TARGET PRACTICE AMMUNITION

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Publication Classification

(51) Int. Cl.
F42B 8/00 (2006.01)

(52) U.S. Cl. ......................................................... 102/444

ABSTRACT

The invention relates to ammunition that is used for target practice and/or sport shooting with an individual live-fire weapon. The inventive ammunition comprises a cartridge case (1) that defines a receiving chamber for an explosive (5), the transverse dimension (D1) of said chamber being at most of the order of that (D2) of the rear face of the missile (2). Said case (1) is formed from a hollow resin mass. The longitudinal dimension of the chamber (4) is also reduced with positive connection means being inserted between at least any two of the elements (6, 5, 2) which make up the series of elements involved in the chain operation of the ammunition and which are disposed at a distance from one another.
TARGET PRACTICE AMMUNITION

[0001] The invention is in the domain of arms. It has for its object ammunition for effecting target practice and/or sport shooting, with a live-fire weapon.

[0002] It is recalled that ammunition principally comprises a case, or cartridge, housing in an inner chamber a reserve of explosive. This reserve of explosive is in contact with the rear face of a missile, in particular bullet or the like, such as syringe. This projectile is supported by the case at its front end that it extends axially. The reserve of explosive is also in contact with a primer located at the rear end of the case, this primer being provided to be struck by the striking pin of the weapon. It will therefore be understood that the ammunition principally comprises the case defining an inner volume forming a chamber for receiving a reserve of explosive, this case receiving a series of elements for the chain operation of the ammunition, from its rear end towards its front end. This series of elements comprises in particular the primer, the reserve of explosive and the projectile.

[0003] The case, generally of truncated form tapering at its front end, is usually formed by a brass cylinder of small thickness, in order to optimize the volume of the chamber receiving the explosive having regard to the overall space requirement of the ammunition. This is why one problem which is raised resides in the use of a weapon arranged to receive live-fire ammunition, for effecting target practice and/or sport shooting. In that case, it is necessary to reduce the quantity of explosive contained in the inner chamber of the case. To that end, it is usual to compensate the volume lacking explosive by an inert substitution material.

[0004] Large-calibre ammunition is known from WO-A-9918408, in which a chamber for receiving the explosive, of reduced diameter, extends over the whole length of the case. Such ammunition does not have a good output, equivalent to that of small-calibre ammunition.

[0005] The purpose of the present invention is to propose ammunition for effecting target practice and/or sport shooting, with an individual live-fire weapon.

[0006] To that end, the invention relates to ammunition for effecting target practice and/or sport shooting with an individual live-fire weapon which comprises a cartridge case defining an inner volume forming a chamber for receiving a reserve of explosive, this case successively receiving a series of elements for the chain operation of the ammunition, from its rear end towards its front end, comprising a primer, the reserve of explosive and a projectile, the volume of the inner chamber of the case being diametrically reduced so as to give the chamber a transverse dimension at the most of the order of that of the face of the projectile. This ammunition is characterized in that the reduction of the volume of the inner chamber is also a reduction in longitudinal dimension.

[0007] The present invention will be described in relation with the Figures of the accompanying drawings, in which:

[0008] FIG. 1 is a schematic view of ammunition of the prior art.

[0009] FIG. 2, FIG. 3, FIG. 4 and FIG. 5 schematically show ammunition in accordance with various respective and preferred variant embodiments of the invention.

[0010] FIG. 3A is a view on a larger scale and in half-section, of a part of the ammunition of FIG. 3, and

[0011] FIG. 6 is a view similar to FIG. 3A for ammunition in accordance with a fifth form of embodiment of the invention.

[0012] In FIG. 1, ammunition of the prior art comprises a cartridge case 1 which:

[0013] a) supports a projectile 2 at its front end 3.

[0014] b) defines an inner volume forming a chamber 4 for receiving an explosive 5.

[0015] c) supports a primer 6 at its rear end 7.

[0016] It will be noted that the wall of the case 1, made of brass, is a thin wall forming an inner chamber 4 whose volume is substantially equivalent to the overall outer volume of the case 1. It will also be noted that the series of elements making up the usual chain operation of the ammunition successively comprises the primer 6, the explosive 5 and the projectile 2.

