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Remarks:

- A request for correction of the translation has been filed pursuant to Rule 139 EPC. A decision on the request will be taken during the proceedings before the Examining Division (Guidelines for Examination in the EPO, A-V, 3.).
- Amended claims in accordance with Rule 137(2) EPC.

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(54) **A RECOILLESS GUN**

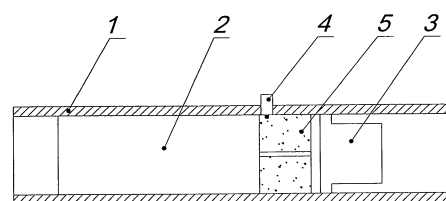
(57) The invention relates to the defense technology, namely the recoilless rifle guns, and can be used in weapons systems for ground and air targets.

Summary of the invention consists in using a two-stage scheme of throwing a projectile or bomblets or finishing items affecting in the recoilless rifle with counterweight.

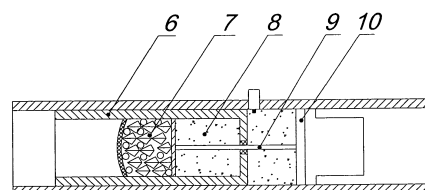
The Recoilless rifle is an thermal impulse machine, structurally, consisting of trunk, body (aka counterweight), shot, consisting of a chassis that includes shell or ready striking elements and propelling charge, the core of the valve, a tube with the female side of the breech area, that one party, tightly in the building shot, while the other rests, on the counterweight, the placed in the space between the pad core valve with counterweight and a shot of electric initiator and initial propellant charge.

Under the action of electric or other subsequent initiation initiator starter propellant charge, calls the movement along a trunk in opposite directions, chassis shot and valve core to push counterweight to compensate for the recoil impulse, the output axis of the valve core out of the shot allows the gases start propellant charge to penetrate the chassis /body shot and initiate the propellant charge shot, that, in turn, will cause the increase of pressure in order to obtain the desired initial speed projectile or striking submunitions, the resulting impact will be offset by additional momentum to the movement of the chassis/body shot and expired gas propellant charge in a region of lower pressure formed in the shot hole, causing acceleration of the valve rod and counterweight.

The proposed invention can provide enhanced range and minimal recoil impulse by a constructive solution, that includes a two-tier scheme of throwing a projectile or manufactured submunitions, though simple in terms of technology, that determines it's mass production at low cost and high "efficiency-cost" in solving problems.



a)



b)

Fig. 1

Description

[0001] The invention relates to military technology to the recoilless rifle guns. Can be used in weapons systems for ground and air targets.

[0002] Object of the invention is a device - thermal impulse machine, which provides increased range, minimizes recoil impulse by a constructive solution that includes a two-tier scheme of throwing the shells, submunitions, ready to respond to various challenges including civil use.

[0003] Known recoilless rifles, containing counterrecoil mechanism that is a hydraulic shock absorber [1].

[0004] The lack of such devices is that they are structurally complex, cumbersome and unreliable after long-term use.

[0005] The closest to the invention was a recoilless rifle, the barrel with the breechblock, which performed at the rear of the jet orifice and balancing weight placed in the barrel between the propelling charge and the back part of the breech ring [2].

[0006] The task of the proposed invention is the creations of recoilless rifles are firing range with minimal impact.

[0007] The technical result in the proposed device is achieved by using two-stage scheme of throwing, features shot and counterweight.

[0008] The new combination of components allows to:

- Electrical or other originator - to initiate seed propellant charge;
- Initial propellant charge - is to provide an initial impulse to the fire and the subsequent initiation of a propellant shot;
- Body shot and a core of the valve, which is a tube with a worn pad from the breech, to one side in the building is tightly shot, while the other rests on the counterweight - is to provide an initial impulse to the fire and the subsequent initiation of a propellant shot;
- Worn pad core valve and counterweight - reduce the recoil impulse starter propellant charge and momentum caused, by the build up of pressure due to the gas propellant shot;
- Propellant charge - provide the required initial speed projectile or damaging elements;
- Projectile or manufactured submunitions - ensure implementation of the basic tasks of the weapon, or complex;
- Trunk - the impulse effect on the shot, counterweight and firing in a particular direction along the axis of the barrel.

[0009] The invention describes a drawing (fig. 1), which described one of the possible technical solutions.

