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(54) Bolt for firearms

(57) An obturator (100) for firearms comprises: a structure (101); a closing head (102), in particular a rotary one, arranged at an end (103) of the cylindrical structure (101); at least a resting surface (104) defined on the closing head (102) to engage the bottom (F) of at least one cartridge (C); at least one through channel (105) extending longitudinally through the cylindrical structure (101) for operatively engaging at least one striker of the firearm. The obturator comprises deformation means (108) associated with the closing head (102) to at least partially deform a firing capsule (109) and/or a bottom of a cartridge (C) loaded on the firearm.

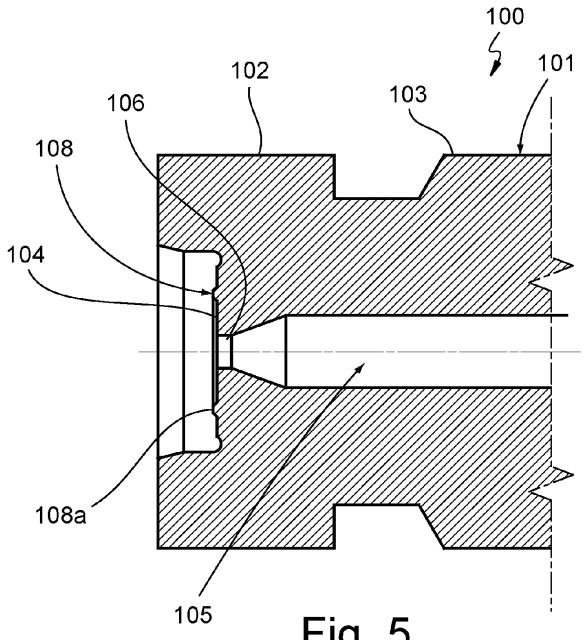

Fig. 5

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Description

[0001] The present invention refers to an obturator for firearms.

[0002] The object of the present invention concerns the field of firearms, like for example pistols, rifles, machine guns and/or similar automatic weapons.

[0003] As known, automatic weapons are provided with at least one obturator that has the purpose of closing the breech and withstanding the expansion force of the gases generated by the detonation of the cartridges. Amongst the various types of obturators that exist, it is possible to identify blowback action or recoil operated obturators and obturators with geometric closure or with stable closure.

[0004] Amongst obturators with geometric closure, the mechanical constraint between the barrel and the slide is ensured by various systems, like for example the Browning system, the Walter system, the Steyr system, the roller system and the rotary obturator system where the head of the obturator, generally equipped with suitable closing tabs, inserts, with a rotational movement, inside the breech block-barrel.

[0005] As can be seen in the attached figures 1a to 1c, an example of a known rotary obturator 1 is schematically represented simplified and in the structure for reasons of clarity.

[0006] In detail, the obturator 1 has a substantially cylindrical structure 2 able to be operatively arranged in a slide (not represented) which carries the obturator of a firearm (also not illustrated).

[0007] The structure 2 has an end 2a provided with a closing head 3 of the rotary type suitable for closing the breech of the respective firearm.

[0008] The closing head 3 defines a resting surface 4 suitable for engaging the bottom of at least one cartridge (not illustrated in figures 1a to 1c) coming from a respective magazine of the respective firearm.

[0009] The resting surface 4 is substantially flat to abut against the bottom of the cartridge.

[0010] As can be seen in figures 1b and 1c, the obturator 1 has at least one through channel 5 extending longitudinally through the cylindrical structure 2 thereof. The through channel 5 is arranged to operatively house a respective striker (not illustrated) of the respective firearm. The through channel 5, at the resting surface 4 of the closing head 3, has at least one opening 6, through which it is free to act directly on the firing capsule of the respective cartridge to cause it to detonate.

[0011] Although the aforementioned obturators carry out their operative functions in a satisfactory manner, the Applicant has realised that they can be improved, in some aspects, mainly in relation to the use of defective cartridges, to the correct operation of the firearm with which they are associated as well as to the pressure that is generated following the detonation of defective cartridges.

[0012] In particular, the Applicant has realised that, among the various cartridges on the market, there are defective cartridges the detonation of which causes unwanted structural yielding at the firing capsules.

