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Chen

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(54) **PLIERS FOR LOOP CLAMP**

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(52) **U.S. Cl.**
CPC ***B25B 27/146*** (2013.01); ***B25B 27/30*** (2013.01)

(58) **Field of Classification Search**
USPC 29/235, 252, 278; 81/9.3, 314, 367, 403, 81/426.5
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,967,960 A * 7/1934 McNemar B67B 7/18 7/151
2,464,472 A * 3/1949 Ward B25B 7/123 81/367
3,223,133 A * 12/1965 Brookey A47J 43/26 241/101.1
9,180,576 B2 * 11/2015 Wu B25B 7/02

FOREIGN PATENT DOCUMENTS

TW	M307500	3/2007
TW	M328357	3/2008
TW	M376397	3/2010

* cited by examiner

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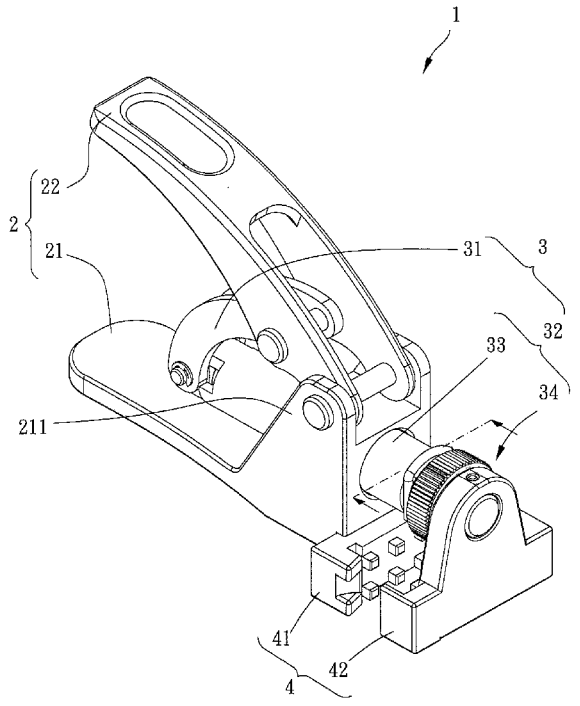
(57) **ABSTRACT**

A pliers for a loop clamp is provided, including a grip assembly, a displacement mechanism and a clamping assembly. The grip assembly has two handle members which are pivotally assembled with each other. The displacement mechanism is movably connected to the grip assembly, and the displacement mechanism can be actuated by the grip assembly. The clamping assembly has two clamping portions for clamping two ends of a loop clamp, the two clamping portions are connected with the grip assembly, and at least one of the two clamping portions is movably connected to the grip assembly and can be actuated by the displacement mechanism to change a distance between the two clamping portions.

