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(54) INVISIBLE ZIPPER SLIDER WITH PULLER CAPABLE OF BEING SUSPENDED AT ANY ANGLE

(57) An invisible slider with a puller capable of being arbitrarily suspended includes a slider body (1), a puller (2), and an end pressing member (3), wherein the slider body (1) includes a base portion (102), a top surface of the base portion (102) is provided with a guide column (101), a left stopper (103) and a right stopper (104) to form a Y-shaped zipper alignment channel, a front end of the end pressing member (3) is a pressed part, a rear end of the end pressing member (3) is a pressing part, a riveting portion (105) is disposed at a position corresponding to the pressed part at the top of the guide column (101), the riveting portion (105) riveting the pressed part at the front end of the end pressing member (3), a rotating shaft of the puller (2) is sandwiched between the pressing part at the rear end of the end pressing member (3) and the guide column (101) and forms rotating connection, the rotating shaft of the puller (2) is in contact with the pressing part and the guide column (101) under the pressing of the pressing part, and a frictional force is present between the rotating shaft of the puller (2) and the pressing part and between the rotating shaft of the puller and the guide column, the frictional force allowing the puller (2) to rotate to any angle to be suspended, and a riveting device is used to rivet and fasten the end pressing member (3), avoiding processing marks on the puller (2), which is beneficial for applying the invisible slider of the present invention to high-end products with strict product appearance requirements; and in addition, the riveting portion (105) in the present invention is relatively large, which is convenient for riveting processing and is not likely to cause breakage.

ance requirements; and in addition, the riveting portion (105) in the present invention is relatively large, which is convenient for riveting processing and is not likely to cause breakage.

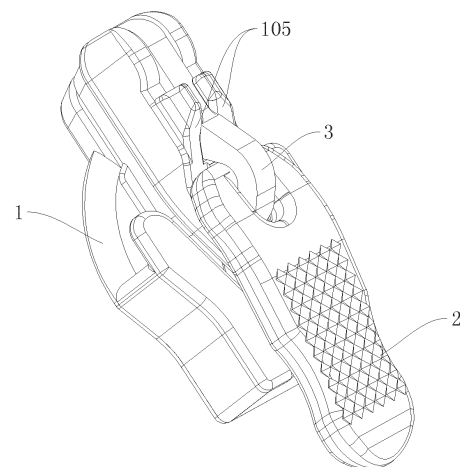


FIG. 1

Description

TECHNICAL FIELD

[0001] The present invention belongs to the field of zippers, and in particular relates to an invisible slider with a puller capable of being arbitrarily suspended.

BACKGROUND

[0002] An invisible slider has a small exposed area after installation, and zipper teeth of a zipper equipped with this type of slider are not exposed, which is conducive to improve the beautiful degree of the product, and makes the shape design of the product have more space to play.

[0003] In the prior art, a patent with an application number of "CN201610105490.0" discloses a slider for a zipper and a zipper. By disposing a pair of claws to tightly grip a rotating shaft of a rubber puller, the effect of arbitrary suspending is achieved. However, in actual production, no matter whatever processing technique is used (such as riveting, which is most commonly used in zipper processing) to achieve the gripping effect of the claws on the rotating shaft of the puller, since the puller and the claws are in direct contact, and a distance between equipment and the puller during processing is extremely close, there may be processing marks (such as pressing marks, scratches, etc.) on the surface of the puller, which is not conducive to applying the slider to high-end products with strict product appearance requirements. Moreover, the slider itself is a tiny part, and as a part of the slider, the claws are smaller in size and so are easy to break during processing.

SUMMARY

[0004] In view of the problems in the related art, the present invention proposes an invisible slider with a puller capable of being arbitrarily suspended to solve the above technical problems in the prior art.

[0005] The technical solution of the present invention is achieved as follows:

an invisible slider with a puller capable of being arbitrarily suspended includes a slider body and a puller, wherein the slider body includes a base portion, a guide column is disposed on one side of a middle of a top surface of the base portion, a left side and a right side of the base portion are symmetrically provided with a left stopper and a right stopper, top ends of the left stopper and the right stopper extend inwardly, a Y-shaped zipper alignment channel is formed in a space enclosed by the left stopper and the right stopper under the separation of the guide column, and the zipper alignment channel is opened upwardly; the puller includes a rotating shaft disposed at a front end and configured to be connected

with the slider body;

the invisible slider further includes an end pressing member installed at a top of the guide column, the end pressing member having a pressed part at a front end and a pressing part at a rear end; and a riveting portion is disposed at a position corresponding to the pressed part at the top of the guide column, the riveting portion riveting the pressed part at the front end of the end pressing member; and the rotating shaft of the puller is sandwiched between the pressing part at the rear end of the end pressing member and the guide column and forms rotating connection, and the rotating shaft of the puller is in contact with the pressing part and the guide column under the pressing of the pressing part, and a frictional force is present between the rotating shaft of the puller and the pressing part and between the rotating shaft of the puller and the guide column, the frictional force allowing the puller to rotate to any angle to be suspended.

[0006] Preferably, the top of the guide column is provided with a positioning groove which is open and configured to place the rotating shaft of the puller, a connecting hole is formed in a space enclosed by the pressing part of the end pressing member and an open end of the positioning groove at the open end of the positioning groove, the rotating shaft of the puller is mounted in the connecting hole to form the rotating connection, and the rotating shaft of the puller is in contact with a hole wall of the connecting hole, and a frictional force is present between the rotating shaft of the puller and the hole wall of the connecting hole, the frictional force allowing the puller to rotate to any angle to be suspended.