[0013] In detail, such cartridges are subject to partial or complete detachment of the firing capsule relative to the bottom, for which reason the expulsion of the respective cases is inevitably compromised by an anomalous geometry thereof.

[0014] The aforementioned drawback involves a series of further more or less serious problems, which generally cause the firearm to jam.

[0015] The main purpose of the present invention is to provide an obturator for firearms, capable of solving the problems encountered in the prior art, i.e.

an obturator capable of avoiding and making up for structural yielding of defective and/or structurally weak cartridges.

[0016] Another purpose of the present invention is to provide an obturator that ensures the correct operation of the respective firearm in the presence of detonations of defective cartridges.

[0017] The purposes specified above, and yet others, are substantially accomplished by an obturator for firearms, as expressed and described in the following claims.

[0018] Now, as an example, it is provided a description of a preferred but not exclusive embodiment of an obturator for firearms, in accordance with the present invention.

[0019] Such a description will be made hereafter with reference to the attached drawings, provided for indicating and therefore not limiting purposes, in which:

figure 1a is a simplified schematic view of a known obturator;
figure 1b is a simplified schematic section of the known obturator illustrated in the previous figure;
figure 1c is an enlarged detail in section of the known obturator represented in the previous figures;
figure 2 is a schematic and simplified perspective representation of an obturator in accordance with the present invention,
figure 3 is an elevation view of the obturator according to the previous figure;
figure 4 is a longitudinal section of the obturator carried out along the line IV-IV of the previous figure;
figure 5 is an enlarged detail in section of the obturator represented in the previous figure;
figure 6 is an interrupted elevation view of the obturator according to figures 2 to 5 engaged with a breech of a barrel of a firearm;
figure 7 is a schematic representation in section carried out along the line VII-VII of figure 6, of the obturator according to figures 2 to 7, before the detonation of the cartridge;
figure 8 is a further enlarged schematic representation in section of the obturator and of the cartridge according to figure 7, represented in deformation

condition of the firing capsule and/or of the bottom of the ammunition following detonation of the cartridge.

[0020] With reference to figures 2 to 8, reference numeral 100 wholly indicates an obturator for firearms, in accordance with the present invention.

[0021] As can be seen in figures 2 to 8, the obturator 100 comprises a substantially cylindrical structure 101 able to be operatively arranged in a slide (not illustrated) which carries the obturator 100 of an automatic or semi-automatic firearm (not represented). As can be seen in figures 2, 4, 5, 7 and 8, the obturator 100 has a closing head 102, in particular a rotary one, arranged at an end 103 of the cylindrical structure 101.

[0022] Again with reference to figures 2 to 5, 7 and 8, the closing head 102 has at least a resting surface 104 suitable for engaging a bottom F (figures 7 and 8) of at least one cartridge C (figures 7 and 8) to be detonated.

[0023] In order to receive, in engagement, a striker (not represented as it is known) of the respective firearm with which the obturator 100 is associated, the latter has at least one through channel 105 (figures 2, 4, 5, 7 and 8) extending longitudinally through its cylindrical structure 101.

[0024] As can be seen in figures 2, 4, 5, 7 and 8, the through channel 105 extends, substantially axially, from one side of the structure 101 of the obturator 100 to the other so as to open out, at the resting surface 104, with at least one opening 106. The opening 106 is positioned in the centre of the resting surface 104 so as to correspond to at least one central area of a firing capsule 109 (schematically illustrated in figures 7 and 8) located on the bottom F of the loaded cartridge C.

[0025] Advantageously, as can be seen in figures 2, 4, 5, 7 and 8, the obturator 1 comprises deformation means 108 associated with the closing head 102 so as to at least partially deform the seat of the firing capsule 109 of the cartridge C.

[0026] In particular, the high internal pressures, generated by the detonation of the cartridge C, determine a force between the resting surface of the bottom of the ammunition and the obturator 100 causing a deformation of the bottom and/or of the firing capsule of the ammunition. In other words, the pressures generated by the detonation of the cartridge C compress the ammunition C against the deformation means 108 of the obturator 100 deforming the bottom and/or the firing capsule of the ammunition so as to keep the latter together with the cartridge C. The engagement of the firing capsule 109 with the cartridge C, obtained by means of the deformation of the bottom and/or of the firing capsule 109 at the firing seat of the cartridge C, prevents the firing capsule 109 from disengaging from the cartridge C during and after detonation. Therefore, the action of the striker cannot in any way pull away and detach the structure of the firing capsule 109 from the respective seat, for which reason the firing capsule 109 stays engaged with the bottom F. Advantageously, the deformation means 108 are arranged at the resting surface 104 of the closing head 102. Preferably, the deformation means 108 comprise at least one surface relief 108a that projects from the resting surface 104 of the closing head 102.

