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(54) **PLASTIC CARTRIDGE CASE AND DEVICE FOR THE PRODUCTION THEREOF**

(57) The present invention generally relates to small arms technology and, more particularly, is concerned with hunting and sporting cartridges having plastic cases.

The objective of the invention is increasing of the ballistic data and structural strength of the product with low price of its manufacturing:

This problem is solved by supplying of the plastic cartridge case in the shape of thin-walled cup of cylindrical external surface and internal surface comprising three conical portions of length and taper increasing from the bottom having the opening for the primer with a dam-diaphragm separating the cartridge case part

and the part for the primer installation. The dam-diaphragm thickness is selected within the range of 0,2 - 0,5 mm.

The device for manufacturing of the plastic cartridge case contains a mold performed of a matrix forming the external surface of the cartridge case, a halfmatrix with conical casting opening which forms the cup bottom and a punch forming the internal surface of the cartridge case. On the halfmatrix is a cylindrical hollow pin forming a closed primer opening. The cylindrical hollow pin together with the punch form a ring sprue.

EP 1 388 726 A1

Description

[0001] The present invention generally relates to small arms technology and, more particularly, is concerned with hunting and sporting cartridges with plastic cases.

[0002] There are known plastic cases for sporting and hunting cartridges in the shape of thin-walled cup of cylindrical external surface and with opening at the bottom for primer (Patent UK 1161422, F 42B 5/30, published in 1969).

[0003] Known from this source device for manufacturing of plastic cartridge case composes of a mold and a distribution block with casting openings.

[0004] The main drawback of the existing case is its low structural strength - the case breaks down during shooting. Internal surface geometry of the case and its processing technique do not provide structural strength because of casting defects.

[0005] These defects are not peculiar to the existing plastic cartridge case with internal surface comprising three conical portions of length and taper increasing from the bottom (Certificate for useful model RU 11882, F 42 B 5/30, 1999 - closest analog). The device for manufacturing of the case is described in this source.

[0006] The drawback of the existing case is penetration of powder corpuscles into the primer during the filling of the cartridge resulting in failure of ignition and cartridge parameters spread.

[0007] The drawback of the device for manufacturing of the case is that the cylindrical pin is arranged on the punch what leads to declination from axis during the casting of matrix by working mass resulting in the case geometry failure and reduction of structural strength.

[0008] The objective of the invention is increasing of the ballistic data and structural strength of the product with low price of its manufacturing.

[0009] This problem is solved by additional supplying of the plastic cartridge case in the shape of thin-walled cup of cylindrical external surface and internal surface comprising three conical portions of length and taper increasing from the bottom having the opening for the primer with a dam-diaphragm separating the cartridge case part and the part for the primer installation. The dam-diaphragm thickness is selected within the range of 0,2 - 0,5 mm.

[0010] The device for manufacturing of the plastic cartridge case contains a mold performed of a matrix forming the external surface of the cartridge case, a halfmatrix with a conical casting opening which forms the cup bottom and a punch forming the internal surface of the cartridge case. On the halfmatrix is a cylindrical hollow pin forming a closed primer opening. The cylindrical hollow pin together with punch form a ring sprue.

[0011] The longitudinal section of the cartridge case is shown on picture 1 and section of the device for manufacturing of the plastic cartridge case is shown on picture 2.

[0012] The cartridge case is shaped as the cup I with internal surface 2 comprising three conical portions.

[0013] At the bottom 3 is the primer opening 4. Inside of the cup (around the opening 4) there is a compensation groove 5. A recess 6 performed concentrically with the opening 4 on the outside surface of the bottom 3.

[0014] The cup (cartridge case) part and part for the primer installation is divided by the dam-diaphragm 7.

[0015] The device for manufacturing of the plastic cartridge case consists of the matrix 8, the halfmatrix 9 and the punch 10. Made on the halfmatrix the cylindrical hollow pin 11 forms the closed primer opening. The ring sprue 12 is between the surface of the pin 11 and the surface of the punch 10.

[0016] The manufacturing process of the cartridge case is as follows:

[0017] The plastic mass is supplied from the distribution block (not shown on the picture) into the cylindrical opening of the halfmatrix 9, then through the pin 11 and the ring sprue 12 penetrates into the mold filling full its space uniformly excluding appearance of defects. After taking the finished cartridge case out of the mold, unnecessary part of pour is removed leaving the dam between the parts of the cartridge case.

[0018] The cartridge case manufactured according to this method has the following advantages.

