



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
25.09.2019 Bulletin 2019/39

(51) Int Cl.:
F41G 1/033 ^(2006.01) **F41G 1/06** ^(2006.01)
F41G 1/02 ^(2006.01) **F41G 1/16** ^(2006.01)

(21) Application number: **18162787.8**

(22) Date of filing: **20.03.2018**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
 Designated Extension States:
BA ME
 Designated Validation States:
KH MA MD TN

(72) Inventors:
 • **Taylor, John D.**
Colorado Springs, CO 80921 (US)
 • **Omanoff, Dennis**
Cocoa Beach, FL 32931 (US)

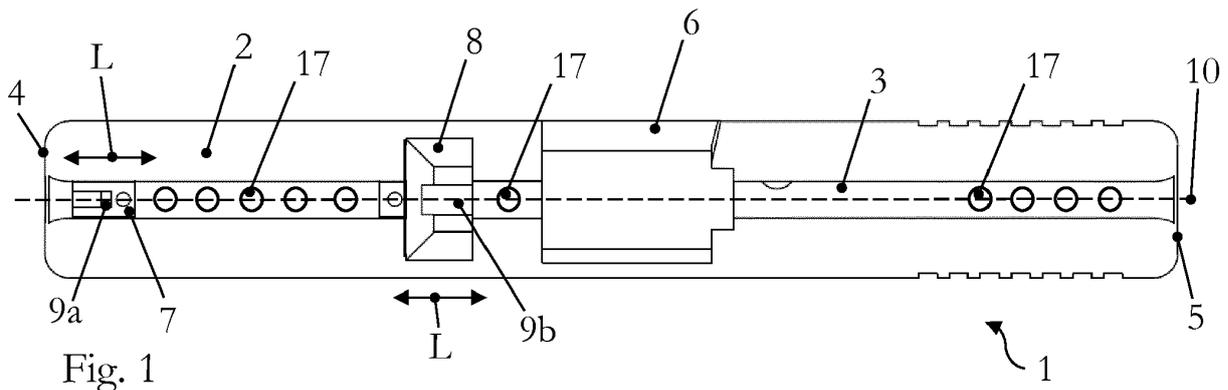
(74) Representative: **MFG Patentanwälte Meyer-Wildhagen Meggle-Freund Gerhard PartG mbB**
Amalienstraße 62
80799 München (DE)

(71) Applicant: **Next Generation Tactical, LLC**
Cocoa Beach, FL 32931 (US)

(54) **POSITIONING MECHANISM FOR SIGHTING SYSTEMS OF GUNS**

(57) The invention relates to a sight positioning mechanism (1) for guns comprising a front sight component (7), a rear sight component (8), and an anchoring mechanism (3), wherein the anchoring mechanism comprises a plurality of fixture points along a longitudinal axis (10) of a barrel for the front and rear sight components

(7, 8) and the front and rear sight components (7, 8) are separately mountable at the fixture points of the anchoring mechanism (3) with variable relative distances to each other and at variable positions relative to an aiming eye of a gun operator.



Description

TECHNICAL AREA

[0001] The present disclosure relates to a sighting system for guns.

TECHNICAL BACKGROUND

[0002] Generally, handguns and many rifles feature a fixed setup of front and rear sights to allow a shooter to acquire a target. This type of setup has been in use since the 14th century, where the rear sight is typically placed at the very back of a handgun's slide or barrel, and the front sight is placed at the very front, respectively.

[0003] By aligning the rear sight and the front sight, a sight line is defined, which extends from the shooter's eye to the intended aim for the bullet. Meanwhile, different kinds of aiming supports have been developed, such as optics in the form of scopes and red dots have also become popular for pistols.

[0004] To use the pistol sights properly, the shooter must focus the eyes on the front sight with the rear sight slightly out of focus. Numerous approaches are known to overcome this difficulty. A so-called Guttersnipe sighting system takes advantage of an optical illusion, which is created by a colored-sighting channel. Also colored or illuminated rear sight systems are known. Precise target acquisition is of especially high interest for law enforcement officers, who may face vicarious liability issues, if innocents are harmed in officer involved shootings due to an out-of-focus sight placement, which could be the case with traditional firearms.