[0007] Preferably, the positioning groove has a downward concave arc-shaped structure, the pressing part of the end pressing member is a bending arm, and the connecting hole is formed in a space enclosed by the bending arm and the open end of the positioning groove at the open end of the positioning groove.

[0008] Preferably, the bending arm serves as an end structure of the end pressing member, the top surface of the guide column is provided with a downwardly recessed slot, the slot is located at one side of the positioning groove, the connecting hole is formed in the space enclosed by the bending arm and the open end of the positioning groove across the open end of the positioning groove, and an end of the bending arm is inserted into the slot.

[0009] Preferably, the top of the guide column is provided with a downwardly recessed pressing member groove, the pressed part of the end pressing member is placed in the pressing member groove, left and right displacements of the end pressing member are limited by the pressing member groove, and the riveting portions are disposed on both sides of a groove opening of the pressing member groove.

[0010] Preferably, the pressing member groove is pro-

vided with a blocking protrusion, the end pressing member is provided with a clamping opening adapted to the blocking protrusion, the clamping opening is clamped to the blocking protrusion, and sliding of the end pressing member in the pressing member groove is limited by the blocking protrusion.

[0011] Preferably, a height of the blocking protrusion is greater than a height of the clamping opening, the blocking protrusion arches the end pressing member when the pressed part of the end pressing member is placed in the pressing member groove, but is not riveted, so a bottom surface of the end pressing member is not in contact with a groove bottom of the pressing member groove.

[0012] Preferably, the top surface of the guide column is provided with a lower groove, a groove bottom of the lower groove protrudes upwardly to form a boss, and a top surface of the boss is recessed downwardly to form the positioning groove; and

the boss divides the lower groove into an upper groove body and a lower groove body, the upper groove body being the pressing member groove and the lower groove body being disposed as the slot.

[0013] Preferably, the bending arm serves as the rear end of the end pressing member, the riveting portion only rivets a middle of the end pressing member, and an outer surface of the front end of the end pressing member is lower than the groove opening of the pressing member groove when the end pressing member is placed in the pressing member groove, but is not riveted.

[0014] Preferably, the bending arm serves as the rear end of the end pressing member, and the riveting portion rivets the front end and a middle of the end pressing member.

[0015] The beneficial effects of the present invention are as follows:

firstly, the provision of the end pressing member not only enables the puller to achieve an arbitrary suspending effect, but also enables a riveting device to rivet the end pressing member without being in contact with the puller during riveting, avoiding processing marks (such as pressing marks, scratches, etc.) on the puller, which is beneficial for applying the invisible slider of the present invention to high-end products with strict product appearance requirements;

secondly, since the present invention is designed for riveting and fastening the end pressing member instead of riveting and fastening the puller, a relatively large riveting portion can be provided, which is convenient for riveting processing and is not likely to cause breakage; and

finally, only the pressed part located at the front end of the end pressing member is riveted, so that the pressing part located at the rear end is not fastened, thereby the pressing part has a small elastic deformation effect, which can adapt to more sizes of the rotating shaft.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

FIG. 1 is a first schematic structural diagram according to the present invention (riveted);

FIG. 2 is a second schematic structural diagram according to the present invention (not riveted);

FIG. 3 is a third schematic structural diagram according to the present invention (not riveted and omitting a puller);

FIG. 4 is a schematic structural diagram of a slider body according to the present invention;

FIG. 5 is a schematic structural diagram of an end pressing member according to the present invention; FIG. 6 is a front view according to the present invention;

FIG. 7 is a cross-sectional view of FIG. 6 in the direction A-A;

FIG. 8 is a fourth schematic structural diagram according to the present invention (not riveted); and

FIG. 9 is a fifth schematic structural diagram according to the present invention (riveted).

[0017] Description of reference signs:

slider body 1, guide column 101, base portion 102, left stopper 103, right stopper 104, riveting portion 105, positioning groove 106, slot 107, pressing member groove 108, and blocking protrusion 109; puller 2; and end pressing member 3, bending arm 301, and clamping opening 302.

DETAILED DESCRIPTION

[0018] The technical solutions in the embodiments of the present invention will be clearly and completely described below in conjunction with the accompanying drawings in the embodiments of the present invention, and obviously, the described embodiments are only a part of the embodiments of the present invention, rather than all of the embodiments. Based on the embodiments in the present invention, all other embodiments obtained by those of ordinary skill in the art without making inventive steps belong to the scope of protection of the present invention.

[0019] In the description of the present invention, it needs to be understood that the terms "center", "longitudinal", "transverse", "length", "width", "thickness", "upper", "lower", "front", "rear", "left", "right", "vertical", "horizontal", "top", "bottom", "inner", "outer", "clockwise", "counterclockwise", and the like indicate an orientation or positional relationship based on the orientation or positional relationship shown in the drawings, merely for ease of description of the present invention and simplification of the description, and are not intended to indicate or imply that the device or element referred to must have a

particular orientation, be constructed and operated in a particular orientation, and therefore should not be construed as limiting the present invention.

[0020] As shown in FIGS. 1 to 7, an invisible slider with a puller capable of being arbitrarily suspended includes a slider body 1 and a puller 2.

