

EXHIBIT 2019

Certified English Translation of
CN Patent Application No.
202210212862.5 to Zhang et al.



Certification of Accuracy

I, Qiang Li, hereby attest that I am a translator fluent in Chinese and English, that I have translated the attached document from Chinese to English, and that to the best of my knowledge, ability and belief this translation is a true, accurate and complete translation of the original Chinese document that was provided to me.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

The document is designated as:

29052_18518200_12-08-2023_PD.FILED.F

Signature of Translator

Date

CERTIFICATE OF AVAILABILITY OF A CERTIFIED PATENT DOCUMENT IN A DIGITAL LIBRARY

The International Bureau certifies that a copy of the patent application indicated below has been available to the WIPO Digital Access Service since the date of availability indicated, and that the patent application has been available to the indicated Office(s) as of the date specified following the relevant Office code:

Document details: Country/Office: CN

Filing date: 04 Mar 2022 (04.03.2022)

Application number: 2022102128625

Date of availability of document: 16 Feb 2023 (16.02.2023)

The following Offices can retrieve this document by using the access code:

AR, AT, AU, BE, BR, CA, CL, CN, CO, DK, EA, EE, EP, ES, FI, GB,
GE, IB, IE, IL, IN, IT, JP, KR, LT, LV, MA, MC, MX, NL, NO, NZ, PL,
SE, US

Date of issue of this certificate: 08 Dec 2023 (08.12.2023)

34, chemin des Colombettes
1211 Geneva 20, Switzerland
www.wipo.int



CERTIFICATION

This is to certify that annexed is a true copy from the records of this office of the patent application as originally filed which is identified hereunder:

Application No.: 202210212862.5

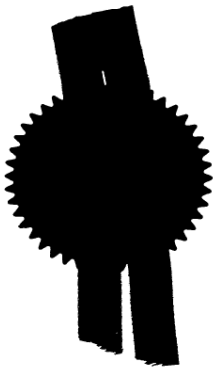
Application type: Invention Patent

Title of the Invention: CONNECTION STRUCTURE OF MODULE, STORAGE BOX AND
STORAGE BOX ASSEMBLY

Filing Date: March 4, 2022

Applicant: Shanghai Meirui Industrial Co., Ltd.

Inventors or designers: ZHANG Hongquan, CAI Shujun



Commissioner: *SHEN Changyu*

SHEN Changyu

February 16, 2023



CLAIMS

1. A connection structure of a module, characterized in that, the connection structure comprises a first connecting portion located on one surface of the module, a second connecting portion located on another surface of the module, and a stopping portion;

the first connecting portion comprises a mounting portion, a locking portion movable relative to the mounting portion, and a first elastic member located between the mounting portion and the locking portion, the first elastic member causing the locking portion to automatically remain in a locked state;

the second connecting portion comprises a mating portion lockable with the locking portion, pressing down the locking portion of one module enabling the locking portion to automatically lock with the mating portion of another module under an action of the first elastic member;

when the stopping portion is located on a locking path of the locking portion, the locking portion is unable to automatically lock, and the first connecting portion and the second connecting portion are maintained in an unlocked state.

2. The connection structure of a module according to claim 1, characterized in that, the stopping portion is retractable, when the first connecting portion and the second connecting portion are in a maintained unlocked state, the stopping portion; and when the first connecting portion and the second connecting portion are in a locked state, the stopping portion is compressed.

3. The connection structure of a module according to claim 2, characterized in that, the stopping portion is disposed on the locking portion and movable together with the locking portion; when the first connecting portion and the second connecting portion are in the maintained unlocked state, the stopping portion is engaged with the second connecting portion on the locking path of the locking portion.

4. The connection structure of a module according to claim 3, characterized in that, the stopping portion comprises an accommodating slot formed on the locking portion, a locking



block receivable within the accommodating slot, and a second elastic member located between the accommodating slot and the locking block; when the second elastic member extends, the locking block extends out of the accommodating slot, and when the second elastic member is compressed, the locking block is compressed within the accommodating slot.

5. The connection structure of a module according to claim 2, characterized in that, the stopping portion is disposed on the second connecting portion and remains stationary relative to the locking portion; when the first connecting portion and the second connecting portion are in the maintained unlocked state, the stopping portion engages with the locking portion on the locking path of the locking portion.

6. The connection structure of a module according to claim 5, characterized in that, the locking portion comprises a locking buckle and a stopping buckle, the locking buckle is correspondingly disposed with the mating portion, and the stopping buckle is correspondingly disposed with the stopping portion.

7. The connection structure of a module according to claim 6, characterized in that, an extension length of the stopping buckle in a locking direction is greater than an extension length of the locking buckle in the locking direction.

8. The connection structure of a module according to claim 6, characterized in that, when the first connecting portion and the second connecting portion are in the maintained unlocked state, the stopping portion engages with the stopping buckle on the locking path of the locking portion; when the first connecting portion and the second connecting portion are in a locked state, the locking buckle and the mating portion are mutually locked, and the stopping buckle abuts against the stopping portion on a non-locking path.

9. The connection structure of a module according to claim 8, characterized in that, the stopping portion comprises an accommodating slot formed on the mating portion, a locking block receivable within the accommodating slot, and a second elastic member located between the accommodating slot and the locking block; when the second elastic member is compressed,



the locking block and the stopping buckle abut against each other on a non-locking path, and when the second elastic member is extended, the locking block and the stopping buckle engage with each other on the locking path of the locking portion.

10. The connection structure of a module according to claim 4 or claim 9, characterized in that, the stopping portion further comprises a fixing slot and a fixing block connected to the locking block; when the fixing block is located in the fixing slot, the second elastic member is compressed, and the stopping portion is not located on the locking path of the locking portion.

11. The connection structure of a module according to claim 1, characterized in that, the locking portion is a horizontally movable sliding locking buckle, a pivotally movable flip locking buckle, or a rotatably movable rotary locking buckle.

12. A storage box, characterized in that, the storage box is provided with the connection structure of a module according to any one of claims 1 to 11, the first connecting portion is provided on a box cover of the storage box, and the second connecting portion is provided at a bottom portion of a box body of the storage box.

13. A storage box assembly, characterized in that, the storage box assembly comprises a plurality of storage boxes according to claim 12, and two adjacent storage boxes are mutually lockable by a first connecting member and a second connecting member.



DESCRIPTION

CONNECTION STRUCTURE OF MODULE, STORAGE BOX AND STORAGE BOX ASSEMBLY

Technical Field

The present invention relates to the technical field of article storage, and in particular relates to a connection structure of a module, a storage box, and a storage box assembly.