[0005] The document US 8,296,990 B2 describes an exemplary sighting system that utilizes a traditional sight positioning. The mentioned patent includes a function for the sights to be configurable by making them easily detachable and exchangeable using a dovetail protrusion in the gun's slide, which the sight components can be attached to. The advantage of this configuration is the exchangeability of sights. The downside, however, is the fixed positioning of the front and rear sights relative to the gun. The reason why this is a disadvantage, is the fact that different shooters have different natural depths of field, meaning that it may be difficult for one shooter to keep both sight components in focus, while this would not pose an issue to the next shooter. The depth of field problem is mainly a factor of distance between the sight components.

[0006] The company Caracal International has addressed this issue with the development of their so-called QuickSight system, which is built on the idea that the average depth of field of all shooters is 1.8 inches. Consequently, the two sight components of their QuickSight systems are spaced exactly 1.8 inches apart from each other, wherein the front sight is placed at the very front of the gun. Both sight components are part of the gun's slide and are fixed in their position. While this setup does

allow for a faster acquisition of targets by making the line-up process of the sights easier on the shooter's eyes, its main drawback is the loss of accuracy due to the reduced sighting radius. In addition, the fixed placement of the sights reduces the user's flexibility, should he or she have a natural depth of field different from Caracal's proclaimed 1.8 inches.

[0007] It is an object of the invention to provide us an enhanced sighting system, which overcomes the above-mentioned drawbacks.

SUMMARY OF THE INVENTION

[0008] The above stated problem is solved by a sight positioning mechanism according to claim 1.

[0009] According to a first aspect of the present invention, a sight positioning mechanism for guns is provided comprising a front sight component, a rear sight component, and an anchoring mechanism, wherein the anchoring mechanism comprises a plurality of fixture points along a longitudinal axis of a barrel for the front and rear sight components and the front and rear sight components are separately mountable at the fixture points of the anchoring mechanism with variable relative distances to each other and at variable positions relative to an aiming eye of a shooter.

[0010] Further aspects and features are obvious for someone skilled in the art in view of the dependent claims, the drawings and the subsequent description of embodiments.

[0011] The present invention combines the advantages of sight adjustability to the user's depth of field with the positive aspects of traditional sighting placements by enabling the shooter to mount the sights at variable positions depending on personal preference and/or different application scenarios. The invention enables a setup, which does not merely benefit shooters, who have an average depth of field, but rather provides every shooter with the possibility to adjust the gun's sights to best serve their own personal depths of field.

[0012] Adjustable sighting positioning systems for weapons are currently mainly known for rifles, where scopes are attached to rails, which are part of or attached to the rifle. The best known rail systems are the Picatinny rail and the NATO Accessory rail, which are used to mount scopes and other accessories at variable positions.

[0013] The goal of this invention is to incorporate the arrangement flexibility known from scope mountings on rifles in the design of handguns to allow an adjustable setup of sights.

SHORT DESCRIPTION OF THE DRAWINGS

[0014] Embodiments will now be described by way of example in view of the drawings, in which:

Fig. 1 shows a top view of an embodiment of a sight

positioning mechanism according to the present invention with a first sight positioning;

Fig. 2 shows a side view of an embodiment of a sight positioning mechanism according to the present invention with the first sight positioning;

Fig. 3 shows an isometric view of a front sight component according to the present invention;

Fig. 4 shows an isometric view of a rear sight component according to the present invention;

Fig. 5 shows a front (left) and rear (right) view of an embodiment of a sight positioning mechanism according to the present invention;

Fig. 6 shows a side view of an embodiment of a sight positioning mechanism according to the present invention with a second sight positioning;

Fig. 7 shows a rear view of a transversally adjustable notch of a rear sight component according to the present invention.