[0021] The slider body 1 includes a base portion 102, a guide column 101 is disposed on one side of a middle of a top surface of the base portion 102, a left side and a right side of the base portion 102 are symmetrically provided with a left stopper 103 and a right stopper 104, top ends of the left stopper 103 and the right stopper 104 extend inwardly, a Y-shaped zipper alignment channel is formed in a space enclosed by the left stopper 103 and the right stopper 104 under the separation of the guide column 101, and the zipper alignment channel is opened upwardly for allowing zipper teeth to be clamped into the zipper alignment channel.

[0022] The puller includes a rotating shaft disposed at a front end and configured to be connected with the slider body.

[0023] The invisible slider in this embodiment further includes an end pressing member 3 installed at a top of the guide column 101, the end pressing member 3 having a pressed part at a front end and a pressing part at a rear end; and a riveting portion 105 is disposed at a position corresponding to the pressed part at the top of the guide column 101, the riveting portion 105 riveting the pressed part at the front end of the end pressing member 3.

[0024] The rotating shaft of the puller 2 is sandwiched between the pressing part at the rear end of the end pressing member 3 and the guide column 101 and forms rotating connection, and the rotating shaft of the puller 2 is in contact with the pressing part and the guide column 101 under the pressing of the pressing part, and a frictional force is present between the rotating shaft of the puller 2 and the pressing part and between the rotating shaft of the puller 2 and the guide column 101, the frictional force allowing the puller 2 to rotate to any angle to be suspended.

[0025] Firstly, the provision of the end pressing member 3 not only enables the puller 2 to achieve an arbitrary suspending effect, but also enables a riveting device to rivet the end pressing member 3 without being in contact with the puller 2 during riveting, avoiding processing marks (such as pressing marks, scratches, etc.) on the puller 2, which is beneficial for applying the invisible slider in this embodiment to high-end products with strict product appearance requirements.

[0026] Secondly, since the end pressing member 3 is riveted and fastened instead of directly riveting and fastening the puller 2 in this embodiment, a relatively large riveting portion 105 can be provided, which is convenient for riveting processing and is not likely to cause breakage.

[0027] Finally, only the pressed part located at the front end of the end pressing member 3 is riveted, so that the pressing part located at the rear end is not fastened,

thereby the pressing part has a small elastic deformation effect, which can adapt to more sizes of the rotating shaft.

[0028] In particular, the puller 2 may be made of a rigid material or a flexible material. When the puller 2 is made of the rigid material, it should be controlled that there is a transition fit between the puller 2 and the end pressing member 3 and between the puller 2 and the guide column 101, i.e., the puller 2 can be arbitrarily suspended without an external force, and the puller 2 can be rotated under the action of the external force. In view of the precise production dimensional requirements required to achieve the transition fit of the rigid material, the puller 2 is preferably made of a flexible elastically deformable material (e.g., rubber, etc.), and the puller 2 in this embodiment is a resin puller. Under the condition of ensuring the puller 2 made of the flexible material to be rotated, the limit of the pressing force of the end pressing member 3 has a relatively loose range, which can reduce the requirement of machining accuracy in this embodiment.

[0029] In particular, the end pressing member 3 is made of a rigid metal, and the end pressing member 3 and the slider body 1 are separately disposed, so that the rear end of the end pressing member 3 is not fastened and has a small elastic deformation effect.

[0030] In this embodiment, the top of the guide column 101 is provided with a positioning groove 106 which is open and configured to place the rotating shaft of the puller 2, facilitating positioning of the puller 2 before riveting, a connecting hole is formed in a space enclosed by the pressing part of the end pressing member 3 and an open end of the positioning groove 106 at the open end of the positioning groove 106, the rotating shaft of the puller 2 is mounted in the connecting hole to form the rotating connection, and the rotating shaft of the puller 2 is in contact with a hole wall of the connecting hole, and a frictional force is present between the rotating shaft of the puller 2 and the hole wall of the connecting hole, the frictional force allowing the puller 2 to rotate to any angle to be suspended.

[0031] In particular, the positioning groove 106 has a downward concave arc-shaped structure, and the pressing part of the end pressing member 3 is a bending arm 301, and the connecting hole is formed in a space enclosed by the bending arm 301 and the open end of the positioning groove 106 at the open end of the positioning groove 106, so that the contact area of the puller 2 with the positioning groove 106 and the end pressing member 3 can be increased to achieve the suspending effect while facilitating the rotation of the puller 2.

[0032] In this embodiment, the bending arm 301 serves as an end structure of the end pressing member 3, in actual production, the bending arm 301 can be produced so that its end is precisely connected to the open end of the positioning groove 106, thereby enclosing the connecting hole, however, in view of the possibility of slight deformation of the end pressing member 3 after riveting, i.e. the bending arm 301 may slightly tilt upwards, long-term pulling of the puller 2 may also cause

the bending arm 301 to tilt upwards, resulting in a gap between the end of the bending arm 301 and the open end of the positioning groove 106, which affects the clamping effect of the bending arm 301 of the end pressing member 3. Therefore, the top surface of the guide column 101 is provided with a downwardly recessed slot 107, the slot 107 is located at one side of the positioning groove 106, the connecting hole is formed in the space enclosed by the bending arm 301 and the open end of the positioning groove 106 across the open end of the positioning groove 106, and an end of the bending arm 301 is inserted into the slot 107, this design ensures that the bending arm 301 has a sufficient length, even the bending arm 301 slightly tilts upwards, the bending arm 301 and the open end of the positioning groove 106 are still maintained to be enclosed, since there is no need to be connected with the open end of the positioning groove 106, the production accuracy requirements are also reduced to a certain extent, and the design of the slot 107 can prevent the bending arm 301 from being deformed such as tilting upwards, thereby reducing the effect of the long-term pulling of the puller 2 on the clamping effect of the end pressing member 3.

