

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
24 March 2011 (24.03.2011)

(10) International Publication Number
WO 2011/032524 A1

- (51) **International Patent Classification:**
F41A 3/58 (2006.01) *F41A 35/06* (2006.01)
F41A 9/45 (2006.01)
- (21) **International Application Number:**
PCT/CZ2010/000100
- (22) **International Filing Date:**
9 September 2010 (09.09.2010)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
PV 2009-606 15 September 2009 (15.09.2009) CZ
- (71) **Applicant (for all designated States except US):** **CESKA ZBROJOVKA A.S.** [CZ/CZ]; Svatopluka Cecha 1283, 688 27 Uhersky Brod (CZ).
- (72) **Inventors; and**
- (75) **Inventors/Applicants (for US only):** **KRUTIL, Josef** [CZ/CZ]; Okruzni 631, 285 22 Zruc nad Sazavou (CZ). **SIMEK Vladimir** [CZ/CZ]; Sidliste 2, 789 83 Lostice (CZ).
- (74) **Agents:** **HAINZ, Miloslav** et al.; Rott, Ruzicka & Guttman, Vinohradská 37, 120 00 Praha 2 (CZ).
- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) **Designated States (unless otherwise indicated, for every kind of regional protection available):** ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— with international search report (Art. 21(3))
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(54) **Title:** A FIREARM WITH A TILTING BARREL

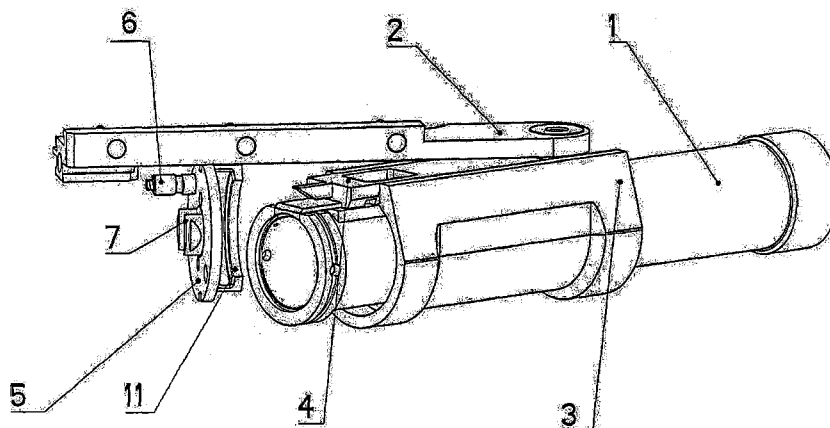


fig. 2

(57) **Abstract:** A firearm with a tilting barrel (1) with the possibility of setting a change of the tilting direction of the barrel (1) containing a breech block (5) for securing the barrel, the breech block containing on a part of its perimeter a locking surface (11) for securing the firearm against its tilting in the direction opposite the locking surface (11). The locking surface (11) can be rotated around the longitudinal axis of the breech block (5) for setting of the change of the tilting direction of the barrel (1).

WO 2011/032524 A1

A firearm with a tilting barrel

Field of invention

The invention deals with a firearm, e.g. a grenade launcher, with a tilting barrel.

Background of the Invention

Firearms are known that have a barrel that can be tilted to a side, especially grenade launchers.

A disadvantage of most of these weapons is that the barrel can only be tilted to one side.

Weapons that offer the possibility of changing the barrel tilting direction require tools and at least disassembly of some parts of the weapon for the execution of such a change. This is e.g. the case of weapons sold under the AG-C/EGLM name made by Heckler-Koch, EAGLE by Colt Canada, etc.

In the case of the AG-C/EGLM weapon made by the Heckler-Koch company, the design of which is described in the patent no. DE 10 2005 016 594 A1, the change of the tilting side requires disassembly of the whole barrel. For this certain time and tools or special instruments are necessary. Our invention eliminates this need as it allows to change the tilting side without using any tools or special instruments. The EAGLE grenade launcher made by Colt Canada, described in the patent no. CA 2 521 935 A1, exhibits a similar problem.