DESCRIPTION OF EMBODIMENTS

[0015] Prior to a detailed description of the embodiment according to Fig. 1, some general comments are provided in the following regarding the embodiments.

[0016] There are embodiments, wherein the anchoring mechanism is formed as a rail at a body part of the gun and the front and rear sight components each have a rail connector, which is adjustably fixable along the rail in a way that a line of sight connecting the front and rear sight components used to acquire a target extends in the direction of a projectile path of the gun. In this embodiment, the rail is either formed as part of the gun's slide or barrel, machined into it, or attached to it as a separate part.

[0017] The rail and the rail connectors are manufactured as geometrically negative to each other in a way that the rail connectors fit into or onto the rail with a tolerance low enough to allow for accurate acquisition of targets using the line of sight of the two sights. This line of sight that is defined as a line running through the hairs or points of target acquisition of the front and the rear sight components, extends in the direction of a projectile's path leaving the muzzle of the gun, ultimately running through potential impact areas of the projectile.

[0018] There are embodiments, wherein the rail is a dovetail groove and the rail connectors are dovetail connectors.

[0019] There are embodiments, wherein the front and rear sight components each comprise means for incorporation of a fastening device to connect and fix the front and rear sight components to any of the fixture points of the anchoring mechanism and wherein the means for incorporation of a fastening device are preferably thread-

ed through-holes and the fastening devices are preferably screws. In this embodiment, a through-hole can be drilled into a small flange, which is preferably a part of the front and the rear sight components. This flange can be formed as a small plate, which is parallel to the dovetail groove's bottom inner surface. A screw can then be used to fix the front and the rear sight components within the dovetail groove into their position by applying permanent pressure with the screw. Alternatively, both the front and the rear sight components can be permanently fixed in place along the anchoring mechanism at customized user-determined positions, which are optimal for the specific user's depth of field. This permanent fixture can be implemented as described herein, or by any other means of fixture, including the manufacture and/or 3D printing of both sight components as part of the anchoring mechanism in their fixed positions. The front and/or the rear sight components can include elevation and/or windage features.

[0020] There are embodiments, wherein the front and rear sight components are made of a steel material. One and/or both sight components can alternatively be made of any combination of plastic, carbon fiber, titanium and 3D printed alloy materials. The sight components can also include tritium and/or fiber optic illumination.

[0021] There are embodiments, wherein sections of the dovetail groove that are not occupied by the front and rear sight components are covered by geometrically fitting inserts, which are formed to fill the entirety of the unoccupied anchoring mechanism. These inserts can be of varying geometries and can also reach the outside of the dovetail groove. Their purpose is to cover the remaining exposed parts of the dovetail groove for aesthetic reasons and to avoid dust and/or dirt from settling inside the dovetail groove. They are slid into the dovetail grooves in a similar fashion as the dovetail connectors are slid on.

[0022] There are embodiments, wherein the inserts are made of plastics of varying colors. The colors can be chosen to be aesthetically pleasing to the gun's user and can alternatively be made from varying materials like plastic, wood or metal.

[0023] There are embodiments, wherein the anchoring mechanism is formed as a Picatinny rail, a Weaver rail, a Warsaw Pact rail, a KeyMod rail, an M-LOK rail, or as a NATO accessory rail and the front and rear sight components are formed to be mounted on the respective accessory rail. The rails can further be of any other kind and are preferably manufactured as part of the gun's slide.

[0024] There are embodiments, wherein the rear sight component comprises a notch with an adjustable notch width along a notch axis, which is transversal to the longitudinal axis of the barrel.

[0025] There are embodiments, wherein the rear sight component comprises a left part and a right part, which are both adjustably fixable along the notch axis and wherein a notch area between the left part and the right

part forms the notch. The notch width can thereby be changed to any desired width. This can be of especial interest when changing the relative position of the front and rear sight components, since the front sight component should preferably be of the same optical width as the notch of the rear sight component in order to allow for a precise definition of the line of sight used for target acquisition. The optical width of the front sight component and the notch changes with variation of the relative positions between a gun operator's aiming eye and the respective positions of the front sight component and the notch. To attain the described equal optical widths for any given relative positions along the longitudinal axis, the transversal adjustability of the notch width can be implemented in an embodiment of this invention. The left part and the right part can both be fixed along the notch axis in a rail that can be part of or mounted on the rear sight component along the notch axis. The front sight component can herein and in general be of any preferred geometric shape, for example a round or rectangular shape.

