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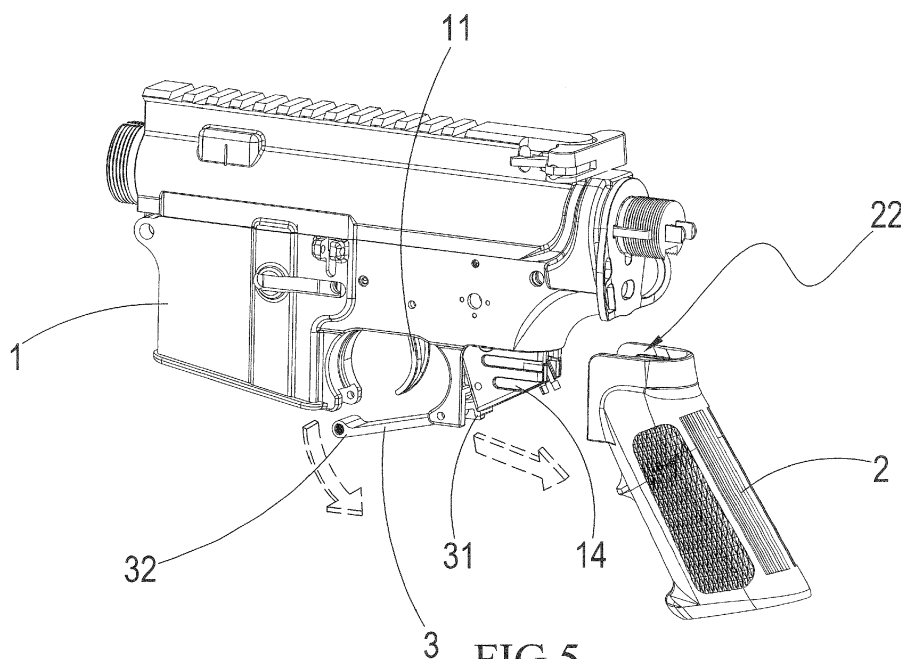
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BA ME(72) Inventor: **Liao, Yin-Hsi****Cambridge, CB1 1AH (GB)**(74) Representative: **Horak, Michael****Horak Rechtsanwälte****Georgstrasse 48****30159 Hannover (DE)**(71) Applicant: **Guay Guay Trading Co., Ltd.****New Taipei City 234 (TW)****(54) Quick assembling/disassembling structure for motor handle module of electrical gear box**

(57) The present invention relates to a quick assembling/disassembling structure for motor handle module of electrical gear box, which includes a firearm body (1), which is provided with a trigger (11) and is sideways connected to a grip (2) that forms a connection slot (21), and a snap-fitting element (3), which is rotatably mounted to the firearm body (1) and is set at a location adjacent one side of the trigger (11). The snap-fitting element (3) has an end forming a snap-fitting section (31) that is in retaining engagement with the connection slot (21). The firearm body (1) has an end forming a coupling section

(12) coupled with the grip (2). The coupling section (12) has inside surfaces forming a guide section (13) and a connection section (22) is coupled with the coupling section (12). A motor (25) is provided with an elastic member (23). A user only needs to pull the snap-fitting element (3) to move the snap-fitting section (31) away from the connection slot (21) of the grip (2) in order to release the grip (2). On the other hand, when the grip (2) is coupled, in a sideways manner, to the firearm body (1), the arrangement of the guide section (13) helps reducing the interference between the gear mechanism (24, 16) so as to achieve easy replacement of components.

**FIG.5****EP 2 698 593 A1**

Description

(a) Technical Field of the Invention

[0001] The present invention generally relates to a quick assembling/disassembling structure for motor handle module of electrical gear box, and more particularly to a quick assembling/disassembling structure for motor handle module of electrical gear box that employs combined operation of a snap-fitting element and a guide section to allow a user to easily replace components and accessories.

(b) Description of the Prior Art

[0002] The highly stressed living of the modern people makes it necessary for people to take certain entertainments for relaxing, both mentally and physically, themselves. Among these leisure activities, one that is exciting and challenging is always a favorite for regular people, such as shooting games that are most favorable by male players. Due to the favor of shooting games, survival games that are a special type of shooting games are popular in the market. In such a game, the "firearms" used makes use of gas or electricity to effect shooting of for example BB bullets from the firearms.

[0003] However, hand tools, such as screwdrivers and hexagonal tools, are commonly used in manufacturing such a firearm or to replace components of the firearm. Familiarity is generally necessary for assembling the components in a disassembling or assembling operation. Replacement of for example a motor or other components of the firearm is generally very difficult for general consumers. This is certainly inconvenient for the general consumers.

[0004] Thus, the present invention is made to overcome such problems and drawbacks of the known devices.

SUMMARY OF THE INVENTION

[0005] In view of the above discussed problems, the present invention provides a quick assembling/disassembling structure for motor handle module of electrical gear box that allows a user to easily replace components and accessories thereof through combined operation of a snap-fitting element and a guide section.

[0006] Thus, an object of the present invention is to provide a quick assembling/disassembling structure for motor handle module of electrical gear box, which allows of quick replacement of the handle.

