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(54) Manual staple gun

(57) This invention provides a manual staple gun. The manual staple gun comprises a gun body (1) with a slot, a drive unit (2), a staple magazine (3), a leaf spring (4) and a handle (5). Said drive unit (2) is disposed in the slot. Said staple magazine (3) connects with the slot of the gun body (1). One end of said handle (5) acts on the drive unit (2), the other end penetrates through the gun body (1) and the handle (5) can force the drive unit to move along the slot of the gun body. One end of the leaf spring (4) acts on the drive unit (2) and the other end acts on the gun body (1). There is a control mechanism that is disposed in the gun body (1) and can lock the drive unit (2) when it is far away from the staple magazine (3). There is also a position limit mechanism that is disposed between the handle (5) and the leaf spring (4) and can ensure the handle break away from the firing pin safely. Said manual staple gun has a simple structure and is safe to operate. When it is used, just small force is needed and staples may be driven with better effects.

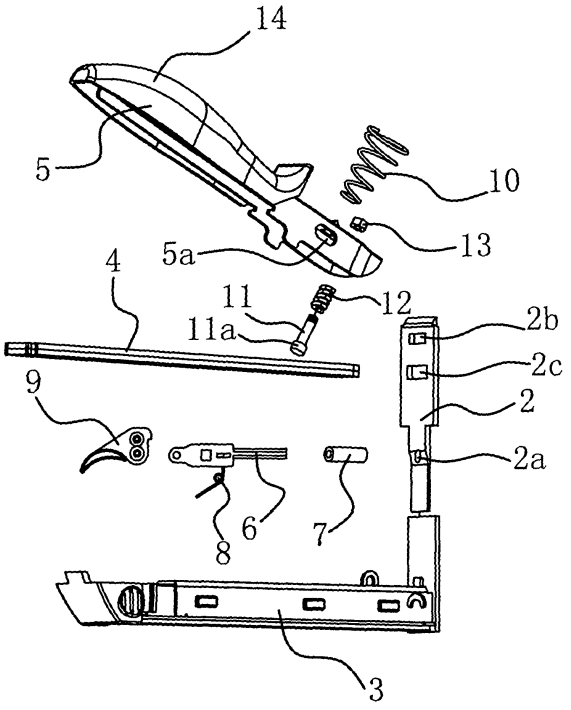

Fig 1

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Description

Field of the Invention

[0001] The invention relates to mechanical technology, and in particular to a staple gun, specifically to a manual staple gun.

Background and Prior Art

[0002] In modern decoration industry, manual staple guns are widely used. At present, a manual staple gun generally comprises a gun body with a slot, a drive unit, a magazine, a leaf spring, a handle, and a reset spring. The drive unit is disposed in the slot of the gun body. The magazine connects with the slot. One end of the handle acts on the drive unit, and the other end penetrates through the gun body. One end of the leaf spring acts on the drive unit and the other end acts on the gun body. One end of the reset spring acts on the handle, and the other end acts on the gun body.

[0003] When the handle is depressed, it moves away from the magazine along the slot with the drive unit together. During the movement of the drive unit, the leaf spring acting on the drive unit produces spring force. When the handle moves to a certain position, it breaks away from the drive unit and under the action of the spring force produced by the leaf spring, the drive unit drives the staple at the end of the staple magazine out.

[0004] To press down the handle, large force is needed. Particularly when the manual staple gun is operated in a high place, even larger force is needed to operate it normally. If the force is not large enough, the staple in the staple magazine will not be driven out normally. More seriously, the user will be hurt by the handle when it rebounds.

Summary of the Invention

[0005] The purpose of this invention is to avoid the above disadvantage of the prior art and provide a staple gun which is safer to use and easier to operate. When it is used, just smaller force is needed.

[0006] The purpose above can be achieved by a manual staple gun as below. It comprises a gun body with a slot, a drive unit, a magazine, a leaf spring and a handle. Said drive unit is disposed in the slot. Said magazine connects with the slot of the gun body. One end of said handle acts on the drive unit, the other end penetrates through the gun body and the handle can force the drive unit to move along the slot of the gun body. One end of the leaf spring acts on the drive unit and the other end acts on the gun body. Said manual staple gun is characterized by a control mechanism that is disposed in the gun body and can lock the drive unit in position when it is away from the magazine.

