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(54) **BUTTSTOCK FOR A GUN COMPRISING AN ADJUSTABLE BUTT MEMBER AND AN ADJUSTABLE CHEEK REST**

(57) The buttstock for an electric air gun contains a main unit (1), an extension unit (2) configured to a front end of the main unit (1), a detachable and adjustable butt unit (4) configured to a rear edge of the main unit (1), and a cheek support unit (3) that can be raised or lower along a top edge of the main unit (1). The extension unit (2)

can be telescoped out of the main unit (1) and the butt unit (4) can also be extended backward for different distance so as to suit users of various arm lengths. The cheek support unit (3) on the other hand can be raised to various heights so that users of different neck lengths can more comfortably operate the electric air gun.

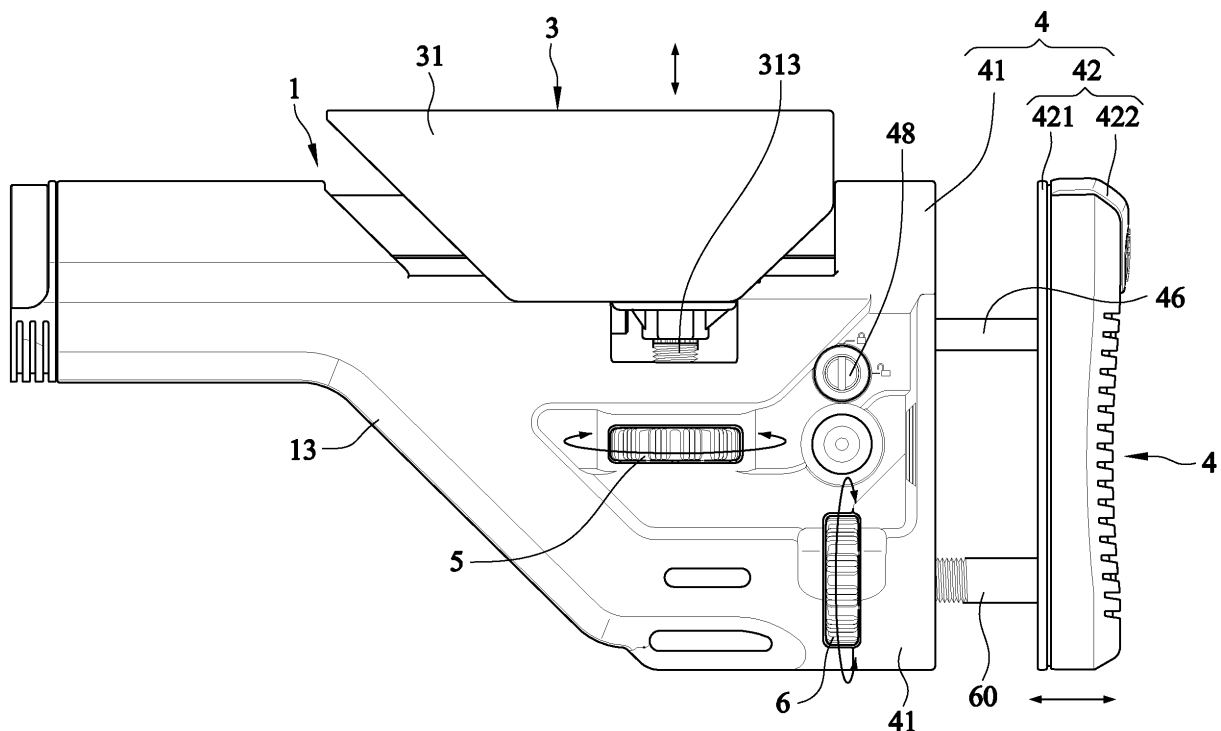


FIG. 12

Description**BACKGROUND OF THE INVENTION****(a) Technical Field of the Invention**

[0001] The present invention is generally related to air guns, and more particular to an electric air gun's buttstock providing adjustment to fit various users.

(b) Description of the Prior Art

[0002] Due to the popularity of war games, air guns such as BB guns and paint guns are of great demand. Conventional air guns have fixed buttstocks and, as users are of various arm or neck lengths, these air guns are not suitable for each and every user, even though some of them are equipped with some minor adjustment mechanisms. For example, Taiwan Utility Model Application Serial No. 099220984 teaches an air gun containing a gun body and a buttstock. The buttstock contains a cheek support assembly containing a cheek support member and a frame engaging the buttstock. The cheek support member is adjustable so as to be more ergonomic. But as mentioned above, this air gun is still not universally applicable to all users.

SUMMARY OF THE INVENTION

[0003] Therefore a novel buttstock is provided herein so as to obviate the shortcomings of the prior art.

[0004] According to the present invention, the buttstock for an electric air gun contains a main unit, an extension unit configured to a front end of the main unit, a detachable and adjustable butt unit configured to a rear edge of the main unit, and a cheek support unit that can be raised or lower along a top edge of the main unit. The extension unit can be telescoped out of the main unit and the butt unit can also be extended backward for different distance so as to suit users of various arm lengths. The cheek support unit on the other hand can be raised to various heights so that users of different neck lengths can more comfortably operate the electric air gun.

[0005] The foregoing objectives and summazy 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.

[0006] 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 illus-

trative example.

BRIEF DESCRIPTION OF THE DRAWINGS**5 [0007]**

FIG 1 is a perspective diagram showing a buttstock according to an embodiment of the present invention when the container is closed.

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FIG 2 is a perspective break-down diagram showing the buttstock of FIG 1.

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FIG 3 is a sectional diagram showing the inside of the buttstock of FIG 1.

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FIG 4 is another sectional diagram showing an extended butt unit of the buttstock of FIG 1.

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FIGS. 6 and 7 are sectional diagrams showing an extension unit of the buttstock of FIG 1 extended for different distances.

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FIGS. 8, 9, and 9A are sectional diagrams showing a butt unit of the buttstock of FIG 1 when it is extended and detached.

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FIGS. 10 and 11 are profile diagrams showing the buttstock of FIG 1 when a butt unit is locked to prevent detachment and unlocked for detachment.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

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[0008] 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.

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[0009] As shown in FIGS. 1 to 3, a buttstock of an electric air gun according to an embodiment of the present invention mainly contains a main unit 1, an extension unit 2 plugged into a front end of the main unit 1, a cheek support unit 3 joined to a top edge of the main unit 1, and a butt unit 4 joined to a rear edge of the main unit 1. The main unit 1 contains a tubular section 11 as an upper portion, a first section 13 and a second section 14 jointly

as a lower portion beneath the tubular section 11. The tubular section 11 has an exposed middle segment 12, a trough 15 beneath a front segment of the tubular section 11, and an upward extending positioning hole 16 penetrating through the trough 15 into the tubular section 11. The main unit 1 further contains a front element having a lateral piece 18 and a ring 17 perpendicularly joined to a front end of the lateral piece 18. The front element is plugged into the trough 15, and has a through hole 181 aligned with the positioning hole 16.

[0010] The extension unit 2 is for connection with the electric air gun, and contains a tubular body 21 with a number of positioning notches 211 along a bottom edge of the tubular body 21. The extension unit 2 is slidably plugged into the tubular section 11 of the main unit 1, and a bolt 22 runs through the positioning hole 16, the through hole 181, and into one of the positioning notches 211 so as to lock the extension unit 2. The extension unit 2 allows a user to adjust the buttstock's length so as to fit his/her arm length.

[0011] The second section 14 of the main unit 1 is plugged into the first section 13. The first and second sections 13 and 14 have positioning holes 19 and 144, and through openings 131 and 141, respectively. After the second section 14 is plugged into the first section 13, the positioning holes 19 and 144, and through openings 131 and 141 are aligned. Then the second section 14 is fixedly joined to the first section 13 by running fasteners 191 and 192 correspondingly through the positioning holes 19 and 144, and applying a bolt 193 to lock the fasteners 191 and 192. A laterally rotatable rotatory wheel 5 is configured in a space formed by the aligned openings 131 and 141.