[0027] The surface relief 108a extends on the resting surface 104 of the closing head 102 according to a ring-shaped development.

[0028] Advantageously, the surface relief 108a substantially surrounds the opening 106 of the through channel 105, as can be seen in figure 2. Preferably, the surface relief 108a extends according to a substantially circular development to deform a respective area of the firing capsule seat 109.

[0029] As can be seen in figures 5, 7 and 8, the surface relief 108a has a profile, along a section plane that extends longitudinally with respect to the cylindrical structure 101, tapering away from the resting surface 104 of the closing head 102 for which reason, following the impact between the surface relief 108a and the cartridge C, the deformation of the bottom and/or of the firing capsule 109 at the firing seat is facilitated and improved by the shape of the relief 108a.

[0030] The obturator according to the present invention solves the problems met in the prior art and achieves important advantages.

[0031] Firstly, the obturator described above deals with the structural yielding of defective cartridges.

[0032] In particular, the presence of the surface relief of the resting surface of the closing head permits, after an impact between the latter and the defective cartridge, the deformation of the firing capsule and/or of the bottom that fixes the position of the firing capsule in the respective firing seat of the cartridge, preventing the deflagration forces from being able to pull away and disengage the firing capsule from the bottom. In this way, every firing capsule of each cartridge loaded, be it defective or structurally weak, is locked on the bottom in its predetermined position without interfering with the correct operation of the cartridge and of the firearm.

[0033] Of course, the fixing of the firing capsule to the cartridge brings a series of big advantages.

[0034] Firstly, the cases of defective cartridges do not suffer damage following detonation. Secondarily, the cases can be expelled in the correct manner, avoiding jamming of the respective firearm used.

Claims

1. Obturator (100), for firearms comprising:

   a structure (101);
   a closing head (102), arranged at an end (103) of said cylindrical structure (101);
   at least a resting surface (104) defined on said closing head (102), said resting surface (104) being adapted to engage the bottom (F) of at

least one cartridge (C),
at least one through channel (105) developing longitudinally through said cylindrical structure (101) for operatively engaging at least one striker of said firearm, said through channel (105) having, at said resting surface (104) of said closing head (102) at least one opening (106),

characterised in that it comprises deformation means (108) associated to said closing head (102) adapted to deform, at least partially, the bottom and/or the firing capsule of said cartridge (C).

2. Obturator according to claim 1, wherein said deformation means (108) are arranged at said resting surface (104) of said closing head (102).

3. Obturator according to claim 2, wherein said deformation means (108) comprise at least a surface relief (108a) projecting from said resting surface (104) of said closing head (102).

4. Obturator according to claim 3, wherein said surface relief (108a) extends, on said resting surface (104) of said closing head (102) according to a ring-shaped development.

5. Obturator according to claim 3 or 4, wherein said surface relief (108a) substantially surrounds said opening (106) of said through channel (105).

6. Obturator according to one or more of claims from 3 to 5, wherein said surface relief (108a) extends according to a substantially circular development.

7. Obturator according to one or more of claims 3 to 6, wherein said surface relief (108a) has a profile, along a section plane extending longitudinally with respect to said cylindrical structure (101), tapering away from said resting surface (104) of said closing head (102).

