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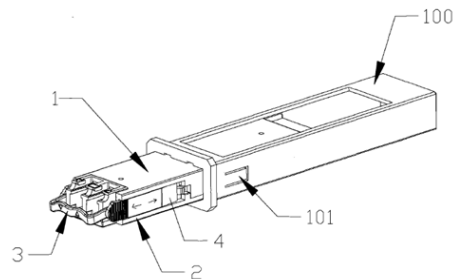
Claims: 2 pages Description: 6 pages Drawings: 4 pages

(54) Title of the Utility Model

XFP OPTICAL TRANSCEIVER INTEGRATED MODULE

(57) Abstract

Embodiments of the present utility model disclose an XFP optical transceiver integrated module, including an upper module cover, a lower module cover, an unlocking pull ring and an unlocking slider. The upper module cover and the lower module cover are docked and snap-fitted to form a limiting groove for accommodating the unlocking pull ring and a groove cavity for accommodating the unlocking slider. The unlocking pull ring is rotatably snap-fitted in the limiting groove by a rotating shaft provided on the unlocking pull ring. The unlocking pull ring is hinged to fix the unlocking slider. The unlocking pull ring drives the unlocking slider to slide in the groove cavity with the rotating shaft as a center of rotation and the limiting groove as a boundary. The XFP optical transceiver integrated module implementing the embodiments of the present utility model meets the hot-swappable requirement of the multi-source agreement, is easily disassembled and assembled, and has low cost.



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1. An XFP optical transceiver integrated module, comprising an upper module cover, a lower module cover, an unlocking pull ring and an unlocking slider, wherein the upper module cover and the lower module cover are docked and snap-fitted to form a limiting groove for accommodating the unlocking pull ring and a groove cavity for accommodating the unlocking slider, characterized in that

the unlocking pull ring is rotatably snap-fitted in the limiting groove by a rotating shaft provided on the unlocking pull ring, the unlocking pull ring is hinged to fix the unlocking slider, and the unlocking pull ring drives the unlocking slider to slide in the groove cavity with the rotating shaft as a center of rotation and the limiting groove as a boundary.

2. The XFP optical transceiver integrated module according to claim 1, characterized in that the upper module cover is rectangular, and cavity channels for accommodating an optical receiving component and an optical transmitting component are provided at an end portion of the upper module cover; and a cavity for accommodating a module circuit board is provided at an end portion of the upper module cover.

3. The XFP optical transceiver integrated module according to claim 2, characterized in that first limiting grooves and second limiting grooves are provided on two sides of a front end of the upper module cover, respectively; the first limiting grooves extend along a direction perpendicular to a surface where the upper module cover is located, and are symmetrically arranged, and the second limiting grooves extend along a direction parallel to the surface where the upper module cover is located, and are symmetrically arranged; and

positioning flanges are provided in a middle portion of the upper module cover.

4. The XFP optical transceiver integrated module according to claim 3, characterized in that an end portion of the lower module cover is provided with a cavity cover plate corresponding to the positions of the cavity channels provided on the upper module cover and used for closing the cavity channels; and

two upward positioning flanges are provided on two sides of a middle portion of the lower module cover, and the two positioning flanges correspond to and are adapted to the positions of the positioning flanges provided in the middle portion of the upper module cover.

5. The XFP optical transceiver integrated module according to claim 3, characterized in that the lower module cover is provided with longitudinal slide grooves corresponding to the second limiting grooves of the upper module cover, and when the lower module cover and the upper module cover are snap-fitted and closed, the second limiting grooves of the upper module cover and the longitudinal slide grooves of the lower module cover are closed to form the groove cavity for accommodating the unlocking slider.

6. The XFP optical transceiver integrated module according to claim 5, characterized in that the unlocking slider is sheet-like, and upper and lower edges of the unlocking slider correspond to and are matched with the longitudinal slide grooves of the lower module cover and the second limiting grooves of the upper module cover, respectively.

7. The XFP optical transceiver integrated module according to claim 6, characterized in that a flange provided on the unlocking slider and the flanges of the upper module cover form a cavity for placing a spring.

