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(71) Applicant: **Zhejiang Weixing Industrial Development Co., Ltd.**
Taizhou, Zhejiang 317025 (CN)

(72) Inventor: **LI, Anqing**
Taizhou, Zhejiang 317025 (CN)

(74) Representative: **Lavoix**
Bayerstraße 83
80335 München (DE)

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(54) **LOWER ZIPPER STOPPER AND ZIPPER**

(57) A lower zipper stopper and a zipper. The lower zipper stopper comprises a lower stopper surface member (4) and a lower stopper bottom member (5). The lower stopper surface member (4) comprises a surface member cylinder (4.3), a hook (4.4) protrudes from an outer peripheral surface of the surface member cylinder (4.3), the hook (4.4) comprises a hook-shaped structure formed by a butt-joint between a guide rod portion (4.4b) and a hook protrusion (4.4a), and the hook protrusion (4.4a) is positioned at the bottom of the hook (4.4) in the axial direction. A main groove (5.3) is provided in the middle of the lower stopper bottom member (5), a bottom member guide protrusion (5.4) and a bottom member limiting protrusion (5.9) are arranged on an inner peripheral surface of the main groove (5.3), the bottom member guide protrusion (5.4) and the bottom member limiting protrusion (5.9) are sequentially arranged in the periph-

eral direction, and a guide channel (5.11) is formed between the bottom member guide protrusion and the bottom member limiting protrusion. During assembly, firstly, the lower stopper surface member (4) and the lower stopper bottom member (5) are axially aligned; then, the lower stopper surface member (4) and the lower stopper bottom member (5) rotate while axially moving until the lower stopper surface member and the lower stopper bottom member axially abut against each other; and finally, the lower stopper surface member (4) rotates, such that the hook (4.4) is snap-fitted with the bottom member limiting protrusion (5.9), thereby realizing axial limiting. The step of manually determining whether the lower stopper surface member (4) and the lower stopper bottom member (5) are connected in place can be omitted, and use is facilitated.

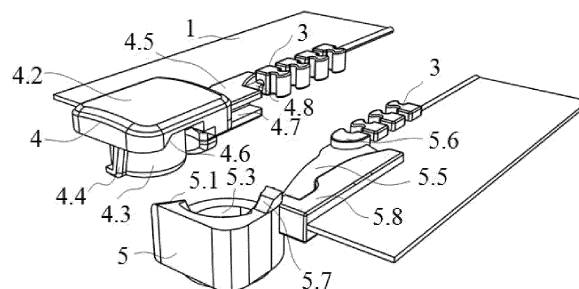


FIG. 5

Description

[0001] The present application claims the priority to the Chinese Patent Application No. 202222215919.5, titled "LOWER ZIPPER STOP AND ZIPPER", filed on August 22, 2022 with the China National Intellectual Property Administration, which is incorporated herein by reference in its entirety.

FIELD

[0002] The present application relates to the technical field of zippers for garments, and in particular to a lower zipper stop and a zipper.

BACKGROUND

[0003] A zipper, as an integral part of garment accessories, is widely used in people's daily wear. Typically, it is a device using a slider to bind two rows of zipper teeth together. The zipper, which is commonly used in daily life of garments, backpacks, tents, and other necessities, consists of cloth tape, zipper teeth, a slider, and upper and lower stops. A conventional zipper has two cloth tapes arranged on two sides, each with a row of zipper teeth. The two rows of zipper teeth interlock with each other for joining, and sliding of the slider allows the zipper teeth on both sides to engage or disengage. A separable-end zipper, commonly used on garment plackets, has a lower stop that allows the two cloth tapes on two sides to engage or disengage.

[0004] In the conventional lower stop of the zipper, a lower stop bottom member includes a pin, and a lower stop plane member includes a box. The zipper teeth on two sides can be joined after the pin is inserted into the box along a direction of slider movement. A precise control is required for a depth of pin inserting into the box to ensure the zipper teeth on the two cloth tapes to interlock properly, which is inconvenient for use.

[0005] Therefore, how to provide a user-friendly zipper is a technical problem that needs to be solved by the skilled in the art currently.

SUMMARY

[0006] An object of the present application is to provide a zipper lower stop and a zipper including the same, which is convenient to use.

[0007] In order to implement the above object, the following technical solutions are provided according to the present application.

[0008] The zipper lower stop includes a lower stop plane member and a lower stop bottom member.

[0009] The lower stop plane member includes a plane member cylinder, and a hook protrudes from an outer peripheral surface of the plane member cylinder. The hook includes a hook-shaped structure formed by a butt-joint of a guide rod portion and a hook protrusion,

where the hook protrusion is located at a bottom portion of the hook in an axial direction.

[0010] A main groove is formed in the middle of the lower stop bottom member, and an inner peripheral surface of the main groove is provided with a bottom member guide protrusion and a bottom member limiting protrusion. The bottom member guide protrusion and the bottom member limiting protrusion are sequentially arranged in the circumferential direction with a guide channel formed between them.

[0011] When the lower stop plane member is assembled with the lower stop bottom member, the plane member cylinder enters the main groove axially downwards, and the hook enters the guide channel axially downwards. At the same time, the guide rod portion and the bottom member guide protrusion fit along the circumferential direction and an oblique guiding is formed to push the lower stop plane member to rotate around a center line of the plane member cylinder relative to the lower stop plane member. After the lower stop plane member moves axially until a lower stop plane board abuts against the lower stop bottom member in the axial direction, the lower stop plane member continues to rotate, enabling the hook protrusion to extend into the limiting groove of the bottom member limiting protrusion, and thereby preventing the lower stop plane member from being separated from the lower stop bottom member in the axial direction.

[0012] Preferably, the guide rod portion gradually extends downward along the axial direction and obliquely in the circumferential direction, and a circumferential end surface of the bottom member guide protrusion close to the bottom member limiting protrusion gradually extends downward along the axial direction and obliquely in the circumferential direction.

[0013] Preferably, a circumferential width of the guide channel gradually decreases downward along the axial direction.

[0014] Preferably, the lower stop plane member further includes a plane member top board fixed at a top end of the plane member cylinder in the axial direction. The plane member top board is provided with a rotating guide member on a bottom surface in the axial direction. A bottom portion of the rotating guide member is located below the plane member cylinder in the axial direction. A recessed guide rail is provided on a top surface of the lower stop bottom member in the axial direction. When the plane member cylinder enters the main groove axially downwards, the rotating guide member and the guide rail fit with each other along the circumferential direction and an oblique guiding is formed to push the lower stop plane member to rotate relative to the lower stop bottom member. When the lower stop plane member moves axially until the lower stop plane member board abuts against the lower stop bottom member in the axial direction, the guide rail abuts against the rotating guide member in the circumferential direction.