[0007] Said manual staple gun is used to drive a staple into softwood or other soft materials. It works as below. Staples are loaded in the staple magazine in rows. As the staple magazine connects with the slot of the gun body, the staple at the end of the staple magazine is delivered into the slot. When the handle is depressed, it will force the drive unit to move away from the staple magazine along the slot. During the movement of the drive unit, the leaf spring acting on it produces spring force. When the handle moves to a certain position, it breaks away from the drive unit and the spring force produced by the leaf spring forces the drive unit to drive the staple at the end of the magazine out.

[0008] To press down the handle, large force is needed. Particularly when the manual staple gun is operated in a high place, even larger force is needed to operate it normally. Said staple gun has a control mechanism that is disposed in the gun body and can lock the drive unit when it is far away from the staple magazine. Thus, when the staple gun needs to work in a high place, the handle can be depressed on the ground in advance and the drive unit can be locked by the control mechanism. Then when the staple gun works in a high place, just press the control mechanism lightly, a staple can be driven into where it is needed.

[0009] In the above manual staple gun, said control mechanism comprises a through hole disposed in the drive unit, a locking pin disposed in the gun body, a locking pin pipe, a torsion spring and a trigger. One end of said locking pin penetrates the locking pin pipe and connects to the through hole, and the other end connects to said trigger. One end of said torsion spring acts on the locking pin and the other end acts on the gun body.

[0010] In initial state, the locking pin presses against the drive unit under the action of the torsion spring. When the drive unit moves to a certain position away from the staple magazine along the slot, the drive unit inserts into the through hole and locks the drive unit in position. When the staple gun needs to work, just press the trigger lightly, then the locking pin breaks away from the drive unit, and a staple will be driven into where it is needed.

[0011] In the above manual staple gun, a reset spring is disposed between the handle and the gun body. One end of the reset spring acts on the handle, and the other end acts on the gun body. Under the action of the reset spring, the handle can reset automatically.

[0012] In the above manual staple gun, a position limit mechanism is disposed between the handle and the leaf spring. It ensures that the handle would break away from the drive unit safely. This position limit mechanism can effectively prevent the handle from hurting the user.

[0013] In the above manual staple gun, the position limit mechanism comprises a rebounding pillar, a position limit spring and a screw cap. Said rebounding pillar penetrates the handle and connects with the screw cap fixedly. Said position limit spring is wrapped around the rebounding pillar. One end of the position limit spring acts on the rebounding pillar, and the other end acts on the handle.

[0014] In the above manual staple gun, there is a prominent baffle that is used to fix the position limit spring at one end of the rebounding pillar, and there is screw threads that is used to connect with the screw cap at the other end. One end of said position limit spring acts on the baffle, and the other end acts on the handle.

[0015] In initial state, the position limit spring wrapped around the rebounding pillar is in compression. The baffle of the rebounding pillar pushes against the leaf spring. When the handle is depressed, the end of the leaf spring acting on the drive unit moves away from the staple magazine along the slot together with the drive unit. As the distance between the handle and the leaf spring becomes shorter and shorter, the baffle withstanding the leaf spring overcomes the force produced by the position limit spring and then the screw cap is forced to separate from the handle. As a result, the position limit spring is compressed further. When the drive unit moves to a certain position, the control mechanism locks the drive unit , then the handle breaks away from drive unit. By the action of the reset spring, the handle would like to reset. But the position limit spring is also compressed which leads a tendency that the distance between the handle and the leaf spring would increase. However, the position of the leaf spring and drive unit is locked by the control mechanism, so the handle could not reset and the user will not be hurt due to the position limit spring. When the trigger of the control mechanism is pressed, the handle returns to original position and is ready for next cycle.

[0016] In the above manual staple gun, there is a connecting hole in the drive unit, the connecting hole penetrates through the drive unit. The end of the handle can insert into the connecting hole, so the handle can force the drive unit to move together with it and also can break away from the drive unit.

[0017] In the above manual staple gun, a fixing bar is also disposed in the gun body. The handle has an mounting hole matched with the fixing bar. The fixing bar is disposed across the mounting hole.

[0018] In the above manual staple gun, said staple magazine and drive unit are perpendicular to each other.