8. The XFP optical transceiver integrated module according to claim 6, characterized in that a first rotating shaft is provided on an outer side of an end portion of the unlocking pull ring, and the position of the first rotating shaft corresponds to and is matched with a through hole provided on the unlocking slider.

9. The XFP optical transceiver integrated module according to claim 8, characterized in that a second rotating shaft is provided on an inner side of the end portion of the unlocking pull ring, and a position of the second rotating shaft corresponds to the positions of the first limiting grooves provided on the upper module cover.

10. The XFP optical transceiver integrated module according to claim 1, characterized in that a rotation angle of the unlocking pull ring is between 0 degrees and 90 degrees.

XFP OPTICAL TRANSCEIVER INTEGRATED MODULE

Technical Field

[0001] The present utility model relates to the field of machinery, and in particular to an XFP optical transceiver integrated module.

Background Art

[0002] According to the requirements of the multi-source agreement (MSA) for an XFP optical transceiver integrated module with a standard rate, the XFP optical transceiver integrated module needs to be hot-swapped with a cage-shaped slot adapted thereto during use, that is, being swapped for use without cutting off the power supply.

[0003] An existing XFP optical transceiver integrated module is generally composed of a module base, an upper module cover and an unlocking device, and the unlocking device is usually composed of a pull rod and a rotating arm and a slider connected at two ends. The unlocking device of the XFP optical transceiver integrated module with this structure has many members, is difficultly assembled, has poor reliability, is disadvantageous for mass production, and has a high production cost.

Summary of the Utility Model

[0004] A technical problem to be solved by the present utility model is to provide an XFP optical transceiver integrated module, which meets the hot-swappable requirement of the multi-source agreement, is easily disassembled and assembled, and has low cost.

[0005] In order to solve the above technical problem, an embodiment of the present utility model discloses an XFP optical transceiver integrated module, comprising an upper module cover, a lower module cover, an unlocking pull ring and an unlocking slider, wherein the upper module cover and the lower module cover are docked and snap-fitted to form a limiting groove for accommodating the unlocking pull ring and a groove cavity for accommodating the unlocking slider, the unlocking pull ring is rotatably snap-fitted in the limiting groove by a rotating shaft provided on the unlocking pull ring, the unlocking pull ring is hinged to fix the unlocking slider, and the unlocking pull ring drives the unlocking slider to slide in the groove cavity with the rotating shaft as a center of rotation and the limiting groove as a boundary.

[0006] The upper module cover is rectangular, and cavity channels for accommodating an optical receiving component and an optical transmitting component are provided at an end portion of the upper module cover; and a cavity for accommodating a module circuit board is provided at an end portion of the upper module cover.

[0007] First limiting grooves and second limiting grooves are provided on two sides of a front end of the upper module cover, respectively; the first limiting grooves extend along a direction perpendicular to a surface where the upper module cover is located, and are symmetrically arranged, and the second limiting grooves extend along a direction parallel to the surface where the upper module cover is located, and are symmetrically arranged; and

[0008] Positioning flanges are provided in a middle portion of the upper module cover.

[0009] A front end of the lower module cover is provided with a cavity cover plate corresponding to the positions of the cavity channels provided on the upper module cover and used for closing the cavity channels; and

[0010] two upward positioning flanges are provided on two sides of a middle portion of the lower module cover, and the two positioning flanges are adapted to the positions of the positioning flanges provided in the middle portion of the upper module cover.

[0011] The lower module cover is provided with longitudinal slide grooves corresponding to the second limiting grooves of the upper module cover, and when the lower module cover and the upper module cover are snap-fitted and closed, the second limiting grooves of the upper module cover and the longitudinal slide grooves of the lower module cover are closed to form the groove cavity for accommodating the unlocking slider.

[0012] The unlocking slider is sheet-like, and upper and lower edges of the unlocking slider correspond to and are matched with the longitudinal slide grooves of the lower module cover and the second limiting grooves of the upper module cover, respectively.

[0013] A flange provided on the unlocking slider and the flanges of the upper module cover form a cavity for placing a spring.

