(19) Europäisches Patentamt
European Patent Office
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(11) **EP 2 266 916 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
**29.12.2010 Bulletin 2010/52**

(51) Int Cl.:
***B67B 7/04*** *(2006.01)*

(21) Application number: **10155163.8**

(22) Date of filing: **02.03.2010**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR**

(30) Priority: **26.06.2009 CN 200910100182**

(71) Applicant: **Ningbo Jialilai Machinery Manufacture CO. Ltd.**
**Ningbo City Zhejiang**
**315113 (CN)**

(72) Inventor: **JIN, Huajun**
**315113**
**Ningbo City**
**Zhejiang (CN)**

(74) Representative: **Rapisardi, Mariacristina**
**Ufficio Brevetti Rapisardi S.r.l.**
**Via Serbelloni 12**
**20122 Milano (IT)**

(54) **A corkscrew**

(57) The present invention discloses a corkscrew, which comprises a tubular body (1), linkage driving mechanism, screw assembly (2), screw guiding assembly (3), elastic limit piece (8), actuation lever (5) and capping assembly (6), wherein the driving link of the driving mechanism is connected with the actuation lever (5), the driven link is connected with the screw assembly (2); the screw guiding assembly (3) is slide-fitted into the tubular body (1); the capping assembly (6) is set on the inner wall of the tubular body (1), which forms an internal shape matching the shape of the neck of bottle (7); the elastic limit piece (8) is installed between the tubular body (1) and the capping assembly (6), the elastic limit piece (8) can prop up the neck of bottle (7) so as to limit the axial sliding of the screw guiding assembly (3). the corkscrew for the present invention can pull out corks from wine bottles and remove them. The abovementioned cork can be pulled out from the wine bottle by rotating the actuation lever back and forth only once, thus featuring convenient operation, time saving and least resistance.

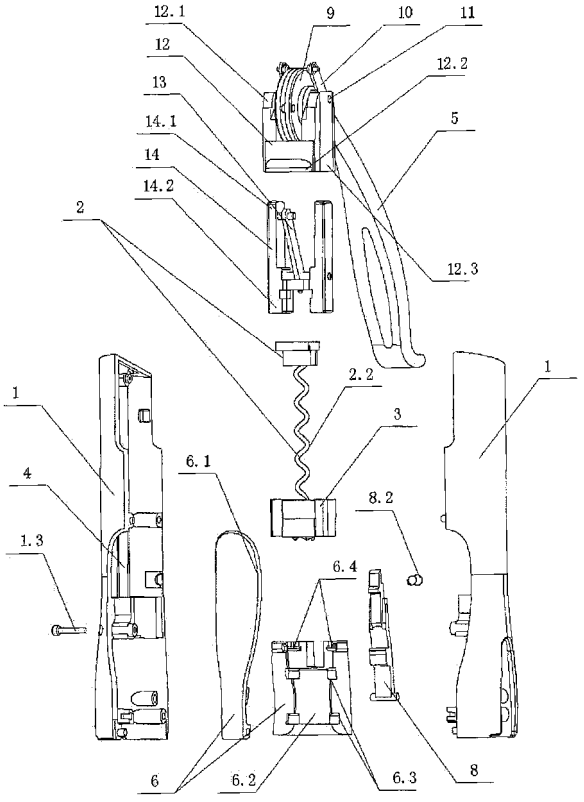



Fig. 1

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## Description

### BACKGROUND OF THE INVENTION

#### Technical Field

**[0001]** The present invention relates to a corkscrew used for opening wood corks and plastic corks of wine bottles.

#### Description of Related Art

**[0002]** The corkscrew for opening wine bottle corks with the existing technology comprises a tubular body with openings on both ends, gear driving mechanism set inside the tubular body, screw assembly, screw guiding assembly for screw of the screw assembly to pass through, elastic limit piece, and actuation lever on the top of the tubular body and capping assembly at the bottom of the tubular body respectively, the screw guiding assembly is slide-fitted in the tubular body; the capping assembly is set on the inner wall of the tubular body, which forms a shape matching the shape of the neck of bottle; the elastic limit piece is installed between the tubular body and the capping assembly, the elastic limit piece can prop up the neck of bottle so as to limit the axial sliding of screw guiding assembly; the gear driving mechanism includes gear, rack set on the inner wall of the tubular body and engaged with the gear, and U-shaped connector for connecting screw, the actuation lever is welded on one point of the outer circumferential surface of the gear, and fit for the gear in a rolling way through the shaft in the central hole of the gear; the opening end of the U-shaped connector hinges on the both end of the shaft, the closed end is fixedly connected with the screw assembly; the U-shaped connector is slide-fitted in the guiding slot of the body along the channel direction of the tubular body.

**[0003]** The abovementioned corkscrew adopts a gear-driving mechanism. The corks for sealing wine bottles can be opened, but the following shortcomings still exist when using it in our daily life: 1. the stroke of gear driving mechanism is the length of rack, the length limits the length for the screw to insert and pull out the corks and the operation handle of the gear driving mechanism can only drive the screw to make one-direction movement during its movement, so the aforesaid corkscrew requires rotating the actuation lever back and forth twice during application to pull out corks from wine bottles and remove the corks on the screw, not only leading to inconvenient operation, but also wasting more time and strength when rotating the lever twice back and forth, thus adding more burden on the person for opening bottles; 2. since the abovementioned corkscrew is mostly applied in some high-class consumption pleasure places particular about elegance of bottle opening movements, while the corkscrew requires rotating the lever twice back and forth, such movement lacks of elegance, thus degrading the high-class consumption pleasure places and decreasing the service quality to some extent.

### BRIEF SUMMARY OF THE INVENTION

**[0004]** The present invention addresses the technical problem, through overcoming the abovementioned defects of the existing technology, by means of providing a timesaving corkscrew with the least resistance and convenience for operation.