[0033] In this embodiment, the top of the guide column 101 is provided with a downwardly recessed pressing member groove 108, the pressed part of the end pressing member 3 is placed in the pressing member groove 108, left and right displacements of the end pressing member 3 are limited by the pressing member groove 108, and the riveting portions 105 are disposed on both sides of a groove opening of the pressing member groove 108, and are mainly used to position the end pressing member 3, preventing the end pressing member 3 from being displaced during riveting, reducing the effect that the end pressing member 3 protrudes outward from the surface of the slider body 1, and making the outer surface of the invisible slider in this embodiment more flat and concise.

[0034] More specifically, the top surface of the guide column 101 is provided with a lower groove, a groove bottom of the lower groove protrudes upwardly to form a boss, a top surface of the boss is recessed downwardly to form the positioning groove 106, and the boss divides the lower groove into an upper groove body, which is the pressing member groove 108, and a lower groove body, which is disposed as the slot 107. The structure is simplified and convenient for production and processing.

[0035] In this embodiment, the pressing member groove 108 is provided with a blocking protrusion 109, the end pressing member 3 is provided with a clamping opening 302 adapted to the blocking protrusion 109, the clamping opening 302 is clamped to the blocking protrusion 109, and sliding of the end pressing member 3 in the pressing member groove 108 is limited by the blocking protrusion 109, further positioning the end pressing member 3, ensuring that the end pressing member 3 is not displaced when riveted, and meanwhile, when the puller 2 is pulled, the bending arm 301 and the positioning groove 106 are easily subjected to a collision force, as the

use time increases, long-term collision may cause the bending arm 301 to be deformed, and the blocking protrusion 109 may share the pulling force, thereby avoiding the problem of deformation caused by multiple collisions of the bending arm 301.

[0036] Referring to FIG. 7, in this embodiment, a height of the blocking protrusion 109 is greater than a height of the clamping opening 302, the blocking protrusion 109 arches the end pressing member 3 when the pressed part of the end pressing member 3 is placed in the pressing member groove 108, but is not riveted, and a bottom surface of the end pressing member 3 is not in contact with a groove bottom of the pressing member groove 108, reserving an elastic space for possible downward deformation of a riveted part of the end pressing member 3 after riveting, thereby preventing the end pressing member 3 from colliding with the groove bottom.

[0037] Referring to FIGS. 1 to 7, the riveting portion 105 may be designed to rivet only a middle of the end pressing member 3, the bending arm 301 serves as the rear end of the end pressing member 3, it should be noted that riveting the middle of the end pressing member 3 may cause slight upward tilting of the front end of the end pressing member 3, therefore, an outer surface of the front end of the end pressing member 3 is lower than the groove opening of the pressing member groove 108 (as shown in FIG. 7) when the end pressing member 3 is placed in the pressing member groove 108, but not riveted, so that a height is reserved for possible upward tilting of the front end of the end pressing member 3, so that the front end of the end pressing member 3 is prevented from protruding outward from the surface of the slider body 1.

[0038] More specifically, the riveting portion 105, which is designed to rivet only the middle of the end pressing member 3, is designed to have a width that is wide in the front and narrow in the back, so as to form a pressing effect of tightening at the front and loosening at the rear on the end pressing member 3, so as to synergistically cooperate with the effect of small elastic deformation of the pressing part.

[0039] Referring to FIGS. 8 and 9, the riveting portion 105 may also be designed to rivet the front end and the middle of the end pressing member 3, and the bending arm 301 serves as the rear end of the end pressing member 3, so that the riveting area is large, breakage is not easily caused, and the fixing effect is reliable, while avoiding the above problem of slight upward tilting of the front end of the end pressing member 3.

[0040] In this embodiment, the slider body 1 includes the base portion 102, one side of the middle of the top surface of the base portion 102 protrudes upwards to form the guide column 101, the top of the guide column 101 is provided with a top which is larger than a width of a body of the guide column 101 and has a tip, the left and right sides of the base portion 102 protrude upwards to form side walls, and the top ends of the side walls extend toward each other to form the top, forming the left stopper

103 and the right stopper 104 which are symmetrical, and the tip of the guide column 101 is inserted between the left stopper 103 and the right stopper 104, and the left stopper 103, the right stopper 104 and the guide column 101 enclose the Y-shaped zipper alignment channel.

[0041] According to the disclosure and teachings of the above description, those skilled in the art to which the present invention belongs can also make changes and modifications to the above embodiments. Therefore, the present invention is not limited to the specific embodiments disclosed and described above, and some modifications and changes of the present invention should also fall within the scope of protection of the claims of the present invention. In addition, although some specific terms are used in this specification, these terms are for convenience of explanation only and do not constitute any limitation on the present invention.