[0015] Preferably, the lower stop bottom member is

provided with a guide block protruding upward from the top surface in the axial direction. The guide block is provided with a guide slope, and the bottom surface of the plane member top board is provided with an inclined portion. The inclined portion, the hook and the rotating guide member are sequentially arranged around the plane member cylinder in the circumferential direction. When the plane member cylinder enters the main groove axially downwards, the guide slope and the inclined portion fit with each other along the circumferential direction and an oblique guiding formed to push the lower stop plane member to rotate relative to the lower stop bottom member.

[0016] Preferably, the lower stop plane member is provided with a plane member magnet, and the lower stop bottom member is provided with a bottom member magnet, and the plane member magnet and the bottom member magnet are configured to magnetically attract each other.

[0017] Preferably, the plane member magnet is embedded in the plane member cylinder, and the bottom member magnet is fixed in the main groove.

[0018] A zipper includes a zipper lower stop described above and further includes a slider, a first cloth tape and a second cloth tape. The first cloth tape and the second cloth tape each is provided with a row of zipper teeth, and the slider is connected to a lower stop plane member.

[0019] Preferably, a plane member fixing board is fixedly arranged on an outer peripheral surface of the plane member cylinder, and a recess is arranged on the plane member fixing board. A bottom member connecting board is fixedly arranged on the outer peripheral surface of the lower stop bottom member. The plane member fixing board is fixed to the first cloth tape, the recess extends along the moving direction of the slider, and an opening of the recess faces the second cloth tape. The bottom member connecting board is fixed to the second cloth tape. When the slider is attached to the lower stop plane member along the moving direction, the plane member fixing board is located in the inner cavity of the slider, and when the hook protrusion extends into the limiting groove, the bottom member connecting board extends into the recess and enters the inner cavity of the slider.

[0020] Preferably, the bottom member connecting board is provided with a bottom member lead-in tooth at one end away from the lower stop bottom member in the moving direction of the slider. After the slider moves in a direction away from the lower stop plane member to enable the zipper teeth on the first cloth tape and the second cloth tape to be engaged with each other, the zipper teeth on the second cloth tape closest to the lower stop bottom member and the bottom member lead-in teeth jointly engage the zipper teeth on the first cloth tape closest to the lower stop plane member.

[0021] A lower zipper stop provided according to the present application includes a lower stop plane member and a lower stop bottom member. The lower stop plane

member includes a plane member cylinder, and a hook protrudes from an outer peripheral surface of the plane member cylinder. The hook includes a hook-shaped structure formed by a butt-joint between a guide rod portion and a hook protrusion, where the hook protrusion is positioned at the bottom of the hook in the axial direction. A main groove is provided in the middle of the lower stop bottom member, and a bottom member guide protrusion and a bottom member limiting protrusion are arranged on an inner peripheral surface of the main groove. The bottom member guide protrusion and the bottom member limiting protrusion are sequentially arranged in the circumferential direction with a guide channel formed between them. In a process of assembling the lower stop plane member to the lower stop bottom member, the plane member cylinder enters the main groove downward in the axial direction, and the hook enters the guide channel downward in the axial direction. At the same time, the guide rod portion and the bottom member guide protrusion are fitted with each other in the circumferential direction and guided obliquely to push the lower stop plane member to rotate around a center line of the plane member cylinder relative to the lower stop bottom member. After the lower stop plane member moves axially until the lower stop plane board abuts against the lower stop bottom member in the axial direction, the lower stop plane member continues to rotate, enabling the hook protrusion to extend into the limiting groove of the bottom member limiting protrusion, and thereby preventing the lower stop plane member from being separated from the lower stop bottom member in the axial direction.

[0022] When assembling the zipper, the lower stop plane member and the lower stop bottom member are axially aligned first, and then rotate while moving axially until the lower stop plane member and the lower stop bottom member axially abut against each other. Subsequently, the hook is engaged with the bottom member limiting protrusion through the rotation of the lower stop plane member, achieving an axial limiting. Through the whole process, a movement along the moving direction of the slider is not necessary, which can reduce the step of manually determining whether the lower stop plane member and the lower stop bottom member are properly connected with each other, making it easier to use and facilitating the quick and convenient closure of the zipper.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] Hereinafter drawings to be applied in embodiments of the present application or in the conventional technology are briefly described, in order to illustrate technical solutions according to the embodiments of the present application or in the conventional technology more clearly. Apparently, the drawings in the following descriptions are only some embodiments of the present application, and other drawings may be obtained by those skilled in the art based on the provided drawings

without any creative effort.

FIG. 1 is a structural view of a zipper provided according to a first embodiment of the present application after zipper teeth are engaged;

FIG. 2 is a structural view of the zipper provided according to the first embodiment of the present application before the zipper teeth are engaged;

FIG. 3 is a structural view of an inner cavity of a slider of the zipper provided according to the first embodiment of the present application before the zipper teeth are engaged;

FIG. 4 is an exploded view of the zipper provided according to the first embodiment of the present application in a first direction;

FIG. 5 is an exploded view of the zipper provided according to the first embodiment of the present application in a second direction;

FIG. 6 is a structural view of a lower stop plane member of the zipper provided according to the first embodiment of the present application;

FIG. 7 is a structural view of a lower stop bottom member of the zipper provided according to the first embodiment of the present application;

FIG. 8 is an exploded view of a lower stop of the zipper provided according to the first embodiment of the present application;

FIG. 9 is a bottom structural view of a lower stop plane member of a zipper provided according to a second embodiment of the present application;

FIG. 10 is a top structural view of the lower stop plane member of the zipper provided according to the second embodiment of the present application;

FIG. 11 is a top structural view of a lower stop bottom member of the zipper provided according to the second embodiment of the present application;

FIG. 12 is a bottom structural view of the lower stop bottom member of the zipper provided according to the second embodiment of the present application.

