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(54) **FASTENER STRUCTURE FOR PLIERS**

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B25B 7/14 (2006.01)
B25B 7/06 (2006.01)
B25B 7/08 (2006.01)

(52) **U.S. Cl.**
CPC . ***B25B 7/14*** (2013.01); ***B25B 7/08*** (2013.01)

(58) **Field of Classification Search**
CPC B25B 7/08; B25B 7/14; B26B 13/16
USPC 81/321–325
See application file for complete search history.

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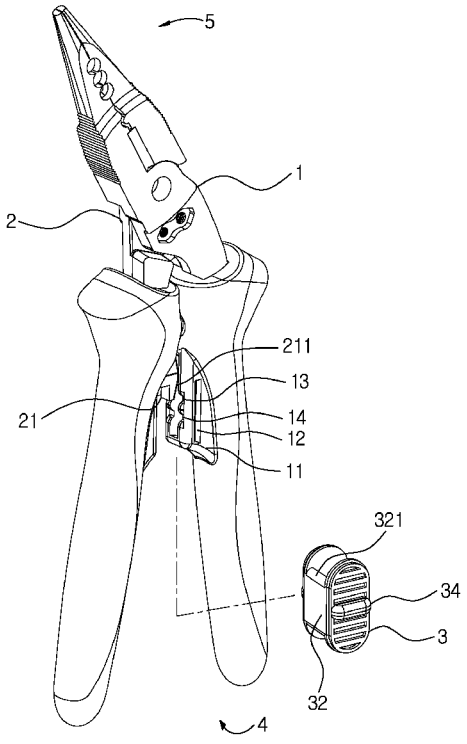
Primary Examiner — Hadi Shakeri

(57) **ABSTRACT**

A fastener structure for pliers contains: a first connecting arm, a second connecting arm, and a slidable fastener. The first connecting arm is rotatably connected with the second connecting arm to form a griping segment and a working segment and includes a holder which has two guiding rails. The first connecting arm also includes a first notch and a second notch, and the second connecting arm includes a locking seat. The slidable fastener is hollow and retains with the holder, and the slidable fastener includes two guide posts, a positioning plate, and an elastic locker mounted on the positioning plate to alternatively retain with the first notch or the second notch, such that when the elastic locker retains with the first notch, the positioning plate limits the locking seat, and when the elastic locker retains with the second notch, the positioning plate releases the locking seat.