[0007] To achieve the above object, the present invention provides a quick assembling/disassembling structure for motor handle module of electrical gear box, which comprises a firearm body, which is provided with a trigger and is sideways connected to a grip that forms a connection slot, and a snap-fitting element, which is rotatably mounted to the firearm body and is set at a location ad-

jacent one side of the trigger. The snap-fitting element has an end forming a snap-fitting section that is in retaining engagement with the connection slot. The firearm body has an end forming a coupling section coupled with the grip. The coupling section has inside surfaces forming a guide section and a connection section is coupled with the coupling section.

[0008] The coupling section has outside surfaces forming at least one slide groove to slidably receive the connection section therein. The coupling section is provided with at least one connector and the connector is located at one side of the guide section. The snap-fitting element forms, at a location remote from the snap-fitting section, a joint section that is connectable to the firearm body. The grip receives therein a motor that is provided with bevel gear. The firearm body receives therein a disk gear mating the bevel gear.

[0009] With such a structure and arrangement, when a user intends to replace components, the user only needs to pull the joint section to have the snap-fitting section located at the remote end move away from the connection slot of the grip in order to release the grip. On the other hand, when the grip is inserted, in a sideways manner, into and thus coupled to the firearm body, the present invention takes advantage of a path defined by the guide section and the arrangement of the elastic member on the motor in such a way that when a bevel gear of the motor is to mate a disk gear, interference is prevented from occurring in the gear mechanism and at the same time, a cushioning effect is achieved to eliminate operation noise of the motor so as to achieve easy replacement of components.

[0010] The foregoing objectives and summary provide only a brief introduction to the present invention. To fully appreciate these and other objects of the present invention as well as the invention itself, all of which will become apparent to those skilled in the art, the following detailed description of the invention and the claims should be read in conjunction with the accompanying drawings. Throughout the specification and drawings identical reference numerals refer to identical or similar parts.

[0011] Many other advantages and features of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying sheets of drawings in which a preferred structural embodiment incorporating the principles of the present invention is shown by way of illustrative example.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

FIG. 1 is an exploded view of a preferred embodiment according to the present invention.

FIG. 2 is a cross-sectional view of the preferred embodiment according to the present invention.

FIG. 3 is a partial perspective view of the preferred

embodiment according to the present invention.

FIG 4 is another partial perspective view of the preferred embodiment according to the present invention.

FIG 5 is a schematic view illustrating operation of the preferred embodiment of the present invention.

FIG 6 is another schematic view illustrating operation of the preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] The following descriptions are exemplary embodiments only, and are not intended to limit the scope, applicability or configuration of the invention in any way. Rather, the following description provides a convenient illustration for implementing exemplary embodiments of the invention. Various changes to the described embodiments may be made in the function and arrangement of the elements described without departing from the scope of the invention as set forth in the appended claims.

[0014] Referring to FIG 1-4, which are respectively an exploded view, a cross-sectional view, and partial perspective views of a preferred embodiment according to the present invention, these drawings clearly show that the present invention provides a quick assembling/disassembling structure for motor handle module of electrical gear box, which comprises the following components.

[0015] A firearm body 1 is provided with a trigger 11. The firearm body 1 has an end forming a coupling section 12 to be coupled with a grip 2 that will be further described. The coupling section 12 has inside surfaces forming a guide section 13. The guide section 13 is composed of a raised portion and a recessed portion.

[0016] The grip 2 is coupled, in a sideways manner, to the firearm body 1. The grip 2 forms a connection slot 21 and a connection section 22 that is coupled to the coupling section 12.

[0017] A snap-fitting element 3 is rotatably mounted to the firearm body 1 and is set at a location adjacent one side of the trigger 11 and has an end forming a snap-fitting section 31 that is in retaining engagement with the connection slot 21.

[0018] The coupling section 12 has outside surfaces forming at least one slide groove 14 to slidably receive the connection section 22 therein. The coupling section 12 is provided with at least one connector 15 and the connector 15 is located at one side of the guide section 13. The snap-fitting element 3 forms, at a location remote from the snap-fitting section 31, a joint section 32 that is connectable to the firearm body 1. The grip 2 receives therein a motor 25 that is provided with bevel gear 24 and comprises an elastic member 23. The motor 25 is provided with a connector support 26. The firearm body 1 receives therein a disk gear 16 mating the bevel gear 24.