[0019] The cartridge case has improved structural strength characteristics. Division of the cartridge case parts: the primer part and the combustion part results in-improvement of ballistic characteristics of the cartridge case due to exclusion of powder charge effect on burning intensity of the primer and ignition process improvement.

[0020] Proceeding from the tests the thickness of the dam-diaphragm should be selected within the range of 0,2 - 0,5 mm. The described cartridge case has improved structural strength characteristics, low manufacturing price, shorter range of spread of filled cartridge parameters of powder charge pressure and shot speed.

Claims

1. The plastic cartridge case, performed in the shape of thin-walled cup of cylindrical external surface and internal surface performed of three conical portions of length and taper increasing from the bottom with the opening for the primer, is notable for the dam-diaphragm of 0,2 - 0,5 thickness separating the cartridge case part and the part for the primer installation.
2. The device for the plastic cartridge case manufacturing, contained the mold performed of the matrix forming the external surface of the cartridge case, the halfmatrix with conical casting opening which forms the cup bottom and the punch forming the internal surface of cartridge case, is notable for car-

ried out on the halfmatrix hollow pin, forming the closed primer opening and, together with the punch forming the ring sprue.

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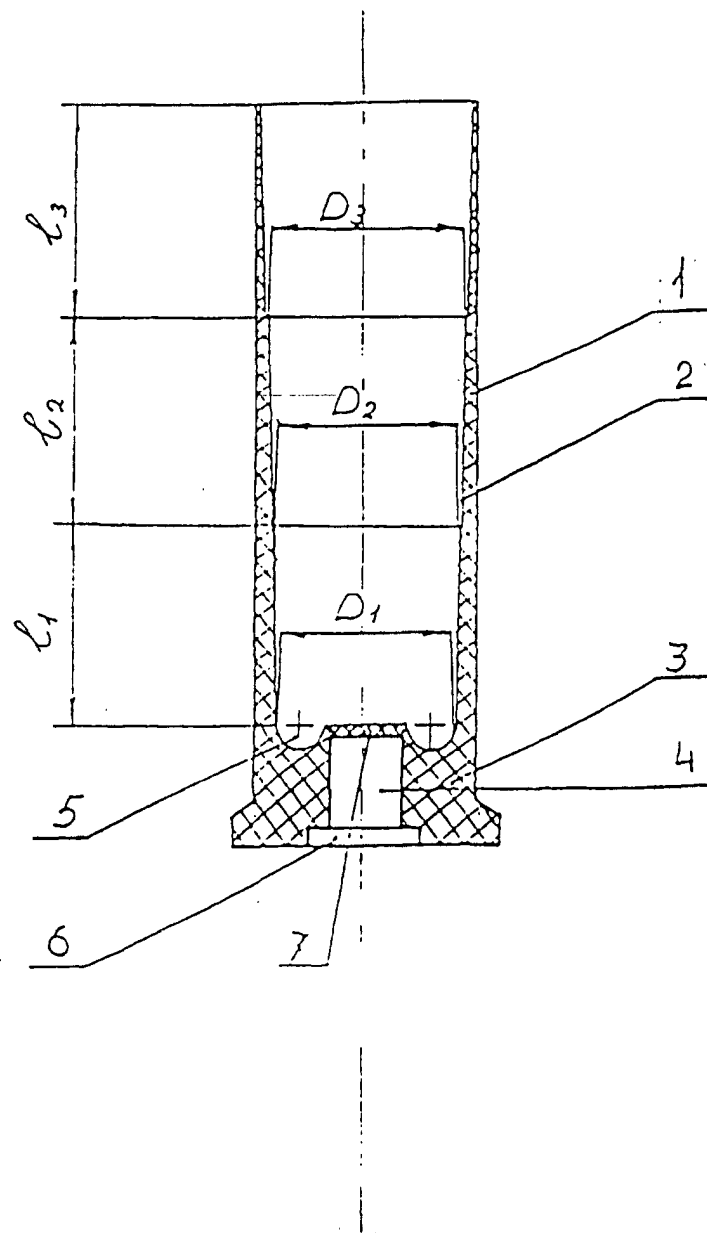


