generator pressed into the cartridge case, in addition to a traumatic element embodied in the form of a rubber bullet provided with a metallic core which prevents the extraction of the bullet. The bullet is rolled inside the body of the gas generator. The electrical ignition fuse and the gas generator can be embodied in the form of a single part or be embodied separately. The cartridge case can be made of a high resistance aluminum alloy or reinforced plastic material. The inventive traumatic element for a barrelless weapon is made of a flexible metal and embodied in the form of a bullet provided with a metallic core which prevents the extraction of the bullet. The bullet consists of two parts, i.e. the head part and the tail part connected with each other with the aid of a strap. The tail part of the bullet has an external diameter which is less than the diameter of the head part. The bullet can be made of rubber. The invention excludes the possibility of bad wounding by the cartridge and the bullet at a distance equal to greater than 1 meter and ensures a stopping effect at the distance equal to or less than 10 meters.

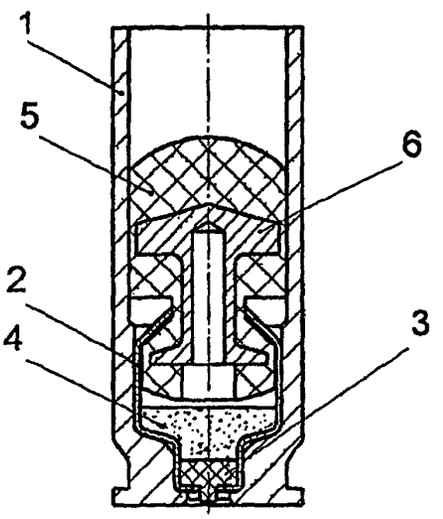

FIG. 1

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Description

Field of the Invention

[0001] The invention relates to cartridges for barrelless weapon for self-defense. This weapon can be used by civil persons for self defense by shooting with traumatic elements for repelling an attack due to pain action which causes shock condition.

Prior Art

[0002] For development of a weapon for self defense several requirements have to be satisfied. First of all, a limitation of a specific energy (ratio between energy and area of transverse cross-section of a bullet) has to be maintained. This value must be less or equal to 0.5 J/mm, since with a greater value heavy.body injuries can be inflicted. At the same time a general level of energy must be sufficiently high (~100J), since otherwise an effect of stopping action will not be achieved. The stopping action is characterized by ability to transmit a certain quantity of kinetic energy to an obstacle with a minimal penetration depth. The action of bullets of cartridges for a self-defense weapon must not lead to heavy body injuries, crippling, and the weapon must exclude a possibility of criminal use for direct purpose. A cartridge for a firearm is known (RU 2103646 CI,F42 B5/02, January 27, 1998), including a cartridge case squeezed at its front end, an ignition fuse, a throwing charge, and a throwable body-bullet.

[0003] This cartridge has the disadvantages that the bullets are metallic and they are formed for penetrating wounds.

[0004] As a prototype a traumatic cartridge is selected for a barrelless weapon, including a cartridge case with screw projections on an inner surface of a wall from the side of a cutoff, an ignition element, and obturation means, and a powder (throwing) charge and a traumatic-deformable striking element accommodated in a chamber of the case (see patent Ru no. 2079087 CI, F41 C3/00, May 10, 1987.

[0005] This cartridge has the following significant disadvantages- a complicated construction, a possibility of conversion of the cartridge for increasing a powder load, and an insufficient stopping action.

[0006] A bullet for traumatic action is also known, composed of a flexible material in form of a hollow sphere with two cast lugs at opposite poles (RU 2095742 CI,F 42 B11/02, November 10, 1987). The disadvantages of this bullet include - insufficient stopping action and the fact that it is impossible to use it in a barrelless weapon.