Background Art

Conventional storage boxes are individually placed between each box body; even when they can be stacked one by one, it can only be ensured that they are placed in a flat state. However, for households and professional users who need to purchase multiple boxes, if a locking function between two box bodies is not provided, multiple box bodies stacked in several layers are likely to topple, thereby causing safety hazards. In particular, when multiple box bodies need to be moved simultaneously, due to changes in the overall center of gravity during dragging and vibrations caused by uneven road surfaces, the upper box bodies are more likely to topple.

To avoid the above problems, the conventional solution is to additionally provide accessories such as ropes to assist in fixing multiple box bodies, thereby addressing this issue. However, this solution not only increases additional costs, but also requires the storage boxes to be untied before items inside can be taken out, which brings considerable inconvenience in practical use.

In view of the above, there is a need to provide a connection structure of a module, a storage box, and a storage box assembly so as to solve the above problems.

Summary of the Invention

An object of the present invention is to provide a connection structure of a storage box, aiming to solve the deficiencies in the above background art, and capable of realizing automatic locking, maintaining an unlocked state, and automatic reset functions, thereby facilitating user operation and use.



The present invention provides a connection structure of a module, comprising a first connecting portion located on one surface of the module, a second connecting portion located on another surface of the module, and a stopping portion;

the first connecting portion comprises a mounting portion, a locking portion movable relative to the mounting portion, and a first elastic member located between the mounting portion and the locking portion, the first elastic member causing the locking portion to automatically remain in a locked state;

the second connecting portion comprises a mating portion lockable with the locking portion, pressing down the locking portion of one module enabling the locking portion to automatically lock with the mating portion of another module under an action of the first elastic member;

when the stopping portion is located on a locking path of the locking portion, the locking portion is unable to automatically lock, and the first connecting portion and the second connecting portion are maintained in an unlocked state.

Further, the stopping portion is retractable, when the first connecting portion and the second connecting portion are in a maintained unlocked state, the stopping portion; and when the first connecting portion and the second connecting portion are in a locked state, the stopping portion is compressed.

Further, the stopping portion is disposed on the locking portion and movable together with the locking portion; when the first connecting portion and the second connecting portion are in the maintained unlocked state, the stopping portion is engaged with the second connecting portion on the locking path of the locking portion.

Further, the stopping portion comprises an accommodating slot formed on the locking portion, a locking block receivable within the accommodating slot, and a second elastic member located between the accommodating slot and the locking block; when the second elastic member extends, the locking block extends out of the accommodating slot, and when the second elastic member is compressed, the locking block is compressed within the accommodating slot.

Further, the stopping portion is disposed on the second connecting portion and remains stationary relative to the locking portion; when the first connecting portion and the second connecting portion are in the maintained unlocked state, the stopping portion engages with the locking portion on the locking path of the locking portion.



Further, the locking portion comprises a locking buckle and a stopping buckle, the locking buckle is correspondingly disposed with the mating portion, and the stopping buckle is correspondingly disposed with the stopping portion.

Further, extension length of the stopping buckle in a locking direction is greater than an extension length of the locking buckle in the locking direction.

Further, when the first connecting portion and the second connecting portion are in the maintained unlocked state, the stopping portion engages with the stopping buckle on the locking path of the locking portion; when the first connecting portion and the second connecting portion are in a locked state, the locking buckle and the mating portion are mutually locked, and the stopping buckle abuts against the stopping portion on a non-locking path.

Further, the stopping portion comprises an accommodating slot formed on the mating portion, a locking block receivable within the accommodating slot, and a second elastic member located between the accommodating slot and the locking block; when the second elastic member is compressed, the locking block and the stopping buckle abut against each other on a non-locking path, and when the second elastic member is extended, the locking block and the stopping buckle engage with each other on the locking path of the locking portion.

Further, the stopping portion further comprises a fixing slot and a fixing block connected to the locking block; when the fixing block is located in the fixing slot, the second elastic member is compressed, and the stopping portion is not located on the locking path of the locking portion.

Further, the locking portion is a horizontally movable sliding locking buckle, a pivotally movable flip locking buckle, or a rotatably movable rotary locking buckle.

The present invention further provides a storage box, the storage box is provided with the connection structure of a module according to any of the above descriptions, the first connecting portion is provided on a box cover of the storage box, and the second connecting portion is provided at a bottom portion of a box body of the storage box.

The present invention further provides a storage box assembly, the storage box assembly comprises a plurality of storage boxes according to the above description, and two adjacent storage boxes are mutually lockable by a first connecting member and a second connecting member.



The connection structure of the storage box provided in the present invention is such that, since the locking portion is movable relative to the mounting portion and the first elastic member can drive the locking portion to automatically maintain a locked state, when two storage boxes are locked, the locking portion of one storage box can automatically engage with the mating portion of the other storage box under the action of the first elastic member, thereby realizing an automatic locking function of the first connecting portion and the second connecting portion. At the same time, by providing the stopping portion, the stopping portion can be engaged on the locking path of the locking portion, so that the first connecting portion and the second connecting portion are in a maintained unlocked state, thereby eliminating the need to manually hold the locking portion in the unlocked state and freeing the user's hands. Moreover, when the two storage boxes are unlocked and separated from each other, the locking portion can automatically reset under the driving of the first elastic member, so as to be ready for the next locking, thereby simplifying the operation steps during locking and facilitating user use.

Brief Description of the Drawings

FIG. 1 is a schematic diagram of a three-dimensional structure of a storage box in a first embodiment of the present invention.

FIG. 2 is a cross-sectional view of FIG. 1.

FIG. 3 is another schematic diagram of a three-dimensional structure of a storage box in the first embodiment of the present invention.

FIG. 4 is a partial exploded structural schematic diagram of FIG. 3.

FIG. 5 is a perspective view of a storage box in FIG. 4.

FIG. 6 is another perspective view of a storage box in FIG. 4.

FIG. 7 is an exploded schematic diagram of a part of the structure in FIG. 6.

FIG. 8 is a schematic diagram of a three-dimensional structure of a storage box in a second embodiment of the present invention.

FIG. 9 is a partial exploded structural schematic diagram of FIG. 8.

FIG. 10 is a structural schematic diagram showing a cooperation relationship between the stopping portion and the locking portion in FIG. 8.

FIG. 11 is a structural schematic diagram of the first connecting portion in FIG. 10.

FIG. 12 is an exploded structural schematic diagram of FIG. 11.



FIG. 13 is a structural schematic diagram of the stopping portion in FIG. 10.

FIG. 14 is an exploded structural schematic diagram of FIG. 13.

Description of the Embodiments

The specific implementations of the present invention will be further described in detail below in conjunction with the accompanying drawings and embodiments. The following embodiments are used to illustrate the present invention, but are not intended to limit the scope of the present invention.