[0024] Reference numerals in the drawings are listed as follows:

1 cloth tape, 1.1 first cloth tape, 1.2 second cloth tape;

2 slider, 2.1 core, 2.2a left block, 2.2b right block;

3 zipper teeth;

4 lower stop plane member, 4.1 rotating guide member, 4.1a guide inclined portion, 4.2 plane member top board, 4.2a first top board hole, 4.2b second top board hole, 4.3 plane member cylinder, 4.3a cylindrical hole, 4.4 hook, 4.4a hook protrusion, 4.4b guide rod portion, 4.5 plane member fixing board, 4.6 inclined portion, 4.7 recess, 4.8 slider fixing groove, 4.9 plane member magnet;

5 lower stop bottom member, 5.1 guide rail, 5.2 bottom member bottom board, 5.2a first bottom board hole, 5.2b second bottom board hole, 5.3 main groove, 5.3a groove hole, 5.4 bottom member guide protrusion, 5.5 bottom member connecting board, 5.6 bottom member lead-in teeth, 5.7 guide block, 5.8 cloth tape fixing portion, 5.9 bottom member limiting protrusion, 5.10 bottom member magnet, 5.11 guide channel, 5.12 limiting groove, 5.13 bottom member ring board.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0025] The technical solutions according to the embodiments of the present application will be described clearly and completely as follows in conjunction with the drawings in the embodiments of the present application. It is apparent that the described embodiments are only some of the embodiments according to the present application, rather than all the embodiments. All other embodiments obtained by those skilled in the art based on the embodiments of the present application without any creative work fall within the protection scope of the present application.

[0026] The core of the present application is to provide a zipper lower stop and a zipper having the zipper lower stop, which is convenient to use.

[0027] In a first embodiment of a zipper lower stop provided according to the present application, referring to FIGS. 1 to 8, the zipper lower stop includes a lower stop plane member 4 and a lower stop bottom member 5.

[0028] As shown in FIG. 6, the lower stop plane member 4 includes a plane member cylinder 4.3, and a hook 4.4 protrudes from an outer peripheral surface of the plane member cylinder 4.3. The hook 4.4 includes a hook-shaped structure formed by a butt-joint of a guide rod portion 4.4b and a hook protrusion 4.4a, where the hook protrusion 4.4a is located at bottom of the hook 4.4 in an axial direction. In this embodiment, the axial direction, circumferential direction and radial direction are based on the axial direction, circumferential direction and radial direction of the plane member cylinder 4.3, and two ends in the axial direction are upper end and lower end respectively. The axial direction is perpendicular to a moving direction of a slider 2 when the lower stop plane member 4 being mounted on cloth tape 1.

[0029] As shown in FIG. 7, a main groove 5.3 is formed

in the middle of the lower stop bottom member 5. A bottom member guide protrusion 5.4 and a bottom member limiting protrusion 5.9 are formed on an inner peripheral surface of the main groove 5.3. The bottom member guide protrusion 5.4 and the bottom member limiting protrusion 5.9 are sequentially arranged in the circumferential direction with a guide channel 5.11 formed between them. Specifically, the lower stop bottom member 5 includes a bottom member bottom board 5.2 and a bottom member ring board 5.13 fixed above the bottom member bottom board 5.2 in the axial direction. The main groove 5.3 is located in a space surrounded by the bottom member ring board 5.13 above the bottom member bottom board 5.2.

[0030] In a process of assembling the lower stop plane member 4 to the lower stop bottom member 5, the plane member cylinder 4.3 enters the main groove 5.3 axially downwards, and the hook 4.4 enters the guide channel 5.11 axially downwards. At the same time, the guide rod portion 4.4b and the bottom member guide protrusion 5.4 fit in the circumferential direction and an oblique guiding is formed, so as to push the lower stop plane member 4 to rotate around a center line of the plane member cylinder 4.3 relative to the lower stop bottom member 5. The plane member cylinder 4.3 is locked with the main groove 5.3, so that the lower stop plane member 4 and the lower stop bottom member 5 can be aligned and limited in the radial direction, and the lower stop plane member 4 and the lower stop bottom member 5 are prevented from moving relative to each other in the radial direction. After the lower stop plane member 4 moves axially until a lower stop plane board abuts against the lower stop bottom member 5 in the axial direction, the lower stop plane member 4 continues to rotate, enabling the hook protrusion 4.4a to extend into the limiting groove 5.12 of the bottom member limiting protrusion 5.9, and thereby preventing the lower stop plane member 4 from being separated from the lower stop bottom member 5 in the axial direction.

[0031] In this embodiment, when the zipper lower stop is assembled, the lower stop plane member 4 and the lower stop bottom member 5 are axially aligned first, and then rotate and move axially with each other until they axially abut against each other. Subsequently, the hook 4.4 is stuck with the bottom member limiting protrusion 5.9 through the rotation of the lower stop plane member 4, achieving an axial limiting. Through the whole process, a movement along the moving direction of the slider 2 is not necessary, which can reduce a step of manually determining whether the lower stop plane member 4 and the lower stop bottom member 5 are properly connected with each other, making it easier to use and facilitating a quick and convenient closure of the zipper.

[0032] Further, as shown in FIGS. 6 and 7, the guide rod portion 4.4b gradually extends downward along the axial direction and obliquely in the circumferential direction. A circumferential end surface of the bottom member guide protrusion 5.4 close to the bottom member limiting

protrusion 5.9 gradually extends downward along the axial direction and obliquely in the circumferential direction. By arranging inclined guide structures on both the guide rod portion 4.4b and the bottom member guide protrusion 5.4, the adaptability of the two in the movement process can be improved.

[0033] Further, as shown in FIG. 7, a circumferential width of the guide channel 5.11 gradually decreases downward along the axial direction. Specifically, the circumferential width at a top portion of the guide channel 5.11 is greater than the circumferential width of the hook protrusion 4.4a, which facilitates the hook protrusion 4.4a smoothly entering the guide channel 5.11 along the axial direction.

[0034] Further, as shown in FIG. 6 and FIG. 7, the zipper lower stop further includes a plane member top board 4.2 fixed at a top end of the plane member cylinder 4.3 in the axial direction. The plane member top board 4.2 is provided with a rotating guide member 4.1 on its bottom surface in the axial direction, and the bottom portion of the rotating guide member 4.1 is located below the plane member cylinder 4.3 in the axial direction.

[0035] Meanwhile, the lower stop bottom member 5 is provided with a concave guide rail 5.1 on the top surface in the axial direction, specifically on a top surface of the bottom member ring board 5.13.

[0036] In the process that the plane member cylinder 4.3 enters the main groove 5.3 axially downwards, the rotating guide member 4.1 and the guide rail 5.1 can fit with each other in the circumferential direction and an oblique guiding is formed, so as to push the lower stop plane member 4 to rotate relative to the lower stop bottom member 5. When the lower stop plane member 4 moves axially until the lower stop plane board abuts against the lower stop bottom member 5 in the axial direction, the guide rail 5.1 abuts against the rotating guide member 4.1 in the circumferential direction.