[0019] With the above structure and arrangement, the

operation of the present invention will be described as follows with reference to FIGS. 2-6, which are respectively a cross-sectional view, partial perspective views, and operation illustrating views, these drawings show that the present invention generally comprises a firearm body 1 that comprises a trigger 11 and a grip 2 that is sideways coupled to the firearm body 1. When a user intends to remove the grip 2, the joint section 32 of the snap-fitting element 3 that is connected to the firearm body 1 is forcibly pulled downward, whereby through a see-saw action, the snap-fitting section 31 formed at the opposite end of the snap-fitting element 3 is moved upward away from the connection slot 21 of the grip and the grip 2 is allowed to slide off the slide groove 14. During the disassembling process, since the disk gear 16 of the firearm body 1 and the bevel gear 24 of the grip 2 are in mated engagement with each other, so that during the operation of sliding off, the raised and recessed arrangement of the guide section 13 is used to force the grip 2, after separating from the firearm body 1, to move in a predetermined direction in order to reduce interference between the disk gear 16 and the bevel gear 24. On the other hand, when the user wishes to re-assemble the grip 2 to the firearm body 1, the grip 2 is positioned to align with the slide groove 14 formed in the firearm body 1 for sideways insertion to couple the grip 2 with the firearm body 1. During such a process, to prevent the motor 25 received in the grip 2 and the bevel gear 24 mounted to the motor 25 from engaging the disk gear 16 of the firearm body 1 in such a direct manner as to cause damage, the guide section 13 that is formed in inside surfaces of the coupling section 12 of the firearm body 1 is used to guide the grip 2, during the insertion process, to move along a predetermined path (namely being guided along the raised and recessed arrangement of the guide section 13) to complete coupling. During the process of coupling, the elastic member 23 that is provided for the motor 25 in the connection section 22 of the grip 2 provides a function of cushioning so as to suppress noise generated during the operation of the motor 25. After the above process is completed, the connection slot 21 of the grip 2 is set in engagement with the snap-fitting section 31 of the snap-fitting element 3 again, so that the connector 15 is connected to the motor 25 of the grip 2 to achieve the purpose of quick assembling and disassembling. Further, the connection of power supply for the motor 25 is also a novel technical feature of the present invention. The conventional way of power supply for a motor is done by electrical wire connecting to a battery and a switch. The wire lay-out and maintenance are troublesome. In the present invention, the quick assembling/disassembling structure for motor handle module comprises a connector 15 arranged at each of two opposite inner sides of the coupling section 12 of the gear box and connected by electrical wire to a power distribution board. A connector support 26 is arranged behind the bevel gear 24 of the motor 25 of the connection section 22 of the grip 2 and the connector support 26 has two ends each pro-

vided with a connector 15 connected by an electrical wire to a power terminal under the motor 25. When the grip 2 is sideways coupled to or separated from the firearm body 1, the connectors 15 arranged at inner sides of the coupling section 12 of the gear box are connected to or disconnected from the connectors on the connector support 26 behind the bevel gear 24 of the motor 25 to achieve the purposes of easy replacement of components.

[0020] However, it is noted that what described above is illustration of a preferred embodiment and is not intended to impose undue limitation to the scope of the present invention. All simple modifications or equivalent structures of what described and taught in the specification and drawings are considered belonging to the scope of the appended claims.

[0021] Thus, referring to all the drawings, when compared to the known techniques, the present invention provides the following advantages in use.

[0022] The combined operation of the snap-fitting element 3 and the guide section 13 allows a user to easily replace components so as to achieve quick replacement operation of the grip 2.

[0023] It will be understood that each of the elements described above, or two or more together may also find a useful application in other types of methods differing from the type described above.

[0024] While certain novel features of this invention have been shown and described and are pointed out in the annexed claim, it is not intended to be limited to the details above, since it will be understood that various omissions, modifications, substitutions and changes in the forms and details of the device illustrated and in its operation can be made by those skilled in the art without departing in any way from the spirit of the present invention.

Claims

1. A quick assembling/disassembling structure for motor handle module of electrical gear box, comprising:

a firearm body (1), which is provided with a trigger (11);
a grip (2), which is coupled, in a sideways manner, to the firearm body (1) and forms a connection slot (21); and
a snap-fitting element (3), which is rotatably mounted to the firearm body (1) and is set at a location adjacent one side of the trigger (11) and has an end forming a snap-fitting section (31) that is in retaining engagement with the connection slot (21).

2. A quick assembling/disassembling structure for motor handle module of electrical gear box, comprising:

a firearm body (1) to which a grip (2) is sideways coupled, the firearm body (1) having an end forming a coupling section (12) to be coupled with the grip (2), the coupling section (12) having inside surfaces forming a guide section (13); and a connection section (22), which is coupled to the coupling section (12) and is formed in the grip (1).

3. The quick assembling/disassembling structure for motor handle module of electrical gear box according to claim 2, wherein the grip (2) and the firearm body (1) are respectively provided with at least two connectors (15), the connectors (15) being set at two sides of the guide section (13).
4. The quick assembling/disassembling structure for motor handle module of electrical gear box according to claim 3, wherein the coupling section (12) has outside surfaces forming at least one slide groove (14) to slidably receive the connection section (22) therein, the connection section (22) comprising a power distribution board set at two ends of inner sides thereof to electrically connect to the connectors (15).
5. The quick assembling/disassembling structure for motor handle module of electrical gear box according to claim 1, wherein the snap-fitting element (3) forms, at a location remote from the snap-fitting section (31), a joint section (32) that connectable to the firearm body (1).
6. The quick assembling/disassembling structure for motor handle module of electrical gear box according to claim 1, wherein the grip (2) comprises a motor (25) received therein, the motor (25) being provided with a connector support (26).
7. The quick assembling/disassembling structure for motor handle module of electrical gear box according to claim 2, wherein the grip (2) comprises a motor (25) received therein, the motor (25) being provided with a connector support (26).
8. The quick assembling/disassembling structure for motor handle module of electrical gear box according to claim 6, wherein the motor (25) comprises a bevel gear (24) mounted thereto.
9. The quick assembling/disassembling structure for motor handle module of electrical gear box according to claim 8, wherein the firearm body (1) receives therein a disk gear (16) mating the bevel gear (24).
10. The quick assembling/disassembling structure for motor handle module of electrical gear box according to claim 2, wherein the guide section (13) is composed of a raised portion and a recessed portion.