[0014] A first rotating shaft is provided on an outer side of an end portion of the unlocking pull ring, and the position of the first rotating shaft corresponds to and is matched with a through hole provided on the unlocking slider.

[0015] A second rotating shaft is provided on an inner side of the end portion of the unlocking pull ring, and the position of the second rotating shaft corresponds to the positions of the first limiting grooves provided on the upper module cover.

[0016] Preferably, a rotation angle of the unlocking pull ring is between 0 degrees and 90 degrees.

[0017] The implementation of the embodiments of the present utility model has the following beneficial effects: Since the upper module cover and the lower module cover are docked and snap-fitted to form the limiting groove for accommodating the unlocking pull ring and the groove cavity for accommodating the unlocking slider, the unlocking pull ring is hinged to fix the unlocking slider, and the unlocking pull ring can drive the unlocking slider to slide in the groove cavity with the rotating shaft as the center of rotation and the limiting groove as the boundary; the XFP optical transceiver integrated module has a simple structural design, meets the hot-swappable requirement of the multi-source agreement, is easily disassembled and assembled, and has low cost.

Brief Description of the Drawings

[0018] In order to more clearly explain the technical solutions in embodiments of the present utility model or the prior art, the drawings needed to be used in the description of the embodiments or the prior art will be briefly described below. Obviously, the drawings in the following description are only some embodiments of the present utility model, and other drawings can be obtained by those of ordinary skill in the art from these drawings without any inventive efforts.

[0019] Fig. 1 is a schematic structural view of an XFP optical transceiver integrated module according to an embodiment of the present utility model in a slot without external force;

[0020] Fig. 2 is a schematic structural view of the XFP optical transceiver integrated module according to the embodiment of the present utility model in the state of being pulled out from the slot under force;

[0021] Fig. 3 is a schematic structural view of an upper module cover of an XFP optical transceiver integrated module according to an embodiment of the present utility model;

[0022] Fig. 4 is a schematic structural view of a lower module cover of an XFP optical transceiver integrated module according to an embodiment of the present utility model;

[0023] Fig. 5a is a front schematic structural view of an unlocking slider of an XFP optical transceiver integrated module according to an embodiment of the present utility model;

[0024] Fig. 5b is a side schematic structural view of the unlocking slider of the XFP optical transceiver integrated module according to the embodiment of the present utility model;

[0025] Fig. 6 is a schematic structural view of an unlocking pull ring of an XFP optical transceiver integrated module according to an embodiment of the present utility model;

[0026] Fig. 7 is a schematic view of an XFP optical transceiver integrated module according to an embodiment of the present utility model in a first use state; and

[0027] Fig. 8 is a schematic view of the XFP optical transceiver integrated module according to the embodiment of the present utility model in a second use state.

Detailed Description of the Preferred Embodiments

[0028] The technical solutions in the embodiments of the present utility model will be described clearly and completely below with reference to the drawings in the embodiments of the present utility model.

[0029] With reference to Figs. 1 and 2 in combination, as shown in the figures, an XFP optical transceiver integrated module disclosed in an embodiment of the present utility model includes an upper module cover 1, a lower module cover 2, an unlocking pull ring 3 and an unlocking slider 4. The upper module cover 1 and the lower module cover 2 are docked and snap-fitted to form a limiting groove for accommodating the unlocking pull ring 3 and a groove cavity for accommodating the unlocking slider 4. The unlocking pull ring 3 is rotatably snap-fitted in the limiting groove by a rotating shaft provided on the unlocking pull ring, the unlocking pull ring 3 is hinged to fix the unlocking slider 4, and the unlocking pull ring 3 drives the unlocking slider 4 to slide in the groove cavity with the rotating shaft as a center of rotation and the limiting groove as a boundary.

