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(72) Inventor: **Lizarralde Ibarguren, Inigo**  
**20570 Bergara (Gipuzkoa) (ES)**

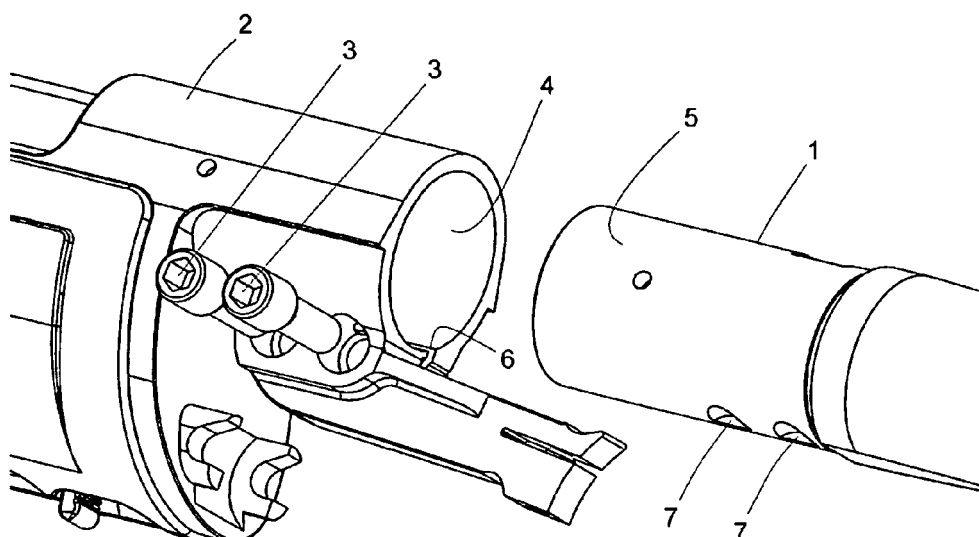
(74) Representative: **Urteaga Simarro, José Antonio**  
**C/ Principe de Vergara, 31**  
**28001 Madrid (ES)**

(71) Applicant: **Dikar S. Coop. Ltda**  
**20570 Bergara (Gipuzkoa) (ES)**

(54) **Rifle with barrel fixed to the body by at least one screw**

(57) Rifle with a barrel (1) fixed to a rifle body (2) by means of at least one screw (3), wherein the rifle body (2) includes a housing (4) to receive the barrel (1) and wherein the screw (3) is fixed to the rifle body (2) so that the rifle body (2) tightens against or grips the outer surface (5) of the barrel (1). In order to strengthen the connection between the barrel (1) and the rifle body (2) and

fully ensure that the former does not move in either a longitudinal or rotary direction in relation to the latter, the barrel (1) includes at least one surface hollow (7) on its outer surface (5), and part of the screws (3) already fixed to the rifle body (2) are arranged inside a surface hollow (7), so that the screws (3) inserted partly into the surface hollow (7) provide longitudinal and rotary locking of the barrel (1) against the rifle body (2).



**FIG.3**

## Description

### Technical field

[0001] The invention relates to a rifle provided with a barrel fixed to the rifle body by at least one screw, so as to prevent any unwanted movement of the barrel when the rifle is being used, which might be very dangerous for the user.

### Prior art

[0002] In general terms, two fundamental parts of a rifle are the rifle body and the barrel. The rifle body includes items such as the trigger, the housing for the bullet (s), the firing mechanisms, the stock, etc. The barrel is an elongated hollow element that projects forward in relation to the rifle body and inside which the bullet is guided and accelerated when the rifle is fired.

[0003] The connection between the barrel and the rifle body must be sturdy and robust to ensure that the barrel does not move in any way when the rifle is fired. A connection which is not robust would nearly always lead to problems of accuracy when shooting. Moreover, a more or less serious accident, depending on the rifle calibre, will most surely occur if the barrel comes loose from the rifle body or the rifle breaks during firing.

[0004] Several methods of fixing the barrel to the rifle body are known in the state of the art, very often based on the use of screws in order to ensure fixing. In these screw-based fixing methods, the barrel is usually inserted into the rifle body in a male-female connection and then screws are inserted that tighten the rifle body against the barrel. The screws are either directly connected to the rifle body or connected to a part or set of parts by way of a flange surrounding the rifle body in the barrel connection area. Examples of this type of connection can be seen in patents US3731418 and US3834053, which show two transverse screws pass through the rifle body and tighten it against the end of the barrel, in this case without the use of auxiliary flanges.