[0007] As a prototype, there is selected here a traumatic (deformable) striking element for a cartridge for a barrelless weapon, which is formed as a hollow cylindrical casing with closed ends, and composed of an elastic (polymeric) material, in which an elastic envelope with a viscous-elastic or particulate filler is located. Screw cuts are provided on an outer side surface of the casing (see patent RU 2079087 CI,F 41 C 3/00 May 10, 1997). The disadvantage of this device include a complicated construction and an insufficient stopping action.

Disclosure of the Invention

[0008] An objective of this invention is to produce an efficient and reliable traumatic cartridge and a traumatic element for a barrelless weapon for self defense, and also to simplify the construction and to prevent a possibility of a direct criminal use and inflicting of heavy body injuries at a distance of 1.0 m and to guarantee obtaining of a stopping (painful) effect at a distance to 10 m.

[0009] This objective for a traumatic cartridge is achieved in that, in a traumatic cartridge for a barrelless weapon comprising a cartridge base, a powder charge, an ignition element and a traumatic element, an ignition element is formed as an electric ignition fuse and a gas generator pressed in the cartridge case. At the same time, the traumatic element is formed as a rubber bullet with a metal core, which serves for non-extraction of the rubber bullet. The bullet is rolled into the body of the gas generator.

[0010] The electric ignition fuse and the gas generator can be formed as a one-piece integral element, or they can be formed separately.

[0011] The cartridge case can be composed of a high-strength aluminum alloy or a reinforced plastic.

[0012] The traumatic element for the barrelless weapon is made of an elastic material, and formed as a bullet with a metal core which serves for its non-extraction. The bullet is composed of two parts, namely a head part and a tail part which are connected with one another by a strap. The tail part of the bullet has an outer diameter which is smaller than that of the head part. The bullet can be composed of rubber.

[0013] A comparative analysis of the proposed solution with the prototype and other technical solutions in this field shows that the claimed solution is distinguished by an ignition element, formed as an electrical ignition fuse and a gas generator pressed in the case. The traumatic element is formed as a rubber bullet with a metal core which serves for non-extraction of the rubber bullet, and the bullet is rolled into the casing of the gas generator. This will allow to exclude completely a possibility of direct criminal use of this means for self defense. Also, a general level of energy for achieving a stopping action is provided, and at the same time a limitation of a specific energy is maintained. The general speed of the bullet can not be increased more than 150 m/s (speed of bullet for inflicting heavy body injuries must be 180-200 m/s). In addition, the electrical ignitors are not sold on a free market, and after its manufacture a strict record is kept.

[0014] For reducing a scattering of an initial speed of the rubber bullet, the pressure of opening of the gas gen-

erator is many times greater than a pressure of a stable burning of the powder charge.

[0015] For preventing a possibility of re-equipping of the cartridge, the rubber bullet is formed with a core which is molded inside, and which is an element for non-extraction, and it is connected, for example , by rolling with a casing of the gas generator which is pressed into a cartridge case of the cartridge. This construction provides non-extraction of the bullet from the gas generator and also of the gas generator together with the bullet from the cartridge case.

Brief Description of the Drawings

[0016]

Figure 1 shows a general view of a traumatic cartridge.

Figure 2 shows a traumatic element (bullet) for a traumatic cartridge.

Figure 3 shows a variant in which a gas generator and an electric ignition fuse for a traumatic cartridge are formed as a single one-piece part.

Figure 4 shows a traumatic element with an electric bullet rolled into the casing of the gas generator.

Variant of Carrying Out of the Invention

[0017] A construction of a traumatic cartridge for a barelless weapon (Figure 1) includes a cartridge case (1), a gas generator (2), an electric ignition fuse (3), a powder charge (4) and a traumatic element (bullet) (5) with a metal core which serves for a non-extraction of the bullet. The bullet (5) is rolled in a casing of the gas generator (2).

[0018] The cartridge case (1) of the cartridge simultaneously performs a function of a barrel and must withstand a pressure which more than 3 times exceeds a pressure of powder gasses during shooting, for which purpose it is made of a high strength aluminum alloy, for example D 16, AMr3, etc., or of reinforced plastic.