[0019] Comparing with the prior art, the manual staple gun according to the invention has a control mechanism that is disposed in the gun body and can lock the drive unit when it is away from the staple magazine. Thus, when the staple gun needs to work in a high place, the handle can be depressed on the ground in advance, and so the drive unit can be locked by the control mechanism. Then when the staple gun works in a high place, just press the control mechanism lightly, the staple at the end of the staple magazine will be driven into where it is needed. Such a manual staple gun has simple structure and is easy to operate. It can also ensure the efficiency. In addition, the position limit mechanism between the handle and the leaf spring ensures the safety of the user since it makes the handle break away from the drive unit safely.

Brief Description of the Drawings

[0020] An example of an apparatus according to the preferred embodiment of the invention will now be described with reference to the accompanying drawings, in which:

FIG.1 is the schematic drawing of the manual staple gun.

FIG.2 is the schematic drawing of the manual staple gun when the drive unit is locked by the locking pin.

FIG.3 is the schematic drawing of the manual staple gun in initial state.

[0021] In these figures:

1, gun body;	2, drive unit;	2a,through hole;
2b, connecting hole;	2c, fixing hole;	3, staple magazine;
4, leaf spring;	5, handle;	5a,mounting hole ;
6, locking pin;	7, locking pin pipe;	8, torsion spring;
9, trigger;	10, reset spring;	11,rebounding pillar;
11 a, baffle;	12, position limit spring;	13, screw cap;
14, soft grip handle;	15, fixing bar.	

Detailed Description of the Preferred Embodiment of the Invention

[0022] Embodiments of the invention are disclosed as follows. Combining with the figures, the technical solution is described further.

[0023] Referring to FIG.1, FIG.2 and FIG.3, the manual staple gun according to the preferred embodiment of the invention comprises a gun body 1 with a slot, a drive unit 2, a staple magazine 3, a leaf spring 4 and a handle 5. Specifically, the drive unit 2 is disposed in the slot of the gun body 1. The staple magazine 3 connects with the slot of the gun body 1. One end of the handle 5 acts on the drive unit 2, the other end penetrates through the gun body 1, and the handle 5 can force the drive unit 2 to move along the slot of the gun body. One end of the leaf spring 4 acts on the drive unit 2 and the other end acts on the gun body 1. The staple magazine 3 and the drive unit 2 are perpendicular to each other. Above the handle 5, A soft grip handle 14 connects to handle 5 fixedly. Users can press the handle 5 by the soft grip handle 14 more comfortablely.

[0024] In the drive unit 2, there is a connecting hole 2b. The end of the handle 5 can insert into the connecting hole 2b. Thus the handle 5 can force the drive unit 2 to move together with it and also can break away from the drive unit 2. There is also a fixing hole 2c in the drive unit 2, and the leaf spring 4 acts in the fixing hole 2c. There is also a fixing bar 15 in the gun body 1. The handle 5 has an mounting hole 5a matched with the fixing bar 15. The fixing bar 15 is disposed across the mounting hole 5a.

[0025] Between the handle 5 and the gun body 1, there is a reset spring 10. One end of the reset spring 10 acts on the handle 5, and the other end acts on the gun body 1. Specifically, the reset spring 10 is a tower spring. Under the action of the tower spring, the handle 5 can return its original position automatically.

[0026] Referring to FIG.1 and FIG.2, a control mechanism that can lock the drive unit when it is far away from the staple magazine 3 is disposed in the gun body 1. The control mechanism comprises a through hole 2a disposed in the drive unit 2, a locking pin 6 disposed in the gun body 1, a locking pin pipe 7, a torsion spring 8 and a trigger 9. One end of the locking pin 6 penetrates the locking pin pipe 7 and connects to the through hole 2a, and the other end connects to the trigger 9. One end of the torsion spring 8 acts on the locking pin 6 and the other end acts on the gun body 1.

[0027] In initial state, under the action of the torsion spring 8, locking pin 6 withstands the drive unit 2. During the drive unit 2 moves away from the staple magazine 3 along the slot, the locking pin 6 inserts into the through hole 2a of the drive unit 2 and locks the drive unit 2. When the staple gun needs to work, just press the trigger 9 lightly, then the locking pin 6 breaks away from the through hole 2a of the drive unit 2, a staple will be driven into where it is needed.