The terms “first”, “second”, “third”, “fourth”, etc. (if any) in the description and claims of the present invention are used to distinguish similar objects and are not necessarily used to describe a specific order or sequence.

The directional terms such as “upper”, “lower”, “left”, “right”, “front”, “rear”, “top”, and “bottom” (if any) in the description and claims of the present invention are defined based on the positions of structures shown in the accompanying drawings and the relative positions among the structures, and are only used for clarity and convenience in expressing the technical solution. It should be understood that the use of directional terms should not limit the scope of the present application.

The present invention provides a connection structure of a module, a storage box having the connection structure, and a storage box assembly. The connection structure may be provided on a storage box, and two adjacent storage boxes may be engaged and locked through the connection structure, thereby facilitating transportation of a plurality of storage boxes. The storage box may be a storage device such as a tool box, a tool basket, a transport box, or a transfer box.

First Embodiment

As shown in FIGS. 1 to 7, this embodiment provides a connection structure of a module, and the connection structure may be provided on a storage box. The connection structure includes a first connecting portion 1, a second connecting portion 2, and a stopping portion 3. The first connecting portion 1 and the second connecting portion 2 may cooperate with each other to be automatically locked. The stopping portion 3 may prevent the first connecting portion 1 and the second connecting portion 2 from being automatically locked after being unlocked, thereby keeping the first connecting portion 1 and the second connecting portion 2 in an



unlocked state, facilitating the first connecting portion 1 and the second connecting portion 2 to be unlocked and separated from each other, freeing the user's hands and facilitating user use.

Further, with reference to FIG. 6 and FIG. 7, in the present embodiment, the first connecting portion 1 is disposed on a box cover of the storage box, and includes a mounting portion 11, a locking portion 12 movable relative to the mounting portion 11, and a first elastic member 13 located between the mounting portion 11 and the locking portion 12. The locking portion 12 can automatically remain in the locked state under the action of the first elastic member 13. In addition, in order to facilitate positioning when the first connecting portion 1 and the second connecting portion 2 are interlocked, a positioning slot 41 may be disposed on the box cover. The positioning slot 41 can just accommodate the bottom portion of the box body, and the first connecting portion 1 may be disposed at an edge of the positioning slot 41. In other embodiments, the positioning slot 41 may cooperate with a protruding portion disposed on the bottom portion of the box body for positioning when upper and lower storage boxes are stacked.

Further, with reference to FIG. 7, in the present embodiment, the mounting portion 11 is fixedly connected to the box cover. The mounting portion 11 includes a mounting slot 111 formed on the box cover and a mounting body 112 located in the mounting slot 111. The mounting body 112 may be fixed in the mounting slot 111 by bolts. In other embodiments, the mounting body 112 may also be integrally formed with the mounting slot 111, or may be fixedly connected by snap connection or the like.

Further, with reference to FIG. 7, in the present embodiment, the locking portion 12 can be accommodated in the mounting body 112 and can move relative to the mounting body 112. The locking portion 12 is a sliding locking buckle that horizontally moves relative to the mounting portion 11, such that the locking portion 12 horizontally moves within the mounting slot 111. In other embodiments, the locking portion 12 may also be a pivotally movable flip locking buckle that pivotally moves relative to the mounting portion 11, or a rotatably movable rotary locking buckle that rotationally moves relative to the mounting portion 11. The locking portion 12 includes a locking body 121 that can be accommodated in the mounting body 112 and a locking buckle 122 located on a side of the locking body 121 close to a center of the storage box. When the locking buckle 122 extends out of the mounting portion 11 (that is, the locking buckle 122 extends into the positioning slot 41), the first connecting portion 1 and the second connecting portion 2 can be mutually locked; when the locking buckle 122 does not extend out



of the mounting portion 11 (that is, the locking buckle 122 does not extend into the positioning slot 41), the first connecting portion 1 and the second connecting portion 2 can be mutually unlocked. Meanwhile, in order to facilitate locking between the locking buckle 122 and the second connecting portion 2, the locking buckle 122 is provided with an inclined surface 122a.

Further, with reference to FIG. 7, in the present embodiment, the first elastic member 13 is located between the locking body 121 and the mounting body 112, such that the locking portion 12 automatically remains in the locked state under the action of the first elastic member 13. Meanwhile, in order to improve the reliability of movement of the locking portion 12, two first elastic members 13 may be provided and respectively located at two ends of the locking body 121. The first elastic member 13 is a compression spring, such that the locking portion 12 performs horizontal movement. In other embodiments, the first elastic member 13 may also be a torsion spring, such that the locking portion 12 performs pivotal movement.

Further, with reference to FIG. 5, in the present embodiment, the second connecting portion 2 is disposed on the bottom portion of the box body of the storage box, and includes a mating portion 21 that can be mutually locked with the locking portion 12 and a recessed portion 22 that can engage with the stopping portion 3. Pressing down the locking portion 12 of one storage box can cause the locking portion 12 to automatically lock with the mating portion 21 of another storage box under the action of the first elastic member 13. In addition, in order to facilitate mutual locking between the mating portion 21 and the locking buckle 122, a protruding portion 42 (the protruding portion 42 herein being the bottom portion of the box body) may be disposed on the bottom portion of the box body. The protruding portion 42 can be just accommodated within the positioning slot 41. When the first connecting portion 1 and the second connecting portion 2 are in the locked state, the locking buckle 122 interferes with the mating portion 21. When the first connecting portion 1 and the second connecting portion 2 are in a maintained unlocked state, the locking buckle 122 does not interfere with the mating portion 21, and the stopping portion 3 engages with the recessed portion 22. In other embodiments, when the first connecting portion 1 and the second connecting portion 2 are in a maintained unlocked state, the stopping portion 3 may directly engage with the mating portion 21. In addition, the mating portion 21 is a plurality of locking slots 211, and the number of the locking slots 211 may correspond to the number of the locking buckles 122.



Further, with reference to FIG. 6 and FIG. 7, in the present embodiment, the stopping portion 3 is disposed on the locking portion 12 and can horizontally move together with the locking portion 12. When the locking portion 12 is in an unlocked state, the stopping portion 3 can engage with the second connecting portion 2 on the locking path of the locking portion 12, such that the locking portion 12 cannot automatically lock, thereby causing the first connecting portion 1 and the second connecting portion 2 to be in a maintained unlocked state. The stopping portion 3 includes an accommodating slot 31 formed on the locking portion 12, a locking block 32 that can be accommodated in the accommodating slot 31, and a second elastic member 33 located between the accommodating slot 31 and the locking block 32. The locking block 32 is retractable relative to the accommodating slot 31 under the action of the second elastic member 33. Specifically, with reference to FIG. 3, when the first connecting portion 1 and the second connecting portion 2 are in a maintained unlocked state, the second elastic member 33 extends, and the locking block 32 extends out of the accommodating slot 31. With reference to FIG. 1 and FIG. 2, when the first connecting portion 1 and the second connecting portion 2 are in the locked state, the second elastic member 33 is compressed, and the locking block 32 is compressed within the accommodating slot 31 under squeezing by the second connecting portion 2.