6 Claims, 6 Drawing Sheets



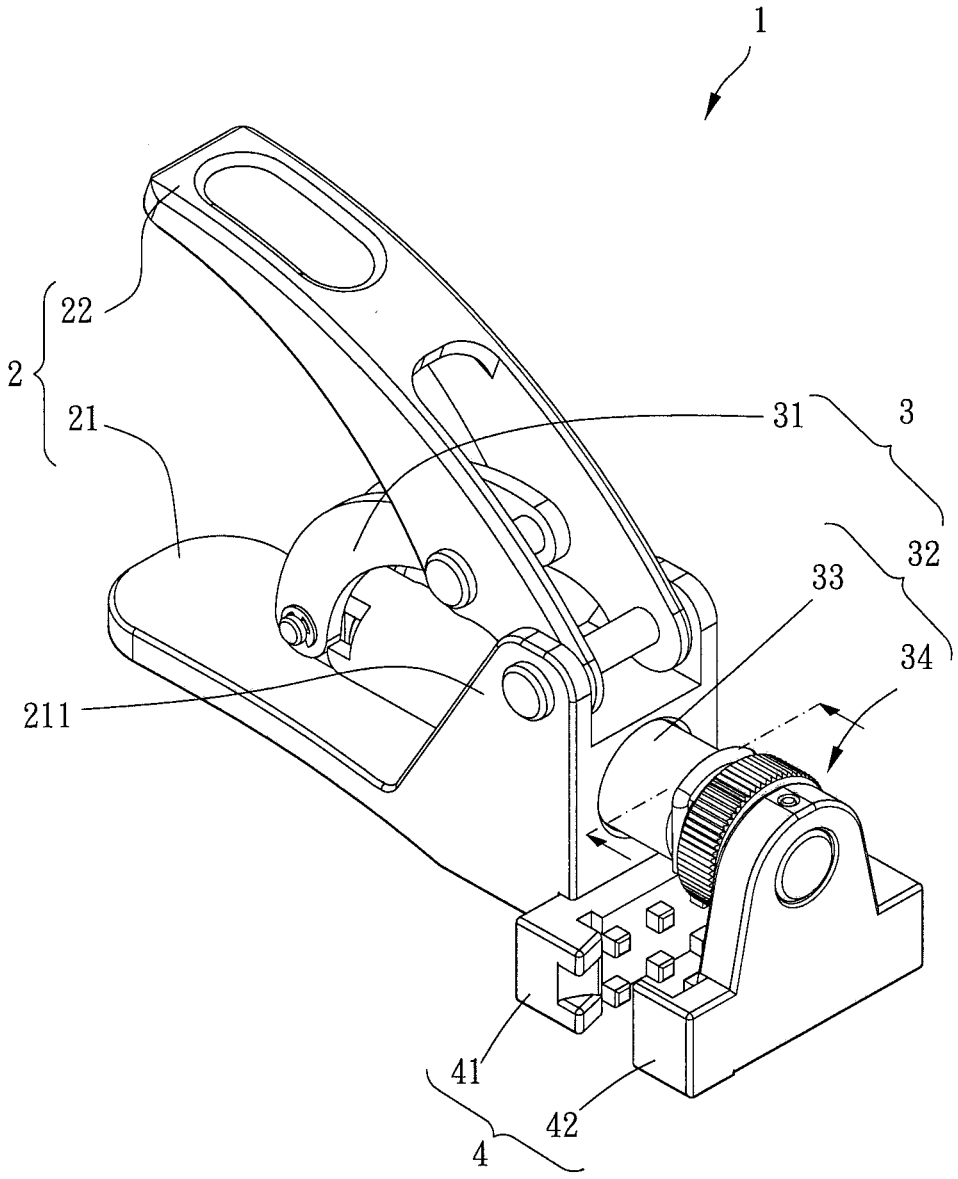


FIG. 1

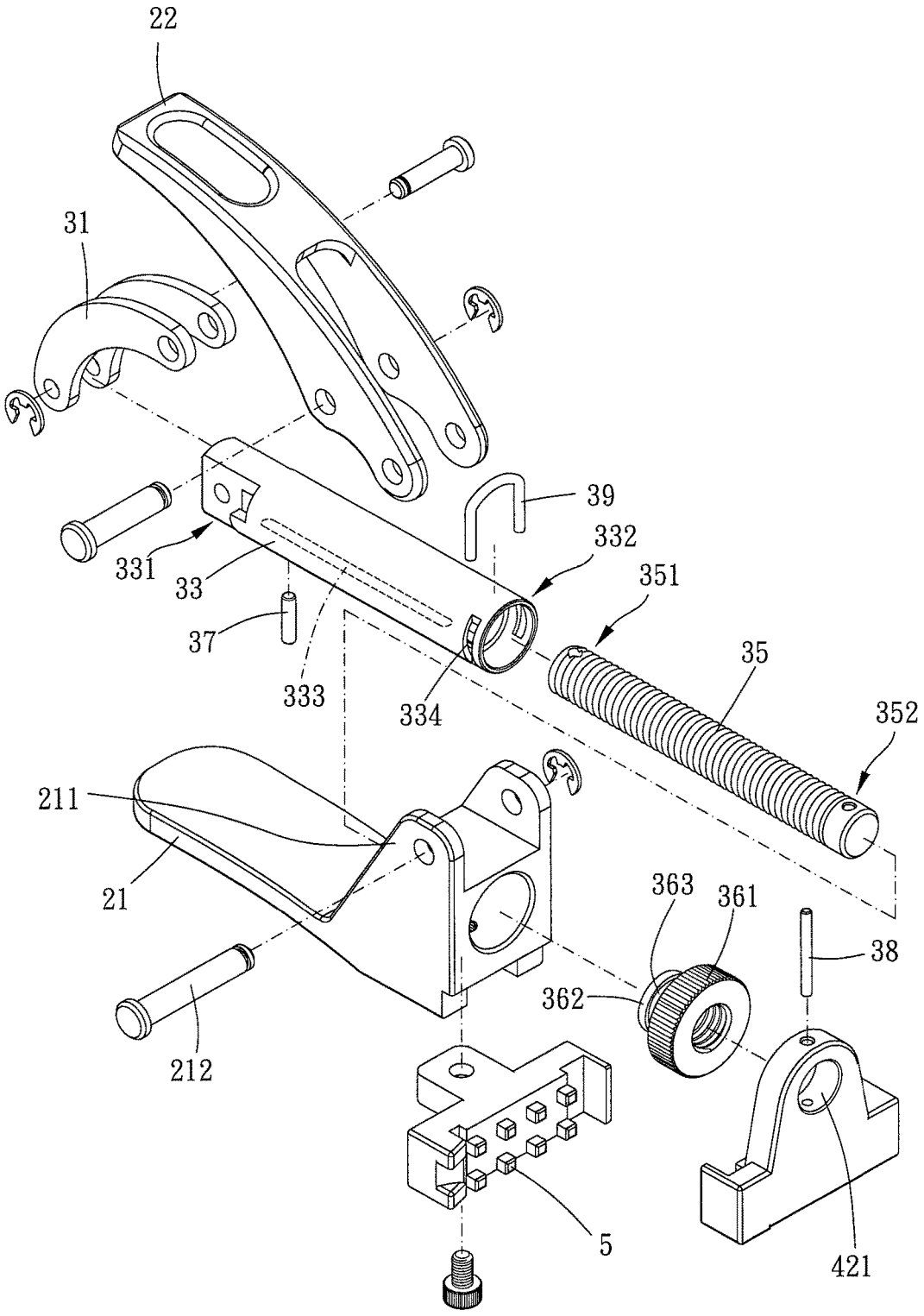

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FIG. 2

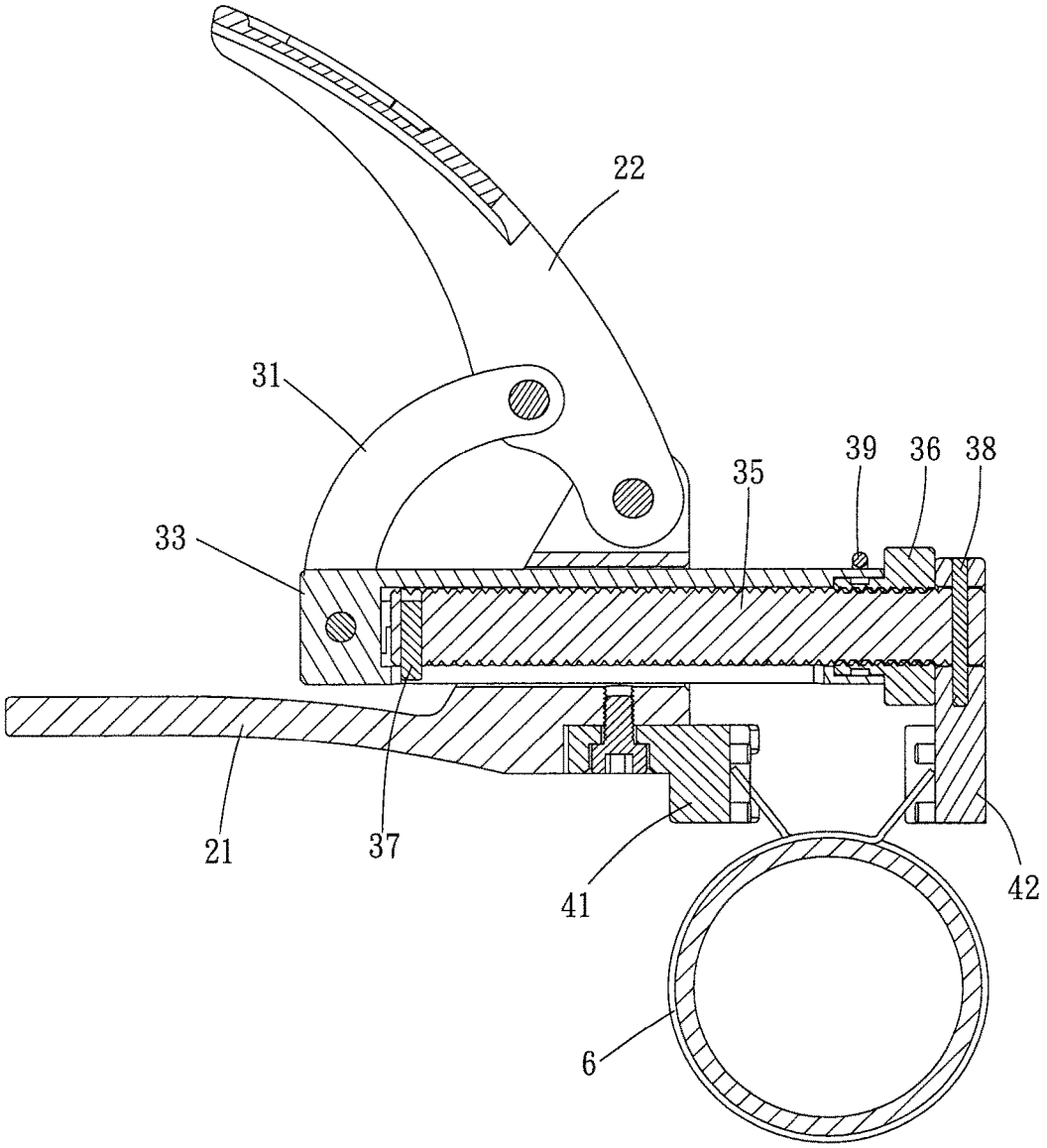

FIG. 3

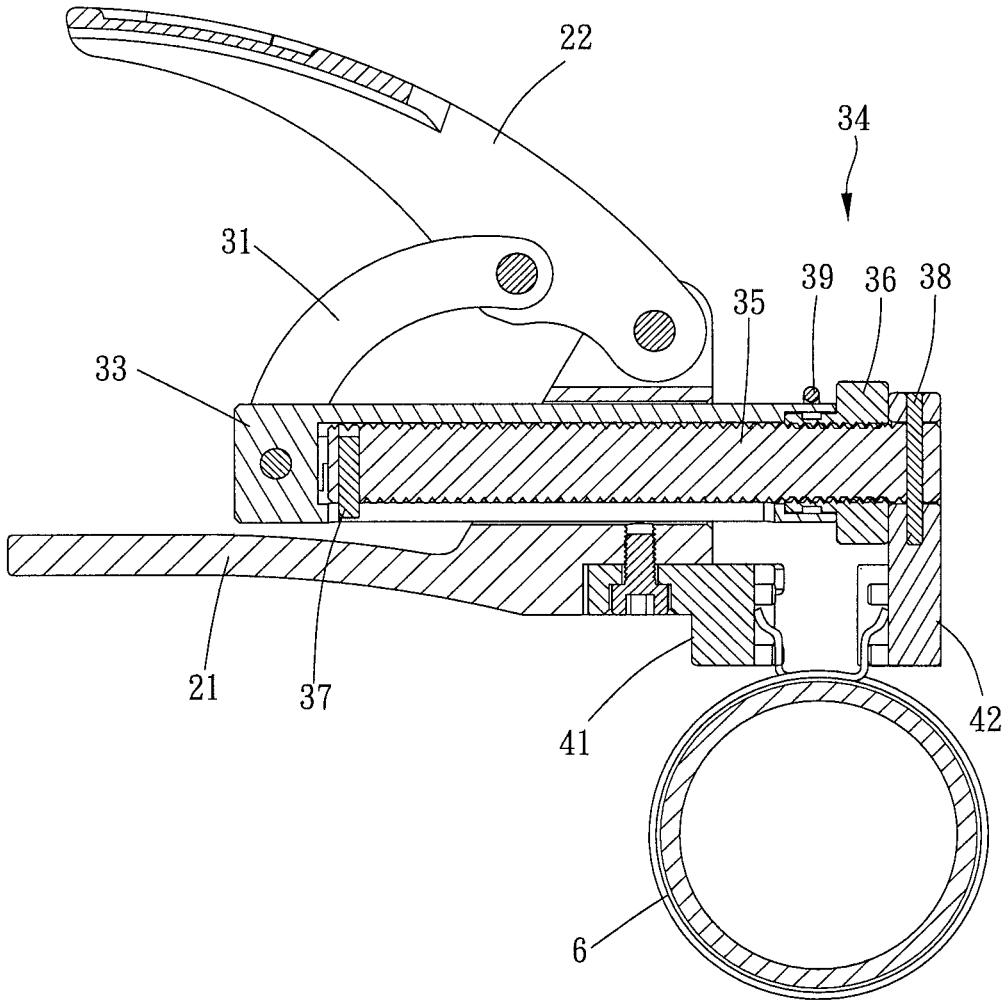

FIG. 4

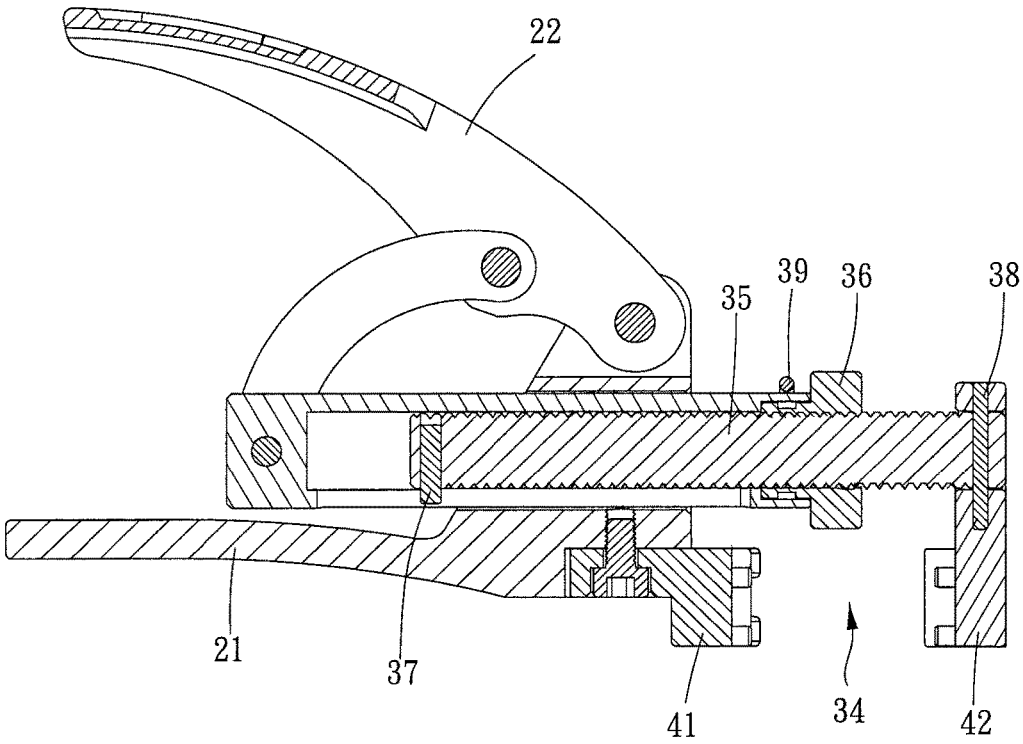

FIG. 5

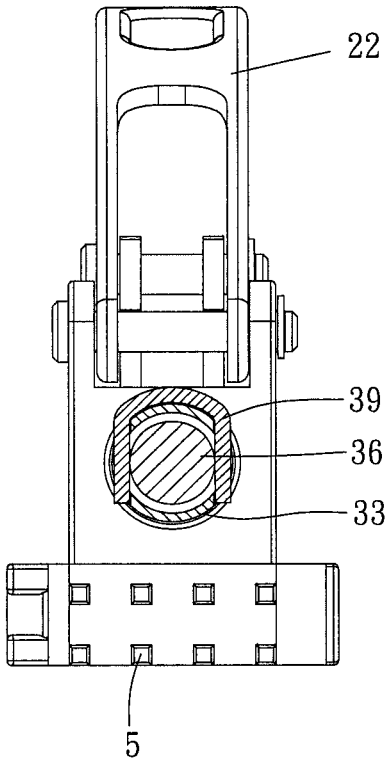

FIG. 6

PLIERS FOR LOOP CLAMP

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a pliers for a loop clamp.

Description of the Prior Art

There are many types of loop clamp removal tools, one of which actuates two clamping portions with a steel wire to clamp a loop clamp tightly; however, a structure of this type of tool is more complex, and it is uneasy to be assembled and put away. Therefore, the two clamping portions are often assembled to a grip portion to be in a pliers shape, and a user can grip the grip portion and clamp two ends of the loop clamp directly. It is convenient, fast and logical for the user to use the loop clamp removal tool. This type of loop clamp removal tools are disclosed in TWM307500, TWM328357 and TWM376397.

However, in this type of prior art, a distance between the two clamping portions cannot be fixed, so when the user wants to clamp the two ends of the loop clamp, the user has to reopen the two clamping portions to a width corresponding to a width of the loop clamp to conduct a removal operation. When there are many loop clamps in similar dimensions needed to be removed, it takes longer time to remove the loop clamps and may cause burden to hands of the user. In addition, in this type of prior art, an opening range of the two clamping portions is limited, and the two clamping portions cannot be opened wider; therefore, when the loop clamp has a greater dimension, it is inconvenient and cost-consuming that the user has to find other proper tools to remove the loop clamp.

The present invention has arisen to mitigate and/or obviate the afore-described disadvantages.

