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(54) **Shell for bullets of automatic or semiautomatic firearms with inertial closure**

Treibladungshülse für Geschosse für automatische oder halbautomatische Feuerwaffen mit einem Trägheitsverschluss

Douille pour balles destinées à être tirées à partir d'armes à feu semi-automatiques ou automatiques ayant une culasse du type à inertie

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Description

[0001] The present invention relates to a shell for bullets of automatic or semiautomatic firearms with inertial closure, particularly for medium- or large-caliber pistols.

[0002] Conventional semiautomatic or automatic pistols with inertial closure have a sliding breech which is supported by the frame of the pistol so that it can slide in a direction which is parallel to the axis of the barrel.

[0003] The magazine with the cartridges is generally accommodated in the butt of the pistol and in each instance one cartridge is moved at the region where the sliding breech operates.

[0004] In practice, the sliding breech is movable from a backward position, for allowing the entry of the cartridge transferred from the magazine, to a forward position wherein it closes the firing chamber to the rear. In passing from the backward position to the forward position, the sliding breech engages the cartridge and inserts it in the firing chamber. When it moves in the opposite direction, the sliding breech, by means of an element known as extractor, engages the collar of the shell and removes the shell from the firing chamber, also expelling it through an adapted opening formed laterally or in an upward region in the body of the sliding breech.

[0005] The backward movement of the sliding breech is contrasted elastically by a spring, arranged around the barrel, which causes the advancement of the sliding breech.

[0006] In these weapons the problem arises of delaying the backward motion of the sliding breech to prevent shell extraction from the firing chamber from beginning before the bullet has left the barrel, i.e., in the presence of very high pressures inside said barrel. If the shell is extracted from the firing chamber whilst the pressure inside said firing chamber is still very high, the shell can burst, causing danger to the user and at the same time jamming the weapon.

[0007] Various measures have been adopted to solve this problem.

[0008] One of these measures consists in increasing the mass of the sliding breech so that the backward movement of the sliding breech is delayed due to the high inertia caused by its increased mass.

[0009] This measure entails some drawbacks, since it increases the weapon weight; moreover, oscillations of the weapon induced by the movement of the sliding breech at the end of its forward and backward movement are observed. These oscillations and the considerable weight of the weapon negatively affect firing precision and the oscillations of the weapon cause the user to lose his line of fire during closely spaced repeat firing.

[0010] Another measure consists in forming the moving barrel together with the sliding breech. In practice, during firing the barrel retracts rigidly with the sliding breech by a first extent, so that the sliding breech keeps the firing chamber closed, and then releases the sliding breech so that it ends its backward movement, extracting and expelling the shell.

[0011] This measure, too, is not free from drawbacks, since it complicates the structure of the pistol and also increases its production costs. Moreover, the coupling between the barrel and the frame of the pistol and between the barrel and the sliding breech must be performed with considerable play in order to allow the various movements, and these plays inevitably affect the precision of the weapon. In order to obviate this drawback, it is often necessary to manually modify the weapon with highly specialized operations that entail very high costs.

[0012] Another measure consists in using the gases produced during firing inside the firing chamber or the barrel, providing an adapted duct with an inlet located in the firing chamber or almost at the end of the barrel in order to deactivate an element which temporarily locks the sliding breech.

[0013] This measure considerably affects the production cost of the pistol and reduces the reliability of the weapon, since the gas conveyance duct can clog after a certain number of shots, thus jamming the weapon. The flow of the gases also generates turbulence which reduces the weapon precision.

[0014] US-A-4 483 251 discloses a shell for bullets according to the preamble of claim 1 and such shell is provided with reinforcement means constituted by an increasing thickness of the walls of the shell.

[0015] US-A-3 797 396 discloses an annular reinforcing means arranged inside a cartridge.

[0016] FR-A-911 696 discloses an annular reinforcement arranged inside the shell and casted at a back portion therein.

[0017] The aim of the present invention is to solve the above problems by providing a shell for bullets of automatic or semiautomatic firearms with inertial closure, which effectively avoids the danger of bursting when it is extracted from the firing chamber without requiring the adoption of particular measures in the structure of the weapon.

[0018] Within the scope of this aim, the main object of the present invention is to provide a shell which solves the problem of bursting during its extraction from the firing chamber without requiring an increase in the mass of the sliding breech.

[0019] Another object of the present invention is to provide a shell which solves the problem of bursting during extraction from the firing chamber without requiring devices for locking the sliding breech or measures for delaying the backward movement of the sliding breech.