**[0005]** The technical solution of the present invention is to provide a corkscrew which comprises a tubular body with opening on both ends, driving mechanism set inside the tubular body, screw assembly, screw guiding assembly for screw of the screw assembly to pass through, elastic limit piece, and actuation lever on the top of the tubular body and capping assembly at the bottom of the tubular body respectively, wherein the driving link of the driving mechanism is connected with the actuation lever, the driven link is connected with the screw assembly; the screw guiding assembly is slide-fitted in the tubular body; the capping assembly is set on the inner wall of the tubular body, which forms a shape matching the shape of the neck of bottle; the elastic limit piece is installed between the tubular body and the capping assembly, the elastic limit piece can prop up the neck of bottle so as to limit the axial sliding of screw guiding assembly, the driving mechanism is a linkage driving mechanism.

**[0006]** After adopting the abovementioned structure, comparing with the existing technology, the present invention has the following favorable effects:

1. The linkage driving mechanism of the corkscrew for the present invention can change the relative length of the various members without adding the stroke of the driving link so as to prolong the stroke of the driven link a lot, so the corkscrew for the present invention can pull out corks from wine bottles and remove the corks on the screw by rotating the actuation lever once back and forth during application, not only leading to convenient operation, but also saving time and strength, thus relieving the burden on the person for opening bottles;
2. Since the corkscrew for the present invention is mostly applied in some high-end consumption places particular about elegance of bottle opening movements, while the corkscrew only requires rotating the lever once back and forth to pull out corks from wine bottles and remove the corks on the screw, the elegant movement upgrades the high-end consumption pleasure places and improves the service quality to some extent.

**[0007]** As further improvement, a rolling cutter is set on the capping assembly for the present invention, tinfoil for externally sealing the bottle can be easily removed through rotating the bottle, so as to improve the practicability of the present invention.

**[0008]** As further improvement, a rolling wheel is set

on the capping assembly for the present invention; the bottle is roll-fitted with the rolling wheel, so the corkscrew for the present invention can easily remove the tinfoil for externally sealing the bottle, thus the corkscrew for the present invention is very convenient for utilization.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0009]**

FIG. 1 is the exploded view of the structure of various components for the corkscrew of the present invention.

FIG 2 is the exploded view of the structure of various parts for the corkscrew of the present invention.

FIG. 3 is the schematic view of the half section of the actuation lever at the 0-degree location for the corkscrew of the present invention.

FIG. 4 is the schematic view of the half section of the lever rotating upwards at the 90-degree location for the corkscrew of the present invention.

FIG. 5 is the schematic view of the half section of the actuation lever rotating upwards at the 180-degree location for the corkscrew of the present invention.

FIG. 6 is the schematic view of the half section of the lever rotating downwards at the 90-degree location for the corkscrew of the present invention.

FIG. 7 is the schematic view of the half section of the lever wrenching downwards at the 0-degree location for the corkscrew of the present invention.

## DETAILED DESCRIPTION OF THE INVENTION

**[0010]** The present invention is further detailed in combination with the drawings and embodiments.

**[0011]** As shown in FIG. 1 and FIG. 2, a corkscrew disclosed by the present invention comprises a tubular body 1 with opening on both ends, linkage driving mechanism set inside the tubular body 1, screw assembly 2, screw guiding assembly 3 for screw 2.2 of the screw assembly 2 to pass through, elastic limit piece 8, and actuation lever 5 on the top of the tubular body and capping assembly 6 at the bottom of the tubular body respectively, wherein the driving link of the driving mechanism is connected with the lever 5, the driven link is connected with the screw 2; the screw guiding assembly 3 is slide-fitted onto the groove of the tubular body 1 (not shown in the figure); the capping assembly 6 is set on the inner wall of the tubular body 1, which forms a shape matching the shape of the neck of bottle 7; the elastic limit piece 8 is installed between the tubular body1 and the capping assembly 6, the elastic limit piece 8 can prop up the neck of bottle 7 so as to limit the axial sliding of screw guiding assembly 3, the tabular body 1 with opening on both ends is fixedly connected through screw 1.3 from the left body 1.1 and the right body 1.2.

**[0012]** The linkage driving mechanism includes the driving wheel 9, connecting rod 10, shaft 11 passing through the center of the circle of the driving wheel 9, U-shaped connector 12, connecting link 13 and U-shaped driven link 14, wherein the driving link of the driving wheel 9 linkage driving mechanism, the driven link of the linkage driving mechanism is U-shaped driven link 14, the lever 5 is welded on the driving wheel 9, the screw assembly 2 is fixed on the bottom of the U-shaped driven link 14 by bolts.

**[0013]** The hinge point of the driving wheel 9 and connecting rod 10, the hinge point of the driving wheel 9 and U-shaped connector 12, and that of the driving wheel 9 and the connecting link 13 are on the same central line of the driving wheel 9.

**[0014]** One end of the connection rod 10 is pivotally associated to the driving wheel 9 and the other end of the connecting rod 10 is pivotally associated to the tabular body 1, which indicates that: there are two connecting rods 10, one side of the two connecting rods 10 is connected with the tabular body 1 through the bolt gasket 10.1 respectively, and the connecting rod 10 can rotate-fitted on the bolts of the bolt gasket; a shaft one 10.2 is set on the edge part of the both sides of the driving wheel, the other side of the two connecting rods is pivotally associated to the both sides of the shaft one 10.2, and axially limits the shaft one 10.2 through the clamp spring 10.3.

**[0015]** A circumferential groove One 9.1 is set on the circumferential surface of the driving wheel 9; one end of the connecting link 13 is placed in the groove One 9.1 and pivotally associated to the driving wheel 9, the other end of the connecting link 13 is placed in the U-shaped groove of the U-shaped driven link 14 and pivotally associated to the U-shaped driven link 14; the shaft 11 passes through the two supporting rods of the U-shaped connector opening end 12.1 and is hinged on to the both ends of the shaft 11.

**[0016]** The three hinge points of the driving wheel 9 are on the same diameter, namely, shaft 11, shaft One 10.2 and shaft Two 13.1 are on the same plane.

**[0017]** The U-shaped driven link 14 is slide-fitted with the U-shaped connector 12, which indicates that: slideways 12.3 are set outside of the two supporting rods of the U-shaped connector opening end 12.1, the two supporting rods of the U-shaped driven link opening end 14.1 is slide-fitted into the two slideways 12.3.