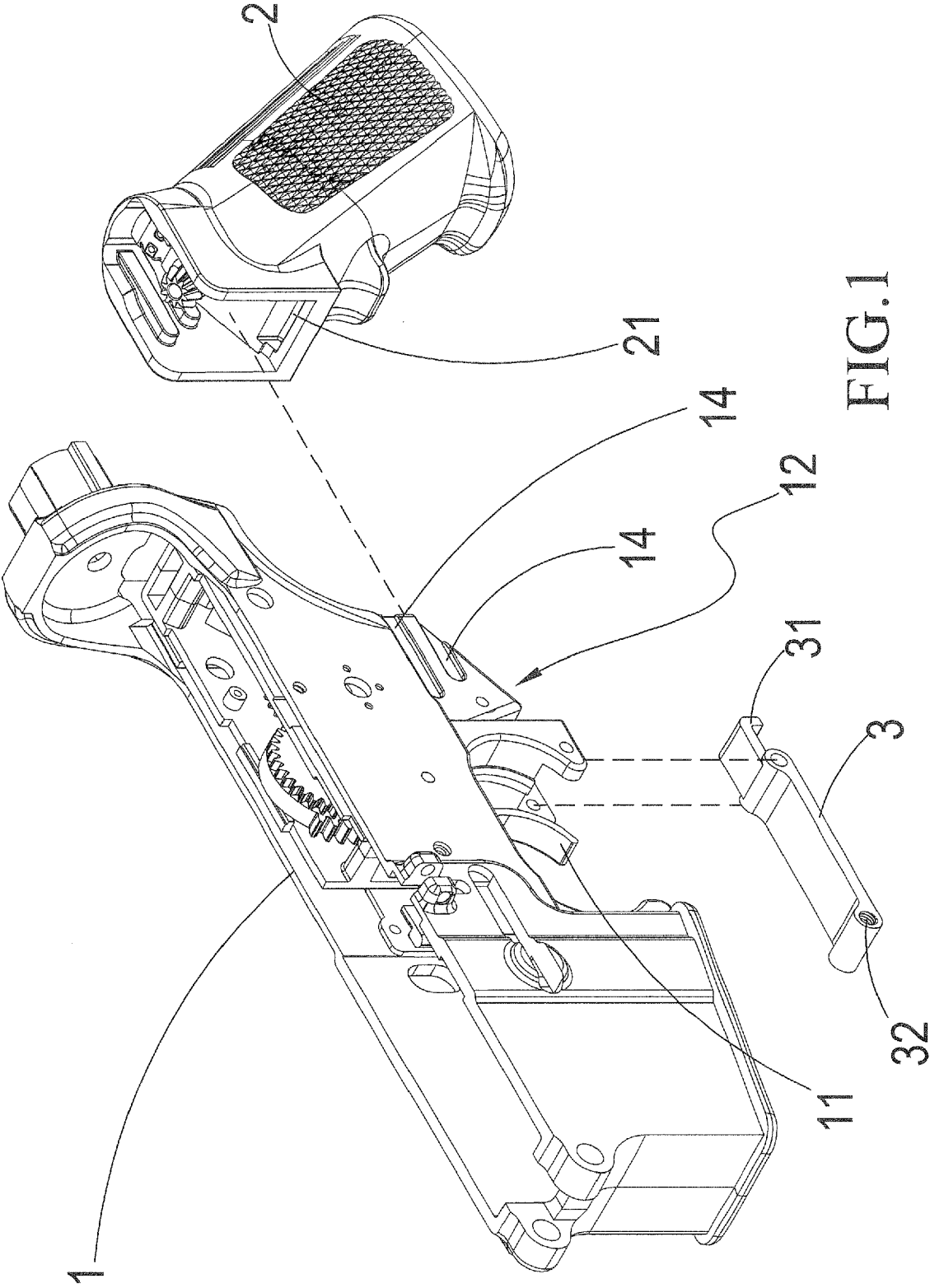
