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(71) Applicant: **Kien Well Toy Industrial Co., Ltd.**
TW-Kuei Jen Hsiang
Tainan Hsien (TW)

(72) Inventor: **Huang, Hai-Lung**
Tainan (TW)

(74) Representative: **Schildberg, Peter**
Hauck Patent- und Rechtsanwälte
Neuer Wall 50
20354 Hamburg (DE)

(54) Bullet-loading assembly for a toy gun

(57) A bullet-loading assembly (3) is mounted on a toy gun. The toy gun has a body (1) and a triggering assembly (2). The body (1) has a handgrip (10), a bullet chamber (11), a guiding slot (14) and a bottle chamber (16). The triggering assembly (3) has a bolt (20), a trigger (21) and a hammer (24). The bullet-loading assembly (3) has a barrel (1A), a bullet passageway (15) and a limiting member (30). The barrel (1A) is mounted on the body (1) and has a rear end and a bore. The bullet passageway (15) is defined through the handgrip and is located adjacent to the barrel (1A). The limiting member (30) is mounted securely around the barrel (1A) and has a limit (301) pressing against an uppermost ball bullet (4) in the bullet passageway (15) to prevent more than one ball bullet (4) from entering the bullet chamber (11).
When the trigger (21) is pulled, the barrel (1A) and the limiting member (30) move back, the rear end of the barrel (1A) engaging with the front end of the bolt (20) and receiving the uppermost bullet (BB).

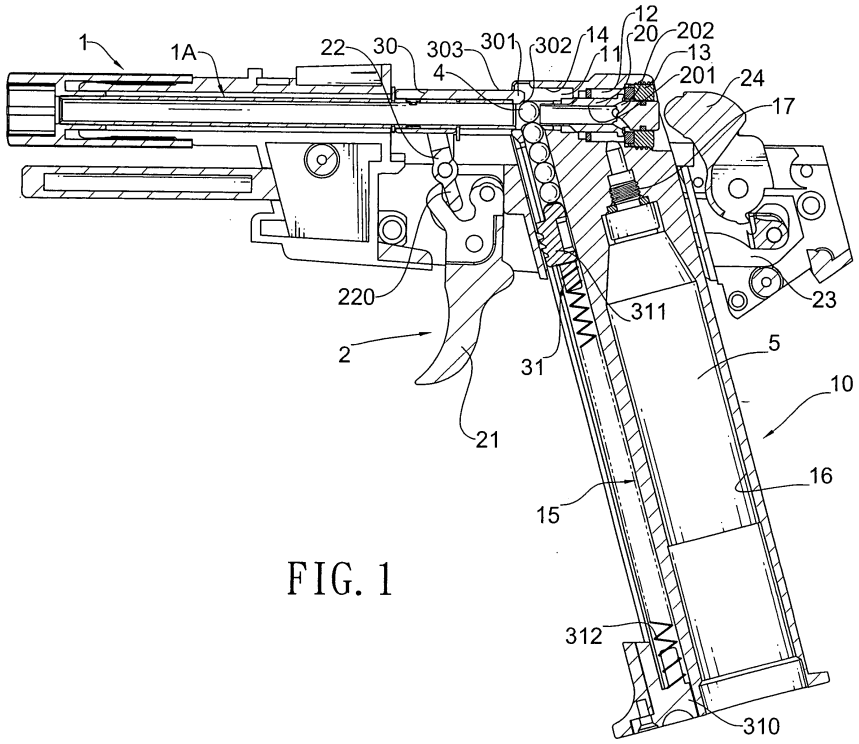

FIG. 1

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Description

1. Field of the Invention

[0001] The present invention relates to a loading assembly, and more particularly to a bullet-loading assembly for a toy gun that has a bullet chamber and controls a single ball bullet to be loaded into the bullet chamber. The bullet-loading assembly prevents more than one ball bullet from being inadvertently loaded into the bullet chamber.

2. Description of Related Art

[0002] A conventional toy gun has a handgrip, a barrel, a trigger, a handgrip, a bolt, a hammer and a loading assembly and may be loaded with ball bullets (BBs) and installed with a high pressure air bottle. When firing the toy gun, a player triggers the toy gun, the hammer is activated to pivot backwards and then forwards to hit and push the bolt. Then high pressure air in the air bottle flows rapidly into the bolt and impacts one BB in front of the bolt to jet the BB through the barrel out of the toy gun.

[0003] The loading assembly is mounted in the handgrip adjacent to the barrel and has a controlling element and a spring. The controlling element is movable in response to the hammer, controls the feeding of the BBs and allows only one BB to pass into and stay in the barrel for firing the toy gun. The spring biases the controlling element to press against one BB and provide the resilient force to recover the controlling element back to its original position after the toy gun is trigger.

[0004] However, after using the toy gun frequently and repeatedly, the spring is fatigued and cannot timely recover the position of the controlling element, which causes more than two BBs inadvertently loaded into the barrel. When triggered with BBs, the toy gun may be jammed and damaged.

[0005] To overcome the shortcomings, the present invention provides a bullet-loading assembly for a toy gun to mitigate or obviate the aforementioned problems.

SUMMARY OF THE INVENTION

[0006] The main objective of the invention is to provide a bullet-loading assembly for a toy gun that has a bullet chamber and controls a single ball bullet to be loaded into the bullet chamber every time after the toy gun is triggered. The bullet-loading assembly prevents more than one ball bullet from being inadvertently loaded into the bullet chamber.