[0019] The traumatic element (bullet) (5) is composed of a hard rubber and has a metallic core (6), for non-extraction of the bullet, which repeats the contours of the bullet (Figure 2). The bullet is composed of two parts, namely a head part (main part) which has a greater size and volume, and a tail part, which are connected by a strap or ((neck)). The tail (lower) part of the bullet is formed with an outer diameter which is smaller than that of the head part of the bullet. At the same time a center of gravity of the bullet is located in a geometric center of the bullet. Such a construction of the bullet provides a possibility of its rolling into a casing of the gas generator with an electric ignition fuse.

[0020] The gas generator (2) with the electric ignition fuse (3) is composed of a steel casing, a red-heating bridge (not shown), and a load of powder charge (4) pressed in the casing. Despite the low energy of ignition, the electrical ignition fuse (2) has a high stability to discharges of static electricity and to induction currents of various sources of electromagnetic fields, which a person encounters in everyday life.

[0021] The gas generator (2) with the electric ignition fuse (3) with the load of powder charge (pyroxylin powder) (4) and with bullet which is rolled in the casing is pressed into the cartridge case. This construction of the cartridge excludes a possibility of extraction of bullet and reconstruction of the cartridge for increasing speed of flight of the bullet.

[0022] The gas generator (2) with the electrical ignition fuse (3) can be formed as a single part (Figure 3) or can be formed separately.

[0023] The traumatic cartridge operates in the following manner. When the electrical ignition fuse (3) is activated from an exterior pulse current source, the red heating bridge (not shown) ignites the load of powder charge (pyroxylin powder) (4) which is pressed in the case of the gas generator (2). When a critical value of the pressure of powder gasses equal to 300 atm is reached, the gas generator (2) with the bullet (5) rolled in it is opened. The gas generator (2) is pressed in the casing of the cartridge (1) and remains inside it. Thereby the bullet (5) flies with required parameters.

[0024] The bullet (5) composed of a hard rubber has a metal core (6) for non extraction of the bullet, which repeats the contours of the bullet. It also serves for preventing a change of the shape of the bullet during its flight. The construction of the bullet provides for a possibility of its rolling into the casing of a gas generator (2) with the electrical ignition fuse (3) (Figure 4).

[0025] A caliber of the bullet, its mass, kinetic energy (58+7) J are selected so as to exclude inflicting of heavy body injuries at a distance from 1.0 m and to guarantee obtaining a stopping (painful) effect at a distance up to 10 m. From this point of view, a diameter of the bullet is selected to be equal to 15.3 mm, and its mass is equal to 8.3 g. An average speed of flight of the bullet of the traumatic cartridge during shooting at a distance 1 m from the cutoff of the cartridge is (120+10) m/s and is provided by selection of the load of powder.

Industrial Applicability

[0026] This cartridge and bullet were tested and exclude inflicting of heavy body injuries at a distance of 1.0 m and guarantee obtaining of a stopping effect at a distance up to 10 m. The construction of the case of the cartridge with the electric ignition fuse made possible its use in a barrelless weapon for self defense, excluding a possibility of its criminal use.

Claims

1. A traumatic cartridge for a baralless weapon, comprising a case, an ignition element, a powder charge and a traumatic element formed as a bullet, **characterized in that** the ignition element is formed as an electrical ignition fuse and a gas generator pressed into the case, and the bullet is formed as a rubber bullet with a metal core which serves for a non-extraction of the rubber bullet, whereas the bullet is rolled into a casing of the gas generator.

2. A traumatic cartridge for a barrelless weapon according to claim 1, **characterized in that** the electric ignition fuse and a gas generator are formed as a single part.

3. A traumatic cartridge for a barrelless weapon according to claim 1, **characterized in that** the electric ignition fuse and the gas generator are formed separately.

4. A traumatic cartridge for a barrelless weapon in accordance with any of claims 1-3, **characterized in that** the case of the cartridge is composed of a high-strength aluminum alloy.