[0005] The connection by means of transverse tightening screws is a simple and quite effective solution. In the first place, it largely prevents the barrel from turning or moving. Additionally, it is also easy to disconnect when the rifle is to be cleaned. In spite of this, it has been found in practice that, especially as regards preventing possible longitudinal movement of the barrel in relation to the rifle body, the connection by means of tightening screws does not fully guarantee that there is no such longitudinal movement and can therefore be improved. Such is the case that, on occasions, rifles have to be provided with extra items, in addition to the screws, to lock the barrel against the rifle body and completely prevent longitudinal movement.

[0006] The aim of the present invention is to provide a screw-based connection between the barrel and the rifle body, which is simple and which completely guarantees

that the barrel will not move longitudinally nor in any other direction in relation to the rifle body when the rifle is fired.

### Brief description of the invention

[0007] It is an object of the invention to provide a rifle with a barrel fixed to the rifle body by at least one screw, where the rifle body includes a housing to receive the barrel and where the screw is fixed to the rifle body so that the rifle body presses against the outer surface of the barrel. Tightening the screw or screws enables the barrel to be secured inside the housing of the rifle body. Additionally, the rifle according to the invention has the particularity that the barrel includes at least one surface hollow on its outer surface, intended to house part of a respective screw and cause additional locking of the barrel. More specifically, part of a screw already fixed to the rifle body is arranged inside a surface hollow, so that the screw inserted partly into the surface hollow prevents potential longitudinal movement of the barrel in relation to the rifle body.

[0008] In this way, the screw or screws in the rifle according to the invention perform a double function. Firstly, they tighten the rifle body against the part of the barrel housed inside the rifle body, preventing the barrel from moving due to friction. Secondly, they come into contact with the barrel itself, being partially housed inside the surface hollows on the barrel, acting like mechanical bolts or stops that completely prevent, due to a collision effect, any longitudinal or rotary movement of the barrel in relation to the rifle body. Thus, if tightening of the screws fails or they become slightly loose, the bolt or stop effect secondly provided by the screws would continue to ensure that the barrel does not moves longitudinally.

### Brief description of the drawings

[0009] Details of the invention can be seen in the accompanying drawings, which do not seek to restrict the scope of the invention:

- Figure 1 shows a side view of one embodiment of the rifle according to the invention, once the handguard is assembled.
- Figure 2 shows the rifle of the previous figure, but without the handguard.
- Figure 3 shows the embodiment of the previous figures, in an exploded view.
- Figure 4 shows a cross-section view, according to the section plane A-A in Figure 2.
- Figure 5 shows the screws on the handguard.

### Detailed description of the invention

[0010] The figures that accompany this description show a specific embodiment of the invention, in different assembly situations, starting with a side view which shows the rifle already assembled with all its compo-

nents. Figure 1 represents the rifle according to the invention, which comprises a barrel (1) fixed to a rifle body (2). The rifle body (2) includes a handguard (2a) which, in this figure, is already assembled, thereby concealing a series of interior components that are relevant to the invention.

**[0011]** Figure 2 shows the rifle of the previous figure, but without the handguard (2a). As shown in this second figure, the rifle comprises two screws (3) to secure the connection between the rifle body (2) and the barrel (1).

**[0012]** Figure 3 shows the components of the previous figure in exploded form. As can be seen, the rifle body (2) includes a housing (4) to receive the barrel (1), in this case to specifically receive one end of the said barrel (1). The figure makes it possible to understand that the screws (3) are fixed to the rifle body (2) so that the rifle body (2) tightens against the outer surface (5) of the barrel (1). In this embodiment, tightening is achieved thanks to the fact that the rifle body (2) has a longitudinal gap (6) that provides the rifle body (2) with a certain elasticity, so that when the screws (3) are tightened, the body slightly deforms and, in turn, the inner walls of the housing (4) are tightened against the barrel (1).

**[0013]** The rifle according to the invention also has the particularity that the barrel (1) includes at least one surface hollow (7) on its outer surface (5). Each surface hollow (7) is intended to receive part of a respective screw (3) so that a mechanical stop effect takes place. As shown in Figure 4, part of a screw (3) already fixed to the rifle body (2) is arranged inside a respective surface hollow (7), so that the screw (3), partly inserted into the surface hollow (7), prevents potential longitudinal or rotary movement of the barrel (1) in relation to the rifle body (2), due to a collision or stop effect.