[0007] A bullet-loading assembly in accordance with the present invention is mounted on a toy gun. The toy gun has a body and a triggering assembly. The body has a handgrip, an outer chamber, a seal, a bullet chamber, a guiding slot and a bottle chamber. The triggering assembly has a bolt, a trigger, a hammer, a linking bar and a link. The bullet-loading assembly has a barrel, a bullet passageway, a magazine and a limiting member. The barrel is mounted on the body and has a rear end and a bore. The bullet passageway is defined through the handgrip and is located adjacent to the barrel. The limiting member is mounted securely around the barrel and has a limit formed located in front of the axis of the bullet passageway and presses against an uppermost ball bullet in the bullet passageway to prevent more than one ball bullet from entering the bullet chamber.

[0008] Other objectives, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

IN THE DRAWINGS

[0009]

Fig. 1 is a side view in partial section of a bullet-loading assembly for a toy gun;
Fig. 2A is a side view of the bullet-loading assembly in Fig. 1;
Fig. 2B is an enlarged perspective view of the bullet-loading assembly in Fig. 2A;
Fig. 3 is an enlarged side view in partial section of the bullet-loading assembly in Fig. 1 with the limiting member has a flat abutment surface;
Fig. 4 is an enlarged side view in partial section of the bullet-loading assembly in Fig. 1 with the limiting member has a concave abutment surface;
Fig. 5 is an enlarged side view in partial section of the bullet-loading assembly in Fig. 1 with the limiting member has a convex abutment surface; and
Fig. 6 is an enlarged operational side view in partial section of the bullet-loading assembly.

[0010] With reference to Figs. 1, 2A and 2B, a bullet-loading assembly (3) in accordance with the present invention is mounted in a toy gun. The toy gun may accommodate an air bottle (5) and ball bullets (BBs). The air bottle (5) has high-pressure air and an outlet valve. The toy gun has a body (1) and a triggering assembly (2).

[0011] With further reference to Fig. 3, the body (1) has a handgrip (10), an outer chamber (12), a seal (13), a bullet chamber (11), a guiding slot (14), a bottle chamber (16) and a discharge member (17).

[0012] The handgrip (10) is mounted on the body (1).

[0013] The outer chamber (12) is defined in the body (1) above the handgrip (10).

[0014] The seal (13) is mounted in the outer chamber (12).

[0015] The bullet chamber (11) is defined in the body (1) in front of the outer chamber (12).

[0016] The guiding slot. (14) is defined in the body (1) above the bullet chamber (11).

[0017] The bottle chamber (16) is defined in the handgrip (10A) and communicates with the outer chamber (12) and may receive the air bottle.

[0018] The discharge member (17) is mounted in the bottle chamber (16) and may pressing against the outlet valve on the air bottle to discharge high-pressure air in the air bottle into the outer chamber (12).

[0019] The triggering assembly (2) is mounted in the body (1) and has a bolt (20), a trigger (21), a hammer (24), a linking bar (23) and a link (22).

[0020] The bolt (20) is mounted slidably in the outer chamber (12), selectively abuts the seal (13) hermetically, selectively communicates with the outer chamber (12) and has a front end, a rear end, an channel (201) and two air passages (202). The channel (201) is defined axially in the front end of the bolt (20), communicates with the bullet chamber (11) and selectively communicates with the outer chamber (12). The air passages (202) are defined transversely through the bolt (20), communicate with the channel (201) and are selectively sealed by the seal (13) to hermetically isolate the channel (201) from the outer chamber (12). When the bolt (20) moves forward and separates from the seal (13), the air passages (202) are unsealed and the channel (201) communicates with the outer chamber (12) to allow high-pressure air in the air bottle (5) to pass into the channel (201).

[0021] The trigger (21) is mounted pivotally in the body (1) and has a connecting end and a recoiling element. The recoiling is mounted on the body (1) and biases the trigger in an un-pulled position and may be a torsion spring.

[0022] The hammer (24) is mounted pivotally on the body (1) and selectively hits the rear end of the bolt (20) to move the bolt (20) forwards.

[0023] The linking bar (23) connects pivotally to the trigger (21) and the hammer (24) so that the hammer pivots backwards and then pivots fast forwards to hit the bolt (20) when the trigger (21) is pulled to pivot backwards.

[0024] The link (22) is Y-shaped, is mounted pivotally in the body (1) and has a lower connecting section (220), two opposite upper prongs (221) and two slide pivots (222). The lower connection section (220) connects pivotally to the connecting end of the trigger (21) so that pulling the trigger (21) pivots the lower connection section (220) forwards. The upper prongs (221) are formed on and protrude longitudinally form the lower connection section (220) and pivots backwards when the lower connection section (220) pivots forwards. The slide pivots (222) are formed respectively on and protrudes transversely inwards from the prongs (221).

[0025] The bullet-loading assembly (3) in accordance with the present invention is mounted in the body (1) and has a barrel (1A), a bullet passageway (15), a magazine (31) and a limiting member (30).

[0026] The barrel (1A) is mounted on the body (1) in front of the bullet chamber (11), is aligned with and in front of the bolt (20) and has a rear end and a bore. The bore is defined axially through the barrel (1A), communicates with the bullet chamber (11).

[0027] The bullet passageway (15) is defined through the handgrip (10A), is located adjacent to the barrel (1A), communicates with the bore of the barrel (1A) and has an axis (C).