[0026] There are embodiments, wherein the body part of the gun with the rail is adjustably attachable to the gun and either the front or the rear or both sight components are permanently or temporarily fixed at a set position of the body part with the rail. In this embodiment, the relative distances between the front and rear sight components in relation to the gun and the aiming eye of the shooter are set by adjusting the position of the body part with the rail along the guns extension and/or the non-set positions of the front and/or the rear sight components at the body part with the rail.

[0027] In order to be able to utilize existing slide-on sight components as described in the technical background above and to connect them to the anchoring mechanism of this invention, their dovetail connectors need to be changed by rotating their slide-on axis to be parallel to the gun's anchoring mechanism. In contrast to this invention, the existing dovetail protrusions in the gun as stated in the technical background run orthogonal to the extent of the barrel of the gun.

[0028] Now returning to Fig. 1, which shows a sight positioning mechanism 1 according to the present invention, the gun's body part used for placement of the sight positioning mechanism 1 is its slide 2. The slide 2 features an anchoring mechanism formed as a dovetail groove 3. The dovetail groove 3 runs along the entire length of the slide 2, reaching from the slide's front end 4 to its rear end 5, and is only interrupted by the casing ejection port 6. The front sight component 7 and the rear sight component 8 are slid into the dovetail groove 3 using their rail connectors. In this depicted first sight positioning, the front sight component 7 is placed in close proximity to the front end of the slide 4, while the rear sight component 8 is placed near the casing ejection port 6. The front and rear sight components 7, 8 are formed in a way that their target acquisition parts 9a, 9b extend outward of the dovetail groove 3 and together define a line of sight 10

that extends in the direction of the projectile path 11.

[0029] Fig. 2 shows a side view of the sight positioning system of Fig. 1 with the same first sight positioning. The target acquisition parts 9a, 9b of front and rear sight components 7, 8 have a trapezoid profile form.

[0030] An isometric view of the front sight component 7 according to the present invention is shown in Fig. 3. The front sight component 7 is formed as one piece comprising a base plate 12, which functions as the rail connector for the dovetail groove 3, and the target acquisition part 9a. The target acquisition part 9a features a trapezoidal side profile form and a rectangular front and rear profile form. The base plate 12 is formed to fill the entire width of the dovetail groove 3 and it has a length l long enough to house the target acquisition part 9a and a threaded through-hole 13 that is used to fix the position of the front sight component 7 with a screw.

[0031] Fig. 4 shows an isometric view of the rear sight component 8, which has a base plate 14 analogous to the front sight component 7. The length m of the base plate 14 is chosen to be long enough to incorporate a threaded through hole 15 for fixation within the dovetail groove 3 using a screw and to incorporate the target acquisition part 9b. The target acquisition part 9b has a trapezoidal side profile form and a trapezoid front and rear profile form with a U-shaped cavity 16 in the top side. The U-shaped cavity 16 has a width that equals the width of the target acquisition part 9a of the front sight component 7. This enables a shooter to align the front and rear sight component 7, 8 with his or her aiming eye by adjusting the position of the gun in a way that the target acquisition part 9a of the front sight component 7 visually lies within the U-shaped cavity 16 of the rear sight component 8 with the top surfaces aligned, defining the line of sight 10 for target acquisition.

[0032] Fig. 5 shows a front (left) and a rear (right) view of an embodiment of a sight positioning mechanism according to the present invention. The front sight component 7 and the rear sight component 8 are fixed within the dovetail groove 3. This view shows the alignment of the sights when acquiring a target, where the target acquisition part 9a of the front sight component 7 visually lies within the U-shaped cavity 16 of the rear sight component 8 with the top surfaces aligned.