[0037] Through the arrangement of the guide rail 5.1 and the rotating guide member 4.1, the guiding for the lower stop plane member 4 can be further improved, and at the same time, the guide rail 5.1 and the rotating guide member 4.1 are in circumferential contact with each other, so that the rotation end point of the lower stop plane member 4 relative to the lower stop bottom member 5 can be effectively limited.

[0038] Further, the lower stop bottom member 5 is provided with a guide block 5.7 protruding upward from the top surface in the axial direction, specifically from the top surface of the bottom member ring board 5.13. More specifically, the guide block 5.7 and the guide rail 5.1 are sequentially arranged around the main groove 5.3 in the circumferential direction. As shown in FIGS. 6 and 7, the guide block 5.7 is provided with a guide slope, and the bottom surface of the plane member top board 4.2 is provided with an inclined portion 4.6. The inclined portion 4.6, the hook 4.4 and the rotating guide member 4.1 are sequentially arranged around the plane member cylinder 4.3 in the circumferential direction. When the plane mem-

ber cylinder 4.3 enters the main groove 5.3 axially downwards, the guide slope and the inclined portion 4.6 can fit with each other in the circumferential direction and an oblique guiding is formed, so as to push the lower stop plane member 4 to rotate relative to the lower stop bottom member 5.

[0039] The arrangement of the guide block 5.7 and the inclined portion 4.6 can guide the lower stop plane member 4 in cooperation with the guide rail 5.1 and the rotating guide member 4.1, so that the lower stop plane member 4 is guided at different positions in the axial direction during the rotation process, and the stability of the movement of the lower stop plane member 4 is improved.

[0040] Further, the lower stop plane member 4 is provided with a plane member magnet 4.9, and the lower stop bottom member 5 is provided with a bottom member magnet 5.10, and the plane member magnet 4.9 and the bottom member magnet 5.10 can magnetically attract each other. By mounting the magnets, it facilitates the alignment of the lower stop plane member 4 and the lower stop bottom member 5, and further convenient for users to quickly and easily combine the lower stop plane member 4 and the lower stop bottom member 5 together through the attractive force of the magnet and the rotating structure of the lower stop.

[0041] Further, the plane member magnet 4.9 is embedded in the plane member cylinder 4.3, and the bottom member magnet 5.10 is fixed in the main groove 5.3, which is convenient for magnet assembly. Specifically, as shown in FIG. 8, the top of the plane member cylinder 4.3 has an opening, and after the plane member magnet 4.9 is put into the inner cavity of the plane member cylinder 4.3 through the top opening, the plane member top board 4.2 is welded on the top opening. In the lower stop bottom member 5, the middle of the bottom member bottom board 5.2 is provided with a mounting hole. After the bottom member magnet 5.10 is mounted into the mounting hole, the bottom member bottom board 5.2 is welded to the bottom member ring board 5.13. The connection strength is high by adopting welding connection.

[0042] In another specific embodiment, as shown in FIGS. 9 to 12, the magnet may also be assembled on the lower stop in other ways, such as integrated molding. Specifically, by defining through-holes in the lower stop plane member 4 and the lower stop bottom member 5, the plane member magnet 4.9 is fixed by an ejector pin in the mold, so that the plane member magnet 4.9 and the lower stop plane member 4 are molded together, and the bottom member magnet 5.10 is molded on the lower stop bottom member 5 by using the same method. This method is simple and convenient, however, it results in an extra hole structure in the lower stop. Compared to the previous magnet assembly method, the appearance is poor.

[0043] In addition to the zipper lower stop described above, a zipper is further provided according to the present application, which includes a zipper lower stop. The zipper lower stop may be the zipper lower stop provided

in any one of the above embodiments, and the beneficial effects can be referred to the above embodiments accordingly.

[0044] The zipper further includes a slider 2, a first cloth tape 1.1 and a second cloth tape 1.2. The first cloth tape 1.1 and the second cloth tape 1.2 each are provided with a row of zipper teeth 3, and the slider 2 is connected to a lower stop plane member 4.

[0045] Specifically, as shown in FIG. 5, a plane member fixing board 4.5 is fixedly arranged on the outer peripheral surface of the plane member cylinder 4.3, a recess 4.7 is arranged on the plane member fixing board 4.5, and a bottom member connecting board 5.5 is fixedly arranged on the outer peripheral surface of the lower stop bottom member 5. The plane member fixing board 4.5 is fixed to the first cloth tape 1.1. The recess 4.7 extends along the moving direction of the slider 2, and an opening of the recess 4.7 faces the second cloth tape 1.2. The bottom member connecting board 5.5 is fixed to the second cloth tape 1.2.

[0046] As shown in FIG. 3, when the slider 2 contact to the lower stop plane member 4 along the moving direction, the plane member fixing board 4.5 is located in an inner cavity of the slider 2, and the bottom member connecting board 5.5 extends into the recess 4.7 and into the inner cavity of the slider 2 during the process that the hook protrusion 4.4a extends into the limiting groove 5.12. By adding the plane member fixing board 4.5 and the bottom member connecting board 5.5, the stability of the connection between the lower stop and the slider 2 can be improved.

[0047] Specifically, as shown in FIG. 3, the plane member fixing board 4.5 defines a slider fixing groove 4.8 at one end away from the lower stop plane member 4. When the slider 2 contacts to the lower stop plane member 4 along the moving direction, one end of the slider core 2.1 of the slider 2 close to the lower stop plane member 4 can abut against the slider fixing groove 4.8, so as to improve the stability of the slider 2 placed on the first cloth tape 1.1.

[0048] Further, as shown in FIGS. 1 to 5, the bottom member connecting board 5.5 is provided with a bottom member lead-in tooth 5.6 at one end away from the lower stop bottom member 5 in the moving direction of the slider 2. After the slider 2 moves in the direction away from the lower stop plane member 4 and the zipper teeth 3 on the first cloth tape 1.1 and the second cloth tape 1.2 are engaged, as shown in FIG 1, the zipper teeth 3 on the second cloth tape 1.2 closest to the lower stop bottom member 5 and the bottom member lead-in teeth 5.6 jointly engage the zipper teeth 3 on the first cloth tape 1.1 closest to the lower stop plane member 4, so as to improve the adaptability between the lower stop and the zipper teeth.