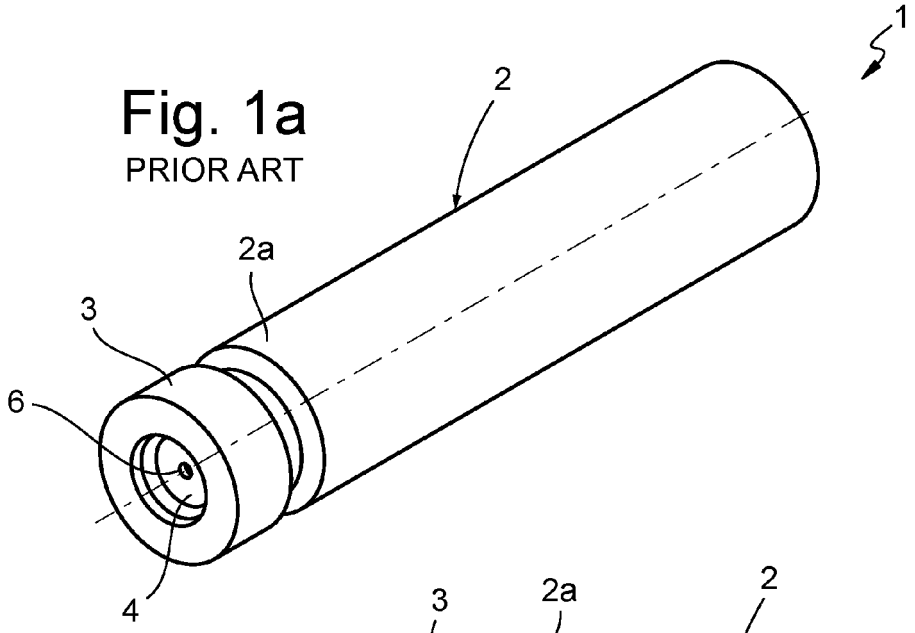


Fig. 1a
PRIOR ART

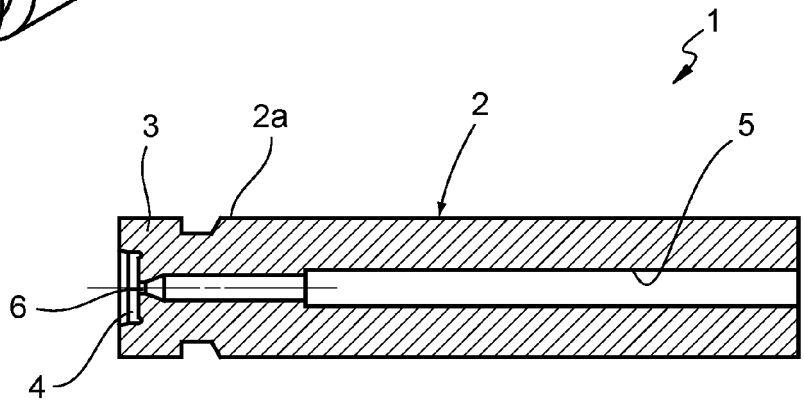