Fig.1

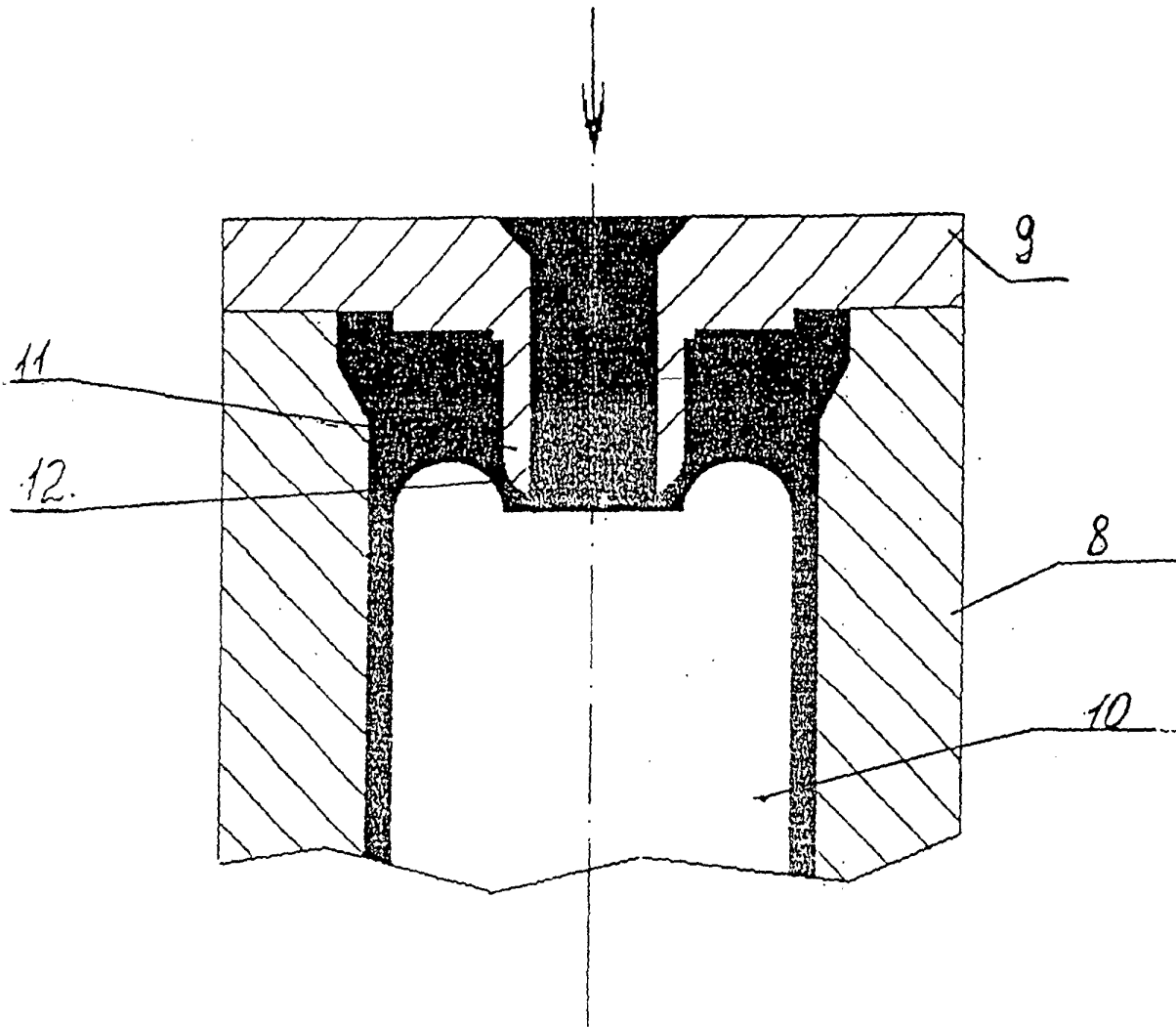


Fig. 2

INTERNATIONAL SEARCH REPORT

International application No.

PCT/RU 02/00232

A. CLASSIFICATION OF SUBJECT MATTER		
F42B 5/30, 7/06		
According to International Patent Classification (IPC) or to both national classification and IPC 7		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) IPC 7		
F42B 5/00, 5/02, 5/26-5/36, 7/00, 7/02, 7/06		
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 11882 U1 (KHVICHYA GEORGY EDUARDOVICH et al) 16.11.1999	1-2
A	US 3477374 A (I.R. BARR) Nov. 11, 1969	1-2
A	US 3559581 A (BLANICKE STROJIRNY NARODNI PODNIK VLASIM) Feb. 2, 1971	1-2
A	US 4867066 A (OLIN CORPORATION) Sep. 19, 1989	1
A	DE 2327947 A (DYNAMIT NOBEL AG) 1974-12-19	1
☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "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 20 September 2002 (20.09.2002)		Date of mailing of the international search report 26 September 2002 (26.09.2002)
Name and mailing address of the ISA/ Facsimile No.		Authorized officer A. Гвоздилов Telephone No.