[0017] The case 1 is provided, at the level of its end 3, with a collar 31 in one piece with the case 1 and which surrounds the projectile 2. This collar 31 makes it possible to hold the projectile efficiently by nesting.

[0018] In addition, the case 1 is equipped, opposite the end 3, with a groove 11. In a variant, a bead may be provided at the foot of the case 1.

[0019] The case 1 has an outer shape substantially in the form of a frustum of cone.

[0020] In FIGS. 2 to 5, various variant embodiments of the present invention are schematically illustrated, of which the general step has consisted in breaking the habits taken in the domain and in reducing the volume of the inner chamber 4 of the case 1.

[0021] In FIG. 2, this reduction in volume is effected at least diametrically, particularly by an increase in the thickness e of the case 1, which in that case is advantageously formed by a hollow resin mass. These arrangements give the chamber 4 a maximum transverse dimension D1 at the most of the order of that, D2, of the rear face of the projectile 2. The fact that D1 is at the most of the order of D2 means, in practice, that D1 is less than about 1.2 times D2. It will be understood that the hollow of the resin mass forming the case 1 forms the chamber 4 for receiving the explosive.

[0022] The outer shape of the case 1 is substantially the same as that of the case of FIG. 1.

[0023] In FIGS. 3 to 5, the reduction of the volume of the inner chamber 4 of the case 1 is also preferably a reduction in longitudinal dimension. The latter is compensated by the interposition, between at least any two of the elements 6, 5 and 2, rendered distant from one another, which makes up the series of elements for the chain operation of the ammunition, of positive connection means between these two distant elements.

[0024] For example in FIG. 3, the connection means are constituted by an added striking pin 8 interposed between the primer 6 and the rear end face 9 of the ammunition, against which the shock of the striking pin of the weapon is provided to be applied. The intermediate striking pin 8, which transmits the action of the striking pin of the weapon to the primer 6 allows the primer and the explosive to be brought closer to each other.
The case 1 is provided, in the vicinity of its end 3, with a circular element in relief 32 which comes into engagement with an element in relief 22 of corresponding shape formed on the projectile 2. The element in relief formed on the projectile 2 is likewise circular.

In this respect, it may be noted that the connection of the elements in relief 22 and 32, which maintains the projectile in the case during storage of the ammunition, is considerably reinforced by the pressure due to the closure of the weapon, just before firing, and this by a wedge effect, as the end 3 bears on the truncated part of complementary geometry formed by the barrel of the weapon.

During the explosion, the elements in relief 22 and 32 are temporarily deformed in order to allow the projectile 2 to be ejected.

The projectile 2 essentially comprises three parts, namely:

- A front end 23 of which the diameter is at maximum equal to that of the barrel of the weapon,
- An intermediate part 24 of which the diameter is equal to that of the bottom of the internal grooves of the barrel of the weapon,
- A rear part 25 which bears the element in relief 22 intended for maintaining the projectile 2 in the case 1. This part is deformed during its passage in the barrel.

As the projectile 2 is shorter than the live-fire bullets, its particular geometry facilitates the hold of the grooves of the barrel, while conserving a good trajectory, with a movement of rotation.

On a first part 12, the case 1 has a truncated outer shape with a relatively large apex angle. On a second part 13, the case is of likewise truncated outer shape with a relatively small apex angle, this allowing it to adapt itself to the chamber of the weapon. On a third part 14, the case 1 is substantially cylindrical with circular section, this making it possible to improve the elasticity of the case and to facilitate deformation of the end 3 for the release of the projectile after the explosion of the explosive 5. This cylindrical geometry also makes it possible to simplify the tools manufacturing the cases and to put up with the manufacturing tolerances of the weapons and ammunitions. This part also makes it possible to design a weapon with a barrel specific to this ammunition of low energy preventing the use of live-fire ammunitions.

The case 1 is also provided with a shoulder 15 which facilitates hold of the ammunition with the extractor of the weapon and facilitates obtaining of the case by moulding.

In FIG. 4, the connection means are constituted by the inner chamber 4 of the case 1, the chamber constituting not only a chamber for receiving the explosive 5, but also a chamber for receiving the projectile 2 inside the case 1.