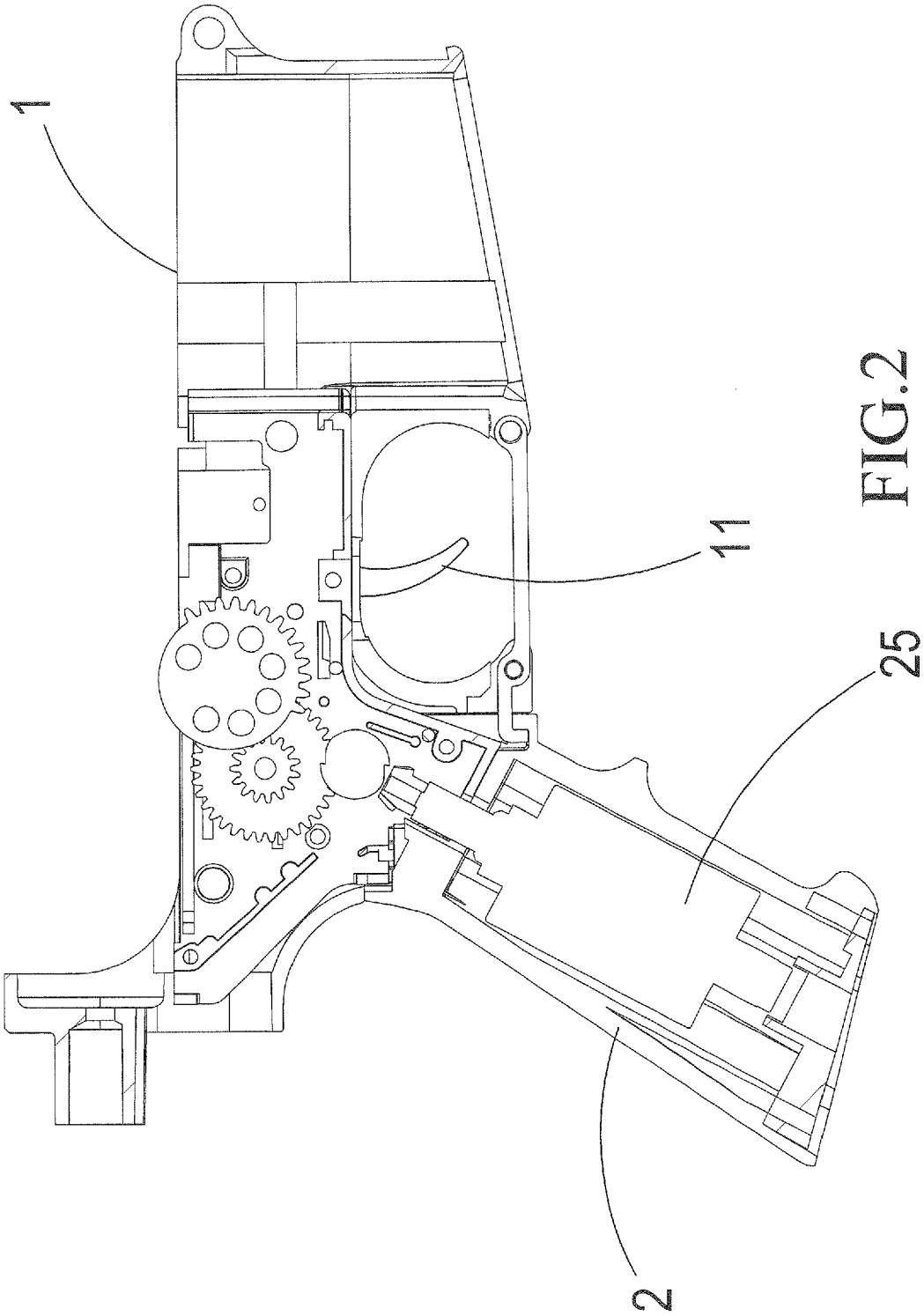