**[0014]** In the embodiment shown, the screwhead (3a) of the screw (3) is partially lodged inside the surface hollow (7). This enables full advantage to be taken of the screw (3), as its threaded part is used to screw and tighten the screw (3) to the rifle body (2), while the screwhead (3a) performs the function of locking itself into the surface hollow (7).

**[0015]** In the embodiment shown, only the screwhead (3a) of the screw (3) is partially lodged inside the surface hollow (7), i.e. no other part of the screw (3) is lodged inside the surface hollow (7).

**[0016]** In the embodiment shown, the rifle includes two screws (3) and the barrel includes two respective surface hollows (7). However, the possibility of having any other number of screws (3) is not ruled out. The invention also contemplates that the number of surface hollows (7) may be different from the number of screws (3), so several screws (3) share a single surface hollow (7) - even if the option of a surface hollow (7) for each screw (3) is the most robust.

**[0017]** Additionally, the screws (3) and the respective surface hollows (7), as shown in Figures 2 and 4, are preferably located at the bottom of the barrel (1). This embodiment has the advantage that the screws (3) and,

in general, the entire lower area, can be hidden by the handguard (2a) when the rifle is fully assembled. Figure 1 shows how the screws (3) are concealed by the handguard (2a) of the rifle body (2).

**[0018]** According to the invention, the handguard (2a) is preferably such that it cannot be assembled correctly onto the rest of the rifle body (2) if the screws (3) have not previously been fully screwed in. This provides increased safety for the user, who, on perceiving that it is not possible to assemble the handguard (2a) will realise that the screws (3) are not properly screwed in and will tighten them fully, making the barrel (1) perfectly secured and locked. For this reason, the handguard (2a) includes at least one internal element (8) intended to prevent assembly of the handguard (2a) onto the rest of the rifle body (2), by colliding with the screw (3) in the event that the screw (3) is not fully screwed in. One example of an internal element (8), in the form of an internal wall or rib, can be seen in Figure 5. In this figure the screws (3) are drawn inside the handguard (2a), schematically showing the screws (3) in their correct position, in which they clear the internal elements (8), i.e. they do not collide with said internal elements (8). The internal elements (8) might take the said form of an internal wall, internal ribs, or any other applicable protuberance that interferes with the screws (3) if they are not correctly positioned (properly screwed in).

## Claims

1. Rifle with a barrel (1) fixed to a rifle body (2) by means of at least one screw (3), wherein the rifle body (2) comprises a housing (4) to receive the barrel (1) and wherein the screw (3) is fixed to the rifle body (2) so that the rifle body (2) tightens against or grips the outer surface (5) of the barrel (1), which is **characterised in that:**
  - the barrel (1) comprises at least one surface hollow (7) on its outer surface (5),
  - part of the screw (3) already fixed to the rifle body (2) is arranged inside a surface hollow (7), so that the screw (3) inserted partly into the surface hollow (7) prevents potential longitudinal movement of the barrel (1) in relation to the rifle body (2).
2. Rifle, according to claim 1, wherein the screwhead (3a) of the screw (3) is partially lodged inside the surface hollow (7).
3. Rifle, according to claim 2, wherein only the screwhead (3a) of the screw (3) is partially lodged inside the surface hollow (7).
4. Rifle, according to claim 1, wherein at least one screw (3) and the respective surface hollow (7) are

located at the bottom of the barrel (1).

5. Rifle, according to claim 1, wherein each screw (3) corresponds to a different surface hollow (7).

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6. Rifle, according to claim 1, wherein at least one screw (3) is concealed by a handguard (2a) of the rifle body (2) and wherein said handguard (2a) comprises at least one internal element (8) intended to prevent assembly of the handguard (2a) onto the rest of the rifle body (2), by colliding with the screw (3) if the screw (3) is not fully screwed in.