Claims

1. An invisible slider with a puller capable of being arbitrarily suspended, comprising a slider body and a puller, wherein the slider body comprises a base portion, a guide column is disposed on one side of a middle of a top surface of the base portion, a left side and a right side of the base portion are symmetrically provided with a left stopper and a right stopper, top ends of the left stopper and the right stopper extend inwardly, a Y-shaped zipper alignment channel is formed in a space enclosed by the left stopper and the right stopper under the separation of the guide column, and the zipper alignment channel is opened upwardly; the puller comprises a rotating shaft disposed at a front end and configured to be connected with the slider body; **characterized in that**

the invisible slider further comprises an end pressing member installed at a top of the guide column, the end pressing member having a pressed part at a front end and a pressing part at a rear end; and a riveting portion is disposed at a position corresponding to the pressed part at the top of the guide column, the riveting portion riveting the pressed part at the front end of the end pressing member; and

the rotating shaft of the puller is sandwiched between the pressing part at the rear end of the end pressing member and the guide column and forms rotating connection, and the rotating shaft of the puller is in contact with the pressing part and the guide column under the pressing of the pressing part, and a frictional force is present between the rotating shaft of the puller and the pressing part and between the rotating shaft of the puller and the guide column, the frictional force allowing the puller to rotate to any angle to

be suspended.

2. The invisible slider according to claim 1, **characterized in that** the top of the guide column is provided with a positioning groove which is open and configured to place the rotating shaft of the puller, a connecting hole is formed in a space enclosed by the pressing part of the end pressing member and an open end of the positioning groove at the open end of the positioning groove, the rotating shaft of the puller is mounted in the connecting hole to form the rotating connection, and the rotating shaft of the puller is in contact with a hole wall of the connecting hole, and a frictional force is present between the rotating shaft of the puller and the hole wall of the connecting hole, the frictional force allowing the puller to rotate to any angle to be suspended.
3. The invisible slider according to claim 2, **characterized in that** the positioning groove has a downward concave arc-shaped structure, the pressing part of the end pressing member is a bending arm, and the connecting hole is formed in a space enclosed by the bending arm and the open end of the positioning groove at the open end of the positioning groove.
4. The invisible slider according to claim 3, **characterized in that** the bending arm serves as an end structure of the end pressing member, the top surface of the guide column is provided with a downwardly recessed slot, the slot is located at one side of the positioning groove, the connecting hole is formed in a space enclosed by the bending arm and the open end of the positioning groove across the open end of the positioning groove, and an end of the bending arm is inserted into the slot.
5. The invisible slider according to any one of claims 1 to 4, **characterized in that** the top of the guide column is provided with a downwardly recessed pressing member groove, the pressed part of the end pressing member is placed in the pressing member groove, left and right displacements of the end pressing member are limited by the pressing member groove, and the riveting portions are disposed on both sides of a groove opening of the pressing member groove.
6. The invisible slider according to claim 5, **characterized in that** the pressing member groove is provided with a blocking protrusion, the end pressing member is provided with a clamping opening adapted to the blocking protrusion, the clamping opening is clamped to the blocking protrusion, and sliding of the end pressing member in the pressing member groove is limited by the blocking protrusion.
7. The invisible slider according to claim 6, **character-**

ized in that a height of the blocking protrusion is greater than a height of the clamping opening, the blocking protrusion arches the end pressing member when the pressed part of the end pressing member is placed in the pressing member groove, but is not riveted, and a bottom surface of the end pressing member is not in contact with a groove bottom of the pressing member groove. 5

8. The invisible slider according to claim 5, **characterized in that** the top surface of the guide column is provided with a lower groove, a groove bottom of the lower groove protrudes upwardly to form a boss, and a top surface of the boss is recessed downwardly to form the positioning groove; and 10
the boss divides the lower groove into an upper groove body and a lower groove body, the upper groove body being the pressing member groove and the lower groove body being disposed as the slot. 15
20

9. The invisible slider according to claim 5, **characterized in that** the bending arm serves as the rear end of the end pressing member, the riveting portion only rivets a middle of the end pressing member, and an outer surface of the front end of the end pressing member is lower than the groove opening of the pressing member groove when the end pressing member is placed in the pressing member groove, but is not riveted. 25
30

10. The invisible slider according to claim 5, **characterized in that** the bending arm serves as the rear end of the end pressing member, and the riveting portion rivets the front end and a middle of the end pressing member. 35
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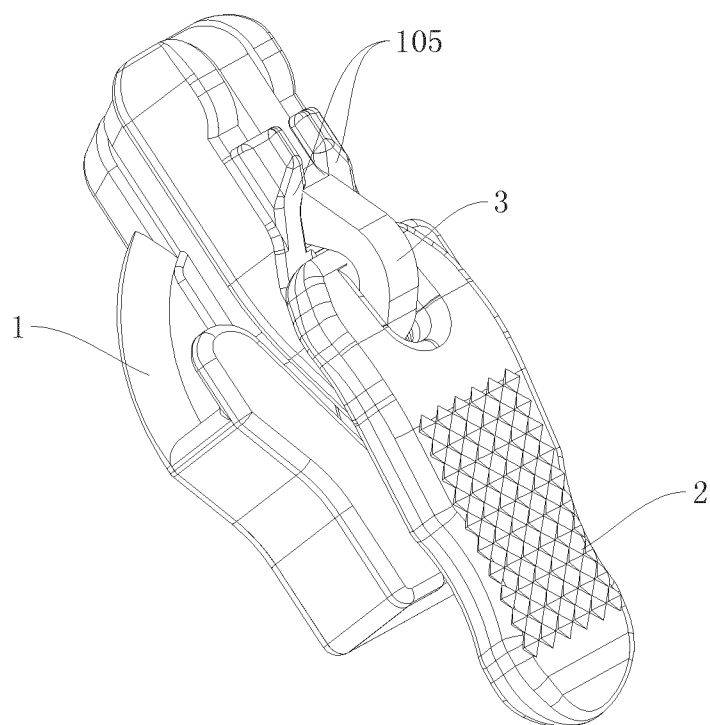