SUMMARY OF THE INVENTION

The major object of the present invention is to provide a pliers for a loop clamp which can adjust a distance between two clamping portions in accordance with a distance between two ends of a loop clamp to be clamped. The pliers for the loop clamp is easy to use. In addition, when a removal operation is conducted repeatedly and quantitatively, the two clamping portions can be positioned in a fixed distance; therefore, a user does not have to repeat actions of opening, closing and adjusting the two clamping portions, and hands of the user can be protected, a working efficiency is elevated, and a working time is saved.

To achieve the above and other objects, a pliers for a loop clamp is provided, including a grip assembly, a displacement mechanism and a clamping assembly. The grip assembly has two handle members which are pivotally assembled with each other. The displacement mechanism is movably connected to the grip assembly, and the displacement mechanism can be actuated by the grip assembly. The clamping assembly has two clamping portions for clamping two ends of a loop clamp, the two clamping portions are connected with the grip assembly, and at least one of the two clamping portions is movably connected to the grip assembly and can be actuated by the displacement mechanism to change a distance between the two clamping portions.

The present invention will become more obvious from the following description when taken in connection with the accompanying drawings, which show, for purpose of illustrations only, the preferred embodiment(s) in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a stereogram of a preferred embodiment of the present invention;

FIG. **2** is a breakdown view of the preferred embodiment of the present invention;

FIGS. **3** and **4** are drawings showing the preferred embodiment of the present invention in operation;

FIG. **5** is a cross-sectional view of the preferred embodiment of the present invention; and

FIG. **6** is another cross-sectional view of the preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention will be clearer from the following description when viewed together with the accompanying drawings, which show, for purpose of illustrations only, the preferred embodiment in accordance with the present invention.

Please refer to FIGS. **1** to **6** for a preferred embodiment of the present invention. A pliers for a loop clamp **1** includes a grip assembly **2**, a displacement mechanism **3** and a clamping assembly **4**.

The grip assembly **2** has two handle members which are pivotally assembled with each other. The displacement mechanism **3** is movably connected to the grip assembly **2**, and the displacement mechanism **3** can be actuated by the grip assembly **2**. The clamping assembly **4** has two clamping portions for clamping two ends of a loop clamp **6**, the two clamping portions are connected with the grip assembly **2**, and at least one of the two clamping portions is movably connected to the grip assembly **2** and can be actuated by the displacement mechanism **3** to change a distance between the two clamping portions. In other words, one of the two clamping portions may move toward or away from the other of the two clamping portions; or the two clamping portions may move toward or away from each other simultaneously.

In this embodiment, the two handle members are respectively a first handle member **21** and a second handle member **22**, the two clamping portions are respectively a first clamping portion **41** and a second clamping portion **42**, the first clamping portion **41** is fixedly connected to the first handle member **21**, and the second clamping portion **42** is connected to the displacement mechanism **3** and connected to the grip assembly **2**. It is to be noted that the first and second clamping portions **41**, **42** are respectively detachably connected to the first handle member **21** and the displacement mechanism **3**, and when the first and second clamping portions **41**, **42** are damaged, the user can replace the first and second clamping portions **41**, **42** directly instead of replacing the whole pliers for the loop clamp **1**. In actual practice, the displacement mechanism **3** drives the second clamping portion **42** to move toward the first clamping portion **41** to clamp the two ends of the loop clamp **6**. Preferably, a working face of the first clamping portion **41** and a working face of the second clamping portion **42** opposite to each other are respectively provided with a plurality of protrusions **5** arranged in intervals, and each said protrusion **5** is for abutting against an end of the loop clamp **6**. Specifically, a distance between either two of the protrusions **5** neighboring to each other is for an end of the loop

clamp **6** to project therein to abut against each said protrusion **5** laterally so that the two ends of the loop clamp **6** will not easily loose during a clamping process.