The working principle of the present embodiment is as follows:

When two storage boxes need to be vertically locked, the upper storage box is pressed downward to contact the locking buckle 122 on the lower storage box. The locking buckle 122 of the lower storage box is squeezed, thereby driving the locking portion 12 to move toward an unlocking direction (that is, away from the center of the storage box). At this time, the first elastic member 13 is compressed to accumulate force. After the upper storage box moves downward by a certain distance, the locking buckle 122 on the locking portion 12 corresponds to the locking slot 211 on the mating portion 21. The locking buckle 122 loses the supporting effect of the upper storage box, and the locking buckle 122 is automatically engaged into the locking slot 211 under the driving of the first elastic member 13, thereby causing the first connecting portion 1 and the second connecting portion 2 to be in the locked state, that is, realizing the automatic locking function of the upper and lower storage boxes. At this time, the stopping portion 3 is compressed into the accommodating slot 31 under squeezing by the second connecting portion 2.



When two storage boxes need to be vertically unlocked, the locking portion 12 of the lower storage box is pulled outward such that the locking portion 12 moves toward the unlocking direction. After the locking portion 12 moves toward the unlocking direction by a certain distance, the locking buckle 122 of the lower storage box is disengaged from the locking slot 211 of the upper storage box, thereby causing the locking portion 12 and the mating portion 21 to be unlocked. Meanwhile, the locking portion 12 continues to be pulled toward the unlocking direction until the stopping portion 3 loses the squeezing force from the upper storage box. The locking block 31 automatically extends upward out of the accommodating slot 31 under the action of the second elastic member 32 and engages with the recessed portion 22, thereby causing the first connecting portion 1 and the second connecting portion 2 to be in a maintained unlocked state, that is, realizing the maintained unlocking function. At this time, the upper storage box only needs to be lifted upward to conveniently unlock and separate the upper and lower storage boxes. Meanwhile, if the user desires to relock at this time, the user only needs to press the locking block 31 downward such that the locking block 31 retracts into the accommodating slot 31. After the upper and lower storage boxes are separated, the locking block 31 remains in an extended state under the action of the second elastic member 32, and the locking portion 12 automatically resets to the locked state under the driving of the first elastic member 13, thereby preparing for the next locking operation.

The advantages of the connection structure of the storage box provided in the present embodiment include:

1. The connection structure of the storage box has an automatic locking function, a maintained unlocking function, and an automatic reset function. Since the locking portion 12 can horizontally move relative to the mounting portion 11, and the first elastic member 13 can drive the locking portion 12 to automatically remain in the locked state, when two storage boxes are locked, the locking portion 12 of one storage box can automatically lock with the mating portion 21 of the other storage box under the action of the first elastic member 13, thereby realizing the automatic locking function of the first connecting portion 1 and the second connecting portion 2. Meanwhile, by disposing the stopping portion 3 and utilizing cooperation between the stopping portion 3 and the second connecting portion 2, the first connecting portion 1 and the second connecting portion 2 can remain in a maintained unlocked state during unlocking, without the need for a user to intentionally hold the locking portion 12 in the unlocked state by hand, thereby



freeing the user's hands. Meanwhile, after the two storage boxes are unlocked and separated, the locking portion 12 can automatically reset under the driving of the first elastic member 13, thereby preparing for the next locking operation, simplifying the operational steps during locking and unlocking (conventional locking and unlocking require at least four steps, whereas the present embodiment only requires two steps), and facilitating user operation.

2. The maintained unlocking function is realized through cooperation between the stopping portion 3 and the second connecting portion 2. When a user desires to relock (for example, due to accidental unlocking by the user), the user only needs to press the locking block 31 downward, without separating the first connecting portion 1 and the second connecting portion 2 before relocking, and without impairing the reliability of the structure.

Second Embodiment

With reference to FIG. 8 to FIG. 14, the difference between the present embodiment and the first embodiment lies in that the locking portion 12 is a pivotally movable flip locking buckle, and the stopping portion 3 is disposed on the second connecting portion 2 and remains stationary relative to the locking portion 12. When the first connecting portion 1 and the second connecting portion 2 are in a maintained unlocked state, the stopping portion 3 engages with the locking portion 12 on the locking path of the locking portion 12.

Specifically, the locking portion 12 includes a locking buckle 122 and a stopping buckle 123. The locking buckle 122 can cooperatively lock with the mating portion 21, and the stopping buckle 123 is correspondingly disposed with respect to the stopping portion 3. The stopping buckle 123 can engage with the stopping portion 3 on the locking path of the locking portion 12, thereby causing the first connecting portion 1 and the second connecting portion 2 to be in a maintained unlocked state. An extension length of the locking buckle 122 in a locking direction is smaller than an extension length of the stopping buckle 123 in the locking direction, such that an angle required for pivotal movement when the stopping buckle 123 and the stopping portion 3 are disengaged from engagement on the locking path is maximized. When the second elastic member 33 is compressed, the locking buckle 122 and the mating portion 21 are mutually locked, the locking block 32 and the stopping buckle 123 vertically abut against each other, and the first connecting portion 1 and the second connecting portion 2 are in the locked state. When the second elastic member 33 extends, the locking block 32 extends out of the accommodating slot 31 and engages with the stopping buckle 123 on the locking path, and the first connecting



portion 1 and the second connecting portion 2 are in a maintained unlocked state. In other embodiments, the locking block 32 and the stopping buckle 123 may also abut against each other on other non-locking paths. For example, the locking block 32 and the stopping buckle 123 may abut against each other in left-right directions. As long as the stopping buckle 123 causes the locking block 32 to abut on the non-locking path, such arrangement falls within the protection scope of the present invention.

Further, with reference to FIG. 9 and FIG. 13, in the present embodiment, the stopping portion 3 further includes a fixing slot 34 formed on the second connecting portion 2 and a fixing block 35 located at an end of the locking block 32 away from the second elastic member 33, wherein the fixing block 35 can be slidably engaged into the fixing slot 34. When the fixing block 35 is located in the fixing slot 34, the second elastic member 33 is compressed, such that the stopping portion 3 is always fixed above the stopping buckle 123. With such an arrangement, the maintained unlocking function can be selectively enabled or disabled, thereby facilitating user operation. In other embodiments, the fixing slot 34 may also be formed on the first connecting portion 1. As long as the stopping portion 3 is prevented from being located on the locking path of the locking portion 12 (that is, the stopping portion 3 cannot contact the stopping buckle 123), such arrangement falls within the protection scope of the present invention.