**[0018]** The U-shaped connector 12 and u-shaped driven link 14 are slide-fitted onto the tabular body 1, which indicates that: an axial groove 4 is set on the inner wall of the tabular body 1, the two supporting rods of the U-shaped connector opening end 12.1 are slide-fitted inside the groove 4, the two supporting rods of the U-shaped driven link opening end 14.1 are slide-fitted outside the groove 4.

**[0019]** The capping assembly is composed of the capping handle 6.1 and capping piece 6.2, wherein at least one rolling wheel 6.3 is set on the capping handle 6.1 and connected onto the inner wall of the capping handle

6.1 body through the shaft; at least four rectangular-arranged rolling wheels 6.3 are installed on the inner wall of the capping piece 6.2 and connected onto the inner wall of the capping piece 6.2 through the shaft; the capping assembly 6 is set on the inner wall of the tabular body 1, which forms an internal shape matching the shape of the neck of bottle 7, the capping assembly 6 can be roll-fitted with the bottle 7; the axis of the rolling wheel 6.3 is parallel to that of the tabular body 1; at least one rolling cutter 6.4 for cutting off the tinfoil of bottle is set on the inner wall of the capping assembly 6, the axis of the rolling cutter 6.4 is parallel to that of the tabular body 1.

**[0020]** The screw assembly 2 includes connector 2.1, screw 2.2 and bolt 2.3, wherein a through hole 2.4 matching the shape of the bolt is set in the connector 2.1, the bolt 2.3 is slide-fitted with the through hole 2.4 and fitted with the shaft; the thread end of the bolt 2.3 is fixed connected with the end away from the head of the screw 2.2; the connector 2.1 is fixedly connected with the bottom of the U-shaped driven link 14.

**[0021]** A elastic limit piece 8 supported and pushed by the neck of bottle 7 is set between the tabular body 1 and the capping assembly 6, the structure is detailed as below: a elastic limit piece 8 is set between the inner wall of the tabular body 1 and the capping assembly 6, the middle part of the elastic limit piece 8 is a protrusion 8.1 against the neck of bottle, wherein the height of the protrusion 8.1 is more than the thickness of the capping assembly 1; one side of the elastic limit piece 8 is pivotally associated to the tabular body 1, the other side of a spring 8.2 props up the tabular body, a groove is set on the inner wall of the tabular body to radially limit the spring 8.2, the other side is provided with a U-shaped hook 8.3 which (8.3) axially limits the screw guiding assembly 3; when the bottle 7 is place inside, the neck of the bottle supports and pushes the protrusion 8.1 so as to drive the hook to move towards the tabular body 1; when the bottle 7 is taken out, it is reset by means of the spring 8.2, the hook 8.3 axially limits the screw guiding assembly 3.

**[0022]** The screw guiding assembly 3 consists of the upper connector 3.1, the guiding piece 3.2 and the lower connector 3.3, wherein the guiding piece 3.2 is composed of two small-diameter columns set on both ends of a large-diameter column respectively; the guiding piece 3.2 is provided with an axial spiral channel 3.4 matching the shape of the screw 2.2; a hole 3.5 slide-fitted with the guiding piece 3.2 is set in the body composed of the upper connector 3.1 and the lower connector 3.3; the both ends of the guiding piece 3.2 extend out over the bodys of the upper connector 3.1 and the lower connector 3.3 respectively and play the role of radial limitation through the abovementioned two connectors, mutually engaged one-way teeth 3.6 are set on the one ladder end face of the guiding piece 3.2 and the end face of the lower connector 3.3 against the ladder end face, wherein the one-way tooth 3.6 has a vertical side and a inclined side, when the guiding piece 3.2 and the lower connector 3.3 rotate anticlockwise, two vertical surfaces contact, so incapable of rotating, when the guiding piece 3.3 and the lower connector 3.3 rotate clockwise, two inclined surfaces make relative sliding, so capable of rotating; the screw 2.2 passes through the axial spiral channel 3.4 of the screw guiding assembly 3; one-way tooth 3.6 is set on the ring-shaped surface of the bottom of the guiding piece 3.2.

**[0023]** As shown in FIG. 3, pull out the capping handle 6.1, place the neck of the wine bottle 7 into the internal body, then grasp the capping handle 6.1 tightly, at this time, rotate bottle 7 or the corkscrew bottle, and rotate to remove the tinfoil of wine bottle 7 by means of the rolling cutter 6.4.

**[0024]** As shown in FIG. 4, push the actuation lever 5 upwards, then the driving wheel 9 acts along the movement trace of the connecting rod 10, the U-shaped connector 12 and U-shaped driven link 14 slide downwards, thus to rotate the screw 2.2 clockwise and insert it into the cork 7.1 until at the 90-degree location, screw 2.2 is now fully inserted into the cork 7.1.

**[0025]** As shown in FIG. 5, push the lever 5 upwards, at this time, since the screw bottle 7 contacts the inner wall of the capping assembly 6 and the bottle 7 holds and pushes the protrusion 8.1 of the elastic limit piece 8, the elastic limit piece 8 does not limit the screw guiding assembly; the driving wheel 9 drives the U-shaped connector 12, the U-shaped driven link 14 slides upwards, the screw 2.2 is incapable of rotating due the anticlockwise sliding, thus the U-shaped driven link 14 drives the screw 2.2 to ascend, and the cork 7.1 can be drawn out of wine bottle when pushing the lever 5 into 180-degree location.

**[0026]** As shown in FIG. 6, take out wine bottle 7, push the lever 5 downwards from the 5-degree to 90-degree location, and the screw 2.2 rotates to the lowermost location of the stroke.

**[0027]** As shown in FIG. 7, then push the lever downwards from 5-degree to 0-degree location, make the screw 2.2 upwards, hold the one-way tooth 3.6 of the guiding piece, so as to pull out the cork 7.1 from the screw, in this way, an entire opening process is completed.