FIG.1



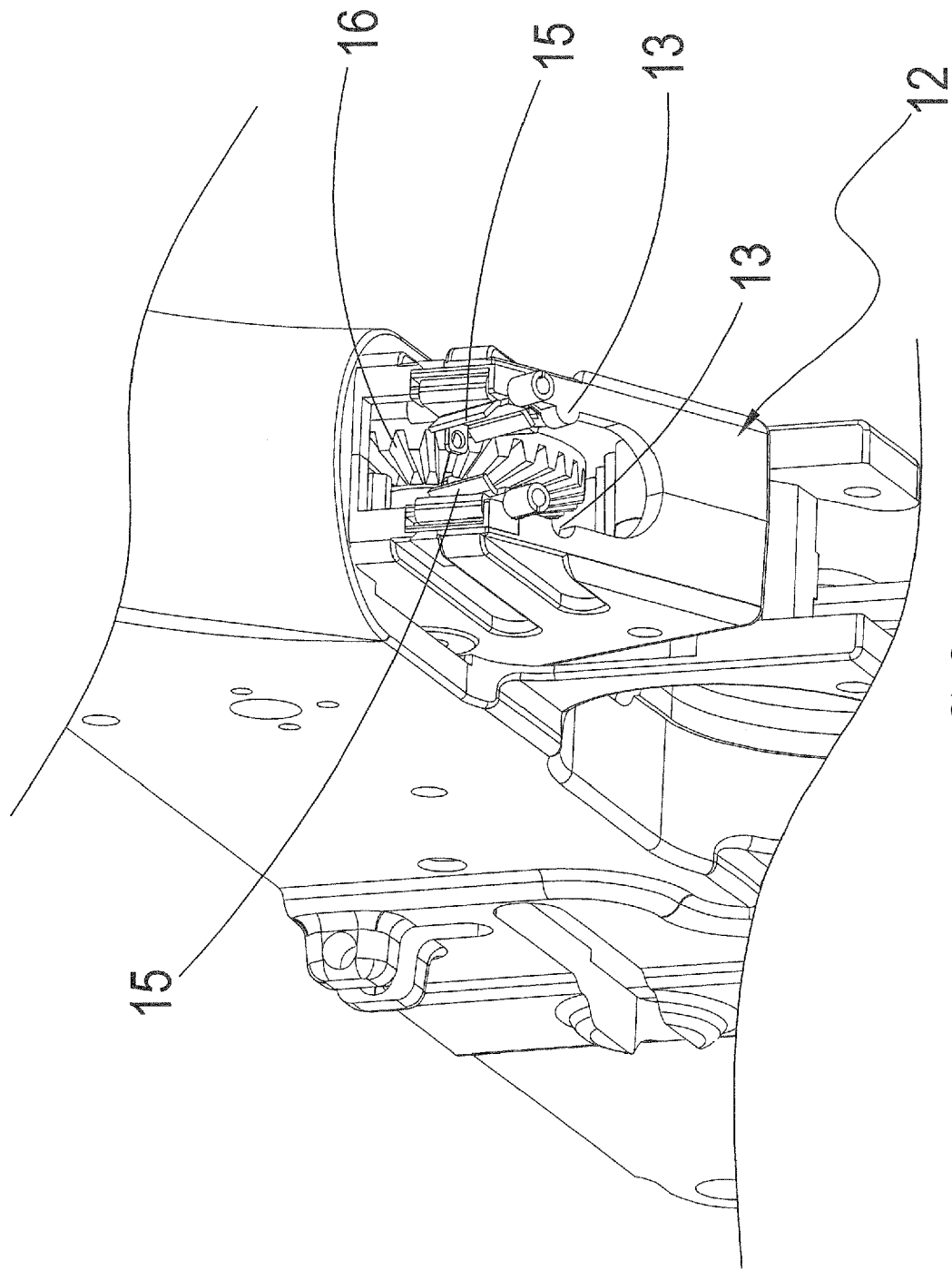
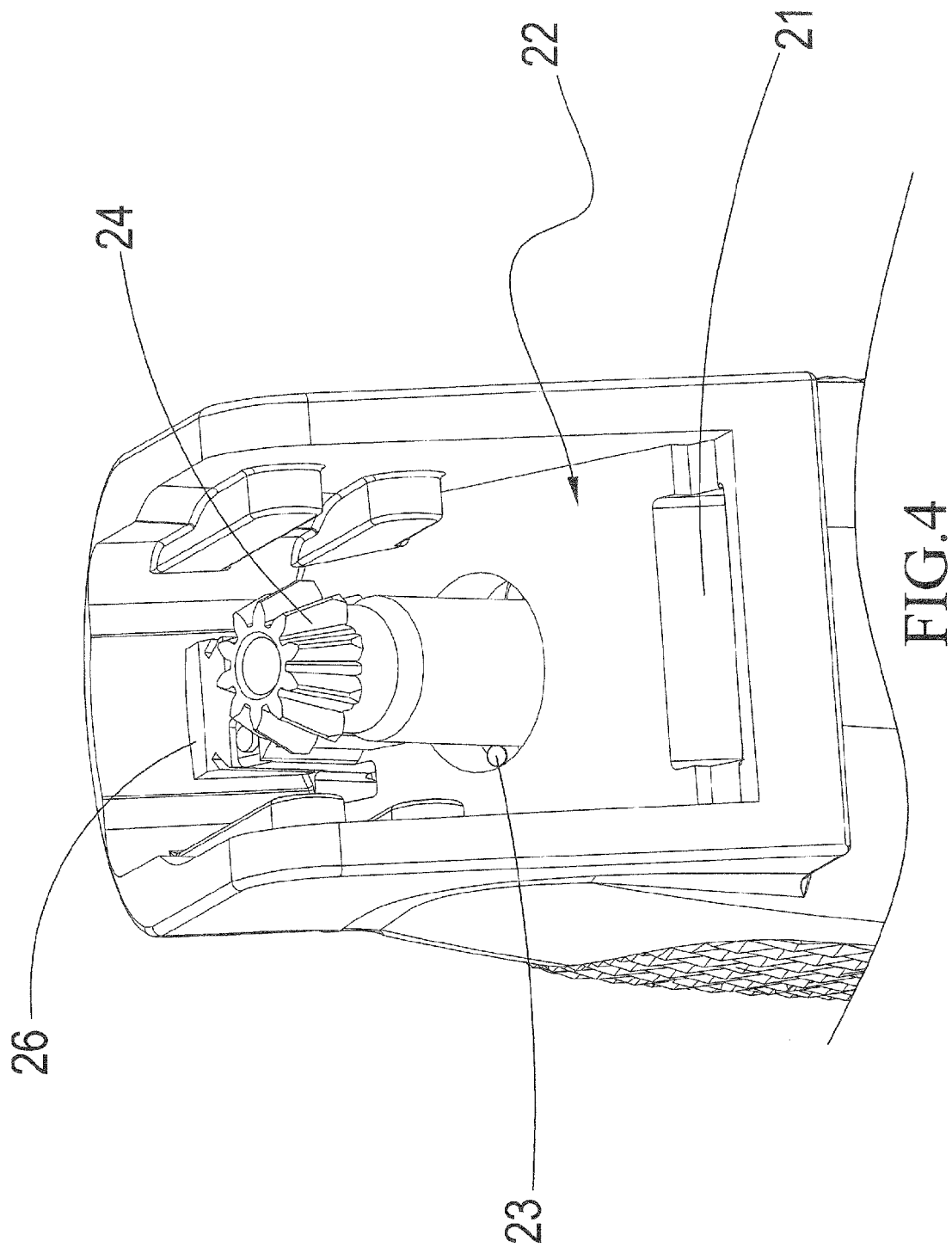