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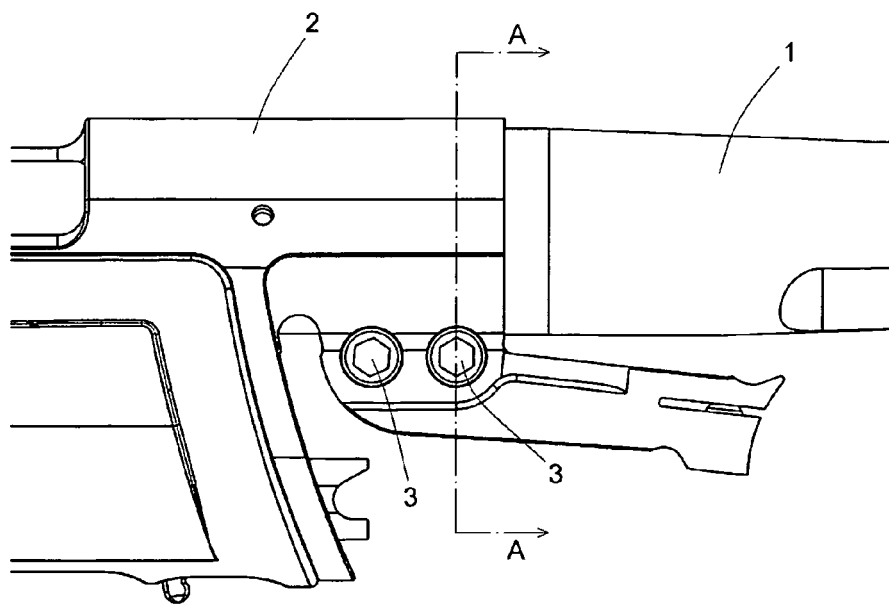
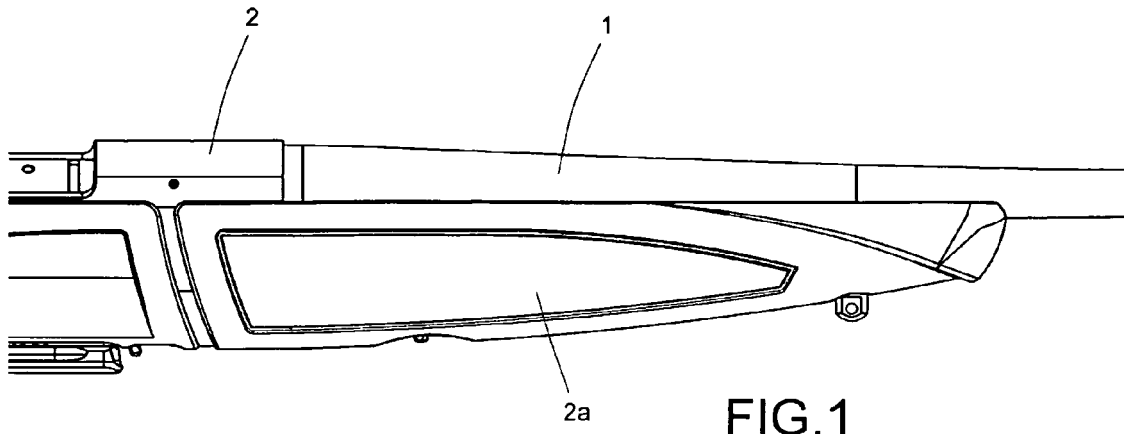
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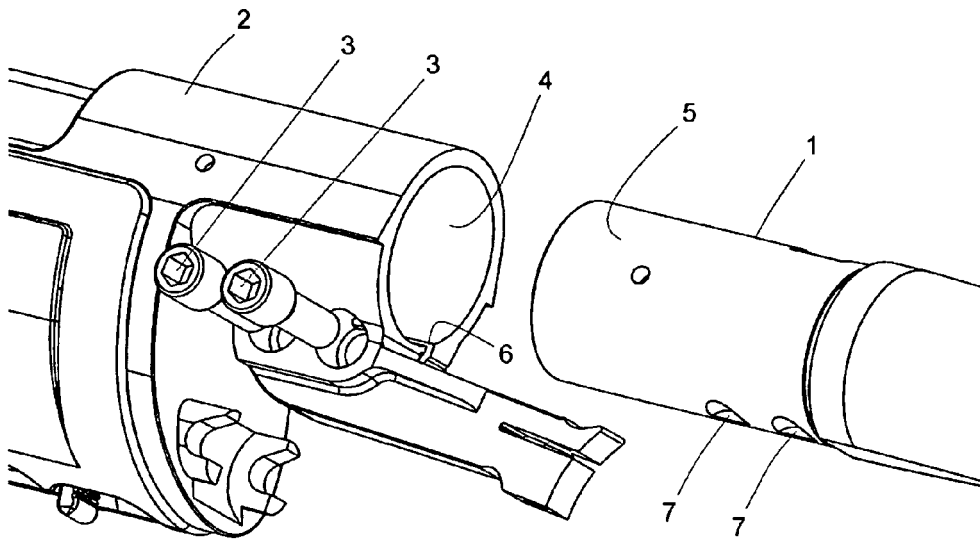