[0028] The magazine (31) is mounted detachably in the handgrip (10) has a base (310), a follower (311) and a spring (312). The base (310) is mounted detachably on the handgrip (10) and extends in the bullet passageway (15). The follower (311) is mounted slidably in the bullet passageway (15) above the base (310) and presses against the BBs (4) to set the uppermost BB (4) into the bullet chamber (15) of the body (1). The spring (312) is mounted between the base (310) and the follower (311) to bias the follower (311) towards the bullet chamber (15).

[0029] The limiting member (30) is mounted securely around the barrel (1A) and has a bracket, a bar (303) and a limit (301).

[0030] The bracket is mounted securely around the barrel (1A) and has two opposite sides, two pivot slots (305) and two C-clasps (306). The pivot slots (305) are defined in the sides of the bracket and pivotally engage respectively with the pivots (222) on the prongs (221) of the link (22) so that the trigger (21) drives the barrel (1A) and the limiting member (30) to move backwards through the link (22). The C-clasps (306) are mounted securely around the barrel (1A) and locates the bracket between the C-clasp (306) to prevent the bracket from slipping on the barrel (1A).

[0031] The bar (303) is longitudinal, is formed on and protrudes backwards from the bracket, is capable of sliding linearly in the guiding slot (14) in the body (1) and has a rear end.

[0032] The limit (301) is formed on the rear end of the bar (303), projects out from the rear end of the barrel (1A), is located in front of the axis (C) of the bullet passageway (15) and presses against the uppermost BB (4). The limit (301) has a limiting surface (302, 302a, 302b). The limiting surface (302) is defined on the limit (301), faces obliquely downward to the bullet passageway (15) and presses against and set the uppermost BB (4) in the bullet chamber (11) to prevent from BBs (4) from inadvertently passing to the bullet chamber (11). With reference to Fig. 3, a first variant of the limiting surface (302) is fat. With reference to Fig. 4, a second variant of the limiting surface (302a) is concave. With reference to Fig. 5, a third variant of the limiting surface (302c) is convex.

[0033] With reference to Fig. 6, when a user pulls the trigger (21), the barrel (1A) and the limiting member (30) moves back. The rear end of the barrel (1A) engages with the front end of the bolt (20) and receives the uppermost BB (4). Simultaneously, the hammer (24) is driven by the trigger (21) through the link bar (23) to knock bolt (20) away from the seal (13) so that the air passages (202) are unsealed. The outer chamber (12) communicates with the channel (201) in the bolt (20) so that the high-pressure air in the air bottle (5) flow fast through the outer chamber (12), the air passages (13) into the channel (201) to jet the uppermost BB (4) out of the toy gun. When the trigger (21) is released, the recoiling element

biases the trigger (21) backwards to the un-pulled position.

[0034] The limiting member (30) of the bullet-loading assembly controls the uppermost BB (4) to be loaded into the bullet chamber (11) and prevents other BBs (4) from being loaded inadvertently into the bullet chamber (11). Therefore, toy gun are loaded precisely with the BBs (4) without being jammed or damaged.

Claims

1. A bullet-loading assembly (3) adapted to be mounted on a toy gun, the toy gun having a body (1) and a triggering assembly (2), the body (1) having a handgrip (10), an outer chamber (12), a seal (13), a bullet chamber (11), a guiding slot (14) and a bottle chamber (16), and the triggering assembly (2) having a bolt (20), a trigger (21), a hammer (24), a linking bar (23) and a link (22), wherein the bullet-loading assembly (3) comprises:

   a barrel (1A) adapted to be mounted on the body (1) in front of the bullet chamber (11), adapted to be aligned with and in front of the bolt (20) and having a rear end and a bore defined axially through the barrel (1A) and adapted to communicate with the bullet chamber (11);
   a bullet passageway (15) adapted to be defined through the handgrip (10A), being located adjacent to the barrel (1A), communicating with the bore of the barrel (1A) and having an axis;
   a magazine (31) adapted to mounted detachably in the handgrip (10) and having

      a base (310) adapted to be mounted detachably on the handgrip (10);
      a follower (311) mounted slidably in the bullet passageway (15) above the base (310); and
      a spring (312) mounted between the base (310) and the follower (311) to bias the follower (311) towards the bullet chamber (11); and

   a limiting member (30) mounted securely around the barrel (1A) and having

      a bracket corresponding to the magazine (31) and mounted securely around the barrel (1A);
      a bar (303) being longitudinal, formed on and protruding backwards from the bracket, adapted to slide linearly in the guiding slot (14) in the body (1) and having a rear end; and
      a limit (301) formed on the rear end of the bar (303), projecting out from the rear end of the barrel (1A), located in front of the axis of the bullet passageway (15) and adapted to press against an uppermost ball bullet (4) in the bullet passageway (15).

2. The bullet-loading assembly (3) as claimed in claim 1, wherein the limit (301) of the limiting member (30) has a limiting surface (302, 302a, 302b) defined on the limit (301), facing obliquely downward to the bullet passageway (15) and adapted to press against and set the uppermost ball bullet (4).

3. The bullet-loading assembly (3) as claimed in claim 2, wherein the bracket of the limiting member (30) has two opposite sides and two pivot slots (305) defined in the sides of the bracket and adapted to pivotally engage respectively with pivots (222) on prongs (221) of the link (22).