FIG. 1

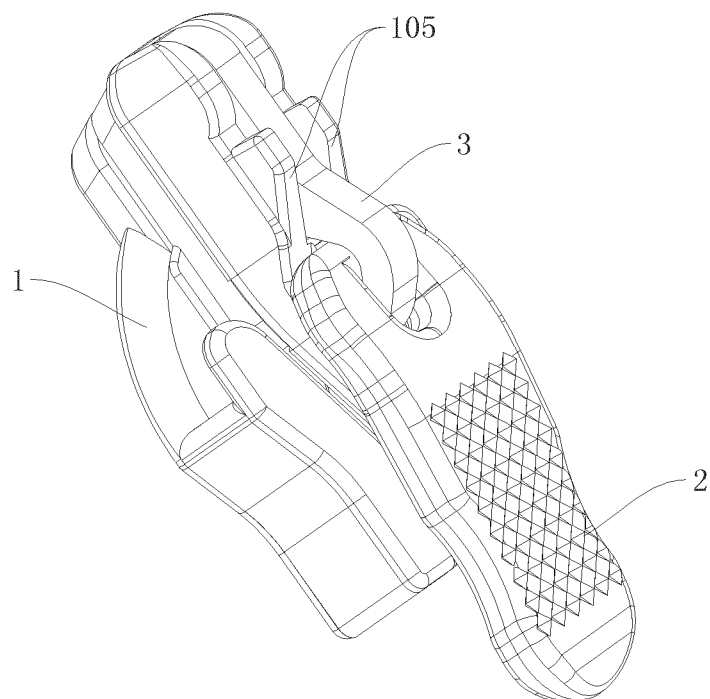


FIG. 2

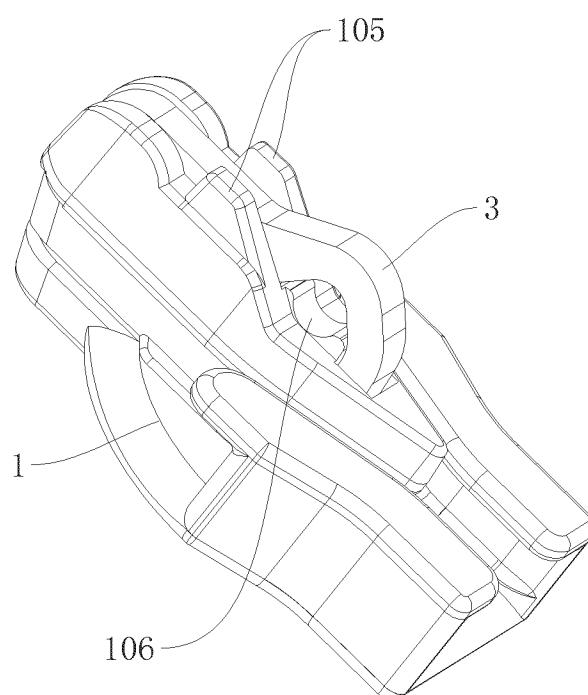


FIG. 3

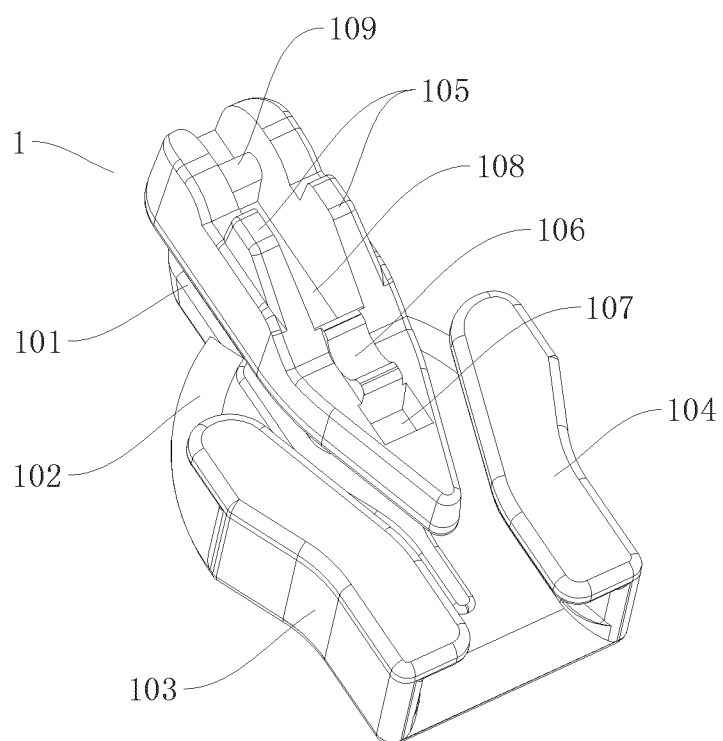