FIG.3

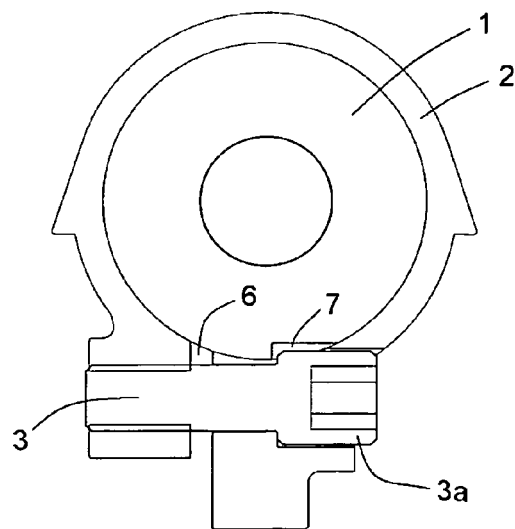


FIG.4

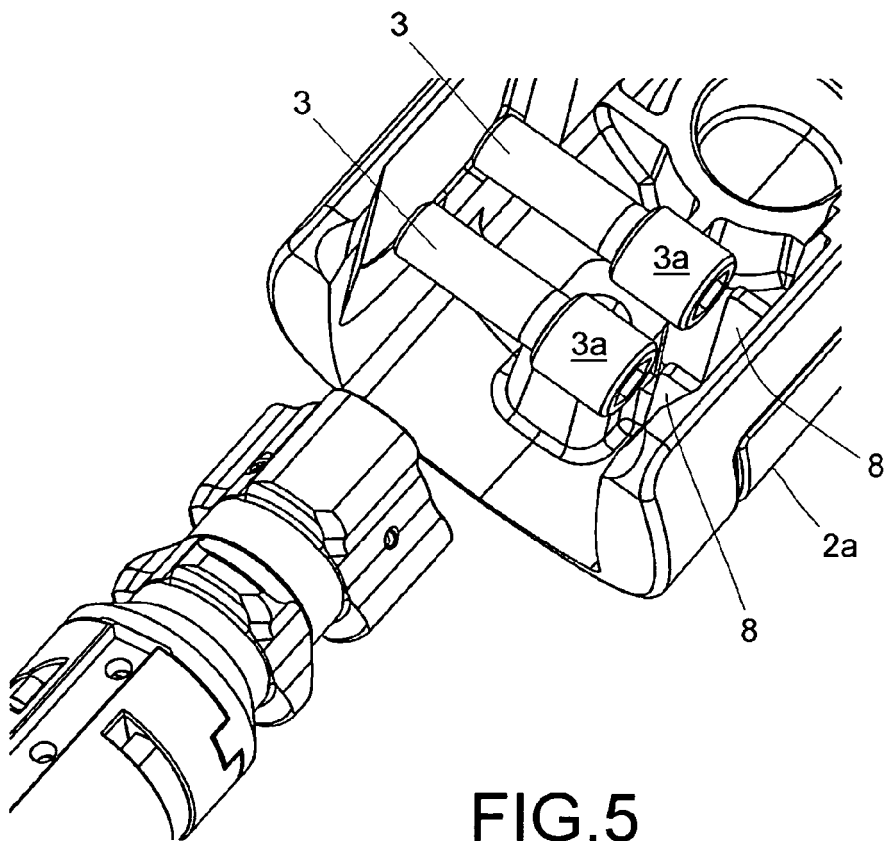


FIG.5



## EUROPEAN SEARCH REPORT

Application Number  
EP 12 38 0009

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                               |                                                  |                                         |
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| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document<br>T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>& : member of the same patent family, corresponding document |                                                                                                                                                               |                                                  |                                         |

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EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
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EP 12 38 0009

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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