More specifically, the displacement assembly **3** includes a connecting member **31** and a displacement assembly **32**, the second clamping portion **42** is connected to the displacement assembly **32**, two ends of the connecting member **31** are respectively connected to the displacement assembly **32** and the second handle member **22**, when the second handle member **22** approaches the first handle member **21**, the connecting member **31** actuates the displacement assembly **32** to move along a first direction to drive the second clamping portion **42** to move toward the first clamping portion **41**, and the first direction is transverse to swinging directions of the two handle members. Specifically, the displacement assembly **32** includes a main body **33** and an adjustment assembly **34**, the adjustment assembly **34** is assembled on a second end **332** of the main body **33**, the adjustment assembly **34** is retractable and positionable relative to the main body **33**, and the second clamping portion **42** is connected to the adjustment assembly **34** so that the user can adjust the distance between the first and second clamping portions **41**, **42** according to a dimension o the loop clamp **6** to be clamped. In addition, please further refer to FIG. **5**. When there is a large quantity of the loop clamps **6** in a same dimension needed to be removed, the user only needs to adjust the distance between the first and second clamping portions **41**, **42** when clamping the loop clamp **6** for the first time, and then the second clamping portion **42** is positioned on a predetermined position so that the user can clamp the two ends of other said loop clamps **6** with the first and second clamping portions **41**, **42** directly without adjusting the distance between the first and second clamping portions **41**, **42** again. Besides, compared with a normal clamping way of a pliers, the pliers for the loop clamp **1** can reduce a burden to hands of the user by decreasing a number of opening and closing the hand. In this embodiment, the main body **33** has a first end **331** and the second end **332**, one of the two ends of the connecting member **31** is pivoted to the first end **331**, the other end of the two ends of the connecting member **31** is pivoted to the second handle member **22**, and the grip assembly **2** can smoothly and quickly actuate the displacement assembly **32** via a pivoting design. In other embodiments, the connecting member **31** may abut against the displacement assembly **32** to actuate the displacement assembly **32**.

Specifically, the adjustment assembly **34** includes a threaded rod **35** and an adjustment member **36** screwed with the threaded rod **35**, the adjustment member **36** is rotatably connected to the second end **332** of the main body **33**, a third end **351** of the threaded rod **35** is movably arranged in an interior of the main body **33**, a fourth end **352** of the threaded rod **35** is disposed through the adjustment member **36** to be assembled to the second clamping portion **42**, and the adjustment member **36** is located between the main body **33** and the second clamping portion **42**. Through rotating the adjustment member **36**, the threaded rod **35** can be quickly controlled to retract relative to the main body **33**, and a distance between the threaded rod **35** and the main body **33** can be adjusted continuously and subtly through screwing. Please refer to FIGS. **2** and **6** for a more detailed description of an assembling way of the adjustment member **36** and the main body **33**. The adjustment assembly **36** further includes an assembling member **39**, the adjustment member **36** further includes a body portion **361** and a head portion **362** projecting into an interior of the second end **332**, a ring portion **363** is recessed around the head portion **362**, an circumference of the second end **332** of the main body **33** has two openings **334** opposite to the ring portion **363**, and when the adjustment member **36** is assembled to the second end **332**, the assembling member **39** is disposed through each said opening **334** and engaged with the ring portion **363**. However, the adjustment assembly **34** may be in other cooperation modes. For example, in other embodiments, the threaded rod **35** may be a rod member having a positioning ball, the second end **332** of the main body **33** may have a plurality of through holes in intervals which are optionally engaged with the positioning ball, and the main body **33** is retracted and positioned via the through holes on different positions.

In this embodiment, the first handle member **21** further has two ear portions **211** which extend along a direction substantially perpendicular to the first direction and a pivot member **212**, the pivot member **212** is inserted through the two ear portions **211** and the second handle member **22** so that the second handle member **22** is pivotable relative to the two ear portions **211**. The main body **33** is located between the first and second handle members **21**, **22**, the second end **332** of the main body **33** is slidably disposed through the first handle member **21** along the first direction, when the second handle member **22** swings toward the first handle member **21**, and the second handle member **22** pushes the connecting member **31**, pulls the main body **33** and drives the second clamping portion **42** to move toward the grip assembly **2**. In other words, the grip assembly **2** moves the second clamping portion **42** through linkage. Preferably, the adjustment assembly **34** further includes a slidable member **37**, the main body **33** has a sliding slot **333** extending along the first direction, an end of the slidable member **37** is assembled on the third end **351** of the threaded rod **35**, and the other end of the slidable member **37** is slidably arranged in the sliding slot **333**. The slidable member **37** can ensure that the third end **351** of the threaded rod **35** in the main body **33** does not collide or abrade with an inner wall of the main body **33** due to shaking so that an assembling stability of the threaded rod **35** and the main body **33** can be elevated. Preferably, the adjustment assembly **34** further includes a fixing member **38**, and the second clamping portion **42** has an assembling opening **421**, the fourth end **352** of the threaded rod **35** is disposed through the assembling opening **421**, and the fixing member **38** is inserted in the second clamping portion **42** and the fourth end **352** to be fixedly connected to the second clamping portion **42** and the fourth end **352**. Therefore, it is convenient for the user to assemble the second clamping portion **42** to the threaded rod **35** to have a more stable structure.