[0010] Recoilless rifle (fig. 1-a) consists of a trunk - 1, 2 - shot, 3 - counterweight, electric or other catalyst - 4 and starter propellant charge - 5.

[0011] Shot (fig. 1-b), consists: chassis - 6 with the projectile or submunitions - 7 and propelling charge - 8, the rod valve (aka tube) - 9, with the female side of the breech area - 10, that one party, tightly in the building shot, while the other rests, on the counterweight.

[0012] Shooting from Recoilless rifle is as follows (fig. 2).

[0013] Under the action of the initiator - 4 (fig. 2-a) the subsequent initiation of seed propellant charge 5, calls the movement along a trunk in opposite directions, hull 6 shot and valve core 9 and 10, push counterweight - 3 to compensate for the recoil impulse (fig. 2-b), when this, outlet valve core axis - 9 from the chassis - 6, lets start a gas propellant charge 5 to penetrate in the chassis 6, through the opening after the release of the core of the valve hole of the transmission detonation time and initiate the propellant charge - 8 (fig. 2-c) that, in turn, will cause the increase of pressure in order to obtain the desired initial speed projectile or projectiles elements - 7 (fig. 2-d) the resulting additional recoil impulse, will be compensated for by the inertia of the progressive movement chassis - 6 in the shot, inertia and pressure starter, propellant charge and propellant gases in the expiration area of lower pressure through in the chassis - 6 shot, hole transmission detonation point, causing acceleration of motion valve core - 10 and 9 counterweight - 3 (fig. 2-e).

[0014] The proposed invention can provide enhanced range and minimal recoil impulse by a constructive solution, that includes a two-tier scheme of throwing a projectile or manufactured submunitions, though simple in terms of technology, that determines it's mass production at low cost and high "efficiency-cost" in solving problems.

List of references

[0015]

1. «Davis non-recoil gun», patent US № 1395630
2. Victor Ron «Panzerfaust», turbulent family. Magazine «weapon» № 1, 2012. page.48-53.

Claims

1. The Recoilless rifle is an thermal impulse machine, structurally, consisting of trunk, body (aka counterweight), shot, consisting of a chassis that includes shell or ready striking elements and propelling charge, the core of the valve, a tube with the female side of the breech area, that one party, tightly in the building shot, while the other rests, on the counterweight, the placed in the space between the pad core valve with counterweight and a shot of electric initiator and initial propellant charge, other than the fact that under the action of electric or other subsequent initiation initiator starter propellant charge, calls the movement along a trunk in opposite directions, chassis/body shot and valve core, push protivomassu to

compensate for the recoil impulse, with the output axis of the valve core out of the shot to start gas propellant charge to penetrate the chassis/body shots and initiate the propellant charge shot, that in turn, will cause the increase of pressure in order to obtain the desired initial speed projectile or striking submunitions, in the resulting impact will be offset by additional momentum to the movement of the chassis/body shot and expired gas propellant charge in a region of lower pressure resulting in a shot through the hole, causing the acceleration of movement of the valve core and counterweight.

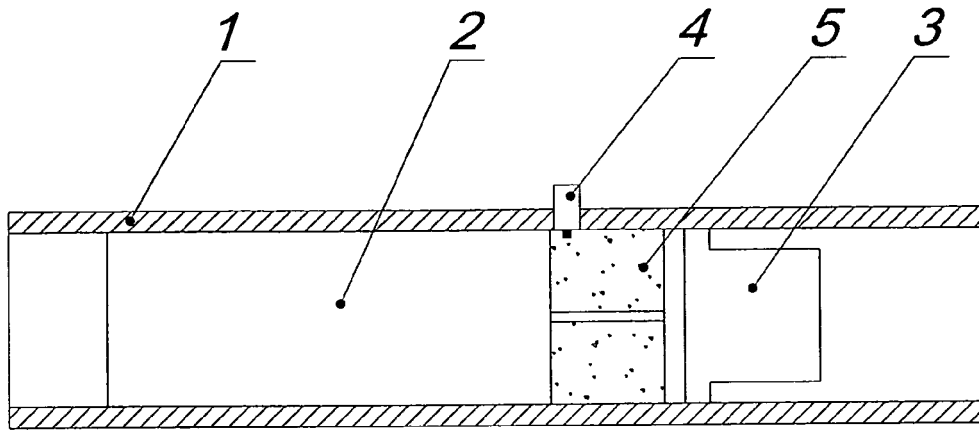
Amended claims in accordance with Rule 137(2) EPC.