The disadvantage of the necessity to use special tools is eliminated e.g. by the MK-13 grenade launcher in the SCAR

project of the FNH USA company, but this firearm is opened by being extended forward in the shooting direction, which means that the barrel is removed from the gunner and that the loading is less comfortable as compared to tilting systems.

The goal of the invention is to eliminate the above mentioned disadvantages of firearms with a tilting barrel in the prior art while a weapon based on the invention will make it possible to change the tilting direction of the barrel easily without the necessity to use tools or special instrument or to disassemble a part of the barrel.

Summary of the Invention

The above mentioned goals of the invention are achieved with a firearm with a tilting barrel in accordance with the invention containing a breech block for securing the barrel with the possibility of changing the barrel tilting direction, the principle of which is that the breech block contains on a part of its perimeter a locking surface for locking the barrel against its tilting in the direction opposite the locking surface, the locking surface being rotatable around the longitudinal axis of the breech block for the purpose of setting the change of the tilting direction.

Such a firearm advantageously contains a forend that is firmly connected to the pawl and is removable in the shooting direction from the rear position, in which the pawl fits into a recess in the breech block and the firearm is thus in the locked condition, to the front position, in which the pawl is disengaged from the recess and the firearm is in the unlocked condition, and back against the shooting direction. The pawl in the position in which it fits into the recess may

advantageously secure the locking surface in its angular position against its rotation around the longitudinal axis of the breech block at the same time.

The breech block advantageously contains a securing means used to secure the locking surface in its angular position against its rotation around the longitudinal axis of the breech block and if the weapon is to be readjusted to the other barrel tilting direction, to release the locking surface to enable its angular rotation to the required position and subsequent locking in this position. The pawl for locking the angular position of the locking surface may advantageously act as the above mentioned securing means.

Brief Description of the Drawings

The invention will be explained in a more detailed way with the use of its example embodiment in connection with drawings where fig. 1 shows the embodiment of the invention with the firearm barrel after tilting to the left, fig. 2 the firearm of fig. 1 after tilting of the barrel to the right and fig. 3 the firearm in the unlocked, but unopened condition, which makes it possible to change the tilting direction of the barrel.

Description of the Preferred Embodiment

Figs. 1 to 3 show a firearm design based on the invention. The fire arm contains a breech block 5 designed for locking the firearm to the barrel 1. In the locked condition the breech block 5 is secured with a pawl 4 that fits into one of the recesses 9, which may be the slot 9, making thus opening of the firearm impossible. In the locked condition the weapon

is ready for shooting. Unlocking is done with the use of the forend 3, which is firmly connected to the pawl 4, by its movement forwards in the locking direction. After this movement the firearm is unlocked, but still closed. The opening is done by tilting of the barrel 1 to a side on a pivot 10 that is installed perpendicularly to the axis of the barrel 1. The axis of the pivot passes through the axis of the barrel 1.

The tilting direction of the barrel 1 is determined by the position of the breech block 5 - if the locking surface 11 of the breech block 5 is on the right, the barrel 1 is tilted to the left (see fig. 1), and if the breech block 5 is removed in such a way that the locking surface 11 of the breech block 5 is on the left, the barrel 1 is tilted to the right (see fig. 2).

The positions of the locking surface 11 of the breech block 5 can be changed simply and quickly directly by the user of the firearm, without the necessity to use any tools or special instruments. The position of the locking surface 11 of the breech block 5 is changed in the unlocked, but still closed condition of the firearm, i.e. in the condition when the forend 3, which is firmly connected to the pawl 4, has been moved forwards in the shooting direction. In this condition of the firearm the pawl 6 of the breech block 5 is removed backwards with regard to the shooting direction, ceasing to fix the position of the breech block 5. It can now turn on the nut 7 of the breech block 5, which is fixed with regard to the breech block 5.