[0030] Referring to Fig. 3, the upper module cover 1 is substantially rectangular, its front end is provided with a cavity channel 12A for accommodating an optical receiving component ROSA and a cavity channel 12B for accommodating an optical transmitting component TOSA, and the rear end of the upper module cover 1 is provided with a cavity for accommodating a module circuit board (not shown). Two sides of the front end of the upper module cover 1 are provided with first limiting grooves 11A, 11B and second limiting grooves 13A, 13B, respectively. The first limiting

grooves 11A, 11B extend along a direction perpendicular to a surface where the upper module cover 1 is located, and are symmetrically arranged, the second limiting grooves 13A, 13B extend along a direction parallel to the surface where the upper module cover 1 is located, and are symmetrically arranged, and two ends of their bottom notches can further restrict the sliding of the unlocking slider 4. Positioning flanges 14A and 14B are provided in a middle portion of the upper module cover 1.

[0031] Referring to FIG. 4, the lower module cover 2 is a rectangular special-shaped structure having a shape substantially the same as that of the upper module cover 1, and its front end is provided with a cavity cover plate 22 corresponding to the positions of the cavity channels 12A and 12B provided on the upper module cover 1 and having the function of partially closing the cavity channels 12A and 12B. When the lower module cover 2 and the upper module cover 1 are snap-fitted and closed, the cavity cover plate 22 partially closes the bidirectionally opened cavity channels 12A and 12B to form the cavity channel 12A for accommodating the optical receiving component ROSA and the cavity channel 12B for accommodating the optical transmitting component TOSA. The lower module cover 2 is provided with longitudinal slide grooves 23A, 23B corresponding to the second limiting grooves 13A and 13B of the upper module cover 1. When the lower module cover 2 and the upper module cover 1 are snap-fitted and closed, the second limiting grooves 13A, 13B of the upper module cover 1 and the longitudinal slide grooves 23A, 23B of the lower module cover 2 are closed to form a groove cavity for accommodating the unlocking slider 4.

[0032] Two upward positioning flanges 24A, 24B are provided on two sides of a middle portion of the lower module cover 2, and the two positioning flanges 24A, 24B correspond to the positions of the two positioning flanges 14A and 14B in the middle portion of the upper module cover 1, thereby realizing the mutual positioning of the upper module cover 1 and the lower module cover 2 for positioning during assembly, avoiding misalignment during assembly, and improving assembly efficiency.

[0033] With reference to Figs. 5a and 5b in combination, as shown in the figures, the unlocking pull ring 3 is hinged to fix the unlocking slider 4. In this embodiment, the unlocking slider 4 is sheet-like, and two unlocking sliders are provided, which are each located in the groove cavity formed by the upper module cover 1 and the lower module cover 2 being docked and snap-fitted. The unlocking sliders 4, i.e., 4A and 4B as shown in the figures, are hinged and fixed on both sides of the unlocking pull ring 3, respectively, and the sliders 4A and 4B are matched with springs adapted thereto, respectively. The upper and lower edges 42A and 43A of the slider 4A as shown in the figures correspond to the longitudinal groove 23B of the lower module cover 2 and the second limiting groove 13A of the upper module cover 1, respectively, and the upper and lower edges 42B and 43B of the slider 4B correspond to the second limiting groove 13B of the upper module cover 1 and the longitudinal groove 23A of the lower module cover 2, respectively. In this way, when the sliders 4A and 4B slide back and forth in the groove cavity formed by the second limiting grooves 13A and 13B of the upper module cover 1 and the longitudinal grooves 23A and 23B of the lower module cover 2 being closed, slightly protruding terminals 44A and 44B arranged

at their end portions can squeeze outward to pop out a locking spring piece 101. The flanges of the sliders 4A and 4B and the flanges of the upper module cover 1 together form a cavity for placing the springs, so that the sliders 4A and 4B remain fixed to the upper module cover 1 when there is no external force.