[0028] In the manual staple gun, a position limit mechanism that can ensure the handle 5 break away from the drive unit 2 safely is disposed between the handle 5 and the leaf spring 4. The position limit mechanism can effectively prevent the handle 5 from hurting the user. The position limit mechanism comprises a rebounding pillar 11, a position limit spring 12 and a screw cap 13. At one end of the rebounding pillar 11, there is a prominent baffle 11 a and at the other end there is screw threads that connects to the screw cap 13. The rebounding pillar 11 penetrates through the handle 5 and connects with the screw cap 13 fixedly. The position limit spring 12 is wrapped around the rebounding pillar 11. One end of the position limit spring 12 acts on the baffle 11a of the rebounding pillar 11, and the other end acts on the handle 5.

[0029] In initial state, the position limit spring 12 wrapped around the rebounding pillar 11 is compressed. The baffle 11 a of the rebounding pillar 11 withstands the leaf spring 4. When the handle 5 is depressed, the end of the leaf spring 4 acting on the drive unit 2 moves away from the staple magazine 3 along the slot together with the drive unit 2. As the distance between the handle 5 and the leaf spring 4 becomes shorter and shorter, the baffle 11 a withstands the leaf spring 4 while overcoming the force produced by the position limit spring 12 and then forces the screw cap 13 to separate from the handle 5. As a result, the position limit spring 12 is compressed further. When the drive unit moves to a certain position, the control mechanism locks the drive unit , then the handle breaks away from drive unit. Under the action of the reset spring 10, the handle 5 would like to reset. But the position limit spring 12 is also compressed which leads a tendency that the distance between the handle 5 and the leaf spring 4 would increase. However, the position of the leaf spring 4 and drive unit 2 is locked by the control mechanism, so the handle 5 could not reset and completely separates from the connecting hole 2b. When the trigger 9 of the control mechanism is pressed, the locking pin 6 breaks away from the through hole 2a of the drive unit 2 to drive a staple as normal. Then the handle 5 returns to its original position only by the action of the reset spring 10 and then is ready for use next cycle.

[0030] In the above manual staple gun, the rebounding pillar 11, position limit spring 12 and the screw cap 13 are very important. Without them, when the handle 5 moves to the certain position, the locking pin 6 inserts into the through hole 2a of the drive unit 2, and the handle 5 breaks away from the connecting hole 2b. In that case, if the user releases the handle 5, the reset spring 10 bounces the handle 5 at once and the end of the handle 5 inserts into the connecting hole 2b again. Then if the trigger 9 is pressed, the locking pin 6 breaks away from the through hole 2a. The drive unit 2 and the handle 5 bounce together at the same time. As a result, the user may be hurt and the staple may not be driven efficiently.

[0031] The manual staple gun is used to drive a staple into softwood or other soft materials. The conventional manual staple gun works as below. Staples are placed in the staple magazine 3 in rows. As the staple magazine 3 connects

with the slot of the gun body 1, the staple at the end of the staple magazine 3 is delivered into the slot. Press down the handle 5, and it will force the firing pin 2 to move away from the staple magazine 3 along the slot. During the movement of the drive unit 2, the leaf spring 4 acting on the drive unit 2 produces spring force. When the handle 5 moves to a certain position, it breaks away from the drive unit 2. Under the action of the spring force produced by the leaf spring 4, the drive unit 2 drives the staple at the end of the staple magazine 3 out.

[0032] To press down the handle, large force is needed. Particularly when the manual staple gun is operated in a high place, even larger force is needed to operate it normally. The staple gun according to the preferred embodiment of the invention has a control mechanism that can lock the drive unit 2 when it is far away from the staple magazine 3 along the slot in the gun body 1. Thus, when the staple gun needs to work in a high place, the handle 5 can be depressed on the ground in advance and the drive unit 2 can be locked by the control mechanism. Then when the staple gun works in a high place, just press the control mechanism, a staple can be driven into where it is needed.

Claims

1. A manual staple gun comprising: a gun body(1) with a slot, a drive unit (2), a staple magazine(3), a leaf spring(4), a handle (5) and a control mechanism; said drive unit (2) is disposed in the slot of the gun body(1); said staple magazine(3) connects with the slot of the gun body(1); one end of the handle(5) acts on the drive unit (2), the other end penetrates through the gun body(1), and said handle(5) can force the drive unit (2) to move along the slot; one end of the leaf spring(4) acts on the drive unit (2) and the other end acts on the gun body(1); said control mechanism is disposed in the gun body(1) and can lock the drive unit (2) in position when it is far away from the staple magazine (3); said manual staple gun is **characterized in that** a position limit mechanism that can ensure that the handle(5) breaks away from the drive unit (2) safely is disposed between the handle(5) and the leaf spring(4), wherein said position limit mechanism comprises a rebounding pillar(11), a position limit spring(12) and a screw cap(13); wherein said rebounding pillar(11) penetrates through the handle (5) and connects with the screw cap(13) fixedly; said position limit spring(12) is wrapped around the rebounding pillar 11, one end of the position limit spring(12) acts on a baffle(11a) of the rebounding pillar(11) and the other end acts on the handle(5).