2 Claims, 7 Drawing Sheets



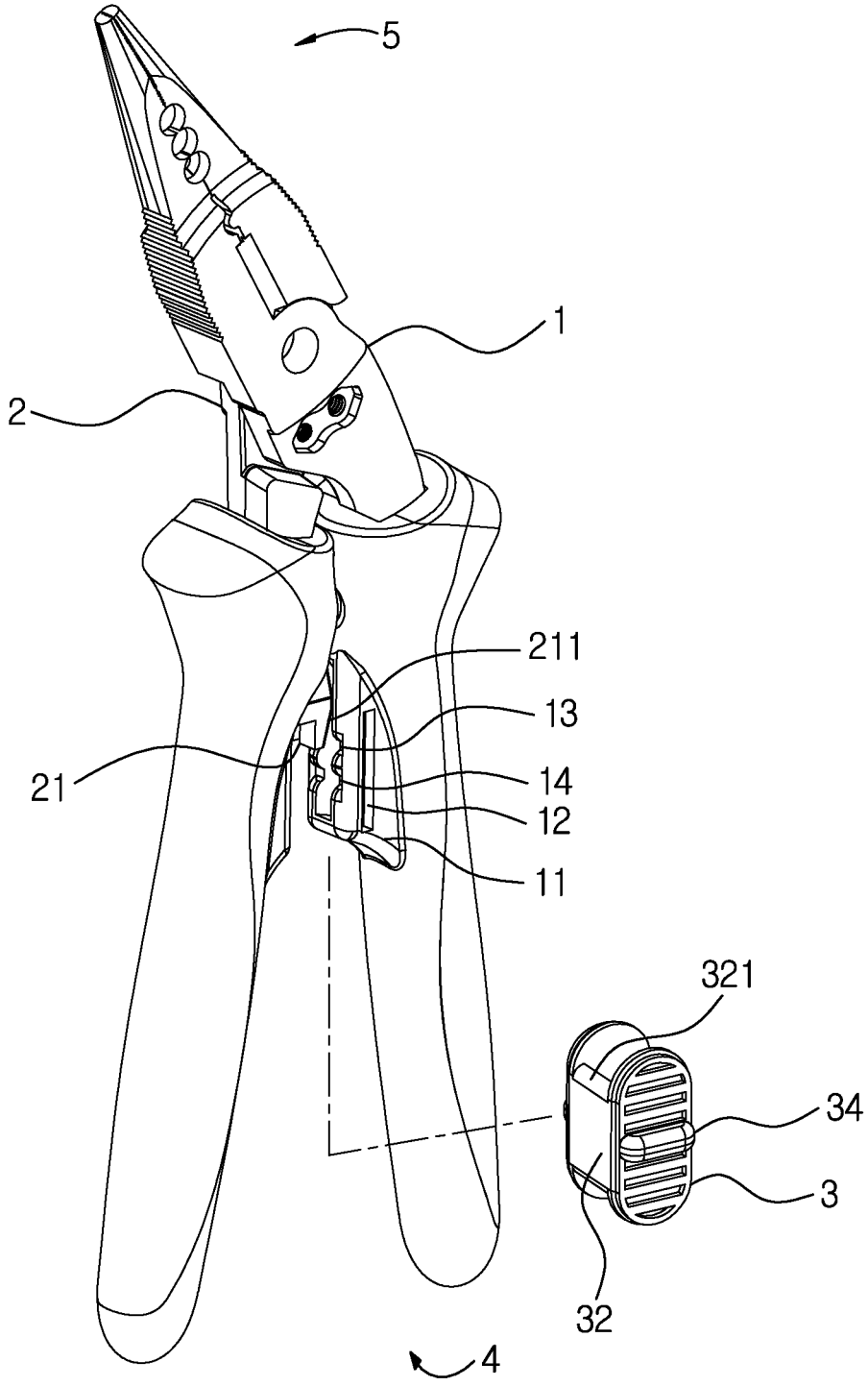


FIG.1

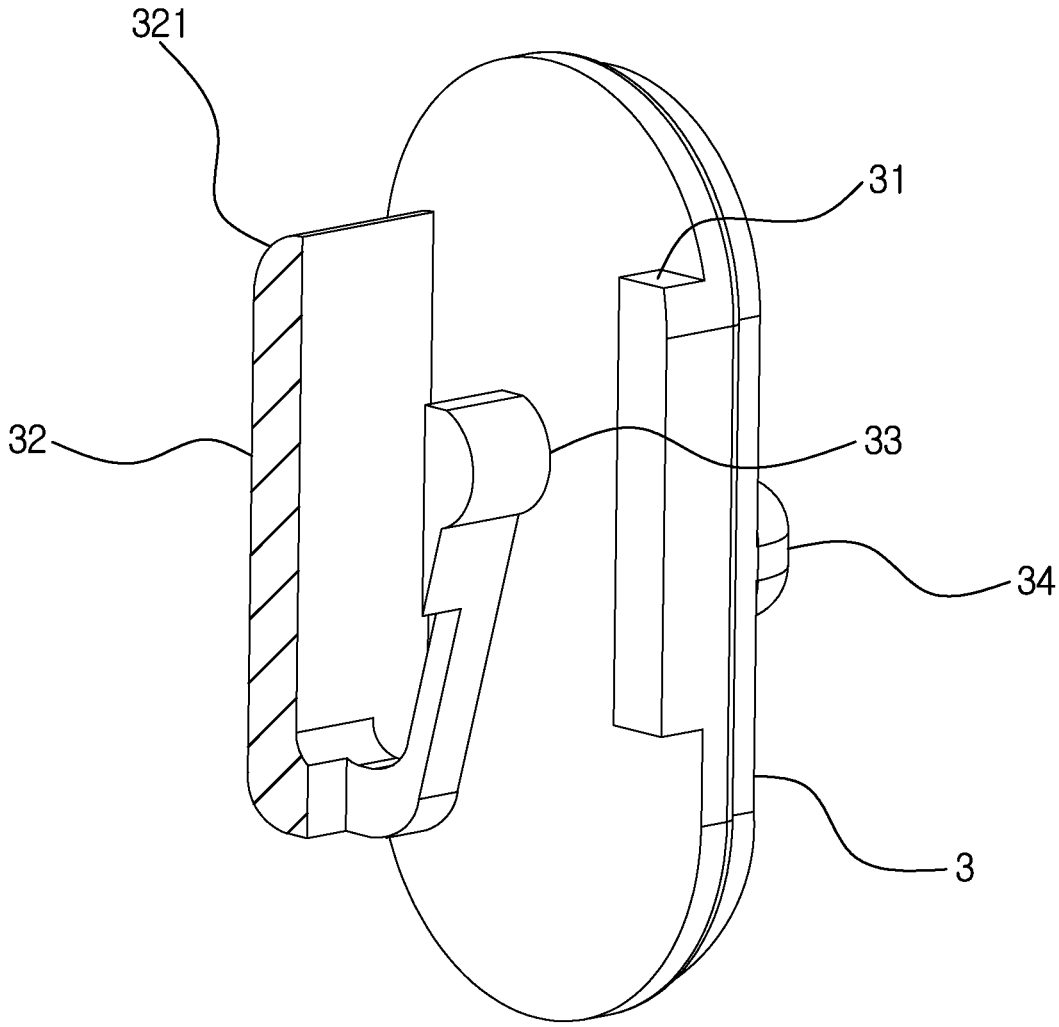