[0049] In the zipper of this embodiment, when the two cloth tapes 1 are connected together, the slider 2 abuts against the lower stop plane member 4, and the slider core 2.1 stops at the slider fixing groove 4.8. With the lower stop plane member 4 on top and the lower stop

bottom member 5 on the bottom, the plane member cylinder 4.3 on the lower stop plane member 4 is axially aligned with and extends into the main groove 5.3, and the hook 4.4 is axially aligned with the guide channel 5.11. The user drives the lower stop plane member 4 to move downward in the axial direction while rotating until the lower stop plane member abuts against the lower stop bottom member 5 in the axial direction. Then, the lower stop plane member 4 no longer moves axially downward. The user drives the lower stop plane member 4 to rotate, enabling the hook protrusion 4.4a to extend into the guide rod portion 4.4b, and allowing the lower stop plane member 4 and the lower stop bottom member 5 to be rotationally locked. During the rotation of the lower stop plane member 4, the bottom member connecting board 5.5 extends into the recess 4.7 and enters the inner cavity of the slider 2. Afterward, when the slider 2 is pulled, the bottom member lead-in teeth 5.6 are engaged with the zipper teeth 3 of the first cloth tape 1.1, and the zipper teeth 3 on the two cloth tapes 1 are engaged with each other.

[0050] The zipper in this embodiment can achieve the engagement of the lower stop through rotation, facilitating easy insertion and removal of the lower stop. During assembly, the plane member cylinder 4.3 and the main groove 5.3 are locked with each other in the axial direction and rotated and guided in the circumferential direction. The cooperation of the hook 4.4 and the bottom member guide protrusion 5.4 can further guide the rotational engagement of the lower stop plane member 4 and the lower stop bottom member 5. The guide block 5.7, in conjunction with the inclined portion 4.6, guides the lower stop plane member 4 to rotate again, thereby facilitating the sliding of the slider 2 for closure. These three cooperating parts serve as the rotating guide member 4.1, enabling the lower stop plane member 4 and the lower stop bottom member 5 to rotate into an engagement state. After that, the lower stop plane member 4 rotates. During this process, the hook protrusion 4.4a extends into the limiting groove 5.12, and the bottom member connecting board 5.5 extends into the recess 4.7 of the plane member fixing board 4.5, while the zipper teeth 3 close to the lower stop engage with each other to form a stable structure. In the axial direction, the circumferential direction and the radial direction, the lower stop plane member 4 and the lower stop bottom member 5 would not separate from each other, thus ensuring the strength of the lower stop. At the same time, the rotating structure of the lower stop, cooperated with the attraction between the plane member magnet 4.9 and the bottom member magnet 5.10, allows for quick and easy assembly of the lower stop.

[0051] It should be noted that when an element is referred to as being "fixed" to another element, it may be directly fixed to another element or an intermediate element may be provided. When an element is referred to as being "connected to" another element, the element may be directly connected to another element or there

may be an intermediate element. Besides, in the description of the present application, unless otherwise specified, "plurality/multiple" means two or more.

[0052] In addition, orientations or positional relationships indicated by the terms "center", "upper", "lower", "left", "right", "vertical", "horizontal", "inside", "outside", and the like, are based on the drawings. These terms are merely intended for facilitating describing the present application and simplifying the description, rather than indicating or implying that devices or elements defined by the terms must comply with the designated orientation, or must be constructed and operated according to the designated orientation. Therefore, such terms should not be construed as a limitation to the present application. Furthermore, the terms "first" and "second" are merely used for purpose of description, and should not be construed as indicating or implying relative importance or implying the number of the indicated technical features.

[0053] Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by those skilled in the art belonging to the present application. The terms in the present application are used to describe specific embodiments, which are not intended to limit the present application.

[0054] The above embodiments in the specification are described in a progressive manner. Each of the embodiments mainly focuses on its differences from other embodiments. The same and similar parts between the various embodiments can be referred to each other.

[0055] Hereinabove the zipper lower stop and the zipper provided according to the present application are described in detail. The principle and implementation of the present application are illustrated by using specific embodiments herein. The above descriptions of the embodiments are only used to facilitate understanding of the method and the core idea of the present application. It should be noted that, several improvements and modifications may be made by those skilled in the art to the present application without departing from the principle of the present application, and these improvements and modifications also fall within the protection scope of the claims of the present application.

Claims

1. A zipper lower stop, comprising a lower stop plane member (4) and a lower stop bottom member (5), wherein

the lower stop plane member (4) comprises a plane member cylinder (4.3), a hook (4.4) protrudes from an outer peripheral surface of the plane member cylinder (4.3), and the hook (4.4) comprises a hook-shaped structure formed by a butt-joint of a guide rod portion (4.4b) and a hook protrusion (4.4a), wherein the hook protrusion

- (4.4a) is located at bottom of the hook (4.4) in an axial direction;
 a main groove (5.3) is formed in the middle of the lower stop bottom member (5), and an inner peripheral surface of the main groove (5.3) is provided with a bottom member guide protrusion (5.4) and a bottom member limiting protrusion (5.9), wherein the bottom member guide protrusion (5.4) and the bottom member limiting protrusion (5.9) are sequentially arranged in a circumferential direction with a guide channel (5.11) formed between them;
 when the lower stop plane member (4) is assembled with the lower stop bottom member (5), the plane member cylinder (4.3) enters the main groove (5.3) axially downwards, the hook (4.4) enters the guide channel (5.11) axially downwards, and at the same time, the guide rod portion (4.4b) and the bottom member guide protrusion (5.4) fit along the circumferential direction and an oblique guiding is formed to push the lower stop plane member (4) to rotate around a center line of the plane member cylinder (4.3) relative to the lower stop bottom member (5), and
 after the lower stop plane member (4) moves axially until a lower stop plane board abuts against the lower stop bottom member (5) in the axial direction, the lower stop plane member (4) continues to rotate, which makes the hook protrusion (4.4a) extend into the limiting groove (5.12) of the bottom member limiting protrusion (5.9), and thereby preventing the lower stop plane member (4) from being separated from the lower stop bottom member (5) in the axial direction.
2. The zipper lower stop according to claim 1, wherein the guide rod portion (4.4b) gradually extends downward along the axial direction and obliquely in the circumferential direction, and a circumferential end surface of the bottom member guide protrusion (5.4) close to the bottom member limiting protrusion (5.9) gradually extends downward along the axial direction and obliquely in the circumferential direction.
 3. The zipper lower stop according to claim 1, wherein a circumferential width of the guide channel (5.11) gradually decreases downward along the axial direction.
 4. The zipper lower stop according to claim 1, wherein the lower stop plane member (4) further comprises a plane member top board (4.2) fixed at a top end of the plane member cylinder (4.3) in the axial direction, the plane member top board (4.2) is provided with a rotating guide member (4.1) on a bottom surface in the axial direction, a bottom portion of the rotating

guide member (4.1) is located below the plane member cylinder (4.3) in the axial direction, and a recessed guide rail (5.1) is provided on a top surface of the lower stop bottom member (5) in the axial direction;

when the plane member cylinder (4.3) enters the main groove (5.3) axially downwards, the rotating guide member (4.1) and the guide rail (5.1) fit with each other along the circumferential direction and an oblique guiding is formed to push the lower stop plane member (4) to rotate relative to the lower stop bottom member (5), and when the lower stop plane member (4) moves axially until the lower stop surface board abuts against the lower stop bottom member (5) in the axial direction, the guide rail (5.1) abuts against the rotating guide member (4.1) in the circumferential direction.