[0020] Another object of the present invention is to provide a shell which does not penalize the precision and reliability of the weapon.

[0021] This aim is pursued by the characterising features of claim 1, a further advantage is achieved by a shell for bullets of automatic or semiautomatic firearms with inertial closure, as ancillary defined in dependent claim 2.

[0022] Further characteristics and advantages of the present invention will become apparent from the description of two preferred but not exclusive embodiments of the shell according to the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is an axial sectional view of the shell according to the present invention in a first embodiment; figure 2 is an axial sectional view of the shell according to the present invention in a second embodiment;
figure 3 is a schematic view of the shell inserted in the firing chamber of the barrel of a weapon;
figure 4 is a schematic view of the initial step of the extraction of the shell according to the present invention from the firing chamber.

[0023] With reference to the above figures, the shell according to the present invention, designated by the reference numerals 1 and 1a in its two embodiments, comprises a substantially cylindrical hollow body which is closed, at one of its axial ends, by a head 2 and is adapted to accommodate a bullet 3 at the opposite axial end.

[0024] The head 2 is centrally provided, in a per se known manner, with a cap 4 containing the primer.

[0025] Inside the shell 1 there is provided a cavity 5, 5a meant to accommodate the firing charge.

[0026] According to the invention, at least the portion of the shell which is extracted from the firing chamber when the fired bullet 3 leaves the barrel 6 is provided with reinforcement means.

[0027] Said portion is designated by the reference numerals 7 and 7a in the figures.

[0028] As shown in the first embodiment, said reinforcement means can be constituted by an annular body 8 which is forced inside the shell body or is cast directly in the shell body, according to requirements. The annular body 8 can be preferably made of light material, such as for example an aluminum alloy.

[0029] As shown in the second embodiment, the means for reinforcing the portion 7a can be constituted simply by an increase in the thickness of the walls at the portion 7a.

[0030] Both the annular body 8 and the increase in thickness at the portion 7, 7a preferably blend with the remaining part of the inner side walls of the shell towards the end that is associated with the bullet 3.

[0031] The length of the portion 7, 7a, measured starting from the head 2, can be different according to the time that elapses between the beginning of the firing action and the instant when the fired bullet 3 leaves the barrel 6. This time depends on various parameters, such as the type of firing charge being used, the weight of the bullet 3, the type of coupling between the bullet 3 and the inside of the barrel 6, the length of the barrel 6, the mass of the sliding breech, and the weight of said shell 1, 1a. In any case, the length of the portion 7, 7a is such that when the sliding breech has started to extract the shell 1, 1a from the firing chamber 9 and the bullet 3 leaves the barrel 6, the shell 1, 1a is extracted from the firing chamber 9 by an extent which is substantially equal to, or slightly smaller than, the length of the portion 7, 7a.

[0032] In this manner, owing to the fact that when the pressure inside the firing chamber 9 decreases the shell is extracted from the firing chamber by an extent which is equal to, or shorter than, the length of the portion 7, 7a, accidental bursting of the shell is effectively avoided.

[0033] The problem of avoiding accidental bursting of the shell is thus solved without having to increase the weight of the sliding breech and without providing special devices for delaying the backward movement of the sliding breech.

[0034] Consequently, the weapon can be lighter than conventional weapons using these measures, to the full advantage of the structural simplicity of the weapon and of firing precision.

[0035] It should be noted that the basic concept of the present invention can even lead to a weight reduction in weapons, since the mass of the sliding breech can be reduced adequately. Although the present invention has been conceived in particular for shells of medium- or large-caliber cartridges, this advantage is particularly appreciated in small- and very small-caliber weapons.

[0036] Optionally, in order to give the cavity 5, 5a meant to contain the firing charge a volume which is equal to the volume of cavities of conventional shells, the shell according to the present invention can be slightly longer than conventional shells. However, this requirement does not entail a structural complication of the weapon, since it is sufficient to make the firing chamber 9 slightly longer than firing chambers of conventional weapons.

[0037] In practice it has been observed that the shell according to the present invention fully achieves the intended aim, since it solves the problem of the accidental bursting of the shell when it begins to be extracted from the firing chamber without entailing an increase in the weapon weight and without making the weapon structurally more complicated.

[0038] Although the basic concept of the present invention has been studied in particular for automatic or semiautomatic medium- or large-caliber pistols, it can nonetheless be used in a wide variety of pistols or in other firearms featuring inertial closure.