Fig. 3 shows the firearm in the unlocked, but closed condition, the breech block 5 being in the position with the

locking surface 11 on the left, so the barrel 1 would open to the right. Change of the opening direction of the barrel 1 is achieved by moving the pawl 6 backwards, thereby unlocking the breech block 5, and by turning the breech block 5 until the pawl 6 fits into the opening 8. When the pawl 6 has fitted into the opening 8, the breech block 5 is fixed with the pawl 6 again and the barrel 1 can be opened to the left as the locking surface 11 of the breech block 5 has been removed to the right side of the firearm. Tilting of the barrel 1 to the right again is made possible in a similar way after releasing the pawl 6 by turning the breech block 5.

Industrial applicability

Reversing the opening direction of the barrel of a firearm can especially be used in grenade launchers and other weapons with barrels that open to a side and the opening direction needs to be changed.

CLAIMS

1. A firearm with a tilting barrel (1) and a breech block (5) for securing the barrel (1), with the possibility of setting a change of the tilting direction of the barrel (1), characterized in that the breech block (5) contains on a part of its perimeter a locking surface (11) for securing the firearm against its tilting in the direction opposite the locking surface (11), the locking surface (11) being rotatable around the longitudinal axis of the breech block (5) for setting the change of the tilting direction of the barrel (1).
2. The firearm according to claim 1, characterized in that it contains a forend (3) firmly connected to the pawl (4), the forend being movable in the shooting direction from the rear position, in which the pawl (4) fits into a recess (9) in the breech block (5) and the firearm is thus in the locked condition, to the front position, in which the pawl (4) is disengaged from the recess (9) and the firearm is thus in the unlocked condition, and back against the shooting direction.
3. The firearm according to claim 2, characterized in that the pawl (4) in the position in which it fits in the recess (9) at the same time secures the locking surface (11) in its angular position against its rotation around the longitudinal axis of the breech block (5).
4. The firearm according to any of the previous claims, characterized in that that the breech

block (5) contains a securing means (6) for securing the locking surface (11) in its angular position against its rotation around the longitudinal axis of the breech block (5), and if the firearm is to be readjusted to the other tilting direction of the barrel (1), for releasing the locking surface (11) for its angular rotation to the required position and subsequent locking in this position.

5. The firearm according to claim 4, characterized in that the securing means (6) is the pawl (6) for securing the angular position of the locking surface (11).

List of reference signs:

- 1 - barrel
- 2 - body
- 3 - forend
- 4 - pawl
- 5 - breech block
- 6 - pawl
- 7 - breech block nut
- 8 - opening
- 9 - recess
- 10 - pivot
- 11 - locking surface on the breech block