FIG.2

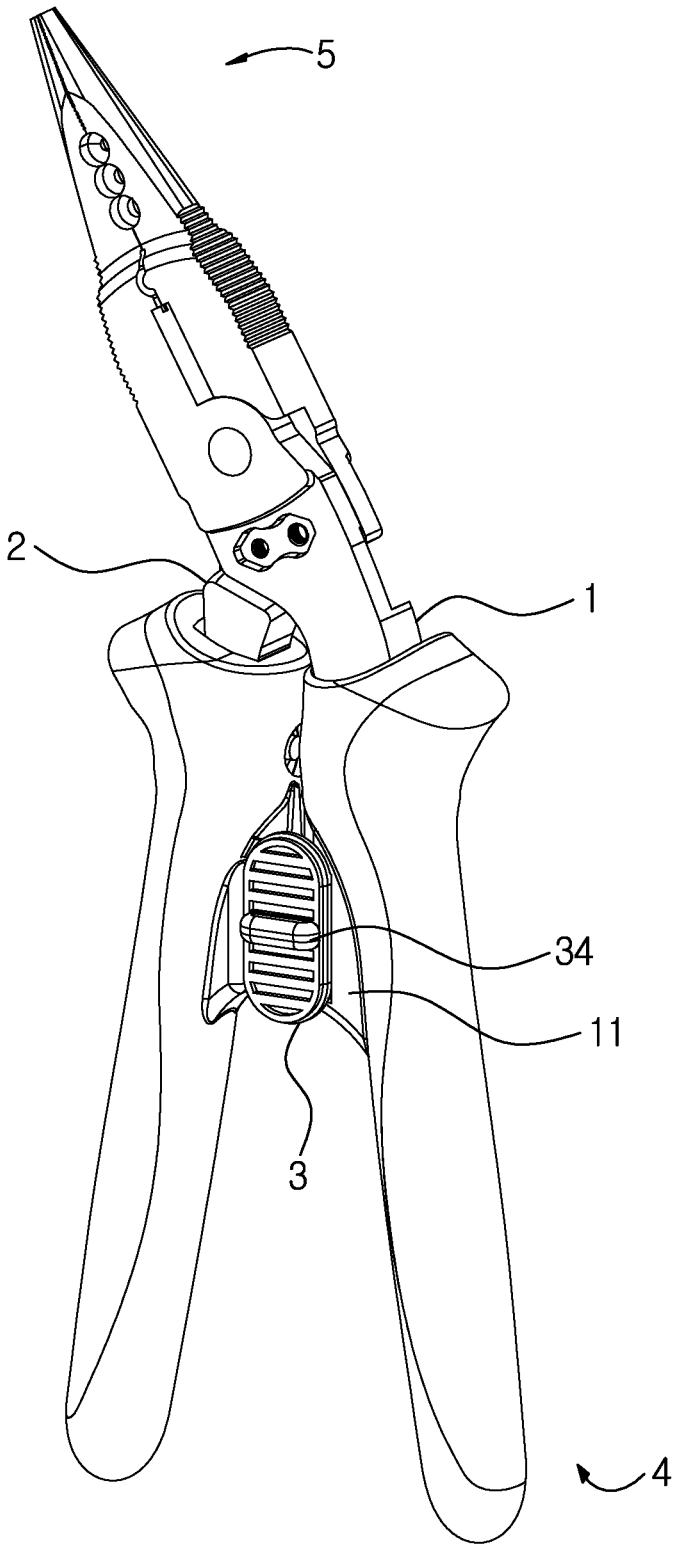


FIG.3

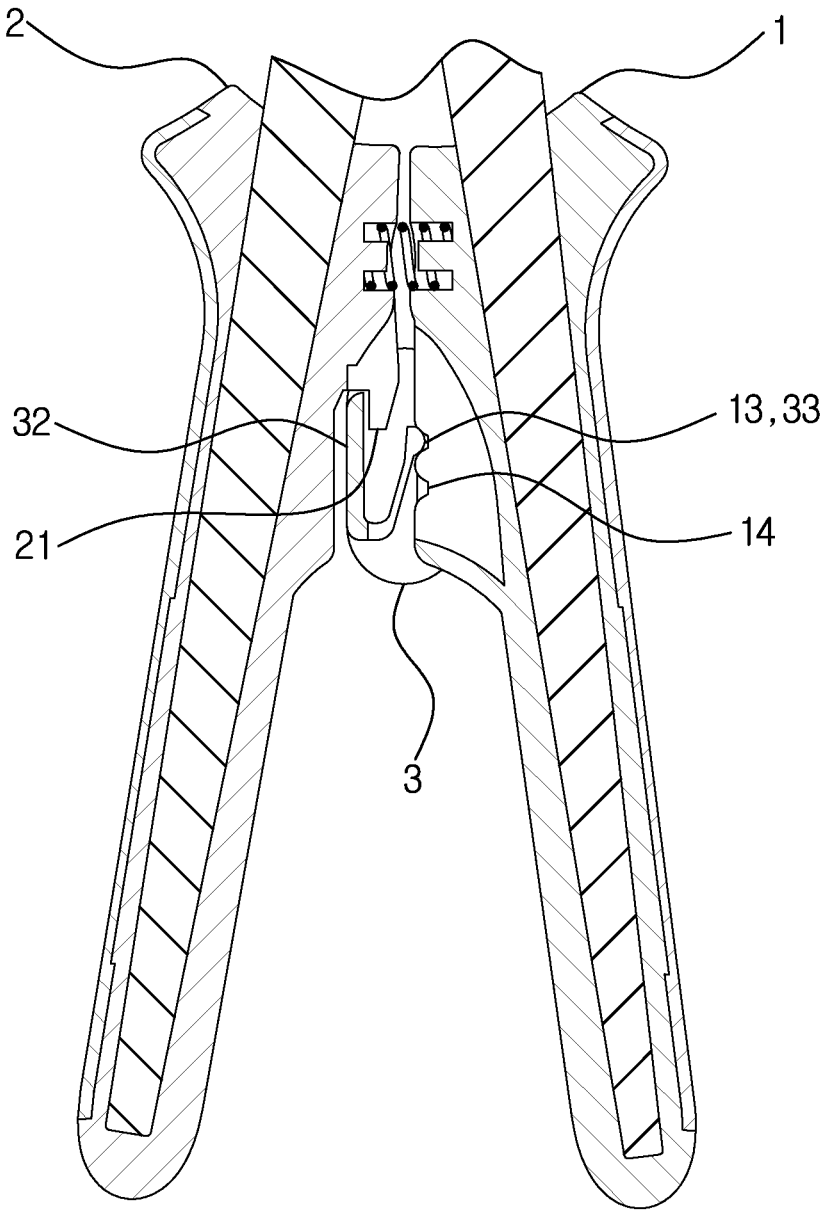


FIG.4