4. The bullet-loading assembly as claimed in claim 3, wherein the limiting surface (302) is flat.

5. The bullet-loading assembly as claimed in claim 3, wherein the limiting surface is concave (302a).

6. The bullet-loading assembly as claimed in claim 3, wherein the limiting surface is convex (302b).

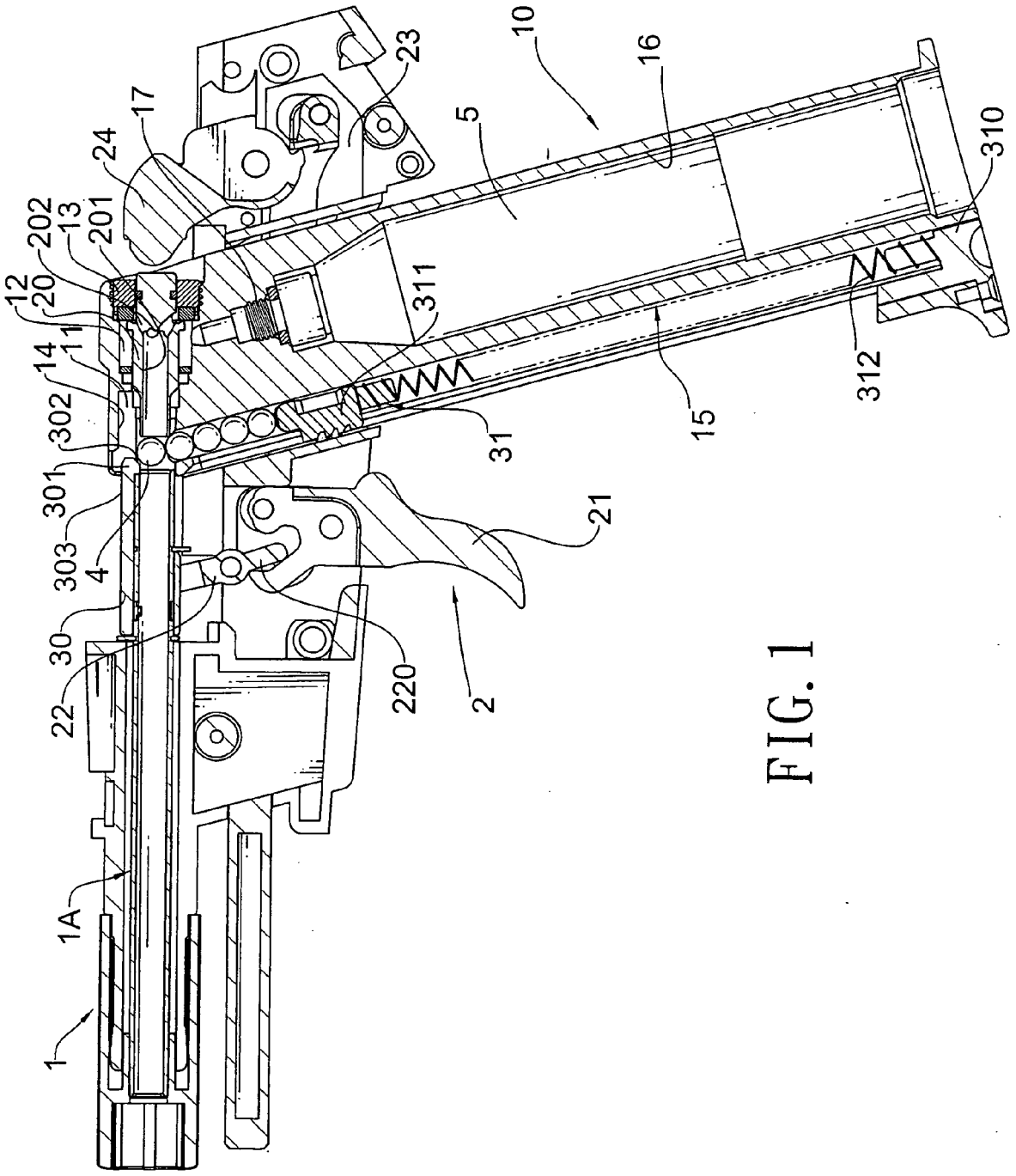
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FIG. 1