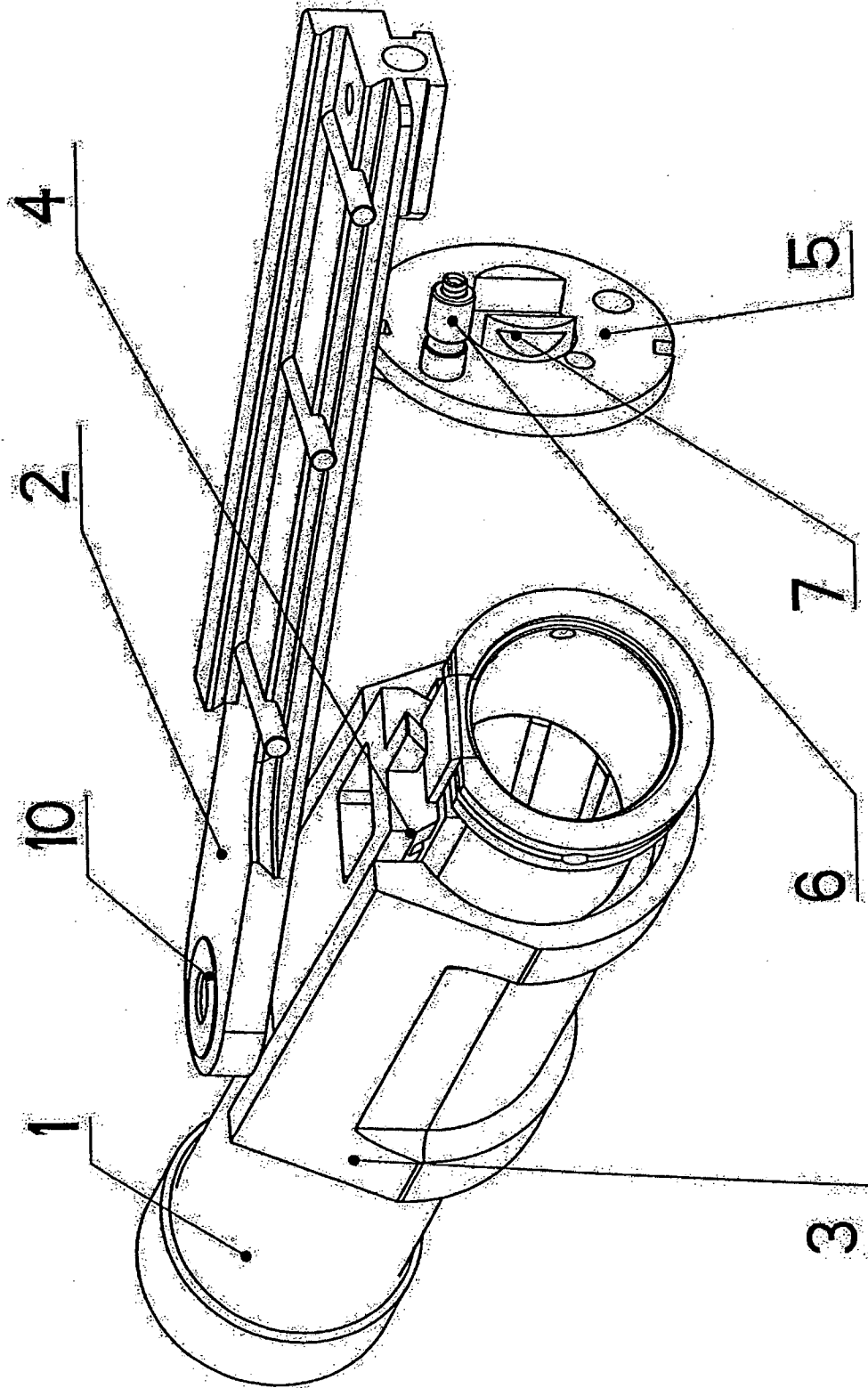


fig. 1

2/3

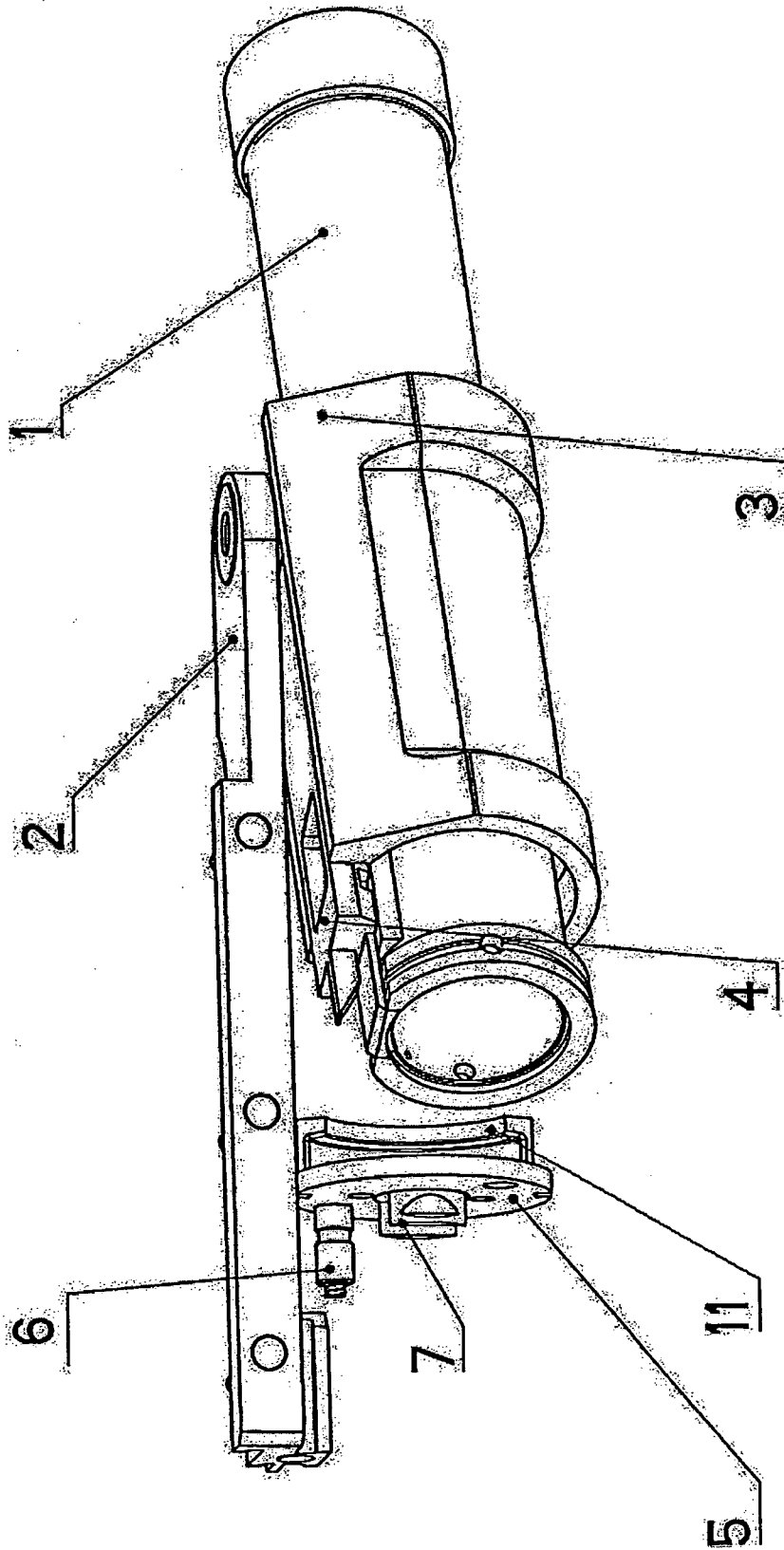


fig. 2

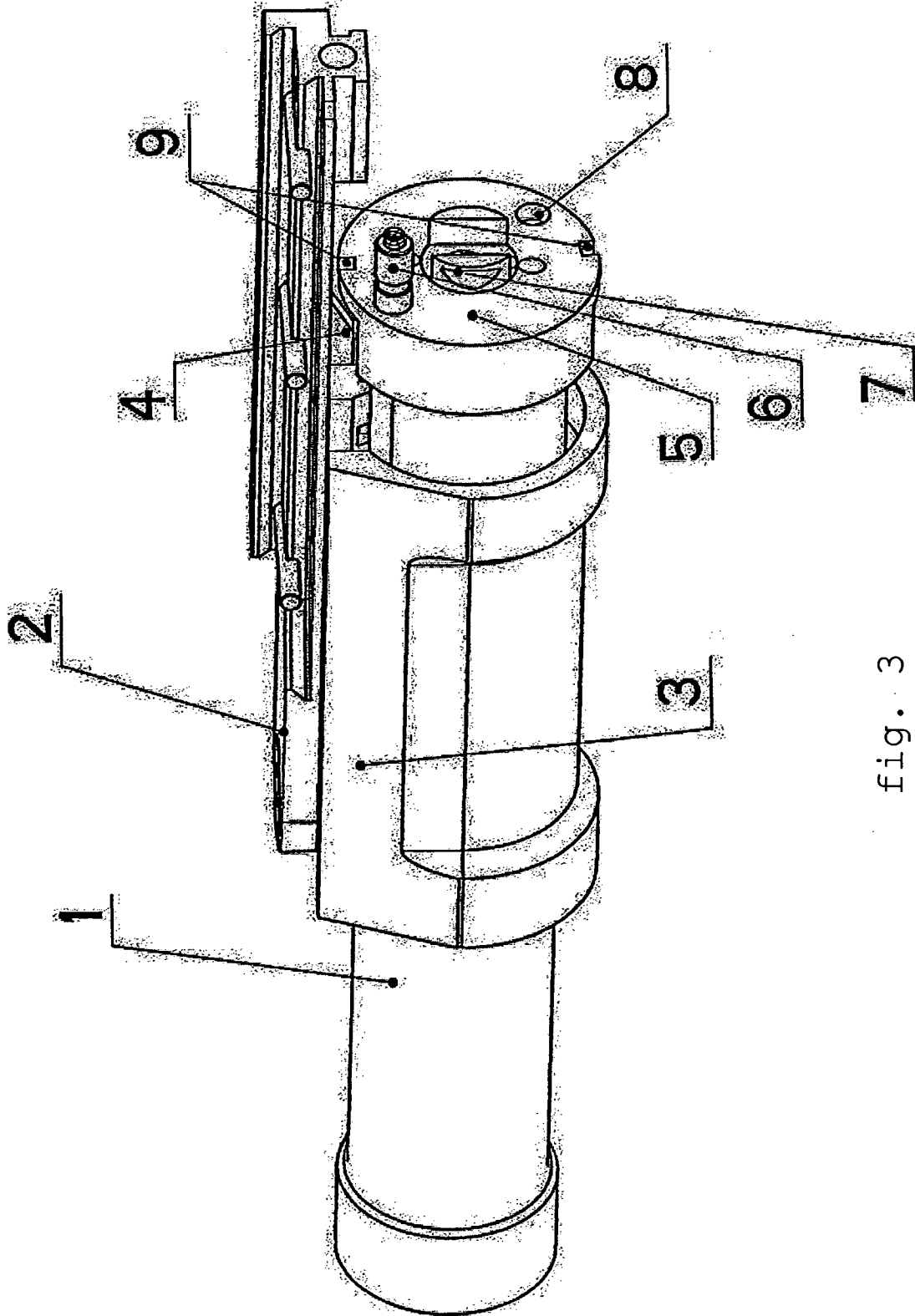


fig. 3

INTERNATIONAL SEARCH REPORT

International application No
PCT/CZ2010/000100

A. CLASSIFICATION OF SUBJECT MATTER
 INV. F41A3/58 F41A9/45 F41A35/06
 ADD.
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
 F41C F41A

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 practical, search terms used)
 EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2007/074437 A1 (COMPTON DAVID W [CA] ET AL COMPTON DAVID WALTER [CA] ET AL) 5 April 2007 (2007-04-05) cited in the application paragraphs [0024] - [0029]; figures 1-3,6,10	1
