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(54) **Shot cartridge.**

(57) A shot cartridge comprises a cartridge-case, a cap, a powder charge (1, 3) and a shot charge (5), a wad (4) and a shot concentrator. The powder charge (1, 3) is divided by a diaphragm (2) with a hole, the diaphragm (2) being placed so that the mass of the powder charge part (1) distal from the shot charge (5) is higher than the mass of the powder charge part (3) close to the shot charge (5). The shot concentrator is made as a container (6).

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The present invention relates to shot cartridges, and preferably to updating sporting shot-gun cartridges.

The most important aim of improving sporting shot-gun cartridges is to increase the shot muzzle velocity which makes it possible to use steel shots instead of lead ones. Besides the economical advantages, ecological problems are also solved; this sporting shot-gun ammunition does not contain toxic lead. At the same time, increasing the powder charge would mean increased gas pressure in the shot-gun barrel which poses a certain danger; also the steel shots must be isolated from the barrel surface as they move through the barrel.

It is an object of the present invention to provide a shot cartridge which is better suitable for steel shots, without incurring their known disadvantages.

This object is settled by the feature given in claim 1. Advantageous developments may be taken from the subclaims.

According to the invention, the powder charge mass or part not adjacent to the shot charge is higher than the mass or part of the powder charge adjacent to the shot charge. Both powder charge parts are separated from each other with a diaphragm with at least one hole. Preferably, the relation between these two powder charge part masses is 2 to 1. It is sufficient to maintain this relation with an accuracy of ± 0.2 or 20 %. With this ratio, the required shot muzzle velocity is achieved such that steel shots may be used instead of lead ones. Correspondingly, the shot charge may be made from steel.

When both a bush forming a shot concentrator and the diaphragm are made from polyethylene, ecological advantages arise.

According to the embodiment shown in Fig. 1, the cartridge design divides a powder charge into two parts 1 and 3 using a polyethylene diaphragm 2 with a small diameter hole, thus ensuring a time delay for ignition of the charge's second part 3. As the first part of the powder charge 1 is ignited, the wad 4 and shot set, or shot container 6, and the charge's second part 3 are accelerated. During acceleration, the powder gases first heat and then ignite the second part of the powder charge 3 through the diaphragm hole 2. That is, the impulse of the powder charge pressure on the shot charge is increased without elevating the maximum breach piece pressure, and consequently, the velocity of the shot charge increases.

In order to prevent damage to the inner surface of the barrel due to the hard steel shot motion, use of a plastic container-concentrator is proposed. The plastic container-concentrator is made up of two bushes 7 and 8 cut along their full length over their generatrices and placed so that their cuts do not

coincide. In this case after leaving the barrel, the shot charge is freed of the container a short distance from the muzzle's end face.

A variant of the cartridge design shown in Fig. 2 consists of a shot container made as a sleeve 9. The open end of the sleeve 9 faces the powder charge, while the closed end is fitted with an asymmetrical cup 10. The container 6 leaving the barrel will begin to turn over under the aerodynamic moment effect and after turnover the steel shots leave the sleeve. The time of the container turn-over may be adjusted with the help of the asymmetric cup 10.

Since the steel shots 5 cover a large part of the trajectory in a container, a high velocity near the target is ensured and the close grouping of firing is increased.

Claims

1. Shot cartridge comprising a cartridge-case, a cap, a powder charge (1, 3) and a shot charge (5), a wad (4) and a shot concentrator, characterized in that the powder charge (1, 3) is divided by a diaphragm (2) with a hole, the diaphragm (2) being placed so that the mass of the powder charge part (1) distal from the shot charge (5) is higher than the mass of the powder charge part (3) close to the shot charge (5), and that the shot concentrator is made as a container (6).
2. Shot cartridge according to claim 1, characterized in that the mass of the part (1) adjacent to the cartridge-case bottom and the mass of the part (3) adjacent to the shot charge (5) are related to each other by a 2 to 1 ratio with accuracy of ± 0.2 .
3. Shot cartridge according to claim 1, characterized in that the shot concentrator container (6) comprises an obturating filler piece made as a disc, with symmetric cups attached to its ends, one of which is fitted with a filler piece, preferably made from pressboard, and two plastic bushes (7, 8) cut along their full length over their generatrices one bush (8) being tightly inserted into the other (7) so that their cuts do not coincide.
4. Shot cartridge according to claim 1, characterized in that the concentrator container (6) is made as a sleeve (9) whose open end faces the powder charge (1, 3) and bears against the wad (4), while its closed end is fitted with an asymmetric annular cup (10).