[0012] The cheek support unit 3 contains a saddle-like cover 31, and a threaded shaft 313 beneath the cover 31. The cheek support unit 3 is joined to and covers the exposed middle segment 12 of the tubular section 11. The shaft 313 as such penetrates through a through hole 142 on a top side of the second section 14, into the opening 141, and axially through the rotatory wheel 5. As the rotatory wheel 5 is turned, the cover 31 is adjusted to move upward or downward. On two corresponding inner walls of the cover 31, there are a number of ribs 311 oppositely configured. As the cover 31 is moved, the ribs 311 engages two notches 121 along the exposed middle segment 12's two bottom edges so as to reliably position the cover 31. There are a pair of blocks 312 oppositely configured besides the ribs 311 on the two corresponding inner walls of the cover 31. Correspondingly, there are a pair of hooks 122 configured along the exposed middle segment 12's two top edges. The hooks 122 engage the blocks 312 so as to prevent the cover 31 from being moved too high.

[0013] As shown in FIGS. 4 and 5, the butt unit 4 contains a front member 41 and a butt member 42. The butt member 42 contains a buffer piece 421 and a rear cap 422. The front member 41 has a forward protruding tubular element 43, a stopping element 44 beneath the

tubular element 43, both in a top portion of the front member 41, and a forwardly open through hole 45 in a bottom portion. A shaft 46 is threaded through the tubular element 43, the buffer piece 421, and the rear cap 422. A bolt 47 is joined to a rear end of the shaft 46 so as to securely lock the butt unit 4 together. After the butt unit 4 is joined to the main unit 1, the first section 13 has a locking hole 132 above the positioning hole 19, and a bolt 48 is threaded through the locking hole 132 and the stopping element 44. The bolt 48 has a notch 481 in the middle, thereby forming a semi-circular cross-section. The notch 481 interfaces with the stopping element 44. By turning the bolt 48 so that the notch 481 faces laterally sideway, the butt unit 4 is locked to the main unit 1. If the notch 481 faces upward, the butt unit 4 is not interfered by the stopping element 44 and is detachable from the main unit 1.

[0014] A threaded shaft 60 is threaded through the through hole 45, the buffer piece 421, and the rear cap 422, and a bolt 47 is joined to a rear end of the shaft 60. A front end of the shaft 60 runs axially through a vertically rotatable rotatory wheel 6 positioned in an indentation 143 along a rear side of the second section 14. By turning the rotatory wheel 6, the butt member 42 can be moved forward or backward so as to fit users of different arm lengths. The shaft 46 has a hook 461 on a front end and, as the butt member 42 is moved backward to an extent, the shaft 46 is moved backward as well and the hook 461 engages a limiting element 431 on an inner wall of the tubular element 43 so as to prevent the butt member 42 from being extended too much.

[0015] As described above, the extension unit 2 can be telescoped out of the main unit 1 and the butt member 42 can also be extended backward for different distance so as to suit users of various arm lengths. The cheek support unit 3 on the other hand can be raised to various heights so that users can more comfortably operate the electric air gun.

[0016] As shown in FIGS. 6 and 7, the adjustment of the extension unit is as follows. Firstly, the bolt 22 is released and the tubular body 21 can be pulled out or pushed in for an appropriate distance. Then, the bolt 22 is fastened into an appropriate positioning notch 211.

[0017] As shown in FIGS. 8 and 9, the adjustment of the butt unit is as follows. The turning of the rotatory wheel 6 drives the shaft 60 to move forward or backward, along with the butt member 42 (including the buffer piece 421 and the rear cap 422) so as to fit users of different arm lengths. For example, turning the rotatory wheel 6 clockwise will extend the butt member 42 outward whereas turning the rotatory wheel 6 counterclockwise will pull the butt member 42 inward towards the front member 41. As the shaft 60 moves backward to a certain extent, the hook 461 of the shaft 60 will be stopped by the limiting element 431 so as to prevent the butt member 42 from too much extension and falling off.

[0018] As shown in FIGS. 9A, 10 and 11, the detachment of the butt unit is as follows. The bolt 48 is turned

until its notch 481 escapes the confinement of the stopping element 44, the entire butt unit 4 can be pulled and separated from the main unit 1. On the other hand, if the bolt 48 is turned so that its notch 481 interferes with the stopping element 44, the butt unit 4 cannot be separated from the main unit 1 and can only be adjusted by turning the rotatory wheel 6. This convenient detachment of the butt unit 4 allows a user to speedily replace or maintain components such as fuse or battery inside the butt unit 4 or in the main unit 1.

[0019] As shown in FIG 12, the adjustment of the cheek support unit is as follows. By turning the rotatory wheel 5, the shaft 313 is driven to raise or lower the cheek support unit 3 upward or downward so as to fit users of various neck lengths. As the cheek support unit 3 is moved upward or downward, the ribs 311 and the notches 121 jointly provide a number of reliable positions for the cheek support unit 3. Additionally, the hooks 122 and the blocks 312 jointly prevent the cheek support unit 3 from being raised to high and fall off.

[0020] 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 claims of the present invention.

Claims

1. A buttstock, comprising:

a main unit (1) comprising a tubular section (11) as an upper portion, a first section (13) and a second section (14) jointly as a lower portion beneath the tubular section (11) where the tubular section (11) has an exposed middle segment (12) and an upward extending positioning hole (16) along a bottom side of the tubular section (11), and the second section (14) has an indentation (143) along a rear side;
an extension unit (2) comprising a tubular body (21) with a plurality of positioning notches (211) along a bottom edge where the tubular body (21) is slidably plugged into the tubular section (11) and a bolt (22) runs through the positioning hole (16) into one of the positioning notches (211) so as to position the extension unit (2);
a cheek support unit (3) joined to and covering the exposed middle segment (12) of the tubular section (11), comprising a saddle-like cover (31) and a threaded first shaft (313) beneath the cover (31), where the first shaft (313) runs through the first and second sections (13, 14) and a first rotatory wheel (5); and

a butt unit (4) comprising a front member (41) and a butt member (42) where the butt member (42) comprises a buffer piece (421) and a rear cap (422), the front member (41) has a forward protruding tubular element (43) in a top portion and a forwardly open through hole (45) in a bottom portion of the front member (41), a third shaft (46) is threaded through the tubular element (43), a second shaft (60) is threaded through the through hole (45) and a second rotatory wheel (6) configured in the indentation (143) of the second section (14);

wherein turning the first rotatory wheel (5) drives the first shaft (313) to move the cover (31) upward or downward so as to fit users of various neck lengths; the extension unit (2) is capable of being telescoped out of the main unit (1) for different distances; turning the second rotatory wheel (6) drives the second shaft (60) to move the butt member (42) outward or inward for different distance; and as such the buttstock is adjustable to suit users of various arm lengths.

2. The buttstock according to claim 1, wherein, on two corresponding inner walls of the cover (31), there are a plurality of ribs (311) oppositely configured that engages two notches (121) along the exposed middle segment (12)'s two bottom edges, respectively, so as to reliably position the cover (31); there are a pair of blocks (312) oppositely configured besides the ribs (311) on the two corresponding inner walls of the cover (31); correspondingly, there are a pair of hooks (122) configured along the exposed middle segment (12)'s two top edges; the hooks (122) engage the blocks so as to prevent the cover (31) from being moved too high.

3. The buttstock according to claim 1, wherein the third shaft (46) has a hook (461) on a front end; and, as the butt member (42) is moved backward to an extent, the third shaft (46) is moved backward as well and the hook (461) engages a limiting element (431) on an inner wall of the tubular element (43) so as to prevent the butt member (42) from being extended too much.

4. The buttstock according to claim 1, wherein the first and second sections (13, 14) have aligned through openings (131, 141), respectively; the first rotatory wheel (5) is configured in a space formed by the aligned through openings (131, 141); the second section (14) has a through hole (142) on a top side into the through opening (141) of the second section (14); the first shaft (313) penetrates through the through hole (142) and into the through opening (141) of the second section (14), and then axially through the first rotatory wheel (5).

5. The buttstock according to claim 1, wherein the first section (13) has a locking hole (132) in a rear portion of the first section (13); the front member (41) has a stopping element (44) beneath the tubular element (42); a bolt (48) is threaded through the locking hole (132) and the stopping element (44) so as to lock and unlock the butt unit (4) to the main unit (1); the bolt has a notch (481) in the middle, thereby forming a semi-circular cross-section; the notch (481) interfaces with the stopping element (44); by turning the bolt (48) so that the notch (481) faces laterally side-way, the butt unit (4) is locked to the main unit (1); and if the notch (481) faces upward, the butt unit (4) is not interfered by the stopping element (44) and is detachable from the main unit (1).