Given the above, the two clamping portions of the pliers for the loop clamp can be adjusted to cooperate with the loop clamps in different dimensions. The adjustment assembly can be adjusted to retract continuously and subtly through screwing.

In addition, when there is a large quantity of the loop clamps in a same dimension needed to be removed, the two clamping portions can be positioned in a fixed distance; therefore, a user does not have to repeat actions of opening, closing and adjusting the two clamping portions, and the hands of the user can be protected, a working efficiency is elevated, and a working time is saved.

In addition, the working face of the first clamping portion and the working face of the second clamping portion opposite to each other are respectively provided with the plurality of protrusions connected in intervals, the two ends of the loop clamp can respectively project therein to abut against each said protrusion laterally so as to elevate the stability.

While we have shown and described various embodiments in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

What is claimed is:

1. A pliers for a loop clamp, including:

a grip assembly, having two handle members which are pivotally assembled with each other;

a displacement mechanism, movably connected to the grip assembly, the displacement mechanism being actuatable by the grip assembly;

a clamping assembly, having two clamping portions for clamping two ends of a loop clamp, the two clamping portions connected with the grip assembly, at least one of the two clamping portions movably connected to the grip assembly and being actuatable by the displacement mechanism to change a distance between the two clamping portions;

wherein the two handle members are respectively a first handle member and a second handle member, the two clamping portions are respectively a first clamping portion and a second clamping portion, the first clamping portion is fixedly connected to the first handle member, and the second clamping portion is connected to the displacement mechanism and connected to the grip assembly

wherein the displacement mechanism includes a connecting member and a displacement assembly, the second clamping portion is connected to the displacement assembly, two ends of the connecting member are respectively connected to the displacement assembly and the second handle member, when the second handle member approaches the first handle member, the connecting member actuates the displacement assembly to move along a first direction to drive the second clamping portion to move toward the first clamping portion, and the first direction is transverse to swinging directions of the two handle members

wherein the displacement assembly includes a main body and an adjustment assembly, the main body has a first end and a second end, the adjustment assembly is assembled on the second end of the main body, the adjustment assembly is retractable and positionable relative to the main body, the second clamping portion is connected to the adjustment assembly, one of the two ends of the connecting member is pivoted to the first end, and the other end of the two ends of the connecting member is pivoted to the second handle member.

2. The pliers for the loop clamp of claim **1**, wherein the adjustment assembly includes a threaded rod and an adjustment member screwed with the threaded rod, wherein the adjustment member is rotatably connected to the second end of the main body, a third end of the threaded rod is movably arranged in an interior of the main body, a fourth end of the threaded rod is disposed through the adjustment member to be assembled to the second clamping portion, and the adjustment member is located between the main body and the second clamping portion.

3. The pliers for the loop clamp of claim **2**, wherein the adjustment assembly further includes a slidable member, the main body has a sliding slot extending along the first direction, an end of the slidable member is assembled on the third end of the threaded rod, and the other end of the slidable member is slidably arranged in the sliding slot.

4. The pliers for the loop clamp of claim **2**, wherein the adjustment assembly further includes an assembling member, the adjustment member further includes a body portion and a head portion projecting into an interior of the second end, a ring portion is recessed around the head portion, an circumference of the second end of the main body has two openings opposite to the ring portion, and when the adjustment member is assembled to the second end of the main body, the assembling member is disposed through each said opening and engaged with the ring portion.

5. The pliers for the loop clamp of claim **4**, wherein the first handle member further has two ear portions which extend along a direction substantially perpendicular to the first direction and a pivot member, the pivot member is inserted through the two ear portions and the second handle member so that the second handle member is pivotable relative to the two ear portions, the main body is located between the first and second handle members, the second end of the main body is slidably disposed through the first handle member along the first direction, when the second handle member swings toward the first handle member, the second handle member pushes the connecting member, pulls the main body and drives the second clamping portion to move toward the grip assembly; the adjustment assembly further includes a slidable member and a fixing member, the main body has a sliding slot extending along the first direction, an end of the slidable member is assembled on the third end of the threaded rod, the other end of the slidable member is slidably arranged in the sliding slot, the second clamping portion has an assembling opening, the fourth end of the threaded rod is disposed through the assembling opening, and the fixing member is inserted in the second clamping portion and the fourth end to be fixedly connected to the second clamping portion and the fourth end.

6. The pliers for the loop clamp of claim **1**, wherein a working face of the first clamping portion and a working face of the second clamping portion opposite to each other are respectively provided with a plurality of protrusions arranged in intervals, and each said protrusion is for abutting against an end of the loop clamp.

* * * * *