## Claims

1. A corkscrew, comprising a tubular body (1) with opening on both ends, driving mechanism set inside the tubular body (1), screw assembly (2), screw guiding assembly (3) for screw (2.2) of the screw assembly (2) to pass through, elastic limit piece (8), and actuation lever (5) on the top of the tubular body (1) and capping assembly (6) at the bottom of the tubular body (1) respectively, wherein the driving link of the driving mechanism is connected with the actuation lever (5), the driven link is connected with the screw assembly (2); the screw guiding assembly (3) is slide-fitted in the tubular body (1); the capping assembly (6) is set on the inner wall of the tubular body (1), which forms the internal shape matching the

shape of the neck of bottle (7); the elastic limit piece (8) is installed between the tubular body (1) and the capping assembly (6), the elastic limit piece (8) can prop up the neck of bottle (7) so as to limit the axial sliding of the screw guiding assembly (3), wherein the said driving mechanism is linkage driving mechanism.

**2.** The corkscrew according to claim 1, wherein the linkage driving mechanism includes the driving wheel (9), connecting rod (10), shaft (11) passing through the center of the circle of the driving wheel (9), U-shaped connector (12), connecting link (13) and U-shaped driven link (14), wherein one end of the connection rod (10) is pivotally associated to the driving wheel (9) and the other end of the connecting rod (10) is pivotally associated to the tabular body (1), a circumferential groove one (9.1) is set on the circumferential surface of the driving wheel (9); one end of the connecting link (13) is placed in the groove one (9.1) and pivotally associated to the driving wheel (9), the other end of the connecting link (13) is placed in the U-shaped groove of the U-shaped driven link (14) and pivotally associated to the U-shaped driven link (14); the two supporting links of the opening end of the U-shaped connector (12.1) are pivotally associated to the both ends of the shaft (11); the U-shaped driven link (14) is slide-fitted with the U-shaped connector (12); the U-shaped connector (12) and U-shaped driven link (14) are slide-fitted onto the tabular body (1); the driving link of the driving mechanism is connected with the actuation lever (5) and the driven link is connected with the screw assembly (2), which indicates that: the driving link of the driving mechanism is the driving wheel (9) of the linkage driving mechanism, the actuation lever (5) is fixed onto the driving wheel (9), the driven link of the driving mechanism is U-shaped driven link (14) of the linkage driving mechanism, the screw assembly (2) is fixed onto the bottom of the U-shaped driven link (14).

**3.** The corkscrew according to claim 2, wherein the hinge point of the driving wheel (9) and connecting rod (10), the hinge point of the driving wheel (9) and U-shaped connector (12), and that of the driving wheel (9) and the connecting link (13) are on the same central line of the driving wheel (9).

**4.** The corkscrew according to claim 2, wherein the U-shaped driven link (14) is slide-fitted with the U-shaped connector (12), which indicates that: slideways (12.3) are set outside of the two supporting rods of the U-shaped connector opening end (12.1), the two supporting rods of the U-shaped driven link opening end (14.1) is slide-fitted into the two slideways (12.3).

**5.** The corkscrew according to claim 2, wherein the U-shaped connector (12) and U-shaped driven link (14) are slide-fitted onto the tabular body (1), which indicates that: an axial groove (4) is set on the inner wall of the tabular body (1), the two supporting rods of the U-shaped connector opening end (12.1) are slide-fitted inside the groove (4), the two supporting rods of the U-shaped driven link opening end (14.1) are slide-fitted outside the groove (4).

**6.** The corkscrew according to claim 1, wherein at least one rolling cutter (6.4) for cutting off the tinfoil of bottle is set on the inner wall of the capping assembly (6), the axis of the rolling cutter (6.4) is parallel to that of the tabular body (1).

**7.** The corkscrew according to claim 1, wherein the capping assembly (6) is composed of the capping handle (6.1) and capping piece (6.2), wherein at least one rolling wheel (6.3) is set on the capping handle (6.1), at least four rectangular-arranged rolling wheels (6.3) are installed on the inner wall of the capping piece (6.2), the axis of the rolling wheel (6.3) is parallel to that of the tabular body (1).