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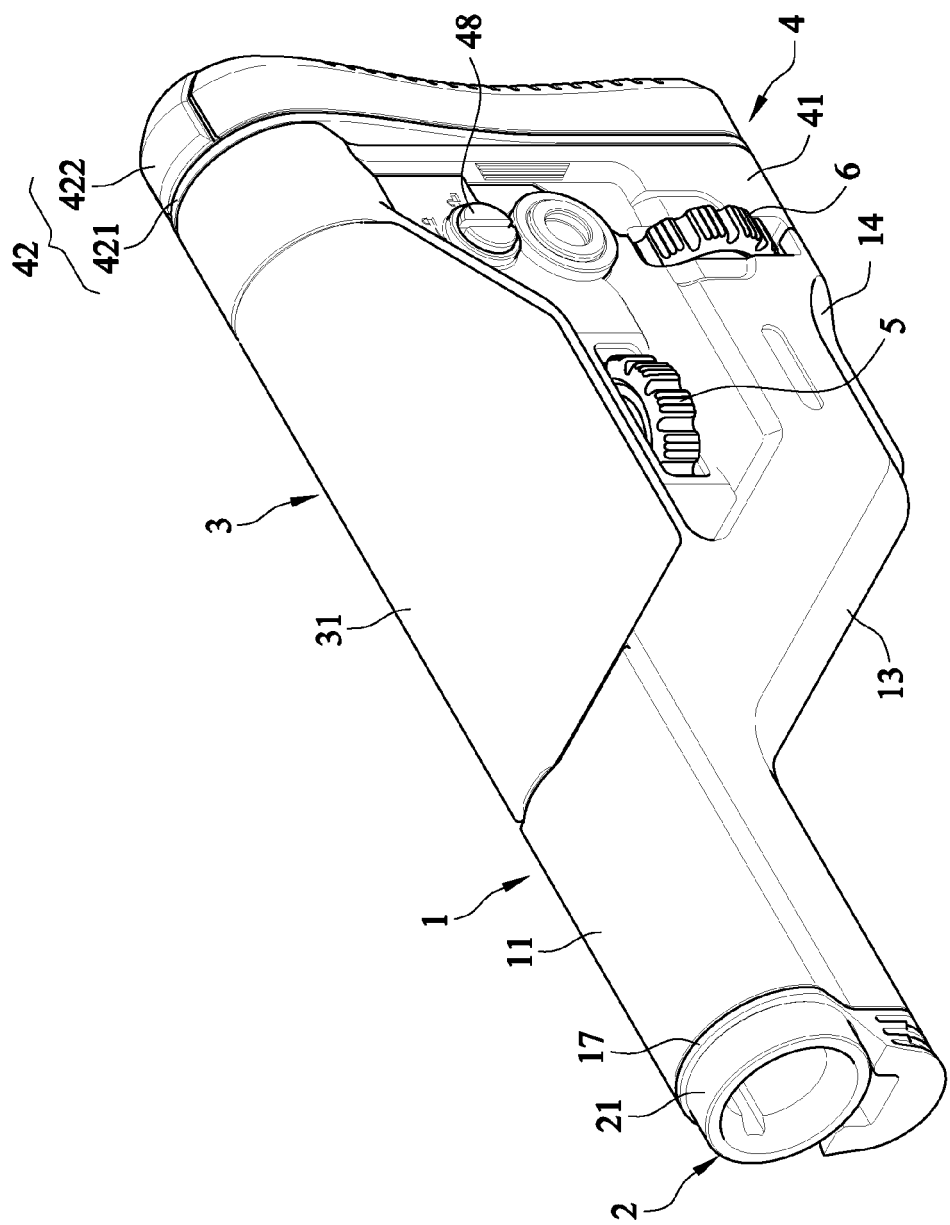