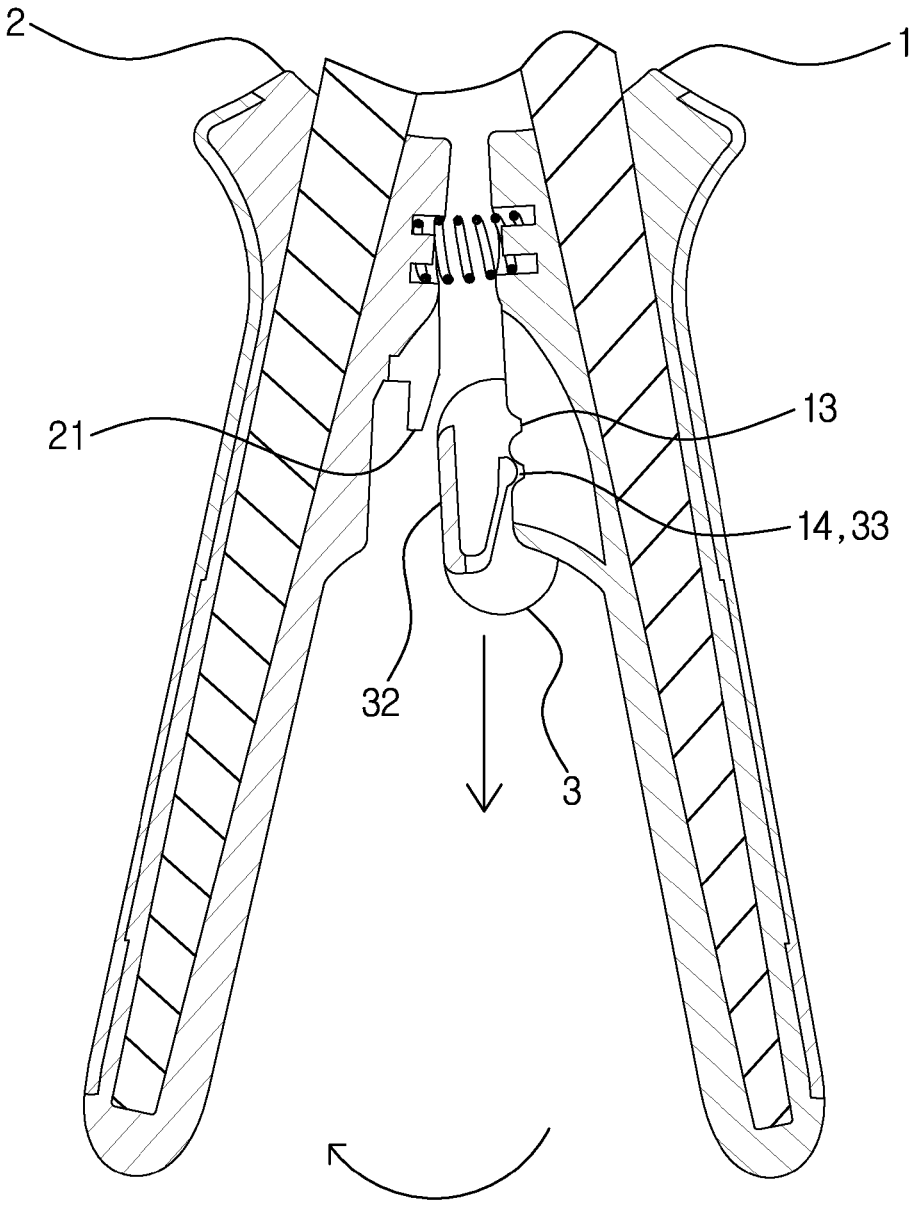


FIG.5

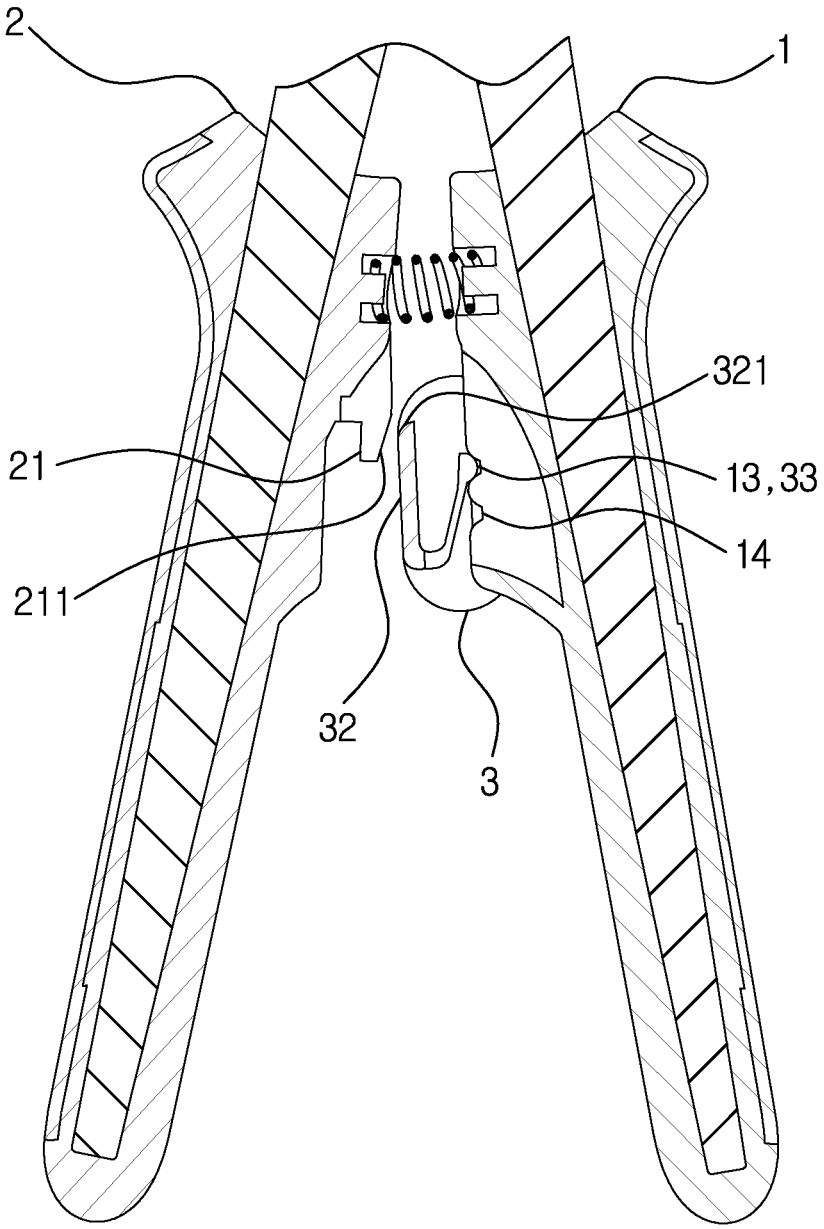


FIG.6

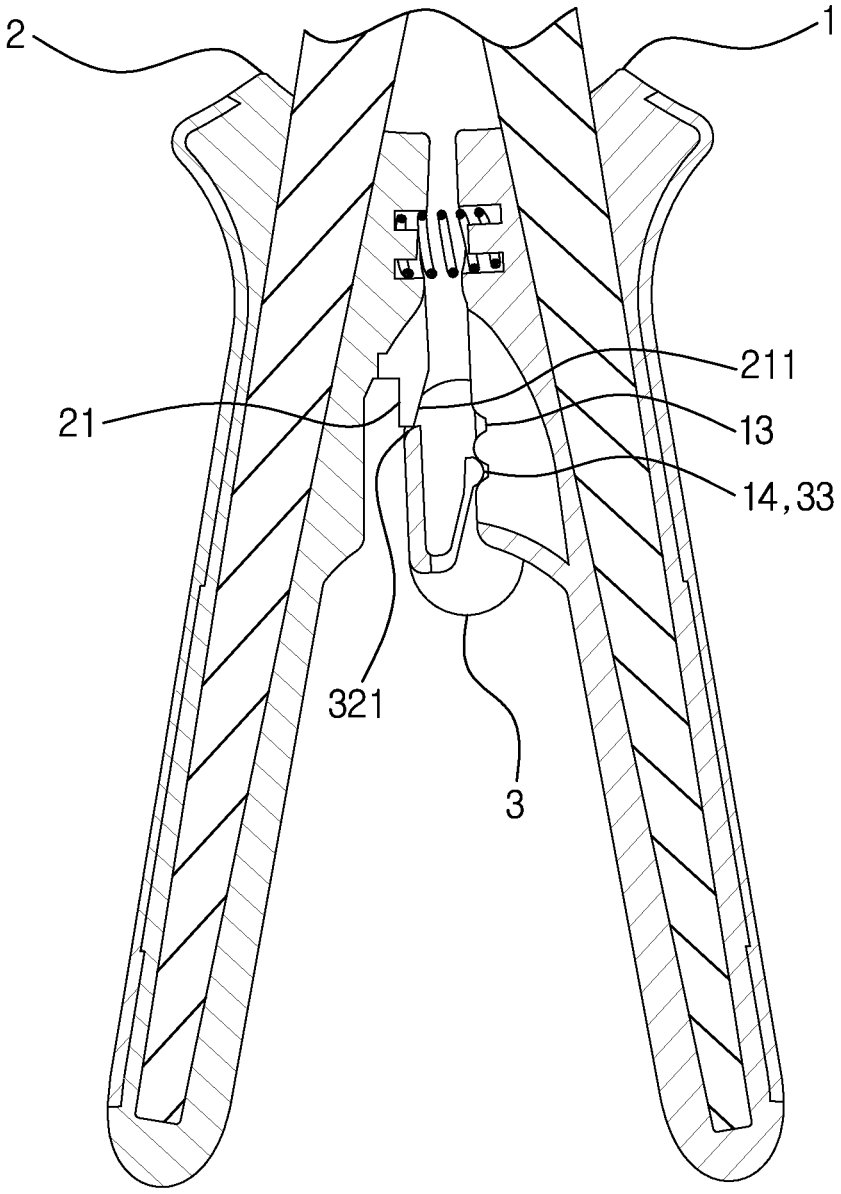


FIG.7

FASTENER STRUCTURE FOR PLIERS

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of U.S. application Ser. No. 14/188,691, filed on Feb. 25, 2014, the contents of which are incorporated herein by reference.