Fig. 1b
PRIOR ART

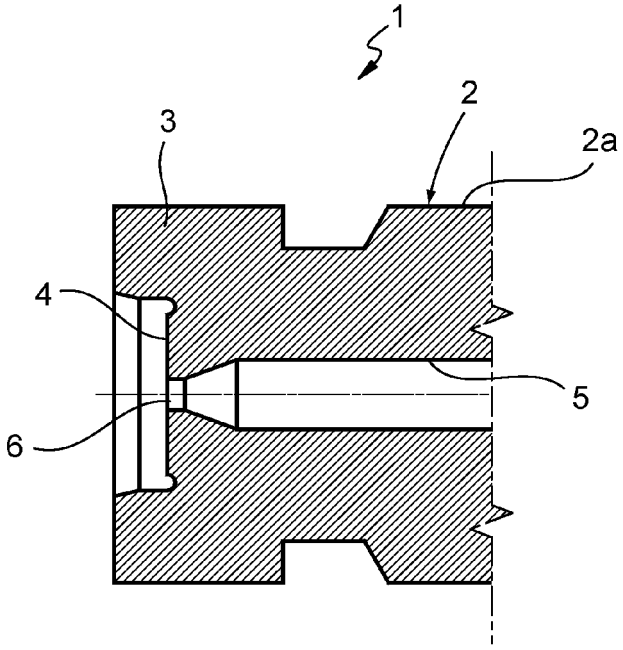
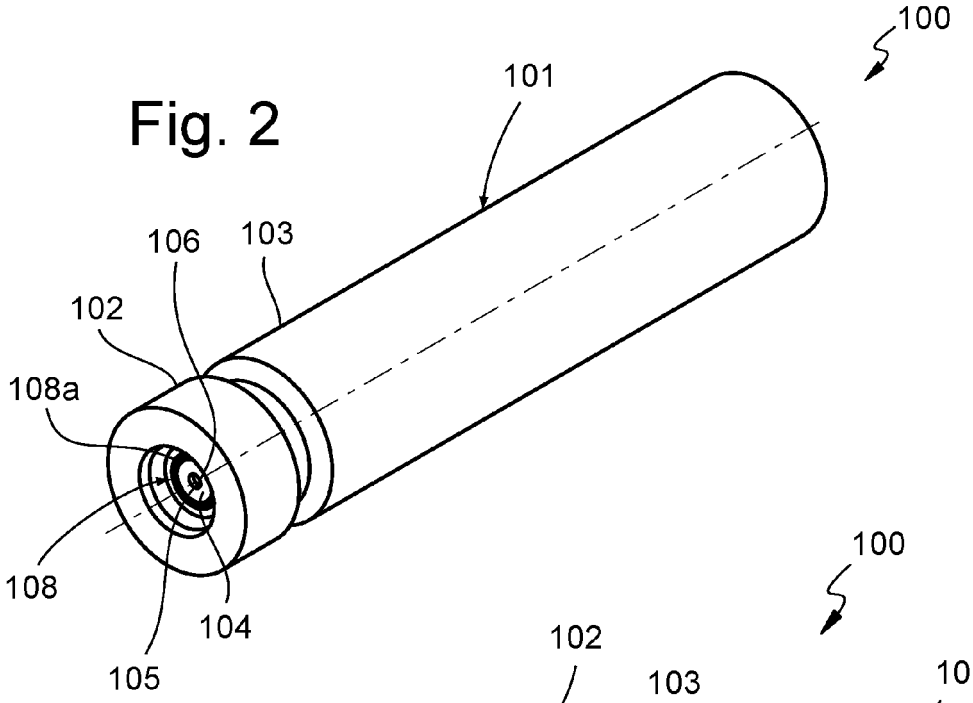