In FIG. 5, the connection means are constituted by an axially extending member 10 extending the rear face of the projectile 2 towards the reserve of explosive 5. In these cases, the member 10 constitutes the rod of a syringe forming the projectile 2 and provided with a needle 2a. This form of embodiment concerns shoots for capture.

The ammunition of the embodiments of FIGS. 4 and 5 have cases 1 of the same outer geometry as that shown in FIG. 2. They might equally well comprise cases of outer geometry similar to that of the case of FIG. 3. In a variant, in the embodiments of FIGS. 4 and 5, those parts of the case 1, at the level of which there is no explosive, may be cylindrical.

As may be seen from a comparison of FIGS. 2 to 5 with FIG. 1, ammunition according to the invention is shorter than that of the prior art.

According to variants of the invention (not shown), the front end 3 of the case 1 may be equipped with a small collar facilitating nesting of the projectile 2 in the case.

The embodiments of FIGS. 2 to 4 are particularly adapted to the majority of target practices and sport shootings, particularly shots made for the preparation and examination of the French hunting permit, such shots being effected on mobile targets. However, in certain cases, such as for the preparation of hunting from a hide or hunting by stalking, fixed targets are used, placed at distances from the gunner greater than in the case of mobile targets.

For this type of shooting, the mass of the projectile 2 is increased which, as shown in FIG. 6, comprises a metal part 26 and a part 27 made of synthetic material, in which part 26 is housed. As previously, an element in relief 22 is provided on the projectile in order to cooperate with an element in relief 32 of the front end 3 of the case 1. This variant with “heavy” projectile may also be used for live-fire or hunting.

The technical characteristics of the different forms of embodiment may be combined together without departing from the scope of the present invention.

1. Ammunition for effecting target practice and/or sport shooting with an individual live-fire weapon, this ammunition principally comprising a cartridge case 1 defining an inner volume forming a chamber 4 for receiving a reserve of explosive 5, this case 1 successively receiving a series of elements for the chain operation of the ammunition, from its rear end 7 towards its front end 3, comprising a primer 6, the reserve of explosive 5 and a projectile 2, the volume of the inner chamber 4 of the case 1 being diametrically reduced so as to give the chamber 4 a transverse dimension (D1) at the most of the order of that (D2) of the rear face of the projectile 2, characterized in that the reduction of the volume of the inner chamber 4 of the case 1 is also a reduction in longitudinal dimension.

2. Ammunition according to claim 1, characterized:
in that the diametral reduction of the inner chamber 4 of the case 1 results from an increase in the thickness (e) of the latter (1), which is formed by a hollow resin mass, this hollow forming the chamber 4 for receiving the explosive 5.

3. Ammunition according to claim 1, characterized:
in that positive connection means (4,8,10) are interposed between at least any two elements (6,5,2) making up the succession of elements for the chain operation of the ammunition, rendered distant.

4. Ammunition according to claim 3, characterized:
in that the connection means are constituted by an added striking pin (8) interposed between the primer (6) and
the rear end face (9) of the ammunition, against which the shock of the striking pin of the weapon is provided to be applied.

5. Ammunition according to claim 3, characterized:
in that the connection means are constituted by the inner chamber (4) of the case (1), the latter constituting not only a chamber for receiving the explosive (5), but also a chamber for receiving the projectile (2) inside the case (1).

6. Ammunition according to claim 3, characterized:
in that the connection means are constituted by an axially extending member (10) extending the rear face of the projectile (2) towards the reserve of explosive (5).

7. Ammunition according to claim 1, characterized:
in that said case (1) and said projectile (2) are provided with elements in relief (22,32) for temporarily blocking said projectile with respect to said case.

8. Ammunition according to claim 5, characterized:
in that said element in relief (22,32) are adapted to be temporarily locked, by wedge effect, during closure of the weapon, before firing.

9. Ammunition according to claim 1, characterized:
in that said case (1) comprises a part (14) of substantially cylindrical outer form of circular section.

10. Ammunition according to claim 1 characterized:
in that said case (1) comprises at least one part (12,13) of substantially truncated outer shape.

11. Ammunition according to claim 1, characterized:
in that said case (1) is provided with a shoulder (15) which facilitates engagement of the ammunition with the extractor of the weapon.

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