[0039] The shell thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept; all the details may also be replaced with other technically equivalent elements.

[0040] In practice, the materials employed, so long as they are compatible with the specific use, as well as the dimensions, may be any according to requirements and to the state of the art.

[0041] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A shell (1a) for bullets of automatic or semiautomatic firearms with inertial closure, comprising a hollow cylindrical body which is closed, at a first axial end, by a head (2a) and accommodates a bullet (3) at a second opposite axial end, said head being centrally provided with a cap (4) that accommodates a primer, a channel being defined between the cap (4) and a cavity (5a) which contains a firing charge, at least a portion of the shell which is extracted from the firing chamber when the fired bullet leaves the barrel being provided with reinforcement means, **characterized in that** a portion (7a) of the body of the shell (1a) measured starting from the head (2a) to the end of the channel has a length which is at least equal to or larger than the length of the portion of the shell which is extracted from the firing chamber (9) when the fired bullet (3) leaves the barrel (6), said portion being a solid region and being integral with said hollow cylindrical body.

2. The shell according to claim 1, **characterized in that** said reinforcement means comprises an annular body (8) cast inside the shell at said portion.

Patentansprüche

1. Hülse (1a) für Geschosse für automatische oder halbautomatische Feuerwaffen mit Trägheitsverschluss mit einem hohlen zylindrischen Körper, der an einem ersten axialen Ende durch einen Kopf (2a) geschlossen ist und ein Geschoss (3) an einem zweiten, gegenüberliegenden axialen Ende aufnimmt, der Kopf ist zentral mit einer Kappe (4) versehen, die einen Zünder aufnimmt, ein Kanal ist zwischen der Kappe (4) und einem Hohlraum (5a), der eine Treibladung enthält, ausgebildet, zumindest ein Abschnitt der Hülse, der aus der Zündkammer heraus bewegt wird, wenn das abgefeuerte Geschoss den Lauf verlässt, ist mit Verstärkungsmitteln versehen, **dadurch gekennzeichnet, dass** ein Abschnitt des Körpers der Hülse (1a), gemessen beginnend von dem Kopf (2a) bis zu dem Ende des Kanals, eine Länge aufweist, die zumindest gleich oder größer als die Länge des Abschnittes der Hülse ist, der aus der Zündkammer (9) heraus bewegt wird, wenn das abgefeuerte Geschoss (3) den Lauf (6) verlässt, wobei der Abschnitt ein massiver Bereich ist, der integral mit dem hohlen zylindrischen Körper ausgebildet ist.

2. Hülse nach Anspruch 1, **dadurch gekennzeichnet, dass** die Verstarkungsmittel einen ringförmigen Körper (8) aufweisen, der innerhalb der Hülse in den Abschnitt eingegossen ist.

Revendications

1. Douille (1a) pour balles d'armes à feu automatiques ou semi-automatiques ayant une culasse du type à inertie, comprenant un corps cylindrique creux qui est fermé, au niveau d'une première extrémité axiale, par une tête (2a) et qui reçoit une balle (3) au niveau deuxième extrémité axiale opposée, ladite tête étant muni en son centre d'une amorce (4) qui reçoit un amorceur, un canal étant défini entre l'amorce (4) et une cavité (5a) qui contient une charge de tir, au moins une partie de la douille extraite de la chambre de combustion lorsque la balle tirée quitte le barillet étant munie d'un moyen de renforcement, **caractérisée en ce qu'**une partie (7a) du corps de la douille (1a) mesurée en partant de la tête (2a) jusqu'à l'extrémité du canal a une longueur qui est au moins égal ou plus grande que la longueur de la partie de la douille qui est extraite de la chambre de combustion (9) lorsque la balle tirée (3) quitte le barillet (6), ladite partie étant une région solide et ne faisant qu'un avec le corps cylindrique creux.

2. Douille selon la revendication 1, **caractérisée en ce que** ledit moyen de renforcement comprend un corps annulaire (8) moulé à l'intérieur de la douille au niveau de ladite partie.