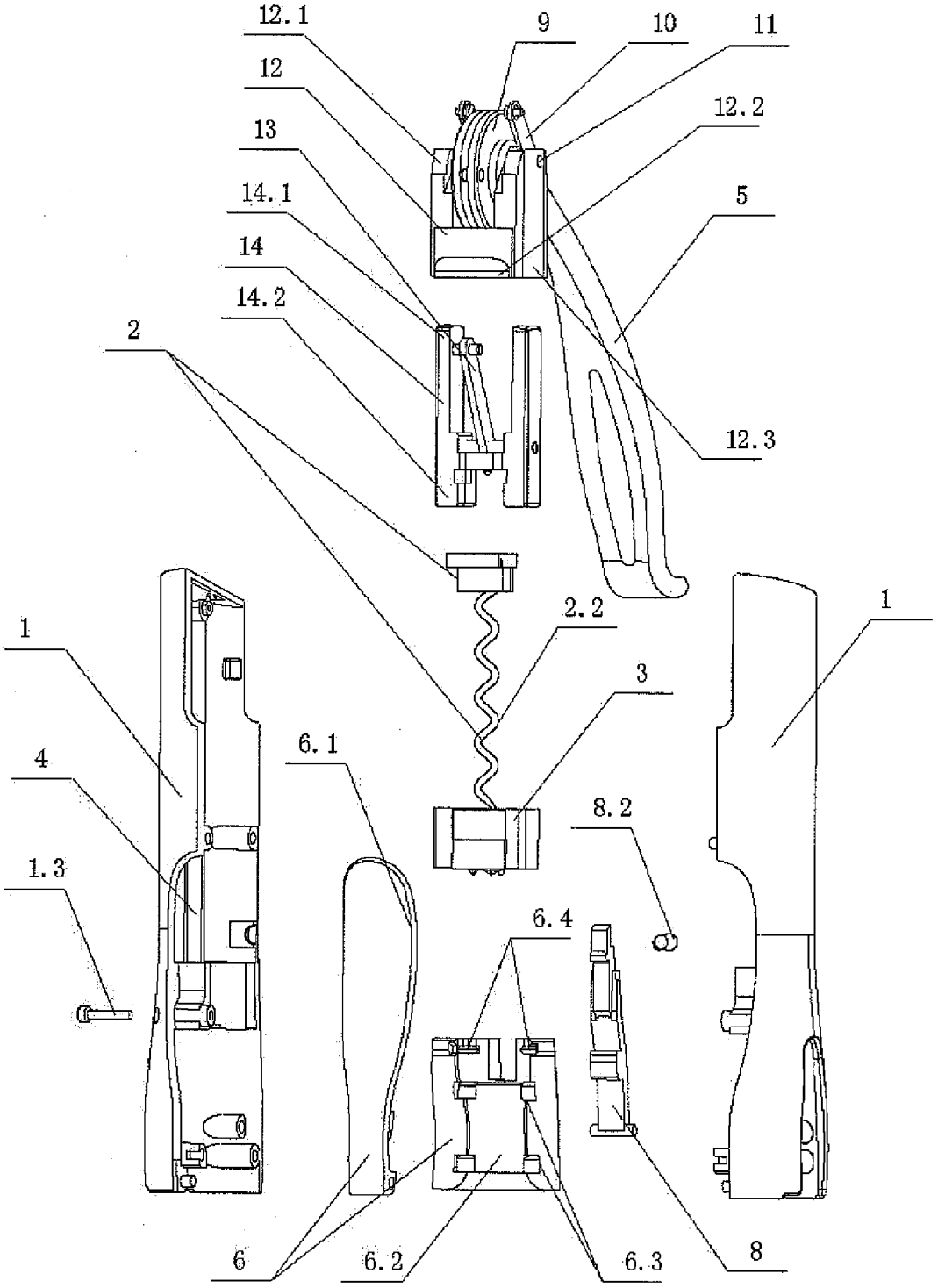



Fig. 1

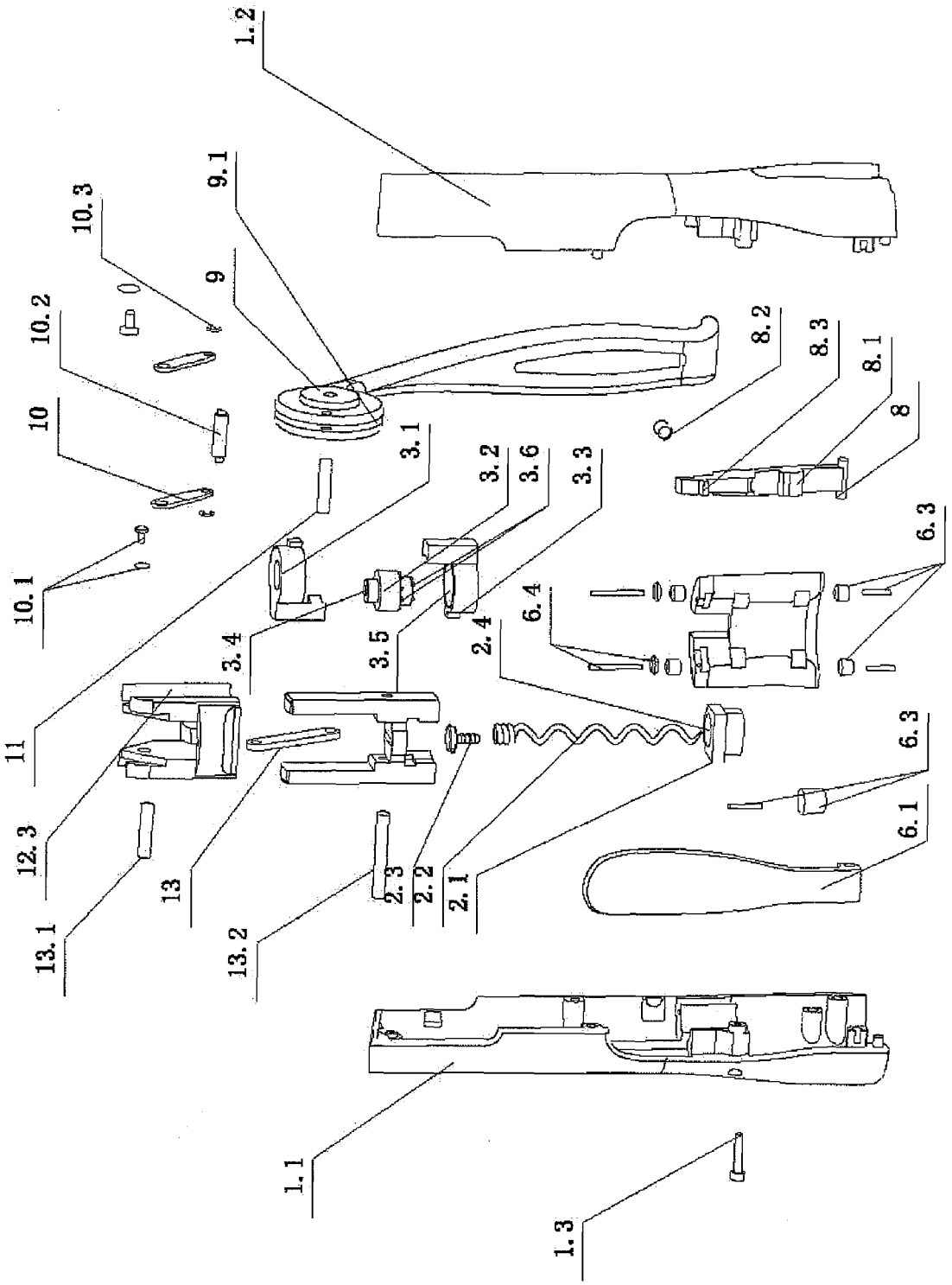

1.2
9.1
10.3
9
10.2
10
10.1
3.1
3.2
3.6
3.3
8.2
8.3
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8
6.3
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2.4
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Fig. 2