[0033] Fig. 6 shows a side view of an embodiment of a sight positioning mechanism according to the present invention with a second sight positioning, where the front sight component 7 is placed near the front end of the slide 4 and the rear sight component 8 is placed near the rear end of the slide 5. Both sight components are fixed in place using screws.

[0034] Fig. 7 shows a rear view of a transversally adjustable notch of a rear sight component according to the present invention, where the rear sight component consists of the rear sight base element 19, the left part 20, and the right part 21. The front sight component 7 and the rear sight base element 19 are fixed within the dovetail groove 3. The inner area between the left part 20 and

the right part 21 forms the notch with the notch width 18. The left part 20 and the right part 21 are fixable at any positions along the notch axis 22 in a rail within the rear sight base element 19. The direction of the left and right part (20, 21) movability is indicated by the arrows N.

[0035] Both the front side component 7 and the rear side component 8 are moveable in a longitudinal direction indicated by the arrows L in Figures 1 and 6. The shown dovetail groove 3, which runs along the entire length of the slide 2, can also be formed as a dovetail rail, which is formed or mounted on top of the slide 2. In such an embodiment the sight components 7 and 8 comprise an interface section which carries a dovetail groove which can be fitted onto the dovetail rail. In case a dovetail rail is formed as a Picatinny rail or as a NATO accessory rail further transversal grooves or ribs define preferred mounting positions for the sight components.

[0036] Such preferred mounting positions can also be defined on the bottom of the dovetail groove according to Figure 1 by depressions or dimples 17 which are formed into the ground of the dovetail groove.

[0037] Instead of the screws for fixation notch or pawl mechanisms can be utilized to fix the sight components in preferred longitudinal positions.

[0038] Instead of the dovetail groove other suitable groove or rail profiles can be utilized to realize a positive fit between the gun component and the sight components.

[0039] Further, variations and embodiments of the present invention are obvious for someone skilled in the art within the scope of the claims.

REFERENCE SIGNS

[0040]

1	sight positioning mechanism
2	slide of the gun
3	dovetail groove
4	front end of the slide
5	rear end of the slide
6	casing ejection port
7	front sight component
8	rear sight component
9a, 9b	target acquisition parts
10	line of sight
11	direction of projectile path
12	base plate of front sight component
13	threaded through-hole (front sight component)
14	base plate of rear sight component
15	threaded through-hole (rear sight component)
16	U-shaped cavity
17	dimple, depression
18	notch width
19	rear sight base element
20	left part (of rear sight component)
21	right part (of rear sight component)
22	notch axis

l	length of base plate (front sight component)
m	length of base plate (rear sight component)

5 Claims

1. A sight positioning mechanism (1) for guns comprising a front sight component (7), a rear sight component (8), and an anchoring mechanism, wherein the anchoring mechanism comprises a plurality of fixture points along a longitudinal axis of a barrel for the front and rear sight components (7, 8) and the front and rear sight components (7, 8) are separately mountable at the fixture points of the anchoring mechanism with variable relative distances to each other and at variable positions relative to an aiming eye of a gun operator.
2. The sight positioning mechanism (1) according to claim 1, wherein the anchoring mechanism is formed as a rail at a body part of the gun and the front and rear sight components (7, 8) each have a rail connector, which is adjustably fixable along the rail in a way that a line of sight (10) connecting the front and rear sight components (7, 8) used to acquire a target extends in the direction of a projectile path (11) of the gun.
3. The sight positioning mechanism (1) according to claim 2, wherein the rail is a dovetail groove (3) and the rail connectors are dovetail connectors.
4. The sight positioning mechanism (1) according to claim 1, 2 or 3, wherein the front and rear sight components (7, 8) each comprise means for incorporation of a fastening device to connect and fix the front and rear sight components (7, 8) to any of the fixture points of the anchoring mechanism and wherein the means for incorporation of a fastening device are preferably threaded through-holes (13, 15) and the fastening devices are preferably screws.
5. The sight positioning mechanism (1) according to one of claims 1 to 4, wherein the front and rear sight components (7, 8) comprise one of the following: steel, plastic, carbon fiber, titanium and/or 3D printed alloy materials.
6. The sight positioning mechanism (1) according to claim 2, wherein sections of the dovetail groove (3) that are not occupied by the front and rear sight components (7, 8) are covered by geometrically fitting inserts, which are formed to fill the entirety of the unoccupied anchoring mechanism.
7. The sight positioning mechanism (1) according to claim 5, wherein the inserts are made of plastics of varying colors.