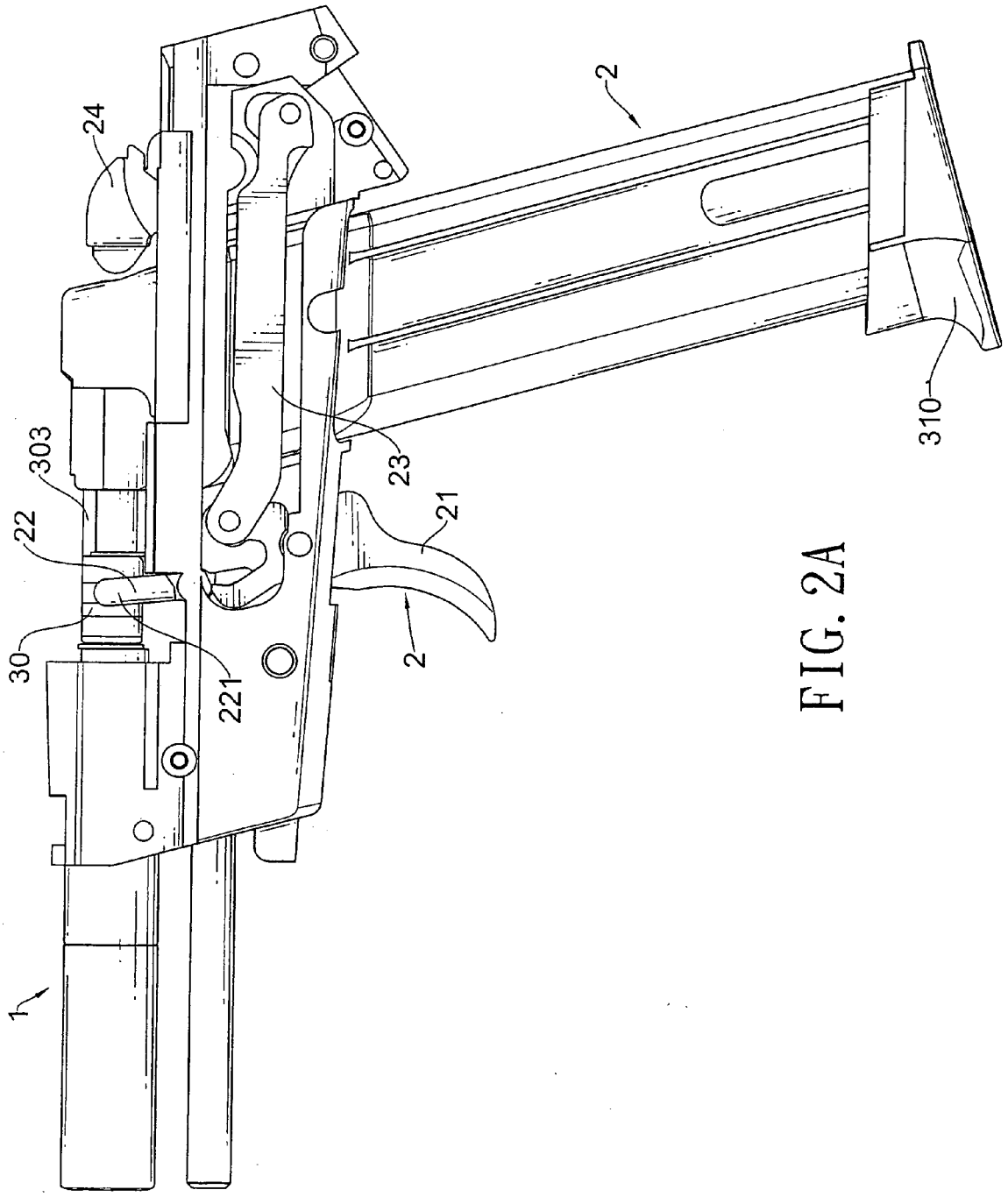

FIG. 2A

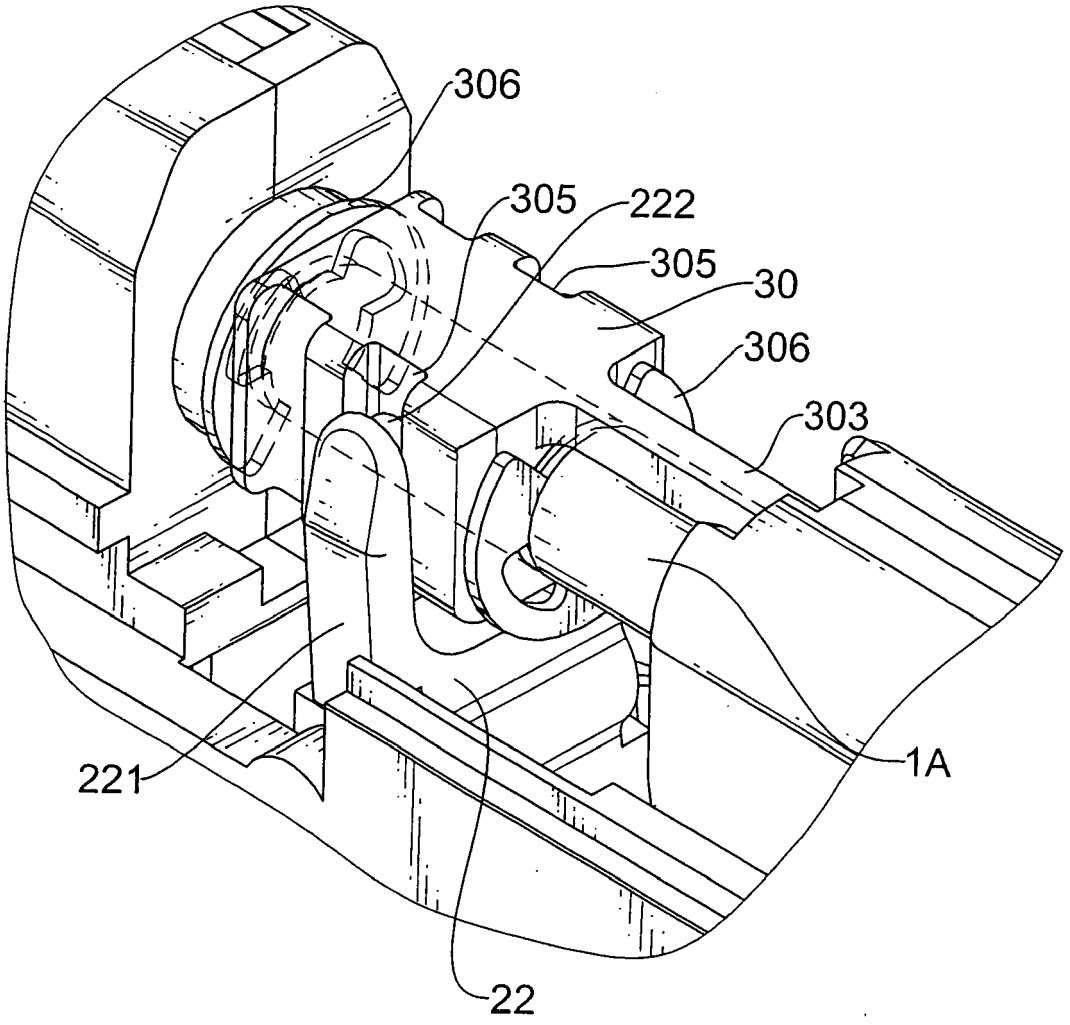

FIG. 2B