The working principle of the present embodiment is as follows:

When two storage boxes need to be vertically locked, the upper storage box is pressed downward to contact the locking buckle 122 on the lower storage box. The locking buckle 122 of the lower storage box is squeezed, thereby driving the locking portion 12 to move toward an unlocking direction (i.e., away from the center of the storage box). At this time, the first elastic member 13 is compressed to accumulate force. After the upper storage box moves downward by a certain distance, the locking buckle 122 on the locking portion 12 corresponds to the locking slot 211 on the mating portion 21. The locking buckle 122 loses the supporting force from the upper storage box, and is automatically engaged into the locking slot 211 under the driving of the first elastic member 13, thereby causing the first connecting portion 1 and the second connecting portion 2 to be in the locked state, i.e., realizing the automatic locking function of the upper and lower storage boxes. It should be noted that during this process, while the upper storage box is pressed downward, the locking block 32 is compressed due to the squeezing force from the stopping buckle 123, and the second elastic member 33 is compressed to accumulate force. The



stopping buckle 123 and the locking block 32 continuously maintain vertical abutment against each other.

When two storage boxes need to be vertically unlocked, the locking portion 12 of the lower storage box is pulled outward such that it moves toward the unlocking direction. After the locking portion 12 moves outward by a certain distance, the locking buckle 122 of the lower storage box is disengaged from the locking slot 211 of the upper storage box, thereby causing the locking portion 12 and the mating portion 21 to be unlocked. Meanwhile, the locking portion 12 is continuously pulled outward until the stopping portion 3 loses its abutment against the stopping buckle 123 of the lower storage box. The locking block 31 automatically extends downward out of the accommodating slot 31 under the action of the second elastic member 32 and engages with the stopping buckle 123 on the locking path of the locking portion 12, thereby causing the first connecting portion 1 and the second connecting portion 2 to be in a maintained unlocked state, i.e., realizing the maintained unlocking function. At this time, the upper storage box only needs to be lifted upward, so that the upper and lower storage boxes can be conveniently unlocked and separated. Meanwhile, if the user wishes to relock at this time, the user only needs to move the locking block 31 upward so that the locking block 31 re-establishes vertical abutment with the stopping buckle 123. After the upper and lower storage boxes are separated, the locking block 31 remains in an extended state under the action of the second elastic member 32, and the locking portion 12 automatically resets to the locked state under the driving of the first elastic member 13, thereby preparing for the next locking operation.

The connection structure of the storage box provided in the present embodiment also has an automatic locking function, a maintained unlocking function, and an automatic reset function. Other structures and functions of the present embodiment are the same as or similar to those of the first embodiment, and will not be repeated herein.

The above description is only a specific embodiment of the present invention, and the scope of protection of the present invention is not limited thereto. Any variations or substitutions that can be readily conceived by a person skilled in the art within the technical scope disclosed by the present invention shall fall within the scope of protection of the present invention. Therefore, the scope of protection of the present invention shall be determined by the scope of the claims.