5. The zipper lower stop according to claim 4, wherein the lower stop bottom member (5) is provided with a guide block (5.7) protruding upward from the top surface in the axial direction, the guide block (5.7) is provided with a guide slope, the bottom surface of the plane member top board (4.2) is provided with an inclined portion (4.6), and the inclined portion (4.6), the hook (4.4) and the rotating guide member (4.1) are sequentially arranged around the plane member cylinder (4.3) in the circumferential direction;
 when the plane member cylinder (4.3) enters the main groove (5.3) axially downwards, the guide slope and the inclined portion (4.6) fit with each other along the circumferential direction and an oblique guiding formed to push the lower stop plane member (4) to rotate relative to the lower stop bottom member (5).
6. The zipper lower stop according to any one of claims 1 to 5, wherein the lower stop plane member (4) is provided with a plane member magnet (4.9), and the lower stop bottom member (5) is provided with a bottom member magnet (5.10), wherein the plane member magnet (4.9) and the bottom member magnet (5.10) are configured to magnetically attract each other.
7. The zipper lower stop according to claim 6, wherein the plane member magnet (4.9) is embedded in the plane member cylinder (4.3), and the bottom member magnet (5.10) is fixed in the main groove (5.3).
8. A zipper, comprising a zipper lower stop according to any one of claims 1 to 7, and further comprising a slider (2), a first cloth tape (1.1) and a second cloth tape (1.2), wherein the first cloth tape (1.1) and the second cloth tape (1.2) each are provided with a row of zipper teeth (3), and the slider (2) is connected to

the lower stop plane member (4).

9. The zipper according to claim 8, wherein a plane member fixing board (4.5) is fixedly arranged on an outer peripheral surface of the plane member cylinder (4.3), 5

a recess (4.7) is arranged on the plane member fixing board (4.5),
 a bottom member connecting board (5.5) is 10
 fixedly arranged on the outer peripheral surface of the lower stop bottom member (5);
 the plane member fixing board (4.5) is fixed to the first cloth tape (1.1),
 the recess (4.7) extends along the moving direc- 15
 tion of the slider (2), and an opening of the recess (4.7) faces the second cloth tape (1.2),
 the bottom member connecting board (5.5) is fixed to the second cloth tape (1.2);
 when the slider (2) contacts to the lower stop 20
 plane member (4) along the moving direction, the plane member fixing board (4.5) is located in the inner cavity of the slider (2), and when the hook protrusion (4.4a) extends into the limiting
 groove (5.12), the bottom member connecting 25
 board (5.5) extends into the recess (4.7) and enters the inner cavity of the slider (2).

10. The zipper according to claim 9, wherein the bottom member connecting board (5.5) is provided with a 30
 bottom member lead-in tooth (5.6) at one end away from the lower stop bottom member (5) in the moving direction of the slider (2);
 after the slider (2) moves in a direction away from the lower stop plane member (4) to make the zipper teeth 35
 (3) on the first cloth tape (1.1) and the second cloth tape (1.2) engage with each other, the zipper teeth (3) on the second cloth tape (1.2) closest to the lower stop bottom member (5) and the bottom member lead-in teeth (5.6) jointly engage the zipper teeth (3) 40
 on the first cloth tape (1.1) closest to the lower stop plane member (4).

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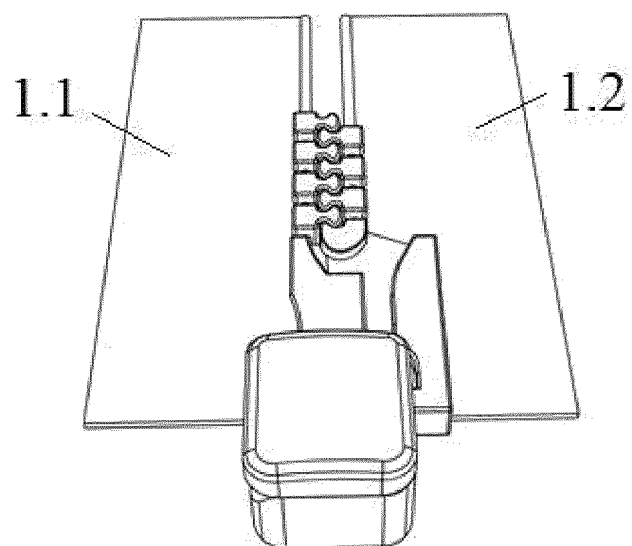