FIG. 1

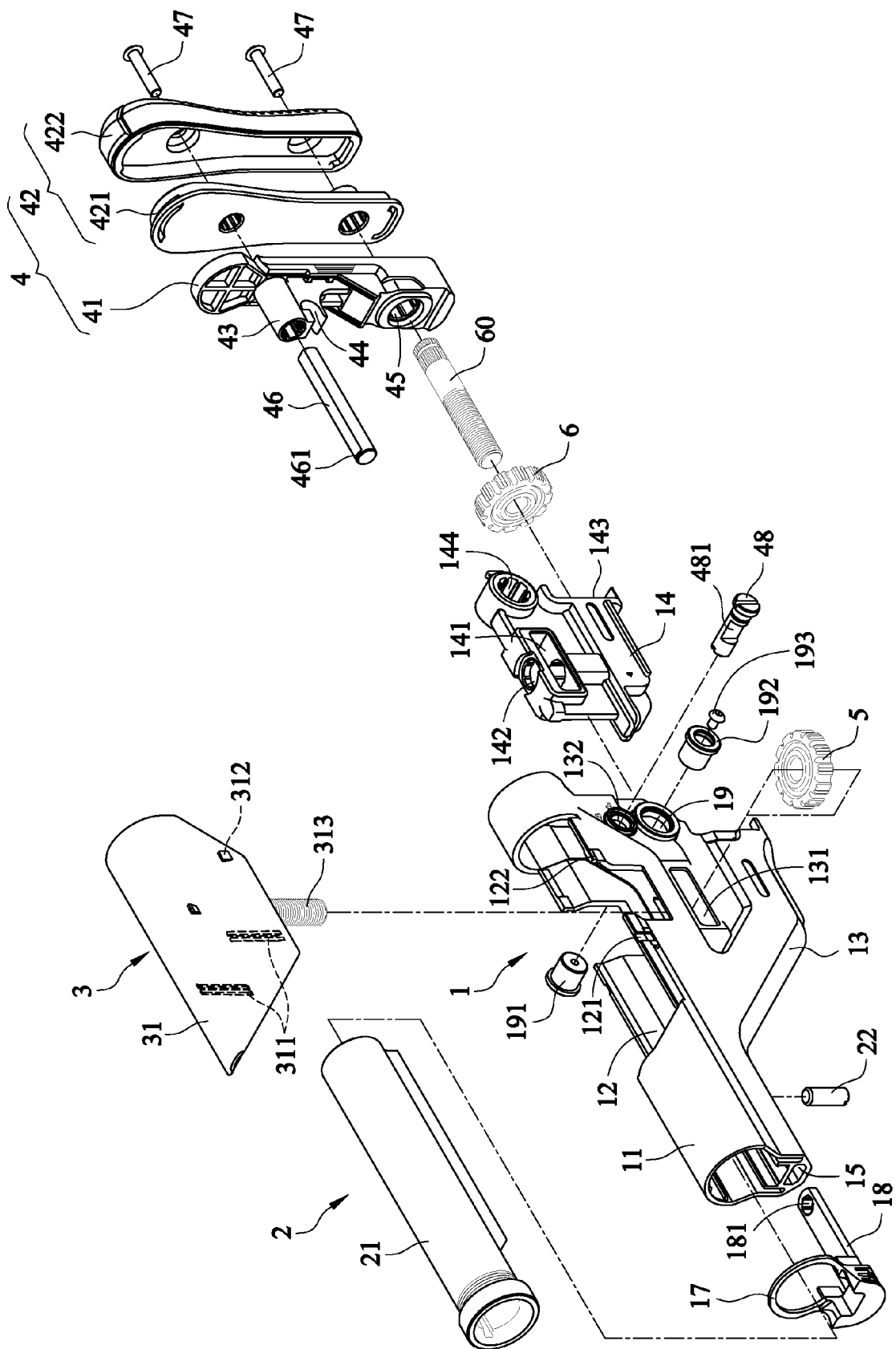


FIG. 2

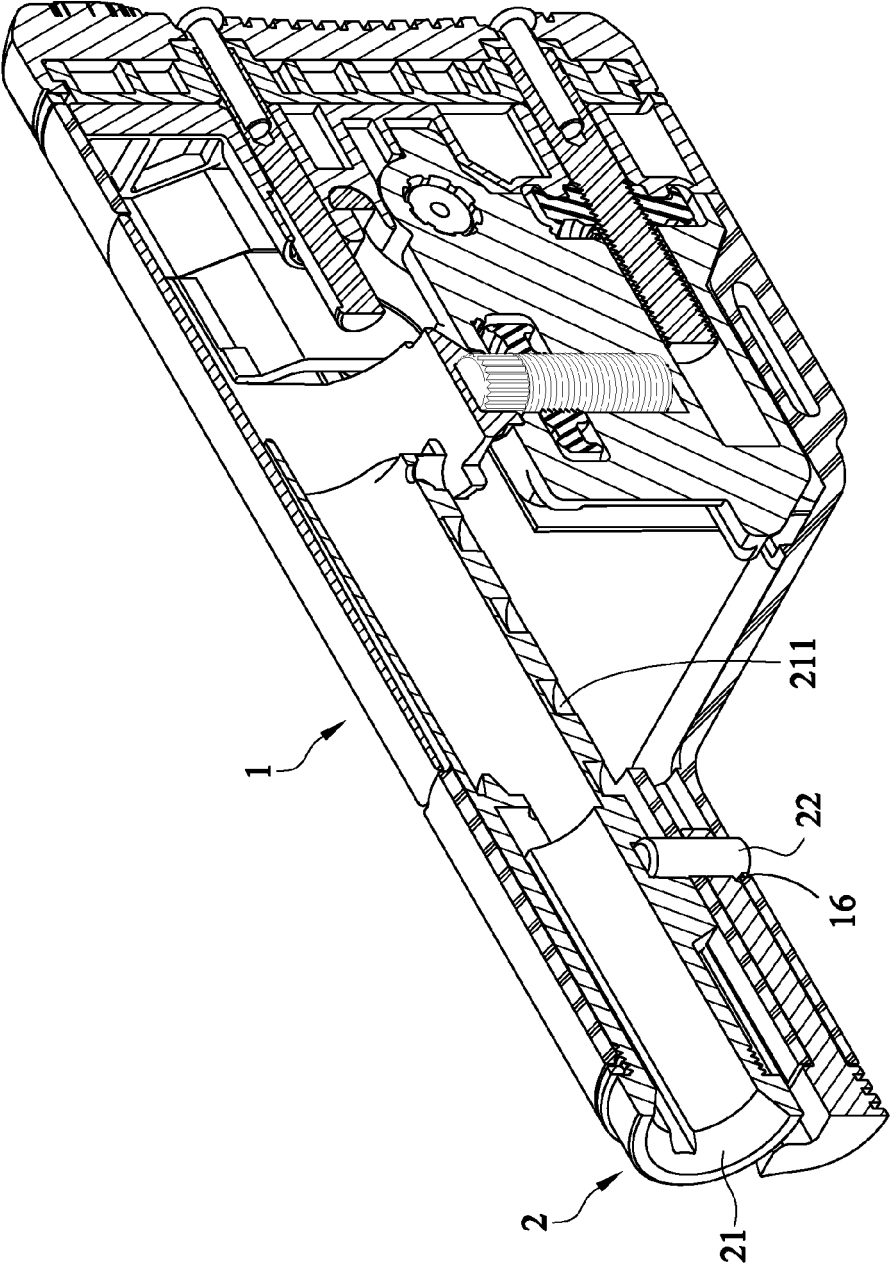


FIG. 3