DRAWINGS

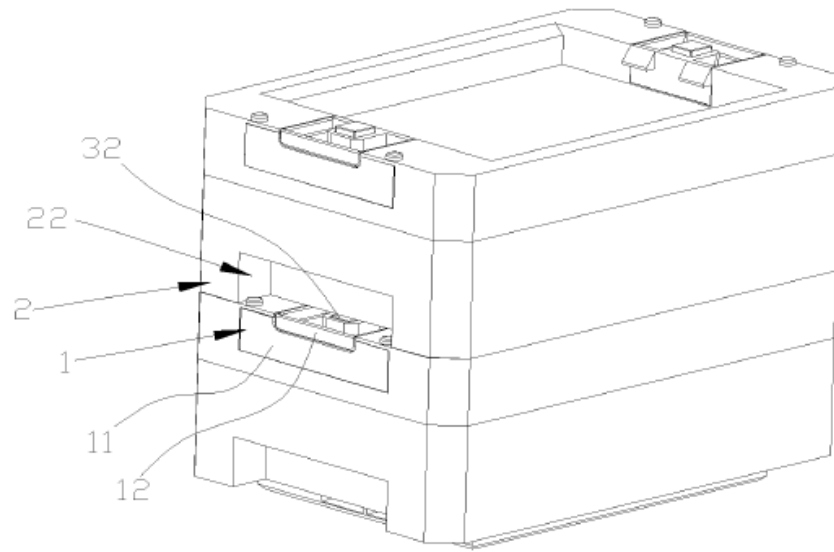


FIG. 1

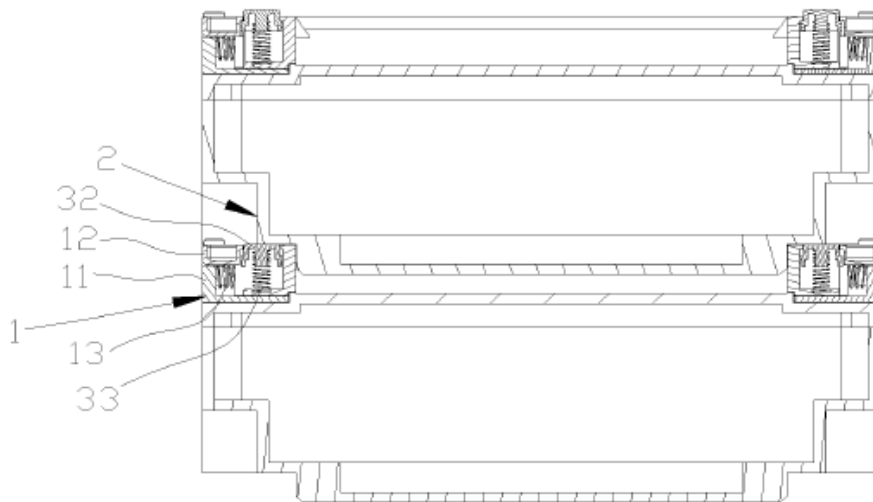


FIG. 2

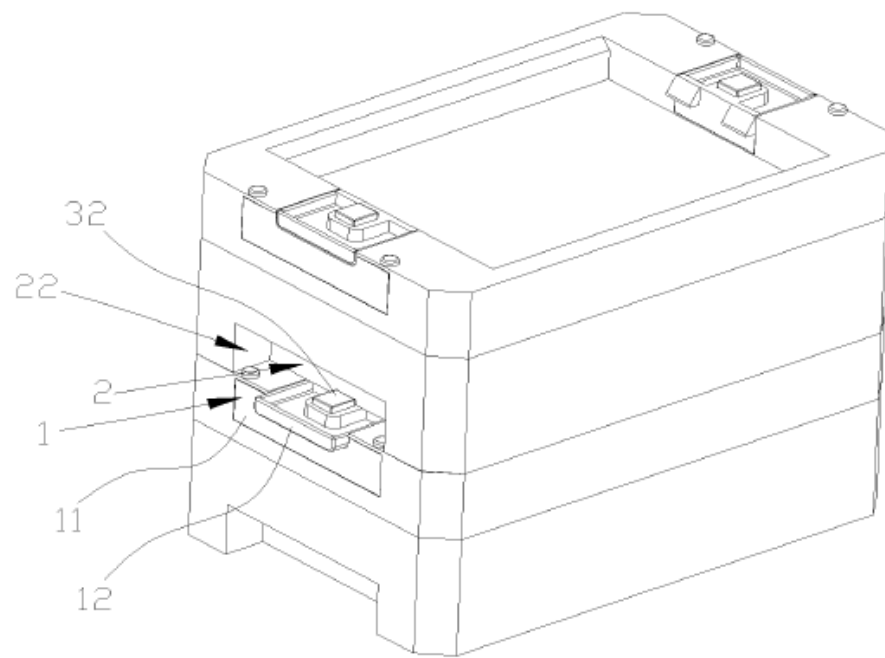


FIG. 3

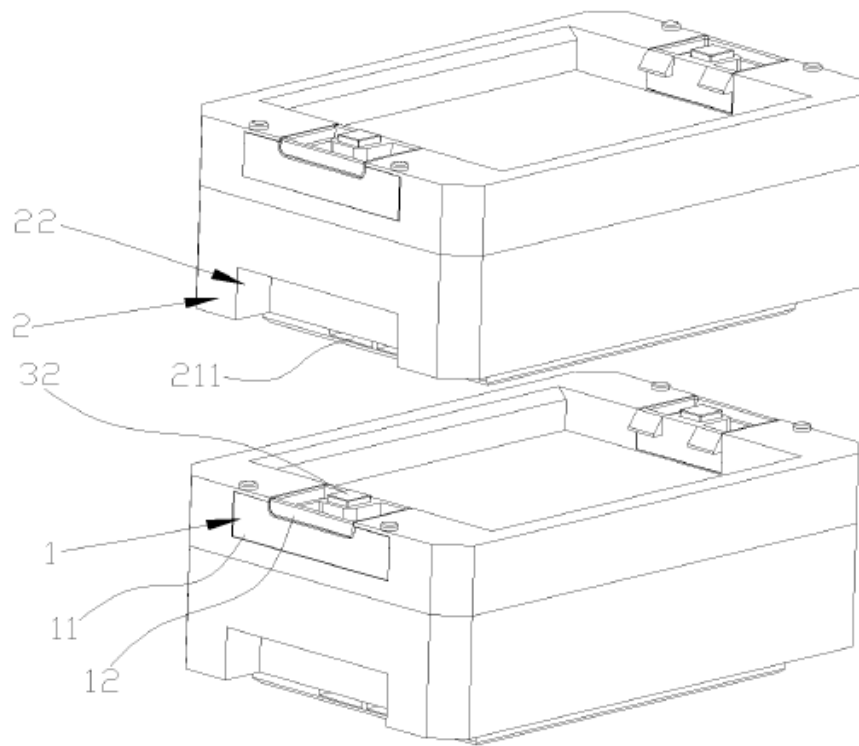


FIG. 4

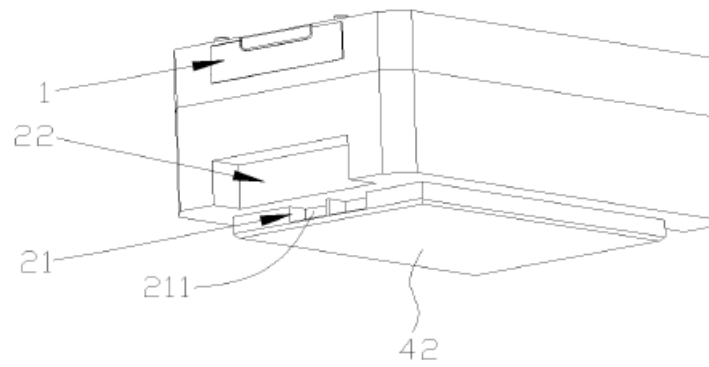