8. The sight positioning mechanism (1) according to any of the aforementioned claims, wherein the anchoring mechanism is formed as one of the following: a Picatinny rail, a Weaver rail, a Warsaw Pact rail, a KeyMod rail, an M-LOK rail, or as a NATO accessory rail and the front and rear sight components (7, 8) are formed to be mounted on the respective accessory rail. 5
9. The sight positioning mechanism (1) according to any of the aforementioned claims, wherein the rear sight component comprises a notch with an adjustable notch width (18) along a notch axis (22), which is transversal to the longitudinal axis (10) of the barrel. 10
15
10. The sight positioning mechanism (1) according to claim 9, wherein the rear sight component comprises a left part (20) and a right part (21), which are both adjustably fixable along the notch axis (22) and wherein a notch area between the left part (20) and the right part (21) forms the notch. 20

25

30

35

40

45

50

55

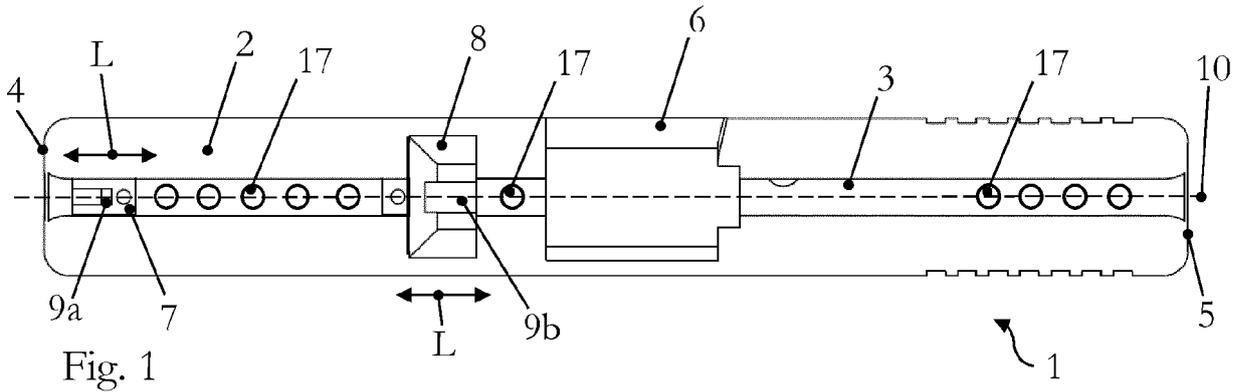


Fig. 1

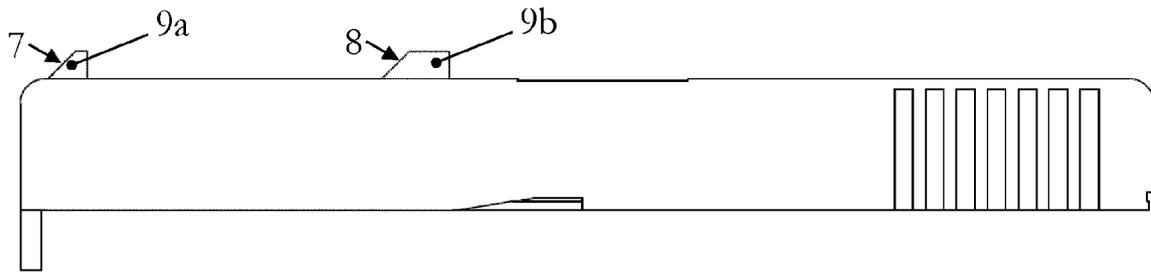


Fig. 2

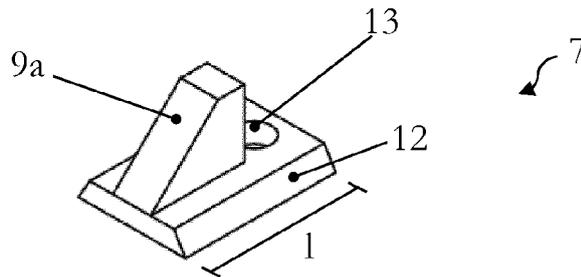


Fig. 3

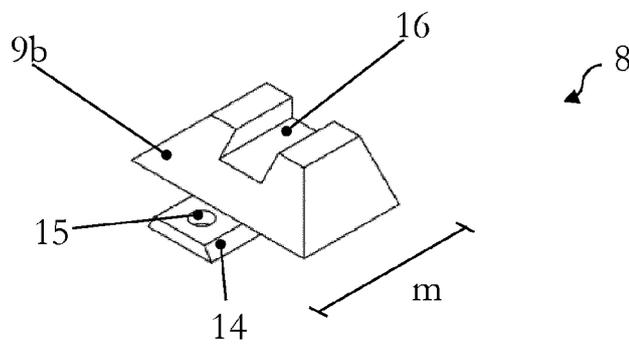


Fig. 4

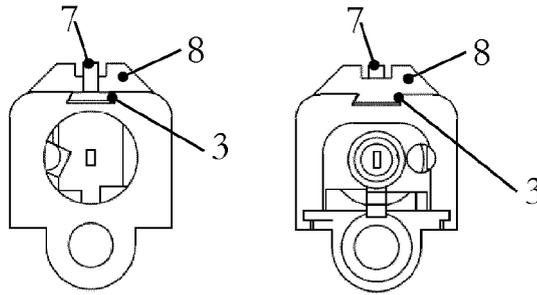


Fig. 5