FIELD OF THE INVENTION

The present invention relates to a fastener structure for pliers which is configured between two handles of the pliers to fasten or unfasten the two handles safely.

BACKGROUND OF THE INVENTION

Conventional cutting pliers or clamping pliers contain two handles rotatably connected together and two clamp jaws opposite to the two handles. As operating the cutting pliers, one of the two handles is gripped by user's thumb and web space, and the other handle is clamped and pressed by other fingers, such that the two handles are manually expanded and retracted. However, after retracting the pliers, the two handles are expanded opposite to a forcing direction of the fingers to cause using inconvenience. To overcome such a problem, an elastic element is defined between the two handles of the pliers to push the two handles outwardly, thus expanding the two handles.

To avoid injuring the user, a retractable fastener is mounted on a distal end of the pliers to retract the pliers. Nevertheless, in operation, the retractable fastener is released or retracted by the user's other hand, thus operating the pliers inconveniently.

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

SUMMARY OF THE INVENTION

The primary objective of the present invention is to provide a fastener structure for pliers which is configured between two handles of the pliers to fasten or unfasten the two handles safely.

To obtain the above objective, a fastener structure for pliers provided by the present invention contains: a first connecting arm, a second connecting arm, and a slidable fastener.

The first connecting arm is rotatably connected with the second connecting arm, such that a griping segment and a working segment are formed, the first connecting arm includes a holder disposed on a first inner wall of the griping segment, and the holder has two guiding rails fixed on two sides of the holder, a first notch defined on an outer surface thereof, and a second notch also defined on the outer surface thereof, the second connecting arm includes a locking seat secured on a second inner wall of the griping segment opposite to the first inner wall of the gripping segment.

The slidable fastener is hollow and retains with the holder, and the slidable fastener includes two guide posts disposed on two sides of an inner surface thereof, a positioning plate formed on an outer surface thereof to limit or release the locking seat, and an elastic locker mounted on an inner wall of the positioning plate to alternatively retain with the first notch or the second notch, such that when the elastic locker retains with the first notch, the positioning plate limits the locking seat, and when the elastic locker retains with the second notch, the positioning plate releases the locking seat.

Thereby, the fastening structure contains the slidable fastener to release or limit the first connecting arm and the second connecting arm so that the working segment is retracted safely. Furthermore, the slidable fastener is fixed on the gripping segment proximate to the connection portion of the two handles to correspond to the user's thumb, such that the slidable fastener is pushed easily by the user's thumb to release or limit the pliers.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view showing the exploded components of a fastener structure for pliers according to a preferred embodiment of the present invention.

FIG. **2** is a cross-sectional perspective view showing the assembly of a slidable fastener of the fastening structure for the pliers according to the preferred embodiment of the present invention.

FIG. **3** is a perspective view showing the assembly of the slidable fastener of the fastening structure for the pliers according to the preferred embodiment of the present invention.

FIG. **4** is a cross sectional view showing the operation of the fastening structure for the pliers according to the preferred embodiment of the present invention.

FIG. **5** is another cross sectional view showing the operation of the fastening structure for the pliers according to the preferred embodiment of the present invention.

FIG. **6** is also another cross sectional view showing the operation of the fastening structure for the pliers according to the preferred embodiment of the present invention.

FIG. **7** is still another cross sectional view showing the operation of the fastening structure for the pliers according to the preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to FIGS. **1-7**, a fastener structure for pliers according to a preferred embodiment of the present invention is configured between two handles of the pliers to fasten or unfasten the two handles safely. The fastening structure comprises: a first connecting arm **1**, a second connecting arm **2**, and a slidable fastener **3**.