1. recoilless gun consisting of

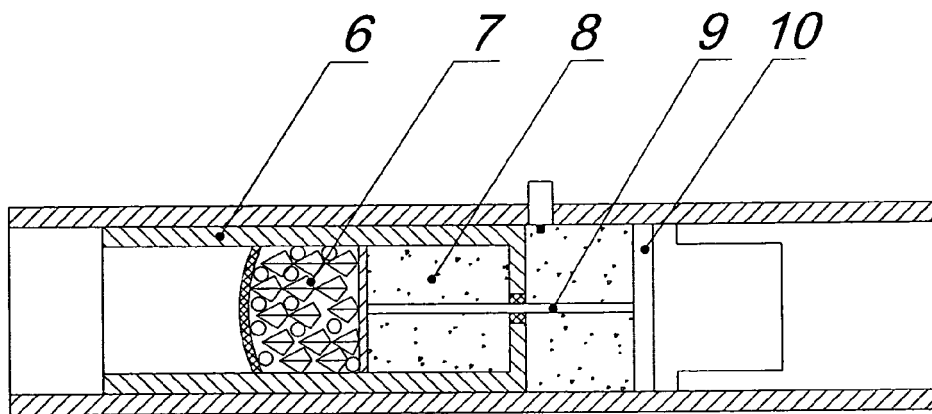
- a gun tube (1),
- a body being a counterweight (3),
- a shell (2) consisting of a case (6) including a projectile or prepared damaging elements (7) and a propellant charge (8),
- an electric or other initiator (4) and
- a starting propellant charge (5),

characterized in that

the shell (2) further comprises a piston comprising a piston rod (9) and a piston head (10) at the breech side of the gun tube, which piston head (10) with one side hermetically enters the shell case (6), while the other rests on the counterweight (3), wherein the starting propellant charge (5) is disposable in the area between the piston head (10) of the piston with the counterweight (3) and the shell (2), wherein when operating the electric or the other initiator (4) the subsequent initiation of the starting propellant charge (5) activates a movement along the gun tube in opposite directions of the shell case (6) and the piston that pushes the counterweight (3) for compensating the recoil impulse, thereby the exit of the piston rod (9) of the piston from the shell case (3) allows gases of the starting propellant charge (5) to penetrate into the shell case (6) and to initiate the propellant charge (8) of the shell (2) which, in turn, will cause the required increase of pressure in order to obtain the desired initial exiting speed of the projectile or the prepared damaging elements (7), whereby the appeared additional recoil impulse will be compensated by the motion of the shell case (6) and the flow of gases of the propellant charge (8) in the area of lower pressure through the orifice generated in the shell case (6), causing an acceleration of motion of the piston and of the counterweight (3).



a)



b)