FIG. 4

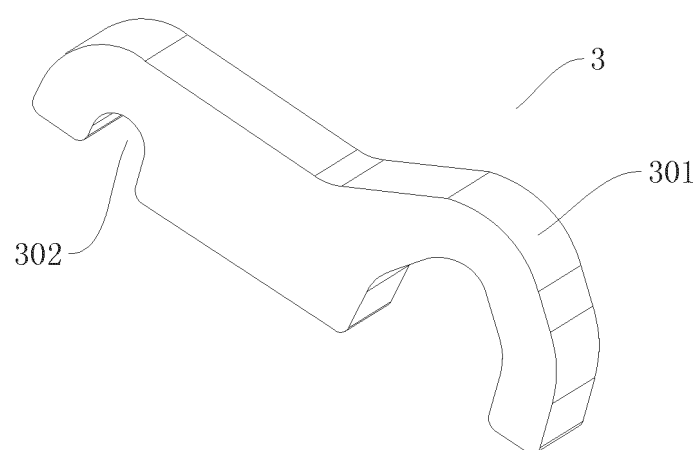


FIG. 5

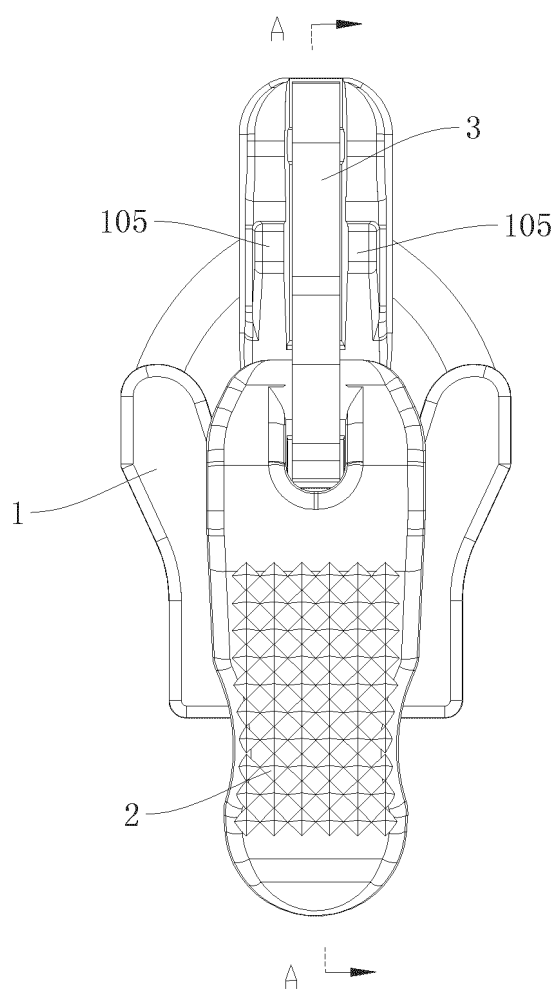
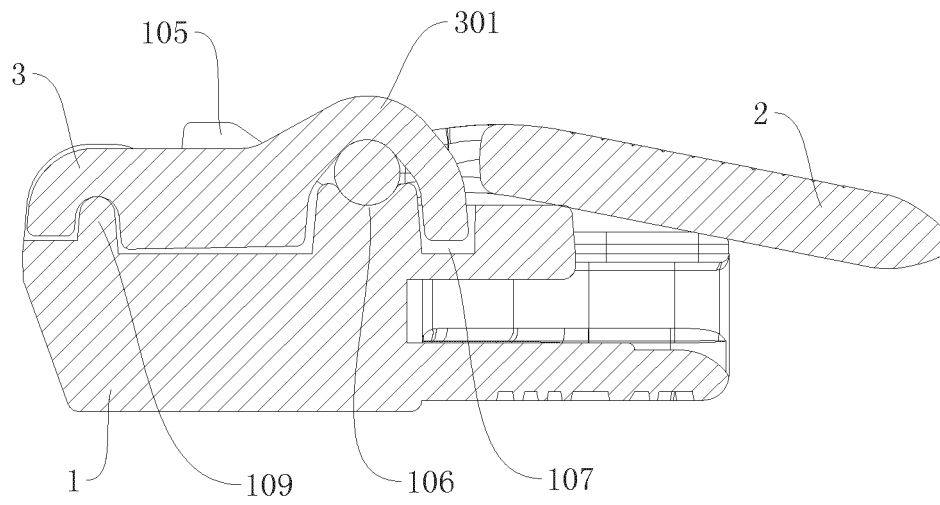