[0034] Referring to Fig. 6, the unlocking pull ring 3 is a structural member that pulls the unlocking slider 4 to slide, and first rotating shafts 31A and 31B are provided on the outer side of an end portion of the unlocking pull ring. The positions of the first rotating shafts 31A and 31B correspond to through holes 41A and 41B provided on the unlocking slider. The unlocking pull ring 3 is hinged to the upper module cover 1 by matching between the first rotating shafts 31A and 31B and the through holes 41A and 41B. The unlocking pull ring 3 can pull the unlocking pull ring 4 during the rotation process. The unlocking pull ring 3 can rotate about the first rotating shafts 31A and 31B relative to the unlocking pull ring 4. Second rotating shafts 32A and 32B are provided on the inner side of the end portion of the unlocking pull ring 3. The positions of the second rotating shafts 32A and 32B correspond to the positions of the first limiting grooves 11A and 11B provided on the upper module cover 1. That is, the unlocking pull ring 3 can slide relative to the XFF optical transceiver integrated module during the rotation process by rotating and sliding the second rotating shafts 32A and 32B in the first limiting grooves 11A and 11B.

[0035] Preferably, a cross section of a pull ring handle 34 is set to be wavy, and its function is to pull out the XFF optical transceiver integrated module with greater adhesion in the process of rotating and pulling the pull ring handle 34.

[0036] Preferably, the outer surface of the pull ring handle 34 is provided with two glue arrow color marks 342 for displaying the transmission rate of the optical module. In specific implementation, the different positions of the optical transmitting component and the optical receiving component can be displayed according to the directions of the arrows.

[0037] With reference to Figs. 1 to 8 in combination, as shown in the figures, a specific assembly process of the XFF optical transceiver integrated module according to the embodiment of the present utility model is as follows: First install the second rotating shafts 32A, 32B on the inner side of the lower end of the unlocking pull ring 3 into the first limiting grooves 11A, 11B of the upper module cover 1, and then put the unlocking sliders 4A and 4B; install the first rotating shafts 31A, 31B on the outer side of an end portion of the unlocking pull ring 3 into the through holes 41A, 41B of the unlocking sliders 4A, 4B, respectively, so that the unlocking pull ring 3 can be in a towable state with the first rotating shafts 31A, 31B on the outer side of its end portion as an axis, and the second rotating shafts 32A, 32B on the inner side of the end portion being hinged to the first limiting grooves 11A, 11B of the upper module cover 1; at this time, install the springs for resetting the unlocking sliders 4A and 4B into cavities for placing the springs formed by the flanges of the unlocking sliders 4A and 4B and the flanges of the upper module cover 1, respectively, and then install the positioning flanges 24A and 24B of the lower module cover 2 into the upper module cover in correspondence with the positioning flanges 14A and 14B of the upper module cover 1; and then use screws passing through screw holes of the lower module cover 2 and internal threads of the upper module cover 1 to lock and fix the two to complete the assembly.

[0038] When the XFP optical transceiver integrated module according to the embodiment of the present utility model is in specific use, under the elastic force of the springs in the cavity formed by the flanges of the unlocking sliders 4A and 4B and the flanges of the upper module cover 1, when no external force is applied to the unlocking pull ring 3, the upper module cover 1, the lower module cover 2, the unlocking pull ring 3 and the unlocking sliders 4A and 4B together form a state diagram of the XFP optical transceiver integrated module as schematically shown in Fig. 7. When in use, the XFP optical transceiver integrated module is inserted into a cage-shaped slot 100 from an end portion as a whole. Since the locking springs 101 on two sides of the cage-shaped slot 100 are pressed inward, the XFP optical transceiver integrated module maintains a normal working state under the pressing state of the locking springs 101. When the XFP optical transceiver integrated module needs to be pulled out of the cage-shaped slot 100, the handle 34 of the pull ring 3 is rotated outward by about 90 degrees, and the rotation of the pull ring 3 drives the unlocking sliders 4A and 4B to slide. When the terminals 44A and 44B are moved to the positions of the locking springs 101 of the cage-shaped slot 100, the outer side walls of the terminals 44A and 44B push the locking springs 101 outward, and the XFP optical transceiver integrated module can be removed from the cage-shaped slot 100, thereby achieving the purpose of unlocking.

[0039] In the XFP optical transceiver integrated module according to the embodiment of the present utility model, the upper module cover and the lower module cover are docked and snap-fitted to form the limiting groove for accommodating the unlocking pull ring and the groove cavity for accommodating the unlocking slider, the unlocking pull ring is hinged to fix the unlocking slider, and the unlocking pull ring can drive the unlocking slider to slide in the groove cavity with the rotating shaft as the center of rotation and the limiting groove as the boundary. The XFP optical transceiver integrated module has a novel structural design, meets the hot-swappable requirement of the multi-source agreement (MSA), is easily disassembled and assembled, and has low cost.