2. The manual staple gun according to claim 1, wherein said control mechanism comprises a through hole(2a) that is disposed in the drive unit (2), a locking pin(6) that is disposed in the gun body(1), a locking pin pipe(7), a torsion spring(8) and a trigger(9); wherein one end of said locking pin(6) penetrates through the locking pin pipe(7) and connects to the through hole(2a), and the other end connects to said trigger(9); one end of said torsion spring(8) acts on the locking pin(6) and the other end acts on the gun body(1).

3. The manual staple gun according to claim 2, wherein a reset spring(10) is disposed between said handle(5) and gun body(1), wherein one end of the reset spring(10) acts on the handle(5) and the other end acts on the gun body(1).

4. The manual staple gun according to claim 1, wherein at one end of the rebounding pillar(11) there is a prominent baffle(11a) and at the other end there is screw threads connecting to the screw cap(13), wherein one end of said position limit spring(12) acts on the baffle(11 a) and the other end acts on the handle(5).

5. The manual staple gun according to claim 2, wherein there is a connecting hole(2b) in the drive unit(2), and the end of the handle(5) can act in the connecting hole(2b).

6. The manual staple gun according to claim 2, wherein a fixing bar(15) is disposed in the gun body(1), said handle (5) has an mounting hole(5a) matched with the fixing bar(15), wherein said fixing bar(15) is disposed across the mounting hole(5a).

7. The manual staple gun according to claim 2, wherein said staple magazine(3) and drive unit(2) are perpendicular to each other.