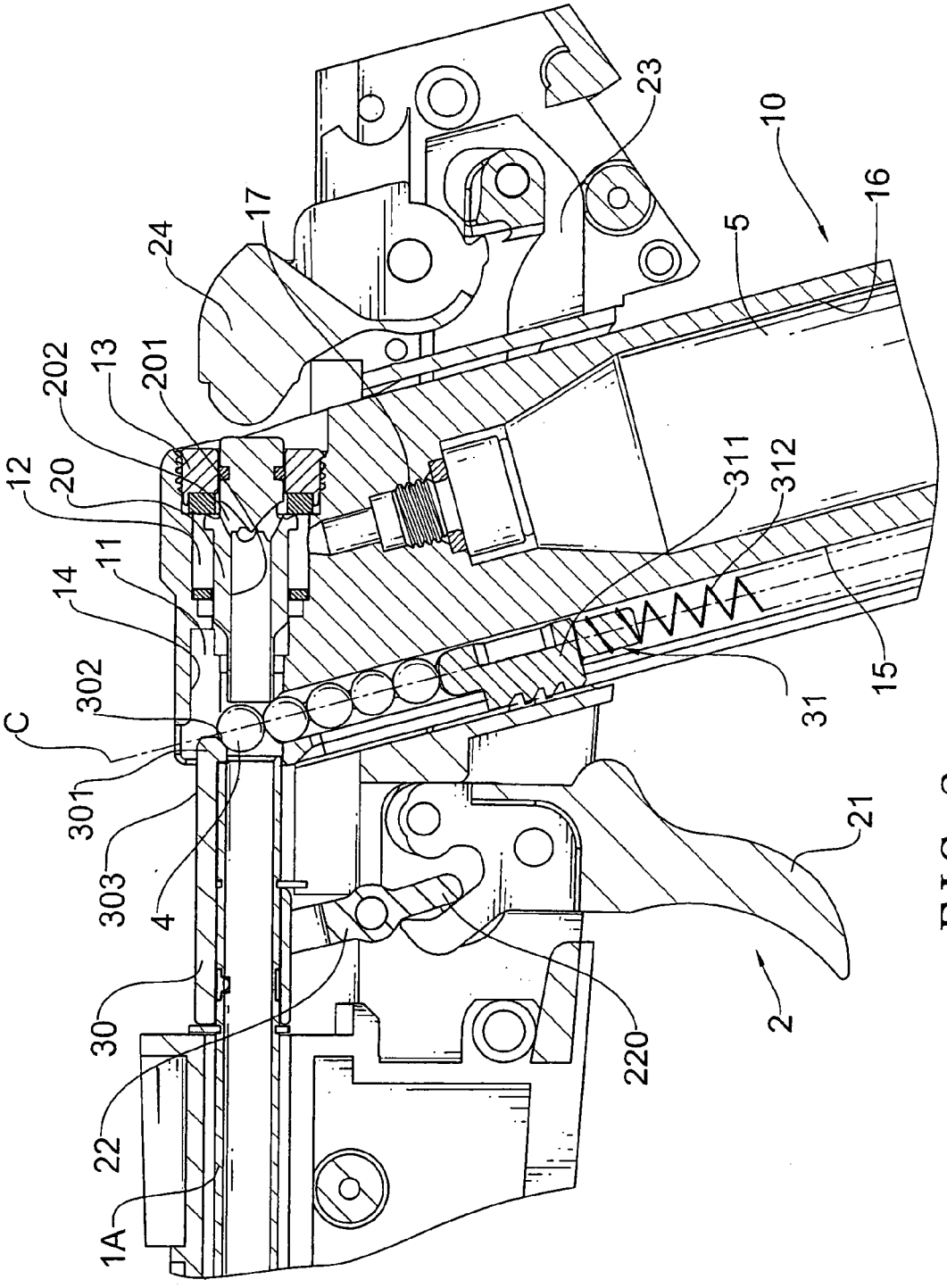
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FIG. 3