FIG. 5

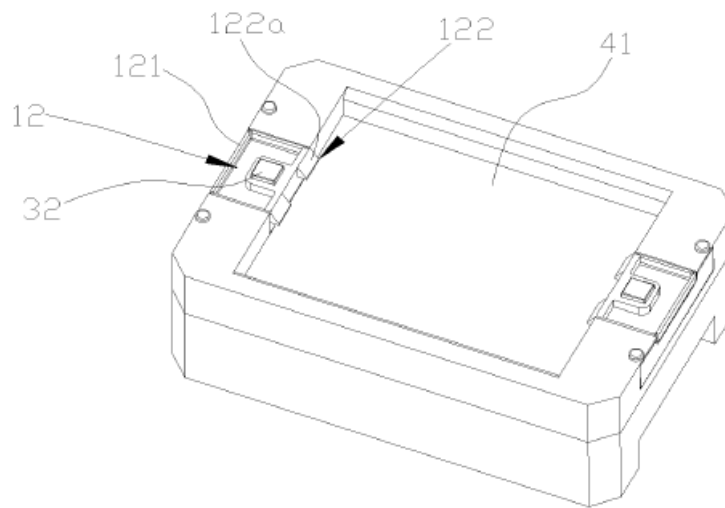


FIG. 6

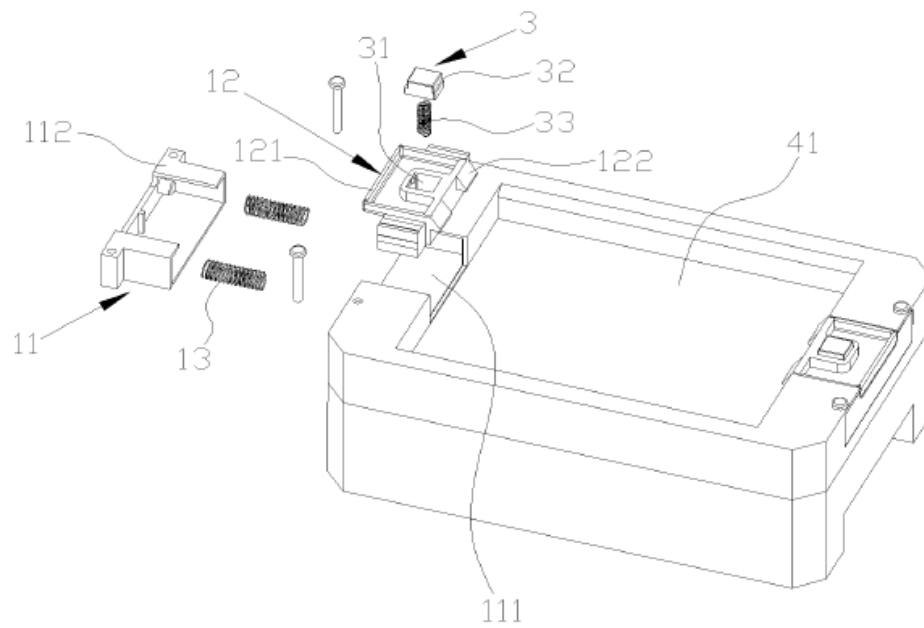


FIG. 7

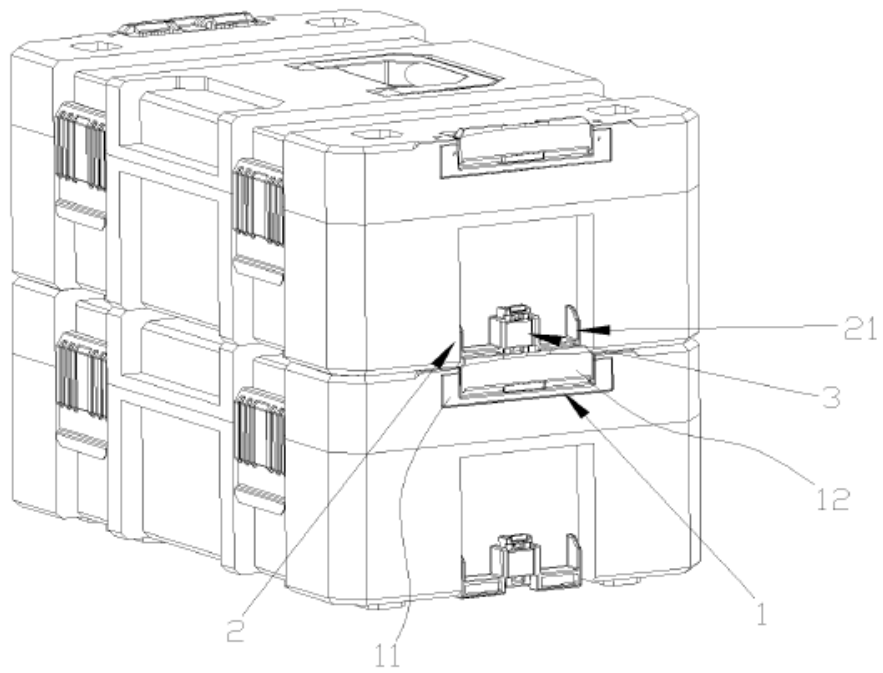


FIG. 8

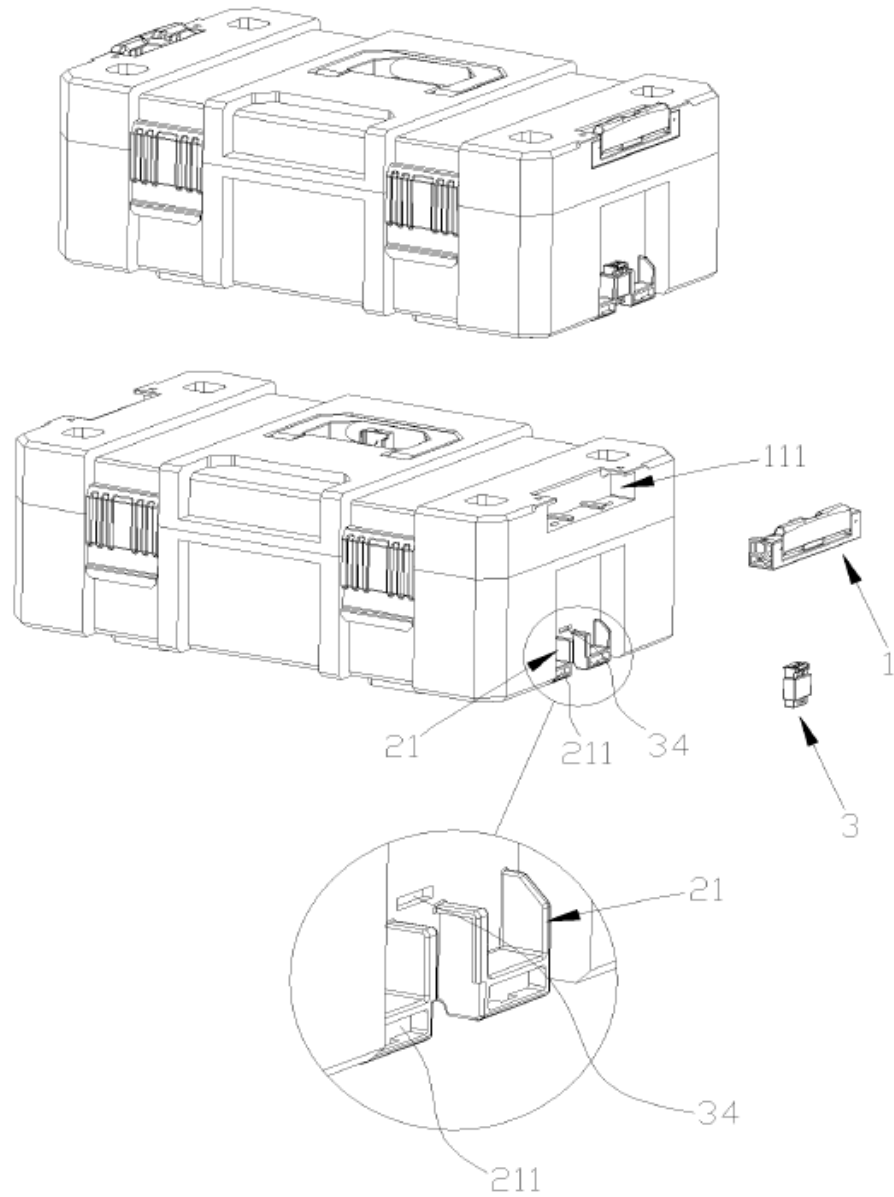


FIG. 9