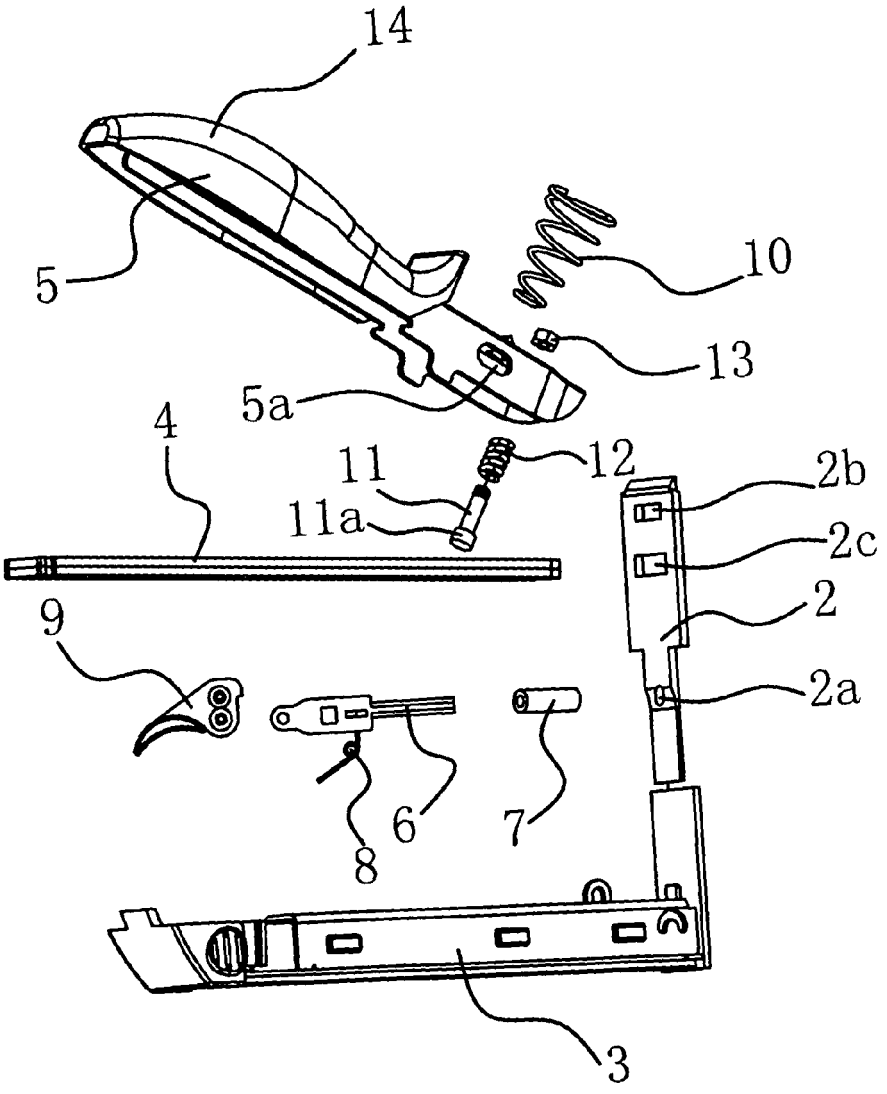

Fig 1

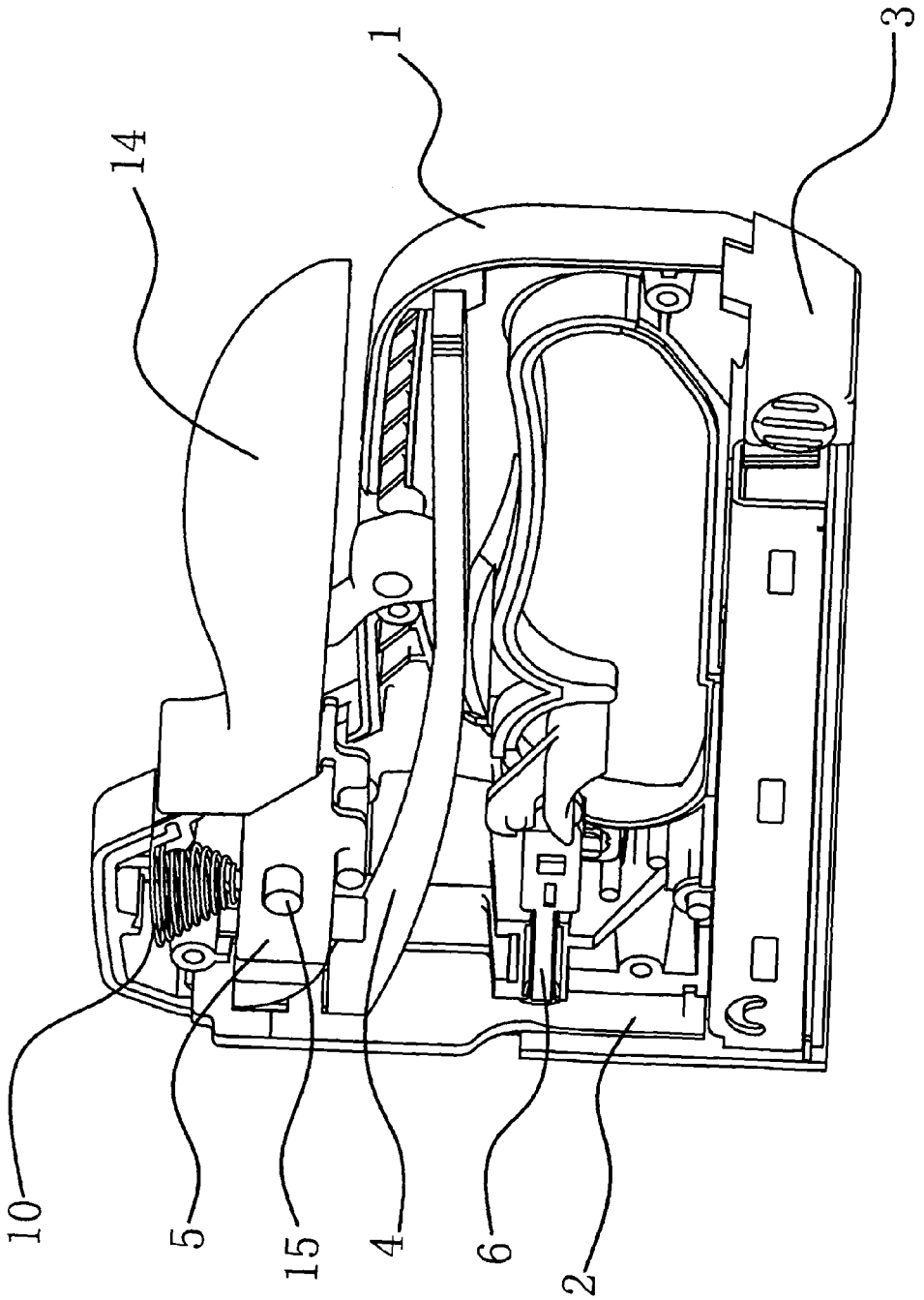