FIG. 6



A-A

FIG. 7

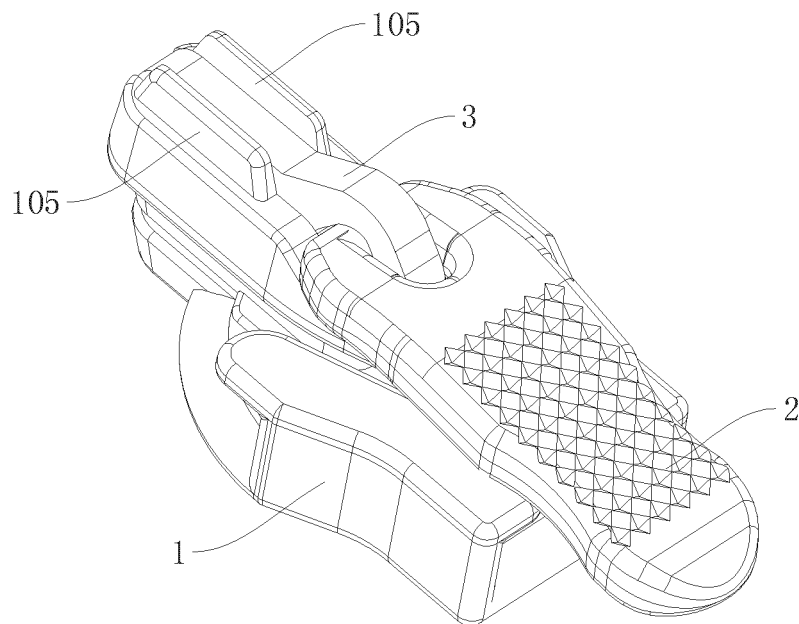


FIG. 8

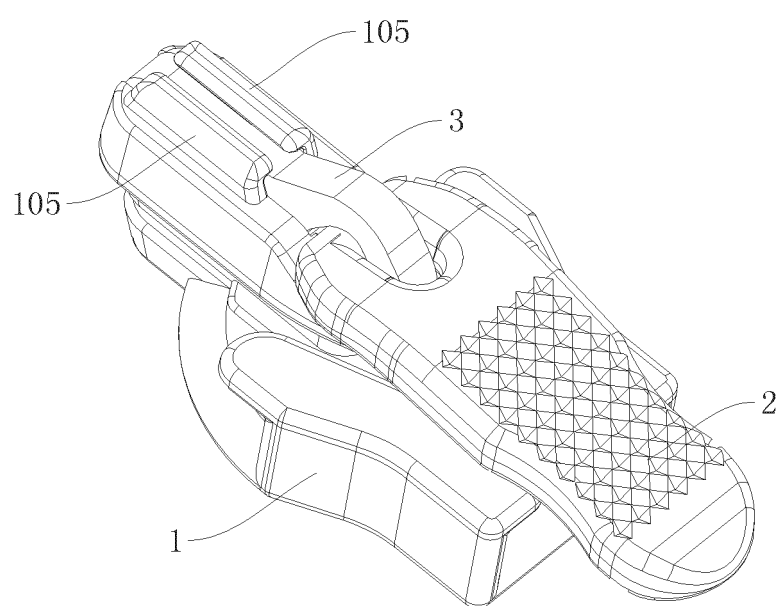


FIG. 9

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/134314

A. CLASSIFICATION OF SUBJECT MATTER

A44B19/26(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A44B19

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNTXT, ENTXTC, WPABSC, ENTXT, DWPI: 理想, 吕宗坚, 丘巍, 邱国亮, 熊梓仁, 隐形, 隐藏, 拉头, 拉链, 悬停, 暂停, 停留, 停顿, 卡顿, 不动, 保持, 拉牌, 拉片, 拉手, 拉攀, 摩擦, 铆压, 压紧, 压接, 铆接, 铆合, 冲压, 冲头, 施压, 按压, 施力, 压迫, 轴, 销, 棒, 柱, 之间, 中间, 夹持, 环绕, 围绕, 空间, invisible, conceal, hide, slider, zipper, hover, retain, keep, stop, suspend, halt, cease, rest, pull, tab, rivet, press, crimp, punch, buckle, friction

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	CN 217986854 U (IDEAL FASTENER (GUANGDONG) INDUSTRIES LTD.) 09 December 2022 (2022-12-09) claims 1-10, description, paragraphs 0004-0058, and figures 1-9	1-10
Y	CN 107136668 A (FUJIAN SBS ZIPPER SCIENCE & TECHNOLOGY CO., LTD.) 08 September 2017 (2017-09-08) description, paragraphs 0004-0037, and figures 1-4	1-10
Y	CN 213664004 U (QUANZHOU XULIN MACHINERY MANUFACTURING CO., LTD.) 13 July 2021 (2021-07-13) description, paragraphs 0004-0043, and figures 1-5	1-10
Y	CN 211532973 U (IDEAL FASTENER (GUANGDONG) INDUSTRIES LTD.) 22 September 2020 (2020-09-22) description, paragraphs 0006-0058, and figures 6-7	4-10
Y	CN 1647713 A (YKK CORP.) 03 August 2005 (2005-08-03) description, page 2 line 15 to page 7 line 18, and figures 1-18	1-10

☒ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"D" document cited by the applicant in the international application	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"E" earlier application or patent but published on or after the international filing date	"&" document member of the same patent family
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search	Date of mailing of the international search report
14 February 2023	15 February 2023
Name and mailing address of the ISA/CN	Authorized officer
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Facsimile No. (86-10)62019451	Telephone No.

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International application No.

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Y	CN 105901843 A (YKK CORP.) 31 August 2016 (2016-08-31) description, paragraphs 0044-0099, and figures 1-12	1-10
Y	CN 211354113 U (IDEAL ZIPPER (JIANGSU) CO., LTD.) 28 August 2020 (2020-08-28) description, paragraphs 0006-0058, and figures 1-7	1-10
A	CN 113729365 A (FUJIAN SBS ZIPPER SCIENCE & TECHNOLOGY CO., LTD.) 03 December 2021 (2021-12-03) entire document	1-10
A	CN 105377071 A (YKK CORP.) 02 March 2016 (2016-03-02) entire document	1-10
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