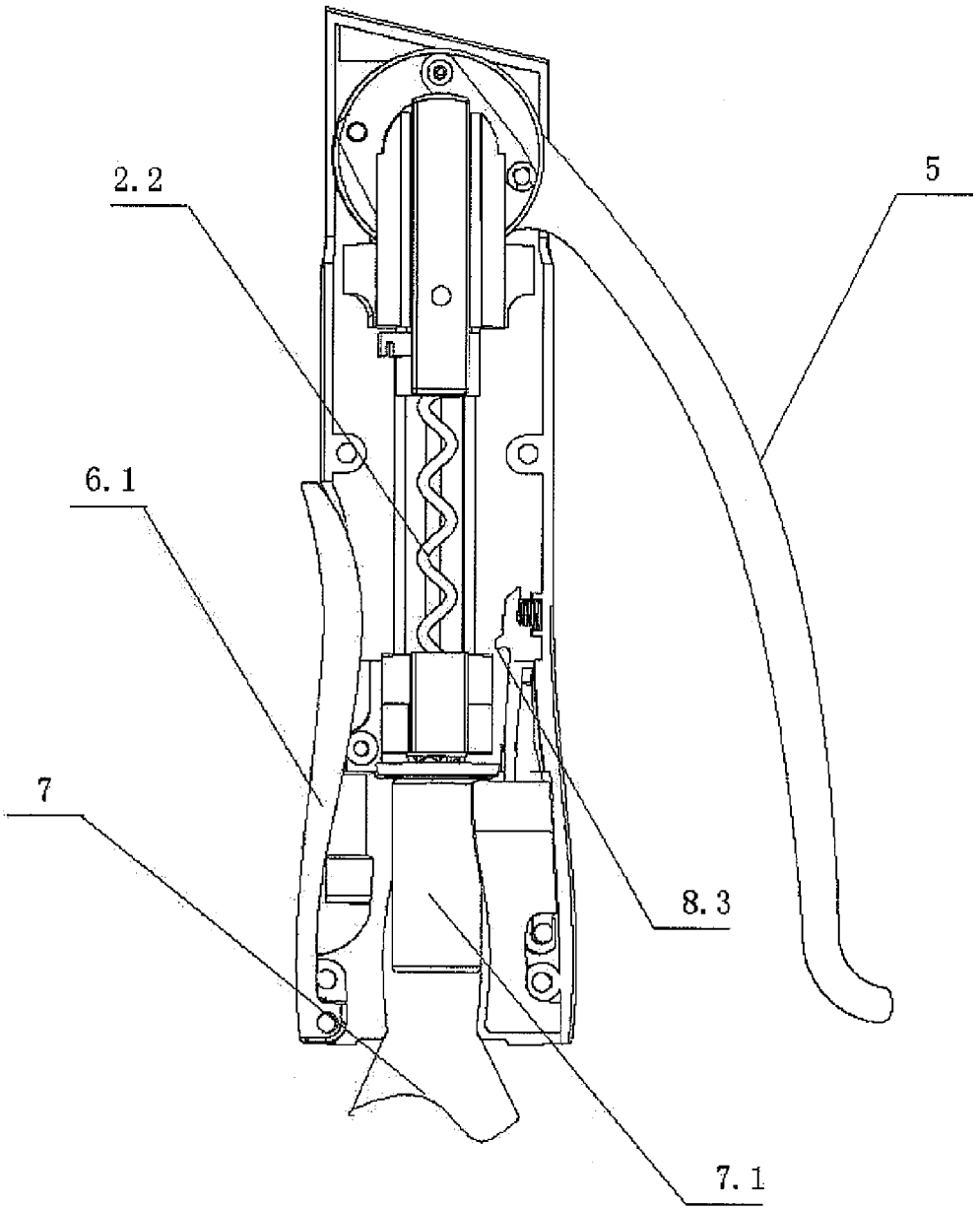



Fig. 3

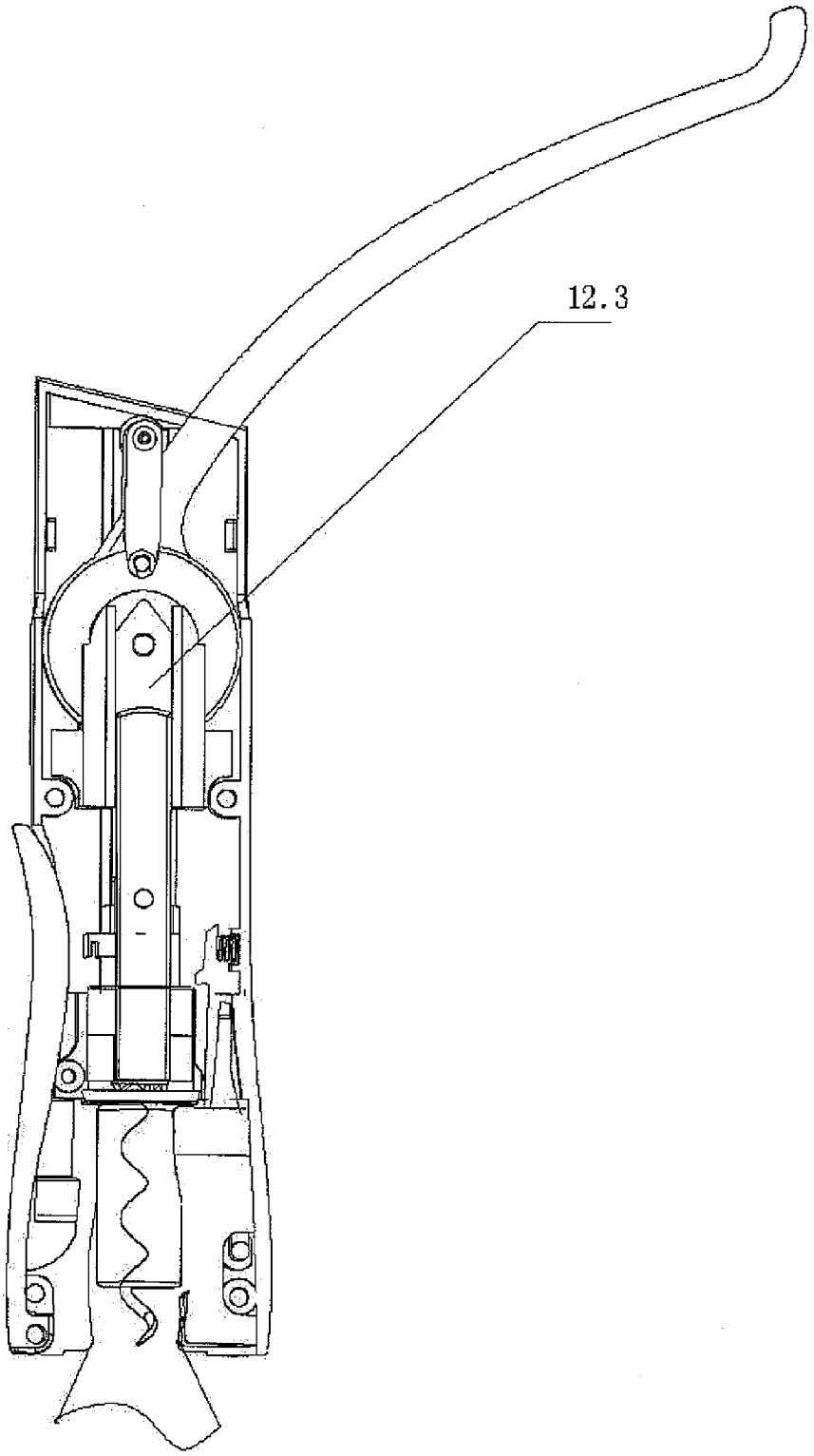