Fig 2

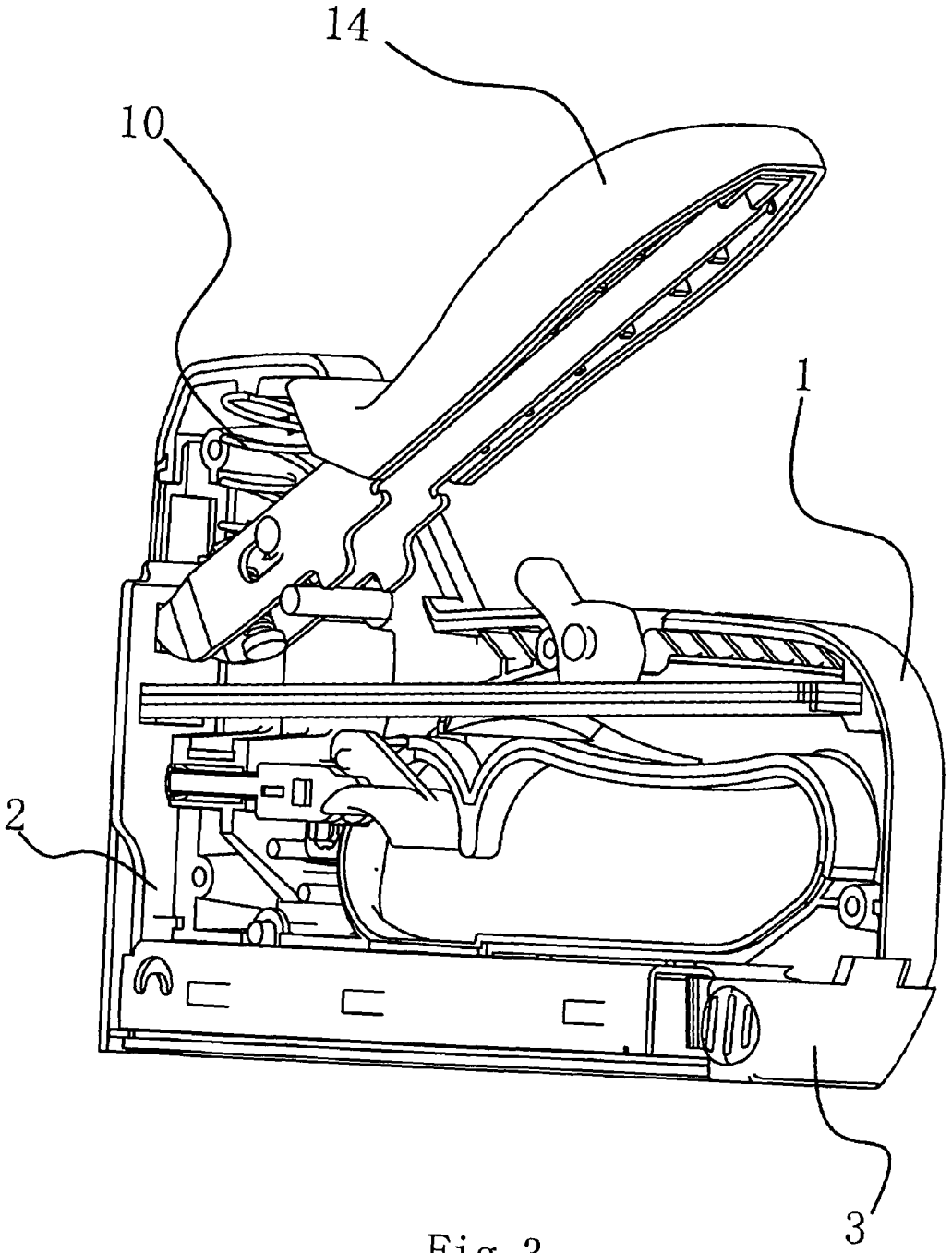

Fig 3