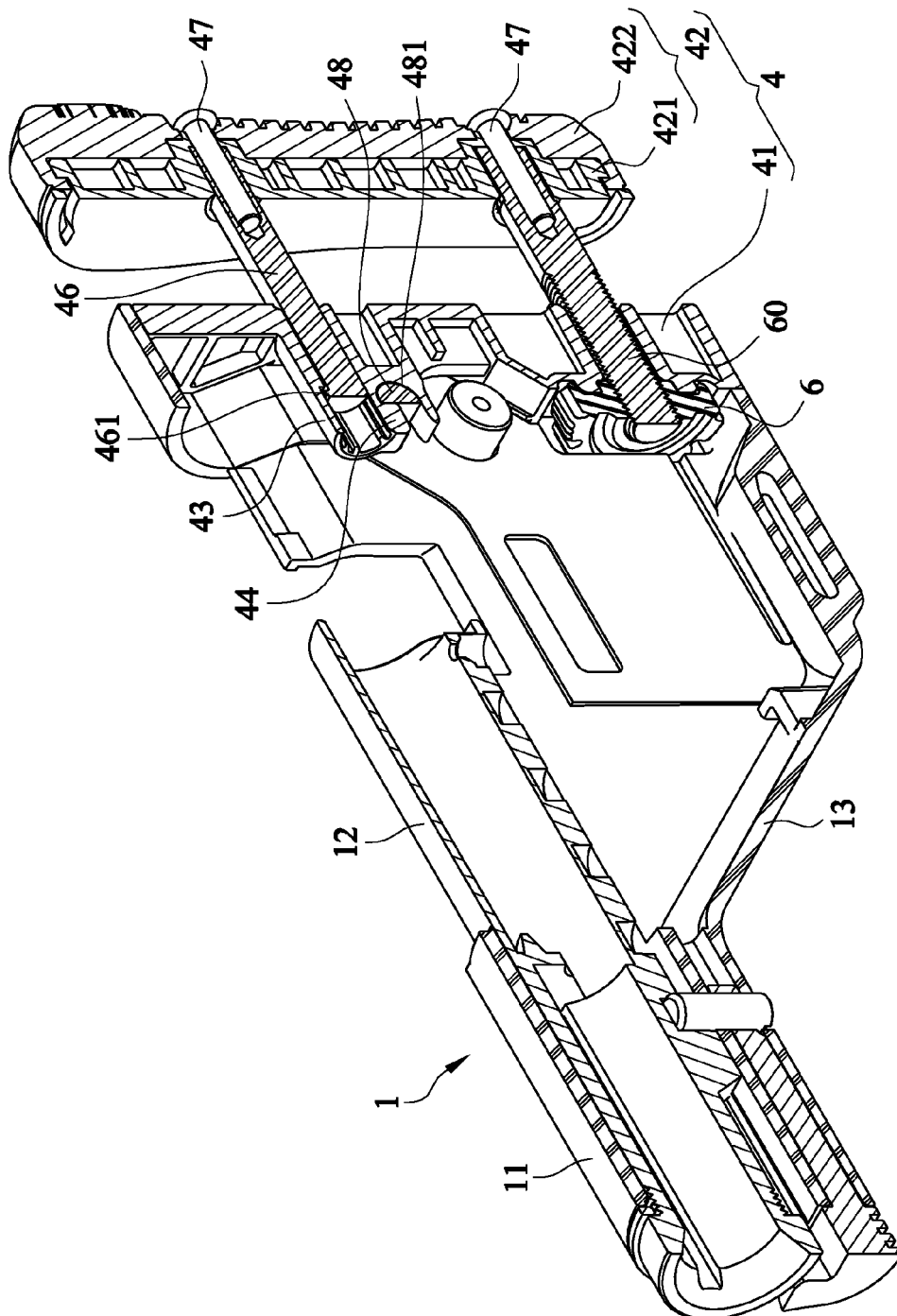


FIG. 4

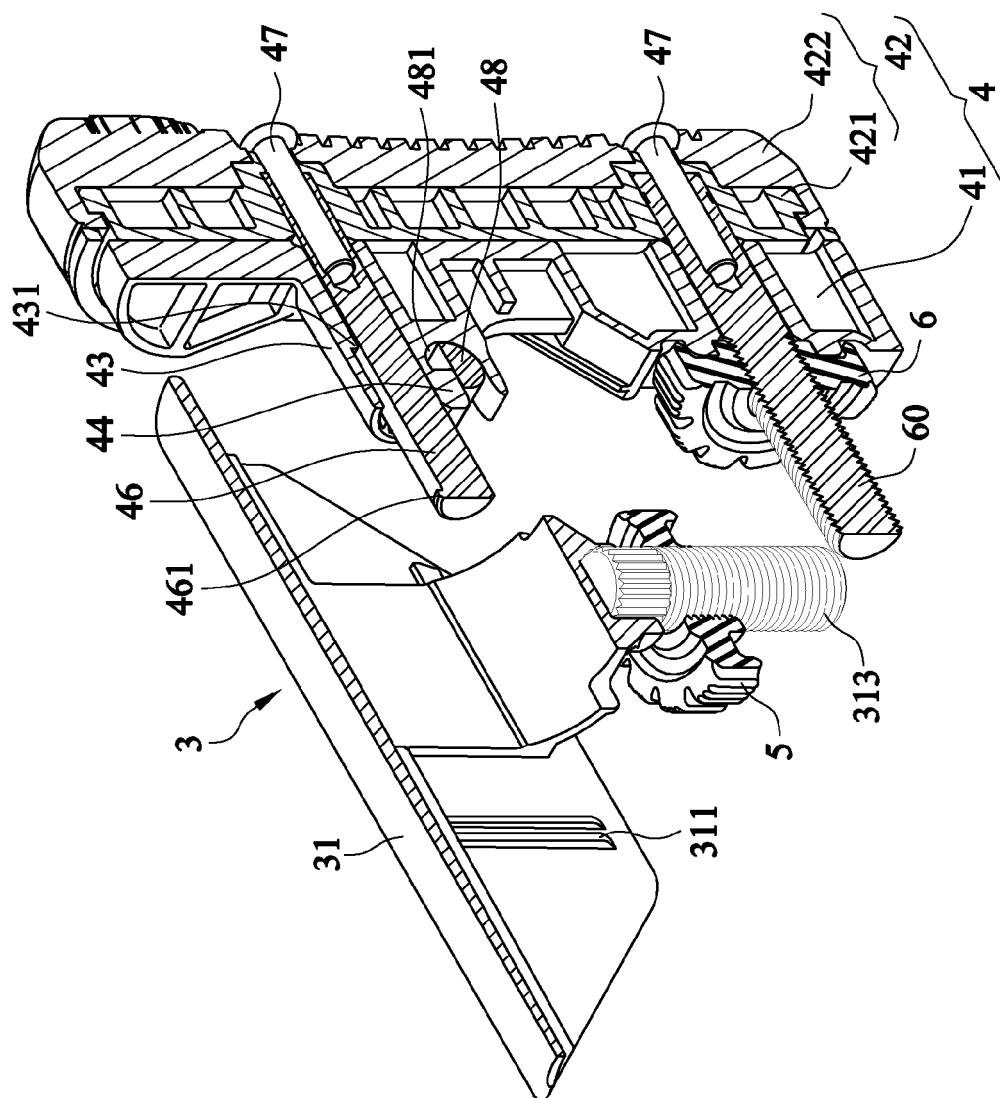


FIG. 5