[0040] Disclosed above is only a preferred embodiment of the present utility model, and of course it cannot be used to define the scope of rights of the present utility model. Therefore, equivalent changes made according to the claims of the present utility model are still within the scope covered by the present utility model.

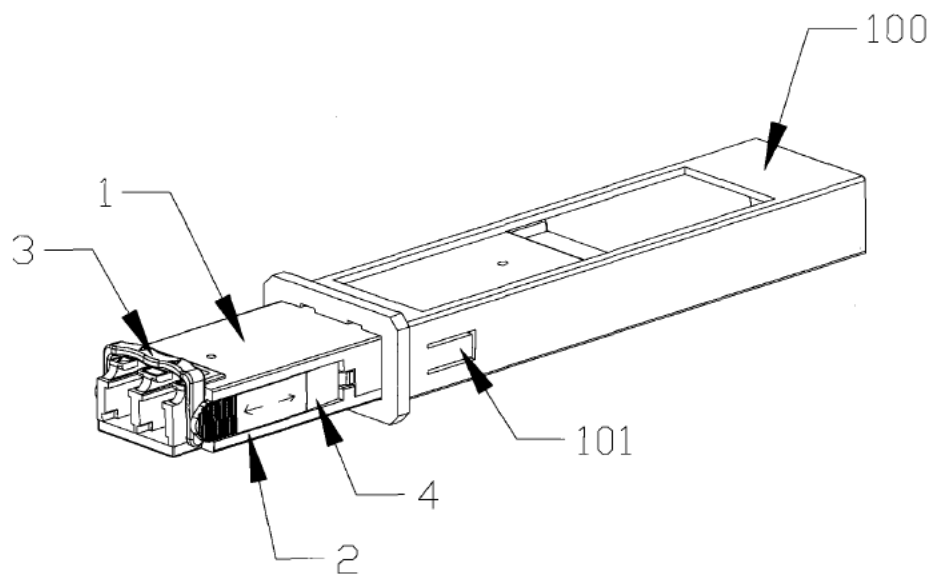


Fig. 1

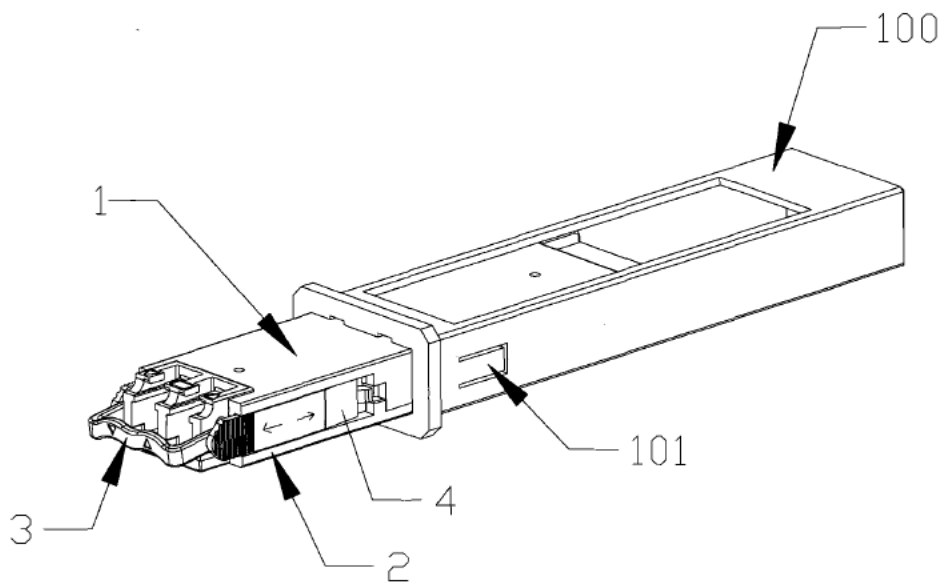


Fig. 2

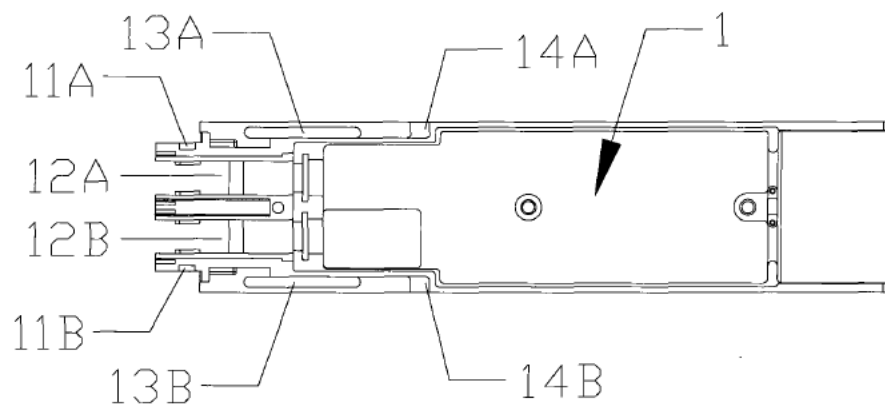


Fig. 3

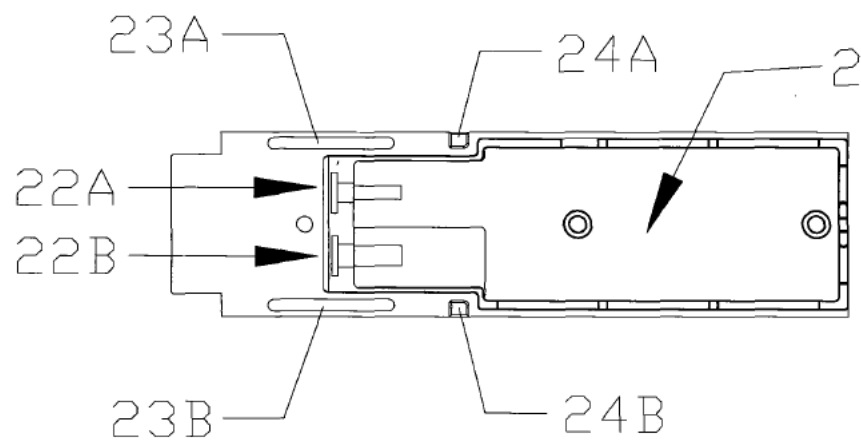