Fig. 1c
PRIOR ART

Fig. 2



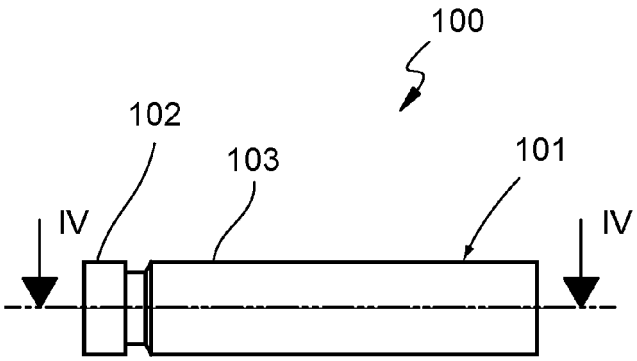


Fig. 3

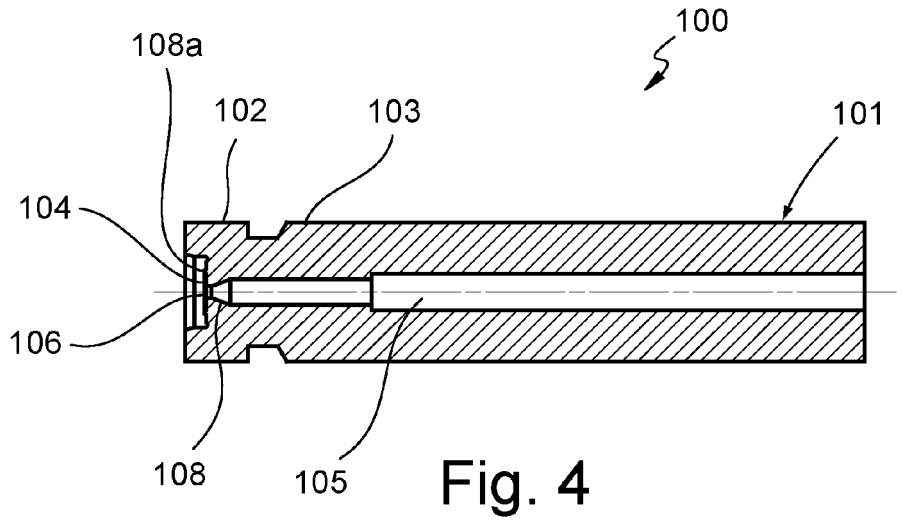


Fig. 4

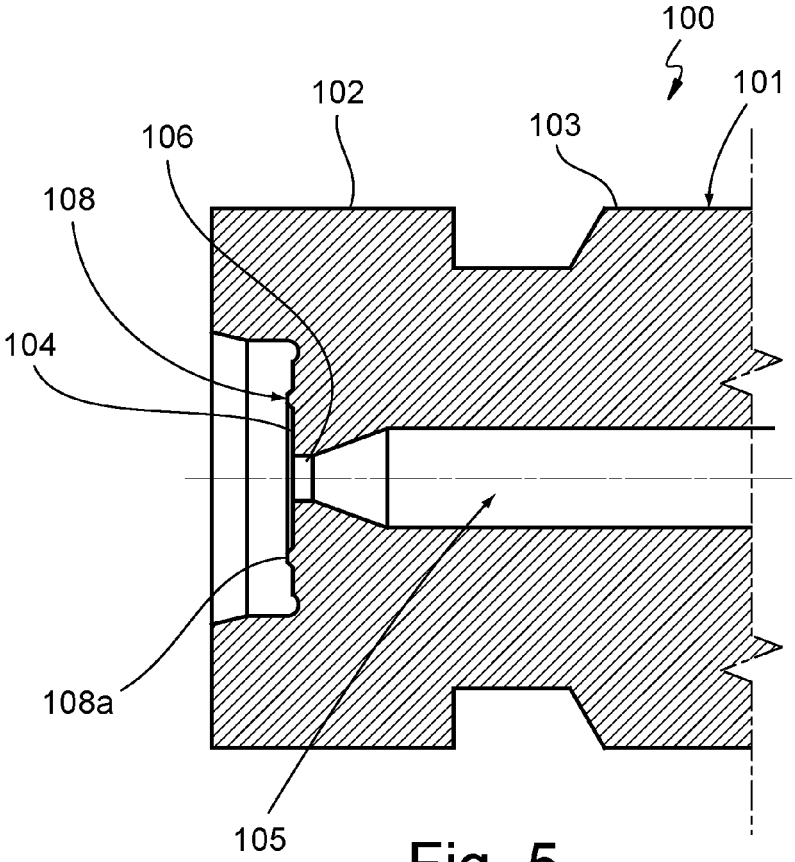


Fig. 5

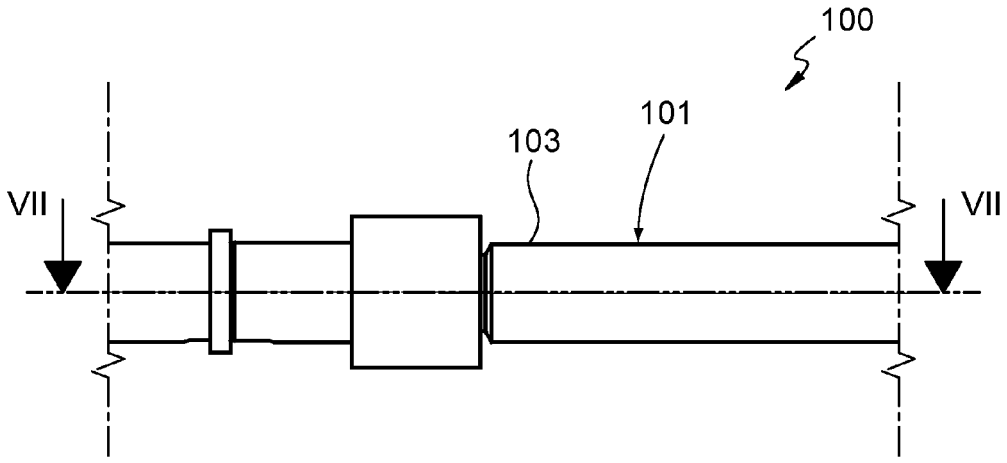


Fig. 6

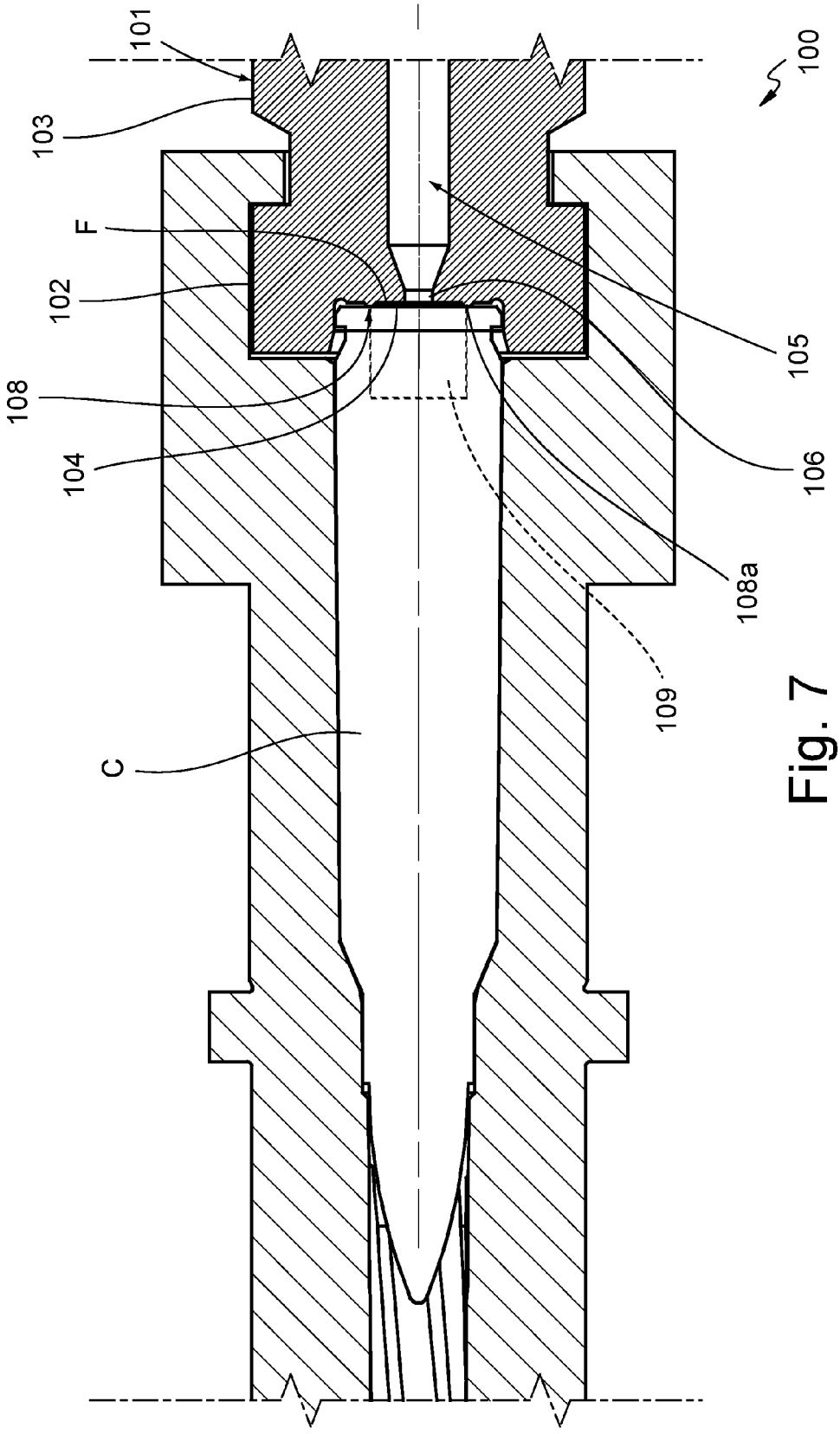


Fig. 7

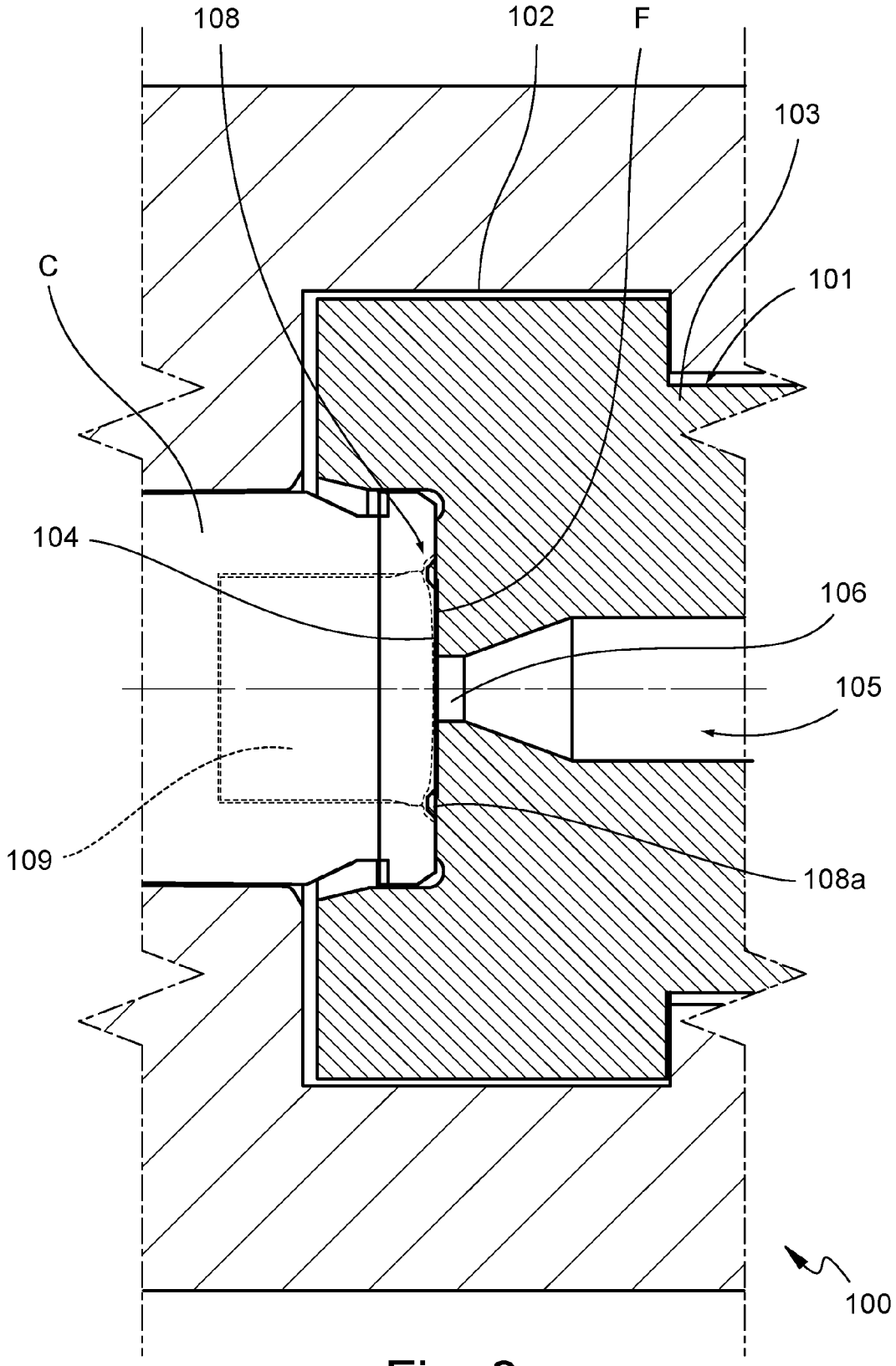


Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 11 19 5290

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	DE 15 78 388 A1 (HECKLER & KOCH GMBH) 25 March 1971 (1971-03-25) * page 2, line 1 - page 4, line 8 * * page 7, line 4 - page 8, line 16 * * page 9, lines 1-5 * * figures 1, 2 * -----	1-7	INV. F41A3/12 ADD. F41A3/26
X	US 6 612 063 B1 (SIGG HANS-PETER [DE]) 2 September 2003 (2003-09-02) * column 1, lines 14-16, 29-42 * * column 3, lines 31-34 * * column 4, lines 6-8 * -----	1-7	
A	US 4 653 210 A (POFF JR CHARLES R [US]) 31 March 1987 (1987-03-31) * figures 1, 5, 6, 10 * -----	1	
			TECHNICAL FIELDS SEARCHED (IPC) F41A

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	17 September 2012	Van Leeuwen, Erik

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 11 19 5290

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
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17-09-2012

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82