A	US 2007/068057 A1 (MACALUSO TONY [BE]) 29 March 2007 (2007-03-29) paragraphs [0032], [0033], [0046], [0063] - [0066]; claims 1,2,5-7; figures 4,5,15-17	1
A	US 4 614 051 A (THACKER GEORGE R [US]) 30 September 1986 (1986-09-30) column 3, line 1 - line 37 column 4, line 36 - column 5, line 14 figures 3,15,16	1

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"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</p> <p>"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.</p> <p>"&" document member of the same patent family</p>
--	--

Date of the actual completion of the international search 7 February 2011	Date of mailing of the international search report 16/02/2011
--	--

Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Seide, Stephan
--	--

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/CZ2010/000100

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2007074437	A1	05-04-2007	NONE
US 2007068057	A1	29-03-2007	AR 057340 A1 28-11-2007
		AU 2006202200	A1 11-03-2010
		BE 1016610	A3 06-02-2007
		BR PI0601947	A 13-02-2007
		CA 2547290	A1 30-11-2006
		EP 1729083	A1 06-12-2006
		JP 2006337014	A 14-12-2006
		KR 20060124582	A 05-12-2006
		SG 127849	A1 29-12-2006
		ZA 200604035	A 31-10-2007
US 4614051	A	30-09-1986	NONE