FIG.3



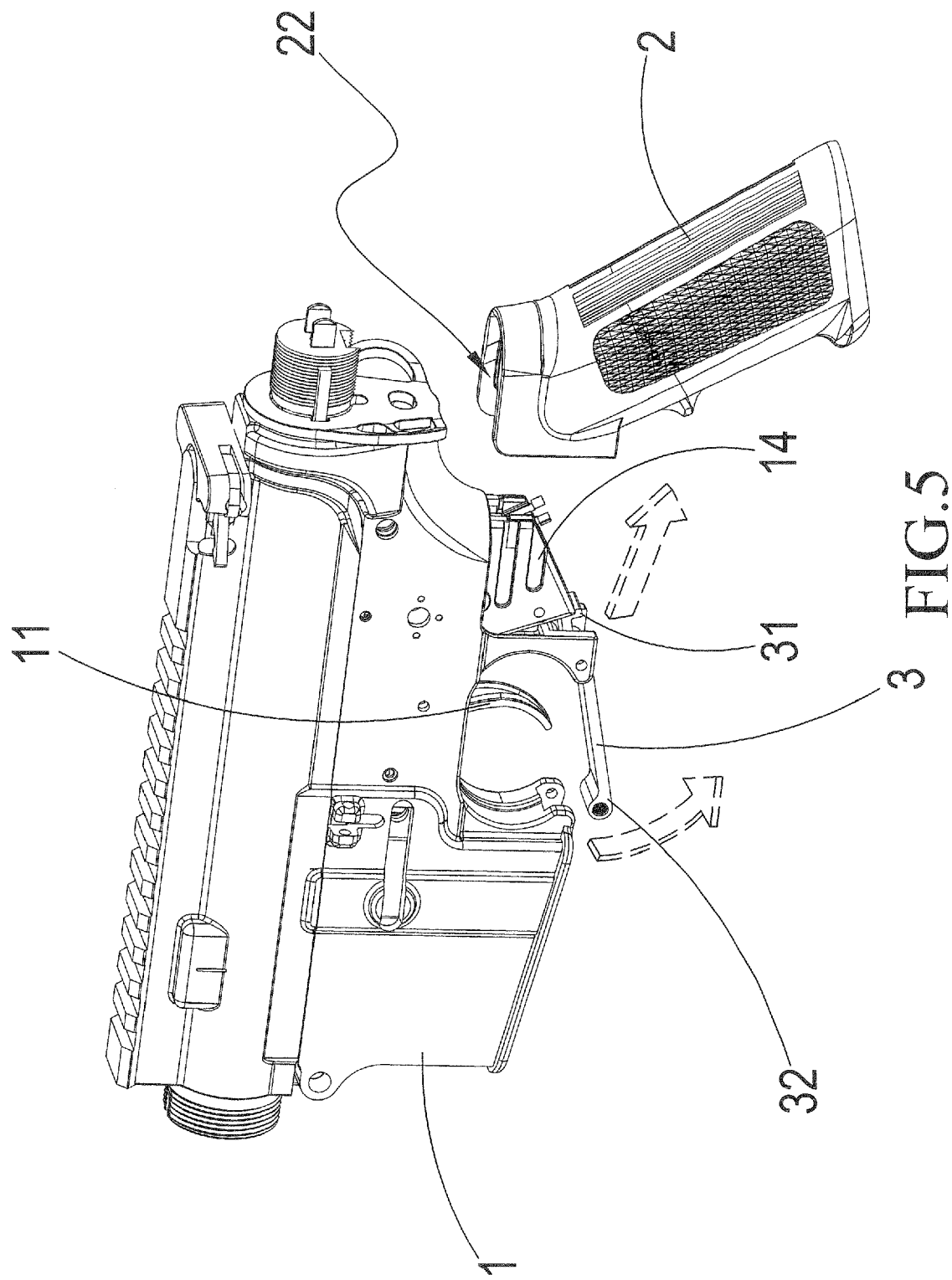


FIG.5

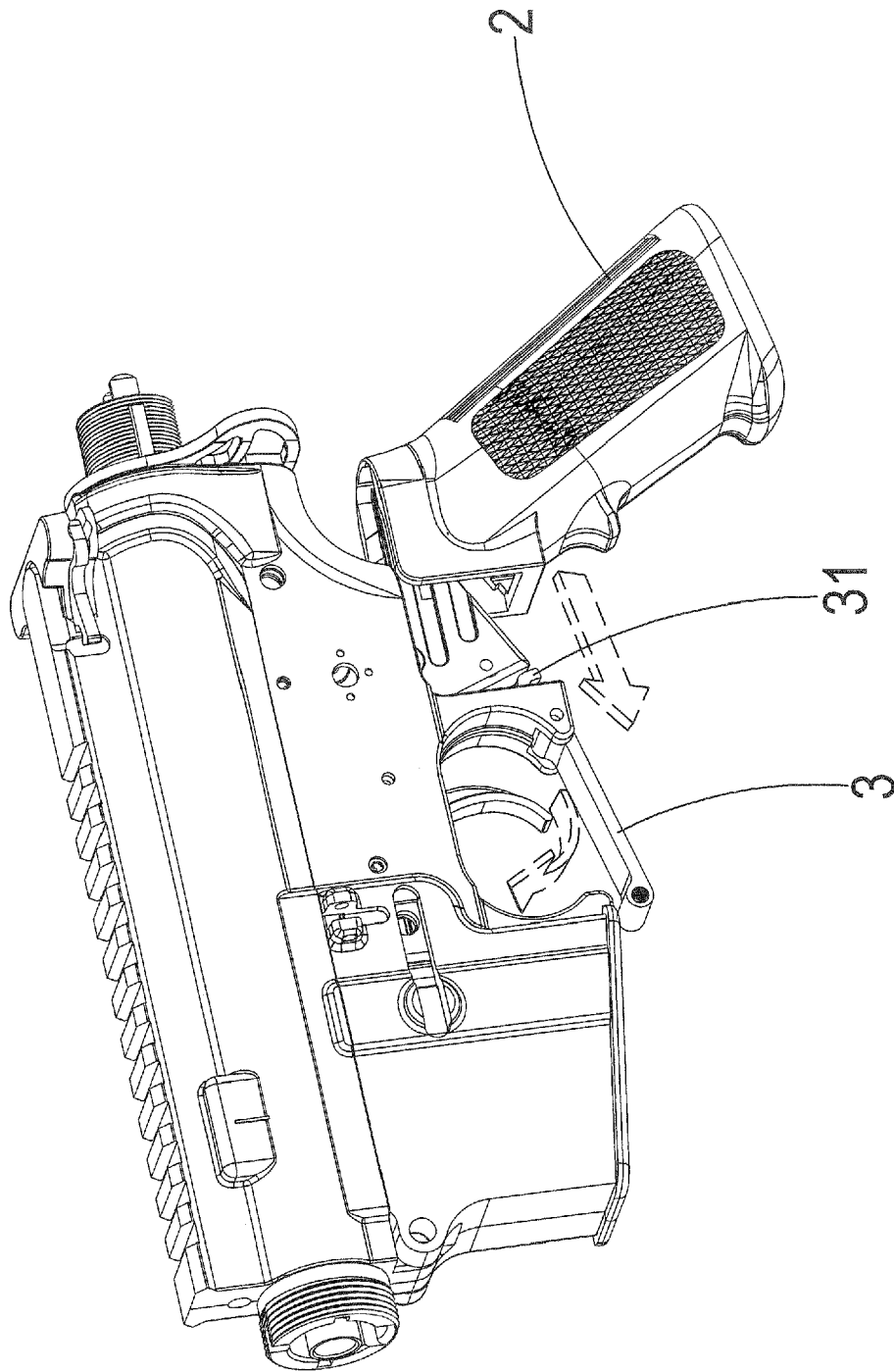


FIG.6



EUROPEAN SEARCH REPORT

Application Number
EP 12 18 0351

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2007/137587 A1 (KLARBORG MARTIN [DK]) 6 December 2007 (2007-12-06) * abstract * * page 1, lines 28-31 * * figure 12 *	1,2	INV. F41B11/646 F41A11/00 F41C23/22
A	US 2006/137671 A1 (CHU CHEN-TANG [TW]) 29 June 2006 (2006-06-29) * paragraphs [0005], [0006] * * figure 2 *	1,2	
A	DE 334 042 C (FRITZ WALTHER) 9 March 1921 (1921-03-09) * page 2, line 72 - page 3, line 25 * * figures 1,2 *	1,2	
A	US 2010/115816 A1 (CHU CHEN-TANG [TW]) 13 May 2010 (2010-05-13)	1,2	
			TECHNICAL FIELDS SEARCHED (IPC)
			F41B F41A F41C
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 11 March 2013	Examiner Menier, Renan
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			

2
EPO FORM 1503 03/82 (P04C01)



Application Number

EP 12 18 0351

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 12 18 0351

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1, 5, 6, 8, 9

quick assembling/disassembling structure for motor handle
module of electrical gear box, comprising a snap-fitting
element

2. claims: 2-4, 7, 10

quick assembling/disassembling structure for motor handle
module of electrical gear box, comprising a firearm body
having an end forming a coupling section having inside
surfaces forming a guide section

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

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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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11-03-2013

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US 2010115816 A1	13-05-2010	NONE	