Fig. 4

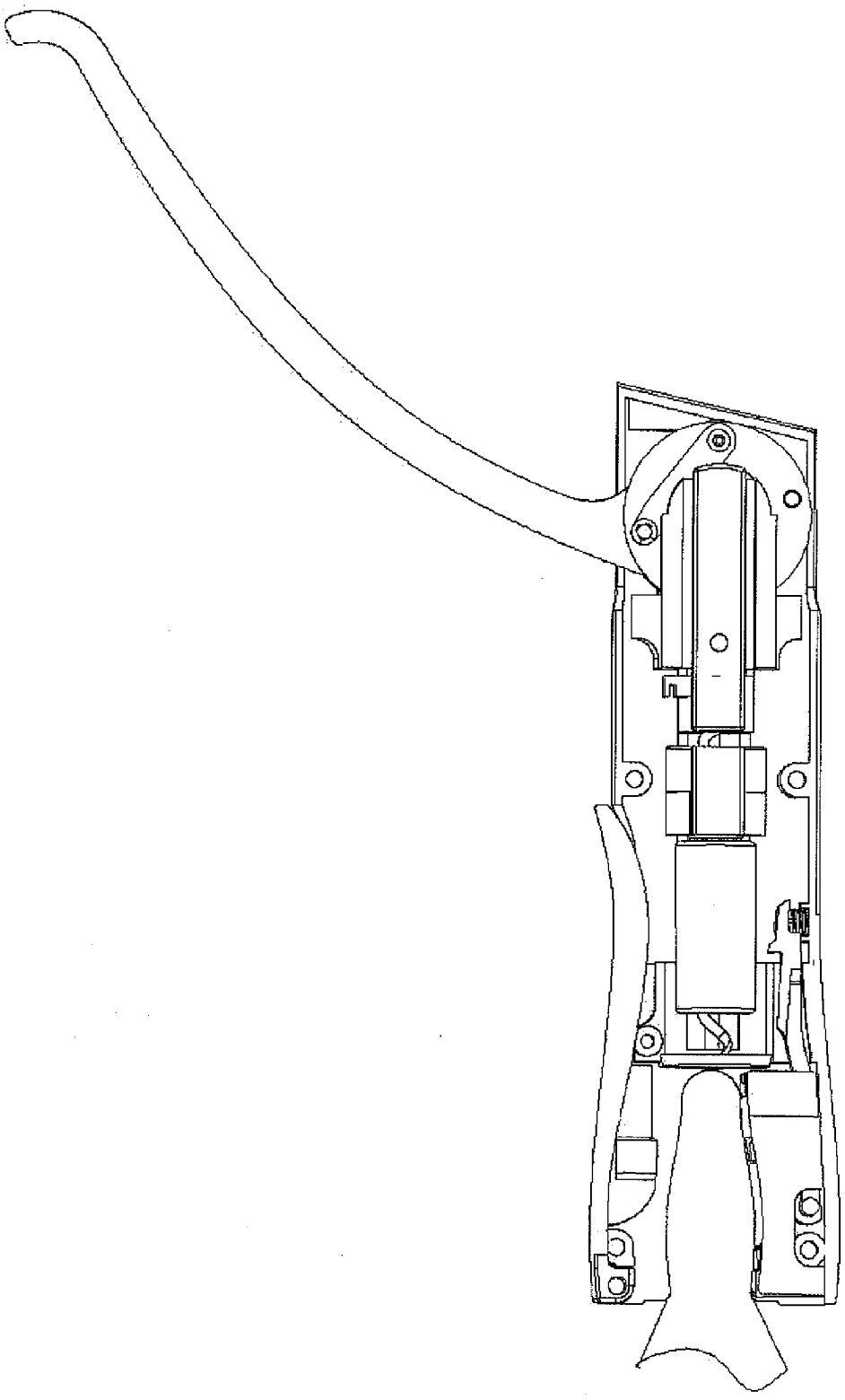


Fig. 5