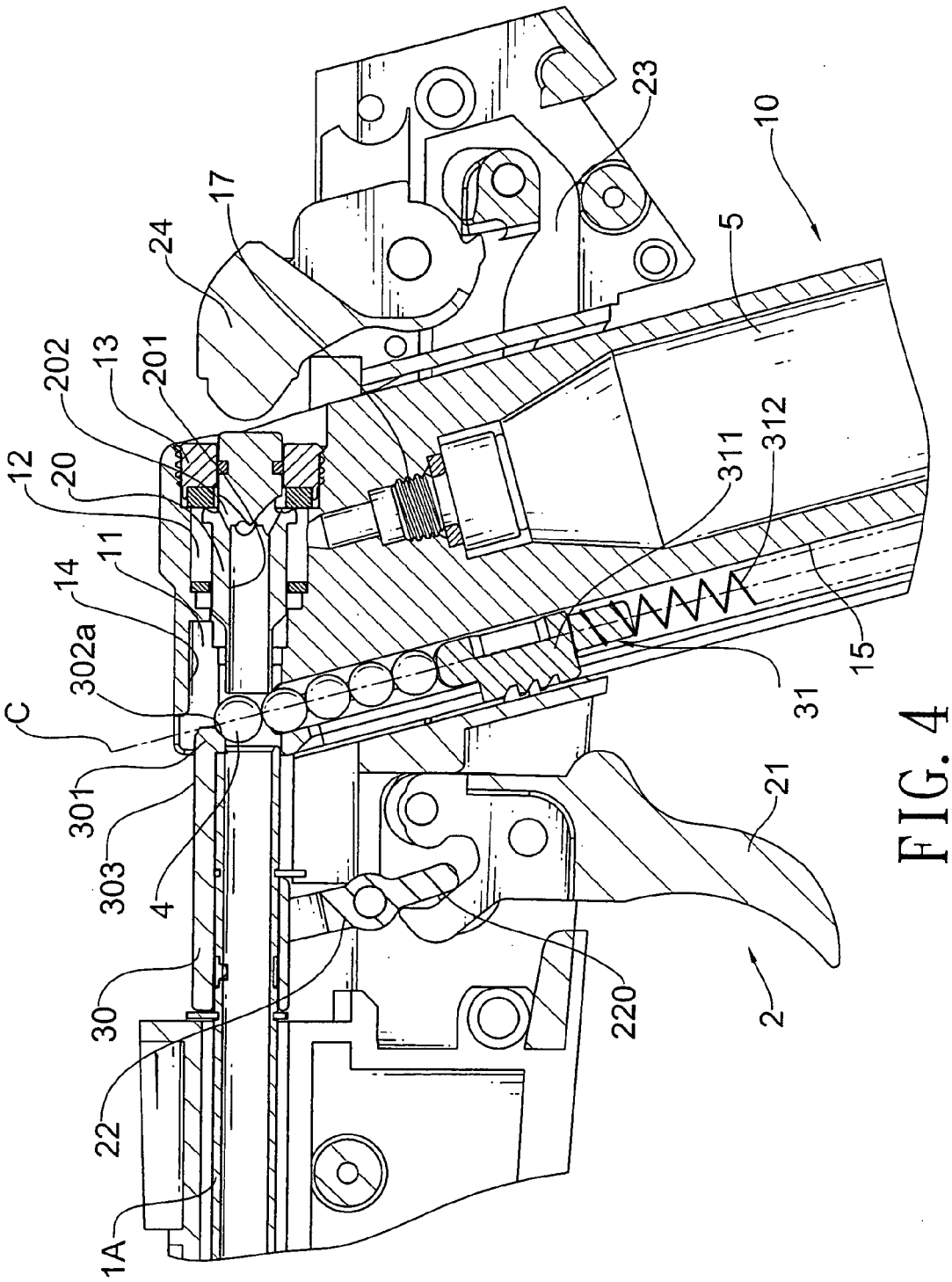
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FIG. 4

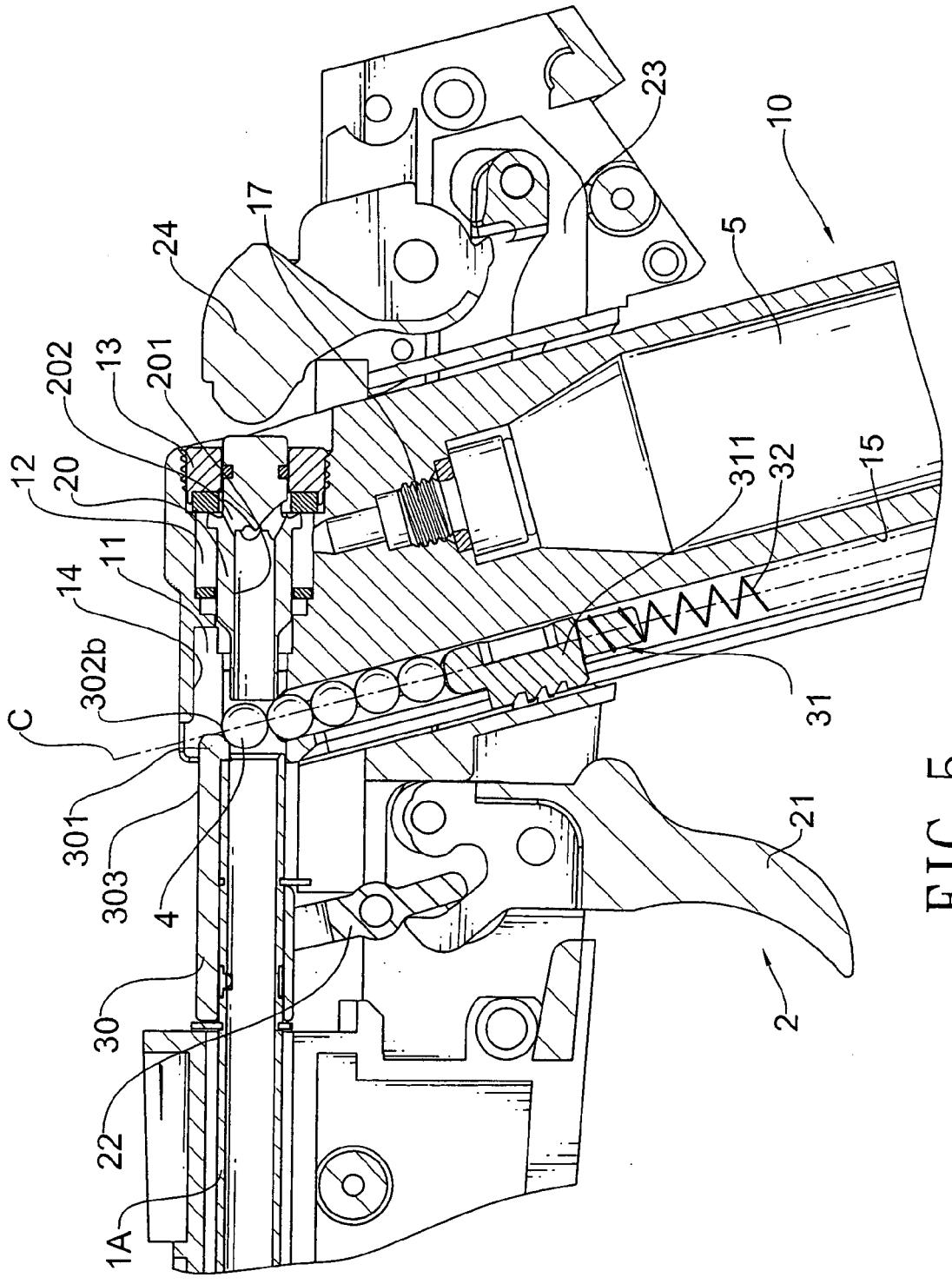
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FIG. 5