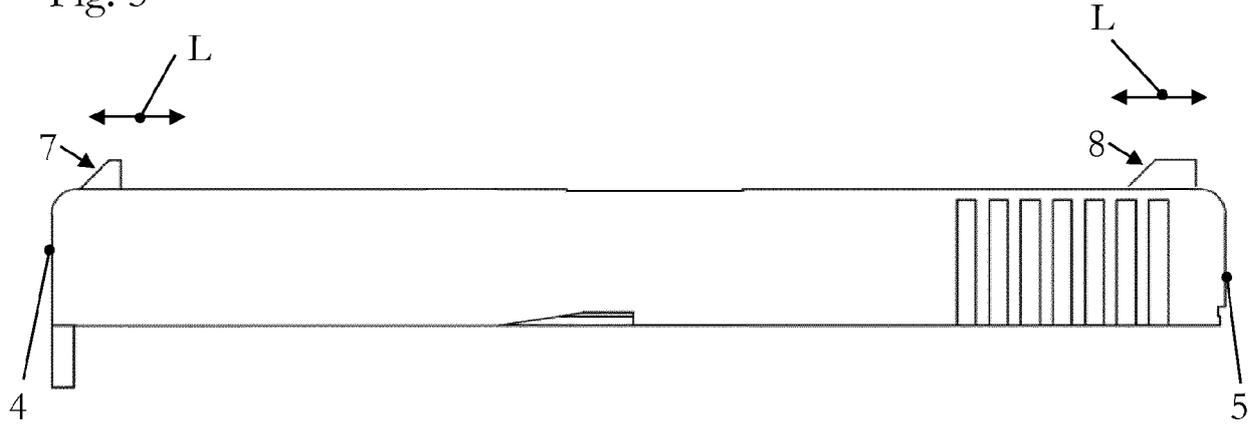


Fig. 6

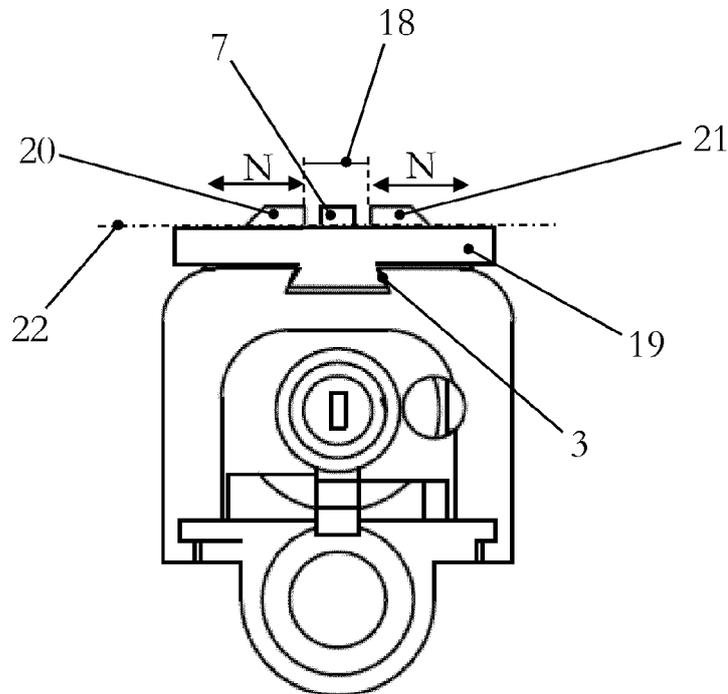


Fig. 7



EUROPEAN SEARCH REPORT

Application Number
EP 18 16 2787

5

10

15

20

25

30

35

40

45

50

55

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	US 2017/350674 A1 (ODLE NATHAN [US] ET AL) 7 December 2017 (2017-12-07)	1-8	INV. F41G1/033 F41G1/06 F41G1/02 F41G1/16
Y	* abstract * * paragraph [0025] - paragraph [0027] * * figures * * removable front and rear sight that can be affixed anywhere along the Picatinny rail. *	9,10	
X	----- US 2016/102941 A1 (BRUCKER CHRISTOPHER [US] ET AL) 14 April 2016 (2016-04-14)	1-5,8	
Y	* paragraph [0047] - paragraph [0050] *	9,10	
A	* figures * * abstract * * foldable removable sights. *	6,7	
Y	----- US 2015/128471 A1 (TROY STEPHEN P [US] ET AL) 14 May 2015 (2015-05-14)	9,10	TECHNICAL FIELDS SEARCHED (IPC) F41G
	* abstract * * paragraph [0016] * * figures *		
X	----- US 4 008 536 A (ADAMS JEAN M) 22 February 1977 (1977-02-22)	1,2	
	* abstract * * column 5, line 30 - column 6, line 16 * * figures * * removable sights front and rear for e.g. shotgun *		
X	----- DE 200 12 672 U1 (GEHMANN WALTER [DE]) 26 October 2000 (2000-10-26)	1,5	
	* claim 1 * * figures *		
		----- -/--	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 5 September 2018	Examiner Vermander, Wim
CATEGORY OF CITED DOCUMENTS		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	
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			

EPO FORM 1503 03.02 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 18 16 2787

5

10

15

20

25

30

35

40

45

50

55

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	US 426 333 A (J.J. SCHOLFIELD) 22 April 1890 (1890-04-22) * front sight movable along axis of barrel with set screw.; the whole document * -----	1	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 5 September 2018	Examiner Vermander, Wim
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	

EPO FORM 1503 03.02 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 18 16 2787

5 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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

05-09-2018

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2017350674 A1	07-12-2017	NONE	
US 2016102941 A1	14-04-2016	NONE	
US 2015128471 A1	14-05-2015	NONE	
US 4008536 A	22-02-1977	NONE	
DE 20012672 U1	26-10-2000	NONE	
US 426333 A	22-04-1890	NONE	

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 8296990 B2 [0005]