5. Shot cartridge according to claim 1, characterized in that the length of the asymmetric annular cup (10) is not less than 1/4 of the container (6) length.

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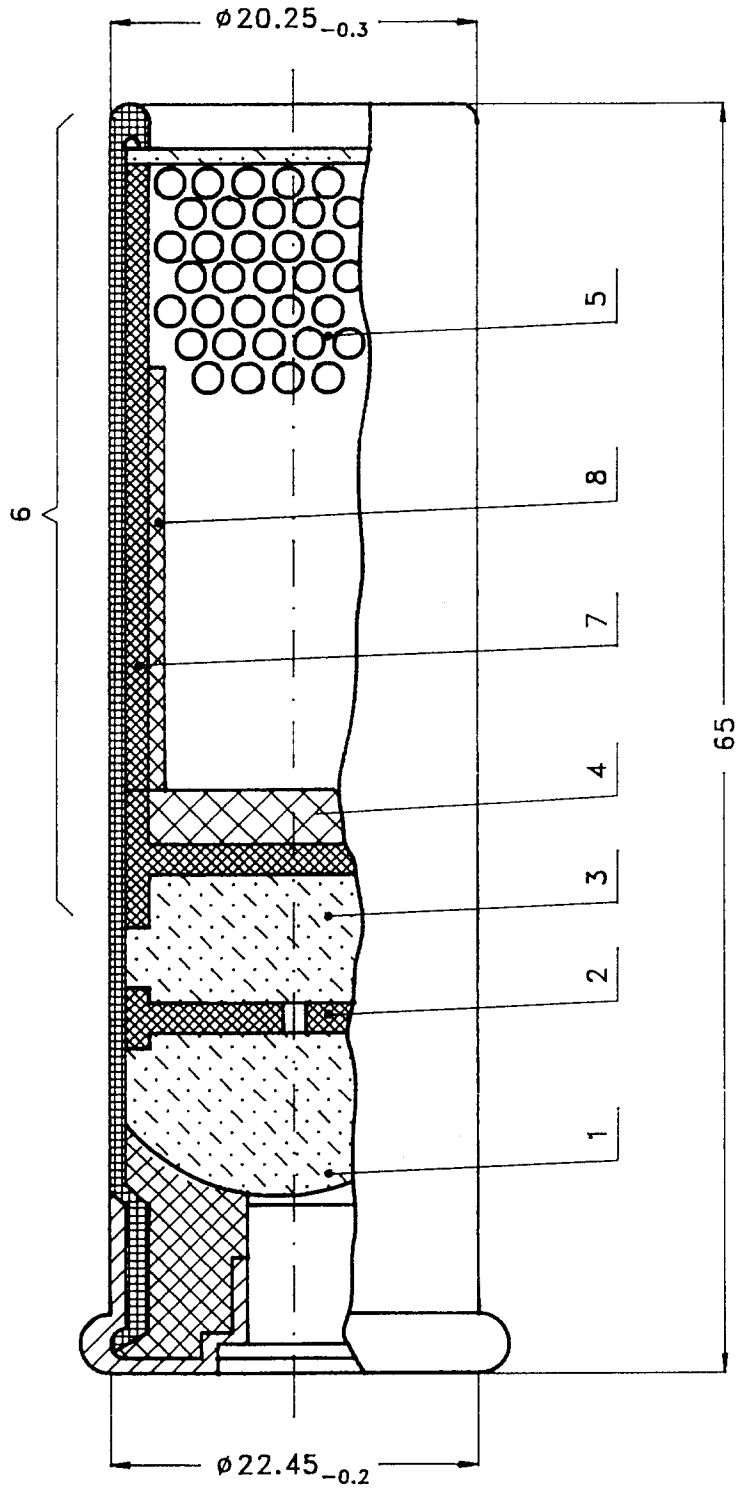