The first connecting arm **1** is rotatably connected with the second connecting arm **2**, such that a griping segment **4** and a working segment **5** are formed (In this embodiment, the working segment **5** is clamp pliers, and it can be also cutting pliers in another embodiment). The first connecting arm **1** includes a holder **11** disposed on a first inner wall of the griping segment **4**, and the holder **11** has two guiding rails **12** fixed on two sides of the holder **11**, a first notch **13** defined on an outer surface thereof, and a second notch **14** also defined on the outer surface thereof. The second connecting arm **2** includes a locking seat **21** secured on a second inner wall of the griping segment **4** opposite to the first inner wall of the gripping segment **4**.

The slidable fastener **3** is hollow and retains with the holder **11**, and the slidable fastener **3** includes two guide posts **31** disposed on two sides of an inner surface thereof, a positioning plate **32** formed on an outer surface thereof to limit or release the locking seat **21**, and an elastic locker **33** mounted on an inner wall of the positioning plate **32** to alternatively retain with the first notch **13** or the second notch **14**, such that when the elastic locker **33** retains with the first notch **13**, the positioning plate **32** limits the locking

seat **21**, and when the elastic locker **33** retains with the second notch **14**, the positioning plate **32** releases the locking seat **21**.

Thereby, after sliding the slidable fastener **3**, the first connecting arm **1** and the second connecting arm **2** are released or limited by the positioning plate **32** and the locking seat **21**, such that the working segment **5** is clamped safely. Preferably, the slidable fastener **3** is fixed on the gripping segment **4** proximate to a connection portion of the two handles to correspond to a user's thumb, such that the slidable fastener **3** is pushed easily by the user's thumb to release or limit the pliers.

Furthermore, the locking seat **21** has a tilted face **211** defined on a bottom surface thereof, and the positioning plate **32** has an arcuate face **321** formed on a top end thereof to correspond to the tilted face **211**, such that the arcuate face **321** is pushed by the tilted face **211** to actuate the slidable fastener **3** to slide downwardly. In operation, when the slidable fastener **3** is located at an interfering position to interface the locking seat **21** (as shown in FIG. **6**, the slidable fastener **3** does not retain with the locking seat **21** and corresponds to the locking seat **21**), the tilted face **211** and the arcuate face **321** force the slidable fastener **3** to remove after pressing the pliers, thus avoiding interfering the pliers (as illustrated in FIG. **7**).

In addition, the slidable fastener **3** further includes two projections **34** arranged on an outer surface thereof to be pushed or pressed by the user's thumb easily.

Thereby, the fastening structure comprises the slidable fastener **3** to release or limit the first connecting arm **1** and the second connecting arm **2** so that the working segment **5** is retracted safely. Furthermore, the slidable fastener **3** is fixed on the gripping segment **4** proximate to the connection portion of the two handles to correspond to the user's thumb, such that the slidable fastener **3** is pushed easily by the user's thumb to release or limit the pliers.

While the preferred embodiments of the invention have been set forth for the purpose of disclosure, modifications of the disclosed embodiments of the invention and other embodiments thereof may occur to those skilled in the art. Accordingly, the appended claims are intended to cover all embodiments which do not depart from the spirit and scope of the invention.

What is claimed is:

1. A fastener structure for pliers comprising: a first connecting arm, a second connecting arm, and a slidable fastener; wherein:

the first connecting arm is rotatably connected with the second connecting arm, such that a griping segment and a working segment are formed, the first connecting arm includes a holder disposed on a first inner wall of the griping segment, and the holder has two guiding rails fixed on two sides of the holder, a first notch defined on an outer surface thereof, and a second notch also defined on the outer surface thereof, the second connecting arm including a locking seat secured on a second inner wall of the griping segment opposite to the first inner wall of the gripping segment; and

the slidable fastener is hollow and retains with the holder, and the slidable fastener includes two guide posts disposed on two sides of an inner surface thereof, a positioning plate formed on an outer surface thereof to limit or release the locking seat, and an elastic locker mounted on an inner wall of the positioning plate to alternatively retain with the first notch or the second notch, such that when the elastic locker retains with the first notch, the positioning plate limits the locking seat, and when the elastic locker retains with the second notch, the positioning plate releases the locking seat;

wherein the locking seat has a tilted face defined on a bottom surface thereof, and the positioning plate has an arcuate face formed on a top end thereof to correspond to the tilted face, such that the arcuate face is pushed by the tilted face to actuate the slidable fastener to slide downwardly.

2. The fastener structure for pliers as claimed in claim **1**, wherein the slidable fastener further includes two projections arranged on an outer surface thereof.

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