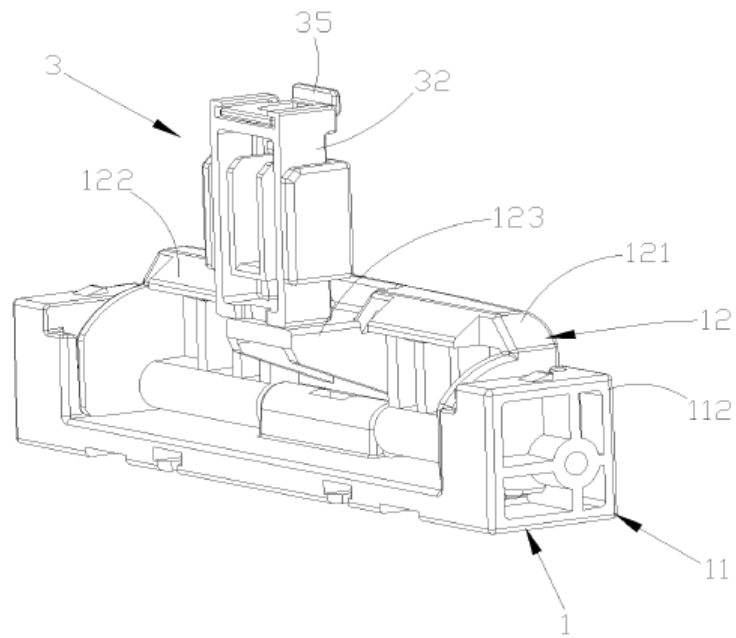


FIG. 10

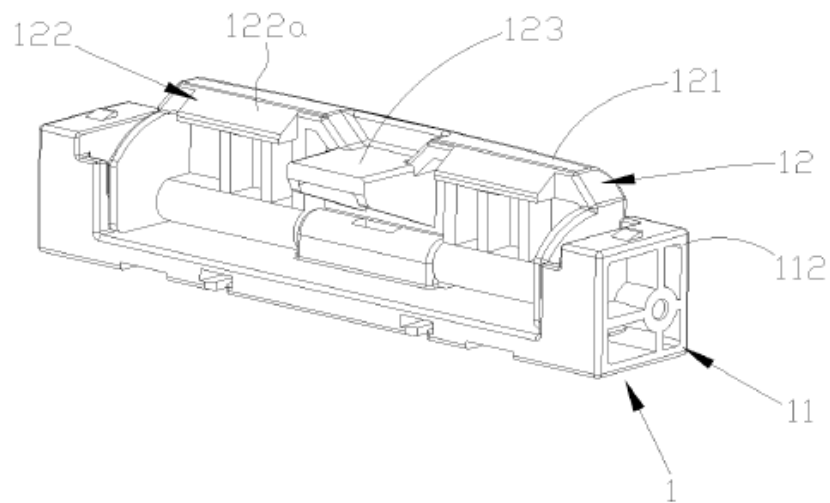


FIG. 11

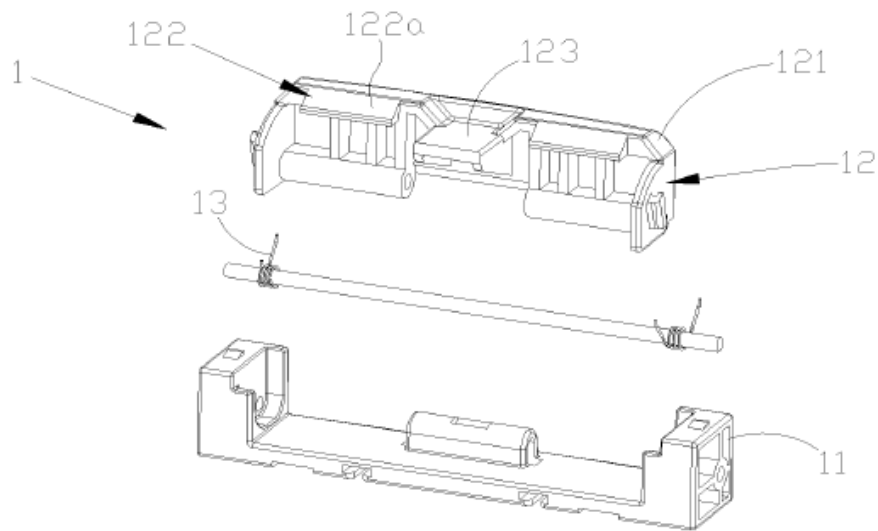


FIG. 12

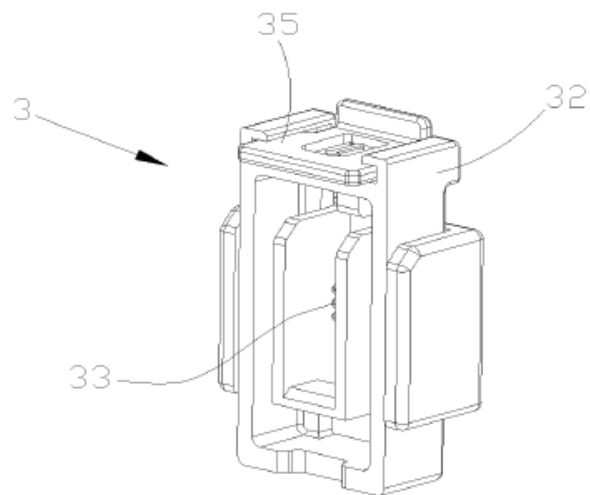


FIG. 13

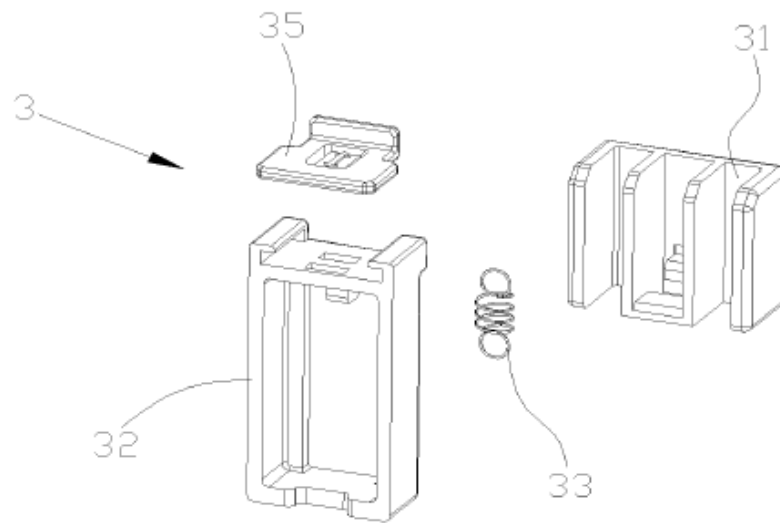


FIG. 14