Figure 1

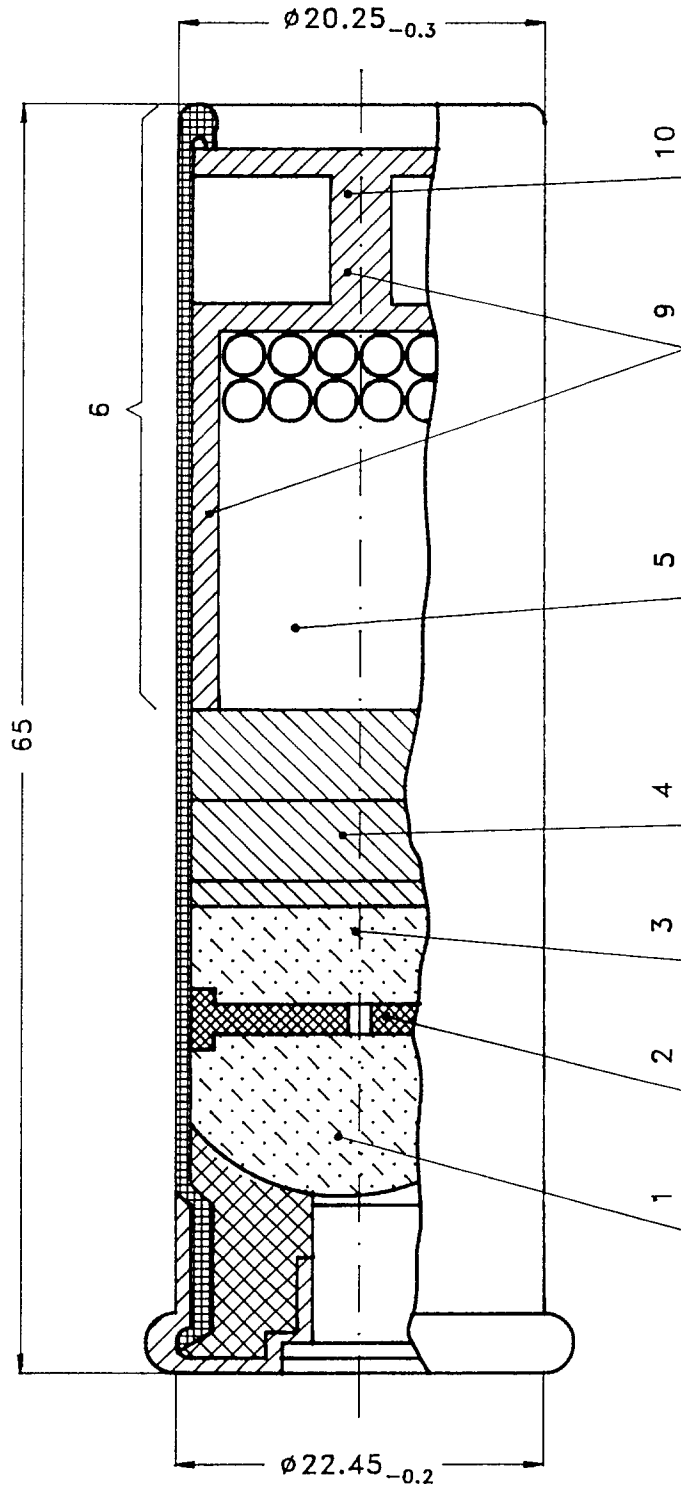


Figure 2



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EUROPEAN SEARCH REPORT

Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	US-A-3 724 378 (R. KNIGHT) * column 3, line 12 - column 6, line 29; figures 1-4 * ---	1-5	F42B7/04 F42B5/16
Y	GB-A-1 273 208 (ARAMA S.A.) * page 1, line 66 - line 74; figure 3 * * page 3, line 124 - page 5, line 20; figures 7-12 * * page 6, line 16-20; figure 17 * * page 6, line 27 - line 66; figures 19-23 * ---	1-5	
Y	US-A-3 721 194 (C. WESTON) * column 3, line 45-59; figures 4,5 * ---	3	
Y	FR-A-1 526 972 (M. PIEGAY) * page 2, left column, last paragraph - right column, paragraph 1; figures 1,2 * ---	4,5	
Y	US-A-3 648 616 (YUNG SHING HSU) * column 3, line 16 - line 24; figure 6 * ---	1,2	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
Y	DE-U-84 22 731 (DIEHL GMBH) * page 2, line 4-29; figures 1,6 * * page 4, line 1-22 * ---	1,2	F42B
A	FR-A-1 255 993 (A. THOUIN) * figures 1-4 * ---	1,2	
A	FR-A-367 414 (W. SCHWARZLOSE) * the whole document * ---	1,2	
A	FR-A-1 210 609 (ACTIVA IBERA) * figures 1,2 * ---	1,2	
A	FR-A-2 063 728 (PIEGAY) * figures 4,9,10 * ---	4,5	
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 1 February 1994	Examiner Van der Plas, J
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			



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Application Number
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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	GB-A-Q01431 (B. FARGAS DE CASANOVAS) &GB-A-01431 A.D. 1915 ---		
A	US-A-3 507 220 (C. MCCLURE) -----		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 1 February 1994	Examiner Van der Plas, J
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			