5. A traumatic cartridge for a barrelless weapon in accordance with any of the claims 1-3, **characterized in that** the case of the cartridge is composed of a reinforced plastic.

6. A traumatic element for a barrelless weapon, formed as a bullet composed of an elastic material, **characterized in that** the bullet is formed with a metal core which serves for its non-extraction and the bullet is composed of two parts, namely a head part and a tail part, connected by a strap, wherein the tail part of the bullet is formed with an outer diameter which is smaller than that of the head part.

7. A traumatic element for a barrelless weapon according to claim 6, **characterized in that** it is composed of rubber.

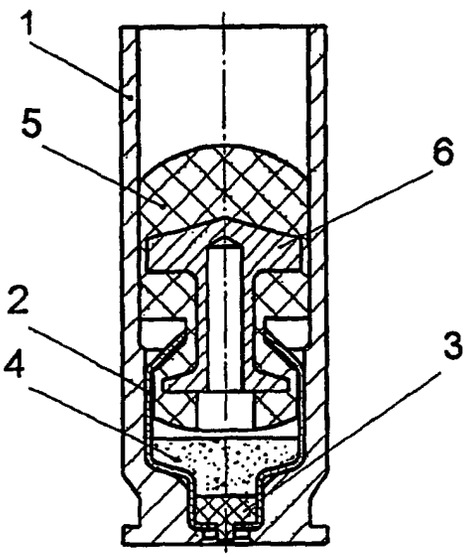

FIG. 1

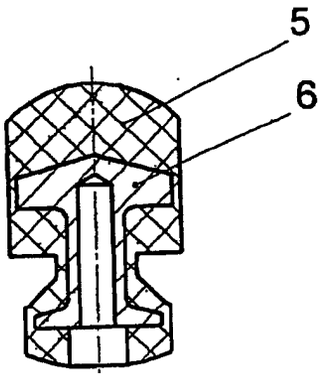

FIG. 2

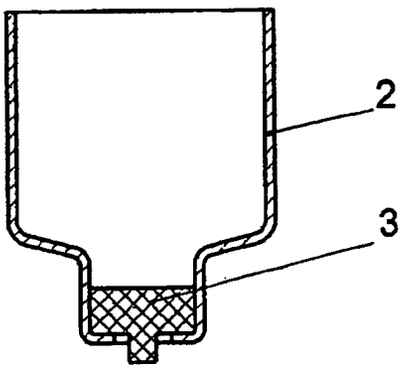

FIG. 3

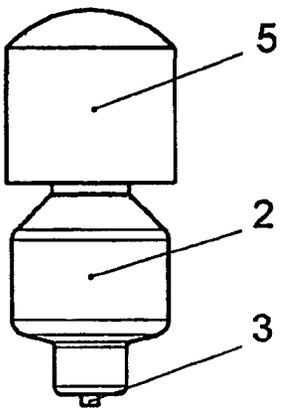

FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/RU 02/00110

A. CLASSIFICATION OF SUBJECT MATTER

F42B 5/073, 5/08, 30/02

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)

F42B 5/00-5/08, 8/00, 8/02, 8/12, 8/14, 12/00-12/02, 12/72-12/78, 30/02

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) 10.05.1997, the claims, figure 4	1-7
A	RU 2117905 C1 (KONSTRUKTORSKOE BJURO PRIBOROSTROENIYA) 20.08.1998, the claims, figures 1, 2	1-7
A	US 5105744 A (PAUL A. PETROVICH) Apr. 21, 1992, the abstract, figures 1-4	1-7
A	GB 2349939 A (TZN FORSCHUNGS-UND ENTWICKLUNGSZENTRUM UNTERLUSS GMBH) 15.11.2000, the abstract, the drawing	1-7

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
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"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	Date of mailing of the international search report
(19.04.2002)	(25.04.2002)
Name and mailing address of the ISA/ RU	Authorized officer
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