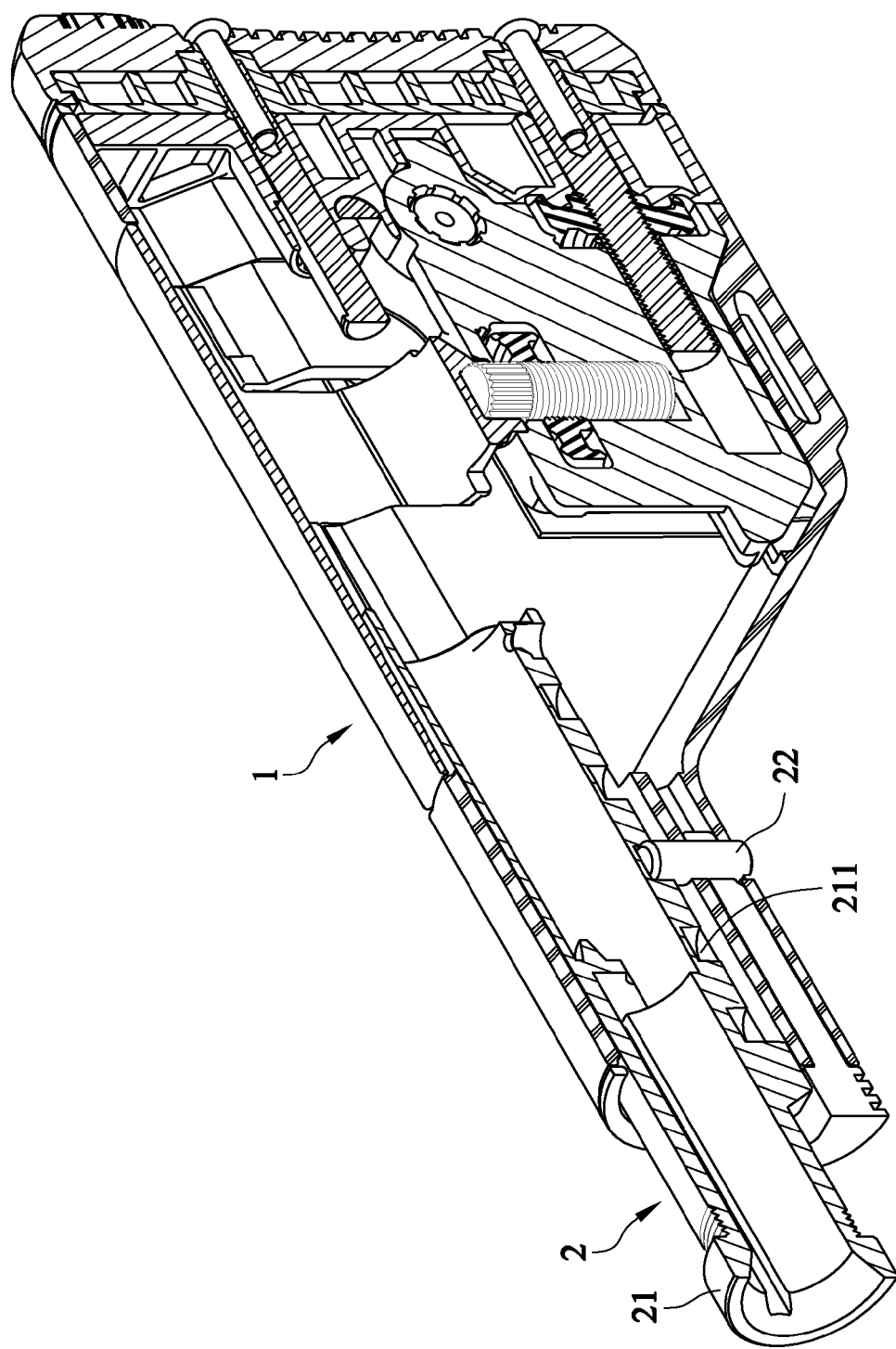


FIG. 6

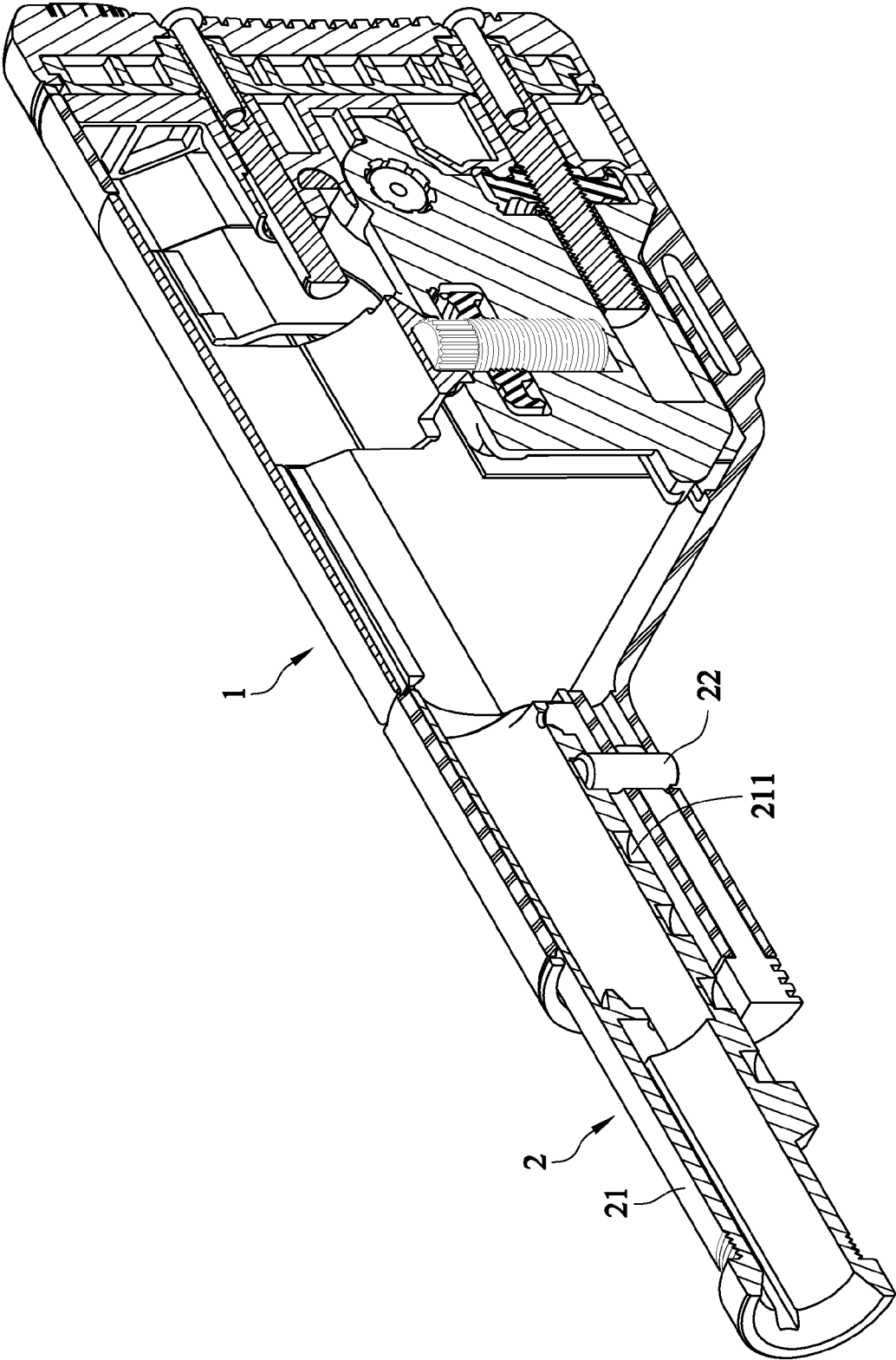


FIG. 7

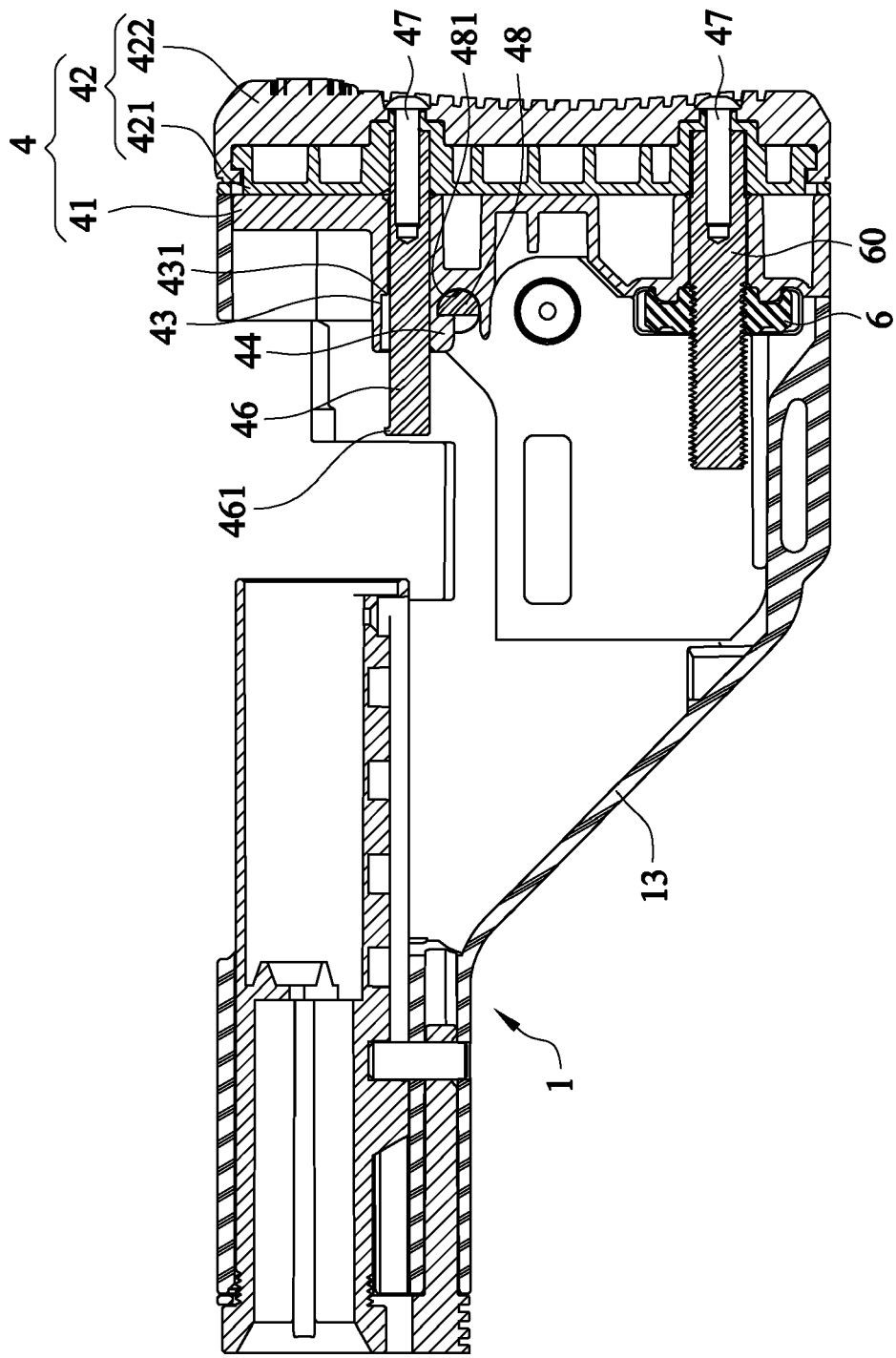