Fig. 4

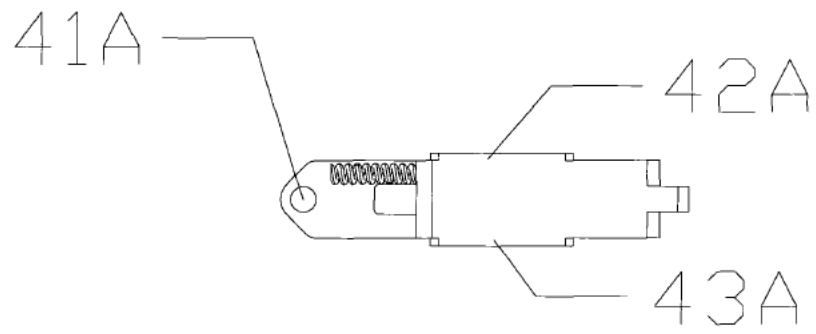


Fig. 5a

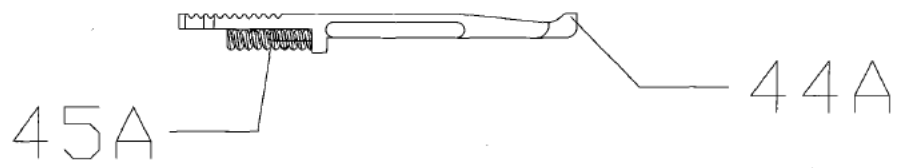


Fig. 5b

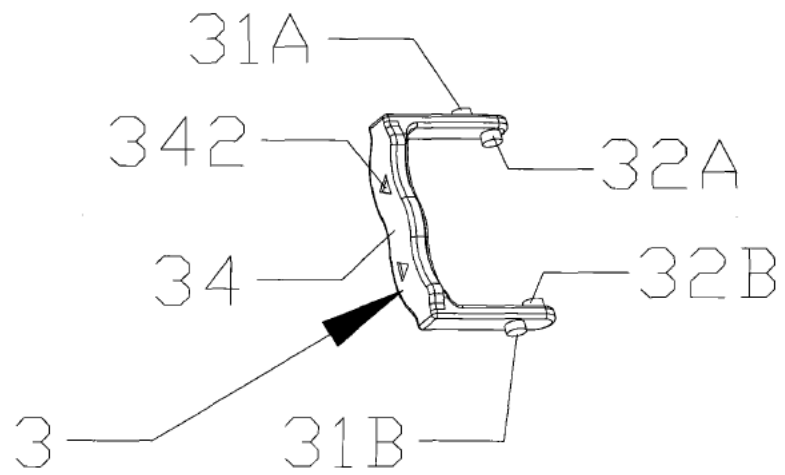


Fig. 6

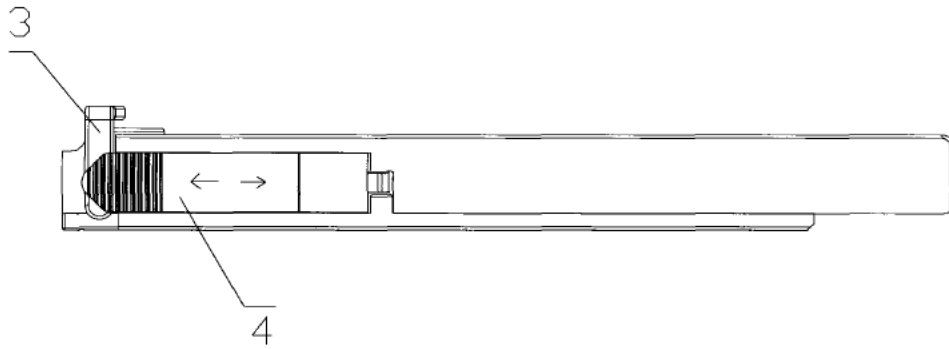


Fig. 7

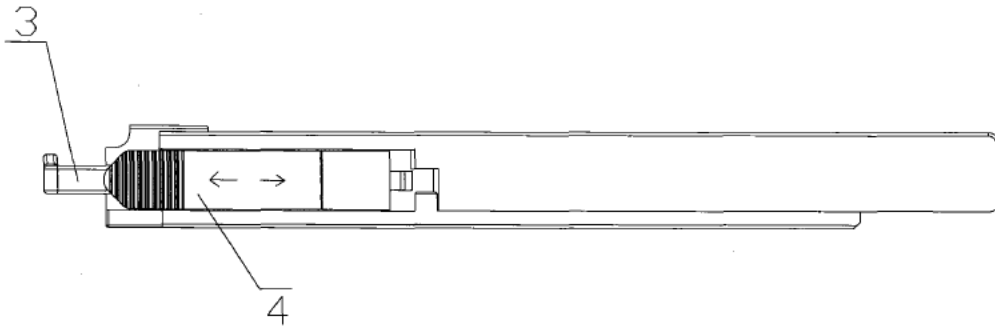


Fig. 8

TRANSLATION CERTIFICATION

Date: January 9, 2025

To whom it may concern:

This is to certify that the attached translation is an accurate representation of the documents received by this office. The translation was completed from:

- Chinese (PRC)

To:

- English (USA)

The documents are designated as:

- CN201820017U

Emily Paras, Project Manager in this company, attests to the following:

“To the best of my knowledge, all statements contained in the translation are true and correct and the aforementioned documents are a true, full and accurate translation of the specified documents. I acknowledge that these statements are subject to the penalties for perjury.”

A handwritten signature in black ink, appearing to read "Emily Paras", written in a cursive style.

Signature of Emily Paras