Fig. 1

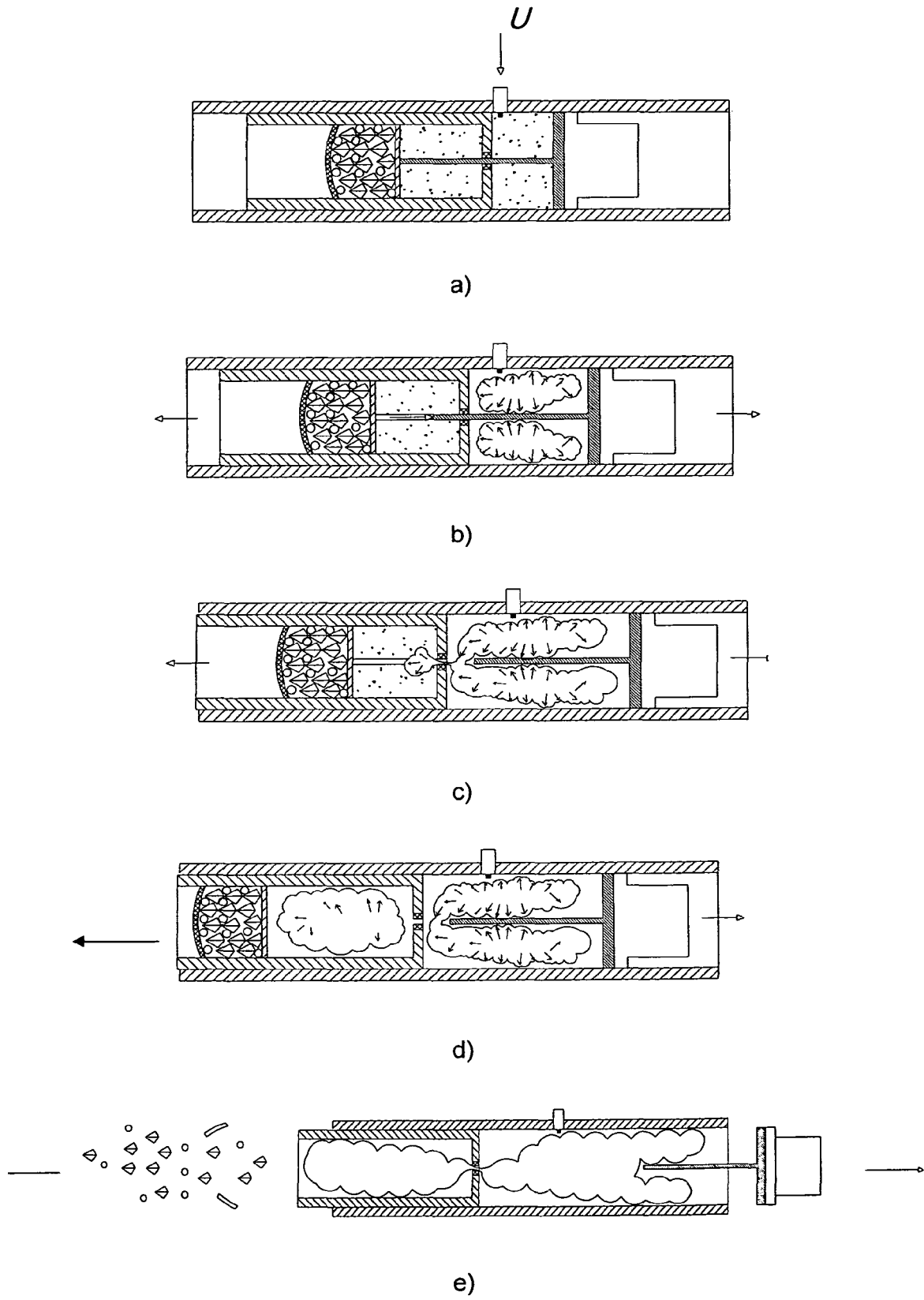


Fig. 2

**PARTIAL EUROPEAN SEARCH REPORT**

Application Number

under Rule 62a and/or 63 of the European Patent Convention.
This report shall be considered, for the purposes of
subsequent proceedings, as the European search report

EP 15 16 6220

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 4 676 136 A (KAELIN ARTHUR [CH]) 30 June 1987 (1987-06-30) * abstract * * column 4, line 46 - column 6, line 29 * * figures 1-4 *	1	INV. F41A1/10
A	US 4 050 351 A (STAUFF EMILE J) 27 September 1977 (1977-09-27)	1	
A	DE 10 2012 010142 A1 (RHEINMETALL WAFFE MUNITION [DE]) 28 November 2013 (2013-11-28)	1	
A	US 4 012 987 A (BURKHALTER JOHN E ET AL) 22 March 1977 (1977-03-22)	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			F41A

INCOMPLETE SEARCH

The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC so that only a partial search (R.62a, 63) has been carried out.

Claims searched completely :

Claims searched incompletely :

Claims not searched :

Reason for the limitation of the search:

see sheet C

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Place of search	Date of completion of the search	Examiner
The Hague	4 December 2015	Menier, Renan
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document		

EPO FORM 1503 03/82 (P04E07)

**INCOMPLETE SEARCH
SHEET C**

Application Number

EP 15 16 6220

5

Claim(s) completely searchable:

-

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Claim(s) searched incompletely:

1

Reason for the limitation of the search:

15

Claim 1 will be construed with the explanations given in the letter
received on 24-11-2015 after the CLAR request.

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 15 16 6220

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

04-12-2015

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4676136 A	30-06-1987	CA 1257496 A CH 668473 A5 GB 2183800 A US 4676136 A	18-07-1989 30-12-1988 10-06-1987 30-06-1987
US 4050351 A	27-09-1977	NONE	
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US 4012987 A	22-03-1977	NONE	

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 1395630 A [0015]

Non-patent literature cited in the description

- **VICTOR RON.** Panzerfaust. *Magazine*, 2012, 48-53
[0015]