FIG. 8

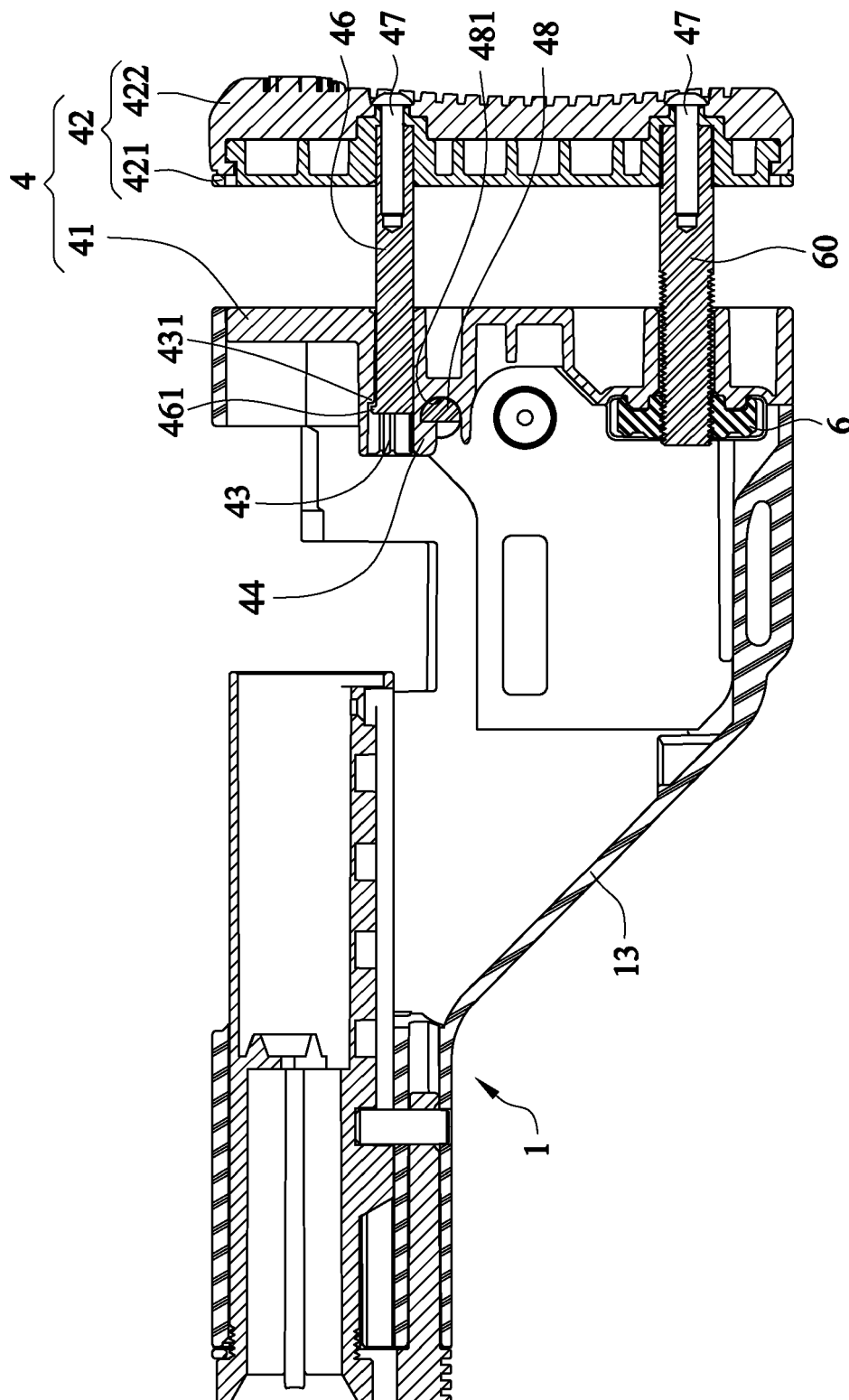
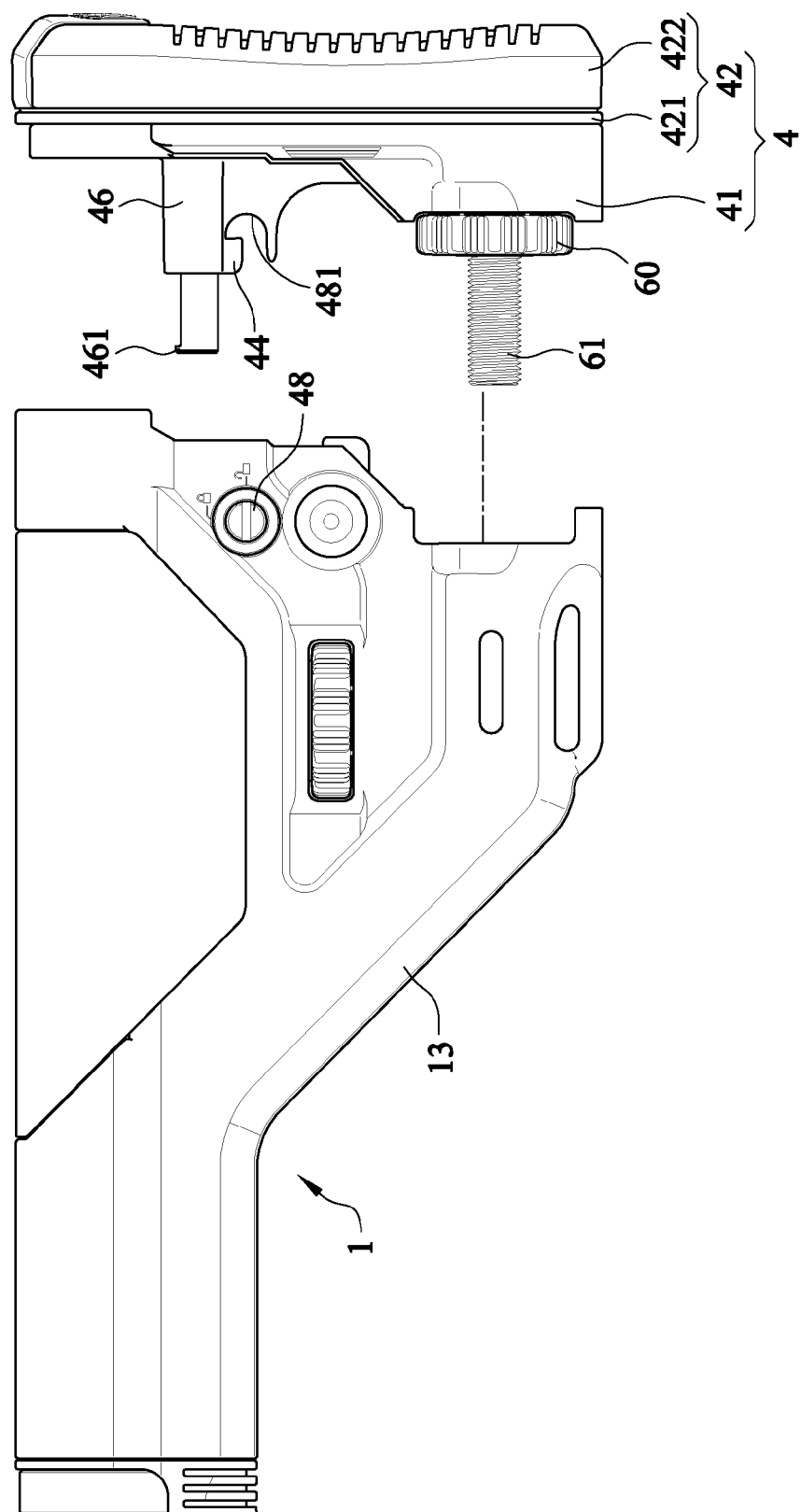