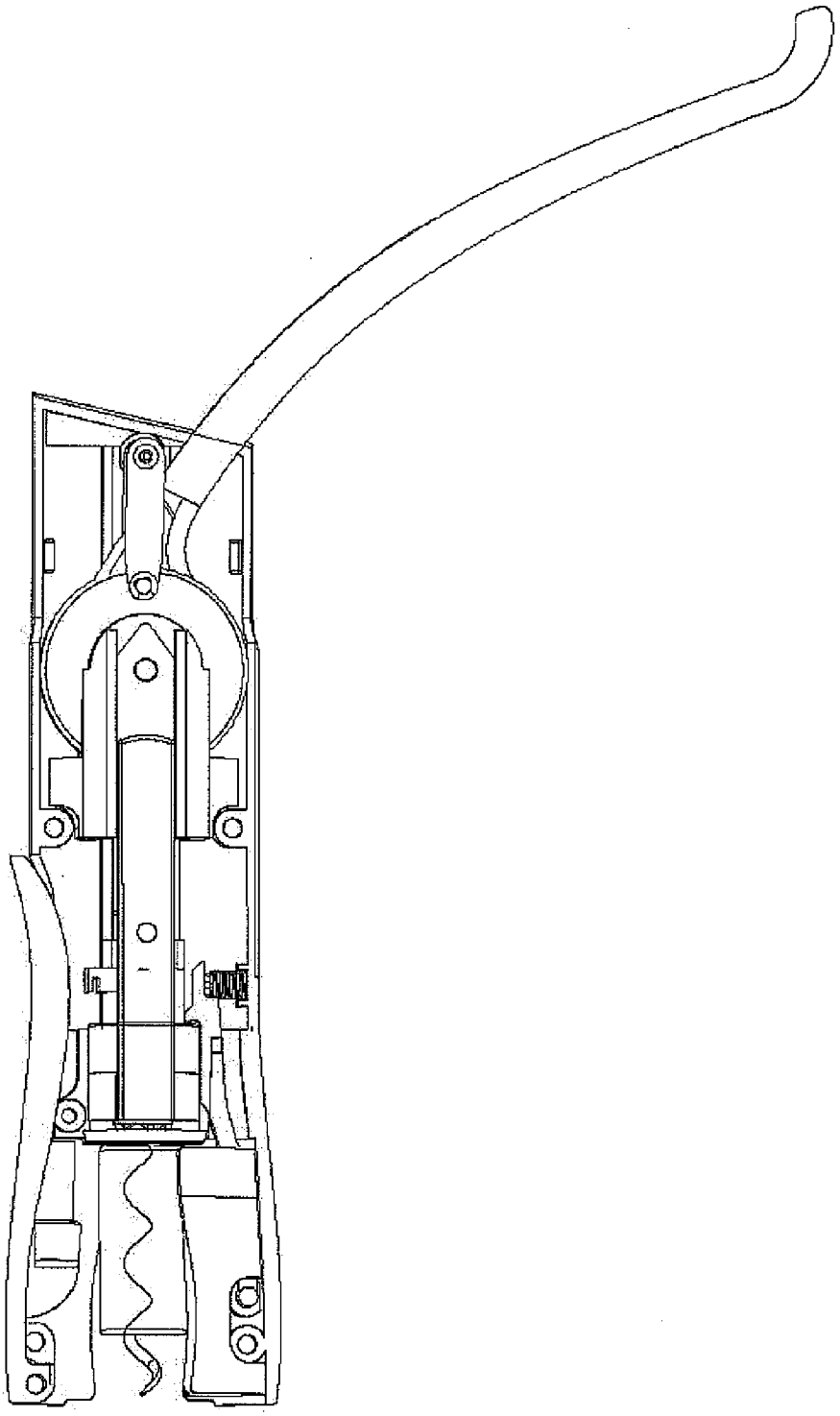


Fig. 6

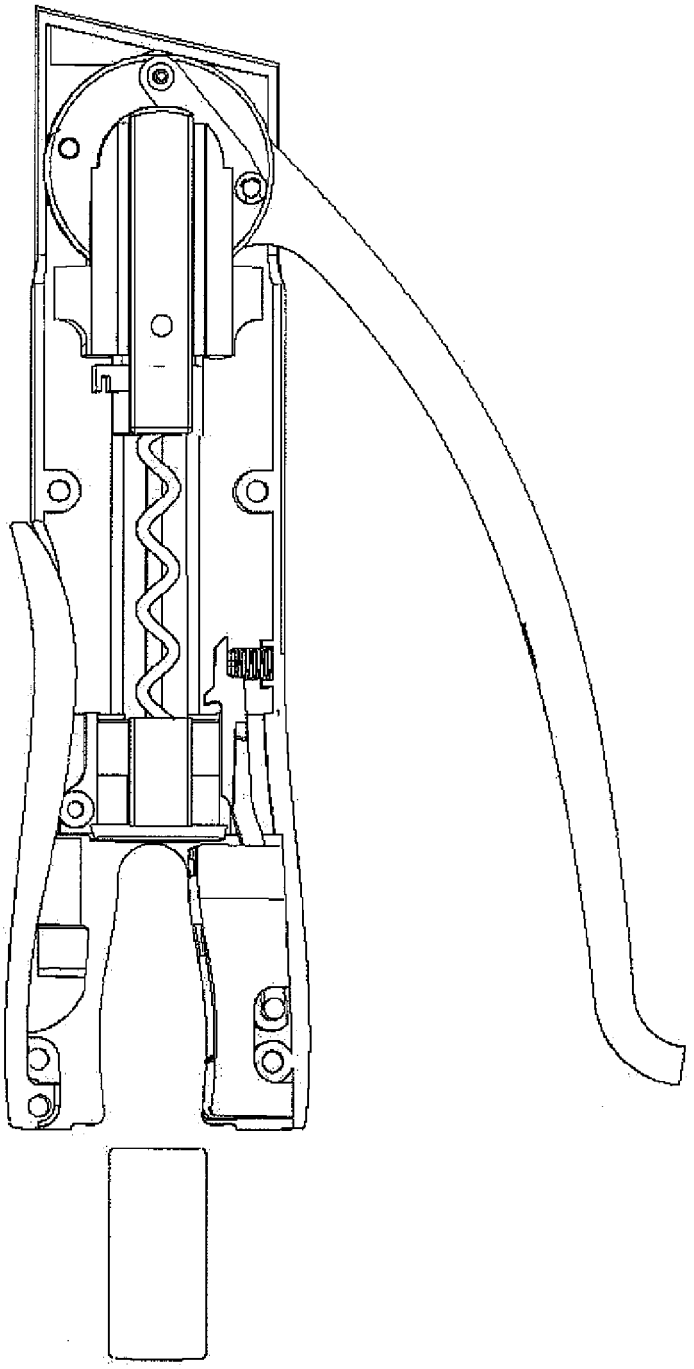


Fig. 7