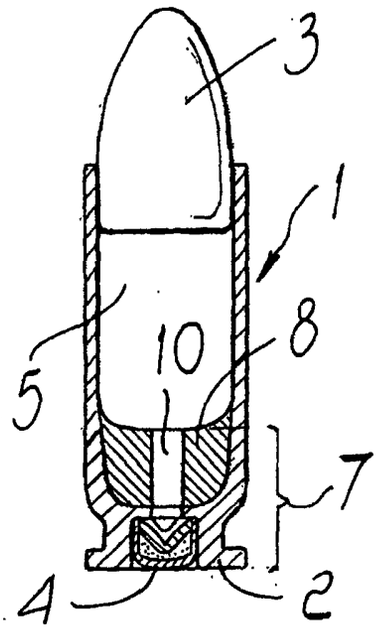

Fig. 1

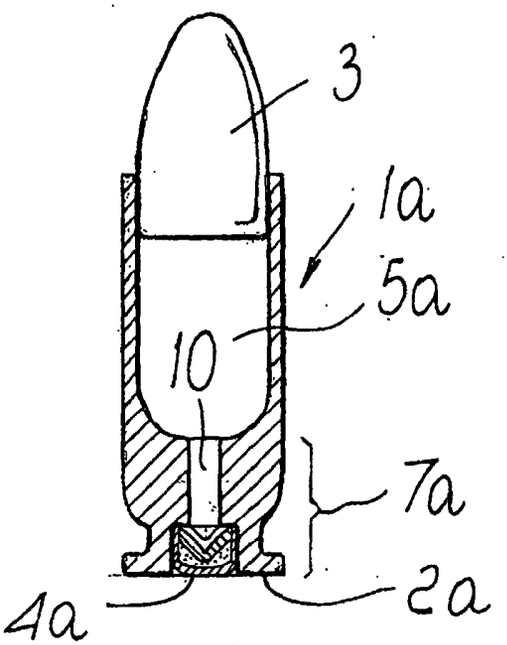

Fig. 2

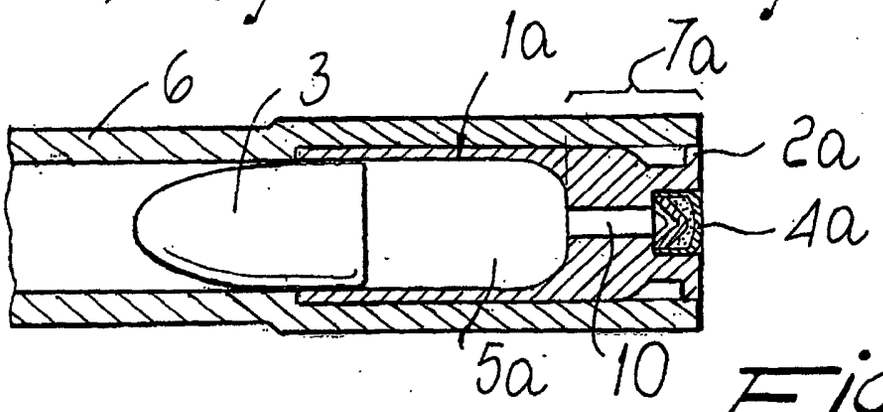

Fig. 3

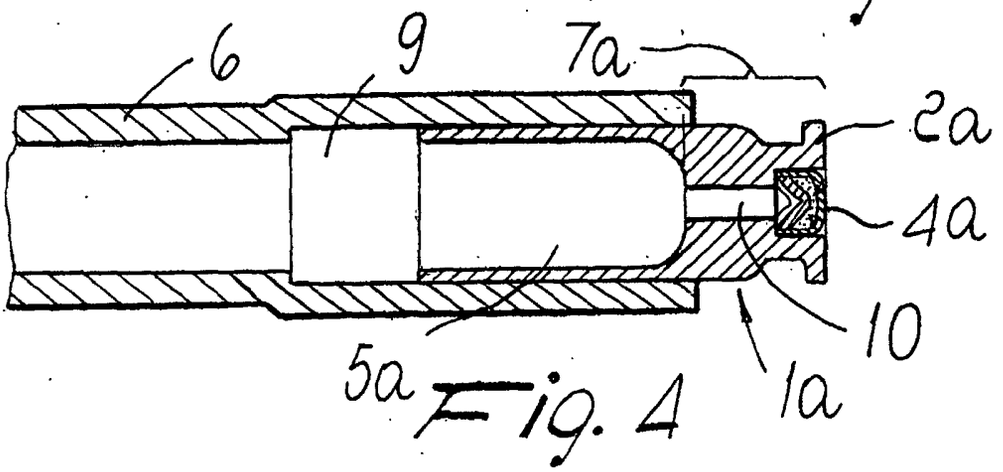

Fig. 4