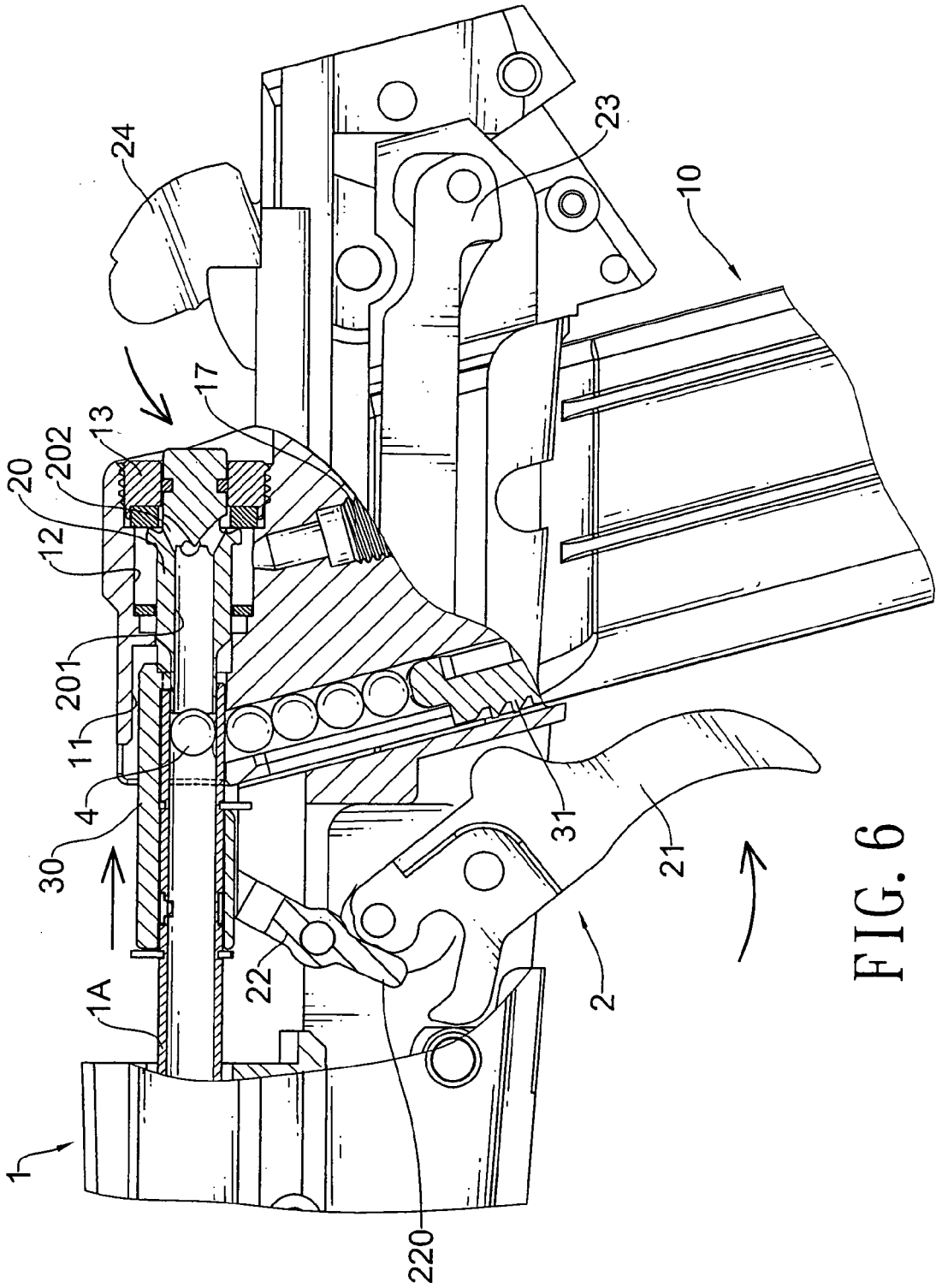

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 08 01 2172

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	15 December 2008	Schwingel, Dirk

CATEGORY OF CITED DOCUMENTS

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