FIG. 1

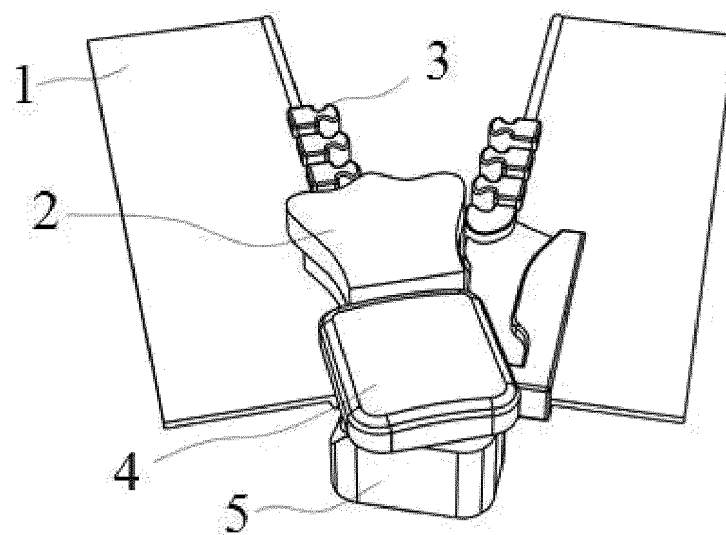


FIG. 2

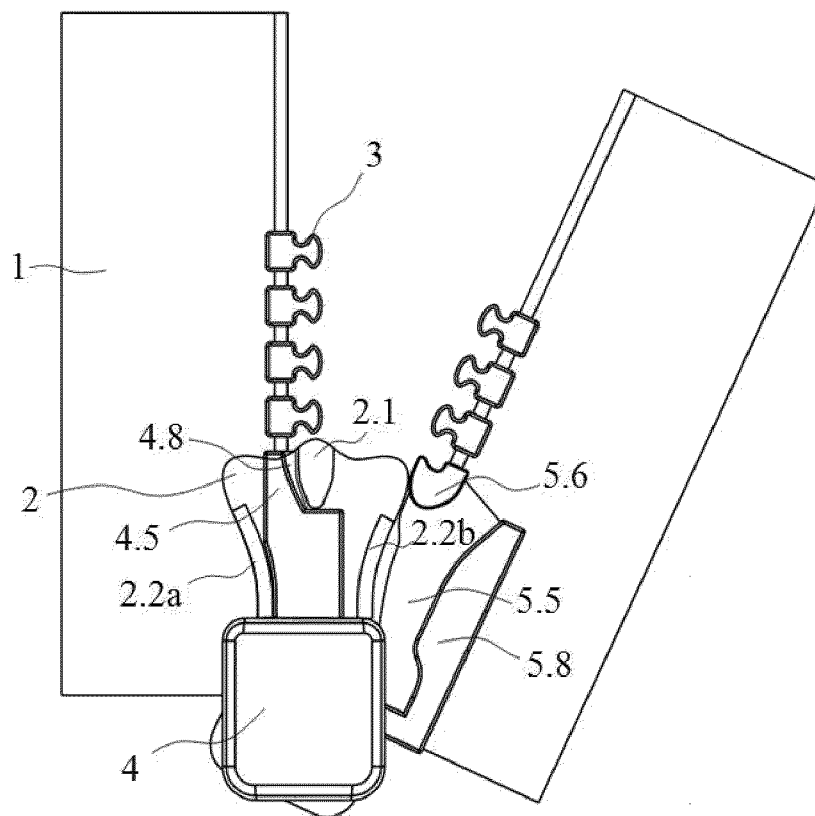


FIG. 3

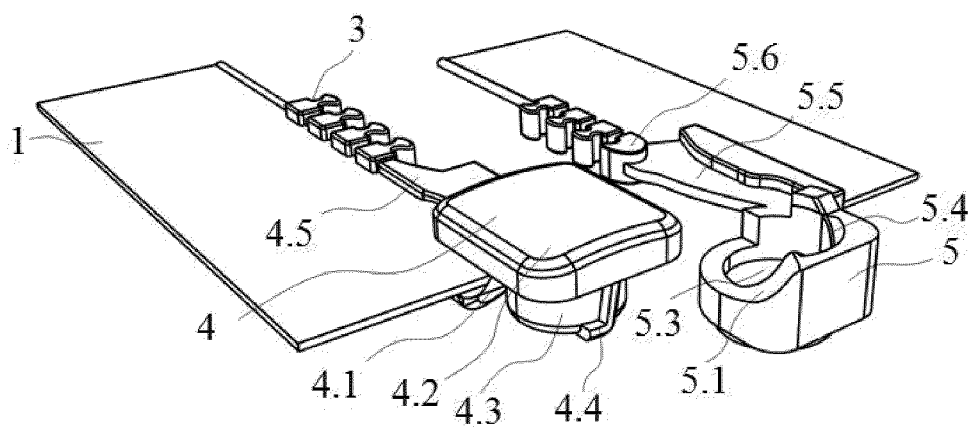


FIG. 4

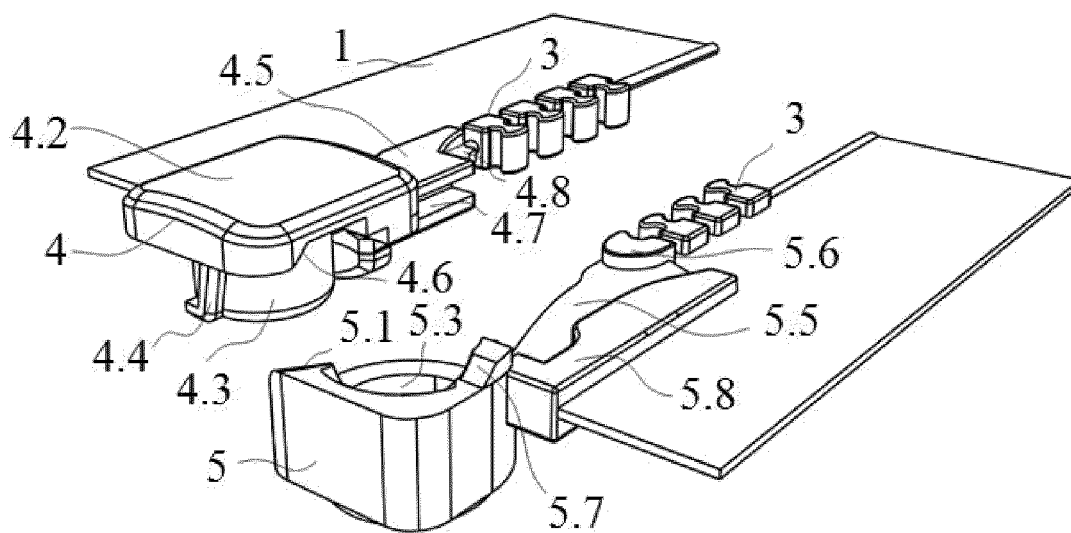


FIG. 5

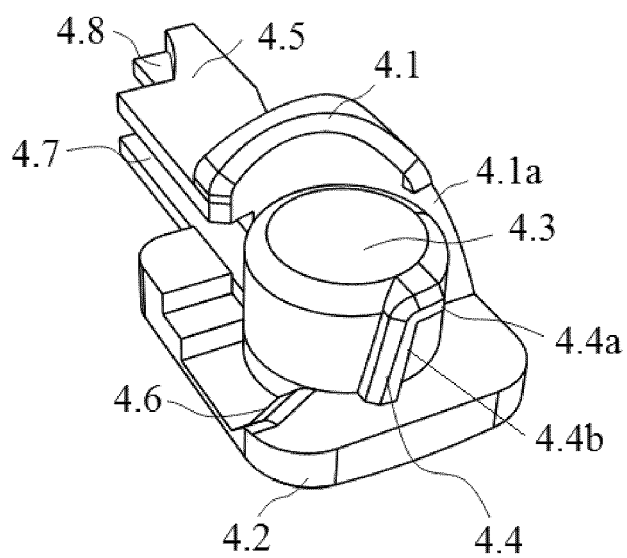


FIG. 6

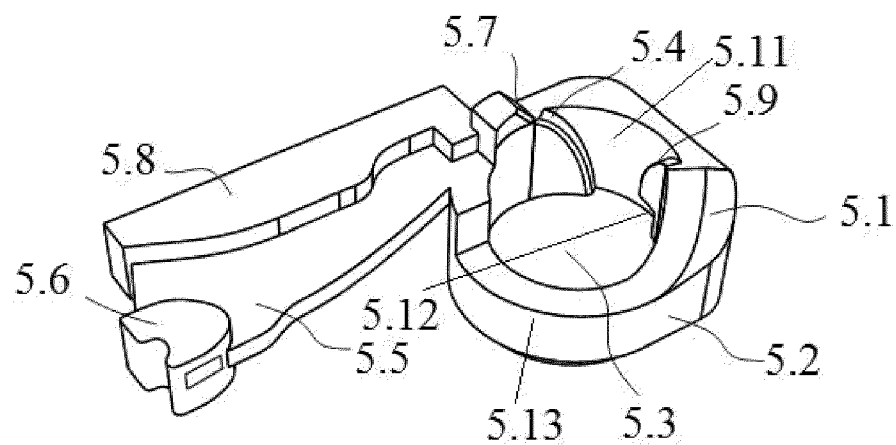


FIG. 7

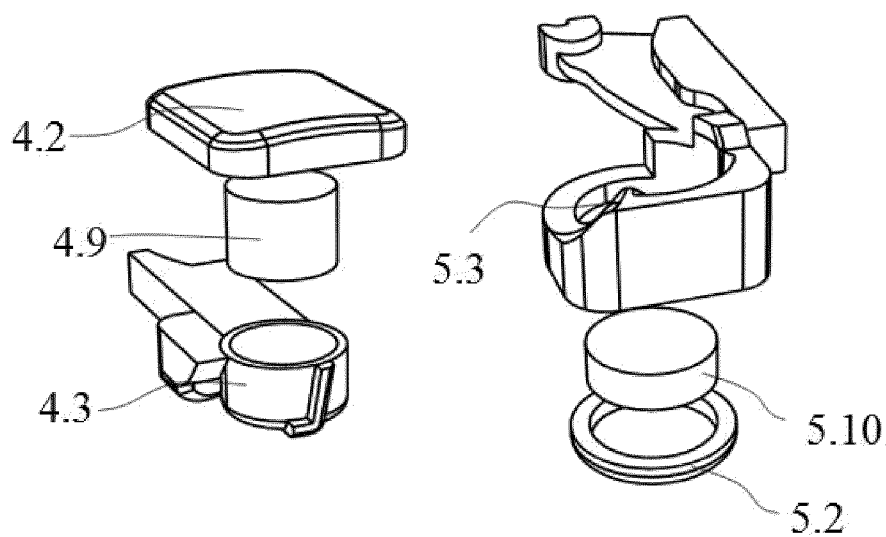


FIG. 8

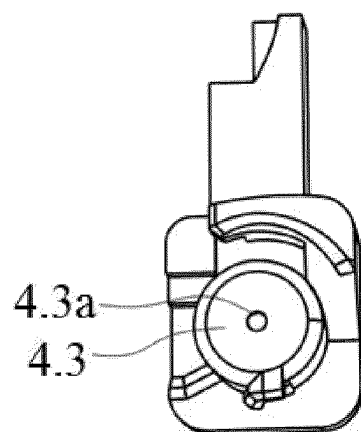


FIG. 9

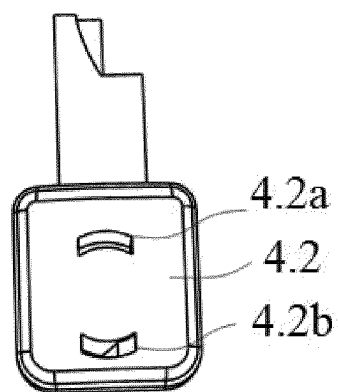


FIG. 10

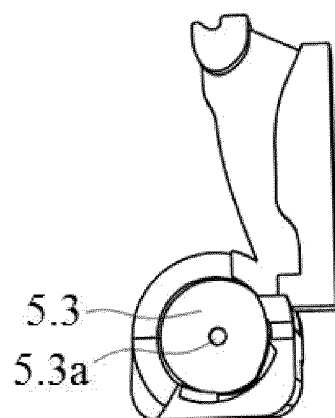


FIG. 11

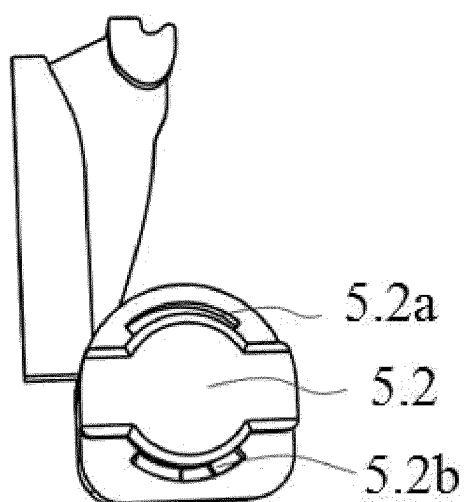


FIG. 12

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/107113

A. CLASSIFICATION OF SUBJECT MATTER

A44B19/36(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, WPABS, CNKI: 拉链 下止 圆柱 钩 导向 倾斜 旋转 转动 凹槽 限位 轴 凸起 突起
slide? fasten+ zipper stringer tape? stop column cylind+ hook guid+ inclin+ slant+ slope tilt+ rotat+ concave groove protr+
bulge project+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 218418702 U (ZHEJIANG WEIXING INDUSTRIAL DEVELOPMENT CO., LTD.) 03 February 2023 (2023-02-03) claims 1-10	1-10
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A	CN 1223103 A (YKK CORP.) 21 July 1999 (1999-07-21) entire document	1-10
A	CN 103005791 A (FUJIAN SBS ZIPPER SCIENCE & TECHNOLOGY CO., LTD.) 03 April 2013 (2013-04-03) entire document	1-10
A	CN 209628781 U (ZHEJIANG WEIXING INDUSTRIAL DEVELOPMENT CO., LTD.) 15 November 2019 (2019-11-15) entire document	1-10

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

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“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

“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

“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

“&” document member of the same patent family

Date of the actual completion of the international search

14 August 2023

Date of mailing of the international search report

18 August 2023

Name and mailing address of the ISA/CN

China National Intellectual Property Administration (ISA/
CN)
China No. 6, Xitucheng Road, Jimenqiao, Haidian District,
Beijing 100088

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/107113

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2023/107113

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