FIG. 9



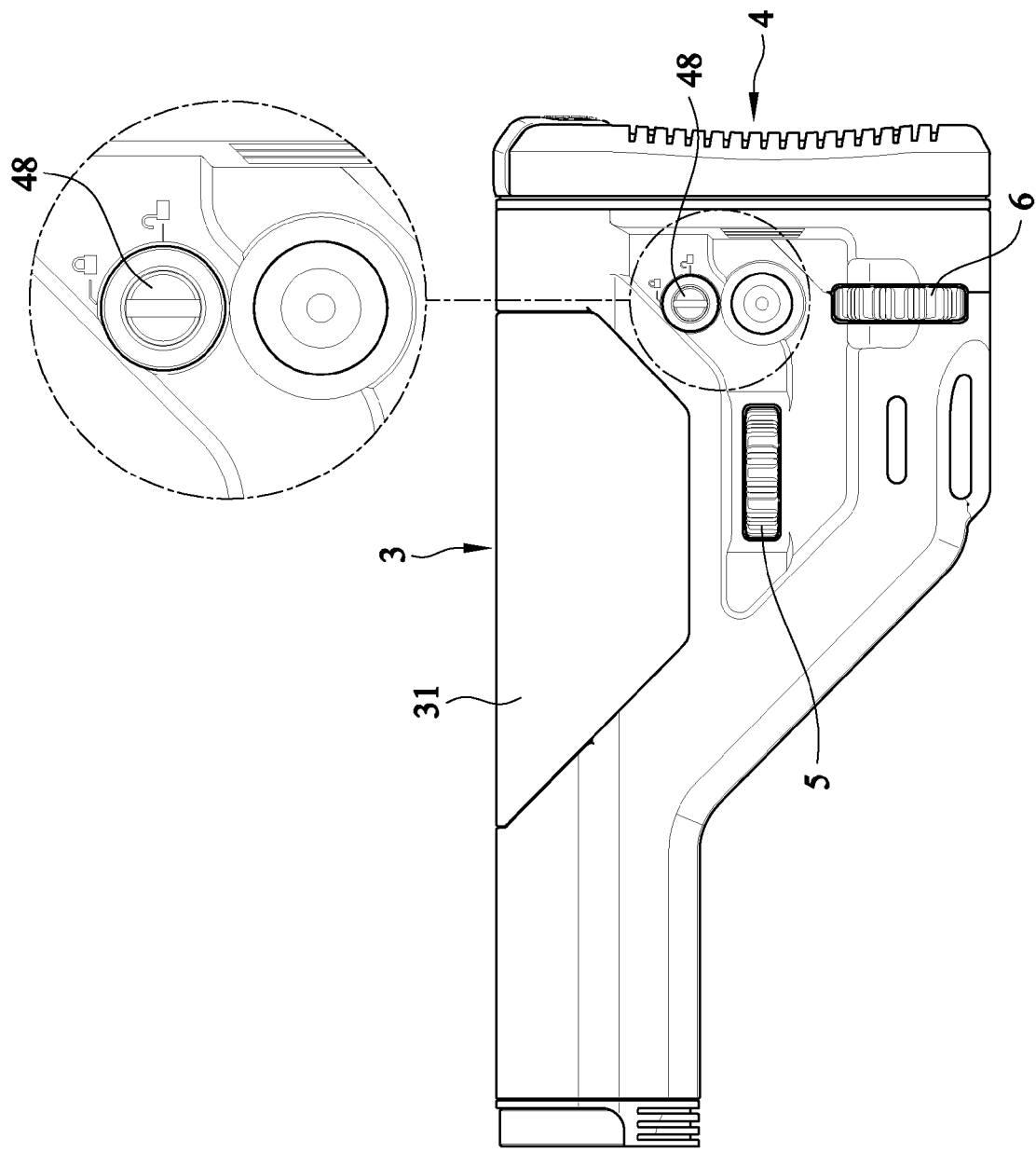


FIG. 10

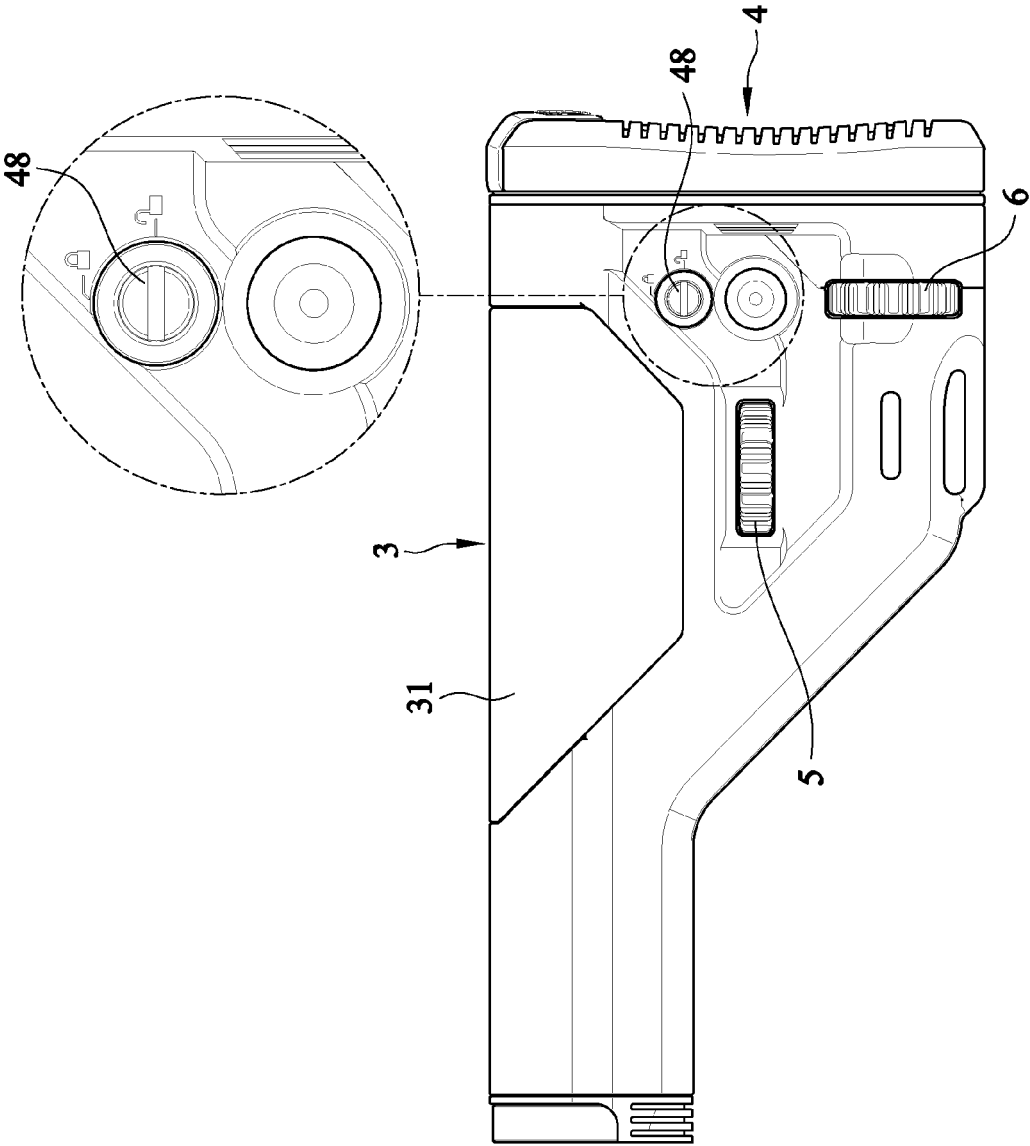


FIG. 11

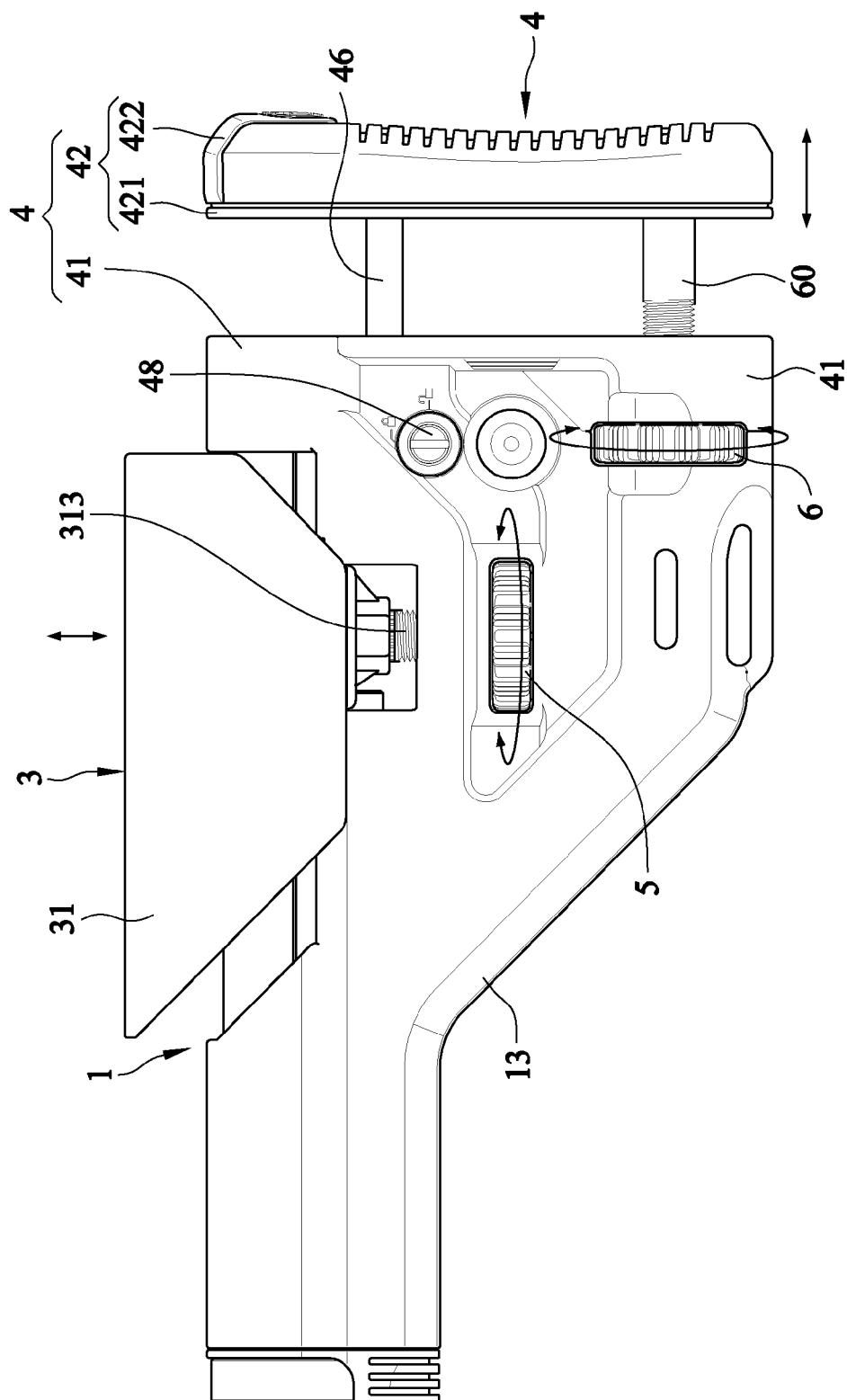


FIG. 12



EUROPEAN SEARCH REPORT

Application Number
EP 15 19 2256

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 12 April 2016	Examiner Van Leeuwen, Erik
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			

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

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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
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12-04-2016

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